

OPERATOR'S MANUAL

Fetor

4911
5911
5945
6911
6945

DEAR OWNER OF THE NEW ZETOR TRACTOR

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

Notice:

During the print of this manual Z 5911 and Z 5945 tractors with and without cab had been introduced in the tractor manufacturing programme. The conception of these tractors is analogical as those of Z 6911 and Z 6945 tractors. That is why maintenance instructions for Z 6911 and Z 6945 tractors mentioned in this manual can be applied also for Z 5911 and Z 5945 tractors as well.

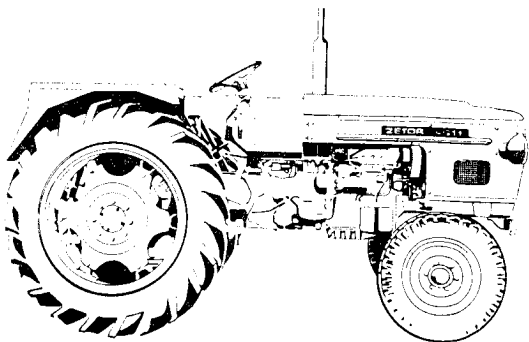
Because of permanent improvement of our products it may happen that the reading of this manual as well as relative illustrations will not correspond completely with the delivered vehicle.

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

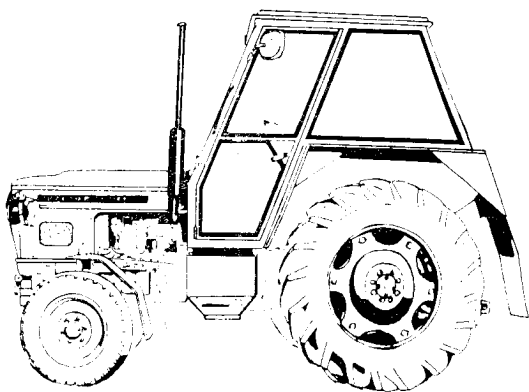
ZETOR

CONTENTS

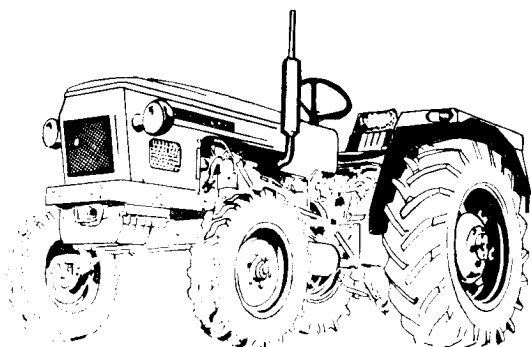
Specifications of Z 4911	6
Specifications of Z 6911, Z 6945	10
Few words about the tractor	16
Pedals and levers	19
Hydraulic circuit and pneumatic system control levers	21
Filling and draining orifices	23
Bleeding of the fuel system	27
Driver's seat	28
Electrical equipment and accessories	30
How to prepare the tractor for travelling	31
Hydraulic system of the tractor	36
Brakes	37
Front axle	38
Rear wheels	40
Tyre inflating	42
Tyre filling with water	43
Special accessories	44
Front driven axle	45
Power assisted steering mechanism	46
Couplings	47
PTO for 540 and 1000 RPM	49
Belt pulley	50
Both front and rear wheels ballast weights	51
Air brakes	51
Coupling for semi-trailer	52
Cab	53
Hot water heating equipment	53
Maintenance and adjustment	56
Maintenance instructions	61
Troubles and their remedies	67
Lubrication chart	



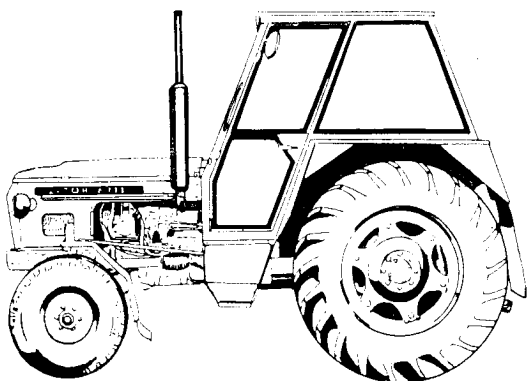
ZETOR 4911



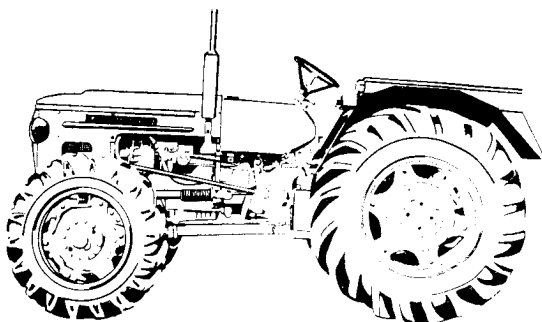
ZETOR 4911 with cab



ZETOR 6911



ZETOR 6911 with cab



ZETOR 6945



ZETOR 6945 with cab

SPECIFICATIONS

Tractor	Z 4911	Z 4911 with safety cab
Engine		
Model	Z 4901	
Type	four strokes in line diesel engine with direct fuel injection	
No. of Cylinders	3	
Bore	102 mm	
Stroke	110 mm	
Compression Ratio	17 : 1	
Output Class	SAE 34.2 kW (46.5 H.P.) — 5 ^{0/10}	
Cylinder Liners	wet, independent for each cylinder	
Nominal Revolutions	2200 RPM	
Injection Timing	24.5°—1.5°	
Nozzles	DOP 150 S-335-4359	
Engine Weight	315 kg	
Cooling System	forced circulation water cooling and thermostatic temperature control device	
Oil Pump	geared	
Oil Cleaner	two stage type	
Fill up Data:		
engine oil sump — oil	9 litres	
injection pump — oil	0,2 litre	
air cleaner — oil	1.3 litre	
gearbox, main trans- mission housing — oil		
— on flat ground	19 litres	
— on unplain ground	25 litres	
portals — oil	3.8 litres (2×1.9 litre)	
steering box — oil	1.9 litre	
cooling system — liquid	9.5 litres	
fuel tank - Diesel-oil	47 litres	67 litres
brake liquid vessel	0.3 litre	
Clutch		
	double acting provided with plate spring	

Gearbox 10 speeds forward: 5 road speeds and 5 reduced ones,
2 reverse speeds: 1 road speed and 1 reduced one

Speeds of the tractor
provided with tyres 12.4/11-28

Road Speeds: km/h

1st speed 4.44

2nd speed 6.60

3rd speed 9.19

4th speed 14.12

5th speed 23.58

Transmission Ratio
for Reduction Speeds 4.2762

Reduced Speeds:

1st speed 1.04

2nd speed 1.55

3rd speed 2.15

4th speed 3.30

5th speed 5.51

Reduced Speeds:

road speed 5.79

reduced speed 1.35

Steering System unilateral, ball-type
(when a trouble occurs not to
disassemble it)

Brakes

foot brakes double pedal hydraulic control brakes
hand brake band-type brake with mechanical control

PTO Drive PTO standard revolutions
540±10 RPM at 2000 engine RPM

PTO dependent at the 1st speed 250.4 RPM

revolutions at the 2nd speed 372.7 RPM

through gearbox at the 3rd speed 519.3 RPM

at the 4th speed 797.2 RPM

at the 5th speed 1331.6 RPM

at the reverse speed —326.8 RPM

Hydraulic Power Lift

Operating pressure	12 MPa (120 kp/sq.cm)
Pump output	20 litres/min.
Lifting power at ball joints of the hydraulic power lift (800 mm)	9.8 kN (1000 kps)

Electrical Equipment

Storage battery	12 V
Alternator	14 V/35 A
Starter	12 V/2.9kW

Tyre Size

front tyre — standard	6.00-16
front tyre — optional	6.50-16
rear tyre — standard	12.4/11-28
rear tyre — optional	14.9/13-28
	12.4/11-32
	9.5/ 9-32

Main Dimensions and Weights

(of tractors provided with standard tyres)

	Z 4911	Z 4911 with safety cab
Overall length (without coupling linkage)	3160 mm	3375 mm
Overall width (at rear wheel track of 1350 mm, with ballast weights)		1848 mm
Height up to the steering wheel upper border	1635 mm	1735 mm
Ground clearance with coupling linkage		298 mm
Height of the swinging bar		344 mm
Wheel base		1988 mm

	Z 4911	Z 4911 with safety cab
Front wheel track — adjustable	1280—1375—1750 mm	
Rear wheel track — adjustable	1350—1800 mm	
Height of the center of gravity	710 mm	693 mm
Front axle ballast weights	140 kg totaly	
Rear wheels ballast weights	175 kg	
Water in rear tyres	2×125 kg	
Travel ready tractor weight if provided with hydraulic power lift	2170 kg	2440 kg
of which:		
— front axle weight	775 kg	850 kg
— rear axle weight	1395 kg	1590 kg
Overall height of the tractor (up to the upper exhaust orifice)	1860 mm	2375 mm

Traction Power of the Tractor

traction power in the swinging bar	20 kN (2050 kp)	21.09 kN (2150 kg)
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SPECIFICATIONS

Tractor	Z 6911	Z 6911 with safety cab	Z 6945	Z 6945 with safety cab
Engine				
Model		Z 6901		
Type		four strokes in line diesel engine with direct fuel injection		
No. of Cylinders		4		
Stroke		110 mm		
Bore		102 mm		
Sompression Ratio		17 : 1		
Output Class		SEA 47.5 kW (64.5 H.P.) — 5 0/0		
Cylinder Liners		wet, separate for each cylinder		
Nominal Revolution		2200 RPM		
Injection Timing		24.5°—1.5°		
Nozzles		DOP 150S — 335 — 4359		
Engine Weight				
Without Accessories		405 kg		
Cooling System		forced circulation liquid cooling system provided with thermostatic temperature control device		
Oil Pump		geared		
Oil Cleaner		centrifugal — full flow type		
Fill up Data:				
engine oil sump — oil		12 litres		
injection pump — oil		0.2 litre		
air cleaner — oil		1.3 litre		
gearbox, final drive housing — oil				
— on flat ground	25 litres		27 litres	
— in terrain	32 litres		34 litres	
portals		3.8 litres (2×1.9)		
steering box — oil		1.9 litre		

	Z 6911	Z 6911 with safety cab	Z 6945	Z 6945 with safety cab
front driven axle housing — oil	—		7 litres	
front wheel planetary reducers — oil	—		2×1 litre	
power steering tank — oil		4 litres		
fuel tank — Diesel-oil	76 litres	67 litres	76 litres	67 litres
cooling system — liquid		13 litres		
brake liquid vessel		0.2 litre		
steering shock absorber — oil	—		0.6 litre	

Clutch double acting clutch provided with plate spring

Gearbox 10 speeds forward: 5 road speeds and 5 reduced ones; 2 reverse speeds: 1 road speed and 1 reduced one; (4th and 5th speeds synchronized — optional only); the torque multiplier delivered also as an optional equipment doubles the number of speeds.

Speeds of the tractor provided with tyres

	14.9/13-28 no torque multiplier	14.9/13-28 with torque multiplier
Road speeds:	km/h	km/h
1st speed	4.35	5.70/ 4.35
2nd speed	6.47	8.49/ 6.47
3rd speed	9.01	11.83/ 9.01
4th speed	13.83	18.16/13.83
5th speed	23.07	23.07/17.60

Transmission ratio for reduction

4,2762

	Z 6911	Z 6911 with safety cab	Z 6945	Z 6945 with safety cab
Reduced speeds :				
1st speed	1.02		1.33/1.02	
2nd speed	1.52		1.98/1.52	
3rd speed	2.11		2.77/2.11	
4th speed	3.24		4.25/3.24	
5th speed	5.40		5.40/4.11	
Reverse speeds :				
road speed	5.67		7.44/5.67	
reduced speed	1.33		1.74/1.33	

Steering System unilateral, ball-type
(when a trouble occurs not to disassemble it)

Brakes

foot brakes double pedal hydraulic control
hand brake band-type mechanical control

PTO Drive PTO standard revolutions:
540 RPM at 2000 engine RPM
1000 RPM at 2050 engine RPM

PTO dependent revolutions on the shifted-in speed (through the gearbox)	Tractor not provided with torque multiplier	Tractor provided with multiplier
at the 1st speed	250.4 RPM	328.8 RPM
at the 2nd speed	372.7 RPM	489.2 RPM
at the 3rd speed	519.3 RPM	681.2 RPM
at the 4th speed	797.2 RPM	1046.6 RPM
at the 5th speed	1331.6 RPM	1331.6 RPM
at the reverse speed	-326.8 RPM	-439.2 RPM

Hydraulic Power Lift

Operating Pressure 12 MPa (120 kp/sq.cm)
Pump output 20 litres/min
Lifting power at hydraulic power
lift ball joints 16 kN (1600 kp)

Electrical Equipment

Storage battery	12 V
Alternator	14 V/35 A
Starter	12 V/2,9 kW

Tyre Sizes

front tyre — standard	7.50-16	11.2/10-24
front tyre — optional	6.50-16	—
rear tyre — standard	14.9/13-28	16.9/14-28
rear tyre — optional	16.9/14-28	16.9/14-30
	16.9/14-30	12.4/11-36
	12.4/11-36	
	13.6/12-36	

