OPERATOR'S MANUAL AND SERVICE CHEQUE BOOK

Zetor

5011
6011
6045
7011
7045

3/81

DEAR OWNER OF THE NEW ZETOR TRACTOR!

The present manual will make you acquainted with the attendance and maintenance of your new ZETOR tractor. Even if you may be familiar with many attendance and maintenance operations as a user of another tractor make, we recommend you to make well acquainted with the just submitted manual.

You will find many items of information that will be very useful to you. We advise you therefore to read the manual very carefully from cover to cover and not to look only for those parts which are interesting to you at present. Solely in that way you can form a true picture of the whole tractor and be well informed where to find individual instructions if the need arises.

By observing all instructions as referred to in this manual you ensure a troublefree performance, a safe travel, an economic utilization and a long life of your new tractor.

Because of a permanent improvement of our tractors it may happen that some instructions and illustrations as given in our manual will not correspond with the tractor supplied. If you wish however, to be informed of carrying out repairs as well as of spare parts you may refer to the following publications:

Workshop Manual — ZETOR 5011—7045
Spare Parts Catalogue — ZETOR 5011—7045

Thousands of reliably performed engine hours

wish you ZETOR-works, BRNO
the manufacturer of your tractor

CONTENTS

Tractor without cab – for export purposes

Tractor with cab — for export purposes

Tractor – Czechoslovak version – with front drive axle

Tractor – Czechoslovak version – with front head axle

RESPONSIBILITY OF THE ZETOR TRACTOR USER

It is the duty of the Zetor tractor user to make acquainted with the recommended procedures and instructions for a safe operation of this tractor. The responsibility of the user also lies in observing tractor specified maintenance, in checking its correct operation and removing possible defects — if any — which might later cause an excessive wear or even a serious damage both to individual parts and assemblies.

Guarantee

1. The manufacturer is responsible — within the guarantee time — for the design, use of suitable materials for the production and a reliable function of the tractor supplied to the first user (owner).
2. The repair — replacement of defective parts — within the guarantee time — must be carried out in a specialized authorized repair workshop or by experts being authorized to perform repairs of Zetor tractors only.
3. The manufacturer is not responsible for a common wear of tractor or its individual parts for defects and damage caused by an incompetent use, by non observing operating instructions and by an insufficient maintenance.
4. The warranty does not relate to any damage or accident caused by an incompetently performed tractor repair outside an authorized repair workshop and it cannot be proved that the damage has been caused by an failure originating from the manufacturer.
5. The warranty does not relate to the operations connected with cleaning, attending, oil changing, brake and valve adjusting etc.

The warranty does not concern a depreciation of the storage battery due to an incorrect maintenance, a negligent manipulation and a mechanical damage.

SAFETY INSTRUCTIONS FOR THE ZETOR TRACTOR USER

The fitted safety devices can be effective if they are duly used and maintained.

Basic safety instructions

1. The tractor may be operated by a skilled operator only who is fully authorized to operate the tractor.
2. The operator who is to operate the tractor must be well acquainted with operating and safety instructions in advance.
3. A tipsy operator is not allowed to operate the tractor nor attend any agricultural machine.
4. The persons who are not authorized to carry out operations connected with tractor auxiliary equipment are not allowed to stay between tractor and its coupling implements.
5. To get on and off the driver's cab use runboards and hold to (handl) holders.
6. Before starting to travel the operator must also check the tractor technical condition for safety as well as the adjustment of brakes, steering, illumination and tyre condition.
7. On trailer or single axle trailer it is to check their safe attachment and locking against uncoupling, the connection of pneumatic brakes, the air pressure in air tank, the electric equipment and tyre condition for their correctness.
8. It is not allowed to start the engine by travelling down the hill (slope).
9. It is allowed to start travelling the tractor in order to start the engine by means of another tractor or another other vehicle when using a tow bar only.
10. Before starting to travel the tractor make sure whether a presence of an incompetent person or another obstacle do not hinder you from travelling.
11. When running the tractor choose such a gear ratio and speed which correspond to the conditions of communication terrain and is completely safe. Travelling down the hill without engaged gear ratio is not allowed! Never remove the key from the switch box when travelling – the steering would be locked!

12. A special attention is to be given to the tractor steering when being on a slope, on a muddy, sandy, icy and uneven terrain. When working on slopes, the wheel track must be set to its minimum. Observe strictly the specified angle of slope performance.

13. Never get off a slowly running tractor in order to attach the trailer by yourself. Take also care of your helper's safety.

14. If you stop the tractor on a slope, lock it against any spontaneous travel by braking, engine disengaging, shifting a low gear ratio and by putting a Scotch block under the wheels.

15. When parking the tractor / tractor with coupled implements overnight outside a parking place or on an unilluminated road, do not forget to illuminate it by at least one light being visible from both front and rear side and located on tractor / tractor-trailer side towards the road centre.

16. Do not park the tractor with (trailed) attached implements in a lifted position. Before leaving the tractor do not forget to remove the key from the switch box and to lock the cab.

17. To lift a sunken (snow-bound) tractor use a low bar or a rope, never use any chains. When lifting the tractor it is dangerous to stay near the tow rope.

18. For pushing other vehicles, trailers etc. by tractor, never use freely inserted planks or bars between the tractor and the pushed object.

19. In a closed building or room the tractor engine may run only when a sufficient ventilation is ensured since exhaust gases are noxious for health.

20. All operations connected with fuel refilling, cleaning, lubricating and tractor or attached implements adjusting may be carried out with engine and other moving parts at rest except the checking of the brake function and charging.

21. Fuel refilling is to be performed preferably after you have finished the work. In summer season do not refill the fuel tank up to its rim. Wipe at once spilled fuel. Do not refill the fuel near any open flame and do not smoke.

Extinguisher is to be permanently available.

22. During all operations use suitable (specified) personal protective means.

23. Do not wear any flutering garments nor long hair. They might be easily drawn in moving parts and cause a serious accident.

24. Check regularly the First Aid kit for its content and replace means for treating tiny injuries and first aid.

By observing basic safety instructions you can create good conditions for a reliable work (operation) with your Zetor tractor.

Health protection when working with crude oil products

Kerosenes (oils), Diesel oils, mineral oils and other crude oil products being used for motor operation and otherwise may cause various dermatic diseases at a direct contact with skin, exert an irritating effect on the mucous membranes — eyes, gastrointestinal system and nasal mucous membrane. Some of them may even result when breathing in vapours or eating them — in a total intoxication.

The operators who get into contact with crude oil products must consistently observe safety and hygiene regulations, use suitable protective means and work in well ventilated spaces (rooms).

After having finished one's work or before eating it is necessary to wash carefully with a non irritating washing means and to treat ones hands with a suitable regeneration ointment (hand cream).

BASIC TECHNICAL DATA OF ZETOR TRACTORS

Characteristics:

Zetor tractors are intended to tow and power-operate machines used in agriculture, forestry, transport, building and industry. They can operate with reliable performance on difficult terrains and in different climatic regions.

Engine model	Z 5001	Z 6001	Z 7001
Engine type	in-line 4-stroke Diesel with direct fuel injection		
Cylinder No	3	4	4
Cylinder volume (cm³)	2695	3456	3595
Bore and stroke (mm)	102×110	100×110	102×110
Engine speed (rpm)			
– rated		2200	
– minimum		600	
– overrun		2460	
Compression ratio		17	
Distribution type		with hanging valves	
Cylinder sequence order	1-3-2	1-3-4-2	1-3-4-2
Valve clearance (mm) on cold engine:			
– suction and exhaust		0.25±0.05	
injection timing (°)		24.5 ± 2	
Injector opening pressure (MPa)	14.7 ± 0.8	15.7 ± 0.8	14.7 ± 0.8
Dry engine weight (kg)	315	405	405

TRACTOR Z 5011

Overall dimensions (mm) a tolerance of ± 5% is admissible

		1	2	3	4	5	6	7
Tyres used.	Front:	6.00-16	6.00-16	6.00-16	6.00-16	7.50-16	7.50-16	7.50-16
	Rear:	12.4/11-28	14.9/13-28	9.5/9-32	12.4/11-32	14.9/13-28	12.4/11-32	17.4/11-36
Overall length without coupled implements (implement hitch)								
with cab					3275			
without cab					3160			
Overall length with coupled implements					3430			
Overall width at rear wheel track of 1350 mm.								
without ballast weights		1652	1715	1591	1652	1715	1652	1715
with ballast weights					1846			
Overall height measured to top of exhaust pipe								
with safety cab		2375	2398	2380	2400	2398	2400	2438
without safety cab		1930	1955	1935	1955	1955	1955	1995
Max. tractor height with cab		2450	2500	2460	2500	2500	2500	2540
Front wheel track — adjustable			1280, 1375, 1750				1433, 1655, 1805	
Rear wheel track — adjustable each 75 mm		1350-1800	1425-1800	1275-1800	1350-1800	1425-1800	1350-1800	1350-1800
Wheel base					2025			

	1	2	3	4	5	6	7
Outer overall turning radius with one braked wheel:							
with cab				7000 (-500)			
without cab				6700 (-500)			
Weight (kg) a tolerance of ±1.5% is admissible Tractor weight without driver but with tanks full, with hydraulic power lift and implement hitch.							
with cab	2545	2590	2515	2565	2650	2625	2640
without cab	2325	2370	2295	2345	2430	2405	2420
Rear type liquid weight	2×125	2×190		2×140	2×190	2×140	2×160
Max. admissible carrying capacity (kg)							
Front swinging unsprung axle at wheel track of 1375 mm and at max. speed of:					at wheel track of 1430 mm.		
25 km/h			1000			1500	
6 km/h (inflating increased by 25%)			1600			2980	
Front swinging sprung axle at wheel track of 1375 mm and at max. speed of:							
25 km/h			1000			1180 (lock. 1500)	
6 km/h (inflating increased by 25%)						(lock. 2200)	

	1	2	3	4	5	6	7
Rear axle at wheel track of 1350 mm or 1425 mm and at max. speed of							
25 km/h	2728	3000	2279	2900	3000	2900	2700
20 km/h	3000	3000	3000	3000	3000	3000	3000
6 km/h (inflating increased by 25%)	3000	3000	3000	3000	3000	3000	3000
Max. tractive force at trailer hitch (hitch height 720 mm) with tanks full, with ballast weights and water in tires:							
with cab				21,58 kN			
without cab				19,62 kN			
Lifting power at the end of three-point hitch lower links within the whole lift.							
lower links length of 800 mm				9,9 kN			
lower links length of 860 mm				8,8 kN			

TRACTOR Z 6011

Overall dimensions (mm) — a tolerance of ±5% is admissible

		1	2	3	4	5
Tyres used	Front:	6.50-16	6.50-16	6.50-16	6.50-16	6.50-16
	Rear:	14.9/13-28	12.4/11-36	13.6/12-36	16.9/14-28	15.9/14-30
Overall length without implement hitch:						
with safety cab				3655		
without safety cab				3655		
Overall length with implement hitch				3720		
Overall width at rear wheel track of 1425 mm.						
without ballast weights		1830	1800	1800	1817	1841
with ballast weights				1848		
Overall height measured to top of exhaust pipe.						
with cab		2451	2491	2538	2475	2493
without cab		1961	2001	2048	1985	2003
Max. tractor height with cab		2510	2550	2600	2535	2550
Front wheel track — adjustable				1280:1375,1750		
Rear wheel track — adjustable each 75 mm				1425 -1800		
Wheel base				2247		

	1	2	3	4	5
Outer overall turning radius with one braked wheel:					
with cab			7500 - 500		
without cab			7500 - 500		
Weight (kg) -- a tolerance of ±5% is admissible					
Tractor weight without driver but with tanks full with hydraulic power lift and implement's hitch:					
with cab	3010	3000	3030	3040	3070
without cab	2810	2800	2830	2840	2870
Rear tyre load weight	2 × 190	2 × 160	2 × 180	2 × 215	2 × 240
Max. admissible carrying capacity (kg)					
Front swinging unsprung axle at wheel track of 1375 mm and at max. speed of:					
25 km/h			1240		
6 km/h (inflating increased by 25%)			1600		
Front swinging sprung axle at wheel track of 1375 mm and at max. speed of:					
25 km/h			1100		
6 km/h (inflating increased by 25%)			1400		

Rear axle at wheel track of 1425 mm and at max. speed of:

25 km/h

20 km/h

6 km/h (inflating increased by 25%)

Max. tractive force in trailer hitch (hitch height 565 mm), with tanks full, with ballast weights and water in tyres:

with cab

without cab

Lifting power at the end of three point hitch lower links within the whole lift:

lower links length — 800 mm

lower links length — 860 mm

Note: If front tyres of 7.50-16 with fixed or spring extensions are used, values of weight and max. permissible carrying capacity according to type Z 7071 are applied.

1	2	3	4	5
3600	3087	3456	3600	3600
3600	3456	3600	3600	3600
3600	3600	3600	3600	3600

27.47 kN

25.51 kN

17.16 kN

16.16 kN

TRACTOR Z 6045

Overall dimensions (mm) a tolerance of 5% is admissible

		1	2	3
Tyres used.	Front:	11,2/10-24	11,2/10-24	11,2/10-24
	Rear:	16,9/14-28	16,9/14-30	12,4/11-36
Overall length without implement hitch:				
with cab			3655	
without cab			3670	
Overall length with implement hitch			3770	
Overall width at rear wheel track of 1425 mm:				
without ballast weights			1950	
with ballast weights			1950	
Overall height measured to top of exhaust pipe				
with cab		2475	2493	2491
without cab		1985	2003	2001
Max. tractor height with cab		2535	2550	2550
Rear wheel track - adjustable each 25 mm			1425 - 1800	
Front wheel track			1510	
Wheel base			2220	

	1	2	3
Outer overall turning radius with one braked wheel,			
with cab		8500 ± 500	
without cab		8500 ± 500	
Weight (kg) – a tolerance of ±5% is permissible with hydraulic power lift and implement hitch –			
with cab	3420	3450	3380
without cab	3220	3250	3180
Rear tyre liquid weight	2 × 215	2 × 240	2 × 160
Max. admissible carrying capacity (kg)			
Front drive axle at max. speed of:			
25 km/h and tyre inflating of 0.18 MPa		2236	
20 km/h		2400	
6 km/h and tyre inflating of 0.225 MPa		3135	
Rear axle at wheel track of 1425 mm and at max. speed of:			
25 km/h and tyre inflating of 0.15 MPa	3600	3600	3082
20 km/h	3600	3600	3456
6 km/h	3600	3600	3600

	1	2	3	...
Tractive forces (kN) — a tolerance of ±5% is admissible				
Max. tractive force in implement hitch (hitch height 355 mm), tractor with tanks full, with ballast weights and water in tyres:				
with cab		34,34		
without cab		32,37		
Lifting force (power) at the end of three-point lower links within the whole lift				
lower links length — 800 mm		17,76		
lower links length — 860 mm		15,76		

TRACTOR Z 7011

Overall dimensions (mm) a tolerance of +5% is admissible

Tires used	Front Rear	1 7,50-15 16,9/14-28	2 7,50-16 17,4/14-36	3 7,50-16 13,6/12-38	4 7,50-16 16,9/14-30	5 7,50-16 16,9/14-38
Overall length without implement hitch:						
with cab				3655		
without cab				3675		
Overall length with implement hitch				3720		
Overall width at rear wheel track of 1475 mm.						
without ballast weights		1817	1800	1800	1841	1841
with ballast weights				1848		
Overall height measured to top of exhaust pipe						
with cab		2475	2497	2538	2493	2475
without cab		1985	2001	2018	2002	1985
Max. tractor height with cab		2535	2550	2600	2550	2535
Front wheel track adjustable				1430, 1655, 1805		
Rear wheel track – adjustable each 75 mm				1475 – 1800		
Wheel base				2247		

