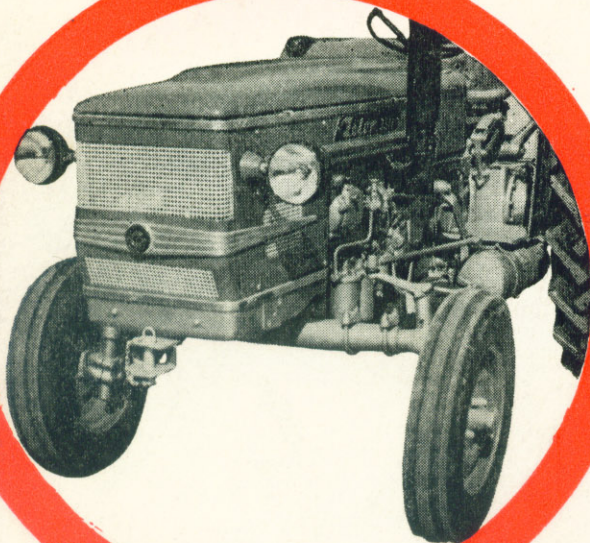




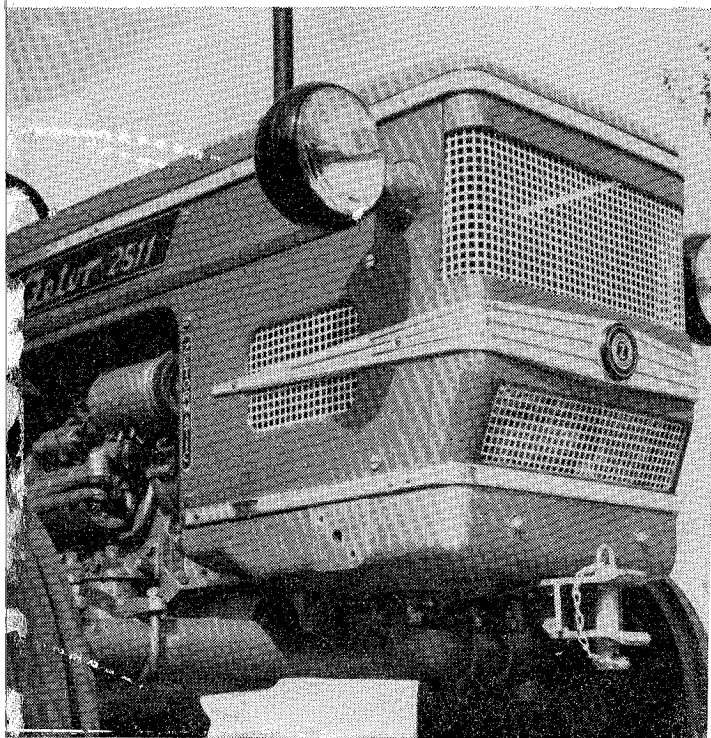
Zetor

2511

3511

4511

OPERATOR'S MANUAL



Reliable Modern Tractor Range

ZETOR 2511

ZETOR 3511

ZETOR 4511

ZETOR 3545

Dear Tractor Owner,

You were surely asking for perfection and elegance in selecting one type of tractors Zetor 2511, Zetor 3511 or Zetor 4511 — and your choice was correct.

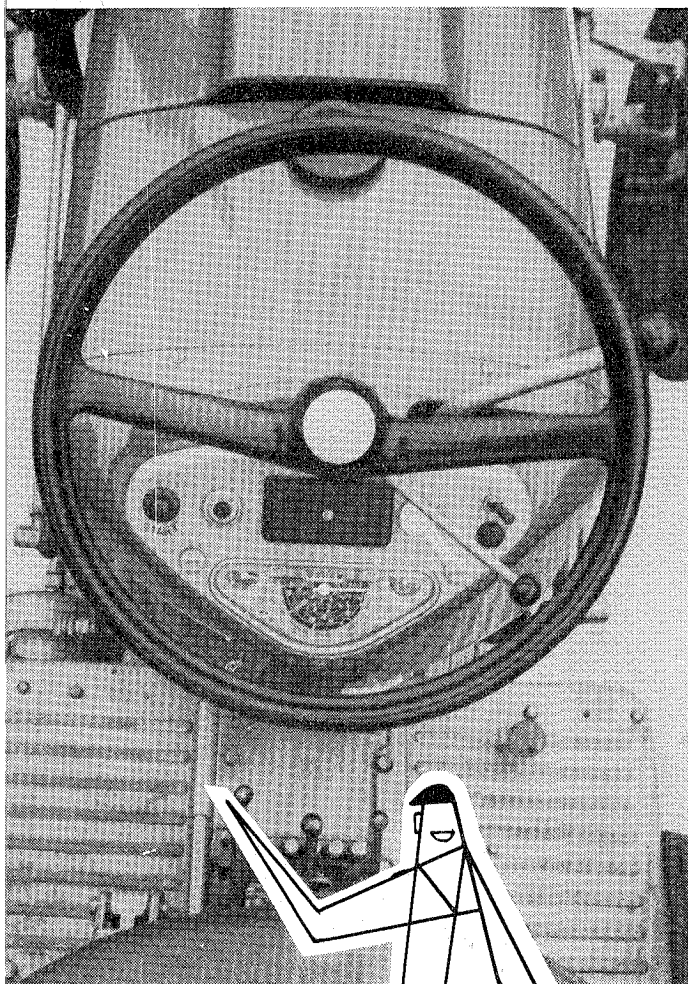
Because 80 per cent of the components are common for all three types, also the Operating Manual is common for these tractors.

Zetor

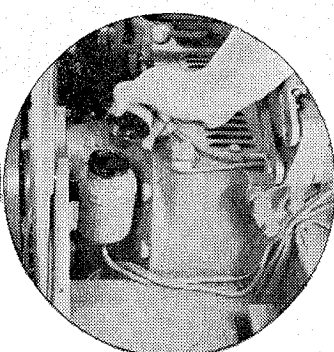
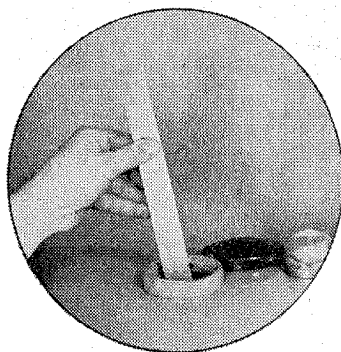
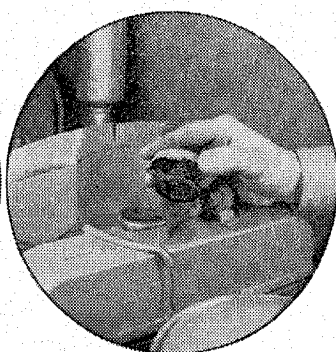
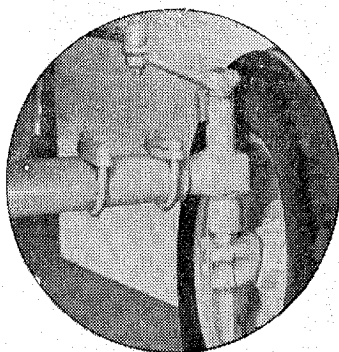
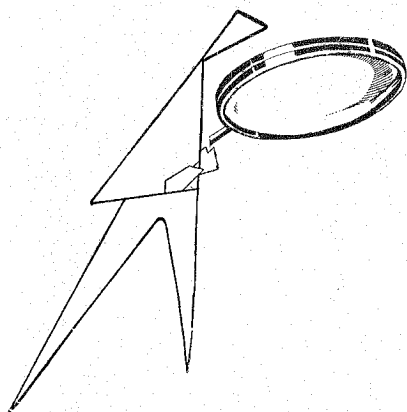
TABLE OF CONTENTS

	Page
Use of the Tractor	5
Preparation of the Tractor for Travel	7
How to Bleed the Fuel System	9
Starting the Engine	9
How to Start Moving the Tractor	11
How to Shift Gears	11
Control of the Tractor during Its Travel	12
Electrical Equipment of the Tractor	12
Brakes	15
Auxiliary Drives and Double-purpose Clutch	16
Cultivating Tractor	18
Setting-up the Wheel Track of the Front Wheels	20
Setting-up the Wheel Track of the Rear Wheels	20
Seat	22
Running-in the Tractor	22
Loading of the Tractor and Inflating of Tyres	23
Operation of the Tractor under Special Conditions	24
Suspensions	25
Directions for the Performance of the Tractor	25
Maintenance of the Tractor	27
Survey of Individual Technical Maintenance	
Operations	28
Technical Inspection I	28
Technical Inspection II	28
Technical Inspection III	29
Technical Inspection IV	29
Description of Operations of Technical	
Maintenance	30
Adjustment of the Toe-in of Wheels	34
Checking and Taking Up the Play of Front Wheel	
Bearings	34
De-aeration of the Hydraulic Brakes	36
Electrical Equipment and Accessories	38
Lubrication of the Tractor	38
Changing of Oil in the Engine	38
Air Cleaner	39
Changing of Oil in the Gearbox and Main	
Transmission Housing	40

	Page
Common Defects and Their Remedy	41
Engine Defects	42
Lubricating System Defects	44
Defects of the Electrical Equipment and Accessories	45
Defects of the Hydraulic Brakes	46
Instructions for Remedying the Defects	47
 Special Accessories	 49
Cooling Set for the Tropics	50
Front Wheel Sprung Pull-out Extension	51
Front Mud Guards	51
Air Compressor	52
Pneumatic Brakes	53
How to Fill Rear Tyres with Water	55
Safety Frame	57
Hot Air Heating Equipment	58
Belt Pulley	59
Vertically Adjustable Drawbar	61
Vertically Adjustable Fork in Fixed Positions	61
Suspension for Single-axle Trailer	61
Fitting of Double Tyres	61
Bottom Exhaust	61
Cab	63
Front Axle Ballast Weights	63
Rear Wheel Ballast Weights	64
Spot Light for Night Ploughing	64
Seat for the Driver's Mate	65
Three-point Suspension of the Hydraulic Power Lift	65
LH Telescopic Strut	65
Hydraulic Power Lift Zetomatic	66
 Technical Data of Zetor 2511, 3511, 4511 Tractors	 68
Zetor 3545 — Operator's Manual	75



Use of the Tractor



Preparation of the Tractor for Travel

Check daily before starting to work with the tractor:

- (1) Condition of steering — connection of the steering levers.
- (2) Amount of water in radiator — swing away the hood cover.
- (3) Amount of fuel — replenish if necessary.
If there is fuel only on the bottom of the tank, when cleaning the fuel filters, or in the case that you have forgotten to open the fuel cock for starting, it is necessary to carry out bleeding of the fuel system.
- (4) Amount of brake fluid; refill, if necessary.
- (5) Amount of oil, according to "Lubrication Chart".
- (6) Tightening of the bolts and nuts at important joints.
- (7) Function of brakes, making sure that the pedal, being depressed, puts up a resistance.

After having set the tractor going, try out the brakes. Inspect if the lever of the brake change-over device is in its middle position.

Because the brake fluid tank of the hydraulic brakes was filled in the production Works with brake fluid of the "Synthol Red No. 1" mark, it is necessary, before re-filling it with another type of fluid, to drain the original fluid and to rinse the whole braking system with alcohol.

In re-filling the fluid, care for cleanliness scrupulously.

- (8) Pressure in tyres.

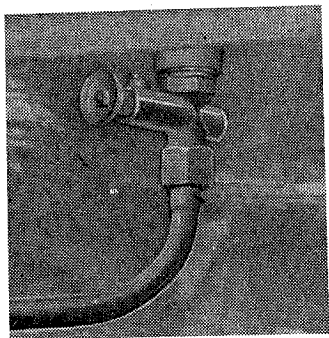


Fig. 1

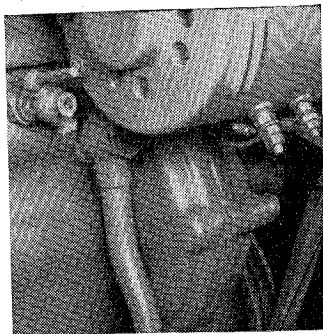


Fig. 2

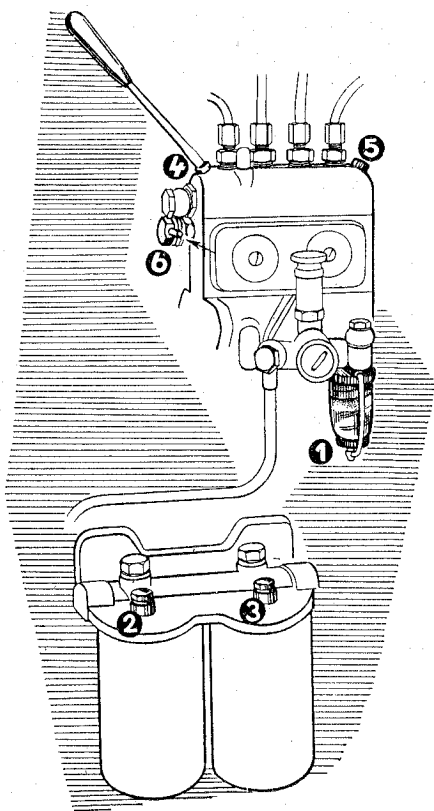


Fig. 3

How to Bleed the Fuel System

- (1) Open the fuel cock (Fig. 1) and loosen the stirrup of the precleaner bowl (Fig. 3/1) so that the bowl is filled with fuel without air bubbles. Attach the bowl by tightening the stirrup.
- (2) Loosen the bleeding screws of the fuel filters (Fig. 3/2, 3) and pump manually until Diesel oil flows out without bubbles from both of them. Tighten the screw of the coarse filter (Fig. 3/2) and proceed with pumping for another moment. Then tighten also the screw (Fig. 3/3) of the second filter.
- (3) Loosen the bleeding screws of the fuel injection pump (Fig. 3/4, 5) and pump manually until Diesel oil without air bubbles escapes around these screws. Without interrupting the pumping, tighten the screw 4 and then the screw 5.

Having finished the bleeding, clean the engine from fuel. Start the engine when all above mentioned operations had been carried out.

Starting the Engine

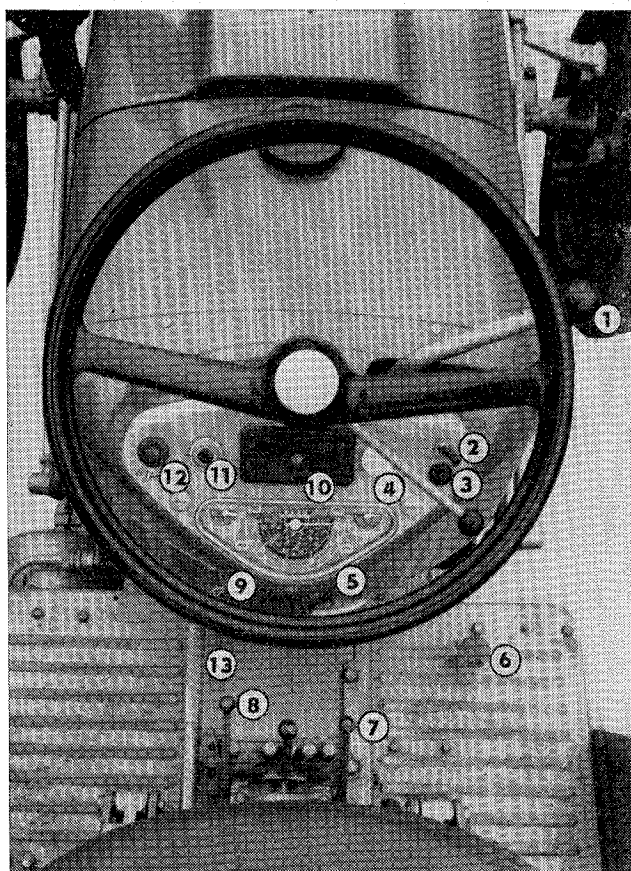
Before starting the engine make sure that the shifting lever and the auxiliary drive shifting lever are in their neutral position and that the hand brake is put out.

- put the switch key to "0" position
- depress the clutch pedal
- set up the maximum fuel delivery
- depress the starter push button
- do not start longer than for 5 seconds.

If the engine does not start immediately for the first time, repeat the starting, but not until 30 seconds are gone.

If the starting is difficult or the temperature is low, use the decompression device.

The correction starter considerably facilitates the starting of the engine; it is put into operation by depressing the push button (Fig. 3/6), and is switched off automatically by the least movement of the fuel delivery governor lever (before depressing the push button it is necessary to set up the fuel delivery lever to the maximum delivery).



- (1) Gear shift lever
- (2) Change-over switch of the direction indicator
- (3) Horn
- (4) Inspection lamp socket
- (5) Decompressor control
- (6) Foot fuel control pedal
- (7) Reduced gear shifting lever
- (8) Drive shifting lever
- (9) Radiator screen control chain
- (10) Fuse box
- (11) Switch box
- (12) Starter push button
- (13) Hand brake control lever

Fig. 4

How to Start Moving the Tractor

Inspect, if the little shifting lever (N) for normal and reduced speeds is in position S (normal travelling speeds) or in position R (reduced speeds).