Main Dimensions and Weights

(of tractors provided with standard tyres)

	Z 6911	Z 6911 with safety cab	Z 6945	Z 6945 with safety cab
Overall length (without coupling linkage)		3655 mm		3655 mm
Overall width (at rear wheel track of 1425 mm)		1800 mm		1980 mm
Height up to the steering wheel upper border	1761 mm	1801 mm	1785 mm	1825 mm
Ground clearance		305 mm		355 mm
Height of the swinging bar		376 mm		355 mm
Wheel base		2247 mm		2220 mm
Front wheel track — adjustable	1430-1655-1805 mm		1510 mm (rigid)	
Rear wheel track — adjustable by 75 mm	1425-1800 mm		1425-1800 mm	
Height of the centre of gravity	745 mm	806 mm	845 mm	

	Z 6911	Z 6911 with safety cab	Z 6945	Z 6945 with safety cab
Front axle ballast weights - maximum	160 kg		400 kg	
Rear wheel ballast weights	315 kg		315 kg	
Water in rear tyres	380 kg (2×190)		430 kg (2×215)	
Maximum weight of the travel ready tractor provided with hydraulic power lift	2730 kg	2980 kg	3120 kg	3370 kg
of which:				
— front axle weight	970 kg	1020 kg	1325 kg	1430 kg
— rear axle weight	1760 kg	1960 kg	1795 kg	1940 kg
Overall height of the tractor (up to exhaust top)	1961 mm	2451 mm	1985 mm	2475 mm

Tractor Traction Power

Traction power of the tractor in the swinging bar	26 kN 2600 kg	28 kN 2800 kg	32 kN 3200 kg	35 kN 3500 kg
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Main Specifications of the Power Assisted Steering Device (optional)

1. Cylinder

Cylinder inner diameter	50 mm
Length at shifted-in piston rod	586 mm
Length at shifted-out piston rod	836 mm
Maximum operating pressure	8 MPa (80 kp/sq.cm)

2. Pump

Maximum input	2.2 kW (3.5 H.P.)
Operating liquid	OL N2
Maximum operating pressure	8 MPa (80 kp/sq.cm)
Revolution range	250 up to 1200 RPM

Pump output (oil OL N2 at the temperature of $20^{\circ}\pm 5^{\circ}$ C and the pressure of 8 MPa at 1200 RPM of the pump)

10 litres/min

3. Tank

Filling capacity

11 litres (proper filling of the power assisted steering device makes 4 litres)

Different specifications of Z 5911, Z 5945

Engine

Z 5901

Bore

100 mm

Output Class

SAE 43 — 5 $\frac{0}{0}$ kW (55.5 PS)

The other specifications are the same as those for the Z 6911 — Z 6945 tractors.

FEW WORDS ABOUT THE TRACTOR

Dash Board (Fig. 1, 2)

1. Switch box with key

Key fully inserted:

position 0 — starting circuit, charging circuit and its pilot lamp are switched on;

position 1 — contour (side) and parking lights as well as tail lights and illumination of instruments are on;

position 2 — high beam, high beam pilot lamp, tail lights, illumination of instruments and side lights are on;

position 3 — dipped lights, tail lights, illumination of instruments and side lights are on.

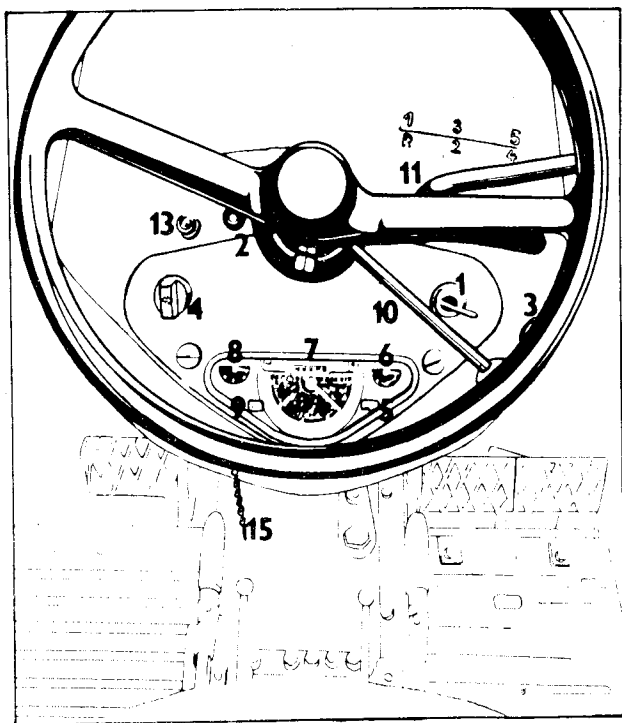


Fig. 1

Is the key only half inserted, circuits of positions 1, 2 or 3 can be switched on.

2. Dashboard illumination switch — switching on is carried out when drawing the button slightly up.
3. Push button of the starter.
4. Trafficator switch with electric horn push button — the right-hand or left-hand trafficator is switched on by turning the lever to the right or to the left, by depressing the button, the horn is operating.
5. Oil pressure gauge (for Z 6911 and Z 6945 tractors with and without safety cab) — correct oil pressure ranges from 0.19—0.5 MPa (1.9—5 kp/sq.cm) at the temperature of 80° Centigrade. If the lubrication pilot lamp in red (for Z 4911 tractors) is on during the tractor performance, it means a trouble in the lubrication system.

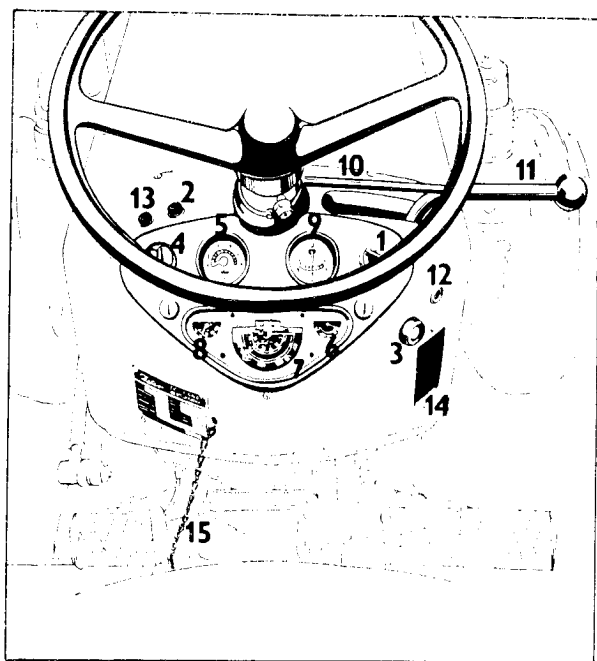


Fig. 2

6. Water thermometer — performance water temperature of the engine should range from 80—95° C (the radiator over-pressure plug opens the cooling circuit at 106—111° C).
7. Engine hour counter with speed indicator — with the engine running at 1600 constant RPM one hour, the engine hour counter indicates one engine-hour.
8. Air pressure gauge — performance pressure of the air is 0.58—0.63 MPa (5.8—6 kp/sq.cm).
9. Ammeter (on Z 6911 and Z 6945 tractors with and without safety cab). Charging pilot lamp (on Z 4911 tractors) is red — if it is on during the performance of

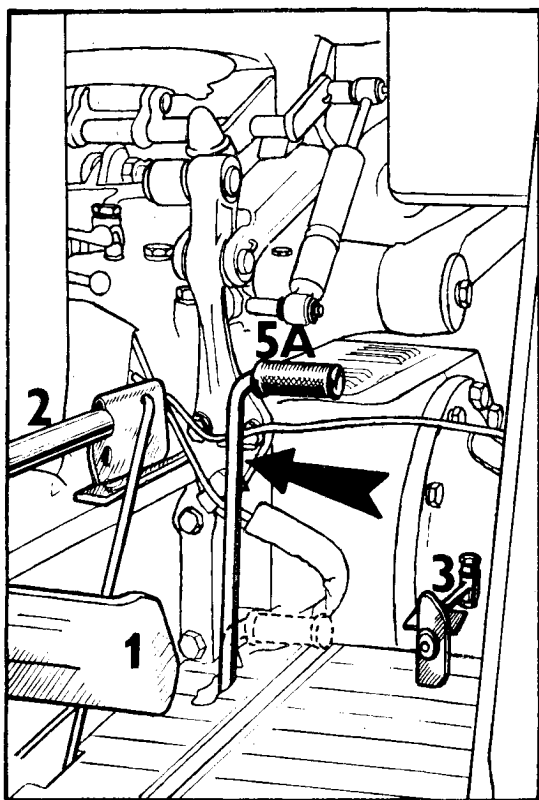


Fig. 3

the tractor, it means some trouble in the charging system.

10. Hand operated accelerator — the fuel dose gets increased when displacing the control lever rearwards.
11. Speed shifting lever.
12. Sockets for the lamp for mounting purposes.
13. Switch of the headlamp for night work.
14. Fuse box.
15. Radiator blind.

PEDALS AND LEVERS

1. Travel clutch pedal (Fig. 3/1).
2. Hand controlled disengagement of the PTO clutch (Fig. 3/2): lower position means that the PTO clutch is engaged, upper position — PTO clutch is disengaged. Hand operated PTO clutch disengagement can be carried out for a short period only. There is a left-hand shifting lever, placed on the gearbox cover which serves for permanent disengagement of the PTO (Fig. 4/4.)

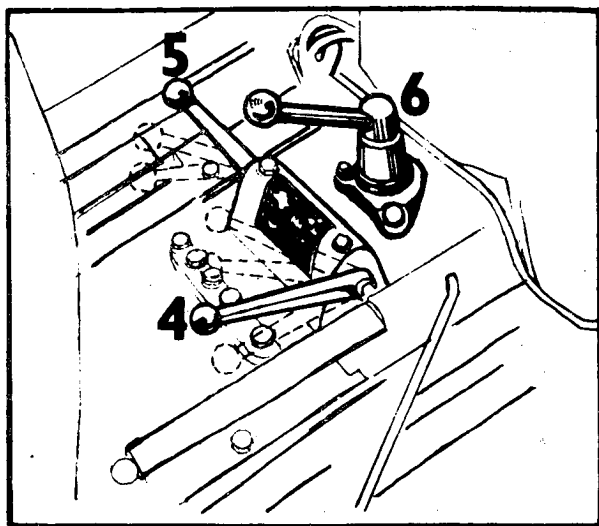


Fig. 4

3. Torque multiplier control pedal (Fig. 3/3) (on Z 6911 and Z 6945 tractors with and without safety cab).

Attention: When the torque multiplier is engaged, the tractor cannot be braked by the engine. The tractor travel can be disengaged by means of the clutch disengagement hand control lever only.

4. Both the PTO and hydraulic power lift control lever (Fig. 4/4):

- a) hydraulic power lift — the control lever is down thus representing the 2nd or lowermost position (the hydraulic power lift is put into operation but without the PTO which does not rotate),
- b) PTO together with the hydraulic power lift are in operation — the control lever is down but in its 1st position only,
- c) neutral position,
- d) PTO is put into operation through the gearbox — the control lever is up; PTO revolutions depend on the engaged speed,

5. Reduced and road speeds control lever (Fig. 4/5):

- a) up — road speeds
- b) centre — neutral position
- c) down — reduced speeds

- 5A. Front axle drive control lever (Fig. 3/5A):

- a) up — front axle drive is engaged
- b) down — front axle drive is disengaged

6. PTO revolution control lever (Fig. 4/6) (on Z 6911 and Z 6945 tractors with and without safety cab) when the control lever is displaced forwards — in the sense of the tractor travel — it is in its neutral position; if the control lever is displaced to the left — 540 RPM of the PTO are engaged, if it is displaced to the right — 1000 RPM of the PTO are engaged.

IMPORTANT

When changing PTO exchangeable end pieces (Fig. 5/11) from 540 RPM (1000 RPM) to 1000 RPM (540 RPM) and vice versa it is necessary to put the PTO revolutions control lever in its neutral position and only then change the PTO end part. This operation being carried out, 1000 RPM (540 RPM) of the PTO can be engaged again.

7. Foot brake pedals are connected by means of a catch (Fig. 5/7).
8. Accelerator pedal (Fig. 5/8).
9. Differential lock pedal (Fig. 5/9).
10. Hand brake control lever (Fig. 5/10) — its bottom position means that the hand brake is unbraked, its top position — braked.

Hydraulic Circuit and Pneumatic System Control Levers

1. Hydraulic power lift remote circuit control lever (Fig. 6/1).
2. Hydraulic power lift inner circuit control lever (Fig. 6/2).
Hydraulic equipment control levers on tractors provided with safety cab pass through the cab floor by means of packed holes. The control panel is fixed on the cab floor thus diminishing the noise in the cab.