	1	2	3	4	5
Outer overall turning radius with one braked wheel:					
with cab			7500 ± 500		
without cab			7500+1500		
Weight (kg) - a tolerance of ±5% is permissible					
Tractor with tires full but without driver, with hydraulic power lift and implement hitch:					
with cab	3060	3060	3050	3090	3140
without cab	2660	2620	2850	2870	2940
Rear tyre loaded weight	2 × 275	2 × 160	2 × 180	2 × 240	2 × 250
Max. admissible carrying capacity (kg)					
Front swinging unsprung axle at wheel track of 1430 mm and at max. speed of:					
25 km/h (inflation 0.275 MPa)			1500		
6 km/h (inflation increased by 25%)			2980		
Front swinging sprung axle at wheel track of 1430 mm and at max. speed of					
25 km/h			1180 (locked 1500)		
6 km/h			2200		

	1	2	3	4	5
Rear axle at wheel track of 1420 mm and at max speed of:					
25 km/h	3600	3082	3456	3600	3600
20 km/h	3600	3456	3630	3600	3600
6 km/h	3630	3630	3600	3600	3600
Tractive forces (kN) a tolerance of ± 5% is admissible					
Max tractive force in implement hitch (trailer hitch) (hitch height 720 mm), tractor with tanks full but without driver and with water in tyres:					
with cab			27,47		
without cab			25,51		
Lifting force (power) at the end of three-point hitch within the whole lift range					
lower links length 800 mm			17,16		
lower links length 860 mm			16,16		

TRACTOR Z 7045

Overall dimensions (mm) -- a tolerance of ±5% is admissible

		1	2	3	4	5
Tyres used:	Front:	11.2/10-24	11.2/10-24	11.2/10-24	12.4/11-24	12.4/11-24
	Rear:	16.9/14-28	16.9/14-30	12.4/11-26	16.9/14-34	13.6/12-36
Overall length without implement hitch:						
with cab				3655		
without cab				3655		
Overall length with implement hitch				3720		
Overall width at rear wheel track of 1425 mm						
without ballast weights				1950		
with ballast weights				1980		
Overall height measured to top of exhaust pipe:						
with cab		2475	2493	2491	2525	2523
without cab		1985	2003	2001	2033	2033
Min. tractor height with cab		2535	2550	2550	2595	2595
Rear wheel track – adjustable each 75 mm				1425 – 1800		
Front wheel track				1510		
Wheel base				2220		

	1	2	3	4	5
Outer overall turning radius with one braked wheel:					
with cab			8500 – 500		
without cab			6500 – 500		
Weight (kg) — a tolerance of ± 1.5% is permissible					
Tractor weight without ballast and driver but with tanks full with hydraulic power lift and implement hitch					
with cab	3460	3490	3420	3530	3530
without cab	3260	3290	3220	3330	3330
Rear tyre liquid weight	2 × 215	2 × 240	2 × 160	2 × 250	2 × 180
Max. admissible carrying capacity (kg)					
Front drive axle at max. speed of:					
25 km/h and tyre inflating 0.18 MPa	2236	2236	2236	2236	2400
20 km/h	2400	2400	2400	2400	2880
6 km/h and tyre inflating 0.225 MPa	3135	3135	3135	3135	3000
Rear axle at wheel track of 1425 mm and at max. speed of:					
25 km/h and tyre inflating 0.15 MPa	3600	3600	3082	3600	3600
20 km/h	3600	3600	3456	3600	3600
6 km/h			3600		

	1	2	3	4	5
Tractive forces (kN) a tolerance of ±5% is admissible					
Max. tractive force in trailer hitch (hitch height 565 mm), tractor with tanks full with ballast and water in tires					
with cab			34,34		
without cab			32.37		
Lifting power at lower links end within the whole lift range:					
lower links length 800 mm			17,16		
lower links length 860 mm			16.16		

TRACTOR SPEEDS

Tractor travel speeds in km/h at rated engine speed of 2200 rpm⁻¹.

On tractor Z 5011 with tyres 12.4/11-28

Gear ratio	without reduction	with reduction	dependent PTO rpm⁻¹
I.	4.44	1.04	250.5
II.	6.60	1.55	372.7
III	9.19	2.15	519.3
IV.	14.17	3.30	797.2
V	23.58	5.51	1331.6
R	5.79	1.35	-325.8

On tractor Z 6011 with tyres 14.9-13-28

a) tractor is not provided with torque multiplier

I.	4.35	1.03	252.9
II.	6.47	1.53	376.3
III	9.01	2.13	524.3
IV	13.83	3.27	804.9
V.	23.07	4.16	1344.4
R	5.67	1.34	-330.1

b) tractor is provided with torque multiplier:

I.	5.70	1.35	332.0
I. TM	4.35	1.03	252.9
II.	8.49	2.00	494.2
II. TM	6.47	1.53	376.3
III	11.83	2.79	688.0
III TM	9.01	2.13	524.3
IV	18.16	4.29	1056.7
IV TM	13.83	3.27	804.9
V.	23.07	5.45	1344.4
V. TM	17.60	4.16	1024.1
R	7.44	1.76	-447.7
R TM	5.67	1.34	-330.1

On tractor Z 7011 with tyres 16.9/14-28

a) tractor is not provided with torque multiplier.

Gear ratio	without reduction	with reduction	dependent PTO rpm
I	8.55	1.07	253
II	6.77	1.60	376
III.	9.43	2.23	524
IV.	14.47	3.42	805
V.	24.18	5.71	1344
R	5.93	1.40	330

b) tractor is provided with torque multiplier

I	5.97	1.41	332
I. TM	4.55	1.07	253
II	8.86	2.10	494
II. TM	6.77	1.60	376
III	12.38	2.92	688
III. TM	9.43	2.23	524
IV	19.00	4.49	1057
IV. TM	14.47	3.42	805
V	24.18	5.71	1344
V. TM	18.43	4.35	1024
R	7.79	1.84	433
R. TM	5.93	1.40	330

Increased reverse speed

Tractor with tyres 12.4/11-28

- without reduction from 5.79 to 9.13 km/h
- with reduction from 1.35 to 2.13 km/h

Tractor with tyres 14.9/13-28

a) is not provided with torque multiplier:

- without reduction from 5.67 to 8.93 km/h
  with reduction from 1.34 to 2.11 km/h

b) torque multiplier fitted

- without reduction from 7.44 to 11.73 km/h
  from 5.67 to 8.93 km/h
- with reduction from 1.76 to 2.77 km/h
  from 1.34 to 2.11 km/h

Tractor with tyres 16.9/14-28

a) torque multiplier not fitted:

- without reduction from 5.93 to 9.36 km/h
  with reduction from 1.40 to 2.21 km/h

b) torque multiplier fitted:

without reduction	from 7.79	to	12.28 km/h
	from 5.93	to	9.35 km/h
with reduction	from 1.84	to	2.90 km/h
	from 1.40	to	2.21 km/h

Tractor Tyreing:

ZETOR 5011	front	6.00-16	standart
		7.50-16	
	rear	12.4/11-28	standart
		14.9/13-28	
		12.4/11-32	
		12.4/11-36	
		13.6/12-36	
		9.5/9 -32	
ZETOR 6011	front	6.50-16	standart
		7.50-16	
	rear	14.9/13-28	standart
		12.4/11-36	
		13.6/12-36	
		15.9/14-28	
		16.9/14-30	
ZETOR 6045	front	11.2/10-24	standart
	rear	16.9/14-26	standart
		12.4/11-36	
		15.9/14-30	
ZETOR 7011	front	7.50-16	standart
		6.50-16	
ZETOR 7045	front	11.2/10-24	standart
		12.4/11-24	
ZETOR 7011, 7045	rear	16.9/14-28	standart
		12.4/11-36	
		13.6/12-36	
		16.9/14-30	
		16.9/14-34	

MAKING ACQUAINTED WITH THE TRACTOR

A basic condition of a correct operation and use of the Zetor tractor is to make well acquainted with it. Make acquainted with it in order to ensure its safe and reliable operation.

Zetor tractors are of frameless design equipped with Diesel engine. Front axle on Z 5011, Z 6011 and Z 7011 is of swinging portal type. Tractors Z 6045 and Z 7045 are provided with front drive axle. Front and rear wheel track is adjustable with the exception of front wheel track on tractors Z 6045 and Z 7045.

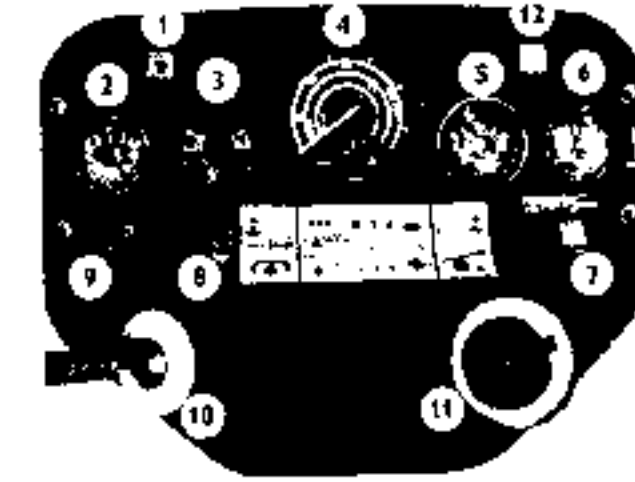


Fig. 1

Dashboard (Fig. 1)

1. Direction indicator pilot lamp (green)
2. Air pressure gauge
3. Pilot lamp dev. (A)
4. Speedometer with engine hour counter (engine hour counter counts 1 EH at 1600 rpm of engine crank shaft per 1 hour)
5. Fuel gauge
6. Cooling liquid thermometer
7. PTO shaft clutch pilot lamp (red)

8. Tail light switch (reverse speed lamp)
9. Lifting switch
10. Direction indicator lights and horn change-over switch (dimmed and distance lights, direction indicator, light and acoustic horn)
11. Switch box with steering lock
12. Free pilot lamp

Pilot lamp device (Fig. 2)

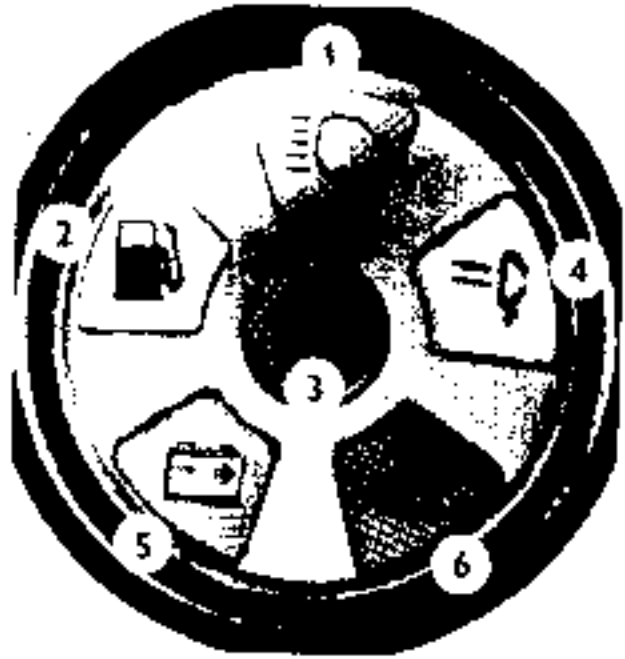


Fig. 2

1. Distance lights - blue
2. Fuel - orange
3. Lubrication - red
4. Working headlamp - yellow
5. Charging - red
6. Hand brake - red

Lighting switch (Fig. 19)

If the lighting switch pushbutton is turned to the right into position „I", contour and parking lights, instrument lights, rail light and state identification number lights are switched on.

If the lighting switch is turned into position „2", contour lights, instrument lights, tail lights with state identification number illumination and passing (distance) lights in headlamps are on. Which headlamp lights are on, depends on light switch lever position (Fig. 1/10).

Switch box with steering lock (Fig. 1/11)

Besides door locking (on tractor with cab) the tractor can be secured against misuse by locking the steering. It is locked in such a way that the key in the switch box is turned to the left from „0" position into „STOP"-position. Upon removing the key and turning the steering wheel, the steering is locked. When unlocking, insert the key into position „STOP" or turning to the right into position „0". When turning the key to the right into position 1, all electric consumers are on. If you keep turning against a flexible resistance into position „2 - START", you start the engine (upon a full clutch pedal depress).

Explanations of symbols located on dashboard

(Fig. 3/1, 2, 3, 4, 5)

1. Use of PTO shaft clutch hand disengaging lever
2. Engaging hydraulic power lift and PTO shaft drive
3. Gear shift diagram.
4. Switching on reduced speeds (slow) — (Fig. 10/2a) road speeds (fast) — (Fig. 10/2b), neutral (Fig. 10/2N)
5. Use of hand (parking) brake.

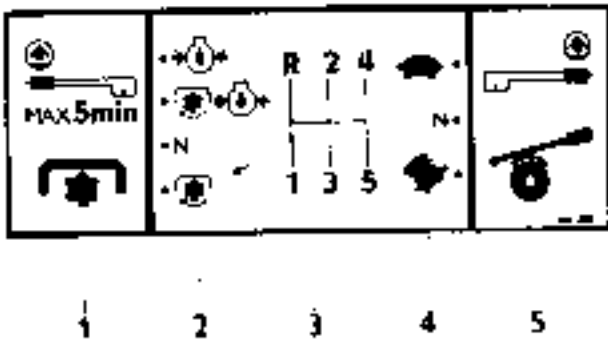


Fig. 2

Fuse box (Fig. 13.2)

The fuse box is accessible after removing the cover which is locked by two quick-closing devices (Fig. 18/3) and is located underneath the dashboard on the right side on a bracket. The fuse box is eight-pole and contains consumer fuses (15 A).

A tractor equipped with a safety cab has two more 15 A fuses which are located on the fuse box left-hand side.

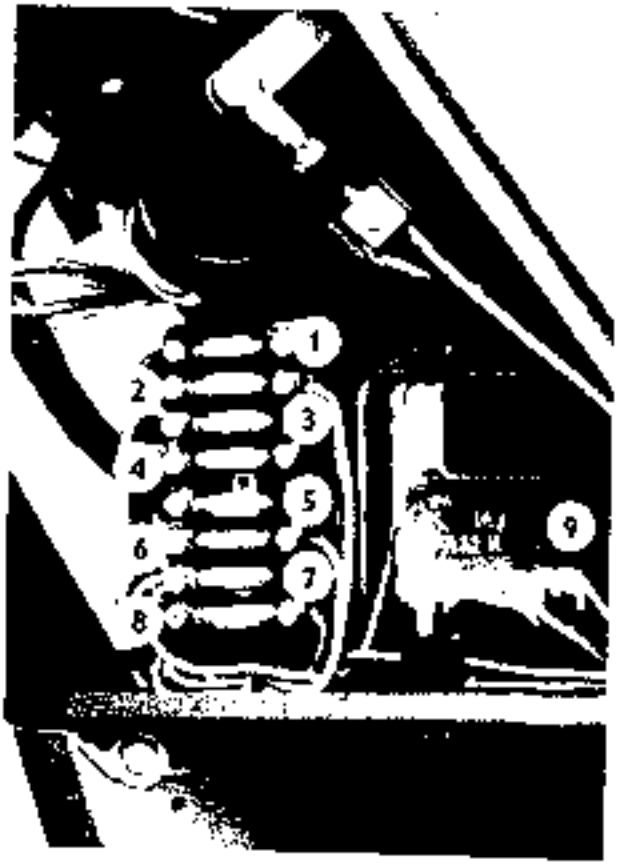


Fig. 4

Switching-on fuses on fuse box panel

(Fig. 4)(1—8)

1. Distance lights and distance light pilot lamp.
2. LH dimmed light.
3. RH dimmed light.
4. RH front and rear contour lights, parking light and instrument illumination.
5. LH front and rear contour lights, parking light and cab auxiliary lights.
6. Assembly socket and power supply.
7. Direction indicators.
8. Brakes and horn.

