Maintenance and User Manual DD30



PREFACE

The DD30 towing tractor has a known structure and known components, such as the torque converter transmission, the hydraulic power steering, the leaf springs and shock absorbers. The new diesel engine is in accordance with the actual exhaust regulations in the user's country.

This towing tractor is available as an open canopy with an overhead guard for the driver or well with a closed cabin, a heating system and an air condition.
This manual gives you the information about the performance, the structure, the operation procedures, the maintenance and trouble-shooting.

Please familiarize yourself with these instructions and refer to them whenever necessary, so that the tractor will stay with you a long time as a reliable machine.

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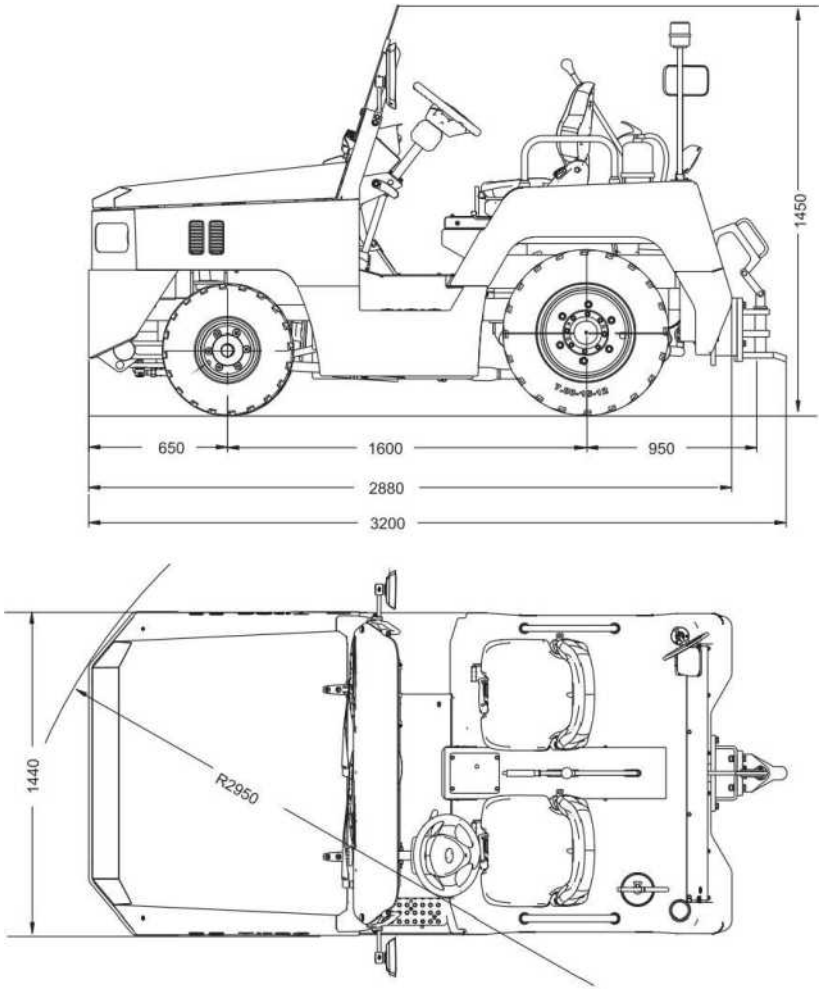
1. General Specifications

01	Manufacturer			DEUTRUCK
02	Type			DD 30
03	Towing capacity		t	30
04	Type of drive	electric, diesel, petrol		diesel
05	Operator type	stand on / driver seated		driver seated
06	Tyres	C = Cushion, P = Pneumatic	front / rear	P / P
07	Wheels (driven)	number front / rear		2 / 2
08	Overall dimensions	L Length	mm	3.000 / 3.190
09		B Width	mm	1.440
10		H Height	mm	2.030
11		seat height	mm	990
12	Turning radius	R1 at outer wheel (max.)	mm	3.800
13		R2 at outer wheel	mm	2.250
14		r (inner)	mm	912
15	Speed	travel	km/h	29
16	Drawbar pull	at the hook laden	kN	30
17	Gradeability	laden / unladen	%	30 %
18	Max. gradeability		%	35 %
19	Weight of truck	incl. battery	kg	4.300
20	Axle loadings	laden / unladen front / rear	kg	1.300 / 3.000
21	Tyres	no. front / rear		2/2
22	Dimensions	front	‘‘ or mm	175/70R14C
23	Dimensions	rear	‘‘ or mm	7.00-15 / 12 PR
24	Wheel base	y	mm	1.605
25	Track width	centre wheels front / rear	mm	1.220 / 1.160
26	Ground clearance	m1 at the deepest point	mm	150
27	Ground clearance	m2 at centre of wheelbase	mm	148
28	Brakes	service brake		hydraulic
29		parking brake		mechanic
30	Springs	axle front / rear		helical / spring leaf
31	Battery	Volt / Ah	V / Ah	12/88
32	I. C. engine	type		4H50 TIC
33		according to		
34		continuous output B as per ISO 1585	kW	55
35		engine speed as per ISO 1585	R.P.M.	2.600
36		strokes / no. of cyl. / cap.		4/4/2000
37		fuel consumption	l / h	4,2
38	Clutch	type		torque converter
39	Gear change	type of change		Electric
40		no. of speeds forwards / backwards		2/1
41	Transmission	type		PST II