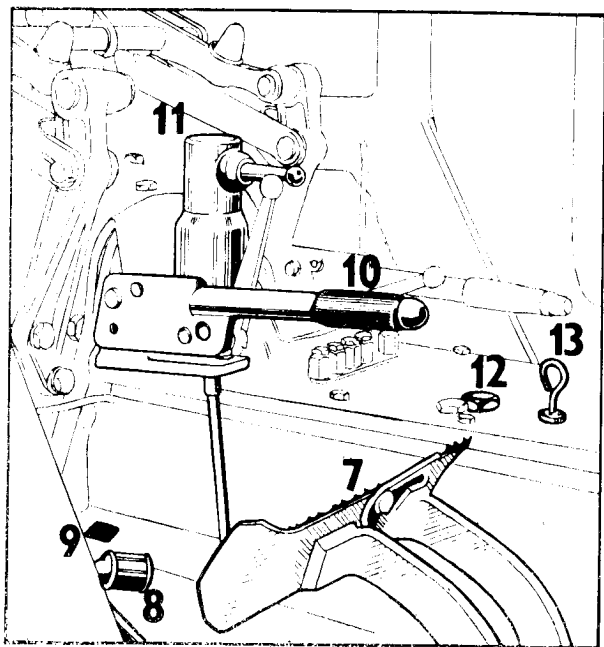


Fig. 5

3. Hydraulic power lift selecting lever (Fig. 6/3) can be displaced in three positions according to the selected control system:
 - draft control
 - mixed control
 - position control.
4. Hydraulic power lift response lever (Fig. 6/4).
5. Oil cleaner magnetix plug of the hydraulic power lift (Fig. 6/5).
6. Compressor control lever (Fig. 7/6). If the compressor is to be put into operation its engagement should be carried out at minimum engine revolutions at the simultaneous tock lifted upwards and the lever engaged in the sense toward the radiator (Fig. 7/6).
7. Lock (Fig. 7/7).

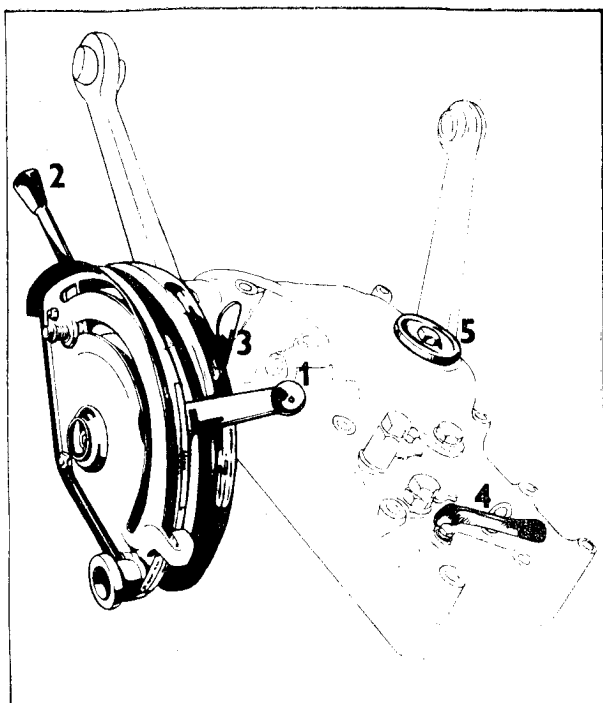


Fig. 6

FILLING AND DRAINING ORIFICES

1. Coolant filling orifice in the radiator (Fig. 10/1).

NOTE: In the winter season when the cooling system is not filled up with antifreeze solution, water must be drained by means of taps situated on the crankcase as well on the radiator bottom part. As far as the tractor is provided with hot water heating equipment, water is to be drained also from this equipment.

2. Fuel filling orifice (Fig. 8/2).
3. Water drain tap from the radiator (Fig. 10/3).
4. Water drain tap from the crankcase (Fig. 8/4).
5. Both oil filling and draining orifices of the steering box are situated on the left-hand top part of the gearbox, under the fuel tank.

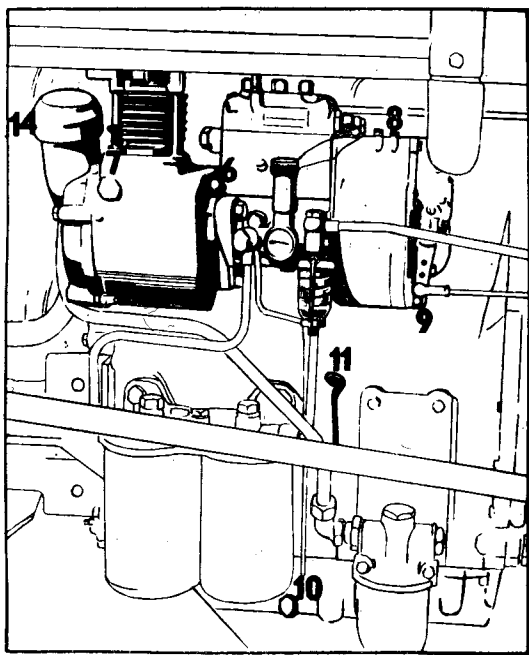


Fig. 7

6. Draining tap of the coolant from the heating equipment (Fig. 8/1).
7. Oil draining bolt of the gearbox is situated in the gearbox bottom part between the front and rear cover.
8. Oil filling orifice of the injection pump and the governor (Fig. 7/8).
9. Oil filling orifice of the engine (Fig. 7/14 — on Z 4911 tractors, Fig. 8/14 — on Z 6911 and Z 6945 tractors with and without safety cab).
On the tractors of the latest execution the filling orifice is situated in the side cover on the tractor RH side.
10. Oil draining hole of the injection pump and the governor (Fig. 7/9).
11. Oil drain bolt of the engine (Fig. 7/10).
12. Oil dipstick for checking the oil level in the engine sump (Fig. 7/11).
13. Oil filling orifice of the gearbox and the final drive housing (Fig. 5/12).
14. Oil dipstick for checking the oil level in the gearbox and the final drive housing (Fig. 5/13).

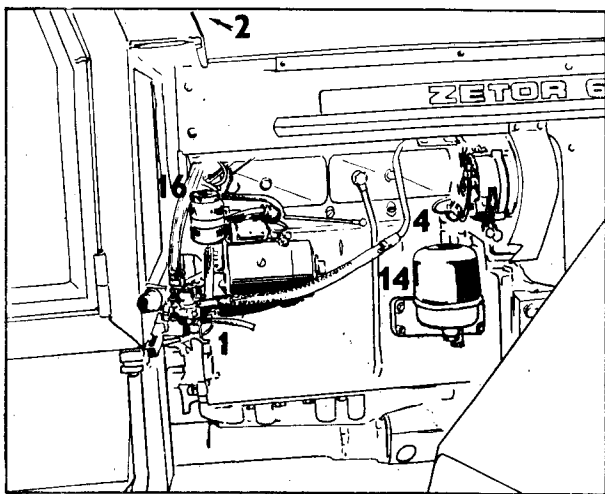


Fig. 8

15. Rear half axle oil filling hole (Fig. 9/14).
16. Rear half axle oil draining hole (Fig. 9/15).
17. Brake liquid filling orifice (Fig. 8/16).
18. Power assisted steering device oil filling orifice (Fig. 10/2).
19. Front driven axle oil filling orifice is situated on the front axle body.
20. Front driven axle draining orifice is situated on the bottom part of the front driven axle body.
21. Oil filling orifices of the reducers (Fig. 11/13).
22. Oil draining orifices of the reducers (Fig. 11/5).

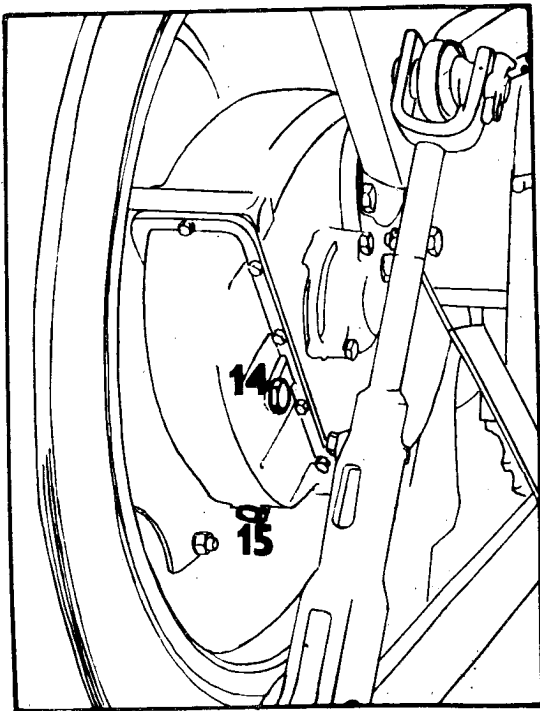


Fig. 9

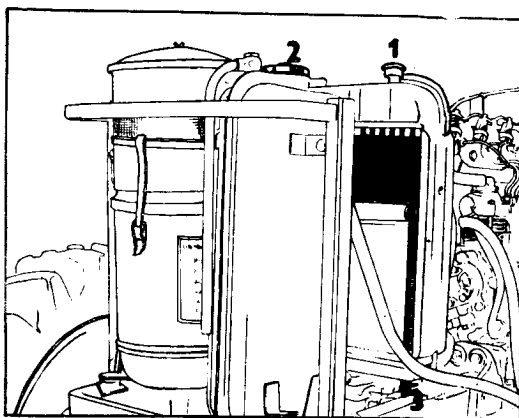


Fig. 10

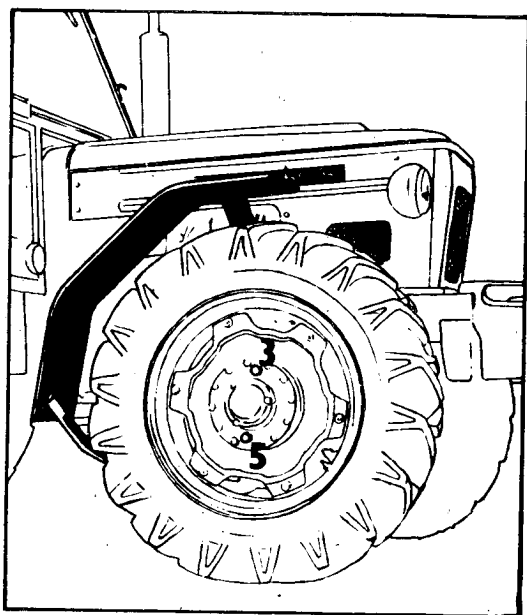


Fig. 11

Bleeding of the Fuel System (Fig. 12)

When cleaning the fuel system, loosening screws or bolts or when removing some part of the fuel system or after a longer period of interruption of the tractor performance or if the fuel is no more in the fuel tank, it is necessary to bleed all the fuel system.

The bleeding is to be carried out by means of the hand pump (Fig. 12/1) at loosened bleeding screws on the fine fuel filter (Fig. 12/2) and on the injection pump as well (Fig. 12/3, 4). Pump manually by the hand pump of the fuel filter until fuel escapes around the bleeding screws of the fine filter and the injection pump free of any bubble. If the fuel flows out free of air bubbles, tighten the bleeding screws on the fine fuel filter and then also on the injection pump as well.

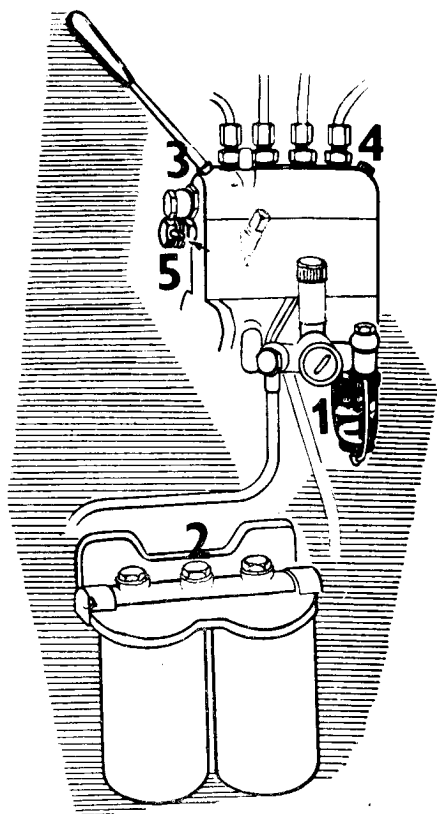


Fig. 12

Driver's Seat

The seat is dully springy and its position can be changed according to the weight and size of the driver's body. The distance of the seat from the steering wheel is changeable by loosening nuts placed on the base plate and by displacing the seat forwards or rearwards as well.

Driver's Seat for the Tractor Provided with the Safety Cab

This seat is of an up-to-date conception and provided with pads with soft filling. It is sprung up by means of a steel spring and the springing is adjusted by a small wheel (Fig. 13/1) according to the weight of the driver from 60 up to 120 kg.

The seat is adjustable in its longitudinal axis from its central position of $+75$ mm when unlocking the lever situated on the left-hand side (Fig. 13/2) and vertically of $+30$ mm when unlocking the lever (Fig. 13/3).