Cab circuit breakers located on panel (on left side):

— Windscreen washer and wiper, heating + ventilation
— Ceiling lamp and radio.

FILLING AND DRAINING HOLES

1. Fuel filling hole (Fig. 5 5).
2. Cooling liquid filling hole (Fig. 5 1).
3. Cooling liquid drain cock is placed on radiator bottom part.

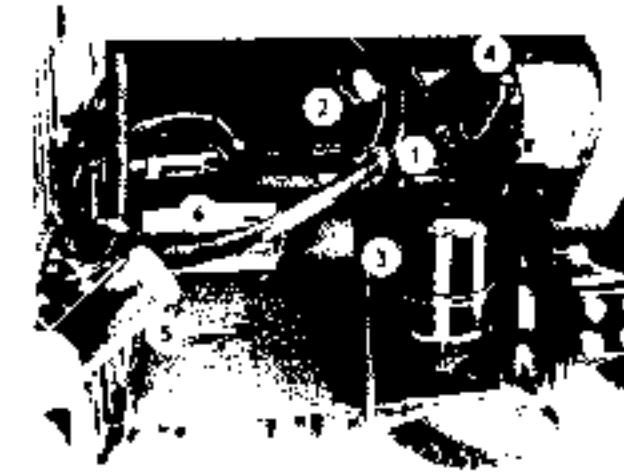


Fig. 5

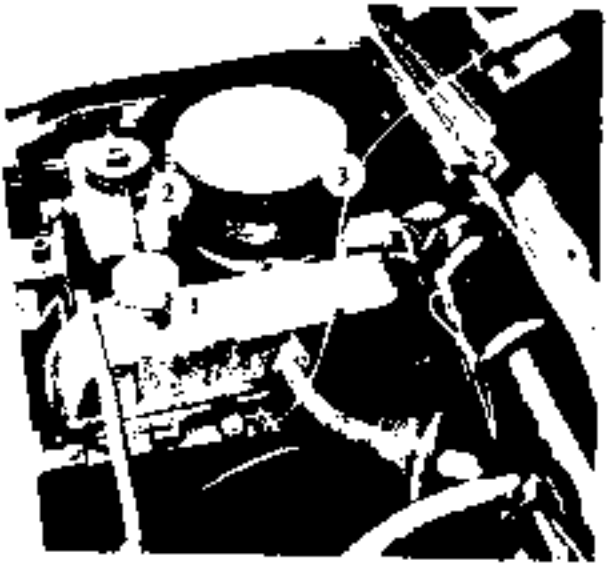


Fig. 6

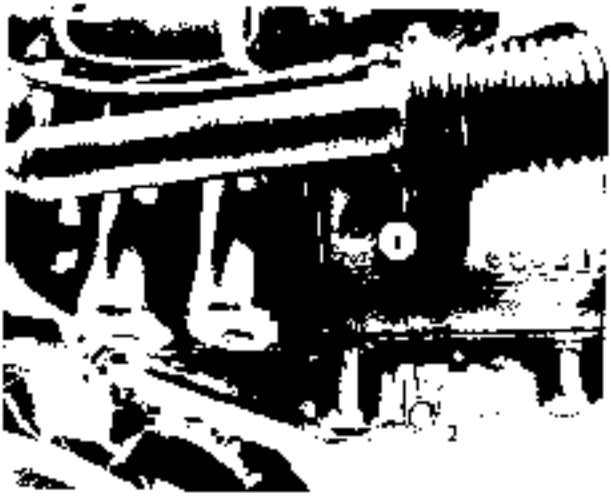


Fig. 7

4. Cooling liquid drain cock from engine block (Fig. 5/1).
5. Engine oil filling hole (Fig. 5/2).
6. Engine oil check gauge (Fig. 7/1).

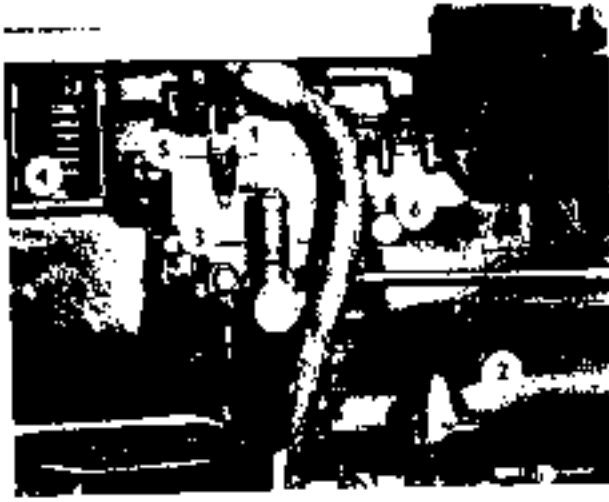


Fig. 8

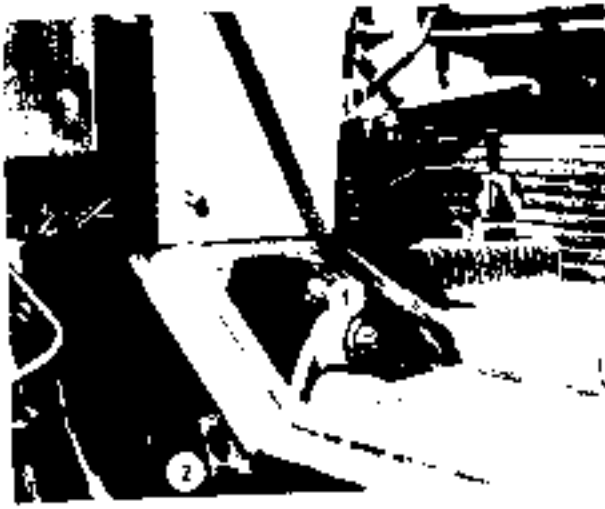


Fig. 9

7 Engine oil drain plug (Fig. 7.2)

8 Injection pump body and governor oil filling hole (Fig. 8.1)

9 Injection pump body and governor oil drain plug (Fig. 8.2)

10 Steering box oil filling hole (Fig. 9.1).

11 Power-assisted steering tank oil filling hole (Fig. 6.2)

12 Power-assisted steering oil drain plug is located on tank bottom part.

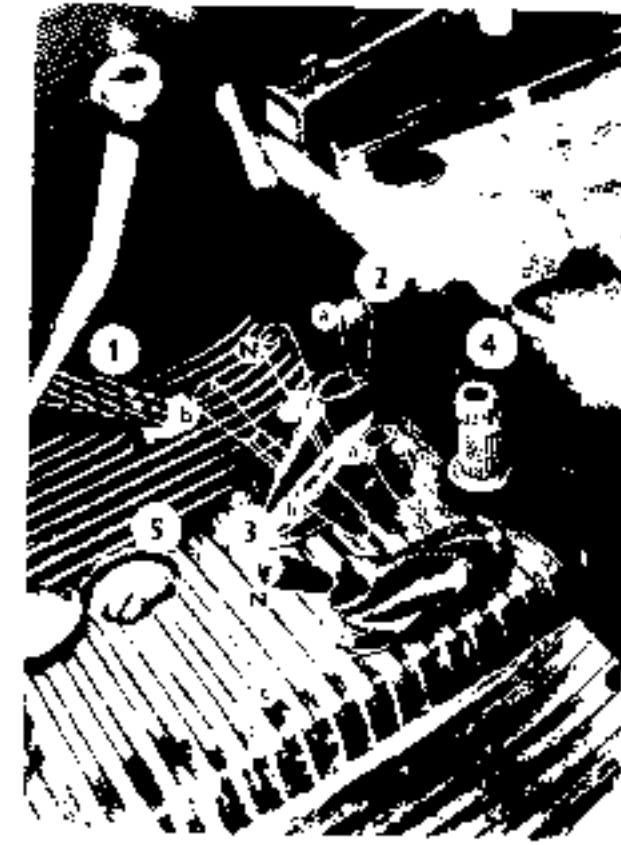


Fig. 10

Fig. 11

12. Gearbox and main transmission housing oil filling hole (Fig. 10/5)
13. Gearbox and main transmission housing oil drain plug (Fig. 11/1)
15. Rear half-axle portal oil filling hole (Fig. 12/1).
16. Rear half-axle portal oil drain plug (Fig. 12/2)
17. Brake fluid filling hole (Fig. 13/1).
18. Front drive axle oil filling hole (Fig. 14/1)
19. Front drive axle oil drain plug (Fig. 14/1)
20. Reducer oil filling hole (Fig. 16/1).
21. Reducer oil drain plug (Fig. 16/1).
22. Reducer oil dipstick hole (Fig. 16/2)
23. Air receiver condensate drain plug (Fig. 17/2).
24. Fuel tank impurities drain plug (Fig. 15/2).

Fig. 12

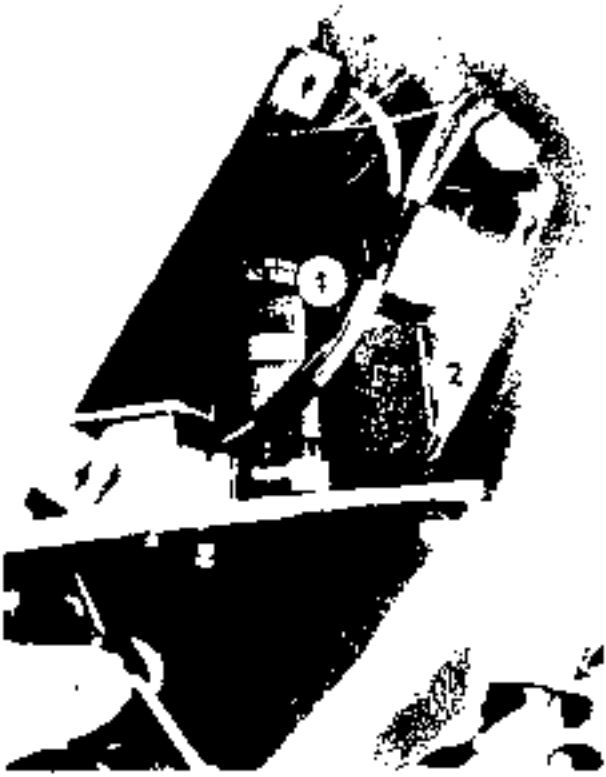


Fig. 13

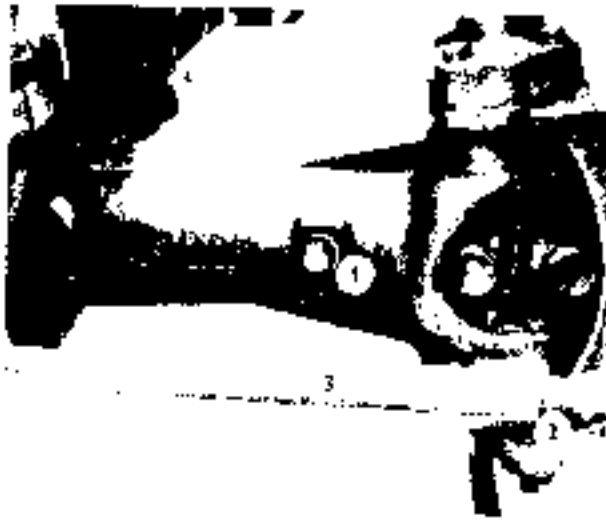


Fig. 14

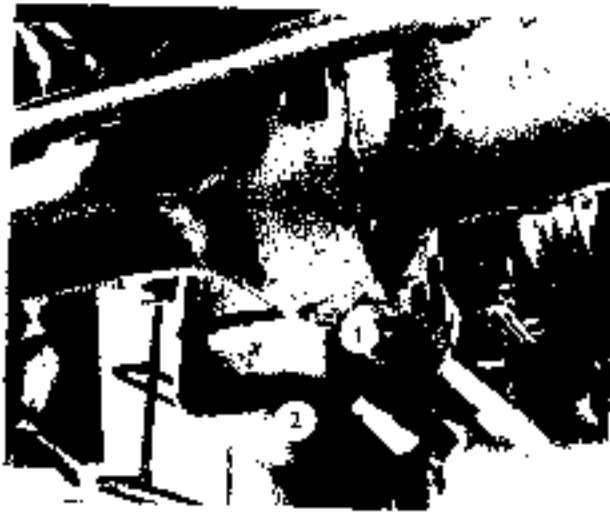


Fig. 15

Fig. 16

LEVERS AND PEDALS

Control lever

1. Hand-operated fuel supply control (Fig. 17/1).
2. Gear shift lever (Fig. 18/2) gear-shifting diagram (Fig. 3,3).

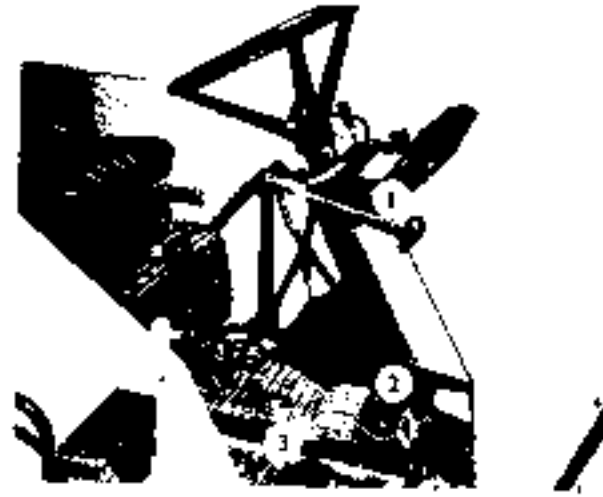


Fig. 17

Fig. 18

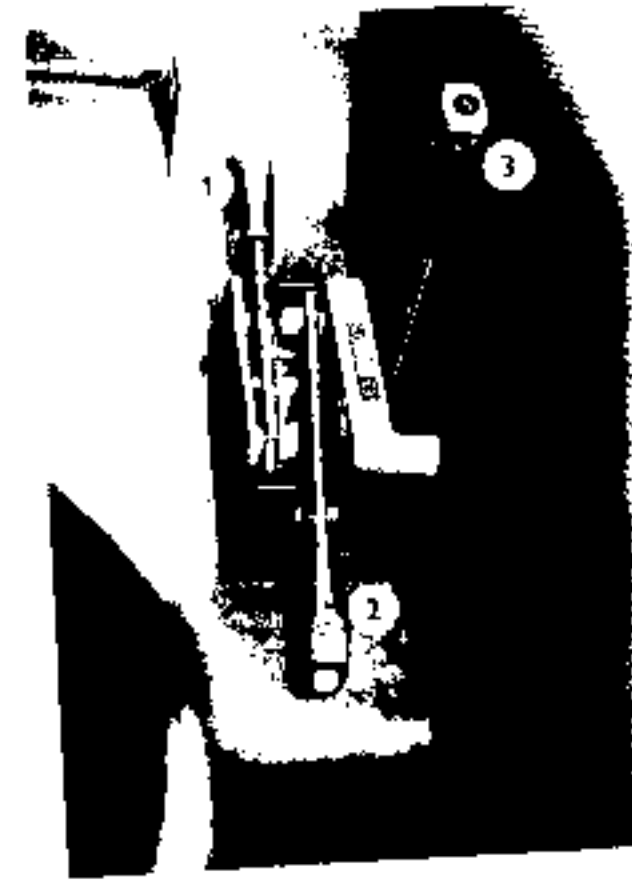


Fig. 19

3 Reduced and road speeds preselection (Fig. 10.2)

4 Hydraulic power lift and PTO shaft drive engagement gear (Fig. 10.2) engages:

a) PTO shaft drive via gearbox, i. e. PTO shaft revolutions are dependent on the selected gear ratio (gear shift lever is up)

b) PTO shaft drive + hydraulic power lift system (gear shift lever is down – position I)

c) Hydraulic pump drive (PTO shaft does not turn, gear shift lever is in lowermost position)