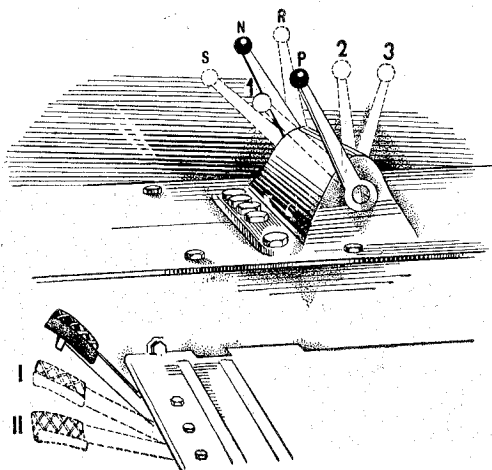
Reduce the engine revolutions to idling speed, depress the clutch pedal to one half of its whole downward travel (I), thus disengaging the travel clutch and engage the chosen speed. If it is impossible to engage the speed, release the clutch pedal and depress (I) it once more.

If the tractor stands on level ground, release the hand brake, slow, engage the clutch pedal and increase the revolutions of the engine until the tractor starts moving.

If the tractor stands on a slope, release the hand brake and simultaneously engage the clutch and increase revolutions of the engine. The clutch pedal position "II" is used for engaging auxiliary drives.

How to Shift Gears

When the tractor had moved, shift individual speeds as follows: Decrease revolutions of the engine, depress the clutch pedal, shift in the speed gear, release the clutch pedal, depress it once more and shift in further speed gear, whereupon release continuously the clutch pedal.



Gear shifting must be carried out noiselessly and smoothly

Changing speeds from a higher to a lower one (for instance from the 5th speed to the 4th, 3rd, etc.) carry it out with "intermediate gas", i. e. reduce the engine revolutions, depress the clutch pedal (I) shift out the speed, release the clutch pedal, increase the engine revolutions (in accordance with the speed at which the tractor moves on), depress the clutch pedal (I), shift in a lower gear and release smoothly the pedal.

Control of the Tractor during its Travel

Watch during travel:

- The pilot lamp of engine lubrication — red colour (Fig. 5/1); if it is switched on during operation, this indicates a defect; have it remedied immediately.
- The charging pilot lamp — red colour (Fig. 5/2); if it lights up during running, this indicates a defect in the charging circuit.
- The water thermometer (Fig. 5/3) — the most advantageous engine operation temperature is within the limits of 80° to 95° C (176° to 203° F); at a lower temperature cover the radiator with a screen.

The engine-hours counter (Fig. 6) gives the number of the tractor worked off hours with the engine running.

The pilot lamp of the direction indicator (Fig. 5/5).

The pilot lamp of the distance lights (Fig. 5/4) — it lights up when the distance lights are switched on.

Electrical Equipment of the Tractor

On the dashboard (Fig. 4) there are; the push button of the horn, the socket which serves for connecting the inspection lamp or the windscreen wiper for the cab front glass, the change-over switch of the direction indicator and the switchbox (Fig. 7) which serves for switching the electric circuits.

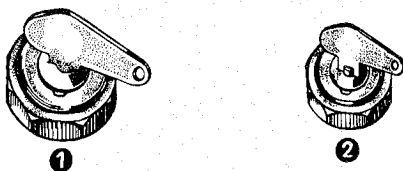


Fig. 7

It has four positions:

Position "0" — the starting circuit, charging, pilot lamp of oil pressure, of direction indicator and socket for the inspection lamp are switched on.

Position "1" — the tail lights and contour lights, the complex panel instrument lighting and the spot light for ploughing, if necessary, light up.

Position "2" — the main lights light up.

Position "3" — instead of the distance lights the dipped lights light up.

The switch key being put in by one half of its length (Fig. 7/2), only the lights necessary for lighting of the tractor, without the pilot lamps of oil pressure and direction indicator are on in the positions "0" to "3".

The horn and the stop light are connected directly to the storage battery.

Lamps

- front direction indicator
- rear combined lamp is equipped with:
 - direction light
 - contour light
 - stop light(in addition, the left combined lamp is adapted for lighting of the state identification number plate).
- the front headlamps are provided with main, dipped and contour lights.

A socket serves for lighting of the trailer (Fig. 8).

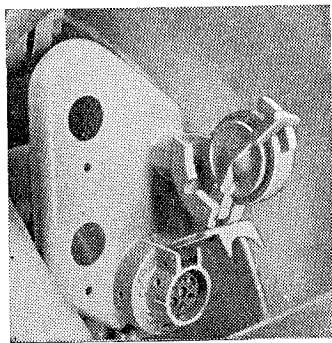
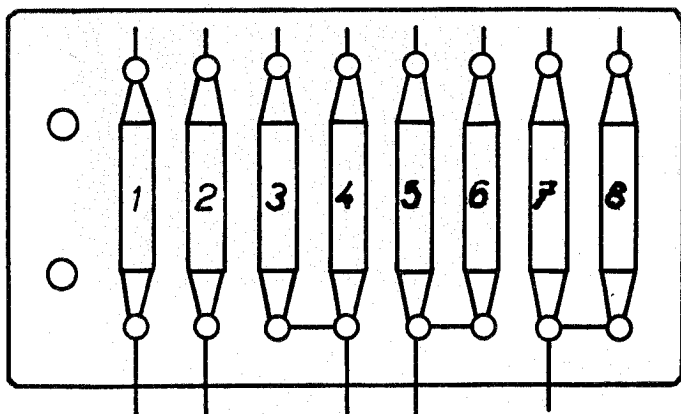


Fig. 8



Fuse Box

This contains the fuses of the individual appliances

- 1 — Front headlamps — main lights
- 2 — Front headlamps — dipped lights
- 3 — Front contour lights
- 4 — Tail lights and rear contour lights
- 5 — Interruptor of the direction indicator
- 6 — Socket for inspection lamp, wiper and oil inspection
- 7 — Regulating relay (fuse 15 A)
- 8 — Horn, stop lamps

Brakes

Hand brake —to be applied to secure the tractor at a standstill.

Braked off (Fig. 10)

Braked by placing the lever up.

Hydraulic foot brake — on braking use only a moderate pressure upon the pedal, brakes are very efficient.

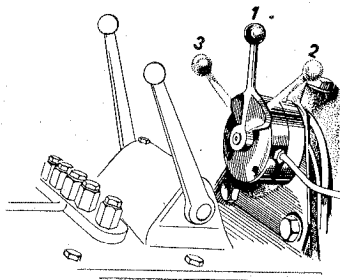


Fig. 9

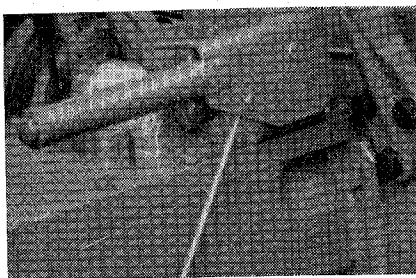


Fig. 10

The hydraulic brake change-over device (Fig. 9) enables:

- (a) To brake both wheels simultaneously — the lever in position 1.
- (b) To brake each wheel separately — the lever in position 2 or 3.

While travelling on a roadway, always keep the change-over device lever in its middle position (Fig. 9/1).

If any of the rear wheels slips in the field, use the differential lock (the differential lock puts the differential out of function — the rear wheels have then conformable revolutions, but only while the pedal is depressed).

Do not use the differential lock while turning.

Auxiliary Drives and Double-purpose Clutch

The design of the double-purpose clutch and of the auxiliary drives enables extensive use of the tractor for various work in agriculture, civil engineering and forest industries.

Shifting of the Drives

Shifting of the auxiliary drives is being carried out by the little lever "P".

At the full clutch pedal depressing (II) shift the little lever to position "1" — in this position the P. T. O. shaft and the hydraulic pump are driven at standardized revolutions (540 r. p. m.).

For working it is possible to use:

- (a) P. T. O. shaft
- (b) Hydraulic pump
- (c) P. T. O. shaft and hydraulic pump simultaneously

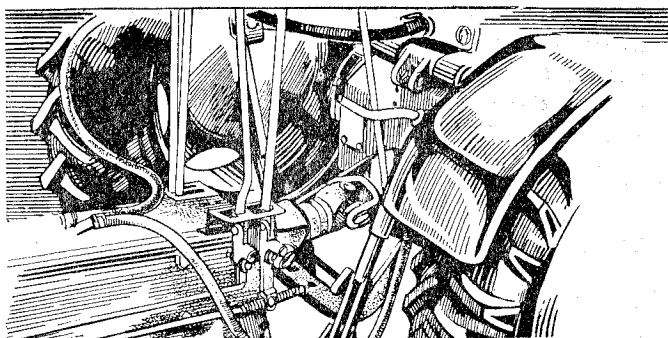


Fig. 11

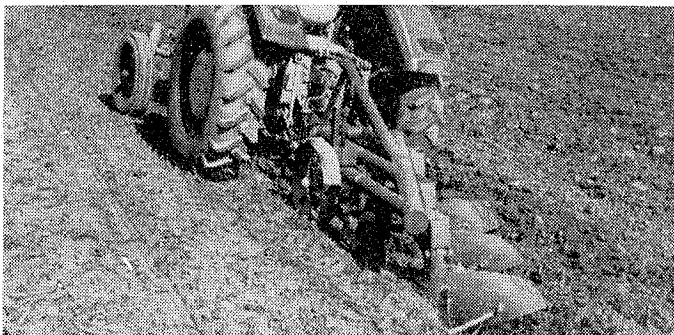


Fig. 12

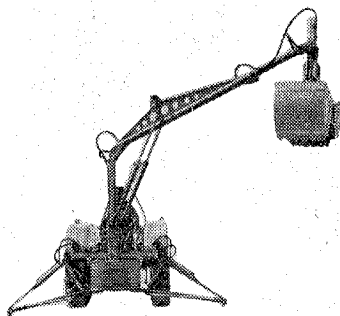


Fig. 13

At the first clutch pedal depressing (I) shift the little lever to position "2" — in this position the P. T. O. shaft is driven through the gearbox.

At the first clutch pedal depressing (I) shift the little lever to position "3" — in this position the hydraulic pump is driven through the gearbox.

In position "N" no drive is effectuated.

Cultivating Tractor

Do you wish to plough, to cultivate?

Simple conversion of the ploughing tractor into a cultivating one.

(1) Setting-up the road clearance of the front axle.

Unlock and loosen four bolts of the hub and shift the wheel with the hub into the bottom groove (the pin in the wheel hub engages with the groove on the king pin).

After having done this operation tighten the bolts and lock them. It is necessary to carry out these operations with the front axle lifted.

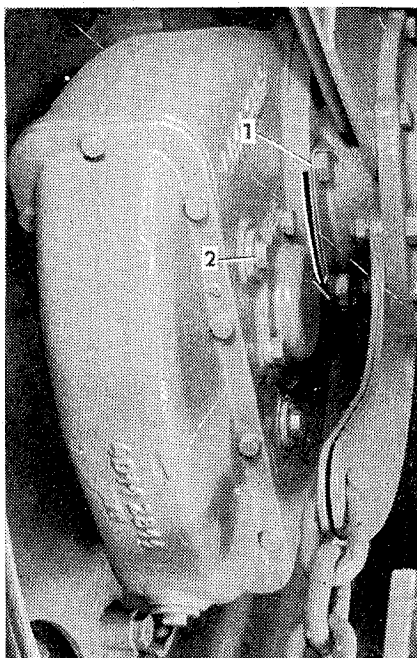
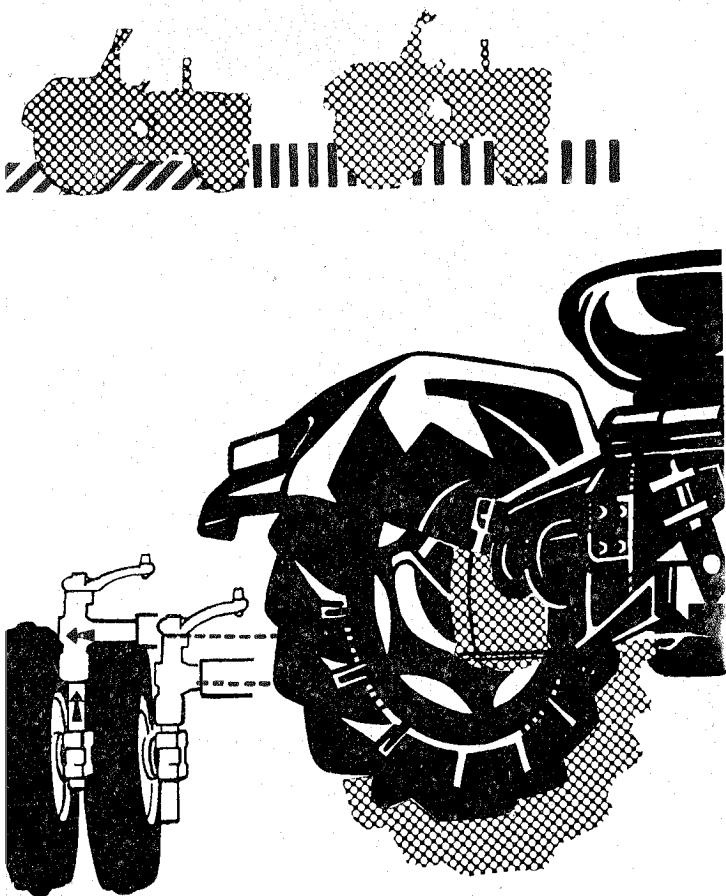


Fig. 14

- (2) Setting-up the road clearance of the rear wheels (to be carried out by moving round the housings of the side gearing).

By means of a lifting jack lift the tractor rear axle. Unlock and remove screws M 14 and move round the housing of the side gearing by one hole on the screw pitch diameter (in the direction of the arrow). Insert the bolts, washers and nuts and tighten them using a torque wrench.



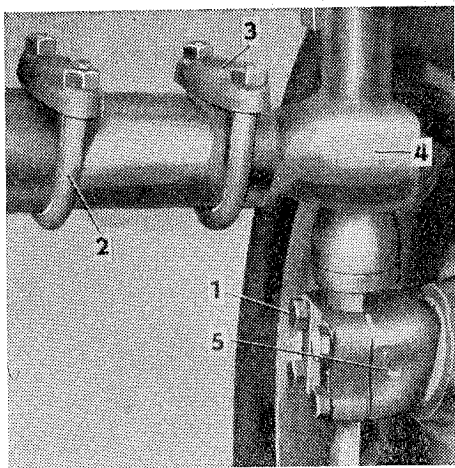


Fig. 15

Setting-up the Wheel Track of the Front Wheels

The Zetor 2511 and Zetor 3511 have three positions of the wheel track as follows:

1275—1575—1725 mm (50.18"—62"—67.91")

The Zetor 4511 has two positions viz. of

1350—1750 mm (53.14"—68.89")

Carry out the setting-up as follows: Loosen the stirrup (Fig. 15/2) sufficiently and remove it together with its pin (Fig. 15/3). Pull out the extension (Fig. 15/4) to the required position so that the pin on the stirrup engages with the groove on the extension. Mount the stirrup with pin (Fig. 15/3) and tighten both stirrups. Check the front wheel toe-in.

After alternation of the wheel track to the third position (in the case of the Zetor 4511 tractor to the second position), adjust the front wheel toe-in.

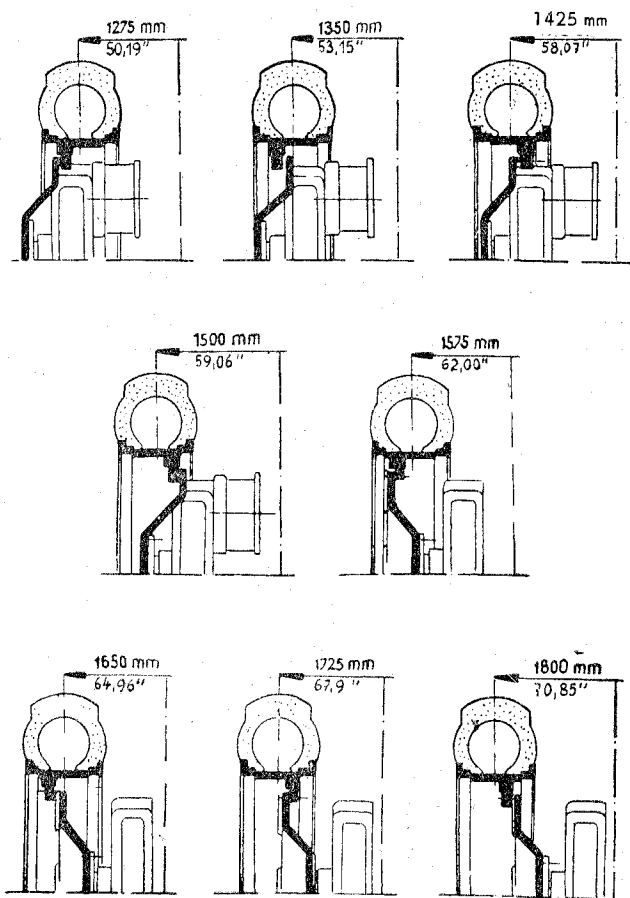
Setting-up the Wheel Track of the Rear Wheels

It is possible to adjust the wheel track of the rear wheels in 8 different positions altogether. Change the wheel track only with the rear part of the tractor lifted so that the wheels rotate freely. Before lifting secure the tractor against movement by supporting the front wheels. The setting-up of the individual wheel tracks is carried out by altering the mutual position of the rims and disks.