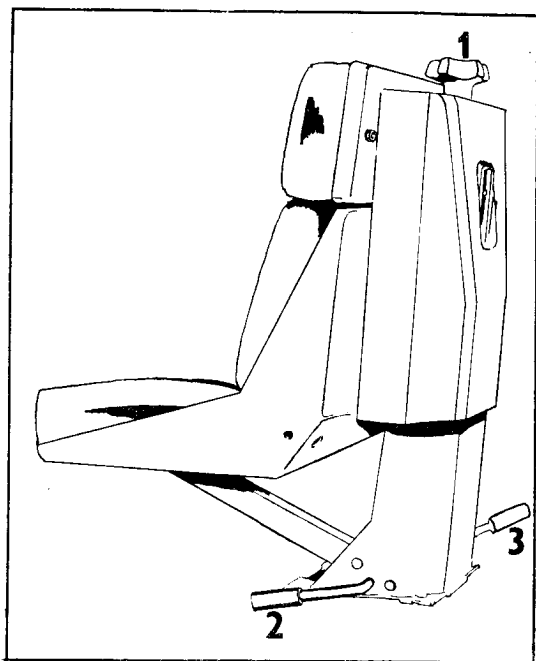


Fig. 13

Driver's Seat „AEROLASTIC“ (Fig. 14)

The seat is pneumatically springy, and provided with a hydraulic shock absorber. The pressure in the diaphragme can be increased according to the weight of the driver up to 250 kPa. The seat is adjustable in its longitudinal axis from its central position of 75 mm forwards or rearwards. Better comfort of the driver is assured with adjustable rests for hands and a back rest as well.

Recommended seat inflating:

Weight of the Driver in kg	Diaphragme Inflating in kPa (kp/sq.cm)
70	100 (1.0)
90	120 (1.2)
110	150 (1.5)
130	180 (1.8)

Tractors are also provided with mate's seat of the driver.

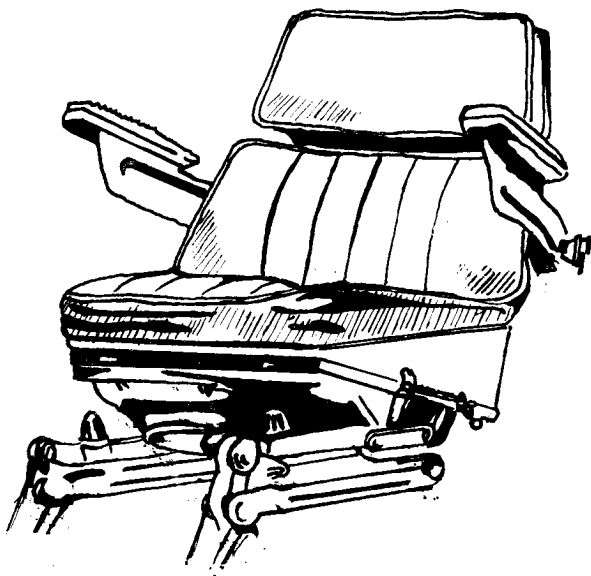


Fig. 14

ELECTRICAL EQUIPMENT AND ACCESSORIES

Storage Battery

During the tractor travel the storage battery is charged automatically. Inspect monthly the electrolyte level. The electrolyte is to be topped exclusively with distilled water in such quantity that the visible plates are slightly overflood. If the tractor shall not be employed for a longer period the storage battery is to be uncharged completely. It must be stored on a dry place and recharged after three months as a minimum.

For storage battery charging are valid general specifications and the charging values as well which correspond with the storage batteries capacity.

The electrolyte density (solution of sulphuric acid with distilled water) of 1.28 at the temperature of $+25^{\circ}\text{C}$ corresponds with the fully charged storage battery, the density of 1.22 means the half charged battery and the density of 1.15 means almost discharged battery which must be charged in such a case outdoors of the tractor.

The electrolyte in the discharged storage battery can get frozen and damage it.

Ever follow instructions of the Manufacturer of storage batteries which are delivered together with the tractor.

Starter Motor

The maintenance of the starter motor is limited to regular inspections, during which the following principles are to be respected:

1. The input cable terminals should be tightened well and protected with a thin coating of grease to avoid their corrosion. Damaged cables should be replaced by new ones.
2. Check collector, carbon brushes and brush holding springs once for six months.
3. Have the starter motor tested in a specialized repair-shop at the occasion of the current repair (CR) of the tractor.

NOTICE: There is a starting safety device fitted on tractors. Before every starting operation is therefore necessary to depress the clutch pedal which connects the switch and closes the starting circuit. Without depressing of the clutch it is not possible to start the tractor.

Voltage Regulating Relay

If the function of the voltage regulating relay had been disturbed have remedy the trouble in a specialized repair-shop. Any inexpert intervention can lead not only to the destruction of the relay but also to serious damage of further electrical accessories.

Alternator

The alternators do not require practically any maintenance during their performance. When washing and cleaning the tractor it should be avoided penetration of water or fuel into the alternator.

HOW TO PREPARE THE TRACTOR FOR TRAVELLING

Before starting to operate with the tractor check daily:

1. Condition of the steering system — steering linkage unions, tightening of bolts and nuts and the steering wheel dead course as well.
2. Water level in the radiator; replenish if necessary with soft (rainy) water free of sediments.
Apply antifreezing coolant during the winter season.
3. Fuel level in the tank — replenish if necessary. If the fuel level sinks to the bottom or if you have forgotten to open the fuel tap when starting the engine, it is necessary to bleed the fuel system and the whole injection set as well.
4. Brake fluid level in the compensating jar — if the fluid level sinks replenish the jar (maximum level should reach the top margin of the Manufacturer's trade mark PAL, the minimum level the top margin of the metallic holder).
5. Oil level in the engine sump.
6. Tightening of important joints — bolts, screws, nuts (particularly those of disks and wheel lugs).
7. Brakes — if some resistance is felt when depressing latched and unlatched pedals.
8. Condition of the electrical system — inspect lamps, lights, trafficators etc., replace defective bulbs or fuses.
9. Pressure in tyres — inflate fully if necessary.

10. When the tractor started to travel check the brakes efficiency (both the hand and foot brakes). Brake pedals must be latched.
11. As far as the trailer is attached to the tractor and equipped with air brakes, check if the compressor engagement is all right and if the minimum air pressure in the pneumatic system before starting to travel is 0.45 MPa (4.5 kg/sq.cm). Check function of air brakes, safety coupling of the trailer and the illumination of it as well.
12. Only one trailer or a vehicle in tow which does not exceed two and a half times the instantaneous weight of the tractor can be coupled to the tractor.

How to Start the Engine

Before starting the engine make sure that the speed gear shifting levers as well as those of auxiliary drives 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);
- open the fuel throttle to its maximum;
- depress the clutch pedal and push down the starter button.

IMPORTANT: Do never start longer than for 5 seconds only.

If the engine fails to start immediately for the first time repeat starting after 30 seconds only, particularly in the winter season. Do never help stopping the engine by means of the starter motor. Wait until the engine stops completely, otherwise the starter motor could be damaged. If necessary, especially in the winter season, depress the fuel overcharge button (Fig. 12/5) at simultaneous displacement of the accelerator hand control lever for full fuel supply.

How to Start the Engine in the Winter Season

It is advisable to preheat the engine at first by means of hot water in the season of lower temperature in such a way that lukewarm water flows out from the crankcase drain tap. The starting operation should be carried out at disengaged travel clutch and after having driven fuel

through the fuel system pumping manually with the fuel delivery pump situated on the fuel injection pump. The excess starting fuel dose is automatically added when the accelerator hand control lever is displaced in its position for full fuel dose at stillstood engine and the fuel over-charge button, placed on the fuel injection pump is simultaneously depressed. Unless the temperature indicated by the thermometer on the dashboard does not reach 45° C, accelerate very slowly and avoid to exceed the engine revolutions over 1800 RPM. (The engine warming-up is faster and more economical when the tractor travels than at idle run of the engine and sopped tractor.)

Commencing to Travel with the Tractor

Verify air pressure on the air pressure gauge when trailer or a vehicle in tow is coupled to the tractor. Minimum air pressure at the moment when the tractor starts to travel should reach 4.5 kp/sq.cm or 0.45 MPa.

1. Select road or reduced speed.
2. Reduce the engine RPM down to the idle run and depress the clutch pedal completely.
3. Engage the first speed by means of the shifting lever placed under the steering wheel at its right-hand side.
4. Release slowly the clutch pedal when simultaneously depressing the accelerator pedal thus augmenting engine revolutions.
5. When changing lower speeds by higher ones (e.g. the second speed by the third one), first depress the clutch pedal and simultaneously displace the speed shifting lever in its neutral position. Engage the clutch again, disengage it once more, shift in a higher speed engaging slowly the clutch.

Speed change from a higher to a lower one should be carried out with intergas. Reduce the engine RPM, disengage the clutch, shift off the previous higher speed, engage the clutch, augment engine RPM (according to the instantaneous travel speed) disengage the clutch, insert a lower speed and engage slowly the clutch at continuously increase of engine revolutions.

Reduced speeds should be shifted in by means of the same shifting lever as applied for road speeds, but after the displacement of auxiliary drives control lever (Fig. 4/5). If the tractor stands on a flat ground, release the hand bra-

ke, engage the clutch slowly and augment engine revolutions in such a way that a smooth start of the tractor is enabled. If the tractor stands on a slope, release the hand brake at simultaneous engagement of the clutch and increase of engine revolutions.

How to Drive the Tractor

1. Having started the engine but before commencing to travel with the tractor, warm up the engine to its sufficient performance temperature. Warming up the engine when driving the tractor under a small load is quicker and more economical.
2. Start to travel continuously without useless delays on lower speeds.
3. When running up a slope, shift in the necessary lower speed in time.
4. When travelling down a longer steep hill or slope, shift in the lower speed the steeper is the slope. This lower speed should be shifted in still before starting to run down the slope (do not overturn the engine).
5. During the tractor travel should be followed:
 - oil pressure gauge (oil pressure pilot lamp)
 - air pressure gauge (correct air pressure is 0.58 to 0.6 MPa or 5.8—6 kp/sq.cm), if the compressor is in operation
 - charging pilot lamp (ammeter)
 - water thermometer — most convenient engine performance temperature is 80—95° C.

If temperature is lower as referred, cover the radiator with the blind,

- engine hours counter — indicates the speed of the tractor with shifted-in fifth gear, including revolutions and the number of the tractor service hours at running engine,
 - trafficator pilot lamp (green), high beam pilot lamp (blue — it is on when the high beam is on, too), charging circuit pilot lamp — as well as the lubrication pilot lamp (red),
 - charging circuit pilot lamp — as well as the lubrication pilot lamp are off at higher revolutions, if they are on, a trouble is signalized.
6. When a trailer provided with pneumatic brakes is coupled with the tractor, check before starting to tra-

vel, if the compressor is engaged, if the minimum air pressure is 0.45 MPa or 4.5 kp/sq.cm, if pneumatic brake function is all right, if the trailer is hitched safely and if trailer lights are in order.

7. When transporting attached implements by means of the hydraulic power lift, lock the hydraulic power lift inner circuit control lever in its position „UP". Before descending from the tractor on the ground, lower the attached implements down to the ground at first.
8. The travel speed of the tractor loaded with attached implements should correspond with the structure of such implements.
9. It is prohibited to drive a tractor on the road with unlatched brake pedals.
10. Before starting to work with the tractor on a slopy terrain, consider well all possibilities of the work in order to prevent any dangerous inclination of the tractor.
11. When applying the tractor to loosen a stuck vehicle, proceed very carefully in order to prevent any accident
12. Do never use the tractor for pushing other vehicles or trailers with the aid of a bar or a plank introduced between the tractor and the pushed object.
13. Do never carry out any maintenance work on the tractor with running engine except when checking brakes efficiency and charging of batteries.
14. Do not open quickly the overpressure radiator plug when the engine is overheated and do not pour cold water into the radiator in such a case. It is always necessary to suspend the overpressure by turing the plug to the half open position.
15. The articulated shaft for driving of agricultural machines should be provided with a safeguard. Do never descend from the tractor unless the articulated shaft is disengaged.
16. No more than in the technical certificate specified number of persons can be transported in the driver's cab only.
17. Do never drive the tractor downhill without an engaged speed.
18. Do never use the differentiel lock when driving the tractor in a curve.

Running-in of the New Tractor

1. Drive the tractor neither with any machines or load nor with engaged auxiliary drives for approximately 10 first performance hours.
2. Do not load the tractor during its next 20 performance hours more than to its half output do not work with the tractor at full engine revolutions. Use such implements only which do not overload the tractor (e. g. sowing machines, harrows, drags, weeders, etc.).
3. Do not load the tractor more than to its $\frac{3}{4}$ output during 1st following next 20 performance hours (i. e. 50 engine hours). Do not apply the hydraulic power lift during the running-in period of the tractor.

After 50 engine hours change the oil in the engine sump and the injection pump.

After 200 engine hours change the oil in the gearbox, portals and the steering box.

HYDRAULIC SYSTEM OF THE TRACTOR (Fig. 6)

The geared pump of the hydraulic system of the tractor is housed in the space of the final drive housing. By means of the selector lever it is possible to select following controls:

- a) draft control,
- b) mixed control,
- c) position control.

ad a) With the draft control engaged the attached implement is automatically held in the position which corresponds approximately with the same traction power of the bottom drawbars of the three point linkage.

ad b) With mixed control engaged, a combination of position and draft controls is carried out.

ad c) With position control engaged, the attached implements are automatically held in the position which corresponds with the position of the control lever.