according to VDI 2198 – standard version – modification without pre-advise

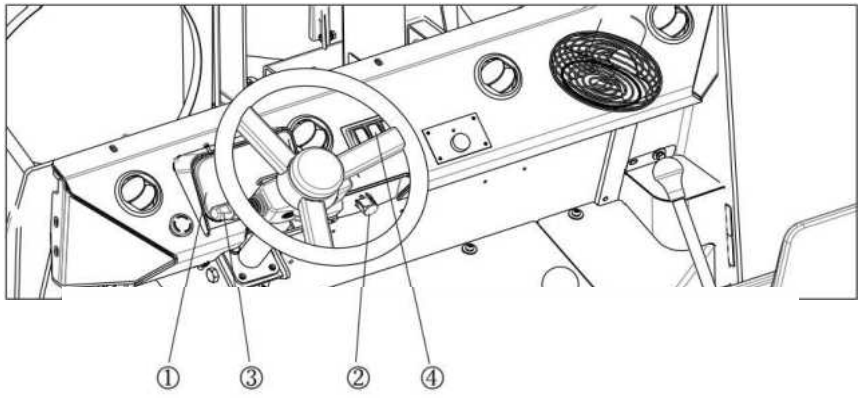
General details

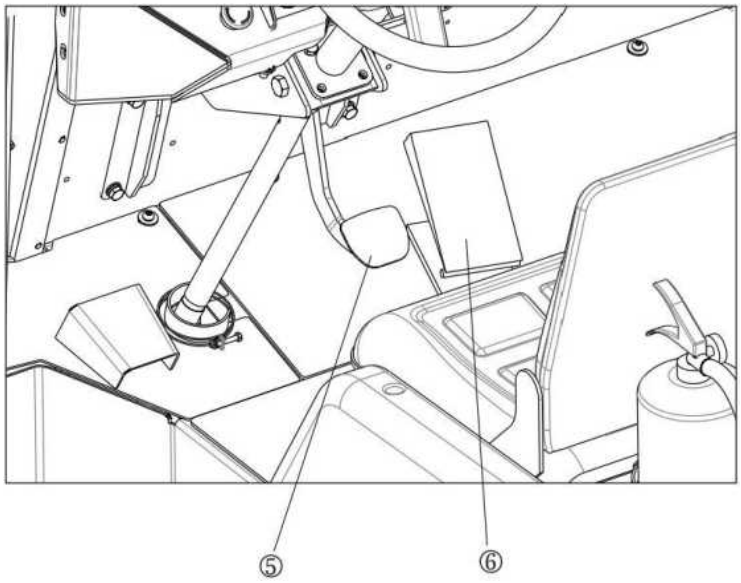
The tractor is equipped with a torque converter transmission with two speeds forward and one speed backwards.



Although the towing tractor is an industrial vehicle there are a lot of components like in small lorry.

The instrument panel is very similar to the comfort of a lorry.





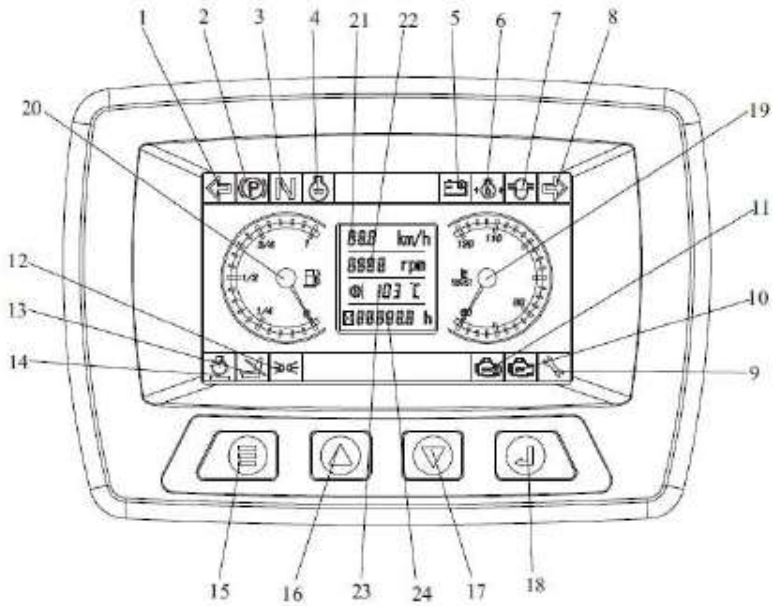
① Instrument Meter ② Starter Switch ③Switch for steering lamp