When mounting, tighten the bolts properly so that, whilst running, the rim on the wheel disk cannot get loose.

Zetor 2511 and Zetor 3511 tractors are supplied from the Works with the wheel track of the rear wheels set up to 1350 mm (53.14") and with the minimum wheel track of the front wheels of 1275 mm (50.18"). The Zetor 4511 tractor is supplied with the wheel track of the rear wheels set up to 1425 mm (56.10") and with a minimum wheel track of the front wheels of 1350 mm (53.14").

For cultivation it is necessary to change the rims and tyres; choose the wheel track according to the rows of plants.



Seat

The seat is well sprung and can be adjusted in accordance with the weight and size of the driver (Fig. 16). The distance of the seat from the steering wheel can be changed by loosening the nut (1) on the base plate (2) and shifting the seat (3) to the chosen positions: I, II, III.

Running-in the Tractor

- (1) Drive without load for the first 20 operating hours.
 - (2) For another 50 operating hours use the tractor with implements without overloading it (i. e. drills, harrow, drags, sprinklers and others).
 - (3) During the time of running-in, do not use hydraulic power lift.
- During this time mind the shorter intervals for maintenance.

Maintenance of the Tractor when Running it in

(to be carried out in the case of a new or overhauled tractor)

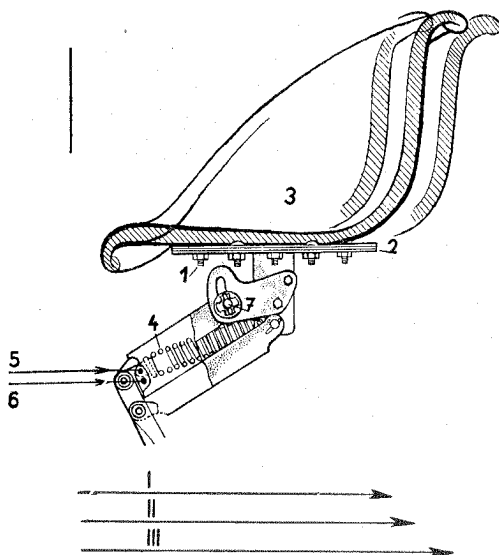


Fig. 16

Carry out after having worked off 30 engine-hours:

- (1) Operations of the daily attendance.
- (2) Change of oil in the crankcase and rinsing.
- (3) Cleaning of oil filters.
- (4) Draining of the oil from the tyre inflator (if the tractor is equipped with an air compressor).

Loading of the Tractor and Inflating of Tyres

In accordance with your option we can supply the tractors with a sprung or unsprung front axle.

If the tractor is equipped with an unsprung front axle, it is possible to use loaders or other adapting equipments, but the pressure in the tyres must be increased according to the maximum load of the front and rear axle.

To Inflate the Front Tyres

Type of tractor	Permissible maximum load of front axle	Pressure in tyres	Note
Zetor 2511	800 kgs (1764 lbs.) 1000 kgs. (2205 lbs.)	2 kp/cm ² (28.4 p. s. i.) 3 kp/cm ² (42.7 p. s. i.)	(only for speeds up to 6 km/h — 3.726 m. p. h.)
Zetor 3511	1000 kgs (2205 lbs.) 1200 kgs (2646 lbs.) 1500 kgs (3307 lbs.)	2 kp/cm ² (28.4 p. s. i.) 2.5 kp/cm ² (35.6 p. s. i.) 3 kp/cm ² (42.7 p. s. i.)	(only for speeds up to 6 km/h — 3.726 m. p. h.)
Zetor 4511	1100 kgs (2425 lbs.) 1600 kgs (3527 lbs.)	2 kp/cm ² (28.4 p. s. i.) 3 kp/cm ² (42.7 p. s. i.)	(only for speeds up to 6 km/h — 3.726 m. p. h.)

The rear tyres of tractors with adapting equipments must be inflated for all tyre sizes to 1.5 kp/cm² (21.3 p. s. i.). For tractors with rear tyres thus inflated the following maximum load on the rear axle is permitted:

Zetor 2511	1200 kgs (2646 lbs.) for tyres 8-28
	1600 kgs (3527 lbs.) for tyres 10-24
Zetor 3511	1500 kgs (3307 lbs.) for tyres 9-32
	2000 kgs (4409 lbs.) for tyres 11-28
Zetor 4511	2600 kgs (5732 lbs.) for tyres 13-28

The measuring of the load on the rear and front axle in the case of tractors with adapting equipment, is carried out on a weightbridge with the adapting equipment fitted, including the equipment with which the adapting equipment is used (e. g. adapting equipment for displacing earth and others).

For ploughing inflate the front tyres as follows:

Zetor 3511 and Zetor 2511 — 1.75 kp/cm² (24.9 p. s. i.)

Zetor 4511 — 2 kp/cm² (28.4 p. s. i.)

rear tyres: to 0.8 kp/cm² (11.4 p. s. i.)

For road transport inflate the front tyres as follows:

Zetor 3511 and Zetor 2511 — 1.75 kp/cm² (24.9 p. s. i.)

Zetor 4511 — 2 kp/cm² (28.4 p. s. i.)

rear tyres of all sizes to 1.5 kp/cm² (21.3 p. s. i.)

Operation of the Tractor under Special Conditions

When operating the tractor in winter (at an ambient temperature lower than -5°C , 23°F), the tractor calls for a somewhat greater care when starting and maintaining the storage battery. Before passing over to the winter operation, it is necessary to change oil as well in accordance with the instruction given in the Lubrication Chart. For the cooling circuit use an antifreezing liquid.

Provided that a liquid is used as a ballast in the rear tyres, fill the tyres also with an antifreezing liquid. To maintain the operating temperature of the engine use a radiator screen. Provided that water is used for cooling, drain it after finishing work by means of a cock on the radiator (Fig. 17) as well as on the crankcase.

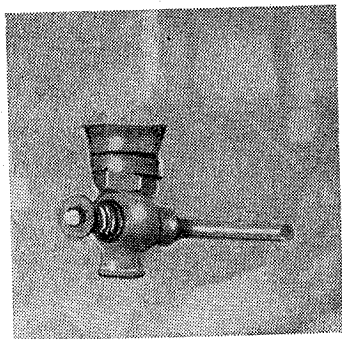


Fig. 17

Operation in the Tropics

For operating the tractor under tropical conditions adhere to these main rules:

- (1) Never use the radiator screen.
- (2) Inspect every day the volume of electrolyte, in the storage battery.
- (3) Clean every day the top bowl of the air filter.
- (4) Adhere to the oil grades in accordance with the individual oil characteristics which are recommended by the Works.
- (5) Inspect daily and fill up water in the radiator and examine the seat of the overpressure lock for tightness. (The overpressure plug being fitted on, the water temperature may attain 111° C, 232° F.)

Suspensions

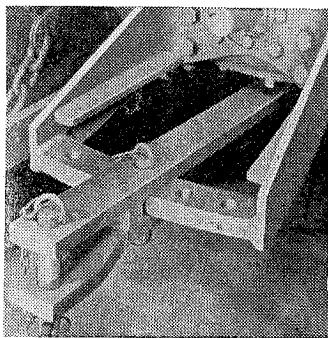
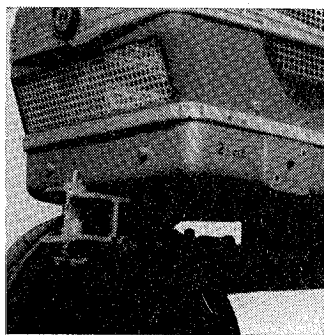
On the bracket of the front axle the tractor is equipped with a towing hook which serves only for towing-away the tractor. The 5 position swinging drawbar serves for the suspension of tracted implements.

Directions for the Performance of the Tractor

For each sort of work choose such a gear ratio which corresponds to the required speed for the particular kind of agricultural work.

Before driving uphill, engage a gear so as to drive up the hill smoothly.

When driving downhill with a freight, engage a gear which it would be necessary to engage for driving up the same hill.



When driving downhill, do not go beyond the maximum engine speed, i. e. 2200 r. p. m. If this speed is exceeded a defect to the engine may result.

The RH and LH brake must brake simultaneously. It is forbidden to drive on the roadway with the change-over device of the hydraulic brakes changed over to the LH or RH wheel.

When using the tractor as a driving machine (for threshing, sawing and the like), see to it that the tractor stands on even ground, that it is braked and locked by means of underlaid shaped wedges against shifting and moving. Secure the knuckle-shaft for driving machines by a protecting guard. As long as the drive of the knuckle-shaft is not disengaged, do not leave the tractor (danger of accident). Before working on a sloping ground, take into consideration the working possibilities so that dangerous inclination of the tractor does not take place. A skilled and cautious driver should be entrusted with the operation of the tractor on a sloping ground.

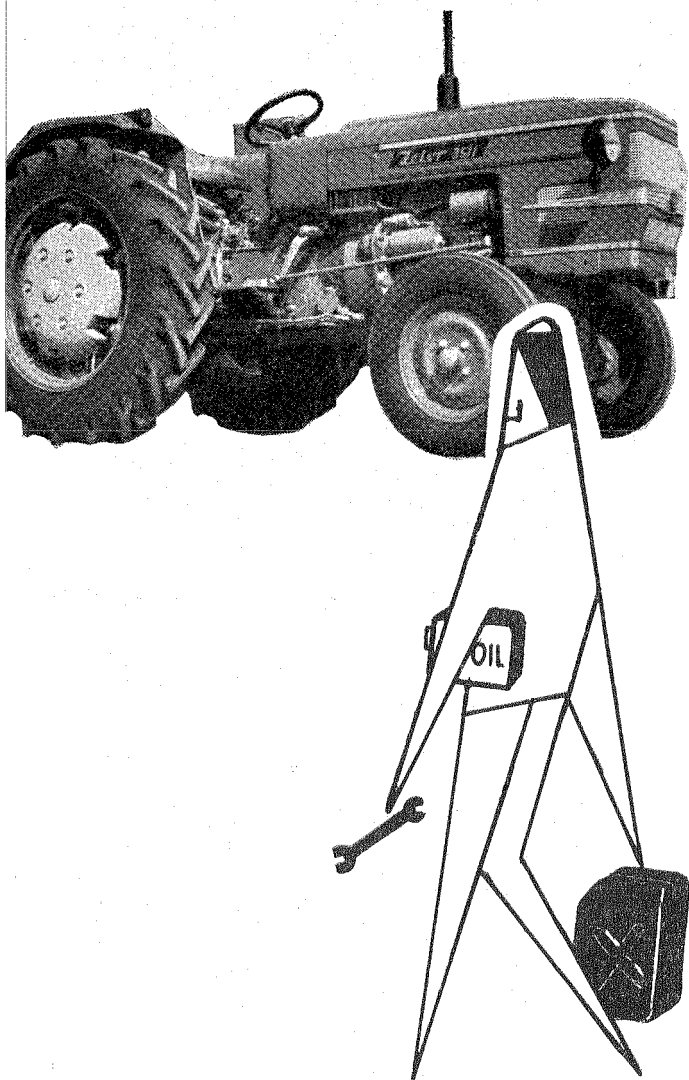
It is not recommended to use the ballast weights of the front wheels for road transport in the case of Zetor 2511 and Zetor 3511 tractors, same being designed for the heaviest field work only.

Do not inspect the level of the storage battery electrolyte when using a naked fire.

The engine being overheated, do not open the radiator closing plug and do not pour cold water into the radiator. Do not fit additional weights to the cultivation tractor, the specific pressure is increased and the tyres are overloaded otherwise.

A long service life and absolute satisfaction are guaranteed if you pay special care to the maintenance of the tractor.

Maintenance of the Tractor



Survey of Individual Technical Maintenance Operations

(A) Daily attendance (to be carried out after working of 8 to 10 engine-hours) consists of following operations:

- (1) Clean the tractor and implements. Inspect for tightness the screws and nuts (joints of the individual tractor elements), especially the fixing bolts of the front and rear wheels, the additional weights and the bolts of all steering levers.
- (2) Replenish fuel and inspect for tightness the joints of the fuel system.
- (3) Replenish water and inspect for tightness the cooling system.
- (4) Ascertain the quantity of oil and inspect for tightness the joints of the oil system.
- (5) Test the function of the hydraulic brakes, eventually of the pneumatic brakes.
- (6) After starting the engine test its regularity of running, the function of lubrication, charging, the function of lights and the horn.
- (7) Test the air pressure in tyres.
- (8) Inspect the drawing coupling linkage — especially the tightening of bolts and the function of the locking devices.

(B) Technical Inspection I

This should always be carried out after 70 engine-hours.

- (9) Daily attendance (points 1 to 8).
- (10) Carry out lubrication of the tractor according to the Lubricating Chart.
- (11) Clean the oil filters No. 1 and 2.
- (12) Test the tightening of the fan belt (Fig. 18).
- (13) Clean the glass sedimentation bowl of the delivery pump (drain oil from the tyre inflator).
- (14) Inspect the electrolyte level in the storage battery (15 mm — .59" — above the upper border of plates), clean the oxidized cable terminals and apply grease.
- (15) Inspect the brake fluid level (capacity 0.3 litres — .066 imp. gal.).

(C) Technical Inspection II

This should always be carried out after 250 engine-hours.

- (16) Lubricate the tractor thoroughly in accordance with the Lubrication Chart.
- (17) Replace No. 1 coarse fuel filter element.
- (18) Check the fins of the radiator of outer impurities — flush them with water.
- (19) Check the play between the release of the clutch and the sleeve.
- (20) Dismount the bottom cover of the crankcase and clean it. Clean the strainer of the oil pump.

(D) Technical Inspection III

This should always be carried out after 500 engine-hours.

- (21) Daily attendance (points 1 to 8).
- (22) Technical Inspection I to II (points 10 to 19).
- (23) Replace No. 2 fuel filter element.
- (24) Check the tightening of the bolts of the cylinder heads.
- (25) Check the play of the valves.
- (26) Test injectors and, if necessary, adjust the pressure to 160 kp/cm^2 (2275.6 p. s. i.).
- (27) Test the toe-in of the front wheels $6 \pm 4 \text{ mm}$ ($.236'' \pm .157''$) and the play of the tapered-roller bearings of the front and rear wheel hubs.
- (28) Test, if necessary, adjust the hand brake.
- (29) Flush the cooling system with clean water to remove sediments.
- (30) Rinse the fuel tank.

(E) Technical Inspection IV

This should always be carried out after 1000 engine-hours.

- (31) Daily attendance and TP I to III — points 1 to 30.
- (32) Lubricate the tractor thoroughly (see the Lubrication Chart).
- (33) Inspect the tightening of the bolts of the main and connecting rod bearings and the screws of the crankshaft counterweights.
- (34) Test for tightness the injection pump elements by a pressure gauge.

We recommend to carry out the operations of technical maintenance Nos. II to IV which are quoted under points 24 to 27, 33 and 34, in a specialized workshop.

Description of Operations of Technical Maintenance

Operations of technical maintenance I

sub 12) Testing of the sag of the water pump and dynamo belt.

The sag of the belt under average finger pressure must not exceed 20 mm (.79" — Fig. 18).

sub 13) Inspection of the sedimentation bowl of the delivery pump.

Remove impurities from the bowl, rinse the sleeve with petrol or Diesel oil and fit it back.

sub 14) Inspection of the electrolyte level. Unscrew the plugs (Fig. 19) and inspect the electrolyte.