The Inner Circuit Control Lever Controls

- a) lifting and lowering of implements,
- b) hights setting-up of the three point linkage at the position control,
- c) traction power setting-up of the draft or mixed control eventually,
- d) floating position setting-up (for work carried out with the implements equipped with their own sustaining wheel).

The Remote Circuit Control Lever

By means of this lever the feed of the pressure oil into the remote circuit outlets, provided with quick couplings, and back in the tractor, is controlled. Following positions can be selected in this case:

- a) lifting (single or double acting cylinder)
- b) stop position (neutral)
- c) locked floating position — the lever remains in its positon (lowering at the single acting cylinder)
- d) forced lowering (doble acting cylinder).

The control mechanism is provided with labels containing inscriptions of above mentioned functions and respective positions of individual control levers.

BRAKES

The foot brakes are controlled hydraulically by means of two pedals bot the left-hand and right-hand wheel can be braked independently). Braking action both of the left-hand and the right-hand wheel is governed by means of a pressure compensator — equalizer. When driving the tractor on the road, the brake pedals must be latched. The hand brake serves to keep standing the tractor. It is put into operation when moving the control lever 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 button and return it back in its previous lower positon (the tractor is unbraked).

Differential Lock (Fig. 5/9)

If one of the tractor rear wheels spins in the terrain, apply the differential lock, as this device puts the differential out of operation so that both the rear wheels keep the same revolutions but during the time of depressed lock pedal only.

IMPORTANT: Differential lock should never be applied when driving the tractor in a curve.

FRONT AXLE

The extensions with wheels can be springy or solid. In both cases it is possible to change on Z 6911 tractors and Z 6911 tractors with safety cab their front wheel track to 1430—1655—1805 mm (the basic front wheel track adjusted at Manufacturer's is 1430 mm).

The front wheel track of Z 4911 tractors and Z 4911 tractors with safety cab makes 1280—1375—1750 mm (the basic front wheel track set up by the Manufacturer is 1375 mm).

Change of the Front Wheel Track (Fig. 15)

1. Put a jack under the front axle and lift it up.
2. Unscrew nuts (Fig. 15/1) from bolts of the front axle extensions and remove the bolts.

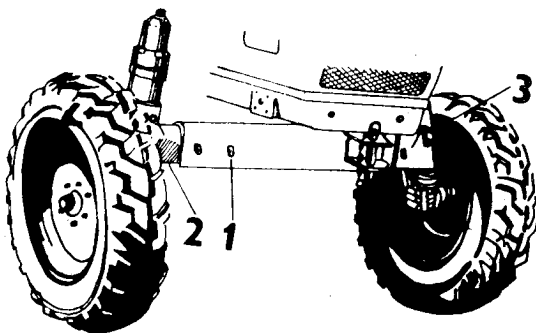


Fig. 15

3. Unscrew the nut from the steering system interconnecting rod and draw it slightly up.
4. Pull out a little both extensions (Fig. 15/2) until the required track is obtained and lock them again with bolts and nuts.
5. Screw on and lock the bolt in the steering system interconnecting rod.
6. Check the front wheel toe-in.

Springy Extensions with Locking

(Z 6911 tractors and Z 6911 tractors with safety cab).

The change of the springy extensions in solid ones can be carried out by fitting in stops. The change itself should be carried out in the following way:

1. Unscrew the screws from the covering lids situated on the extensions body and remove the lids (Fig. 15/3).
2. Check if there is a spline in the locking part positioned exactly against the hole of the extension body and adjust this correct position eventually by depressing or lifting slightly the axle.
3. Slide the locking inlet pieces in the holes of the extension body — the milled part must fit into the spline of the locking part.
4. Put elastic inlet parts (rubber rolls) in cavities of locking inlet pieces.
5. Reinstall covering lids with their packing on the extension body and tighten them with screws (it is necessary to overcome the resistance of elastic inlet parts).

When removing locking inlet pieces apply the plug from the filling orifice for their taking off as the plug can be screwed in the inner thread of the locking inlet piece.

Front wheel track of the four wheel drive front axle remains permanently unchanged (of Z 6945 tractors and Z 6945 tractors provided with safety cab) — i. e. 1510 mm. These tractors are not provided with vertically adjustable extensions.

Rear Wheels — provided with standard tyre size

The rear wheel track can be adjusted in six different positions in the range of 1425—1800 mm on Z 6911 tractors, Z 6911 tractors provided with safety cab, Z 6945 tractors and Z 6945 tractors provided with safety cab (Fig. 16). On Z 4911 tractors and Z 4911 tractors provided with safety cab the rear wheel track can be adjusted in seven different positions in the range of 1350—1800 mm (Fig. 17). The change of the track should be carried out at slightly lifted tractor rear axle only and in such a way that wheels could rotate freely. Before lifting the tractor rear axle, front wheels should be locked thus avoiding to move the tractor.

The adjustmet of individual tracks is carried out by changing rims and disks.

Screws should be tightened well.

The screws joining the disk to the wheel rim must be tightened by 216—235 Nm, as well as nuts joining the disc to the shaft by 362—382 Nm.

Tyre Inflating

The tractors are provided with a tyre inflator which belongs to the tractor standard equipment. If the tractor is equipped with pneumatic brakes or with a torque multiplier, a combined pressure regulator is installed in the tractor. This pressure regulator fulfills the function of the pressure equalizer, tyre inflator and the safety valve as well.

When inflating tyres, unscrew the butterfly nut from the combined pressure regulator screwing a hose for tyre inflating on its place. This hose is to be duly screwed in till its last thread in order to depress the non-return valve. The tyre cannot be inflated in the moment of opened release valve of the combined pressure regulator but only at the moment when the pressure in the pneumatic system drops bellow 0.58 MPa and the release valve is closed. When the tyre is inflated, screw the butterfly nut back in its place again.

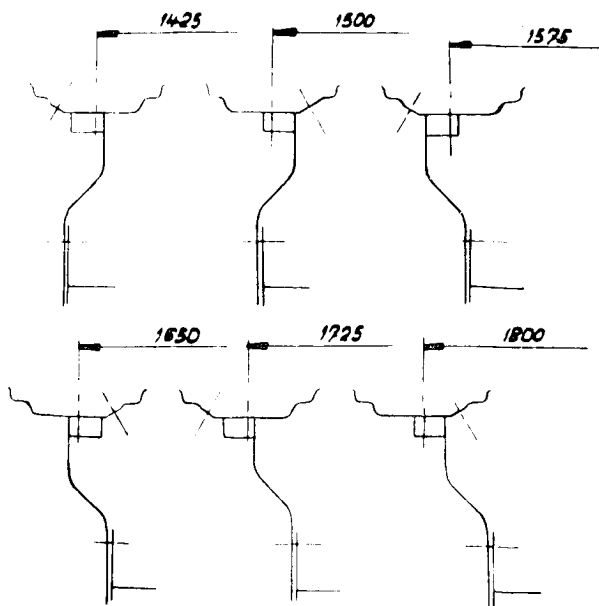


Fig. 16

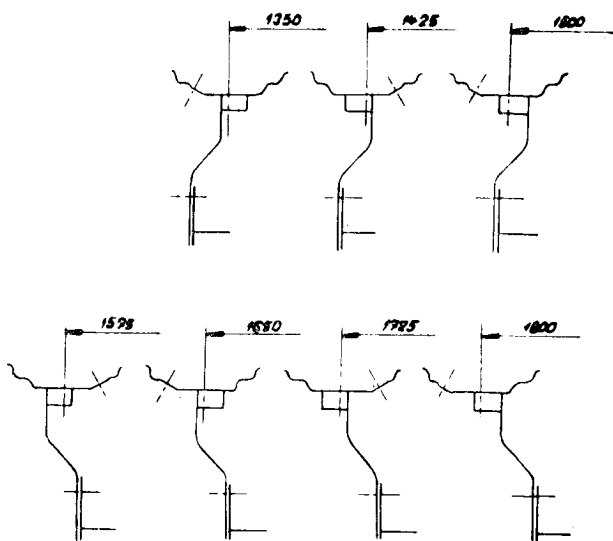


Fig. 17

Tyre Inflating

Tyre size	Inflating in kPa	Carrying capacity*) of one tyre in kg	Kind of work
6.00-16	250	560	Field labour, transport
9.5/9-32	200	1035	Field labour, transport
12.4/11-28	150	1200	Field labour, transport
6.50-16	250	590	Field labour, transport
	300	620	Field labour, transport
	375	1240	Work with industrial units at max. travel speed of 6 km/h.
7.50-16	250	710	Field labour, transport
	275	745	Field labour, transport
	345	1490	Work with industrial units at max. travel speed of 6 km/h.
11.2/10-24	170	1005	Field labour, transport
	210		Work with industrial units at max. travel speed of 6 km/h.
14.9/13-28	90	1240	Field labour
	170	1805	Transport
16.9/14-28	110	1705	Field labour
	150	2045	Transport
16.9/14-30	110	1760	Field labour
	150	2110	Transport
12.4/11-36	80	935	Field labour
	150	1350	Transport
12.4/11-32	80	890	Field labour
	150	1280	Transport

*) The carrying capacity of tyres can be exploited only up to the value admissible for the load capacity of axles mentioned under basic tractor specifications.

The carrying capacity of rear tyres can be increased of 20% at maximum travel speed of the tractor of 20 km/h. (but it is not allowed to pass over the value of the permitted pressure force of the axle).

Rims

Wheel rims for both the rear and front wheels are of Wide Base type. When changing tyres the same size of Barum mark is to be applied. When employing tyre casings of foreign trade marks, only such types can be used rolling radius of which corresponds with the specified Czech tyre sizes. The front wheels (only on tractors Z 6945 and Z 6945 tractors provided with safety cab) and the rear wheels are delivered with valves for water filling of tyres.

Tyre Filling with Water

An increase of tractor adhesion and thus its traction force can also be obtained by filling the inner tubes of tyres with water. Although it is possible to fill tyres with water also by means of normal valve, the inner tubes are provided with a special valve for this purpose which facilitates speedy and easy filling of tyres with water. It is recommended to use an antifreeze agent for filling tyres during the winter season.

Filling Technique

Apply a vessel or gravity tank for tyre filling. Ease the tyre by means of a lifting jack put under the tractor and turn 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

Caution — water squirts out when unscrewing the valve air section. A vacuum can be caused in the tyre when draining water from it and therefore it is necessary to turn the wheel slightly time to time so that the valve comes into its upper position. Screw on the bottom valve section of the water valve body and the inner tube valve air section on it. Inflate the inner tube with air until water stops flowing out through the tube of the body. After emptying all the water from the inner tube, screw off the water valve.

SPECIAL ACCESSORIES

Tractors referred in this manual can be equipped with following optional accessories:

Hand Operated Disengagement of the PTO Clutch

(Fig. 3/2)

This accessory serves for independent disengagement of the PTO drive. In its disengaged position the control lever is blocked by means of a safety lock. When torque multiplier is installed in the tractor, hand operated disengagement of the PTO clutch carries out simultaneously the disengagement of the tractor travel.

Torque Multiplier (Fig. 3/3)

(Only for Z 6911 tractors, Z 6911 tractors provided with safety cab, Z 6945 tractors and Z 6945 tractors provided with safety cab.) This equipment enables practically shifting-in of transmissions of 1.31 under load. Thus 20 forwards and 4 reverse speeds can be obtained. Both the engagement and disengagement of the torque multiplier is carried out without any disengagement of the clutch so that no wheel drive is set off i. e. no interruption of the engine power transmission on the tractor rear wheels is caused.

IMPORTANT:

- a) at engaged torque multiplier the tractor does not brake by means of the engine,
- b) at engaged torque multiplier the tractor travel must be disengaged by means of the hand operated control lever only (Fig. 3/2),
- c) when employing the torque multiplier the compressor must work permanently.

Synchronising Clutch

(For Z 6911 tractors, Z 6911 tractors provided with safety cab, Z 6945 tractors and Z 6945 tractors provided with safety cab.)

The synchronising clutch can be installed on both the 4th and 5th speed gear, thus assuring a noiseless shifting-in of the 4th and 5th speed.

Front Driven Axle (Fig. 11) of Four Wheel Drive Tractors

(On Z 6945 tractors and Z 6945 tractors provided with safety cab.)

This axle is wobbling at maximum swing of $\pm 15^\circ$. It is driven from the drive box by means of the protected articulated joint shaft. The drive is distributed on both front half-axes by means of the differential gear without any differential lock. The attendance of these four wheel drive tractors differs from those of basic tractors types by front wheel drive only. The front wheel drive is controlled from driver's seat by means of an engagement lever, placed on at the left-hand gearbox side (Fig. 3/5A). The shifting-in of the drive is carried out by means of a gear clutch. When displacing the engagement control lever upwards and getting dropped the catch into the slot of the floor, the shifting-in spring which engages automatically the front wheel drive during he tractor travel, will be pre-loaded. The shifting-out of the catch and the displacement of the control lever downwards cause the front wheel drive disengagement. Both the engagement and disengagement of the front wheel drive can be carried out during the tractor travel without any disengagement of the travel clutch.