④ Headlights combination Switch ⑤ Pedal Brake ⑥Pedal Accelerator

DEUTRUCK GMBH
FÖRDERTECHNIK

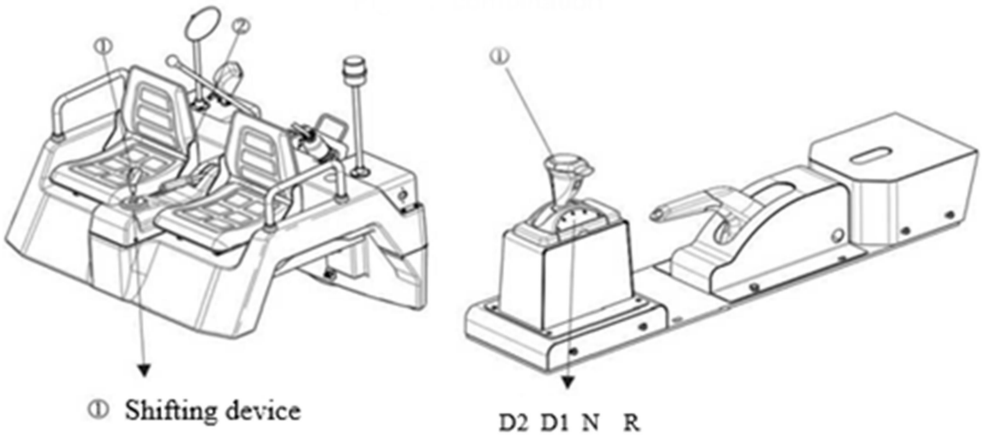
D 351636

1	Blinker links	Direction indicator
2	Handbremskontrolllicht	Hand brake lamp
3	Neutral	Neutral
4	Vorglühanzeige	Preheater
5	Ladekontrollleuchte	Charging Control
6	Öldruckalarm	Oil pressure low alarm
7	Öl-Wasser-Abscheider	Oil-Water separation
8	Blinker rechts	Direction indicator
9	Serviceanzeige	Maintenance Indicator
10	Motor Stopp	Engine stop
11	Motorfehlfunktion	Engine malfunction
12	Kontrollleuchte	Width lamp optional
13	Sitz-Kontroll-Schalter	Seat lock indicator
14	Luftfilteranzeige	Air filter alarm light
15	Menüknopf	Menu button
16	Seitenanzeige	Page up button
17	Seitenanzeige	Page down button
18	--	--
19	Wassertemperaturanzeige	Water temperature indicator
20	Kraftstoffanzeige	Fuel meter
21	Geschwindigkeitsanzeige	Speed meter
22	Drehzahlmesser	Tachometer
23	Öltemperaturanzeige	Oil temperature indicator
24	Betriebsstundenzähler	Hour meter



The tractor is equipped with a comfortable driver's seat which is adjustable for the size and the weight of the driver. The same seat is available as a co-driver's seat. Similar to the drive of a lorry there is a transmission shifting device placed to the right of the driver. A hand brake lever is close behind.

Fig. 2 combination



Safety Operation and Caution

Prior to the first start of your new operating a new tractor there are technical aspects to be considered like in the use of an industrial lorry.

Regarding the diesel engine please observe the engine manual of the engine manufacturer.

The same refers to the transmission maintenance manual attached.

The daily checking before starting should refer to the water level in the radiator and also in the water tank of the wiper system. Please control the fastened nuts and bolts of the wheels.

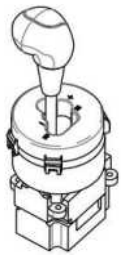
Any leakage should be eliminated before the use of the machine.
During the first fifty hours of operation the daily check should be affected twice a day.

Control the electric system of your lighting equipment provided. Check the level of the fuel, the function of the electric components including horn, seat belts etc.

Before turning the starter key to the pre-heat position (clock-wise) please check that the gear is in neutral position.

Fig. 3: Shifting operation

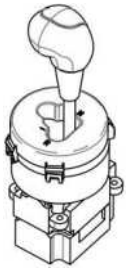
-： Low speed shift. When need of max. towing force or on downgrade, the shifting lever set on "-" position.



+: High speed shift. When tractor travel normally, the lever set on "+" position, at this condition, the shift may change between "- "and "+" freely.



N: Neutral shift. When start engine or under condition of engine in working need to brake the tractor, the shifting lever must be set on "N" position.



R: Reverse shift. When tractor is in reverse travel, the shifting lever set on "R" position.

4. Structure and Performance of the Main Parts

4.1 Transmission system

4.1.1 Engine Refer to Engine Manual for its service and maintenance

4.1.2 Automatic transmission

The torque converter type is 2-speed A/T, symmetrical, 3-element, 1-stage, 2-phase. It possesses the advantage of easy to operate and good performance, its max. efficiency can reach 92%, the transmission type is 2-speed forward and 1-speed reverse, constant-mush. The clutch is welted multi disc type. The oil pump type is interior meshing in volute gear pump.

Towing tractor is equipped with automatic transmission which is controlled by pressure-regulating valve and magnetic valve, possesses the advantage of being easy to operate and good performance.

① .Reverse clutch
② .Reverse shaft
③ .2nd forward clutch
④ .Individual forward clutch
⑤ .Connect plate
⑥ .Turbo shaft
⑦ .Guide wheel
⑧ .Pump wheel
⑨ .Turbo wheel
⑩ .Output shaft
⑪.Counter shaft

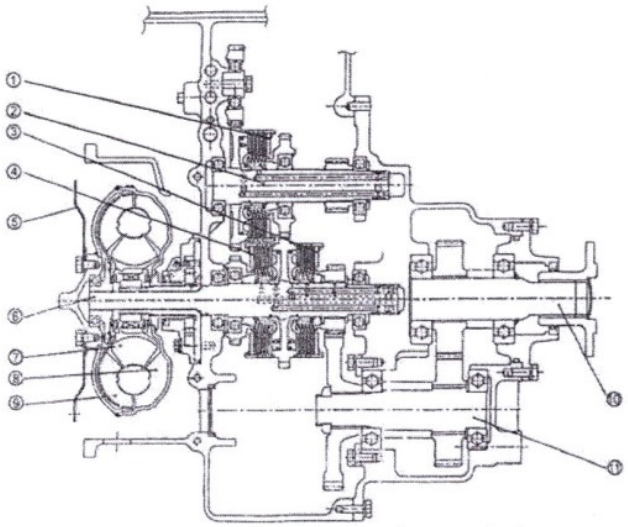


Fig. 4 Automatic transmission

4.1.3 Canard propeller shaft

The Canard propeller shaft is composed of universal flange fork, universal-joint fork and universal-joint cross spindle. It is a double cross spindle stiff type Canard propeller shaft.