The electrolyte must overtop 15 mm (0.59") the upper border of the plates. For filling up use distilled water only. From time to time clean the battery terminals and apply a thin layer of vase-line. If electrolyte has been poured out, fill up the cells with electrolyte of the prescribed density, i. e.

for normal conditions	1.28 (32° Bé)
for the tropics	1.23 (27° Bé)

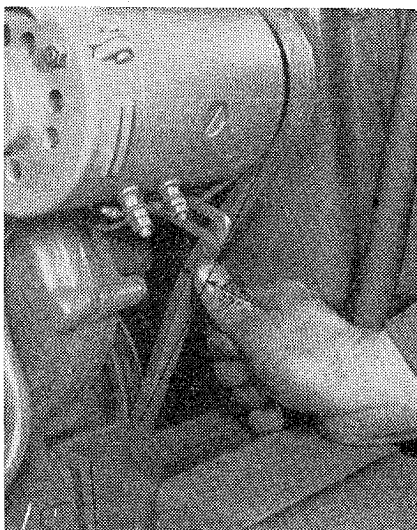


Fig. 18

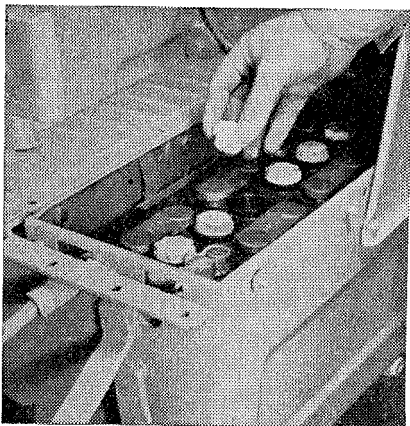


Fig. 19

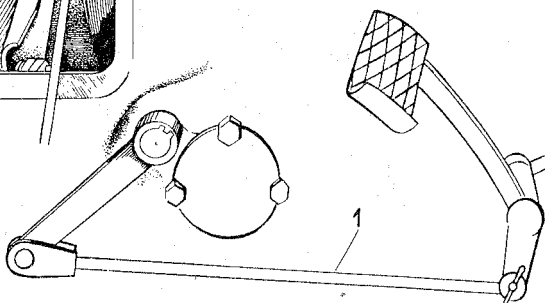
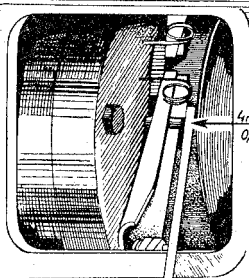


Fig. 20

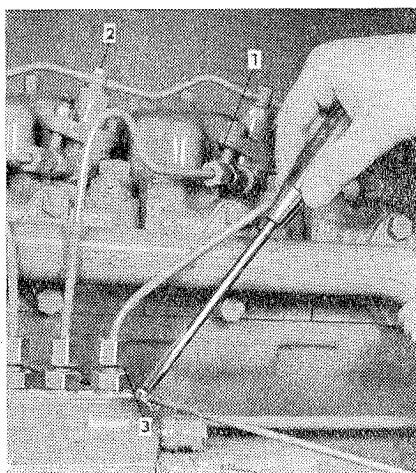


Fig. 21

sub 25) Checking the play of valves — we recommend to carry out this operation in a specialized workshop.

The valve play should be adjusted when the engine is cold.

Play of the intake valve 0.20 mm (.0079")

Play of the exhaust valve 0.30 mm (.0118")

sub 26) In the case of a serious defect of the fuel systems — of the injection pump, take the tractor to a specialized repair shop.

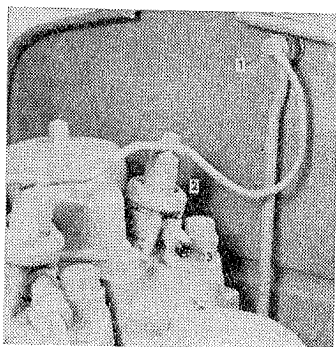


Fig. 22

Ascertain the defect of the injector as follows:

- (1) Set the engine running at minimum speed.
- (2) Loosen the cap nut (Fig. 21/3); if the engine revolutions diminish — the injector is good, if the engine revolutions do not change, the injector is defective and it is necessary to clean the holes of the nozzle, or to replace the injector with a new one.

sub 27) Testing of the front wheel toe-in and taking-up the play of bearings.

Adjustment of the Toe-in of Wheels

The toe-in of the wheels is adjusted by shortening or lengthening of the steering tie rods (Fig. 23). By shortening the tie rods the toe-in increases (the tie rods should be moved round in the direction of the arrow 1). By lengthening the tie rods the toe-in diminishes (the tie rods should be moved round in the direction of the arrow 2). The toe-in should be measured on the rims. It is 6 ± 4 mm or $.236'' \pm .157''$.

Checking and Taking Up the play of Front Wheel Bearings (Fig. 24)

- (1) Insert a lifting jack under the front axle bracket so that the wheel is free to rotate.
- (2) Ascertain on the wheel periphery, if there is no great play in the bearing. The play should be adjusted by tightening the nut of the bearing, having first removed the cap and pulled out the split pin.
- (3) Having taken up the bearing play, the wheels must rotate freely, while the bearings should not exhibit

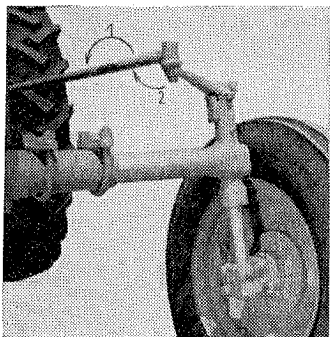


Fig. 23

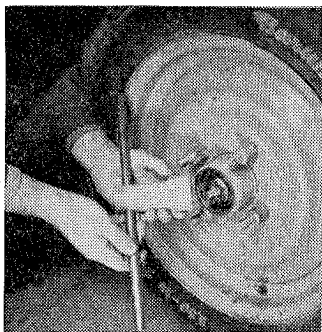


Fig. 24

any noticeable play (swinging out of the wheel on the bearing is imperceptible).

- (4) After adjustment secure the nut by a split pin, fill the bearing with grease and screw on the cap.

sub 28) Testing of Brakes and Adjustment of the Hand Brake.

The hand brake must be adjusted in such a way that it brakes effectively already on the third tooth of the catch. The adjustment should be carried out as follows: Slightly loosen the screw holding fast the guard and remove the latter. Pull out slowly the tie rod of the hand brake until the catch locks the brake on the third tooth. Leave the lever in this position, loosen the top nut and tighten the bottom nut until the brake band contacts the brake drum. Tighten the lock nut. From below lift the pin holding the spring of the band (Fig. 25), put on the guard of the brake and secure it with a little screw. In the same way proceed also in the case of the second brake band.

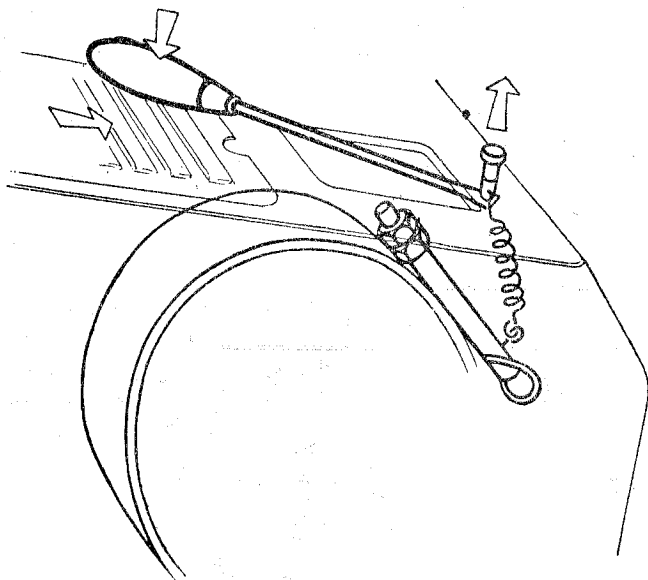


Fig. 25

De-aeration of the Hydraulic Brakes

If any of the pipe couplings has been dismantled, or the brake fluid has escaped and has been replenished, perfect de-aeration of the brake system must be carried out as follows:

Fill up the tank with brake fluid, slip on a rubber hose to the narrowed end of the bleeding screw of the brake change-over device and immerse the other end of the hose in the fluid in a transparent vessel (Fig. 26).

Loosen the bleeding screw about two turns and depress the brake pedal. Thus the fluid together with air bubbles is drained. In the end, depressing the pedal simultaneously, tighten the bleeding screw. Proceed in the same way in the case of both brake cylinders. At the same time take care that there is enough fluid in the tank.

Remember when de-aerating:

- (a) The level in the auxiliary vessel must be higher than the mouth of the bleeding screw.
- (b) During the de-aerating procedure depress the pedal quickly and release it slowly.

The brake cylinders of the brake shoes should not be adjusted, because they are self-adjusting.

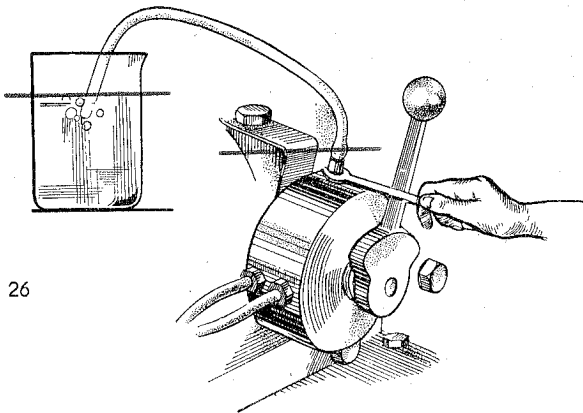


Fig. 26

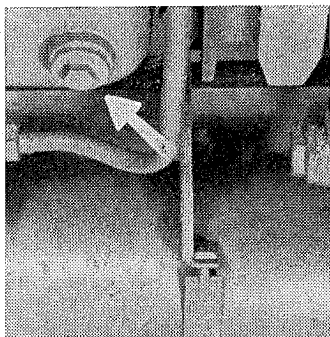
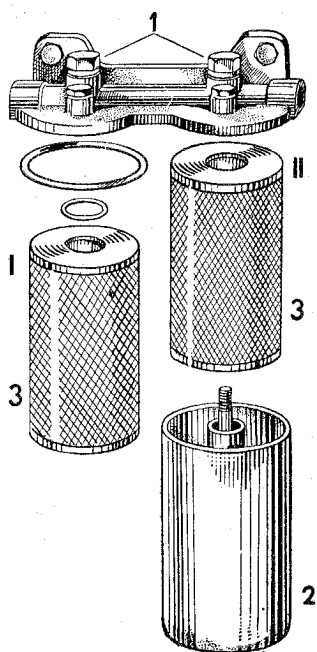


Fig. 27



Electrical Equipment and Accessories

Inspect the connection of the wires regularly you will thus prevent unnecessary defects of the electrical equipment. Have the maintenance procedures of the dynamo, starter motor and voltage regulating relay carried out in a specialized repair shop.

Lubrication of the Tractor

Lubrication and changing of oil constitute the substantial part of the technical maintenance of the tractor.

Tractors of the unified range have a very simple system of lubrication. Carry out the individual procedures at time intervals according to the "Lubrication Chart" of the tractor.

For filling of the tractors the production plant uses oils, which comply with the characteristic of oils stated in the Chart of Lubrication. In accordance with this chart choose the grades of oil of your producers.

Changing of Oil in the Engine

Change oil at the prescribed periods always after ending the run, while oil is still warm:

- (1) Unscrew the magnetic drain plug (Fig. 27) and drain oil completely. Clean the plug.
- (2) Unscrew the closing nuts (1) of the oil filters and remove the bowls (2) with inserts (3) and wash them simultaneously in kerosen or petrol. At the same time remove the wire mesh disks from their centering pins, do not interchange the coarse "I" for fine "II". Dry up the bowls and inserts, because even slight residues of the cleaning agents debase the oil.

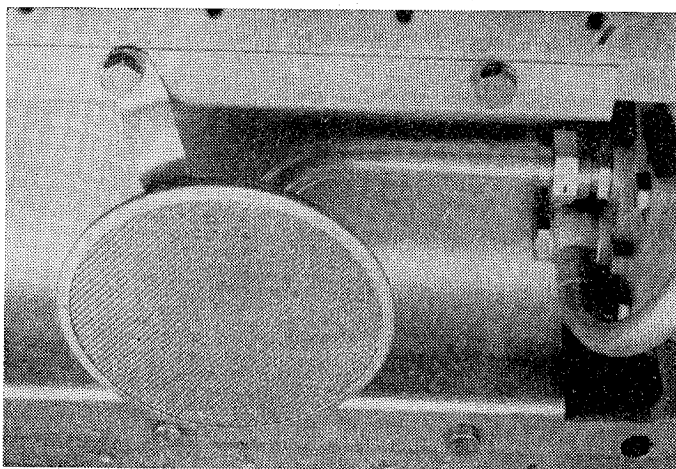
After reassembly of the inserts fill the filter bowls to about one half of their capacity with fresh oil and fit them back to the holder. Pour the oil into the crankcase up to the top gauge mark on the oil dip stick (Lubrication Chart). At low revolutions watch immediately the lubrication pilot light on the dashboard (the red bulb lights off) and also find out, if the filter bowls are tightened properly.

Air Cleaner

- (1) Inspection of the oil volume and cleaning of the pre-cleaner of dust (to be carried out at 1st Technical Inspection).
 - (a) Lift the hood.
 - (b) Unscrew the nut and remove the precleaner cover.
 - (c) Loosen three quick-coupling clips, remove the whole precleaner upwards and clean it.
 - (d) Inspect, if oil is up to the gauge mark in the cleaner casing, if necessary, refill it.
- (2) Change of oil (to be carried out after 60 engine-hours). Dismount in accordance with point 1.

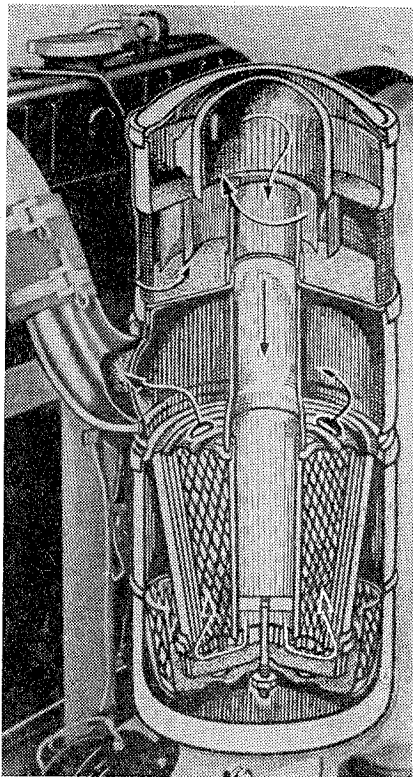
Wash the cleaner casing and the cleaner elements in petrol or Diesel oil and dry them before reassembling. Take care that the protective strainer around the intake slots is not choked.

Having finished the cleaning, join the parts by means of a bolt and nut and insert them into the casing filled with unused engine oil up to the gauge mark. Fit the casing back to the cleaner cover. Grease the contact surface of the cover and of the sealing ring on the neck of the insert.



Changing of Oil in the Gearbox and Main Transmission Housing

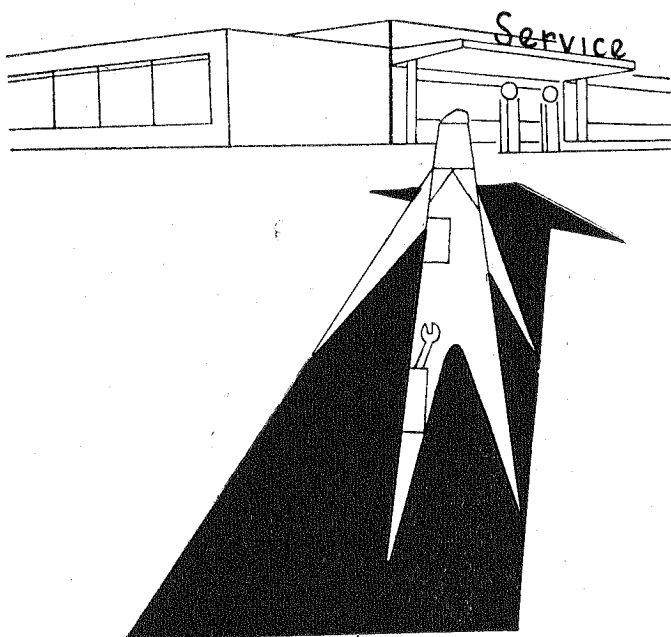
After having ended the run, drain oil from the gearbox and from the main transmission housing. Clean the plugs and pour rinsing oil into the boxes. Drive the tractor for about 10 minutes and drain the rinsing oil. Refill the boxes with prescribed oil (Lubrication Chart).



Common Defects and Their Remedy

A defect may arise on the tractor during operation, in most cases it is caused by negligence and bad maintenance.

Every defect, even the slightest one, remedy immediately after having ended the operation, if necessary even during the operation. The driver is able to remove common operational defects by himself. In the case of a more serious defect of the engine, injection pump, electrical and hydraulic equipment have the repair carried out in a special ZETOR service repair shop.



Engine Defects

Impossible to start the engine

Cause :	Remedy :
Storage battery discharged	Recharge the storage battery
The fuel injection pump does not supply fuel:	
(a) the fuel cock is closed	open the fuel cock
(b) the fuel system is de-aerated insufficiently	de-aerate the fuel system
(c) the fuel filters are contaminated heavily	clean the fuel filters
(d) fuel supply regulation is not set for full delivery	set the lever for full delivery, use the correction starter, if necessary

The engine runs irregularly

(a) air in the fuel piping	loosen the cap nuts on the injector and crank the engine until Diesel oil flows out without bubbles (de-aerate)
(b) some tightening nuts of the fuel pipes between the injection pump and injectors are tightened insufficiently and Diesel oil leaks	tighten the nuts
(c) some injector nozzles are choked	inspect and clean them
(d) dirt in the seat of the delivery valve	dismantle and clean it

The engine output is insufficient

(a) some nozzles are seized or choked	inspect, replace the nozzle, if necessary
---------------------------------------	---

Cause :

- (b) injectors are not adjusted properly
- (c) the injection pump is not adjusted correctly
- (d) the fuel injection start is adjusted incorrectly

Remedy :

have the injectors adjusted preferably in a specialized workshop
adjust the pump in a specialized workshop
adjust the fuel injection start to 20° before T. D. C.
(in a specialized service repair shop)

- (e) insufficient compression pressure in the cylinders which may be caused by:

- (1) untight valves
- (2) incorrectly adjusted valve play
- (3) a defective gasket between the cylinder head and crankcase
- (4) loosened cylinder head stud bolts
- (5) baked piston rings

regrind the valves in their seats
adjust to correct valve play
replace the gasket
tighten according to diagram (see the Instruction Book)
loosen the rings and clean the grooves in the pistons

Have the defects quoted under points 1, 2 and 4 repaired in a specialized service workshop.