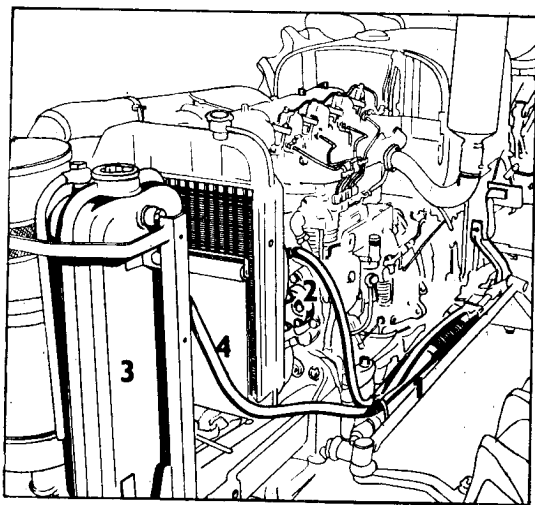


Fig. 18

Power Assisted Steering Mechanism (Fig. 18)

This equipment makes the tractor steering easier as it reduces the force on the steering wheel which is needed for steering of wheels especially when travelling in the terrain or employing agricultural or industrial machines and units. It simultaneously damps shocks of steered wheels transmitted on the steering wheel. The power assisted steering mechanism works only in the case when the engine is running. When the engine does not work the tractor can be steered by the force of the driver executed on the steering wheel by means of the mechanical transmission only.

IMPORTANT: When turning the steering wheel up to its stop, it is necessary to turn it than a little back. There are no adjustable stops in the steering box and from this reason when levers bear against stops on the front axle, the driver has still the possibility to turn the steering wheel a little thus enabling to displace the slide valve in the cylinder. This situation causes a strain of the whole steering mechanism by maximum force of the power assisted steering device (9.8 kN or 1000 kp) and oil is warmed up very quickly so that the pump could be damaged. A similar situation occurs when the tractor travels in a deep furrow groove and the driver tries to get the tractor out of it by turning wheels aside by means of the power assisted steering device and he does not succeed. Thus the slide valve is displaced causing excess strain of the whole steering mechanism, too. From this reason it is necessary to turn back the steering wheel in its original position after 30 seconds at the latest.

The power assisted steering device consists of

- a cylinder with the slide valve distribution (Fig. 18/1)
- a pump (Fig. 18/2)
- a tank and accessories (Fig. 18/3)
- high pressure hoses (Fig. 18/4).

COUPLINGS

Three Point Linkage (Fig. 19)

The three point linkage consists of bottom links, vertical links and the upper link. The vertical links are fitted by

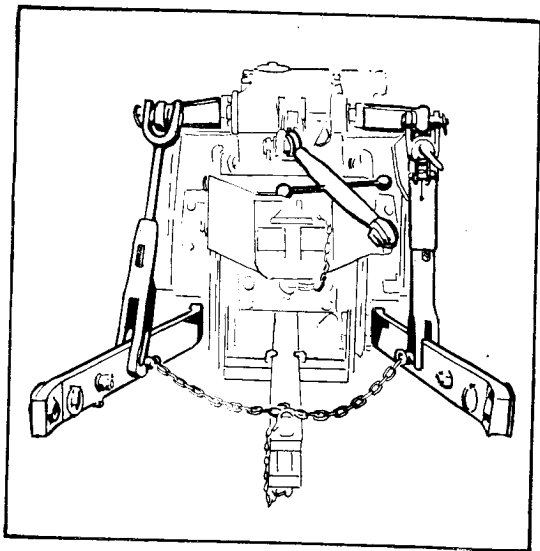


Fig. 19

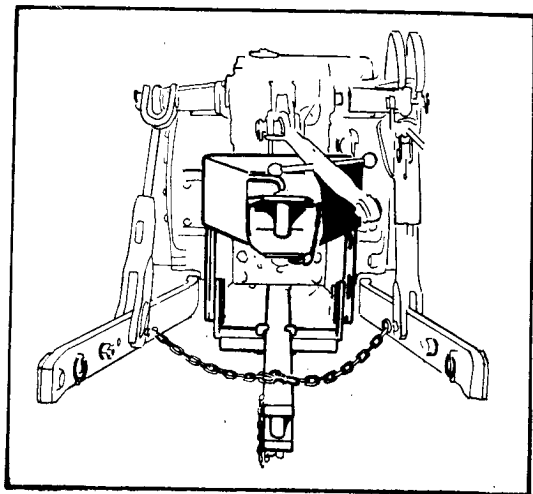


Fig. 20

their ball joints on the lifting arms outer pins. Both links have the possibility to alter continuously their length. Maximum adjustable length is 100 mm.

Multistage Suspension Linkage (Fig. 20)

This equipment serves for coupling trailers or trailers on toe. It is vertically adjustable in four positions. Its permissible vertical static load is maximum 12.1 kN (1300 kp). The traction static force is 29.4 kN (3000 kp).

Swinging Drawbar (Fig. 21)

The swinging drawbar consists of a bracket provided with a pin, the bracket being bolted to the final transmission housing bottom wall and of the swinging drawbar itself, which can be adjusted in four positions horizontally. The drawbar is fixed to a solid bar by means of two bolts with nose.

Permissible vertical static load of the swinging drawbar is maximum 6 kN or 600 kp.

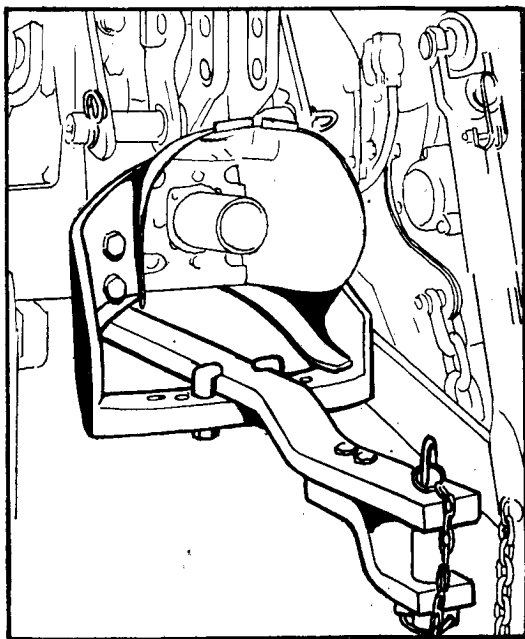


Fig. 21

PTO for 540 RPM and 1000 RPM

Design I (Fig. 5)

The engagement of the PTO respective revolution number can be carried out at stillstanding engine only. The PTO end piece for 540 RPM is six-splined, that for 1000 RPM with involute profile is twenty-one-splined.

At Manufacturer's Works tractors are provided with a six-splined PTO end piece for 540 RPM.

When changing the PTO end piece it is necessary to remove the cover at first, to unscrew the plug and the screw with which the PTO end piece is fixed to the adapted PTO end part. Now the PTO end piece can be slid off the PTO and replaced by another end piece provided with twenty one splines and determined for the drive at 1000 RPM.

The new end piece must be taken off from the guide on the gearbox cover at first. The end piece is safeguarded with a control lever (Fig. 5/11) which can be removed very easily from the PTO end piece splines. In order to facilitate sliding off of the end piece from the guiding it is necessary that the control lever and thus also the end piece are in their central i. e. neutral position.

The PTO end piece provided with six splines and removed from the PTO end part is to be inserted in the guide situated on the gearbox cover in the reverse way. The locking device of the locking mechanism allows to turn the control lever in the only sense according to the applied PTO end piece. The PTO end piece for 540 RPM is engaged by means of the PTO end piece for 1000 RPM fitted in the control lever and vice versa.

Design II (Fig. 4/6)

The PTO is provided with a six-splined profile only but it is possible to engage 540 RPM (the control lever displaced to the left) or 1000 RPM (the control lever displaced to the right).

A tractor equipped in such a way allows to choose following alternatives:

When displacing the control lever (Fig. 4/4) in the position I, the hydraulic power lift pump is put into operation only; this pump rotates according to the selected system either by 540 RPM or 1000 RPM.

When displacing the control lever from its position I in the position II the geared coupling displaces itself in such

a way that not only the hydraulic power lift pump but also the PTO are driven by selected RPM.

In N (neutral) position all functions are off.

The position III assures PTO drive through the gearbox.

The positions I, II, III, N are marked on the label fixed on the gearbox cover.

Belt Pulley (Fig. 22)

The belt pulley serves for driving of the stationary machines. It is attached to the PTO and its drive is carried out by the shifted-in 5th speed. The reduction speed control lever must be displaced in its neutral position and the

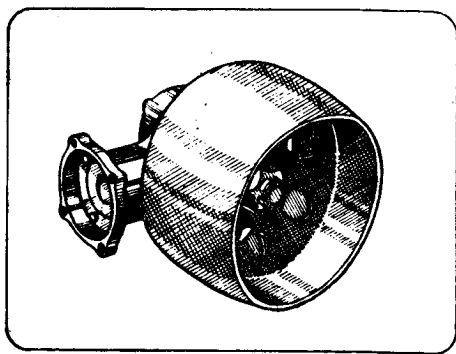


Fig. 22

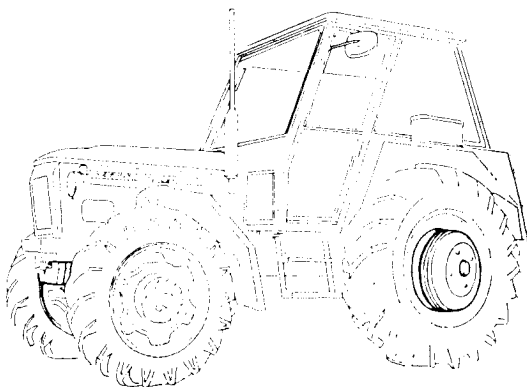


Fig. 23

PTO drive control lever in its top position in this case. By turning the belt pulley through 180° , the clockwise sense is changed in the counter-clockwise one. In such a case it is necessary to install the bleeding plug on the belt pulley body reverse side in order to avoid oil leaking.

Both the Front and Rear Wheels Ballast Weights

(Fig. 23)

These ballast weights serve for additional increasing of the adhesion efficiency of the tractor weight. Any ballast weight of the front axle can be applied in simultaneous combination of rear axle ballast weights.

Air Brakes (Fig. 24)

The pneumatic system consists of a compressor, combined pressure equalizer, air container, brake valve, pressure gauge, brake valve control effectuated by means of the brake pedal as well as by the hand brake, coupling head and connecting pipes. The brake valve linkage mechanism controlled by means of the hand brake control lever is set up in such a way that the trailer is braked simultaneously with the tractor. The operating pressure is adjusted up to 0.6 MPa (6 kp/sq.cm). When coupling the trailer with the tractor, the latter must be immobilised by means of the hand brake that the relieve valve is not under the pressure. Is the tractor employed for transport, it is necessary to follow the air pressure gauge placed on the dashboard.

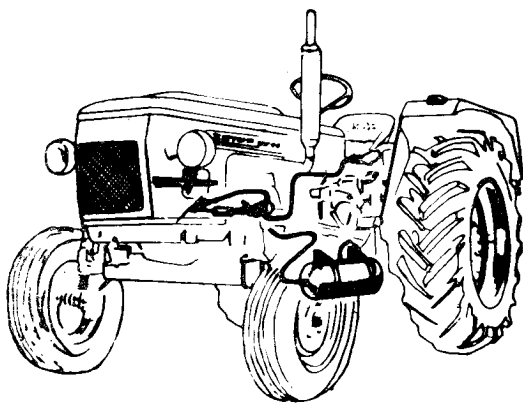


Fig. 24

Coupling for the Semi-trailer (Fig. 25)

The coupling linkage for the single-axle trailer serves for automatic coupling of these trailers to the tractor. It is fitted instead of the swinging drawbar on the central pin of the final transmission housing and attached by chains to the bottom links. The hitch setting-up in its operation position is facilitated by a guiding which is bolted to the bracket. The hitch together with the trailer beam are lifted by means of the hydraulic power lift arms and bottom links til the moment when the hitch fits in the arms where it is to be locked by means of a pin and a lock. When uncoupling the trailer from the tractor, the hitch together with the trailer beam should be lifted a little by means of the hydraulic power lift and unlocked by the deviation of the control lever in the direction from the driver rearwards. Only then the lowering can follow. Permissible maximum vertical static load of the single-axle trailer coupling device is 12.1 kN (1300 kp). The diameter of the trailer beam eye for the hitch is 50 mm.