– Neutral "N"

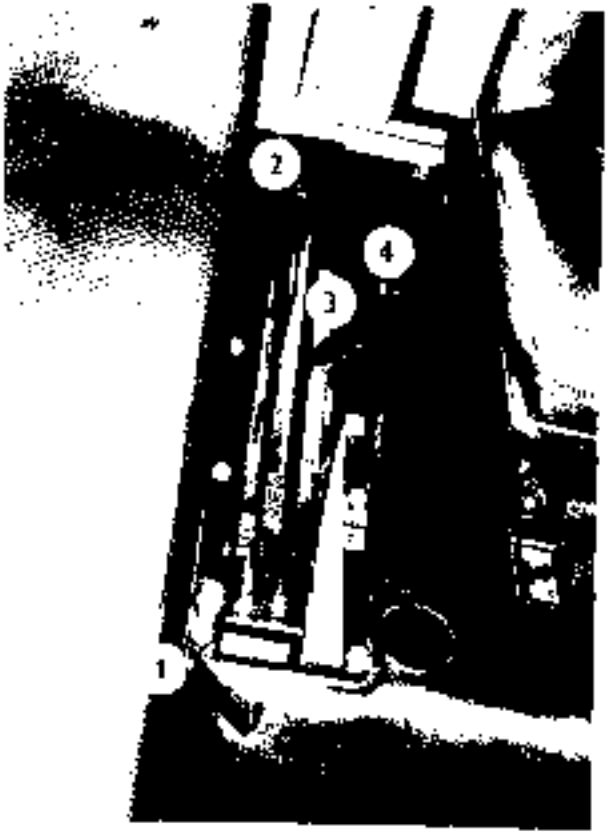


Fig. 20

5 PTO shaft speed gear shift lever for 540 and 1000 rpm (Fig. 10/4) — fitted on Z 6011—7045 only.

Attention:

When changing speed from 540 to 1000 rpm or vice versa it is necessary to displace the gear shift lever to neutral and use correct exchangeable PTO end pieces. PTO end piece for 540 rpm is six-grooved.

6 PTO shaft clutch hand disengagement lever (Fig. 19/1).

7 Reaction rate lever (Fig. 20/1).

8 Hydraulic power lift outer circuit lever (Fig. 20/3).

9 Hydraulic power lift inner circuit lever (Fig. 20/2).

10. Hydraulic power lift system preselector (Fig. 20:4).
11. Single-axle trailer hitch disengagement lever (Fig. 19:3).
12. Hand (parking) brake lever (Fig. 19:2).
13. Front drive engagement lever (Fig. 21:2).
14. Compressor engagement lever (Fig. 9:3).
15. Compressor engagement safety pin (Fig. 6:4).

Pedals

1. Foot-operated fuel supply (throttle) control (Fig. 10:1).
2. Foot brake latched pedals (Fig. 19:2). A two-pedal brake system with automatic pressure equalizer is fitted.
3. Differential lock pedal (Fig. 21:3).
4. Clutch pedal (Fig. 18:1).
5. Torque multiplier pedal (Fig. 21:1).

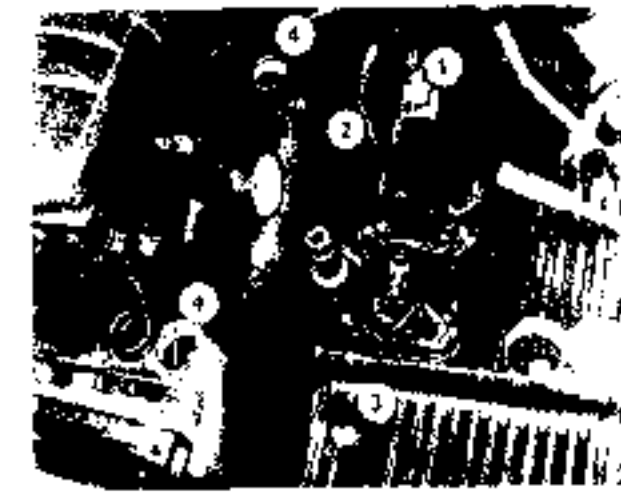


Fig. 21

HYDRAULIC POWER LIFT AND IMPLEMENT HITCH (COUPLING)

Hydraulic power lift system „ZETOMATIC" is used to control agricultural machines and implements. It consists of two circuits, each of which is controlled by a separate lever — inner circuit (Fig. 20,2) and outer circuit control lever (Fig. 20,3). The functions of inner circuit are designated by a label (Fig. 22 and 23).

a) **Inner circuit** — is intended to raise and lower agricultural hitched (attached) machines and implements hitched (attached) machines and implements.

Inner circuit lever serves for

- raising and lowering agricultural implements into transport or working position
  height adjustment of hitched implements in positional control,
  traction force value adjustment in draft or mixed control;
- adjustment of the so-called floating position when working with implement having its own supporting wheels.

Inner circuit is controlled by the main and two auxiliary levers, such as:

1. Hydraulic power lift system preselector (Fig. 20,4) selects control type. Its three positions are designated by marks P, M, D (Fig. 22)

   „P" — position (lever) control. The trailed implement is automatically held in an approximately constant vertical position with respect to tractor forming an integral unit with implement so that the tractor swingings are transmitted onto the trailed implement.

   „D" — draft control. The trailed implements are automatically held in the vertical position being dependent on soil resistance change.

   „M" — mixed control. Combines both foregoing control types.

   The design arrangement of the hydraulic power lift also makes it possible to work with implement provided with supporting wheels in the so-called free (floating) position.

2. Reaction rate lever (Fig. 20,1) is intended to perform several functions

— Maximum ploughing depth when selecting D and M control

— Antislip when selecting P control

— Free (floating) position. Maximum lowering when selecting P control

— Three-point hitch vertical adjustment

Maximum oil supply

— Minimum oil supply

Motion reaction speed designation

— draft control

— mixed control

— position control

— Maximum raising

Fig. 22. Inner circuit designation

- in position control it controls the lifting rate and the magnitude of lightening force (anti-slide).
- in mixed and (draft) power control it controls the function sensitivity, i.e. the rate with which the control device reacts to the induced deviation formed by soil resistance.
- in all control types it controls the lifting rate of the three-point hitch;
- it regulates oil amount supplied to the outer circuit

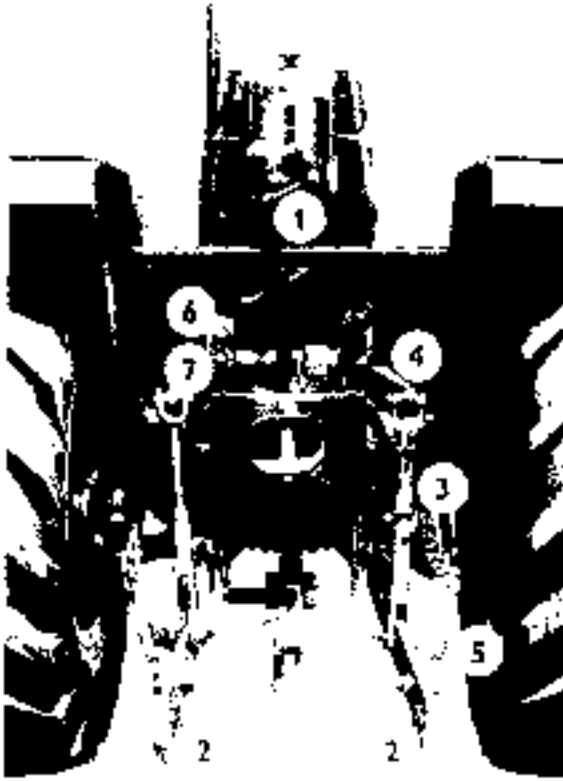


Fig. 24

— Motion in one direction — starting the double-acting cylinder.

— Control lever is not locked, it returns automatically to neutral. The lever must be held.

— Free - floating - position for the double-acting cylinder. Starting the single-acting cylinder. In this position the lever is locked and need not be held.

— Neutral — locked position. In this position the lever is locked.

Travel direction

— A similar target designation can be found on the quick coupler (Fig. 24/6, 7), it designates pressure oil supply upon raising.

— Motion in opposite direction — raising. Control lever is not locked, it returns automatically to neutral. The lever must be held.

Fig. 23. Outer circuit designation

b) Outer circuit

supplies pressure oil to machines and implements having their own hydraulic cylinders outside the tractor, both single-acting (hydraulically controlled hoes etc.) and double-acting (loaders, cutter bars, hydromotors etc.). This circuit is provided with two outlets having each a quick coupler (quick coupling device) at its end (Fig. 24 6, 7, 25 2, 3).

Outer circuit is controlled by two levers

1. hydraulic outer circuit lever;
2. reaction rate lever

In hydraulic power lift system „ZETORMATIC" both circuits, i.e. inner and the outer one, may be used at the same time. The amount supplied to individual circuits is controlled by the reaction rate lever. If the reaction rate lever is in its LH utmost position, all oil is supplied to the inner circuit, if it is in its RH utmost position all oil is fed to the outer circuit.

If only the outer circuit is in operation and the inner circuit control lever is in neutral, the whole amount of oil is supplied to the outer circuit independently of the reaction rate lever position (Fig. 20.1). If the inner circuit lever is displaced into the position being 20 to 30

Fig. 25

far from the lowermost position, the amount of pressure oil may be controlled by the position of the lever. The outer circuit main lever controls two outlets, i.e.:

- outlet 1 — is attached (coupled with) to single-acting cylinders (Fig. 24.6, 25.2)
- outlet 2 — is attached (coupled with) to double-acting cylinders (Fig. 24.7, 25.3).

The discharge of hydraulic pump is at 540 rpm⁻¹ PTO 19 MPa pressure and 20 to 50 C oil temperature — 25 l — and at 1000 rpm⁻¹ — 35 l. The amount of oil supplied in the outer circuit is 6 to 10 l.

The outer circuit lever controlling single-acting cylinder connected with outlet „1" has three positions:

1. **Raising** — control lever is in its uppermost position. The lever must be held.
2. **Neutral** — control lever is in its central position and is automatically locked.
3. **Lowering** — control lever is in the middle between neutral and the lowermost position. In this position it is automatically locked and need not be held.

Use of outer circuit lever when controlling a double-acting cylinder

The above cylinder is connected with outlet „1" (Fig. 24.6 and 25.2) and „2" (Fig. 24.7 and 25.3) in such a way that outlet „1" is intended for pressure oil when raising and outlet „2" when lowering. The flow direction is designated on the hydraulic cover by arrows.

When controlling a double-acting cylinder the outer circuit control lever has four positions:

1. **Raising** — control lever is in its uppermost position.
2. **Neutral** — control lever is in its central position.
3. **Free position** — control lever is in the middle between neutral and its lowermost position. The lowering operation starts. In this position the control lever is automatically locked and need not be held nor locked.
4. **Lowering** — control lever is in its lowermost position.

Three-point hitch

The three-point hitch represents an outer coupling device serving for attaching agricultural machines and implements. It consists of an upper link being longitudinally adjustable (Fig. 24/1) and two lower links (Fig. 24/2) which are attached by a RH and LH strut (Fig. 24/3) to the hydraulic lifting mechanism arms (Fig. 24/4). The RH strut is longitudinally adjustable – without dissembling – by means of a crank, bolt and nut, whereby RH lower link is vertically adjustable. The upper link as well as lower links

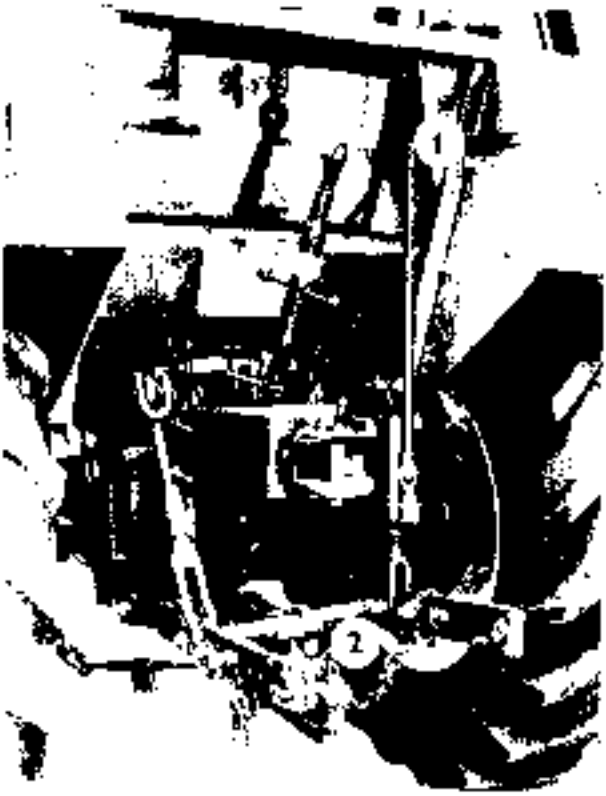


Fig. 24

are provided with ball joints and openings enabling lower links ends to (sway) swing by ±125 mm. By changing the length of the torsion nut (Fig. 24/5), the lower links sway can be adjusted within the whole hydraulic mechanism (1). As long as the tractor is without any attached (coupled) implement, the upper link can be hanged onto a flexible holder (Fig. 23/1). The tractor provided with a safety coil can be optionally equipped with a longitudinally adjustable RH strut (from the driver's seat) by means of a crank located in the cab (Fig. 26/1). When working with an implements, it is necessary to remove lower links bearings (Fig. 25/2).

Multistage trailer hitch

serves for attaching double-axle and lighter single-axle trailers (Fig. 27/3). This hitch enables vertical adjustment into four positions (if a fixed and swinging drawbar are fitted) or into seven positions if the swinging drawbar is not fitted. The height of individual row mouth positions above ground depends on the tyres used. The pitch of individual mouth positions is 50 mm. The admissible vertical static load is 10 kN maximum. Tractive static force is 30 kN.

Single-axle trailer hitch (Fig. 27/1)

It is used to attach single-axle trailers. The hitch is lifted and lowered hydraulically by means of the three-point linkage, which considerably enables the trailer to be attached to tractor. The hitch can be fitted even if the tractor has been provided with a multistage hitch. Admissible vertical static load is 10 kN.

Trailer hitch extension (Fig. 27/2)

It is fitted together with single-axle trailer hitch and is intended for coupling agricultural machines driven by PTO shaft at 1000 rpm. It basically replaces the fixed and swinging drawbar.