- (f) soiled fuel filters, the pump supplies little fuel at higher loading

clean the filters

The engine gets overheated

- (a) little water in the radiator
- (b) the V-belt of the water pump is slack
- (c) the radiator is clogged with water incrustations

fill up the radiator
stretch out the belt
clean the radiator

Lubricating System Defects

Defect :	Cause :	Remedy :
The pilot lamp does not light	(a) defect of the electrical system	examine, have it repaired in a specialized repair shop
	(b) the bulb is burnt	replace with a new one
The pilot lamp lights	(a) defect of the pressure switch	new pressure switch
	(b) little oil in the housing	fill up some until the level is up to the gauge marks of the dipstick
	(c) leakage of the lubricating system piping	examine the piping, tighten joints
	(d) choked oil filter	clean the filter
The pressure is sufficient at higher engine revolutions, at low revolutions, it is low	(e) choked strainer	clean the strainer
	(a) defect of the pressure switch	replace the pressure switch
	(b) defect of the reduction valve	take it out, clean and repair
	(c) thin, debased oil	drain, replace with a fresh one
	(d) choked oil filter	clean the filter
Heavy oil consumption, blue smoke from exhaust	(e) leakage in the lubricating system piping	examine the joint and tighten
	(a) baked-in piston rings	loosen the rings, clean the grooves, in the pistons (in a specialized workshop)
	(b) bushings of the valve stems have excessive play	replace (in a specialized workshop)

Defects of the Electrical Equipment and Accessories

Defect :	Cause :	Remedy :
The dynamo does not charge	(a) the dynamo brushes are worn out	replace the brushes
	(b) the commutator is too soiled	clean with a rag dipped in petrol and dry properly
	(c) same brush springs are broken	replace the broken spring with a new one
	(d) voltage regulating relay is damaged	have it repaired in a specialized workshop, replace it with a new one, if necessary

The starter does not function	(a) the connecting cables to the starter are loosened	repair, tighten
	(b) the storage battery has insufficient voltage	test, have the storage battery charged
	(c) worn brushes	replace with new brushes
	(d) the brush spring is broken	replace it with a new one
	(e) the commutator is soiled	clean it
	(f) defect in the electromagnetic coil	repair

The defects under points "a" to "f" should be repaired in a specialized workshop.

Slow running of the starter motor	(a) insufficient voltage of the storage battery	test, have the storage battery recharged
The horn does not sound	(a) damaged insulating washer	replace with a new one
	(b) loosened or missing adjusting screw	replace with a new one, adjust

Defects of the Hydraulic Brakes

Defect :	Cause :	Remedy :
The path of the brake pedal is too long	insufficient quantity of fluid	fill up the brake fluid
The path of the brake pedal is too long, the pedal springs when it is depressed	air in the braking system	de-aerate the braking system

Instructions for Remedying the Defects

The defects of units which have not been described till now.

- (1) Replacement of the oil pressure switch (Fig. 28):
disconnect the cable (1) and with the use of a wrench "24" screw out the pressure switch (mind the washer).
- (2) Dismount and repair of the reduction valve of the lubrication circuit (Fig. 29):
unscrew the reduction valve by means of a wrench "22" and wash it in Diesel oil.
- (3) Inspection of the connecting cable of the starter:
tighten the cables well (Fig. 30):

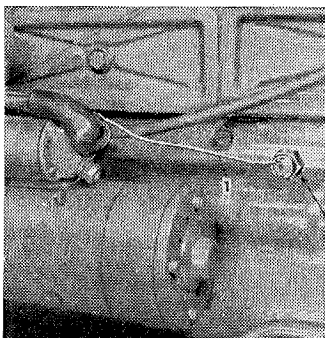


Fig. 28

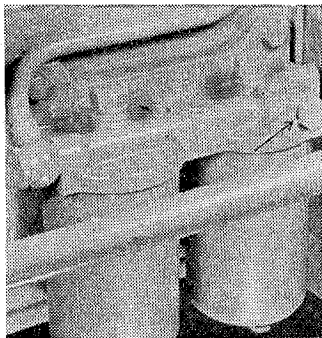


Fig. 29

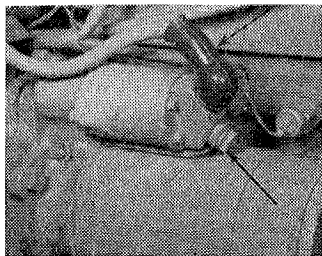
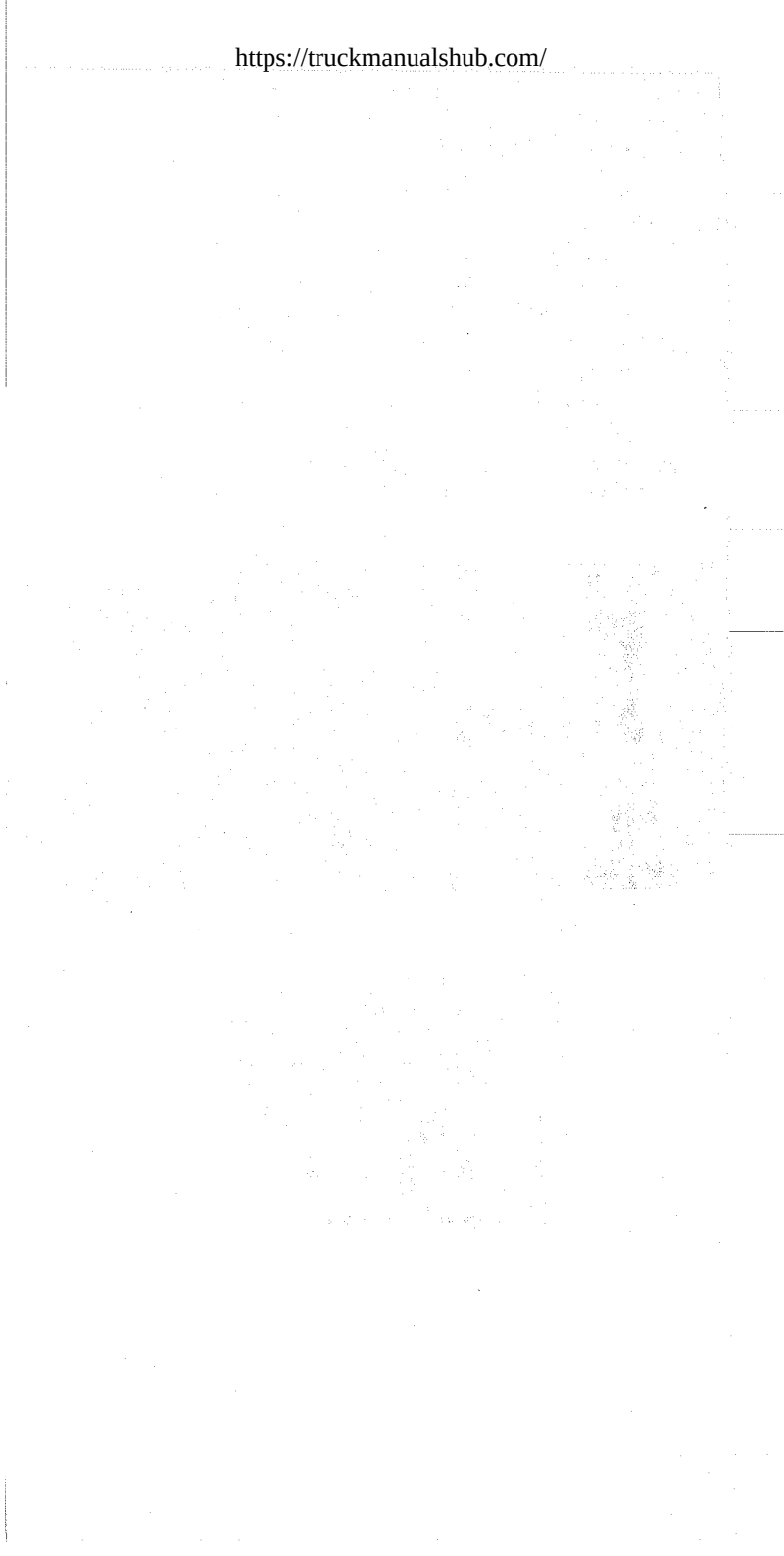
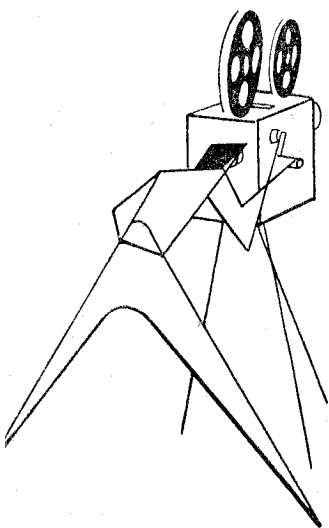


Fig. 30.





Special Accessories

Special Accessories

On your particular option we shall supply to you a wide assortment of special accessories which you can order mounted on the tractor or as a separate delivery.

We supply special accessories in the following assortment:

- Decompression device
- Cooling set for the tropics (on the Zetor 4511 tractor it is mounted as standard)
- Front wheel sprung pull-out extensions
- Front mud guards
- Air compressor including tyre inflator and complete hose
- Pneumatic brakes
- Valve for filling the tyres with water
- Safety frame
- Hot air heating device
- Belt pulley
- Fork adjustable in height in fixed positions
- Vertically adjustable drawbar
- Suspension for single-axle trailer
- Fitting of double tyres
- Bottom exhaust
- Cab and its electrical equipment
- Front axle ballast weights and front wheel ballast weights
- Rear wheel ballast weights
- Rear spot light
- Seat for driver's mate
- Three-point suspension
- Outer circuit outlets
- Hydraulic power lift
- Multi-control hydraulic power lift Zetomatic

Control, Application and Maintenance of Special Accessories

Cooling Set for the Tropics

When using the tractor at higher altitudes or when the temperature is higher, it is necessary to intensify the efficiency of the engine cooling. For this purpose serves a fan with multiple vanes and a special radiator cap with an overpressure and underpressure valve. By using this special cap, the boiling point of the cooling liquid increases up to 111° C (232° F). The Zetor 4511 tractor is normally equipped with a tropical cooling system.

Front Wheel Sprung Pull-out Extension

(Fig. 31)

These extensions make it possible to adjust the wheel track to 1275—1575—1725 mm (50.18"—62"—67.91") on Zetor 2511 and Zetor 3511 tractors. On the Zetor 4511 tractor it is possible to adjust the wheel track to 1350—1750 mm (53.14"—68.89").

Maintenance

After 60 engine-hours grease the vertical pin of the front axle with grease A00.

Front Mud Guards (Fig. 32)

These are attached by two screws. When ploughing, it is necessary to remove the mud guards.

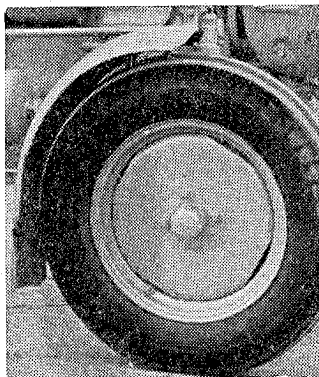


Fig. 32

Fig. 31

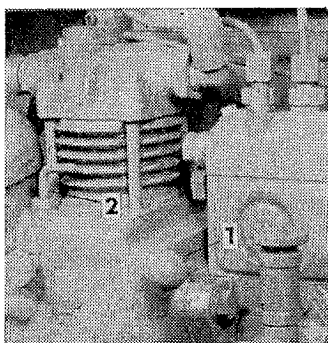


Fig. 33

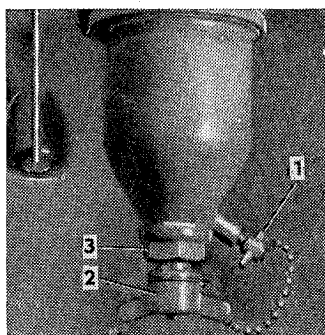


Fig. 34

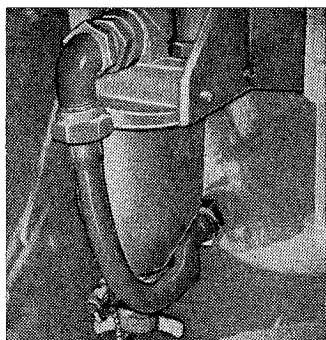


Fig. 35

Air Compressor (Fig. 33)

This is used for inflating tyres and for pneumatic brakes.

Control:

Engagement is carried out at idling speed of the engine (500 r. p. m.) by the shift lever (1). When engaging or disengaging, it is necessary always to lift up the lock (2).

Maintenance

Always after 1000 engine-hours change the inflator insert as follows:

Unscrew the bottom nut (Fig. 34/3), whereby the inflator covering is loosened. Replace the insert with a new one and cleanse the covering.

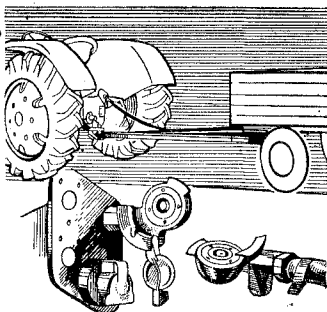


Fig. 36

Pneumatic Brakes

These serve for braking the trailer. They are operated by the same pedal as the hydraulic brakes. Before connecting the trailer to the pneumatic brakes, brake the tractor by the hand brake. Connect the hose with the coupling from the trailer to the coupling head on the tractor (Fig. 36). Engage the air compressor and watch the pressure on the pressure gauge, until it reaches 6 kp/cm^2 (85.3 p. s. i.). After having reached the operation pressure, test the function of the brakes when driving. The force for braking the trailer depends on the pressure applied to the pedal. Do not continue driving, if the braking equip-

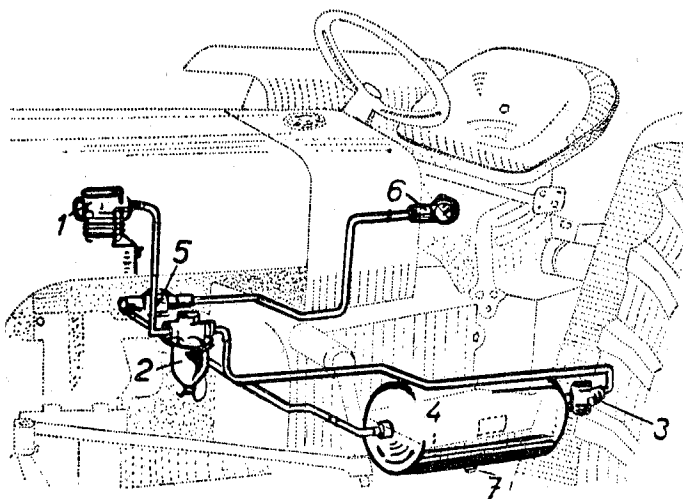


Fig. 37

ment is out of order. When driving without a trailer, shift the cap of the coupling head on the bearing surface.

Maintenance

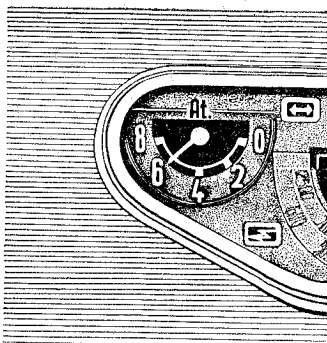
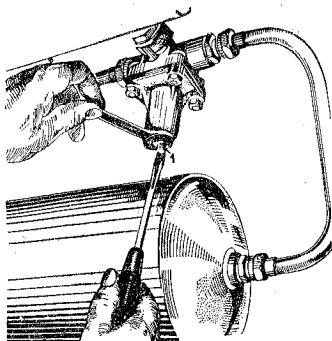
On the air tank is a plug (Fig. 37/7) for draining the impurities or water, which must be drained when freezing.

Adjusting of Pressure

If the pressure gauge does not indicate the prescribed operation pressure, i. e. 6 kp/cm^2 (85.3 p. s. i.) it is necessary to adjust the pressure as follows:

Blow out air from the air tank by depressing the brake pedal several times. Then engage the air compressor and wait until the pressure gauge indicates the pressure of 6 kp/cm^2 (85.3 p. s. i.). In this moment the air pressure equalizer (Fig. 37/3) should blow out the air pressure excess through the relief valve. If the relief valve blows out the air earlier or later than 6 kp/cm^2 (85.3 p. s. i.) adjust the prescribed pressure by tightening or loosening the bolt which is secured by a nut. When the pressure decreases by 0.3 kp/cm^2 (4.3 p. s. i.), the air compressor must start again to replenish the air. It is recommended to remedy this defect in a specialized service repair shop. If the air is not replenished by the air compressor at a pressure decrease of 0.3 kp/cm^2 (4.3 p. s. i.), have this defect repaired in a specialized service repair shop.