When clearance between the universal-joint shaft and the needle bearing is too much, it is necessary to replace shaft or bearing. In replace of bearing must be complete set of needle bearing. Don't lubricate needle bearing with thick oil, frequently add lubricating oil when tractor work on the ambiance where air filled dust.

4.1.4 Driving axle

The structure of driving axle is shown in Fig. 5.

It consists of drive unit, wheel hub, axle tube, differential shaft and drive wheels.

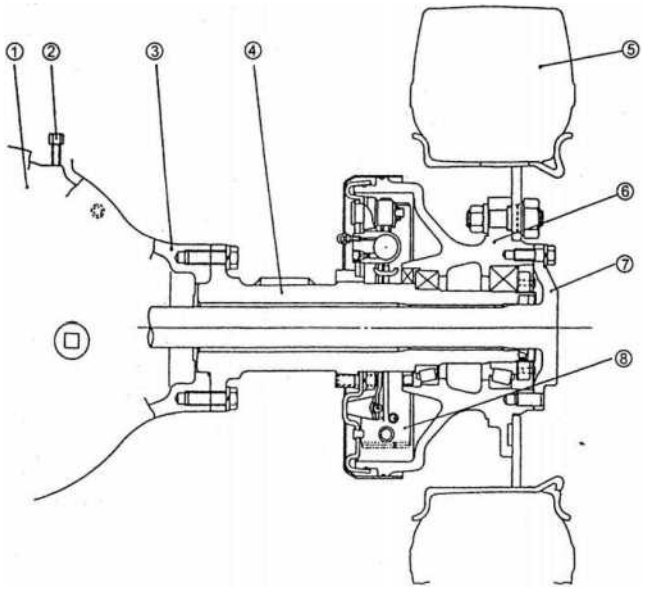


Fig. 5 Drive axle

①. Drive unit assembly

②.Vent screw plug

③. Axle housing

④.Axle tube

⑤. Drive wheel assembly

⑥.Hub

⑦. Driveshaft

⑧ Rear brake assembly

4.2 Brake System

4.2.1 Foot brake system

It is a four wheel brake system, and is equipped with vacuum valve, so it has the advantage of being reliable and easy to operate.

The braking fluid from master cylinder via ratio valve to wheels cylinders of front and rear wheels.

4.2.2 Parking brake system

Pull the parking brake lever upward, make teeth plate to move 7-8 teeth, so that the pull force will be conduct to two rear brake device perform brake.

4.3 Steering System

The steering system is controlled by hydraulic. It consists of a handle, a wheel, a steering column, a power steering set, steering pull rod, knuckle, and steering wheel etc. Structure of steering system see Fig. 6 and Fig. 7.

Fig. 6: Steering system

① . Steering wheel

② . Steering column

③ . Bracket

④ . Steering shaft

⑤ . Steering pitman arm

⑥ . Power steering set

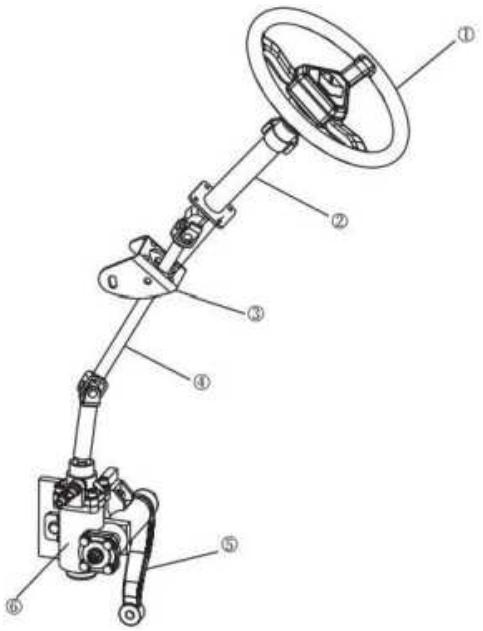


Fig. 7: Steering Rod

① Left trailing arm

② Bell crank

③ Right trailing arm

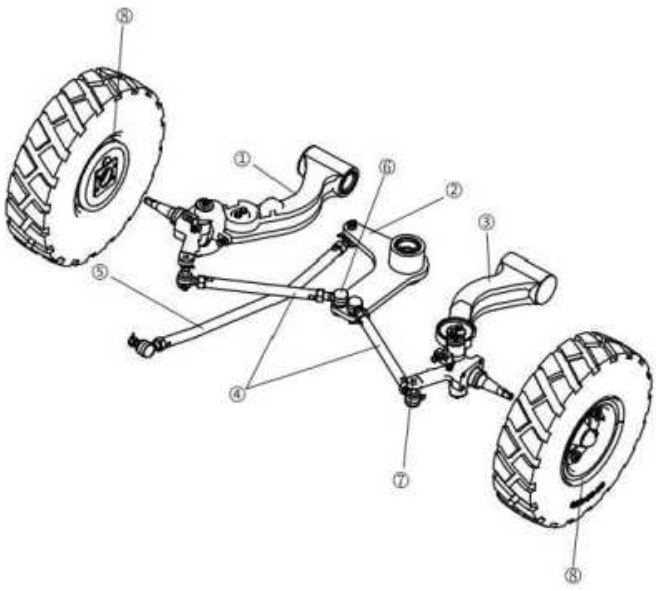
④ Tie rod

⑤ Drag rod

⑥ Tie rod assembly (left spiracle)