Fixed and swinging drawbar

It is used on tractors without multistage hitch. The fixed drawbar is intended for coupling trailed agricultural machines and implements.

Fig. 27

The swinging drawbar is transversally adjustable into five positions. If the tractor is provided with a multistage hitch, the swinging drawbar is fixed to the multistage hitch bracket. Admissible vertical static load: max. 6 cN

Tilting trailer hitch

enables the tow mouth to be vertically adjusted into three positions and is used for coupling agricultural machines and implements.

DRIVER'S SEAT

The driver's seat has a soft leatherette covered filling. It is sprung by a steel spring. The spring-loading is adjustable according to the driver's weight from 60 to 120 kg by a screw nut in the upper seat part. After unlocking the lever on the LH side the seat is longitudinally adjustable by ±75 mm. When unlocking the lever on the RH seat side, the seat is vertically adjustable by ±30 mm. The springing seat stroke is 120 mm.

CLUTCH

The clutch is double-purpose, built-in into the flywheel. It consists of two plates, the one for tractor travel and the other for PTO shaft drive. The pressure force is derived from a Belleville spring.

TORQUE MULTIPLIER

It enables speed ranges to be changed by the gear ratio of 1.31 without disengaging engine clutch, i. e. without interrupting the torque transmission onto tractor drive wheels. Thus the peripheral force on tractor drive wheels is increased by 31 %. By using torque multiplier, 20 forward speeds and 4 reverse speeds are obtained.
When increased resistances have cleared the torque multiplier can be put out of operation without any clutch disengagement. The torque multiplier is actuated by a pedal (Fig. 21.1). The tractor equipped with torque multiplier is provided with a hand-operated PTO clutch disengagement (Fig. 19.1).

No torque multiplier is fitted on Z 5011.

ATTENTION.

With torque multiplier engaged, the tractor cannot be braked by engine! The tractor travel is disengaged with torque multiplier engaged — by depressing clutch pedal as far as the stop not to switch on the switch on clutch pedal. In the event that electric current is interrupted and the pilot lamp of the PTO shaft clutch hand operated disengagement (Fig. 19.7) is not on, the tractor travel must be disengaged by the PTO shaft clutch hand operated disengagement lever (Fig. 19.1).

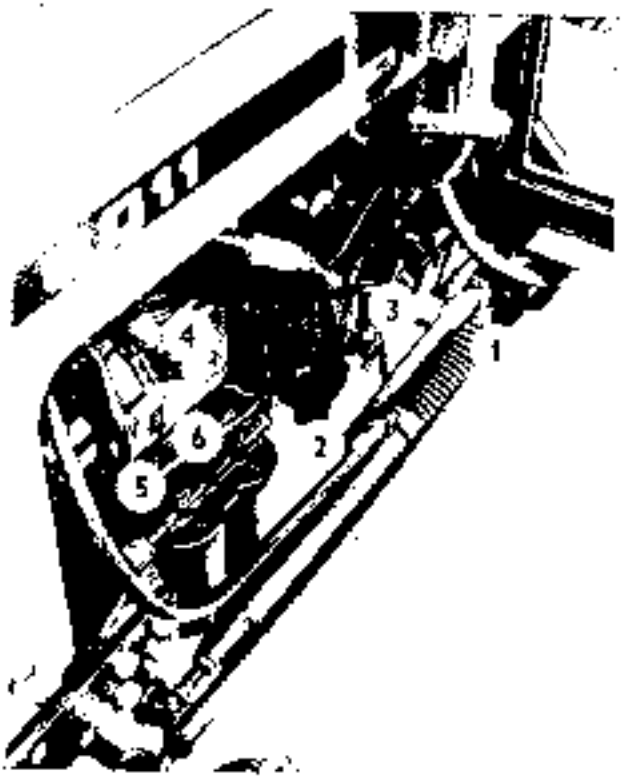


Fig. 28

STEERING BOOSTER (Fig. 28/1)

It facilitates tractor steering in such a way that it reduces the force being applied to the steering wheel to steer the wheels. At the same time shocks resulting from wheel steering and being transmitted onto the steering wheel are damped. With the engine at rest, the tractor can be steered by a mechanical transmission [illegible] driver's force [illegible] onto the steering wheel.

BRAKES

Hand brake — parking brake — is mechanical, band-type, acts simultaneously on the outer periphery of either wheel brake drums.

Foot-operated brakes are liquid, shoe-type. The tractor is provided with a two-pedal brake system with an automatic equalizer so as to be able to brake only an one wheel independently of the other one. Disconnected pedals may be used solely when working in terrain and on a field upon tractor turning on the spot. For on road travel it is necessary to latch both pedals (Fig. 17/3).

On tractors Z-6045, 7045 with front drive axle and engaged front drive also front axle is braked via transmission. With front drive axle engaged, it is impossible to brake each front wheel separately.

Fig. 29

ADDITIONAL BALLAST WEIGHTS (Fig. 29/1, 2 and 30/1)

In order to increase additionally the weight of tractor, additional ballast weights can be used. The use of additional ballast weights is limited by the carrying capacity of tyres and axle.

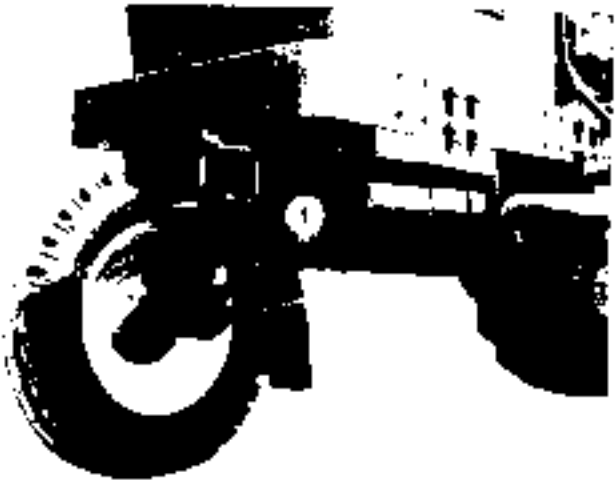


Fig. 30

Use of additional ballast weights	Tractor model		
	Z 5011	Z 5011 Z 7011	Z 6045 Z 7045
Front axle max.	160 kg	160 kg	400 kg
Rear axle max.	300 kg	300 kg	300 kg

Note: On tractors where tyres with inner tubes provided with valves for water filling are fitted, the weight may be increased — according to the tyre type — by max. 2×250 kg

ELECTRICAL EQUIPMENT

The nominal voltage of the electrical equipment is 12 V. The standard version is provided with one storage battery 6T 150 seated in the housing on the LH side underneath the floor (Fig. 31/1). The current source consists of an alternator 12 V 35 A (Fig. 5/4) and a semiconductor governor (Fig. 4/9). The output of the electric starter is 2.9 kW (Fig. 5/6).

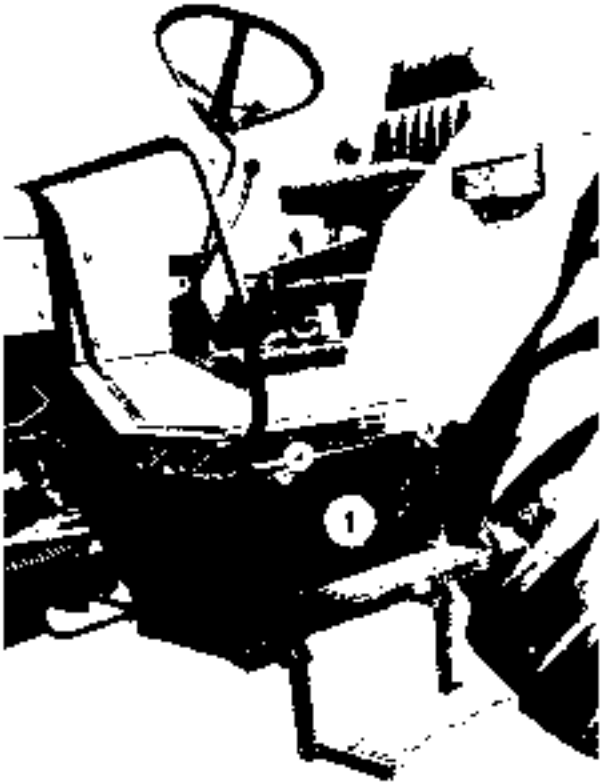


Fig. 31

SAFETY CAB (Fig. 32)

It prevents considerable deformations upon tractor upset and protects the driver from a more serious injury. The cab is fixed on the tractor body by means of four silent-blocks with interlocking. The windows are of safety glass, doors are provided with handles on either side which can be locked. Cab floor, overbridging above hydraulic power lift, roof and mudguards are of noise suppressing type.

On LH cab side behind the mudguard (Fig. 31-1), a housing with storage battery is located. After unscrewing two bolts (Fig. 31-10), the cover with dashboard are lifted and the storage battery can be pulled out by its handle on the lifted housing cover.

Mate's seat is located on the LH or RH mudguard close to the driver. To facilitate the access to the driver's seat the mate's seat can be lifted.

Front working headlamps are fitted on the cab roof (Fig. 32-1) and are controlled by a switch (Fig. 33-1). When in use the illumination switch must be switched on (Fig. 1-9). The rear working headlamp is placed on the RH rear mudguard and is controlled by a switch from the driver's dashboard (Fig. 1-8).

The windscreen wiper is controlled by the switch (Fig. 33-7).

Fig. 32

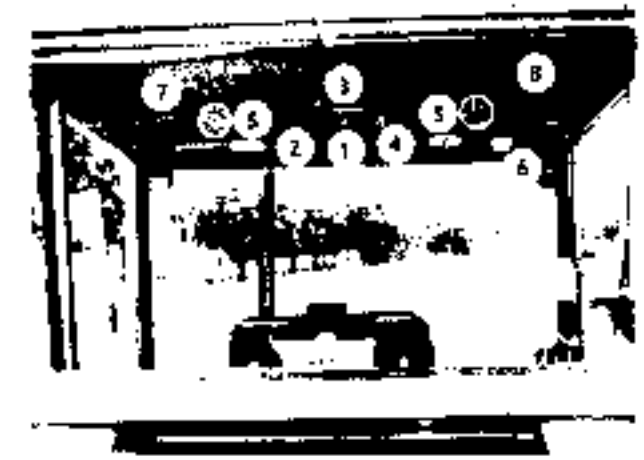


Fig. 33

Windscreen washer

The windscreen washer vessel which is located underneath the dashboard on the LH side, is accessible after removing the guard locked by two quick closing devices (Fig. 18,3). The vessel capacity is 2.5 l. It is filled with water and in winter season with the liquid specified for windscreen washers. By pushing down washer control switch located on cab panel (Fig. 33/2), the washer is started. Maximum washer pump load time is 20 sec.

Cab heating and ventilation

The heating is located together with ventilation in the cab ceiling panel. The heating is of warm-water type of approx. 4600 W output at 80° engine cooling liquid temperature. The heating control can be carried out by opening or closing water cock actuated by a lever on the cab panel (Fig. 33/3). In the event of a complete water supply shut-off to the heating body, the heating works as a ventilation unit. Heated or cool air is introduced into the cab by means of a ventilation unit consisting of two fans. Each fan can supply approx. 170 m³/h. The fans are controlled by the double-speed switch (Fig. 33/4).
Fresh air is sucked via air cleaners located in cab roof front part. The air cleaners are accessible after removing

decorative grill lined by quick closing devices (Fig. 32/2). Air can be directed to the cab space and to the windscreen by means of air blowers (Fig. 33,5) provided with lockable controls.

The illumination of the cab inner space is ensured by a ceiling lamp where the switching on and off is controlled by turning the cover (guard) — (Fig. 33/6).

Radio receiver

An autoradio Tesla SPIDER 3 2108 B (Fig. 33/7) with loudspeaker (Fig. 32/8) can be fitted — as an option — into the cab ceiling panel. In the case of a later fitting, it is necessary to proceed according to the autoradio manufacturer instructions. A whip antenna is fixed on the cab front column (Fig. 32/3).

GENERAL PRINCIPLES OF ZETOR TRACTOR OPERATION

A reliable tractor operation requires that the operator is well acquainted not only with the technique of travel but also with correct principles of its operation and the use of a special tractor outfit.

When operating the tractor in summer season, a special attention must be drawn (particularly) to:

1. the amount of cooling liquid in radiator and the sealing condition of overpressure valve seat. The temperature of cooling liquid may attain 105 °C for a short time only. At a higher temperature, the overpressure valve opens and the cooling liquid escapes.
2. Air cleaner in dusty environment and clean it daily, if necessary.
3. Storage battery, check the amount of electrolyte daily and dilute it with distilled water.

How to prepare the tractor for travel

Before starting to travel make sure whether the tractor technical condition complies with the principles of safe operation. If a trailer or an attached implement are involved, check their attachment and a proper load fixing.

Then it is necessary to check the amount of:

- fuel in tank
- oil in engine
- coolant in radiator
- brake fluid

  and to check the tightness of all joints (connections) and wheel nut retightening
- function of electrical equipment (lights, direction indicators, brake lights, windscreen wipers, horn and trailer illumination)
- if a trailer with pneumatic brakes is attached, check the compressor for connection. Before starting to travel, the minimum air pressure is to be 0.15 MPa. It is possible to attach only one trailer or one single-axle trailer to tractor whose weight does not exceed by two and a half the momentary tractor weight.

  Pressure in tyres which must correspond with the intended work with tractor
- State identification numbers for their cleanliness

After having performed the above checking operations, start the engine and check:

- steering condition (incl. steering wheel free travel which must not exceed 15°),
  function of instruments and pilot lamps,
  run the tractor for a short time and check operating and parking brake for efficiency.

All defects found remove at once and refill missing liquids to the specified level!

Starting the engine

Before starting the engine, make sure whether the tractor is duly braked and the gear shift lever of gear ratio (ranges) as well as auxiliary drive levers in neutral. Then proceed in the following way:

- adjust the fuel supply to its maximum,
  insert the key into the switch box, turn it to the right into position I and the pilot lamp (red) of recharging and engine lubrication is on,
- depress clutch pedal to stop, whereby the start circuit breaker switch is switched on (without clutch depressing engine cannot be started),
  turn the key to the right into position „2 - START"

ATTENTION

Never start the engine for more than 10 seconds! If the engine fails to start at once turn the key back as far as the stop into position „0" and repeat starting once again, but as late as after 30". Never help the stopping engine by means of the starter, otherwise you run a risk of damaging it.

Engine starting in winter season

If the ambient air temperature drops below 5°C, the engine starting can be assisted by pushing down a push-button for additional fuel supply on pump (Fig. 8.5) when observing the basic starting procedure.

Unless the coolant temperature has attained 45°C do not increase engine speed above 2000 rpm min⁻¹. An alternate sudden speed increasing is not admissible. The engine must not be loaded unless the oil pressure exceeds 0.25 MPa.

Engine warming-up by travel is not only quicker but also more economic than that on the spot at idle run of 750 to 800 rpm min⁻¹.

Travel technique

A reliable fulfilment of working (labour) tasks is also considerably affected by a correct and safe tractor operation. A correct driver's sitting position behind the steering wheel is a basic assumption of a good travel. The driver's seat can be adjusted according to his weight and tallness in such a way that his left leg — after a full clutch pedal depressing — remains slightly bent or stretched. When adding fuel by his right leg, no pressure should be left into the thigh (upper part). The steering wheel must be held with both hands, without violence and both arms are to be slightly bent.