Note: If the tractor is equipped with compressor and tyre inflator only, it is possible to put the compressor into operation also when tyres are not inflated. Tyre inflator is provided with a safety valve.



How to Fill Rear Tyres with Water

An increase in adhesion and tractive force of the tractor can be attained, in addition to the ballast weight, also by filling-up the tyres with water.

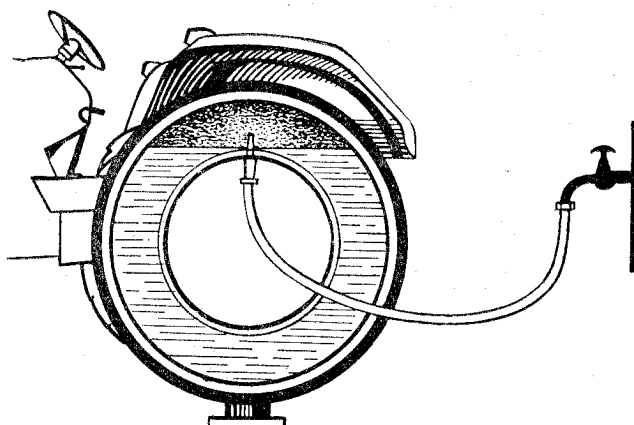
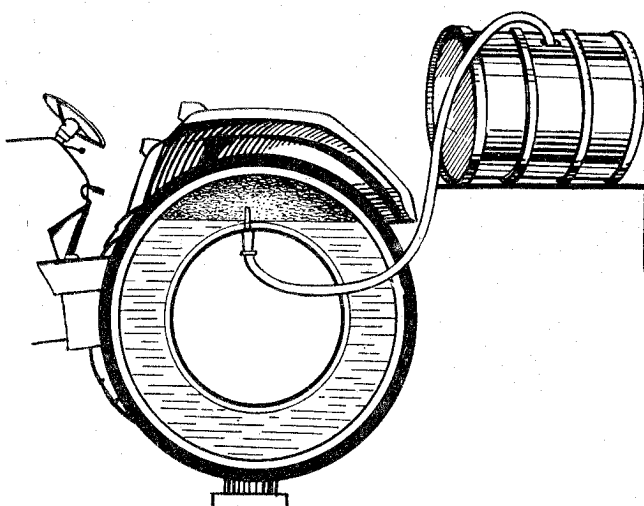
During the winter season fill the tyres with an anti-freezing solution.

Water filling in rear tyres:

Zetor 2511 tractor 2× 62.5 kgs (137.81 lbs.) — tyre 10-24

Zetor 3511 tractor 2×100 kgs (220.46 lbs.) — tyre 11-28

Zetor 4511 tractor 2×150 kgs (330.69 lbs.) — tyre 13-28



Filling Procedure

For filling can be used a gravity tank for anti-freezing solution or pressure filling.

- (1) Ease the tyre by means of a lifting jack and turn the valve upwards.
- (2) Deflate the air completely and unscrew the valve air part (Fig. 38/1).
- (3) Screw on the water valve (Fig. 39/1) with air extension (Fig. 39/2) and slip it on the hose for the liquid. Fill up the tyre with the prescribed amount of liquid.
- (4) After filling-up the tyre with the liquid screw on the valve air part (Fig. 38/1) and inflate the tyres to the prescribed pressure.

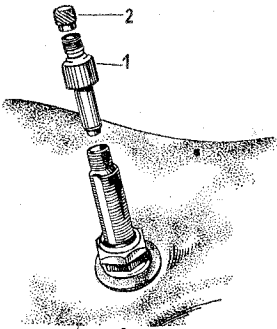


Fig. 38

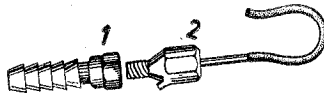


Fig. 39

Procedure for Draining Water from Tyres

- (1) Unscrew the air part of the inner tube valve. Caution, the water will squirt out!
- (2) When draining, turn the wheel slightly from time to time to get the valve in the upper position and turn the wheel back, thus placing the valve in its bottom position.
- (3) Remove the residue of water — screw on the water valve (Fig. 40) and inflate the tyre with air until water ceases to flow out from the pipe.
- (4) After draining the inner tube unscrew the water valve, screw back the valve air part and inflate to the prescribed pressure. Finally, screw on the protecting cap (Fig. 38/2) to the valve.

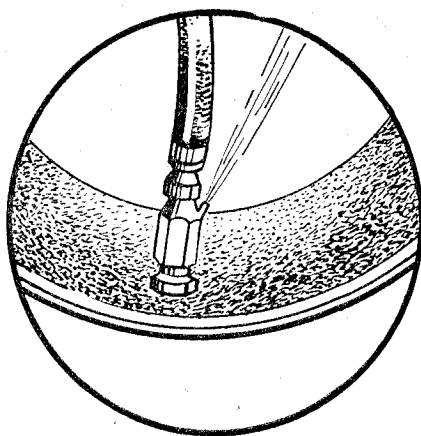


Fig. 40

Safety frame (Fig. 41)

The frame consists of together welded tubes and joints are reinforced with angle braces. The safety frame is



Fig. 41

attached to the central part of the gearbox and back to the main transmission housing by means of brackets, The frame does not limit the out-look of the tractor driver and it is determined first of all to augment the driver's safety at work.

Hot Air Heating Equipment (Fig. 42)

In order to do more agreeable the work conditions of the tractor driver, a hot air heating equipment of the driver's cab has been designed profitting the presence of hot air which is supplied from the engine radiator.

The proper hot air heating equipment consists of a special guard covering only the upper part of the air collector on the engine radiator. Hot air is delivered into the driver's cab by a flexible sealed hose dia. 100 mm or 3.94" which ensures the supply of sufficient amount of hot air. In the cab there is fitted a distributing tube from which hot air can be distributed into the cab bottom part. During the operation of the tractor equipped with the hot air heating it is necessary:

- (a) to follow attentively the temperature of the cooling liquid on the thermometer which should not exceed the recommended optimum engine temperature;
- (b) to follow the amount of cooling liquid in the cooling system (maximum quantity);
- (c) to maintain the cooling system in good condition (remove impurities, sedimentations and incrustations, to follow the function of radiator screen, thermostat, fan belt etc.).

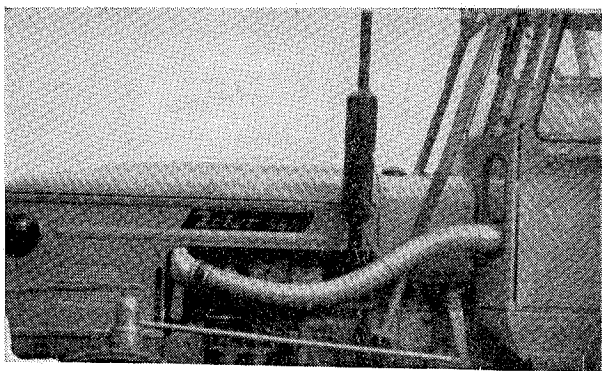


Fig. 42

It is necessary to remove the hot air heating equipment when the ambient temperature is $+15^{\circ}\text{C}$ (59°F) up to $+20^{\circ}\text{C}$ (68°F).

Belt Pulley

This is used for driving stationary machines. It is possible to mount it on the tractor in a simple way by sliding the belt pulley body on the splines of the P. T. O. shaft and screwing it on by four screws. By turning it through 180° , the clockwise direction changing into the counter-clockwise one.

Manipulation

The tractor is put out of service by shifting the RH small lever on the gearbox cover to the neutral position and securing it against moving by shaped wedges. The belt pulley revolutions can be independent through the gearbox (the shifting is similar to that of the P. T. O. shaft). After having attained the standard belt speed, engage the 5th gear, which corresponds to the peripheral speed of the belt pulley:

Zetor 2511 — 15.3 metres p. s. (50.2 ft. p. s.)

Zetor 3511

Zetor 4511 — 15.1 metres p. s. (49.54 ft. p. s.)

Revolutions and Peripheral Speeds of the Belt Pulley

Zetor 2511, Zetor 3511 and Zetor 4511

Gearing engaged	Belt pulley revolutions	Peripheral speed
1st	217 r. p. m.	2.83 m. p. s. (9.29 ft. p. s.)
2nd	323 r. p. m.	4.22 m. p. s. (13.85 ft. p. s.)
3rd	450 r. p. m.	5.88 m. p. s. (19.29 ft. p. s.)
4th	690 r. p. m.	8.91 m. p. s. (29.23 ft. p. s.)
5th	1152 r. p. m.	15.10 m. p. s. (49.54 ft. p. s.)
reverse	282 r. p. m.	3.69 m. p. s. (12.11 ft. p. s.)

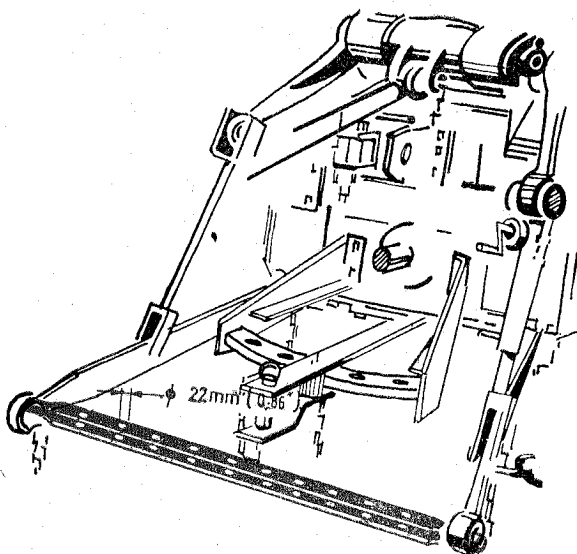


Fig. 43

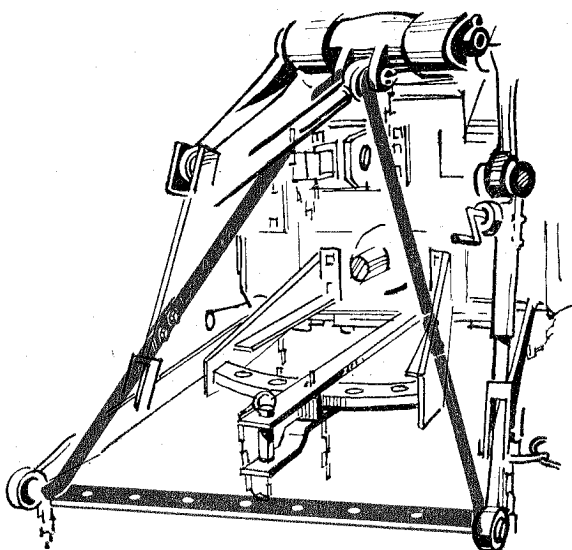


Fig. 44

Vertically Adjustable Drawbar (Fig. 43)

This serves for suspending lighter tracted implements (cultivators, fertilizer sprayers and others). The necessary height can be adjusted by lifting the hydraulic power lift arms.

Vertically Adjustable Fork in Fixed Positions (Fig. 44)

This is used for attaching of towed implements as they should keep the same position. The necessary height is adjusted by shifting the tie rods which are secured by screws.

Suspension for Single-axle Trailer (Fig. 45)

This serves for automatic coupling of single-axle trailers to the tractor.

The suspension is mounted instead of the swinging drawbar on the pin of the hydraulic power lift cover (this pin being in its central position) it is attached by means of chains to the lower links.

Fitting of Double Tyres

This is used for the Zetor 3511 tractor on a ground of low bearing capacity.

Bottom Exhaust

This is especially suitable for work in orchards.

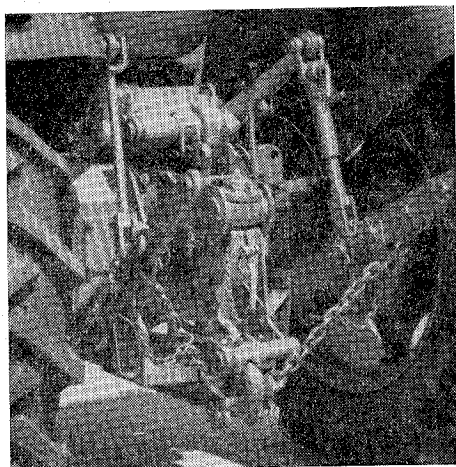


Fig. 45

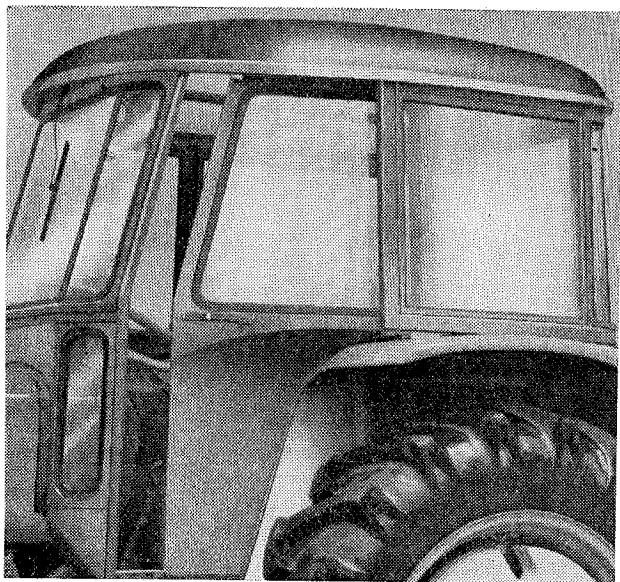
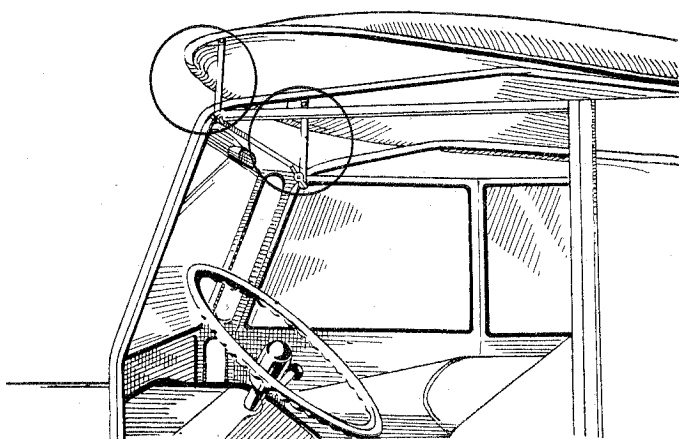


Fig. 46



Cab (Fig. 46)

This protects the driver and his mate against unfavourable weather. It is provided with sliding door. The front wind-screen is provided with an electric wiper. When ploughing in cold weather it is possible to draw a tilt over the driver's mate seat and to secure its bottom edge by means of hooklets to the holders on the rear axle housings.

Additional Ballast Weights

(1) Front axle ballast weights :

(a) Front wheel ballast weights — on the Zetor 4511 tractor are supplied as standard.

(b) Front axle ballast weights — carry out the mounting as follows:

First slide on the top bolt to the bracket and put on it the basic weight. Then insert the bottom bolt, apply the additional weight and tighten by nuts.

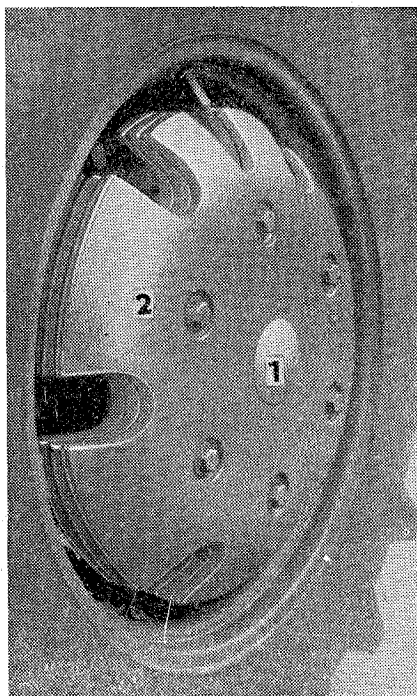


Fig. 47

On Zetor 3511 tractors the front wheel ballast weights are designed only for the heaviest field work, the maximum permissible speed being 15 km p. h. (9.32 m. p. h.). It is not recommended to use the weights for road transport, where it is more suitable to use front axle ballast weights.

(2) Rear wheel ballast weights (Fig. 47)

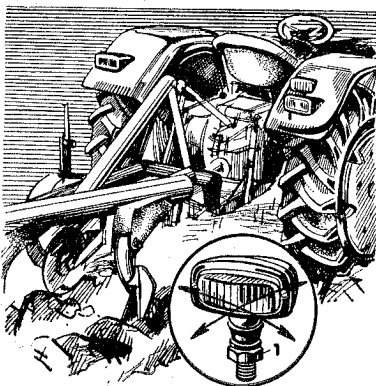
are mounted on the disks. They consist of basic weight I (1) and weight II (2). Weight I is mounted on the disk and the necessary number of pieces of weight II are mounted on it.

The additional ballast weights are not fitted on the tractor provided with tyres for cultivation operations.