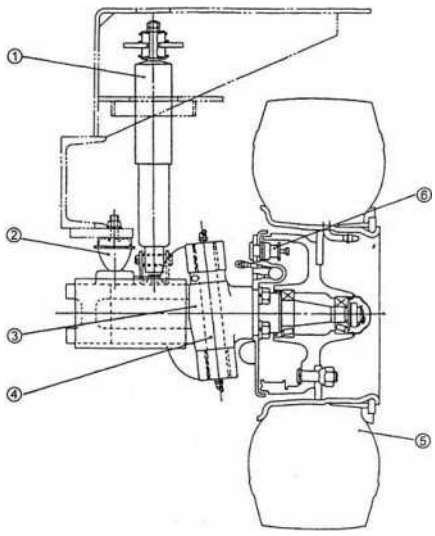
⑦ Tie rod assembly (right spiracle)

⑧ Front wheel



4.4 Suspension System

Structure of front Suspension System includes longitudinal arm independent suspension type, coil spring and double direction hydraulic shock absorber mounted on front axle, can absorb shock energy. Structure of Front Suspension System see Fig. 8

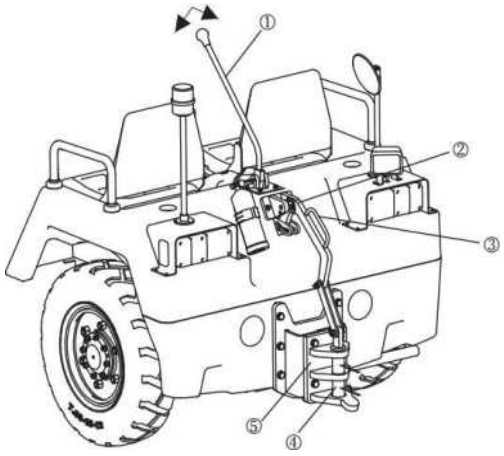


① Front shock absorber
② Rubber block shock absorption
③ Steering knuckle
④ Kingpin
⑤ Steering tyre assembly
⑥ Front brake assembly

Fig. 8: Front suspension system

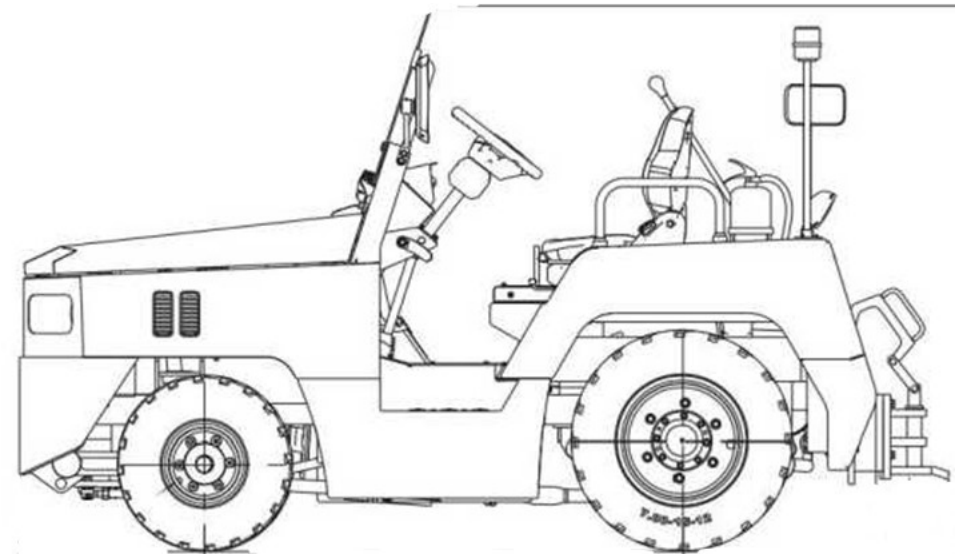
4.5 Towing Device

The towing device can be operated from the operator's seat, when the towing lever is moved forward, the pin is lifted up. It can be operated from the back of truck too. Move the grasper on the arm up. Towing device see fig. 9



① Lever for operation
② Towing arm
③ Grasper
④ Towing pin
⑤ Bracket for towing pin