Before starting to travel with a new tractor, make first acquainted with the gear-shift diagram (Fig. 3:3) and check individual positions of the gear shift lever with the engine at rest. When (gear) shifting individual gear ranges, use double clutch disengagement.

Example. When shifting from lower to higher gear ratio (from third to third gear ratio range), proceed as follows:

- depress clutch pedal simultaneously releasing fuel accelerator pedal.
  also put gear shift lever in neutral at the same time
- release clutch pedal (clutch is engaged)
- depress clutch pedal once again
  shift in a higher gear range.
- continuously release clutch pedal (clutch is engaged) and at the same time increase engine speed.

The shifting of gear ranges from a higher to a lower gear range is to be carried out basically with intergas as follows:

- reduce engine speed by releasing fuel accelerator pedal, brake the tractor, if necessary.
- depress clutch pedal.
  displace gear shift lever in neutral.
- release clutch pedal and at the same time increase quickly engine speed (intergas, speed rate depends on tractor travel speed)

Do not forget:

When shifting to lower gear range upon going up the hill, add less intergas since tractor speed quickly drops. When going down the hill, add more intergas, since the tractor speed is increased!

- Release quickly fuel accelerator pedal and depress again clutch pedal,
- shift in lower gear range
- release slowly clutch pedal upon simultaneous engine speed increasing in such a way to avoid lugging (pulling).

Note:

The choice of correct gear ranges is a matter of experience and feeling and exerts a considerable influence on tractor life.
The gear shifting of reduced speeds is identical to that of road speeds but the preselector for reduced speeds (Fig. 10/2) can be shifted in when the tractor is at still stand only.
In order to find more exactly a suitable engine operating move, a speedometer is used.

ATTENTION:

If you run down a longer hill or slope shift in the lower gear range. The steeper the slope is. This lower gear range is to be shifted in as early as before going up the hill — if possible.

REMEMBER:

The gear range in which you manage to go up the hill is also that to be shifted in to go safely down the hill.

Starting the tractor to travel

Before commencing to move consider correctly the spot to start (terrain, slope etc.) and take also into account the tractor weight and particularly that of the load carried by the trailer.
A very quick starting may cause a considerable stress of the drive mechanism and its possible damage, an increased fuel consumption and an excessive tyre wear. Upon a quick starting and an abrupt stopping, a load displacement or even its damage may take place.
The start with shifted-in gear range is to be used with a heavy trailer only when going up the slope and on a difficult terrain. On a plane and with the tractor itself start as a rule with 3rd gear range shifted in. After starting shift in — as soon as possible — higher gear ranges.
The use of front drive axle depends on actual terrain and load conditions.

ATTENTION:

Do not use front drive axle on hard road surface!

Prior to run the tractor, carry out consequently all operations as laid down in the chapter „How to prepare the tractor for travel" and then proceed as follows:

- select road or reduced speeds,
- start the engine and adjust the speed to 750 - 800 rpm (never below 600 rpm),
- depress clutch pedal to full declutch,
- shift in suitable gear range for tractor travel and slightly increase engine speed,
- prepare parking (hand) brake for brake releasing.
  release clutch pedal just until the moment of clutch engagement. In this moment the tractor starts to travel. In order to obtain a continuous start of travel, stop releasing clutch pedal for a moment, then carry on continuously releasing the clutch pedal at a simultaneous speed increasing,
  release completely parking (hand) brake.
- when travelling check regularly engine operating mode (regime), i.e. engine speed (rpm), lubrication, coolant temperature or pressure, storage battery recharging and fuel level.
- If a trailer with load or other equipment are attached to the tractor, check regularly their fixing.
- when travelling in a curve do not use differential lock.

REMEMBER:

During all operations observe strictly safety instructions!

Change of travel speed and tractor stopping

If you have to reduce the speed for any reasons, reduce fuel supply first by releasing accelerator pedal. If necessary, shift in a lower gear range and utilize the maximum engine braking effect. This way of a slow speed reducing saves brake mechanism and ensures a high operating safety.

When travelling on a road, either brake pedal must be latched. Thus a safe tractor braking of both rear wheels is ensured at the same time. Take care that the tractor does not get into slip in case of a sudden braking.

Under usual conditions stop the tractor slowly. Strictly

before stopping decision completely the clutch pedal and displace the gear shift lever in neutral. Whenever stopping do not forget to lock the tractor (tractor combination) against a spontaneous starting to travel.

ENGINE OPERATING MODE (REGIME):

– engine speed	– operating:	2000 ÷ 2200 rpm⁻¹
	– at idling run.	750 ÷ 830 rpm⁻¹
oil pressure	– operating.	0.2 ÷ 0.5 MPa
	– at idling run	0.05 MPa
cooling temperature		80 ÷ 95 °C
– air pressure		min. 0.45 MPa

If a trailer with pneumatic brakes is attached the correct pressure is 0.58 ÷ 0.6 MPa.

Running-in the new tractor

Within the time of running-in the new tractor, observe carefully the following principles, otherwise you run a risk of damaging important components, particularly engine.

1. Observe all instructions for tractor operation issued by the manufacturer in his Operator's Manual and especially check the filling of the engine lubricating and cooling system.
2. After engine starting check the lubricating circuit pressure level. In case of any failure stop immediately the engine and remove the failure.
3. Never warm-up the engine by a long-lasting engine idling run. Due to low temperatures an imperfect fuel combustion and an excessive carbon deposition in the combustion space take place. This carbon is very dangerous causes the so-called engine pitching and particularly sealing piston ring sticking injector opening clogging and valve seiting in guides.
4. Allow the engine to run at 1000 rpm⁻¹ for about 2 min. Within that time check the lubrication, it correct, storage battery recharging and other functions ensuring a correct (due) tractor operation. Then shift to a low or reduced gear range (ratio) and the necessary engine warming-up is to be carried out as late as during the travel.

5. **Tractor gradual running-in for first 70 EH** (engine hours)

a) Tractor running-in is to be carried out for the first 5 to 10 engine hours with the driver alone or with a vacant trailer without hydraulic pump engaged (switched on). Do not use the highest gear range and keep engine speed within the range of 1900–2100 rpm[-1].

b) After 10 engine hours drain warmed-up oil from gear box into a clean vessel and allow it to stand for at least 2 hours (preferably overnight). Then pour off the oil carefully so as to leave mechanical impurities on the vessel bottom and pour back pure oil into the gearbox. If necessary refill with new (fresh) oil of the same grade to the specified level. After that switch on hydraulic pump. Since then you may use hydraulic system without any restriction.

c) From 10 to 30 engine hours use tractor for transport with the specified trailer and utilize its carrying capacity to 50% only. You may also use lighter agricultural machines, trailed and hitched, such as: other type hay tedders, artificial fertilizer spreaders etc.

d) From 30 to 70 engine hours you may use all lighter agricultural machines except ploughs or cultivators for soil cultivation, crop cutters etc. where full engine performance is needed. Keep, however, to the principle of our earlier suggestion of lower gear ratios in such a way that the engine is not overloaded. Engine speed must not, at a given gear ratio, drop below 2000 rpm[-1].

e) After having run 70 engine hours, drain oil from engine, clean oil filter and fill the engine with a new (fresh) oil to the specified level.

f) From 70 to 200 engine hours you may carry out all agricultural works using recommended or approved agricultural machines. It is, however, necessary for the user to take care of the principle not to overload the engine and to prevent its overloading by an easy shifting-in to a lower gear ratio in such a way so as to maintain engine speed within the range of 2000 to 2200 rpm[-1].

g) After 200 engine hours you may operate your tractor without any restriction.

ATTENTION:

Within the time of running in the tractor, observe the recommended engine operating mode (regime).
Check daily bolt connections (joints), particularly those of tractor supporting parts. Draw your special attention to front axle bracket, then to front axle shaft-out extensions, to the flange engine-gearbox and gearbox-main transmission housing, to the flanges of rear bushings and pivots, to steering ball pivots to wheel bolts, ballast weights etc. Remove immediately all failures you may have found thus preventing subsequent damages or even a risk of operation safety. This procedure is to be also observed after tractor warm-up.

Tractor maintenance and attendance

A regular and duly carried out maintenance ensures a troubleless tractor operation. All operations of tractor attendance are included in scheduled maintenance. The scheduled maintenance begins immediately after putting the tractor into operation. By a consistent maintenance you prevent a premature occurence of possible technical failures, you ensure a safe and reliable operation and extend the life of individual tractor components and parts.

A scheduled maintenance means

- daily attendance
- technical attendance 1, 2, 3 and 4
- technical attendance following tractor overhaul

Most of scheduled maintenance operations can be carried out by the tractor operator-user himself. If there is not, however, sufficient technical equipment available, have these difficult operations carried out by a specialized workshop.

During all operations observe strictly labour safety instructions!

Daily attendance (DO)

After each 8 to 10 tractor (engine) hours we recommend to carry out regularly.

1. If necessary clean the tractor and the implements used (wash with water)
2. Refill the fuel and check fuel system joints for their tightness

Check.

3. Cooling system joints for tightness and refill missing coolant.
4. Lubrication system joints for tightness and refill oil to the specified level.
5. Oil amount in air cleaner (Fig. 6/3) and if necessary clean the precleaner from dust.
6. Fluid brakes for tightness and brake fluid for its amount. Check brake pneumatic system for tightness and tractor brakes with trailer for efficiency.
7. Oil amount in power-assisted steering tank.
8. Condition and operation of electrical equipment and accessories incl. storage battery.
9. Air pressure in front and rear tyres.
10. Steering rods, levers, front and rear wheels bolts and nuts for retightening.
11. Water pump drive and alternator V-belt tensioning (max. sagging 15 mm).
12. Condition of hitched and attached implements incl. trailer.
13. All failures found are immediately to be removed and do not forget to refill missing operating liquids and tractor cabin.

Technical attendance 1 (TO 1)

It is performed regularly after each 100 engine hours or after fuel consumption of 500 l.

14. Carry out operations 1 to 13 and then proceed as follows.

Check:

15. Oil amount in particle (Fig. 12/1).
16. Oil amount in gearbox (Fig. 10/5).
17. Oil amount in steering damper tank (between oil cleaner and radiator) on Z 6045 and Z 7045 only.
18. Oil amount in front axle housing and in wheel reducers on tractors Z 6045 and Z 7045 (Fig. 14/1 and 16/2).
19. Oil amount in steering box (Fig. 5/1).
20. Centrifugal oil filter drum rotor (if necessary clean it, Fig. 5/3).
21. Electrolyte level height in storage battery. Clean oxydised cable clamps.
22. Power-assisted steering tank plug (Fig. 5/2).

23. Water pump and alternator belt tensioning (max sag 15 mm)
24. Lubricate water pump by turning lubricator cover through 1 turn
25. Lubricate clutch release sleeve and disengaging tie-rod pin on pedals with oil (Fig. 9/2)
26. Lubricate hand brake, PTO clutch hand disengaging and single-axle trailer hitch Bowden cable with some oil drops.
27. Lubricate front axle bracket by means of lubricating press, also wheel extensions (adapters), clutch disengagement shaft, pedals, three-point hitch RH strut, power control link and lower links tension nuts
28. Perform attendance on air cleaner (based on manufacturer instructions) – (Fig. 6/3)

Technical attendance 2 (TO 2)

It is carried out regularly after each 200 engine hours or a fuel consumption of 1000 l

29. Carry out operations 1 to 28 and then proceed as follows:
30. Replace oil in engine, injection pump and governor
31. Clean carefully centrifugal oil filter. On tractor Z 5011 clean carefully (wash in petro) filter elements in oil filter main and by-pass stage. Drain oil from the inflator or pressure governor (Fig. 28/2)
32. Replace coarse fuel filter cartridge (Fig. 28/5)
33. Check clearance between clutch disengagement levers and sleeve
34. Check and if necessary set (adjust) injector valves.

Technical attendance 3 (TO 3)

It is to be performed regularly after each 600 engine hours or a fuel consumption of 3000 l.

35. Carry out operations 1 to 34 and then proceed as follows:
36. Clean line fuel filter cartridge (Fig. 28/6) and engine oil pump suction strainer
37. Lubricate safety cab door hinges. If the tractor is provided with a three-point, RH strut controlled fro-power control link and lower links tension nuts
38. Clean the radiator (rinse wash) 1 with pure water

under pressure so as to wash out sediments. When using antifreeze mixture, replace it every two years by a new one.

39. Check valve clearance (on cold engine, suction and exhaust. 0.25±0.05 mm). If necessary, regrind.
40. Check front wheel toe-in or toe-out and tapered roller bearing clearance of front wheel hubs. Refill grease in front wheel hubs.
41. Check operation and if necessary adjust hand brake.
42. Check operation of driver's seat liquid damper.

Technical attendance 4 (TO 4)

It is to be carried out after each 1200 engine hours or a fuel consumption of 6000 l.

43. Carry out operations 1 to 42 and then proceed as follows:

Replace:

44. Oil in steering box.
45. Oil in power-assisted steering circuit.
46. Oil in portals.
47. Oil in gearbox and main transmission housing.
48. Fine fuel filter cartridge (Fig. 28-6) and clean coarse fuel filter (Fig. 28-5).
49. Tyre inflator (section or compression wheel as pressure governor is fitted).

49a. Clean hydraulic system suction strainer.

After each 2400 engine hours or a fuel consumption of 12 000 l carry out, besides TO 4, also the following operations:

50. Replace oil in front drive axle housing, oil in double joints and reducers.
51. Check or adjust steering play and steering wheel free travel. (Must not exceed 15°).
52. Check and attend charging system incl. storage battery.
53. Reverse front wheel tyre casings due to their one-sided wear.

Note: The operations as referred to under 33, 34, 39, 40, 41, 51, 52, 53 and 61 and 62 require a more exacting technical equipment, knowledge and cannot be usually performed by an only operator. We recommend to have these operations carried out by a special civil workshop.

TECHNICAL ATTENDANCE TIME SCHEDULE

Operations carried out each:

100 Eh	
300 Eh	
600 Eh	
1200 Eh	
2400 Eh	

Tractor overhaul (GO)

A tractor overhaul must be immediately carried out if a further operation is uneconomical, if the majority of tractor components and parts are liable to repair and the total technical condition of tractor does no more guarantee safe operation.

According to the difficulty of operating conditions an engine overhaul is to be carried out after 4000 engine hours and that of gearbox after 6000 engine hours. Tractor total life is about two overhauls, its time of operation being 7 to 9 years.

Tractor technical attendance after overhaul

On tractor running-in carry out carefully daily attendance within operation range 1 to 13. After 10 engine hours drain oil from gearbox into a clean vessel, allow to stand for at least 2 hours and pour it back. If necessary, refill it to the specified level.

After 70 engine hours perform:

54. Oil replacement in engine and injection pump
55. Oil replacement in steering box

Check:

56. Oil filter for tightness (clean the rotor)
57. Oil amount in gearbox
58. Fan belt tensioning (max. sag 15 mm).

59. Retightening of front bracket and engine painting bolts, axle with pinions (axlestars), rear bushing and portal flanges, front and rear wheel and ballast weight nuts, engine-gearbox and gearbox-main transmission housing flange.

Technical attendance 1

It is to be performed after each 100 engine hours or a fuel consumption of 500 l.

Carry out operations 1 to 28 and then proceed as follows:

60. Clean fuel filters 1 and 2 (drain sediments from vessels).
61. Retighten cylinder head bolt nuts (tightening torque 167—177 Nm)
62. Adjust valve clearance for cold engine 0.25 ± 0.05 mm).

Technical attendance 2

It is carried out after each 200 engine hours or a fuel consumption of 1000 l.