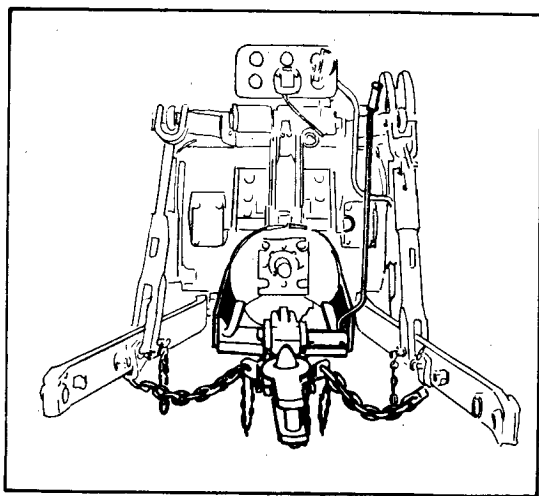


Fig. 25

Cab (Fig. 26)

The driver's cab is provided with a safety frame which represents the base of the whole cab. The cab is fixed to the tractor body and located on silentblocks which reduce essentially vibrations in the cab inner space. The cab is glazed with safety glass.

IMPORTANT: A repaired cab after an accident (or a cab attacked considerably by the corrosion) has no more be mounted on the tractor.

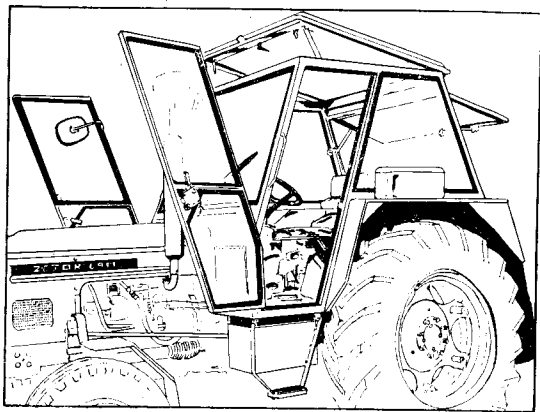


Fig. 26

Hot Water Heating Equipment of the Cab (Fig. 27)

The output of this equipment is 2600 W, at the temperature of 80 °C of the coolant of the engine. The quantity of the supplied air is 240 m³/h approximately, the hot air being led on the feet of the driver or on the front wind shield of the tractor. The valve control is carried out by means of a tie rod (Fig. 27/2).

IMPORTANT: When filling the engine with the coolant, simultaneously is also filled the heating equipment radiator. Before starting to fill the coolant into the engine it is necessary to loosen the bleeding screw (Fig. 27/1) placed on the heating equipment radiator and open simultaneously the heating equipment



Fig. 27

valve (Fig. 8/1). After having filled the cooling system with the coolant not to forget to tighten (close) the bleeding screw.

When draining the coolant front the cooling system it is necessary to loosen also the bleeding screw and open the heating equipment valve as well as the tap situated on the inlet tube leading from the engine to the heating equipment radiator.

When the cooling system is filled with the coolant, it is convenient to start the engine and check the coolant level in the radiator.

Front Mudguards (Fig. 11)

Front mudguards can be fitted on wheels at all front wheel tracks except of that of 1280 mm.

Headlamp for Night Labours

This headlamp is fitted on the rear right-hand mudguard and switched on by means of a switch (Fig. 1/3).

Coupling Elements

1. Quick couplings (Fig. 28/1).
2. Head for coupling the trailer hose of the brake air container (Fig. 28/2).
3. Socket for trailer lightening (Fig. 28/3).

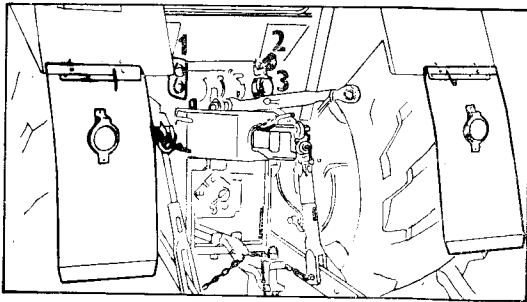


Fig. 28

MAINTENANCE AND ADJUSTMENT

The maintenance of tractors is one of the most important operations. In due time and correctly carried out maintenance ensures the trouble-free tractor performance. If there are no sufficient experience and good technical equipment of the repairshop. It is better to have carried out the relative operations in a specialized repairshop or workshop.

Average fuel consumption is 4.5—6 litres.

All following instruction are to be observed carefully.

Daily Attendance (to be carried out each 8—10 hours)

1. Clean both the tractor and implements.
2. Replenish fuel and inspect for tightness joints of the fuel system.
3. Check water level and inspect for tightness joints of the cooling system.
4. Check oil level and inspect for tightness joints of the lubricating system.
5. Check oil level in the air cleaner and clean the pre-filter removing dust from it.
6. Check function both of the foot and hand brake and the air pressure indicated by the air pressure gauge. Check brake liquid level in the jar and hydraulic brake system for tightness.
7. Check pneumatic brake system for tightness and brake efficiency of the tractor coupled with a trailer. Drain oil from the tyre inflator.
8. Inspect the condition of the electrical installation, check lights, trafficators etc. Check the regulator run of the running engine, correct lubrication and charging.
9. Check air pressure both in the front and rear tyres, screw on caps and tighten them well.
10. Check if screws, bolts and nuts of the steering system linkage and leverage and disks both of the front and rear wheels.
11. Check if water pump drive V-belt as well as that of the alternator are tightened well and correctly.
12. Inspect oil level in the tank of the power assisted steering device.

13. Before starting to drive the tractor with trailers or trailers in toe check their state as well as the state and condition of coupling and locking elements.
14. When starting to employ the hydraulic power lift, unscrew the magnetic oil cleaner from its housing (Fig. 6/5). Rinse and blow off the screen and clean the magnet. It is recommended to inspect and clean the magnetic oil filter each 10—100 performance hours of the tractor during the starting period of the hydraulic power lift service. Check each 30—50 engine hours the oil level in the injector pump.

Technical Inspection 1 (TI 1)

This inspection is to be carried out after each 500 litres fuel consumption or after each 100 engine hours of the tractor performance. All operations 1—14 are to be carried out at first.

15. Check oil level in the crankcase oil sump and clean the centrifugal oil cleaner drum rotor (oil cleaner on Z 4911 tractors).
16. Inspect oil level in portals.
17. Inspect oil level in the gearbox.
18. Inspect oil level in the steering damper tank (on Z 6945 tractors and Z 6945 tractors provided with a safety cab only).
19. Unscrew the butterfly nut from the air cleaner, remove the cover and check the condition of the sedimentation bowl. Untie three bottom quick couplings and remove the complete pre-cleaner upwards (evacuate the dust) and complete air cleaner body downwards. Wash air cleaner jacket, cartridge, blade distributor with rebounding plate in petrol or gasoil and dry them before assembly. Suction slots protecting strainer must also be clean. Bolt parts with screw and nut together and put them into the cleaner jacket filled up before with pure unused engine oil up to the relative margin and fix the body to the air cleaner cover. Lubricate the contact surface of the cover and the sealing rubber ring with grease, situated on the cartridge neck.
20. Lubricate the water pump by turning the greasing nipple through one turn and check fan belt sag — which is to be maximum of 15 mm.
21. Oil the clutch disengaging sleeve.

22. Lubricate front axle bracket, wheel extensions, shaft for the clutch disengagement, pedals, right-hand strut, stirrup of the draft control, struts - tension nuts and the collar with the steering wheel small control lever by means of a greasing nipple press.
23. Inspect the electrolyte level in the storage battery — which should reach 5 mm above the upper border of plates. Clean corroded cable terminals.
24. Lubricate the Bowden cable at braked tractor by means of the hand brake with few drops of the oil SAE 80.
25. Clean the magnetic plug of the power assisted steering tank.
26. Inspect oil level in the front axle housing and reducers as well (on Z 6945 tractors and Z 6945 tractors provided with a safety cab).

Technical Inspection 2 (TI 2)

This inspection is to be carried out after each 1000 litres fuel consumption or after each 200 engine hours of the tractor performance.

All operations 1—26 are to be carried out at first.

27. Change oil in the crankcase oil sump, injection pump body and the governor.
28. Clean duly the centrifugal oil cleaner (oil cleaner only on Z 4911 tractors).
29. Replace the cartridge of the coarse fuel filter.
30. Check clearance between the clutch disengaging levers and the sleeve.
31. Inspect and if necessary clean and set up the injector. Inspect the oil level and replenish if necessary the steering box.

Technical Inspection 3 (TI 3)

This inspection is to be carried out each 3000 litres of fuel consumption or after each 600 engine hours of the tractor performance.

All operations 1—31 are to be carried out at first.

32. Replace the fine fuel filter cartridge.
33. Grease cab door hinges.
34. Check valve clearance (have do it in a specialized

workshop) on the cold engine — both the intake and exhaust valve of 0.25 ± 0.05 mm.

35. Check the front wheel toe-in and the divergency as well as the play of the front wheel heads taper roller bearings, replenish the grease in the front wheel heads.
36. Check and adjust the hand brake if necessary.
37. Flush the cooling system under the pressure of pure water in order to remove sediments.

Technical Inspection 4 (TI 4)

This inspection is to be carried out each 6000 litres of fuel consumption or each 1200 engine hours of the tractor performance.

All operations 1—37 are to be carried out at first

38. Change oil in the steering box.
39. Change oil in portals.
40. Replace the tyre inflator cartridge at the compressor.
41. Clean the suction strainer of the oil pump.
42. Have checked tightness of the injection pump elements in a specialized workshop.
43. Change oil in the circuit of the power assisted steering device.

Current Repair (CR)

This repair is to be carried out after each 12 000 litres of fuel consumption or after each 2400 engine hours of the tractors performance.

All operations 1—43 are to be carried out at first.

44. Check or have repaired the steering wheel play according to the steering wheel dead point position.
45. Check the charging unit and the starter motor — in a specialized workshop.
46. Clean and rinse the radiator with the sodium solution.
47. Turn the front wheel tyre casings with respect to one side wear of them.
48. Have ground-in engine valves in a specialized workshop.
49. Change oil in the front driven axle housing as well as in double joints and reducers housing.
Change oil in the injection pump.

Tractor Overhaul

The tractor overhaul is to be carried out after 4000 to 6000 engine hours of the tractor performance.

- 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;
- if very many tractor parts need to be repaired;
- if further tractor performance is no more economical.

TECHNICAL INSPECTIONS OF THE OVERHAULED TRACTOR

Technical Inspection of the Run-in Tractor

These inspections are to be carried out after 250 litres of the fuel consumption or after 50 engine hours of the tractor performance.

All operations 1—14 are to be carried out at first.

50. Check oil cleaner for tightness (and clean its rotor).
51. Drain oil from the crankcase oil sump and refill it with new pure engine oil. Change oil in the injection pump housing and the governor box as well.
52. Change oil in the steering box.
53. Inspect connecting bolts for tightness
 - of the front bracket with the engine,
 - of the front axle with extensions,
 - of the front and rear wheels nuts,
 - of beads of rear wheels and ballast weightst.
54. Inspect oil level in the gearbox.
55. Check fan V-belt for sag — maximum sag is 15 mm.

Technical Inspection 1 (TI 1)

This inspection is to be carried out after 500 litres fuel consumption or after 100 engine hours tractor performance. All operations 1—26 are to be carried out at first.

56. Check the cylinder head stud nuts for tightness (tightening torque is 167—177 Nm or 17—18 kpm) — have carried out in a specialized workshop.
57. Set up the valve clearance on the cold engine — both the intake and exhaust valve on 0.25 ± 0.05 mm — have carried out in a specialized workshop.

58. Clean the fuel filters 1 and 2 (drain impurities from the jars).

Technical Inspection 2 (TI 2)

This inspection is to be carried out after 1000 litres of fuel consumption or after 200 engine hours of the tractor performance.

All operations 1—31 are to be carried out at first.

59. Change oil in portals.

Change oil in the gearbox, clean the suction strainer of the hydraulic power lift and inspect the function of the liquid shock absorber of the AEROLASTIC seat.

Technical Inspection 3 (TI 3)

This inspection is to be carried out after 3000 litres of fuel consumption or after 600 engine hours of the tractor performance.

All operations 1—37 are to be carried out at first.

60. Change oil in the power assisted steering device, in the gearbox and portals as well, Inspect oil level in the steering box.

MAINTENANCE INSTRUCTIONS

Oil Filling for Engine Lubrication

Replenish oil in the crankcase oil sump till the top gauge mark of the oil dipstick. Then start the engine and let it run for 2—3 minutes at low RPM. After the oil level is calmed again, check the oil level and top up the oil to the upper gauge mark of the oil dipstick.

The oil is always to be changed after the tractor travel is finished while it is still warm. Unscrew first the magnetic drain plug on the bottom crankcase cover. Clean the plug when removing caught metallic particles.

Centrifugal Oil Cleaner

Cleaning of this cleaner is to be carried out in the following way: unscrew the nut, remove the cover, take off the rotating part, unscrew nut M 32 and separate rotating parts from themselves. Wash duly both the inner and bot-

tom parts and reassemble them again. The gauge marks stamped both on the top and bottom rotor parts are to face each other in order not to violate the dynamic equilibrium of rotating parts. The lubrication pressure is monitored by the pressure gauge or the lubrication pilot lamp.

Oil Pump Suction Strainer Cleaning

Drain old oil, remove the crankcase bottom cover, take off the oil pump suction strainer and wash it in petrol or diesel oil. Reinstall duly dried suction strainer back to the oil pump, lock against loosening and fix the bottom cover to the crankcase. Tighten well the bottom bolts to prevent oil leaking.