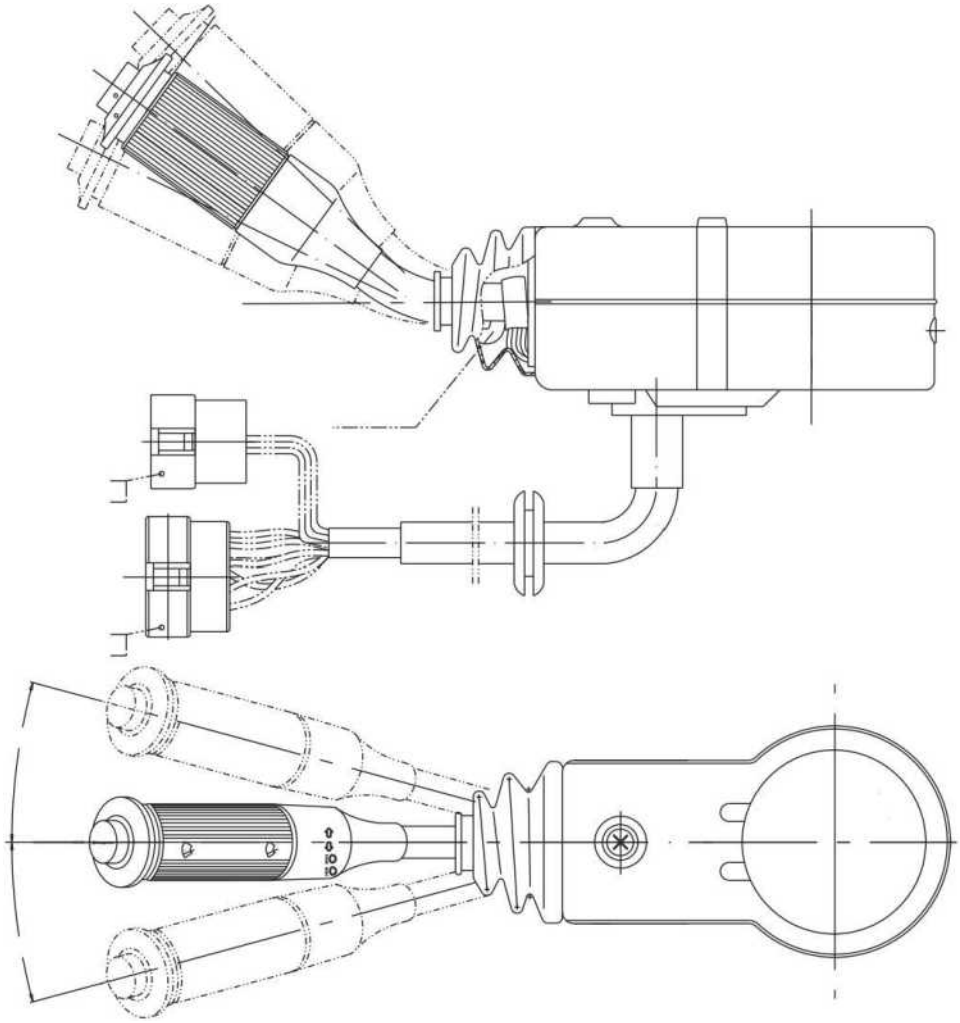
Fig. 9: Towing device

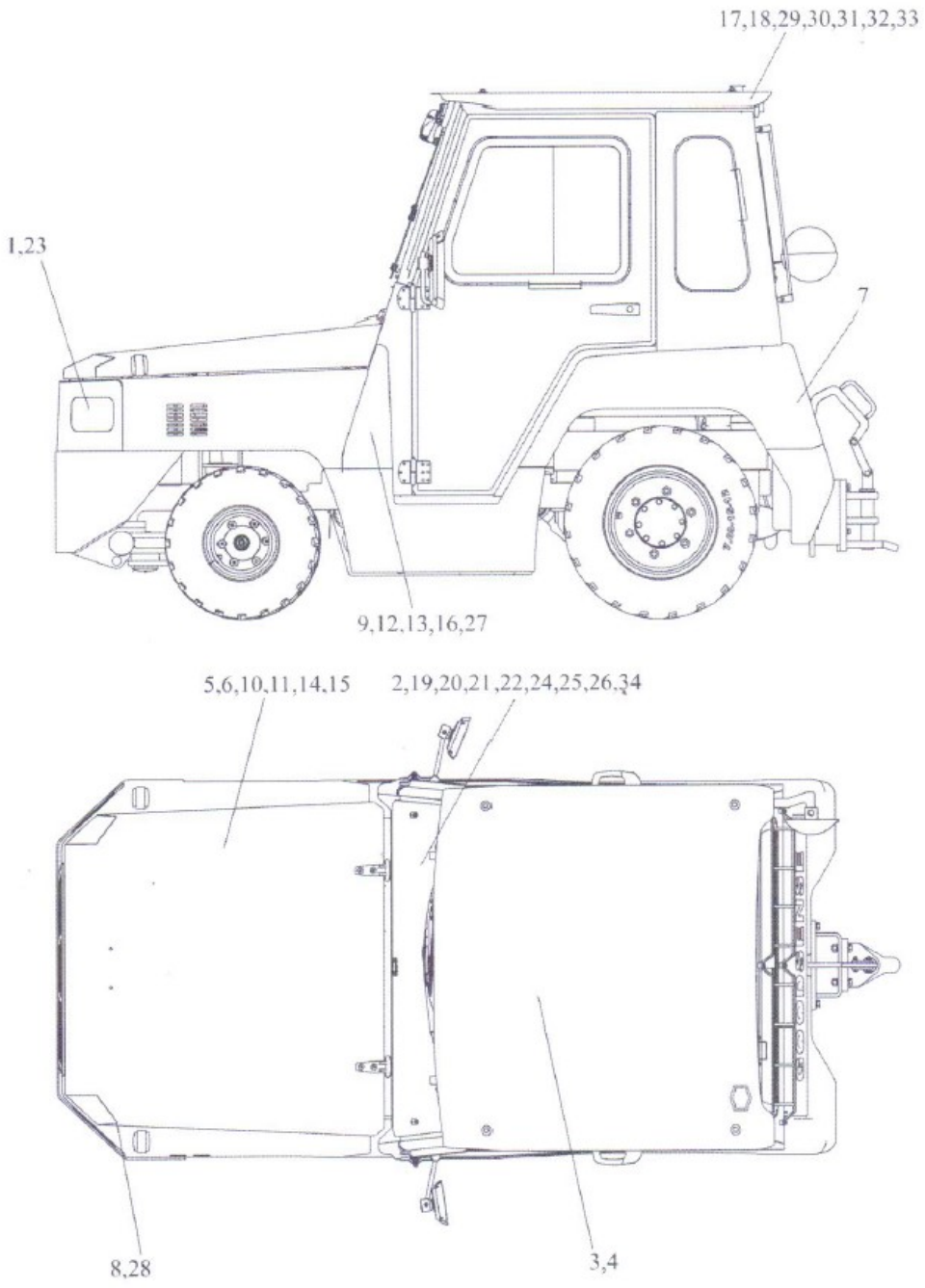


Your towing tractor is equipped with a fire extinguisher placed inside of the cabin.