Carry out operations 1 to 34 and proceed as follows:

Replace

63. Oil in portals.
64. Oil in power-assisted steering
65. Oil in gearbox.
66. Clean hydraulic system suction strainer.
67. Check driver's seat liquid damper for operation

Technical attendance 3

It is performed each 600 engine hours or a fuel consumption of 3000

Carry out operations 1 to 42 and then proceed as follows.

68. Replace oil in front drive axle housing incl. oil in double joints and reducers. (On Z 6045 and Z 7045)

Further technical attendance must be carried out regularly as based on the specified extent of EO

ATTENDANCE INSTRUCTIONS

Oil refilling and replacement in engine

Keep oil level in engine between bottom and top of dipstick gauge mark (Fig. 7.1); upon a scheduled oil replacement in engine, drain oil immediately after having finished the operation when oil is still warm by unscrewing drain plug on engine housing bottom guard (Fig. 7.2). Clean drain plug from caught metallic particles. At the same time clean centrifugal oil filter (Fig. 6.3). Oil pump suction strainer is to be cleaned during the third oil replacement, i.e. after 600 engine hours. Pour the specified amount of engine oil through filling hole (Fig. 3.2). Then start the engine and allow it to run for 2 to 3 min. at 750 to 800 rpm. After stopping the engine allow the oil level to set, check oil amount by means of oil dipstick and if necessary refill up to gauge mark. Keep impeccably clean!

Centrifugal oil filter (Fig. 6.3)

After unscrewing the nut remove the guard, take out rotary part, unscrew the nut M 32 and separate rotating parts from each other. Clean carefully both inner and bottom part in petrol or Diesel oil and after drying reassemble. When fitting oil filter rotor pay gauge marks stamped on bottom and top rotor part shall face each other not to disturb dynamic balance. The checking of lubrication pressure is assured by a lubrication pilot lamp (red) (Fig. 2.3).

Cleaning oil pump suction strainer

After draining oil or removing engine housing bottom guard disassemble oil pump suction strainer and clean it in petrol or Diesel oil. Fix a duly cried suction strainer back into the pump. Take it against loosening and put bottom guard in engine housing sealing it with sealing compound. Reaghten firmly fixing bolts.

Oil refilling and replacement in injection pump

To drain oil a drain plug (Fig. 8.2) on injection pump and governor is used. Oil replacement is to be carried out parallely with oil replacement in engine housing. A checking plug (Fig. 8.6) gives oil level height. When

taking the tractor out of operation for a longer time, it is necessary, no matter how many km or engine hours the tractor has covered, to drain oil from injection system.

Brakes and their bleeding

It is necessary to maintain brake fluid level in tank (Fig. 13,1) within the range of maximum filling and drop of about 10 mm. During the manipulation with brake fluid keep a perfect cleanliness.
If the brake pedal is flexible within its whole course, the brake system is full of air and must be bleeded.

Brake fluid refilling and bleeding

Fill equalizer bow (tank) with brake fluid and remove rubber cap (Fig. 34,1) from the brake cylinder bleeding screw. Slide the rubber cap onto the bleeding screw and immerge its other end into a transparent bowl partially filled with brake fluid. Then loosen the bleeding screw (plug), depress completely brake pedal and retighten the bleeding screw. Pedal may be released as late as after bleeding screw retightening. Repeat the above procedure as long as brake fluid free of air bubbles starts escaping from the hose.
Take care to hold the level as highly as possible and to keep the hose end immerged in fluid. The same operat-

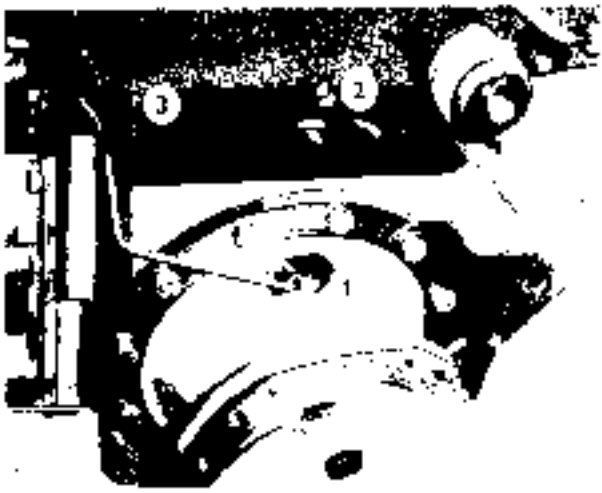


Fig. 34

ion is to be carried out on the other wheel too. Bleeding must be performed with pedals disconnected, each wheel separately. During the bleeding operation follow the fluid amount in bowl to prevent air suction. Refill now fresh fluid only! The above operations shall be carried out with a helper.

Note. For a better access to the RH bleeding screw (plug) we recommend to remove the guard of hydraulic system control levers.

Hand brake checking and adjustment

First make sure whether lever pins of hand brake band are in basic bracket hand position. In the case that the pins are not in their basic position, adjust them. At the same time it is necessary to have hand brake lever in its unlocked position.

Adjust a correct hand brake efficiency in the following way:

1. Unscrew the bolt using hand guard (Fig. 34:3) and turn the guard.
2. Pull hand brake lever until it fits into ratchet third tooth.
3. Loosen lock nut (Fig. 34:2) and tighten hand brake onto brake drum by means of a bottom nut.
4. Lock brake band by an adjusting nut. Turn brake guard back and fix by bolt.
5. This is to be carried out in the same way also on the other hand brake band. Check the brakes for efficiency!

Clearance adjusting in front wheel taper roller bearings

This is to be performed on tractors without front drive axle only.

1. Unscrew bearing cover (Fig.32:4) and remove the split pin.
2. Tighten castle nut by tightening torque of 15 Nm.
3. Loosen castle nut through 180 and loosen the bearings by means of wooden hammer knock on wheel hub.
4. Retighten castle nut by torque spanner by a tightening torque of 3 - 5 Nm in such a way that its nearest cut matches any opening in the pivot. The wheel must turn freely but also without resistance and jarming.
5. Lock castle nut by split pin and screw on front wheel bearing cover.

Note. Adjust the other wheel in the same way. Front axle must be lifted.

Sprung extension (adapter) modification (Fig. 35-2)

In order to prevent sprung extension (adapter) spring damage when working with tractor provided with a loader etc., the extensions (adapters) may be locked by means of a stop. The modification of the sprung extension to the locked one is to be performed as follows:

1. Unscrew bolts of extension body cover lids and remove the lids (Fig. 35-3).
2. Check whether there is a groove in the locking connection being operable and the extension body opening and adjust, if necessary, a correct position by compressing or lightening the bolt.
3. Slide in a locking insertion into extension body openings. The machined part must fit into the locking connection groove.
4. Slide in flexible insertions into locking insertion cavity.
5. Put on cover lids with gaskets and retighten by means of bolts. It is necessary to overcome the resistance of the flexible insertion.

When disassembling locking insertions the threaded part M 20X1.5 may be used which is screwed into locking insertion inner thread.

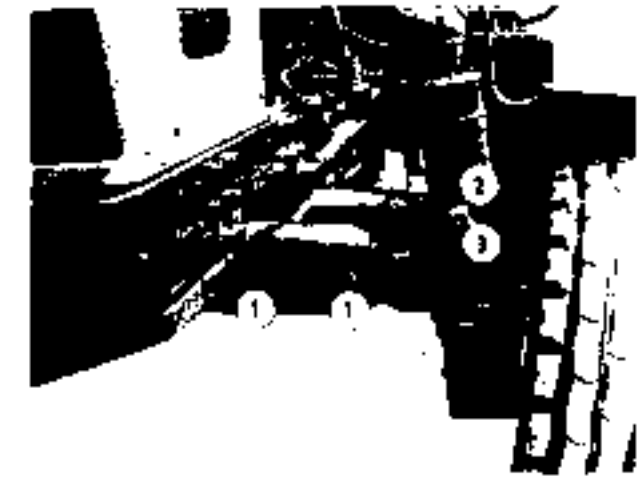


Fig. 35

Front wheel track change

According to the type of work performed, the front wheel track on tractors Z 5011, Z 6011 and Z 7011 can be changed (modified) in the following way:

1. Lift front axle (by jack) and support it
2. Unscrew front axle extension bolt nuts and remove the bolts (Fig. 35,1)
3. Unscrew the nut of the steering connecting rod and take out the rod
4. Pull out the extensions to the required track and lock them by bolts and nuts. When using tyres 6.50-16: 1280; 1375; 1750 mm. When using tyres 7.50-16: 1430, 1555, 1805 mm.
5. Screw on and lock the bolt on the steering connecting rod
6. Check front wheels for toeing-in.

Rear wheel track change

On all tractors as referred to in the present Manual, rear track can be changed (modified). On tractor Z 5011 with standard tyres 12.4/11-28 rear wheel track can be adjusted into seven positions within the range of 1350 mm to 1800 mm. On tractors Z 6011 to Z 7045 with standard tyres 14.9/13-28 (16.9/14-28) rear wheel track can be adjusted into six different positions within the range of 1425 mm to 1800 mm. The adjustment of individual tracks is carried out by a combined assembly change of rims and disk (Fig. 36)

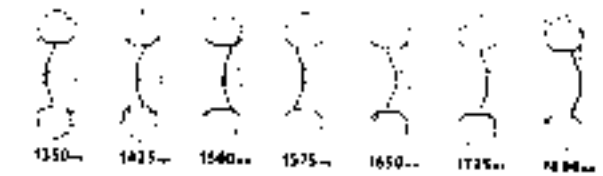


Fig. 36

The track change shall be carried out with a lifted tractor rear part so that the wheels can freely turn. Prior to lifting do not forget to lock the tractor against movement by wedging-up front wheels. Do not tighten all bolts. Bolts connecting the disk with the rim by the tightening torque of 160–180 Nm; nuts connecting the rim with the shaft by the tightening torque of 450–470 Nm

Toe-in and toe-out

To avoid a quick and asymmetric wear of front tyres, a correct front wheel toe-in and toe-out must be ensured. On tractor Z 5011, Z 6011 and Z 7011 the front wheel toe-in varies within the range of 6±4 mm. On tractor Z 6045 and Z 7045 the front wheel toe-out varies within the range of 12 to 15 mm.

Adjusting procedure:

1. Loosen lock nuts on either steering connecting rod joint hub (Fig. 14/2).
2. By turning connecting rod central part (Fig. 14/3) set the specified toe-in (toe-out) — being measured on rim side
3. Retighten lock nuts — joint hub upper surfaces must be parallel!

Hydraulic power lift attendance

Keep a perfect cleanliness when replacing oil in hydraulic power lift system. Hydraulic system filling is common with gearbox and main transmission housing. Filling hole is located on gearbox guard (Fig. 10-5).

After 60 working hours of hydraulic system operation clean hydraulic system magnetic cleaner (filter) located on hydraulic system guard. For an easier access we recommend to lift the driver's seat. Disassembling and cleaning magnetic filter is to be carried out in the following way:

1. Unscrew the nut from the hydraulic system guard
2. Slide out with magnet and strainer upwards.
3. Slide strainer (with magnet) down from magnet and wash in pure Diesel oil. Wipe off impurities from the magnet.
4. The assembly of the magnetic filter is to be carried out in the reverse way.

Note: At least once a year remove hydraulic system bottom guard and rinse (wash) pump strainer with Diesel oil.

Alternator maintenance

The alternator (Fig. 5/4) does not practically need any maintenance when in operation, it is, however, necessary to prevent penetration of water or Diesel oil pump wash-

...ng and tractor cleaning into alternator. Moreover observe the following instructions

1. The storage battery must always be connected by its „minus" pole to the earth and by its „plus" pole to the alternator. An adversely connected storage battery may damage the whole semi-conductor equipment or even the alternator. Alternator cannot be re-excited
2. When using an auxiliary storage battery for tractor starting, do not forget to connect its outlets to „plus" and „minus" respectively.
3. If replacing a part of charging circuit, disconnect the storage battery. Thus random short-circuits on alternator or governor terminals are eliminated.
4. During operation the storage battery must not be disconnected!
5. Never put into operation a non-loaded alternator, i.e. with a wire disconnected from terminal „+ B" and a connected terminal „M". This condition could induce, at an increased speed, an extraordinary high alternator voltage which would damage semi-conductors
6. Never short-circuit any alternator or governor terminal during operation.
7. Alternator must not be additionally excited. In the case of such an intervention a damage of the semi-conductors would take place.
8. Take care of a perfect electrical connexion on connecting terminals and of a perfect earthing both of alternator and governor.
9. A burnt charging pilot lamp must be replaced at once, otherwise no proper alternator excitation can be ensured.
10. When repairing the tractor by electric arc welding, all wires must be disconnected from the alternator. The wire „+ B" shall be protected from a short-circuit

Storage battery maintenance and attendance

The storage battery requires a special attention, particularly in summer season when an increased evaporation takes place. A checking of a correct fixation, a perfect connexion, its cleanliness and electrolyte amount are to be carried out in summer every fortnight at the latest in winter every 4 weeks. Electrolyte is to be refilled with

distilled water only in such a way as that its level is of the height of 5 mm above separators. Refilling must be always performed before tractor travel so that a proper mixing with electrolyte takes place. Electrolyte density must be kept at 1.28, which complies with 32° Bé (in tropics 1.23, i.e. 27 Bé).

Electrolyte can be refilled only when it has obviously been poured out.

ATTENTION:

Electrolyte may freeze in a discharged storage battery in winter and thus damage the battery. Never allow the storage battery to belt left in a discharged condition!

Tyre maintenance and attendance

To inflate tyres use tyre inflator (Fig. 28/3). In the case pneumatic brakes or torque multiplier are fitted, a pressure governor is mounted instead of tyre inflator, functioning as a pressure equalizer, tyre inflator and relief valve. During tyre inflating the wing nut of pressure governor is unscrewed and a hose for tyre inflating is fitted instead. The hose is to be screwed into the thread ends in such a way so that the return valve is compressed. The tyre cannot be inflated at the moment of opening drain valve of pressure governor but as late as the pres-

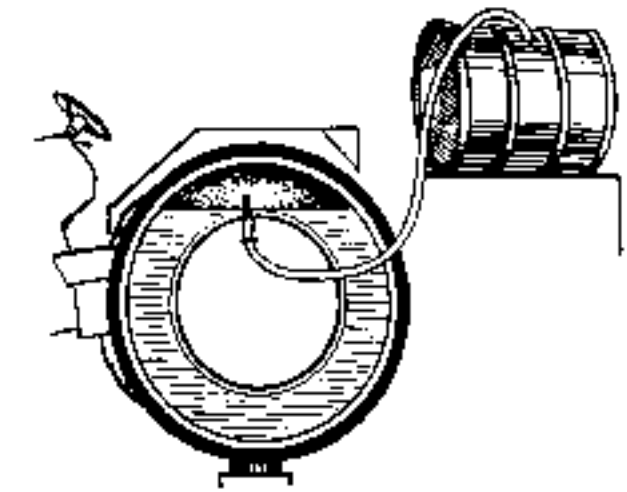


Fig. 37a

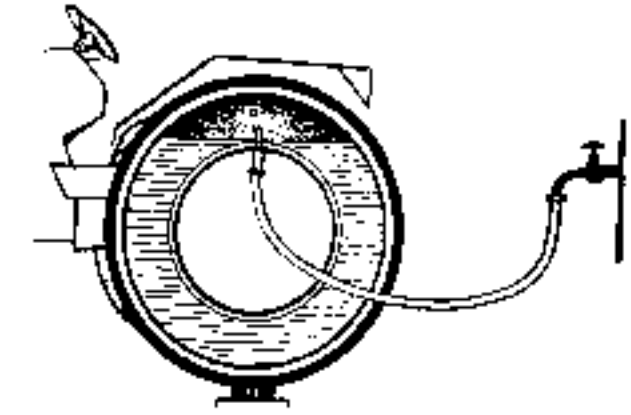


Fig. 37b

sure in the system drops below 0,6 MPa and the discharge valve is closed. After inflating has finished, the wing nut must be screwed on again.