The basic condition for lifting ballast weights consists in the fact that both sides of the tractor must be loaded by the same weight.

Spot Light for Night Ploughing

This is switched on by means of a change-over switch. By loosening the nut (1) it is possible to adjust the necessary direction of light.



Seat for the Driver's Mate (Fig. 48)

This can be used both on tractors with cab and without cab. While sitting on it, rest your left foot against the screw.

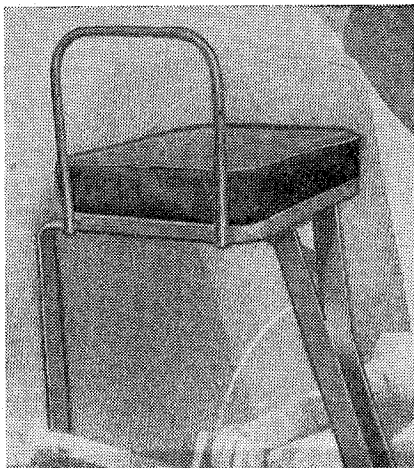


Fig. 48

Three-point Suspension of the Hydraulic Power Lift

This serves for attaching the mounted implements. The top tie rod is adjustable within a length range of 540 to 840 mm (21.26" to 33.07"), the RH bottom tie rod is adjustable in height by means of the RH tie rod strut. The lateral swing of the tie rods is limited by lock chains. Ball joints are supplied in the following sizes:

- (1) The top and bottom one having a hole dia. of 25.4 mm (1").
- (2) On special request the top one with a dia. of 22 or 19 mm (.87" or .75").
On special request bottom one with a dia. of 22 or 28 mm (.87" or 1.1").

LH Telescopic Strut

This is mounted instead of the LH standard strut. It is used for some kinds of mounted or towed implements (e. g. sowing machines).

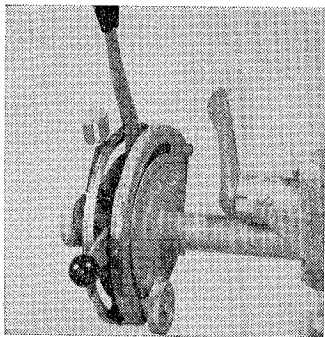


Fig. 49

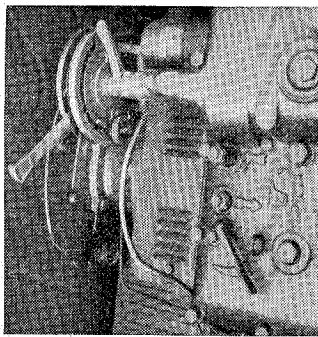


Fig. 50

Hydraulic Power Lift Zetomatic (Fig. 50)

Hydraulic power lift Zetomatic consists of two circuits (Fig. 49). Each circuit is controlled by its own independent lever. Functions of both circuits are indicated on their plates.

(A) Inner Circuit

Besides the inner circuit main control lever the inner circuit is controlled with two auxiliary levers as follows:

- control system selector lever
- reaction speed control lever (Fig. 51).

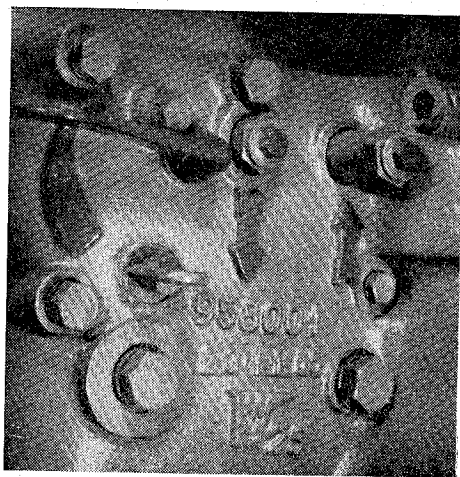


Fig. 51

By means of the control system selector lever following control systems can be chosen:

Position control — "P"

Mixed control — "M"

Depth control — "S"

By the reactions speed control lever following functions are regulated: lifting speed and antislip power at the position control, speed with which reacts the regulating system on the provoked alternations caused by the resistance of the soil at the mixed depth control.

Inner Circuit at Depth and Mixed Control Has Following Functions:

free circuit

lifting

lowering

antislip at position control

(B) Outer Circuit

The outer circuit facilitates to attach outer one or double-acting work cylinders located out of the tractor. It is controlled by means of two levers: outer circuit main control lever and reaction speed control lever. The hydraulic power lift Zetormatic enables to apply both circuits simultaneously. In such a case it is recommended to displace the reaction speed control lever in the middle of the regulating range.

The outer circuit fulfils following functions

neutral

lifting

floating position

lowering (applied for double-acting cylinder only)

TECHNICAL DATA OF ZETOR 2511, 3511, 4511 TRACTORS

I. Engine

Engine make	Zetor 2001, 3001, 4001
Engine type	Diesel engine, four-stroke, with direct fuel injection
Number of cylinders	2, 3, 4
Bore	95 mm (3.74")
Stroke	110 mm (4.33")
Compression ratio	17,9 : 1
Power output of nozzles	25 H. P., 35 H. P., 45 H. P.
Cylinder lines	wet
Cylinder head	separate for each head
Valve gear	OHV system
Fuel consumption	195±5 g/H. P./hr. (.43±.011 lbs./H. P./ hr.)
Oil consumption	1.5±0.5 g/H. P./hr.
Nominal engine speed	2000 r. p. m.
Fuel injection start	20° before TDC
Injection pressure category	160 kp/cm ² (2275.6 p. s. i.)
Nozzles	PAL-DOP 150 S 525-53
Air cleaner	consists of a cyclone type precleaner and of the cleaner proper with oil filling
Cooling	forced-water circulation type with thermostat
Lubrication	pressure type, circulation- system with wet crankcase
Capacity of cooling set	Zetor 2511 — 7.5 litres (1.65 imp. gal.) Zetor 3511 — 9.5 litres (2.08 imp. gal.) Zetor 4511 — 13 litres (2.86 imp. gal.)
Capacity of fuel tank	Zetor 2511 — 40 litres (8.8 imp. gal.) Zetor 3511 — 40 litres (8.8 imp. gal.) Zetor 4511 — 70 litres (15.4 imp. gal.)
Oil filling in engine	Zetor 2511 — 5 litres (1.32 imp. gal.) Zetor 3511 — 8 litres (1.76 imp. gal.) Zetor 4511 — 10 litres (2.12 imp. gal.)

Oil filling	Zetor 2511 — 15 litres (3.36 imp. gal.)
in gearbox	Zetor 3511 — 19 litres (4.18 imp. gal.)
	Zetor 4511 — 25 litres (5.5 imp. gal.)
for labour with	Zetor 2511 — 17 litres (3.74 imp. gal.)
hydraulic power	Zetor 3511 — 23 litres (5.06 imp. gal.)
lift in hilly terrain	Zetor 4511 — 31 litres (6.32 imp. gal.)
for labour with	Zetor 2511 — 19 litres (3.96 imp. gal.)
hydraulic power lift	Zetor 3511 — 27 litres (5.94 imp. gal.)
in mountainous	Zetor 4511 — 37 litres (8.14 imp. gal.)
terrain	
Design weight	Zetor 2511 — 230 kgs (507.1 lbs.)
of engine (without	Zetor 3511 — 300 kgs (661.39 lbs.)
accessories)	Zetor 4511 — 340 kgs (749.57 lbs.)

II. Clutch

Double-purpose one, consisting of two friction disks i. e. of a disk for tractor travel and a disk for driving the P. T. O. shaft.

III. Gearbox

There are 10+2 gears, i. e. 5 road gears and 1 reverse gear, 5 reduced gears and 1 reduced reverse gear in the gearbox.

	Zetor 2511	Zetor 3511	Zetor 4511
1st gear	4.2 km. p. h. (2.61 m. p. h.)	4.77 km. p. h. (2.96 m. p. h.)	4.82 km. p. h. (2.99 m. p. h.)
IInd gear	6.1 km. p. h. (3.79 m. p. h.)	7.1 km. p. h. (4.4 m. p. h.)	7.17 km. p. h. (4.45 m. p. h.)
IIIrd gear	8.5 km. p. h. (5.15 m. p. h.)	9.9 km. p. h. (6.15 m. p. h.)	9.99 km. p. h. (6.2 m. p. h.)
IVth gear	13.3 km. p. h. (8.26 m. p. h.)	15.2 km. p. h. (9.44 m. p. h.)	15.34 km. p. h. (9.53 m. p. h.)
Vth gear	21.6 km. p. h. (13.41 m. p. h.)	25.4 km. p. h. (15.77 m. p. h.)	25. 6 km. p. h. (15.89 m. p. h.)
reverse	5.94 km. p. h. (3.69 m. p. h.)	6.24 km. p. h. (1.46 m. p. h.)	6.29 km p. h. (3.91 m. p. h.)
Applying reduction	1 : 4.11	1 : 4.27	1 : 4.27
1st gear	1.02 km. p. h. (.63 m. p. h.)	(.63 m. p. h.) 1.12 km. p. h.	1.13 km. p. h. (.7 m. p. h.)

	Zetor 2511	Zetor 3511	Zetor 4511
IInd gear	1.48 km. p. h. (.92 m. p. h.)	1.66 km. p. h. (1.02 m. p. h.)	1.67 km. p. h. (1.04 m. p. h.)
IIIrd gear	2.03 km. p. h. (1.26 m. p. h.)	2.31 km. p. h. (1.43 m. p. h.)	2.34 km. p. h. (1.45 m. p. h.)
IVth gear	3.24 km. p. h. (2.01 m. p. h.)	3.55 km. p. h. (2.2 m. p. h.)	3.59 km. p. h. (2.23 m. p. h.)
Vth gear	5.24 km. p. h. (3.25 m. p. h.)	5.93 km. p. h. (3.68 m. p. h.)	5.99 km. p. h. (3.72 m. p. h.)
reverse	1.45 km. p. h. (.9 m. p. h.)	1.46 km. p. h. (.91 m. p. h.)	1.47 km. p. h. (.91 m. p. h.)

IV. Steering

of self-locking type

V. Brakes

Foot operated shoe type, hydraulically controlled, operated by one pedal, with change-over device which makes it possible to brake each wheel separately

Hand operated band type

VI. Drive

The standard speed of the P. T. O. shaft at the engine speed of 2000 r. p. m.

541.6 r. p. m.

The speed of the P. T. O. shaft driven through a gearbox of engine speed of 2000 r. p. m. is the same for normal and reduced speeds.

	Zetor 2511	Zetor 3511, Zetor 4511
Ist gear	199.9 r. p. m.	227.7 r. p. m.
IInd gear	289.7 r. p. m.	338.9 r. p. m.
IIIrd gear	395.3 r. p. m.	472.1 r. p. m.
IVth gear	632 r. p. m.	724.7 r. p. m.
Vth gear	1023.3 r. p. m.	1210.5 r. p. m.
reverse	282.4 r. p. m.	297.2 r. p. m.

Number of revolutions of the P. T. O. shaft for driving a trailer

Zetor 2511	— 11 650 revolutions/km
Zetor 3511	— 12 247 revolutions/km
Zetor 4511	— 12 122 revolutions/km

VII. Belt Pulley

Belt pulley dia. 250 mm (9.84")
width 150 mm (4.72") *5.91"*

The standardized belt speed of 15.3 metres p. sec. (50.2 ft. p. s. — Zetor 2511) and 15.1 metres p. s. (49.54 ft. p. s. — Zetor 3511, Zetor 4511) is attained when driving the belt pulley in the Vth gear.

Speed of the belt pulley through gearbox:

Ist gear	217 r. p. m.
IInd gear	323 r. p. m.
IIIRD gear	450 r. p. m.
IVth gear	690 r. p. m.
Vth gear	1152 r. p. m.
reverse	282 r. p. m.

Belt pulley speed for the independent drive of the P. T. O. shaft 516 r. p. m. of the P. T. O. shaft at 2000 r. p. m.

VIII. Hydraulic Power Lift Zetormatic

Working pressure 150 kp/cm²
(2133.48 p. s. i.)

Pump output at
11200 r. p. m. and at
a pressure of 120 kp/cm² 20 litres p. m.
(1706.78 p. s. i.) (4.4 imp. gallons)

Lifting force on the	Zetor 2511 — 800 kp (1775 lbs.)
end of the tie rod	Zetor 3511 — 1000 kp (2204 lbs.)
	Zetor 4511 — 1400 kp (3075 lbs.)

IX. Electrical Equipment

Storage battery	12 V
Dynamo	12 V, 150 W
Regulating relay	12 V, 150 W
Starter	Zetor 2511 — 12 V, 1.8 HP
	Zetor 3511
	Zetor 4511 — 12 V, 4 HP

X. Tyre sizes

	Zetor 2511	Zetor 3511	Zetor 4511
Front tyres	5.50-16	6.00-16	6.00-18
Rear ploughing tyres	10-24 (10-28)	11-28 (11-32)	13-28 (11-36) (11-32)
Rear cultivation tyres	8-28	9-32	

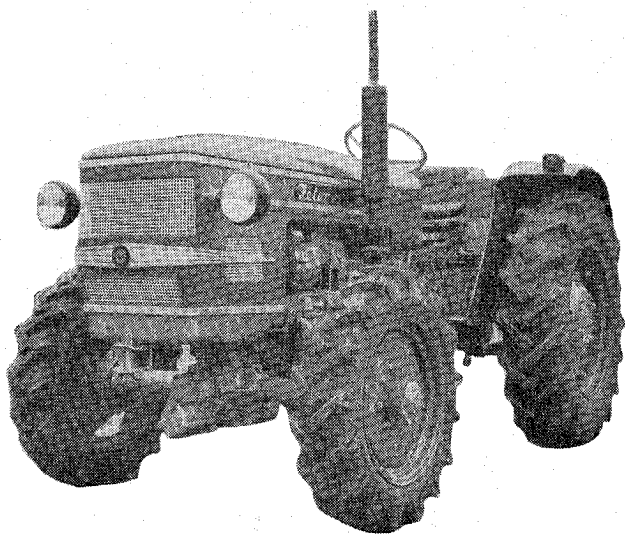
XI. Main Dimensions and Weights

	Zetor 2511	Zetor 3511	Zetor 4511
	ploughing design (10-24)	ploughing design (11-28)	ploughing design (13-28)
Length	3040 mm (119.52")	3266 mm (128.83")	3555 mm (140.95")
Width (rear wheel track being 1350 mm — 53.14", 1425 mm — 56.1" — Zetor 4511)	1620 mm (63.83")	1652 mm (65.50")	1790 mm (70.47")
Height up to upper rim of steering wheel	1456 mm (57.28")	1525 mm (60.03")	1620 mm (63.77")
Road clearance	360 mm (14.17")	400 mm (15.75")	436 mm (17.16")
Height of swinging drawbar from the ground (at the fork center)	310 mm (12.20")	350 mm (13.78")	500 mm (19.68")
Wheel base	1745 mm (68.70")	1918 mm (75.55")	2125 mm (83.36")
Front wheel track adjustable	1275 mm—1575 mm— 1725 mm (50.18"—62"—67.91")		1350—1750 mm (53.14"— 68.89")
Rear wheel track adjustable by 75 mm (2.95")	1275 mm—1800 mm (50.18"—70.86")		1425 mm—1800 mm (56.15"—70.86")
Weight of tractor standard design without special accessories	1340 kg (2950 lbs.)	1530 kg (3375 lbs.)	2010 kg (4425 lbs.)
from which:			
front axle load	590 kp (1300 lbs.)	700 kp (1550 lbs.)	900 kp (1984 lbs.)
rear axle load	750 kp (1654 lbs.)	830 kp (1830 lbs.)	1110 kp (2425 lbs.)

	Zetor 2511	Zetor 3511	Zetor 4511
Weight of tractor with special accessories and with water in tyres	1920 kg (4225 lbs.)	2460 kg (5412 lbs.)	3040 kg (6700 lbs.)
from which:			
front axle load	680 kp (1500 lbs.)	865 kp (1903 lbs.)	970 kp (2125 lbs.)
rear axle load	1240 kp (2734 lbs.)	1595 kp (3509 lbs.)	2070 kp (4575 lbs.)

XIII. Output

Tractive force at suspension, with additional ballast weights, on dry concrete roadway	1140 kp (2525 lbs.)	1550 kp (3425 lbs.)	2100 kp (4630 lbs.)
--	------------------------	------------------------	------------------------



ZETOR 3545

Application of the Four Wheel Drive Tractor

The tractor Zetor 3545 is a modification derived from the tractor Zetor 3511. Instead of the standard front axle with extensions tractors Zetor 3545 are equipped with a driven front axle provided with the safety slip clutch. The front wheels remained as steering wheels. Their diameter is smaller as of rear wheels.

The tractors Zetor 3545 are intended mostly for heavier soils with reduced passability and with lower adhesion coefficient and for operations on maximum slope of 16°. They suit especially for agricultural duties in hilly, humid, marshy or sandy terrain. In such difficult conditions the tractor Zetor 3545 can cope with all the work as the standard Zetor 3511 except cultivating operations and such ones which are carried out with implements driven by the front PTO shaft as this tractor Z 3545 it not provided with it.