Once you are familiar with all elements and levers inside of your cabin you may start your first move.

Steering light combination switch diagram





Electric System

D699361G

Pos. No.	Bestell-Nr. Part-No. No. de la pièce	Gruppe ELEKTRISCHE ANLAGE Benennung	group ELECTRIC SYSTEM Description	Ensemble SYSTEME ELECTRIQUE Désignation	D699361G	Stck. pc.	Ausf. exec.
1	D351635	Frontscheinwerfer	head lamp	phare		2	
2	D351636	Kombiinstrument	meter combined	instrument combiné		1	
3	D351637	Kombischalter	switch combined	commutateur combiné		1	
4	D351638	Schalterhülle	combination switch shell	capot		1	
5	D350097	Sicherungsdose	fusebox	boite à fusible		1	
6	D351639	Starterbatterie	battery	batterie de demarrage	12V	1	
7	D351640	Rückfahrlicht	rear lamp	feu arrière		2	
8	D351641	Kabelbaum	vehicle wiring harness	faisceau	Fahrzeug	1	
9	180type	Isolierband	tape	ruban de cerclage		15	
10	D351642	Öltemp.Sensor	oil tempsensor	sensor temp d'huile		2	
11	D351643	Rückwärtswarner	back buzzer	avertisseur		1	
12	D351644	Dose	box	boitier		1	
13	D351645	Bremslichtschalter	brake switch	commutateur de frein		1	
14	D351646	Hupe	horn	claxon		1	
15	D351647	Kabel +	cable (+)	câble +		1	
16	D351648	Kabel -	cable (-)	câble -		1	
17	D351649	Kraftstoffsensor	fuel level sending unit	sensor du reservoir		1	
18	D351650	Rückleuchte	rear lamp	feu arrière		1	
19	D351651	Gewschwindigkeitssensor	speed sensor	sensor de vitesse		1	
20	D351652	Glühstartschalter	key switch	commutateur de demarrage		1	
21	D351653	Notausschalter	emergency stop switch	commutateur arrêt urgence		1	
22	D351654	Schild	marking	etiquette		1	
23	D351655	Signalleuchte	double side signal light	feu signaletique		2	
24	D351656	Schalter Arbeitsscheinwer	working lamp switch	commutateur phare de trav		1	
25	D351657	Schalter Wischer	switch wiper	commutateur essui-glaces		1	
26	D351658	Rand	border	Rand		2	
27	D351659	Zwischenträger	intermediate bearer	support		1	
28	D351660	Abdeckung	blocking cover	capot		1	
29	D351661	Kabelbaum Kabine	cab harness	faisceau cabine		1	
30	D351088	Kombileuchte	combi-headlamp	feu combiné		1	
31	D351662	Blinkerleuchte	turn light	feu signaletique		2	
32	D351663	Stoplicht	high-mount stop lamp	feu stop		1	
33	D351664	Hindernisleuchte	aviation obstruction ligh	feu d'obstacle		1	
34	D351665	Blinkerschalter	double flash switch	interrupteurde clignotant		1	

9. Common Trouble and Removals

If any trouble happens with the towing truck, it should be checked, analysed and removed.

The common troubles and their removal methods are as following:

Component	Trouble	Probable Cause		Removal method
Automatic transmission	Power isn't transmitted	A) No pressure build up		
		1	Insufficient oil	Add oil to sufficiency
		2	Oil pump and drive oil line trouble	Replace faulty parts
		3	Control valve damage or faulty	Replace
		4	Seal of clutch piston faulty	Check. Replace faulty parts
		B) Mechanical damage		
		1	Input shaft	Check. Repair. Replace as necessary
		2	Gear	
		3	Hub of clutch	Check. Repair. Replace as necessary
		4	Driving plate. Driven plate	
Automatic transmission	Output decrease	A) Oil pressure too low		
		1	Insufficient oil	Add oil to sufficiency
		2	Clogged strainer	Clean or replace
		3	Spring of regulating valve weaken or piston faulty	Check. Replace as necessary
		4	Seal of clutch piston faulty	
		B) Mechanical damage		
		1	Damaged or deformed impeller	Replace faulty parts
		2	The hub of clutch is deformed	
		3	The driving plate and driven plate is deformed	
		C) Use of improper oil		Replace with specied oil
	Oil temperature increase abnormally	1.Improper oil level		Add or drain oil to specified level
		2.Vane in connect with adjacent parts		Replace faulty parts
		3.Drag due to worn driving plate or driven plate		Replace faulty parts
		4.Bearing be worn or seized		Check. Repair .Replace
		5. Oil cooler faulty		
		6.Clutch slippage or low efficiency due to use of improper oil		Replace with specified oil, Replace clutch disc as necessary
		7.Transmission oil pump is worn or damaged		Replace faulty parts
	Abnormal noise is emitted	1. Insufficient oil or cavition due to trapped air from inlet side.		Add oil to sufficient, exhaust air
		2. Transmission oil pump faulty		Disassemble and replace faulty parts

Component	Trouble	Probable Cause	Removal method
Automatic transmission	Abnormal noise is emitted	3.Vane in contact with adjacent parts due to deformity	Disassemble and replace faulty parts
		4.Damaged input disc	
		5.Damaged gear and splines	
		6.Bearing is worn or damaged	
		7.Worn contact surfaces of clutch hub and driven plate	
		8.Loose bolt	Tighten or replace bolt
		9.Clutch slippage due to drop in oil pressure	Increase oil pressure to specifications
		10.Cavitation due to clogged strainer	Clean or replace strainer
	Oil leak	1.Oil seal faulty	Replace
		2.O-ring seal is damaged	
		3.Loose bolt	Tighten
		4.The surface of matching part is scratched	Repair or replace
	Clutch engages too slowly	1. Driving plate and driven plate excessive worn 2. Owing seal faulty to leak oil 3. Spring or piston of regulating valve faulty 4. Clogged oil line 5. Select valve faulty	Check. Clean. Replace
	Shook occurs	1.Accumulator's spring is fatigued	Check. Replace
		2.Accumulator's piston faulty	
		3.Taper driven plate is damaged	