Injection Unit Lubrication (Fig. 7)

A plug serves for filling oil into the housing both of the injection pump and the output governor. A screw indicates the oil level. For draining old oil from the housing serves a plug situated on the bottom of the injection pump and another plug on the output governor bottom. The engine oil is to be applied for lubrication both of the fuel injection pump and output governor.

The specified period for the oil change in the engine oil sump should be profitted also for the oil change in the whole injection unit. Before taking the tractor off its performance for a longer time, it is necessary to drain oil from the injection unit no matter how many kilometers the tractor covered.

Brakes

Keep the brake fluid level in the bowl in the range of its maximum and the drop of 10 mm approximately. Observe perfect cleanliness when replenishing the brake fluid and apply a fine sieve situated in the filling neck of the bowl for this purpose.

After the manipulation with the brake fluid is finished, it is necessary to wash immediately the hands by means of soap. For permanent manipulation with this fluid it is necessary to protect the skin with a special unguent as a long effect of the fluid on the skin may originate the skin inflammation. Eating of meals stained with the brake fluid e. g. by means of not washed hands can cause stomach troubles.

Bleeding of the Brake System

If some connecting pipe union had been removed or the brake fluid had leaked and had been refilled, a perfect bleeding operation of the brake system must be carried out. If there is no sufficient quantity of the brake fluid in the bowl, the brake pedals are springy and the brake efficiency is reduced; with the brake fluid quantity with which the brake pedal is springy in all its course, the brake does not work being without any efficiency.

Fill the bowl with the brake fluid and slip off a rubber cap from the brake cylinder bleeding screw. Put a rubber small hose on the bleeding screw and immerse the other end of it into the fluid contained in a transparent bowl. Then loosen the bleeding screw, depress fully the relative brake pedal and retighten the screw. The brake pedal can be released only when the bleeding screw is duly tightened. It is necessary that two men carry out this operation. 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. The bleeding operation must be carried out with unlatched pedals, each wheel separately. Follow the movement of the fluid level in the bowl during the bleeding operation to prevent air suction in the system. When filling the brake fluid into the bowl, employ ever new fresh brake fluid only.

IMPORTANT: For bleeding of the right-hand foot brake system on tractors provided with a safety cab, it is necessary to remove the cover of the hydraulic power lift control levers at first, which is fixed by means of six bolts on its circumference. After removing this cover there is sufficient space for the access to the bleeding screw.

Hand Brake

Unscrew the bolt which fixes the brake band cover and turn the cover aside. Pull the hand brake control lever until it fits into the third tooth of the pawl. Leave the control

lever in this position, loosen the lock nut and tighten the brake band by means of the bottom nut on the brake drum. Lock the adjusted band with the adjusting nut, turn the brake band cover back in its position and fix it with the bolt. The same procedure is to be carried out also for the second brake band of the hand brake. When the hand brake control lever is released, the bands on the brake drums are released, too, in such a degree, that during the tractor travel no harmful overheating of brakes takes place. Check correct function of the brakes as the last operation.

IMPORTANT: Before starting to adjust the brake bands, make sure that the hand brake band control lever pins are in their basic position in the band bracket. It is also necessary that the hand brake control lever placed on the gear-box is in its unbraked position. In case that the pins are not in their basic position in the band bracket, it is necessary to adjust them by means of the adjusting nut situated on the brake tie rod by its loosening or re-tightening. This adjustment should be done in a specialized workshop.

Play Adjustment of Front Wheel Taper Roller Bearings

(on Z 4911 tractors, Z 4911 tractors provided with a safety cab, Z 6911 tractors and Z 6911 tractors provided with a safety cab)

This adjustment is to be carried out at lifted front axle. The thrust bearings play must be of 0.06 mm.

1. Unscrew front wheel locking nut.
2. Remove the cotter pin and tighten duly the castellated nut.
3. Now loosen this castellated nut a little back in such a way that the next cut of it corresponds with some hole in the pivot. The wheel has to rotate freely in this state, without any play, but it should not jam. The wheel swing on the bearings is quite slight.

IMPORTANT: Pre-loading of Bearings Reduces Considerably Their Life.

4. Now lock the nut by means of a split pin in this positions and screw on the front wheel locking nut.

On tractors Z 6945 and Z 6945 tractors provided with a safety cab this adjustment is to be carried out in the similar way. Axial play of the front wheel bearings is 0—0.05 mm.

Toe-in and Toe-off

On Z 4911 tractors, Z 4911 tractors provided with a safety cab, Z 6911 tractors and Z 6911 tractors provided with a safety cab the front wheel toe-in ranges between 6 ± 4 mm. On Z 6945 tractors and Z 6945 tractors provided with a safety cab the front wheel toe-off is 12—15 mm.

Toe-in Adjustment

1. Loosen the conternuts of both articulated heads of the steering system connecting bar.
2. Set up the specified front wheel toe-in when turning the connecting bar (tube) central part — the toe-in is to be measured on the rim side.
3. Tighten the conternuts — the upper surface of the articulated heads must be parallel.

Power Assisted Steering Device (Fig. 18)

For the power assisted steering the oil OLN2 is to be applied — the amount being 4 litres approximately.

1. Check oil level,
2. Check hoses and end pieces,
3. Observe the oil change.

Belt Pulley (Fig. 22)

The belt pulley is provided with a plug for filling and draining the oil. The same sort of oil as for the gearbox is to be applied for the belt pulley as well. Amount is 0.9 litre approx. The oil is to be changed after 2000 belt pulley service hours. When employing the belt pulley permanently check and refill oil daily if necessary.

Maintenance and Attendance of Tires

Due attention to the maintenance and care of tyres is to be paid. Correct tyre inflating is a very important for it. Insufficient inflation causes quick cracking of tyres sides and danger of fissures in the texture. Excessive inflation of tyres does not allow normal bending of tyres sides so

that the runners are worn only in the centre. Incorrect front wheel toe-in adjustment (wheels diverge or converge excessively) leads to considerable tyre wear. Incorrect brake function causes a shortening of tyre life. One of the greatest dangers of tyre life is unskilled, unexpert and forceful tyre fitting. Tyres and rims are designed in such a way that no excessive effort and force are needed for fitting them on the wheel. Make sure that rims are always free from dirt and particularly from rust.

TROUBLES AND THEIR REMEDIES

Engine Troubles

It is not possible to start the engine

Cause:

Remedy:

Fuel injection pump does not supply fuel:

- | | |
|--|--|
| a) fuel system bled insufficiently | bleed fuel system |
| b) fuel filters contaminated excessively | clean fuel filter or replace cartridge |

Engine runs irregularly

- | | |
|------------------------------------|---|
| a) air in fuel tubes | loosen the cap nuts on injectors and crank the engine til diesel oil flows out free air bubbles |
| b) some injector nozzle is clogged | inspect and clean it |
| c) dirt on the delivery valve seat | remove and clean it |

Engine output is insufficient

- | | |
|---|---|
| a) some nozzle is sized or clogged | check and replace the nozzle if necessary |
| b) injectors adjusted incorrectly | have adjusted them in a specialized workshop |
| c) fuel injection pump adjusted incorrectly | have adjusted it in a specialized workshop |
| d) insufficient compression pressure in cylinders what may be caused by | |
| 1. untight valves | reground valves in their seats |
| 2. uncorrectly set up valve play | set up correct valve clearance |
| 3. defective gasket between the cylinder head and the crankcase | replace the gasket |
| 4. loosed cylinder head stud bolts | tighten to specified torque |
| 5. baked piston rings | remove piston rings and clean grooves in the piston |

Cause:

Remedy:

Engine gets overheated

- | | |
|--|---------------------------------|
| a) little water in the radiator | replenish water in the radiator |
| b) V-belt of the water pump is slack | stretch out the V-belt |
| c) radiator considerably clogged with water incrustation | clean the radiator |

Troubles of the Electrical Equipment

Insufficiently charged battery

- | | |
|--|--|
| a) alternator drive belt spins | stretch the belt in order to achieve maximum sag of 5—8 mm under the finger pressure of 2 kp approx. |
| b) defective battery | verify it |
| c) voltage regulating relay is set up to low voltage | have it repaired in a specialized workshop |
| d) defective alternator | have it repaired in a specialized workshop |

**Excessively charged battery
(electrolyte boils and evaporates)**

- | | |
|---------------------------------------|---|
| a) short circuit in one battery cell | check the battery and have it repaired if necessary |
| b) defective voltage regulating relay | have it repaired in a specialized workshop |

Starter motor does not work

- | | |
|--|--|
| c) carbon brush spring broken | tighten them |
| d) starter motor are released | |
| b) worn carbon brushes | replace them with new ones |
| c) carbon brush spring broken | replace it with a new one |
| d) collector is soiled | clean it |
| e) defect in the electro-magnetic coil | have it repaired in a specialized workshop |

Cause:

Remedy:

Slow run of the starter motor

insufficient voltage of the
battery

check and have charged
the battery

Troubles of Hydraulic Brakes

Brake pedal travel too long

insufficient amount
of brake fluid

top the brake fluid bowl

Brake pedal travel too long,
pedals springy when depressing them

air in the braking system

bleed the braking system

Insufficient efficiency of the hand brake
to long travel

adjust it

It is not possible to inflate the tyre by means of the
combined pressure regulator:

Remedy:

- a) screw in the hose for tyre inflating till its last thread
- b) let drop the pressure in the pneumatic system bellow
0.58 MPa (5.8 kp/sq.cm) in order to shut the release
valve of the combined pressure regulator
- c) have repaired the combined pressure regulator in a
specialized workshop

Incorrect Function of the Power Assisted Steering Device

insufficient amount of oil in
the tank

replenish and bleed the power
assisted steering system

Troubles of the Torque Multiplier

1. After having put in operation the torque multiplier the
speed of the tractor does not change; this trouble is
caused by

a) small air pressure in
in the air pressure tank

check pneumatic system
for tightness

b) incorrectly adjusted
clutch levers

adjust them*)

2. After having put in operation the torque multiplier the tractor power drops as the clutch slips; this trouble is caused by

incorrectly adjusted adjust them*)
clutch levers

*) How to set up clutch release levers

1. Disconnect the clutch pedal tie rod and remove the clutch side lid.
 2. Adjust the clutch release levers for the tractor travel in such a way that the disengaging sleeve clearance is 6 mm.
 3. Set up the clutch release levers for PTO in the same way that the disengaging sleeve clearance is 15 mm.
 4. Connect the clutch pedal and adjust the tie rod in such a way that the set up clearance decreases to 4 mm.
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Operator's Manual

for Zetor Z 4911, 5911, 5945, 6911, 6945 Tractors

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To be lubricated	Operation / number of points for lubricating	Lubricant Summer — Winter
Daily — each 8 to 10 engine hours		
Engine	check / 1	SAE 30 SAE 10 W/30
Gearbox	check / 1	SAE 80
Air cleaner	check / 1	SAE 30 SAE 10 W/30
Power steering tank	check / 1	OL N2
TI 1 — each 100 engine hours		
Engine	check / 1	SAE 30 SAE 10 W/30
Gearbox (transmission housing)	check / 1	SAE 80
Air cleaner	change / 1	SAE 30 SAE 10 W/30
Front driven axle housing	check / 1	SAE 80
Front driven axle reducers	check / 2	SAE 80
Portals	check / 2	SAE 80
Water pump	give a turn / 1	LITOL 24
Fuel injection pump	check / 1	SAE 30 SAE 10 W/30
Clutch releasing sleeve	lubricate / 1	SAE 30 SAE 10 W/30
Front axle bracket	lubricate / 2	LITOL 24
Wheel extensions	lubricate / 4	LITOL 24
Clutch releasing shaft	lubricate / 1	LITOL 24
Pedals	lubricate / 3	LITOL 24
RH strut	lubricate / 1	NH2, LITOL 24
Draft control stirrup	lubricate / 1	LITOL 24
Struts — tension nuts	lubricate / 2	LITOL 24
Steering wheel sleeve with lever	lubricate / 1	LITOL 24
Hand brake - Bowden cable	lubricate / 1	SAE 80
Steering damper tank	check / 1	Oil for damper
TI 2 — each 200 engine hours		
Engine	change / 1	SAE 30 SAE 10 W/30
Steering box	check / 1	SAE 80
TI 3 — each 600 engine hours		
Gearbox (drive box)	check / 1	SAE 80
Front wheel hubs	replenish / 2	NH2
Cab door hinges	lubricate / 4	OL N2
TI 4 — each 1200 engine hours		
Gearbox (drive box)	change / 1	SAE 80
Portals	change / 2	SAE 80
Steering box	change / 1	SAE 80
Power steering	change / 1	OL N2
CR — 2400 engine hours		
Fuel injection pump	change / 1	SAE 30 SAE 10 W/30
Front driven axle housing	change / 1	SAE 80
Front driven axle reducers	change / 1	SAE 80

NOTE: Filling quantities of lubricants are referred under Specifications on the introduction pages of the present manual. The oil SAE 20 W/30 can be used all the year round instead of the oils SAE 30 and SAE 10 W/30.