Tyre filling with liquid

Although it is possible to fill rear tyres by using an ordinary valve, the tyre tubes are provided with a special valve. When inflating the tyres a gravity tank may be used (Fig. 37a) or the filling can be carried out with water under pressure (Fig. 37b).

Preparation of filling solution in winter:

1. Anhydrous calcium chloride $CaCl_2$ is added to water, never inversely!
2. Solution is not dangerous but it is necessary to proceed carefully. Spilled drops are to be washed with water at once.

Water for solution preparation in litres	Calcium chloride $CaCl_2$ in kg	Hydrated lime in kg	Solution density at 20°C	Setting point °C (approx.)	Total volume in litres	Additional weight in kg
45	1,8	0,21	1,13	−18	50	37
45	3,6	0,23	1,18	−25	50	59
45	5,4	0,25	1,21	−30	50	61

Max. weight of liquid used in rear tyres in kg

12,4/11-28	12,4/11-32	12,4/11-36	13,6/12-36	14,9/13-28	16,9/14-28	16,9/14-30	16,9/14-34
2×125	2×140	2×160	2×180	2×190	2×215	2×240	2×250

3. Prior to filling allow the solution to cool. Keep to the specified amount of hydrated lime.
4. The solution must not come into contact with metallic parts and electrical equipment. It is, however, not harmful to tyre tube valve.
5. Antifreezing solution prepared in the following composition must not be used for radiator!

Filling procedure:

1. By lifting the tractor lighten the tyre and turn it with its valve towards
2. Drain air completely and unscrew valve air part
3. Screw on water valve with air extension on which liquid hose is slid. Fill tyre tube with the specified amount of liquid.
4. Remove the hose and unscrew rear valve with air extension
5. Screw on valve air part and inflate the tyre to the specified pressure.
6. After inflating screw a protective cap on the valve
7. Proceed in the same way with the other tyre

Procedure of liquid draining from tyres:

1. By lifting the tractor lighten the tyre
2. Unscrew tyre tube valve air part. ATTENTION! When unscrewing valve air part, some liquid is spilled out. Since an underpressure may be produced in tyre during liquid draining, it is necessary to turn the wheel from time to time so that the valve gets to the upper position and then turn the wheel back again so that the valve returns to its bottom position

Carrying capacity of tyres used

Tyre size designation	ply	Tyre inflating (kPa) 160	170	180	210	275	300	325
		Tyre carrying capacity (kg)						
6.00-16	6							360
6.50-16	6						615	
7.50-16	6					745		
9.5/9-32	6				1065			
11.2/10-24	6			1045				
12.4/11-24	6		1200					
12.4/11-28 V	6		1275					
12.4/11-32 V	6		1355					
12.4/11-36	6		1440					
13.6/11-36 V	6	1615						
14.9/13-28 V	6			1880				
16.9/14-28 V	6		2175					
16.9/14-30 V	6		2245					
16.9/14-34 V	8		2380					

3 Remove liquid rests by screwing on water valve and by inflating air until liquid stops running out through an extension tube.

4 After the tyre tube is empty unscrew water valve and screw on valve air part again.

5 Inflate the tyre to the specified pressure. Screw a protective cap on the valve.

6 Proceed in the same way with the other tyre.

Note:

Carrying capacity values are valid provided the tractor speed does not exceed 30 km/h.

On tractors equipped with trailed implements, the steering axle carrying capacity may be increased by 35 % and that of drive tyres by 20 % at tractor speed up to 20 km/h.

When working with front loaders, the carrying capacity of steering tyres may be increased by 100 % and that of drive wheels by 50 % at max. tractor speed of 6 km/h and tyre inflating increased by 25 %.

Tyre sizes designated with „V" are supplied with tyre tubes provided with valves for water filling

Operating liquids used (litres)

Denomination	Sort	Z 5011	Z 6011—Z 7045
Engine coolant (dilute with distilled water 1 : 1.5)	Frider Scofena	6.3—7.1 with heating	
Fuel	Diesel oil	70	70
Average fuel consumption		5—6 l/h	
Engine oil	SAE 20 W/30	9	12
Gearbox and main transmission housing oil	SAE 80	19	25
Oil amount when working in terrain on 12° slope and when using hydraulic equipment increase to		25	32
Final transmission oil	SAE 60	2×1.9	
Steering box	SAE 80	1.9	1.9
Brake fluid	Synthol 190 HD	0.4	0.4
Air cleaner	SAE 20 W/30	1.2	1.3
Steering damper	damper oil	—	0.6
Power assisted steering	OI N2	—	4.4
Front wheel planetary reducers	SAE 80	—	2×0.5
Front drive axle housing	SAE 80	-	7
Gearbox and main transmission housing on tractors with front drive axle	SAE 80		27

OPERATOR'S MANUAL for ZETOR tractors
Z 5011, 6011, 6045, 7011, 7045

Edition: III — 10.3ED — 1982

Publication No. 725 342 510 160

Issued by ZETOR BRNO, Dept. of Technical Documentation and Advertising, Czechoslovakia

Tisk 52 1359-81

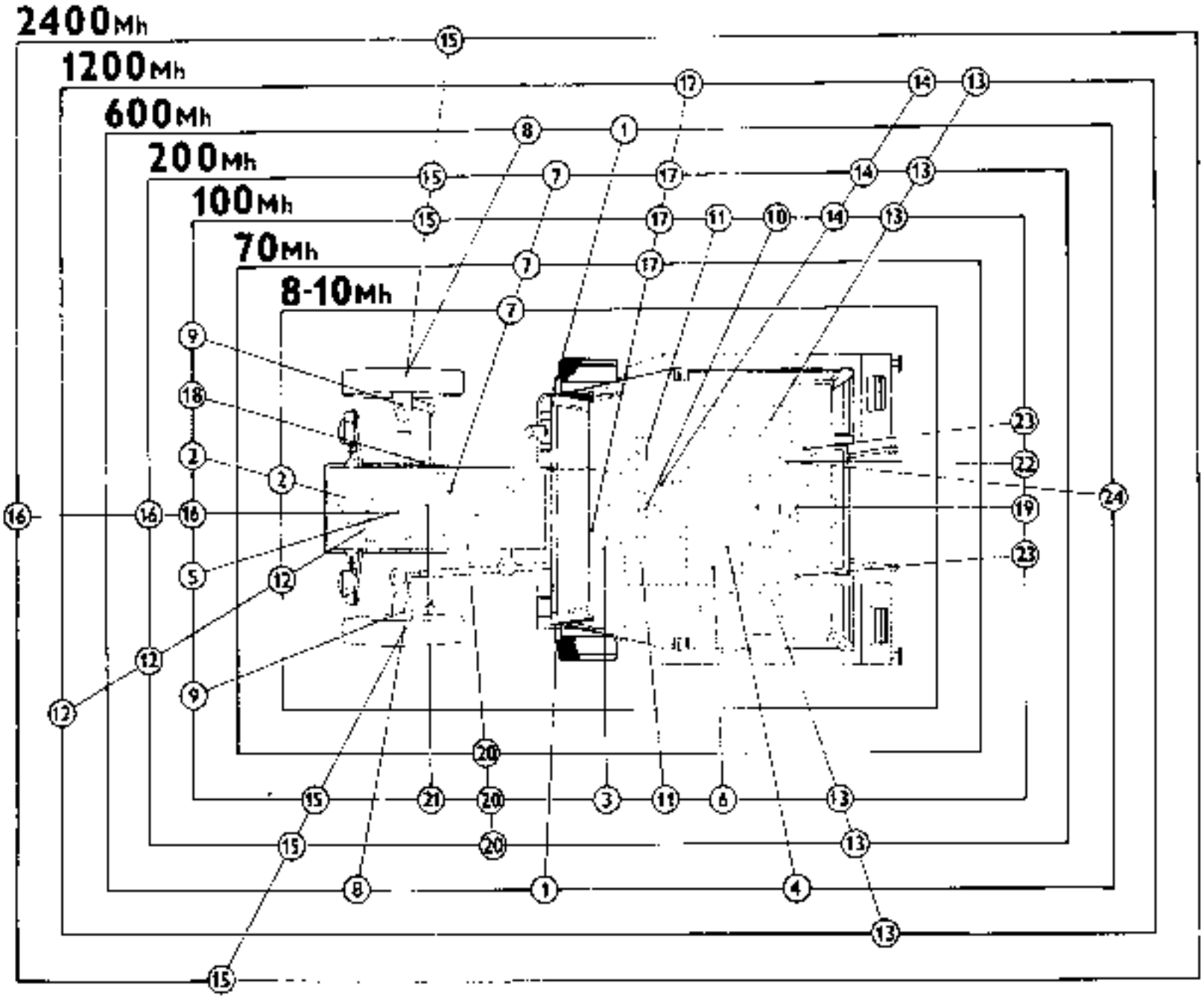
TRACTOR LUBRICATION CHART

Ser. No.	Lubrication point	Operation (No. of lubrication points)							Lubricant sort
		9 – 10 EH	70 EH	100 EH	200 EH	600 EH	1200 EH	2400 EH	
1	Cab door hinges					P/4			OL - N2
2.	Air cleaner	K/1		V/1					engine oil SAE 20 W/30
3.	Clutch disengagement shaft			P/1					Litol 24
4.	Driver's seat liquid damper					K			OL - N2
5.	Front axle bracket			P/2					Litol 24
6.	Hand brake, PTO clutch hand disengaging and single-axle trailer hitch control Bowden cable			P/1					SAE 80
7.	Engine	K/1	*V/1		V/1				SAE 20 W/30
8.	Front wheels hubs					O/2			Litol 24
9.	Wheel adapters (extensions)			P/4					Litol 24
10.	Steering wheel sleeve			P/1					Litol 24
11.	Pedals			P/3					Litol 24
12	Power-assisted steering	K/1			*V/1		V/1		OL - N2
13	Portals			K/2	*V/2		V/2		SAE 80
14	Gearbox and main transmission housing			K/1	*V/1		V/1		SAE 80
15	Front drive axle reducers			K/2	*V/2			V/2	SAE 80
16.	Front drive axle housing		*V/1	K/1	*V/1			V/1	SAE 80
17	Steering box			K/1	*V/1		V/1		SAE 80
18	Steering damper			K/1					damper oil
19	Power control stirrup		*V/1	P/1					Litol 24
20	Injection pump with governor			K/1	V/1				SAE 20 W/30
21	Water pump			P					Litol 24
22.	Three-point hitch RH. strut			P/1					Litol 24
23.	Struts — tension nuts			P/1					Litol 24
24.	Lower link RH strut control telescopic shaft					P/1			Litol 24

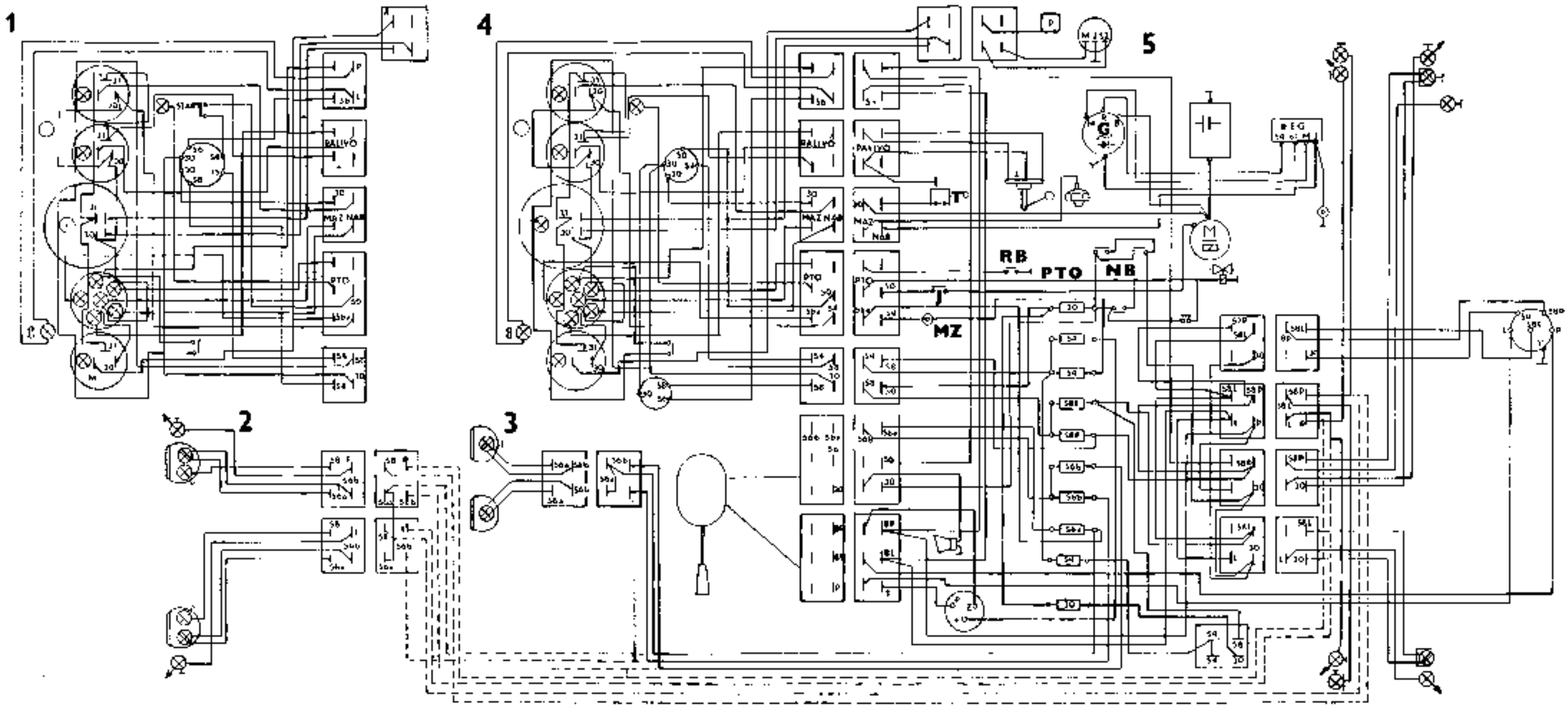
Note: Operations designated (marked) with * are carried out during new tractor running-in or after tractor overhaul.

Abbreviations. D = lubricant refilling P = lubrication
K = inspection (checking) V = replacement

LUBRICATION CHART



WIRING DIAGRAM



1 — Dashboard connection with switch-over box
2 — Headlamp connection for Czechoslovakia
3 — Headlamp connection for export purposes
4 — Dashboard connection with steering lock
5 — Front combined tractor lamp connection with cab and without cab for export

REG — regulating relay
G — alternator
RB — hand brake switch
NB — foot brake switch
PTO — PTO clutch hand disengaging switch
J — circuit breaker
MZ — assembly socket

Attention: Plug-in (socket) connections may be connected and disconnected without electrical consumers switched-on only. Any manipulation with the semi-conductor governor must be carried out with the engine at rest and with the disconnected storage battery.