This tractor can be used for following operations:

- (a) for forest operations — for the work with the winch, for the transport of stems to the stock yard,
- (b) for agricultural operations — in hilly terrain for traction or drive.

Attendance of the Front Wheel Drive

The front axle drive is controlled from the driver's seat by means of an engaging lever (Fig. 53) placed on the left-hand side of the gearbox. When moving the lever backwards, the front wheel drive has been engaged, by a reverse movement it has been disengaged.

Attention: When driving on the road, the front drive should be disengaged.

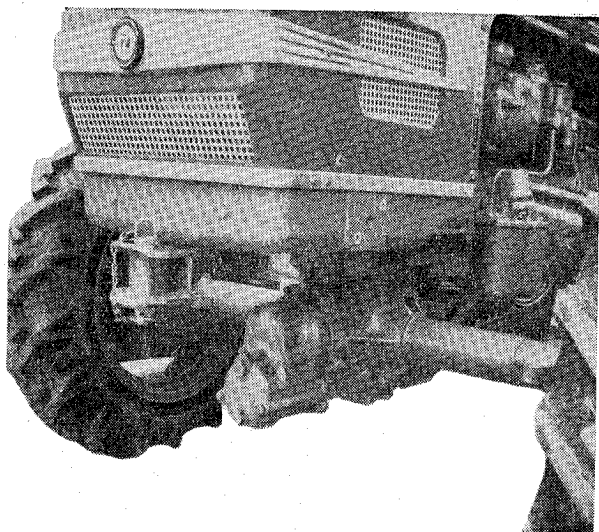


Fig. 52

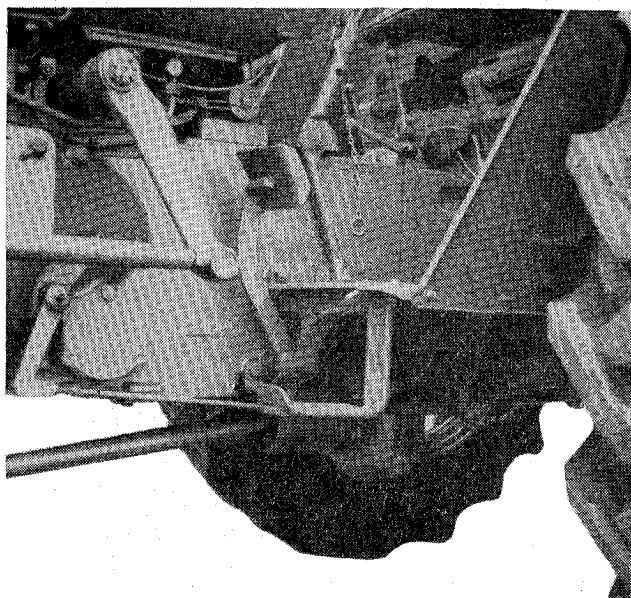


Fig. 53

The front wheel drive can be used only in connection with the road speeds (the right-hand side shifting lever on the gearbox is in its uppermost position). **If reduced speeds are applicated, the front wheel drive has to be disengaged.** Shifting-in of the front wheel drive can be carried out exclusively when the tractor does not move. At a permanent use of the road speeds it is not necessary to disengage the front wheel drive even not in the case that the tractor does not work directly in a difficult terrain.

When the front axle is a driving one in connection with the differential, the drive is divided on both front wheels by means of the differential as well as of two half axles, but the differential is not provided with a lock. When the traction load increases in such a way that the rear wheels start to slip, the front wheels start to be engaged into operation, too.

If the tractor Zetor 3545, provided with the differential, is in service it is possible to exploit the increased traction

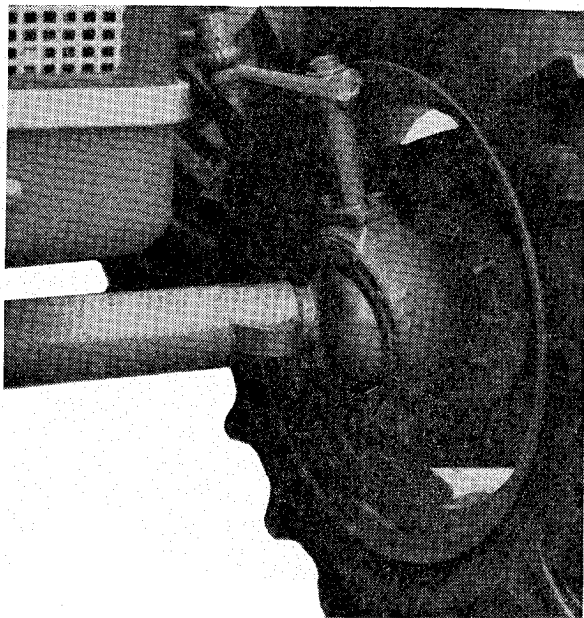


Fig. 54

force for the reverse speed, too. At braking a good use is made of the front axle weight.

If it is not possible to disengage the front wheel drive (the control lever of the front wheel drive cannot be shifted forwards or the right-hand shifting lever on the gear-box cover cannot be moved in its neutral position downwards), any force should never be applied.

In this case it is recommended, when driving forward (rearward) to roll slightly back (forward). Thus the prestress in the drive mechanism of the front wheel drive is going to be eliminated and then it is possible to shift the control lever easily. If the function of the front wheel drive should be correct, it is important to observe the prescribed size of the front and rear tyres.

General Information

Following new elements are mounted on the tractor Zetor 3545 instead of the front axle, both right-hand and left-hand extensions with wheels or sprung extension:

- drive box and cardan joint shaft (Fig. 53)
- front driving axle (Fig. 52)
- double joint and wheel drive (Fig. 54).

Besides of these new elements, modifications have been carried out on the steering mechanism which is single-side on this tractor only and both front wheels are connected by means of a connecting rod (Fig. 55) placed behind the front axle.

All remaining parts of the tractor Zetor 3545 are identical with those of the tractor Zetor 3511.

Front Driving Axle

The driven front axle is both of bridge- and car-type, unsprung, swivel-mounted. The axle covers are bolted to the axle housing (Fig. 52) with tubes of the half-axes. The half-axle tubes are opened into semi-spheres (Fig. 54) in which the double joint is located. The front wheel track is given by the design and it can be enlarged only when reversing the discs. The front wheels are not adjustable vertically; it is consequently not possible to augment the ground clearance under the front axle and thus it is also not possible to change the tractor Zetor 3545 in a cultivation-type tractor.

Inflating of Tyres

Front tyres:

for ploughing and road
performance

1.5 kp/cm² (21.34 psi)

Rear tyres:

for ploughing

0.8 kp/cm² (11.38 psi)

for road performance

1.5 kp/cm² (21.34 psi)

If tyres are replaced it is necessary to mount ever only tyres of specified size on the tractor Zetor 3545. Correct tyre dimensions both of front and rear wheels ensure a correct function of the front wheel drive, too.

Running-in of the tractor:

The running-in of the tractor Zetor 3545 should be carried out in the same manner as it is done with the tractor Zetor 3511 but always with the engaged front wheel drive. The front hitch (Fig. 52) should be applied only in the case that it is necessary to pull away the tractor itself, without any trailer or implement.

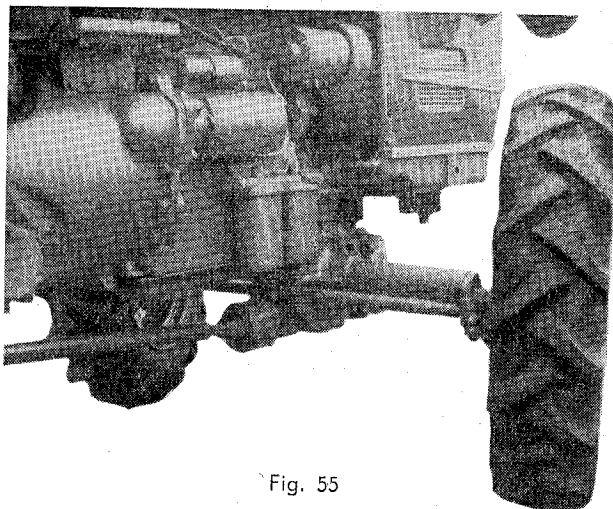


Fig. 55

Maintenance and Setting-up

The drive box has a common oil space with the gearbox. Checking and topping of the oil level is carried out simultaneously with the inspection of the gearbox oil level. When changing oil, screw out the drain bolt from the drive box body and remove sediments from the plug. All necessary attention to the maintenance of the tractor Zetor 3545 should be paid as well as respective instructions, mentioned in the Operator's Manual for tractors Zetor 2511, 3511, 4511 should be followed.

Both the inspection and replacement of oil of particular groups of the front wheel drive should be carried out in the following way:

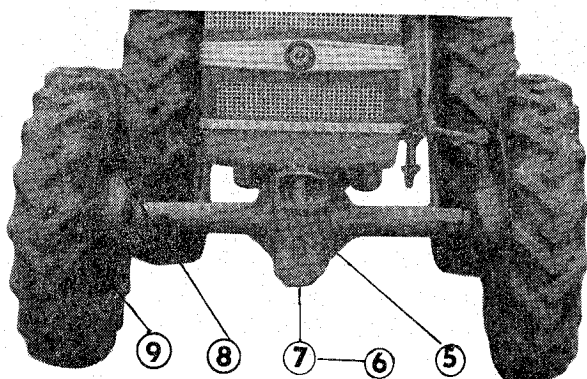
The axle housing is provided with its own filling space. Checking, topping as well as replacement of oil should be carried out at the same time as it is done with the gearbox. Inspection and filling orifice, which is the same, is located on the rear wall of the axle housing.

The drain orifice is located in the bottom part of the front cover. The double joint and bearings of the pivot are lubricated with oil which is poured in through the filling orifice in the top part of the pivot. Each joint has its own oil filling space. Inspection and change of oil is also carried out at the same time intervals as it is done with the gearbox — see Lubrication chart of the front wheel drive. Oil is drained by means of the draining plug in the bottom part of the pivot. The pivot is sealed against oil leakage by means of a special sealing ring.

All the rest of the maintenance should be carried out according to the results of technical inspections as mentioned in the Operator's Manual for tractors Zetor 2511, 3511, 4511.

Front Wheel Toe-in

The front wheel toe-in can be adjusted when the connecting rod, located behind the front axle under the tractor, is shortened or prolonged. The toe-in of the front wheels of the tractor Zetor 3545 is set up to 3—5 mm (.12"—.20") and it is measured on rims in the horizontal wheel axis.



LUBRICATION CHART OF THE FRONT WHEEL DRIVE

Fig.	Lubricated spot	Operation	Kind		Quantity
			Winter	Summer	
Attendance after 70 performance hours					
5	Drive box — gearbox	Inspection	PP 7 (SAE 90)		24.5 litres + + 4 litres (5.39 + 0.88 brit. gal.) when operating with the hydraulic power lift in hilly terrain
6, 7	Front axle housing	Inspection	PP 7 (SAE 90)		2 litres (.44 brit. gal.)
8, 9	Double joint	Inspection	PP 13 SAE 90	PP 44 SAE 140	2×0.75 litres (2×.16 brit. gal.)
Attendance after 1000 performance hours					
5	Drive box — gearbox	Oil change, rinsing	PP 7 (SAE 90) B 1 (B 2)		24.5 litres + 4 litres (5.39 + 0.88 brit. gal.)
6, 7	Front axle housing	Oil change, rinsing	PP 7 (SAE 90) B 1 (B 2)		2 litres (.44 brit. gal.)
8, 9	Double joint	Oil change, rinsing	PP 13 SAE 90 B 1	PP 44 SAE 140 (B 2)	2×0.75 litres (2×0.16 brit. gal.)

Checking of the Play of Taper Roller Bearings of the Front Wheels

The front wheel heads are filled during assembly in the manufacturer's Works with the lubricating grease. This grease serves for lubrication of antifriction bearings only to the moment when the plain bearing of the half-axle begins to push oil from the pivot space.

The inspection and an eventual adjustment of the play of front wheel taper roller bearings and of the pivot taper roller bearings is carried out during the Technical inspection No. 3 (P3). The play of taper roller bearings of the front wheels is set up in the same manner as that of the tractor Zetor 3511. The way how to set up this play has been described in the Operator's Manual for tractors Zetor 2511, 3511, 4511.

If you find out on the circumference of the wheel any play under the pressure of the hand in the top part of the wheel against the inner semi-sphere, it is necessary to adjust this play of taper roller bearings of the pivot when taking out adjusting shims between the steering shaft, eventually the steering pin (the right-hand side) and the pivot.

Technical data — Zetor 3545

Main Dimensions

Length (together with hydraulic power lift)	3440 mm (13.43')
Width (rear wheel track being 1350 mm or 53.14')	1652 mm (65.50')
Road clearance	276 mm (10.96')
Wheel base	1940 mm (76.38')
Front wheel track	1340 mm (52.75')
Front wheel track after turning discs	1506 mm (59.29')
Minimum turning diameter (when braking one wheel)	7.10 m (7.767 yd.)
Water filling in front tyres 2×30 kg or 2×66.139 lbs.	60 kg (132.277 lbs.)
Water filling in rear tyres 2×100 kg or 2×220.462 lbs.	200 kg (440.924 lbs.)
Weight of the tractor ready for drive, with special accessories	2565 kg (5,655.825 lbs.)
from which:	
front axle load	930 kp (2,050.30 lbs.)
rear axle load	1636 kp (3,605.525 lbs.)

Tyre size:

Front tyres	8-20''
Rear tyres	11-28'

Output:

Tractive force in suspension, with additional ballast weights and water in tyres, on dry concrete roadway:

without front wheel drive	1500 kp (3,307 lbs.)
with engaged front wheel drive	1650 kp (3,636.62 lbs.)



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Lubrication Chart

No.	Lubrication point	Procedure	Grade summer - winter SAE SAE		Zetor 2511	Zetor 3511	Zetor 4511
Lubrication after 8 to 10 operating hours (daily attendance)							
13	Engine	Inspection	30	20	6 litres (1.32 imp. gal.)	8 litres (1.76 imp. gal.)	11 litres (2.42 imp. gal.)
16	Air cleaner	Inspection	30	20	1.3 litres (.29 imp. gal.)	1.3 litres (.29 imp. gal.)	1.3 litres (.29 imp. gal.)
Lubrication after 70 operating hours							
15	Engine	Change	30	20	6 litres (1.32 imp. gal.)	8 litres (1.76 imp. gal.)	11 litres (2.42 imp. gal.)
5	Gear box	Inspection	90		15 litres (3.3 imp. gal.) 17 litres (3.74 imp. gal.) when working with hydraulic power lift in hilly ground	19 litres (4.08 imp. gal.) 23 litres (5.06 imp. gal.) when working with hydraulic power lift in mountainous ground	25 litres (5.5 imp. gal.) 31 litres (6.82 imp. gal.)
6	Outer gearing portal housing	Inspection	90		2.5 litres (.55 imp. gal.)	2.5 litres (.55 imp. gal.)	2.5 litres (.55 imp. gal.)
12	Injection pump	Inspection	30	20	0.1 litres (.02 imp. gal.)	0.16 litres (.35 imp. gal.)	0.2 litres (.044 imp. gal.)
16	Air cleaner	Change	30	20	1.3 litres (.29 imp. gal.)	1.3 litres (.29 imp. gal.)	1.3 litres (.29 imp. gal.)
1	Water pump	To be turned by one thread	A 4				
11	Clutch disengaging sleeve	To be filled up	30	20	0.06 litres (.013 imp. gal.)	0.06 litres (.013 imp. gal.)	0.06 litres (.013 imp. gal.)
	Front axle pin	To be greased thoroughly	A 00		0.1 kg (.22 lbs.)	0.1 kg (.22 lbs.)	0.1 kg (.22 lbs.)
3	Front axle vertical pins	To be greased thoroughly	A 00		0.04 kg (.088 lbs.)	0.04 kg (.088 lbs.)	0.04 kg (.088 lbs.)
7	Housing of hydraulic power lift suspension	To be greased thoroughly	A 00		0.03 kg (.066 lbs.)	0.03 kg (.066 lbs.)	0.03 kg (.066 lbs.)
Lubrication after 250 operating hours							
4 15	Engine	Flushing with	B1 or B2		4 litres (.88 imp. gal.)	6 litres (1.32 imp. gal.)	9 litres (1.98 imp. gal.)
Lubrication after 1000 operating hours							
5 8	Gear box	Flushing with	B1 or B2		10 litres (2.2 imp. gal.)	13 litres (2.86 imp. gal.)	15 litres (3.3 imp. gal.)
6	Outer gearing portal housing	Change	90		2.5 litres (.55 imp. gal.)	2.5 litres (.55 imp. gal.)	2.5 litres (.55 imp. gal.)
2	Front wheel hubs	To be filled up	AV 2				
Lubrication after 2000 operating hours							
12 14	Injection pump	Change	30	20	0.1 litres (.02 imp. gal.)	0.16 litres (.035 imp. gal.)	0.2 litres (.044 imp. gal.)
9 10	Steering	Change	90		1.6 litres (.35 imp. gal.)	1.6 litres (.35 imp. gal.)	1.6 litres (.35 imp. gal.)