Component	Trouble	Probable Cause	Removal method
Propeller shaft	Abnormal noise is emitted	1.Flange bolt loosen	tighten bolt
		2.Insufficient lubrication	Add fill lubricant
		3.Universal joint worn excessively	Replace

Component	Trouble	Probable Cause	Removal method
Steering system	Steering wheel vibration. Shock. Instability	1.The pressure of tyre is abnormally	Adjust the pressure of tyre to normal
		2.Steering king pin or sleeve is worn	Replace
		3.Pull lever or ball head excessively worn, loosened	Adjust or Replace
		4.Hub bearing is worn or its clearance is abnormal	Adjust or Replace

Component	Trouble	Probable Cause	Removal method
Steering system	Steering wheel vibration. Shock. Instability	5.Thrust bearing of king pin is worn	Replace
		6.Gear clearance of steering set incorrect	Adjust
		7.Front wheel or tyre is deformed or worn unevenly	Repair or Replace
		8.The toe-in incorrect	Adjust
		9.Loose steering set	Tighten
	Steering wheel hard to turn	1.The pressure of tyre is abnormal	Adjust the pressure of tyre to normal
		2.Steering king pin requires lubrication	Refill lubricate grease
		3.Rear rod ball head requires lubrication	Refill lubricate grease
		4.Foreign substance in steering set, oil insufficient	Clean\replace\fill oil to sufficient
		5.Bent steering linkage, interferes	Repair or replace
		6.Partly gear incorrect meshing	Adjust or replace
		7.The clearance of steering set gear incorrect	Adjust
Steering system	Steering wheel hard to turn	8.Bearing of steering set is worn or damaged	Replace
		9.Toe-in incorrect	Adjust
		10.Insufficient oil in oil tank	Refill oil
		11.Air is exhausted inadequate	Adequate drain air
		12.Hose or tube oil leak, clogged oil passage	Repair\clean
	Oil does not rise	1.Hose or tube oil leak,clogged oil lines	Repair\clean
		2.Leak oil in Seal of steering set	replace
	Trevel on one side	1.Left and right steering wheel unbalanced	replace
		2.Left and right braking clearance incorrected	Adjust
		3.Left and right wheel's toe-in incorrect	Adjust
		4.Steering wheel loosen	Tighten bolt
		5.Pull lever rod ball head excessive loosen	Adjust or replace
		6.Steering gear's clearance incorrected	Adjust
		7.Steering wheel be deformed	Replace
	Steering wheel do not return to normal position	1.Steering column fatality	Disassemble.clean.replace
		2.Steering gear engage abnormal	
		3.Worm gear and worm faulty	
		4.Left.right wheels toe-in incorrect	Adjust
		5.The pressure of tyre abnormal	Adjust to normal pressure
	Steering system emit abnormal voice	1.In oil lines of system there be air	Exhaust the air
		2.Worm be worn or damaged	Replace

Component	Trouble	Probable Cause	Removal method
Braking system	Braking force not enough	1. Braking hydraulic system leak oil	Repair, add fill braking fluid
		2.There be air in hydraulic system	Exhaust all air
		3.There be water or oil on braking lining surface	Clean or replace
		4.Braking lining is deformed or contact abnormal	Grind repair or replace
		5.Braking lining is worn excessively	Replace
		6.Braking master cylinder abnormal	Repair or replace
		7.Clogged hydraulic system	Clean
	Brake applies only on one side	1.The pressure of tyre incorrect	Adjust the pressure
		2.Braking clearance do not equal	Adjust
		3.Other side brake lining's surface there be water or oil	Clean or replace
		4.On braking drum there be dust or sane	Clean
		5.Other side brake lining be deformed and damaged	Grind repair or replace
		6.Faulty braking shoe lining contact	Grind repair
		7.Other side brake lining be excessively worn	Replace
		8.Braking drum be excessively worn or damaged	Replace or repair
		9. Braking wheel cylinder faulty	Repair or replace
		10. Braking shoe lining contact faulty	Adjust
		11.The bolt of braking bottom plate be loosen	Tighten or replace
		12. Braking bottom plate be deformed	Replace
		13. The clearance of bearing incorrect	Adjust or replace
	Brake drags	1.There not be clearance of pedal	Adjust
		2.Braking wheel cylinder fatality	Repair or replace
		3.Return spring faulty	Replace
		4.Braking shoe lining contact faulty	Adjust
		5.Parking brake shoe not return or clearance incorrect	Repair or adjust
		6.Clogged oil return port of braking master cylinder	Clean
		7.Clogged hydraulic system	Clean

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D350078B-E

The airport towing tractor type DD30 is equipped with a camera showing the rear view to the driver in the display.

The display is fixed to the instrument panel allowing the driver to observe the driving positon and also, like in a car, the towed trailer or well aircraft.

The camera as well as the screen are directly connected to the electric system of the towing tractor.

When starting the engine via your ignition switch the camera is connected and operational. The screen has an additional switch which may be used.

You may change the position of the camera upon you requirement either to have the view to the tow bar or well to the aviation engineer being in the cockpit of the aircraft towed.





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