UTILEV®

1.3T–2.0T 3-Wheel Electric Counterbalanced Forklift Truck

Service Manual

APRIL 2017

Part No. 76002086 (R4)

The Service Manuals are updated on a regular basis, but may not reflect recent design changes to the product. Updated technical service information may be available from your local authorized UTILEV® distributor. Service Manuals provide general guidelines for maintenance and service and are intended for use by trained and experienced technicians. Failure to properly maintain equipment or to follow the instructions contained in the Service Manual could result in damage to the products, personal injury, property damage or death.

May 2013 (Ref. Date)

Foreword

This manual covers the components, operation, and servicing of the 1.3T-2.0T 3 Wheel Electric forklift truck. To ensure safe operation of this truck, it is important to read and understand the contents of this manual.

Only qualified service personnel should perform maintenance on this truck.

Product specifications in this manual may vary from your actual truck due to periodic improvements in design. Please contact your sales agent if you have any questions or comments regarding this manual.

This electric three-wheel forklift truck has passed the requirements for, and is approved for operation in countries adhering to CE regulations.

Model	Drive Controller	Pump Controller	Rated Capacity(t)/ Load Center(mm)
UT13PTE	CURTIS 1234X2	CURTIS 1234	1.3 / 500
UT15PTE	CURTIS 1234X2	CURTIS 1234	1.5 / 500
UT16PTE	CURTIS 1234X2	CURTIS 1234	1.6 / 500
UT18PTE	CURTIS 1234X2	CURTIS 1234	1.8 / 500
UT20PTE	CURTIS 1234X2	CURTIS 1234	2.0 / 500

Contents

1. Drive System

The drive system adopts a dual-motor front wheel drive, wherein the left and right drive wheels are driven independently by different motors, the rotation speed of the left and right motors is controlled by the rear wheel steering angle, and each motor is connected to the gearbox, brakes, solid tires, rims and other components.

The reduction gearbox is a double reduction system with a compact structure, comprising a first-stage cylindrical helical gear set and a second-stage planetary final drive.

The brakes are maintenance-free, wet disc brakes.

Failure	Possible Cause	Remedy
Loud impact sound when travelling and changing direction	Excessive Gear Backlash	Adjust
	Excessive Gear Wear	Replace
Gear Noise when Travelling	Gearbox Oil Level Too Low	Top Up Gear Oil
	Excessive Gear Backlash	Adjust
	Excessive Gear Wear	Replace

Gearbox

Technical Parameters

Item		Parameter
Weight (Without Oil)		31 kg
Oil Capacity		0.35 L
Oil Type		ATF DEXRON II
Foot Brake	Brake Fluid	DOT3
	Operating Pressure	60-80 bar
	Normal Pressure (Maximum Continuous)	80 bar
	Maximum Pressure	100 bar
	Hydraulic Cylinder Brake Fluid Volume (Under Normal Conditions)	1.71 cm^3
	Hydraulic Cylinder Brake Fluid Volume (Under Maximum Wear Conditions)	3.71 cm^3
Hand Brake	Hand Brake Lever Pulling Force	100 N
	Stroke	6 mm
	Wear Limit Stroke	13 mm

Structure

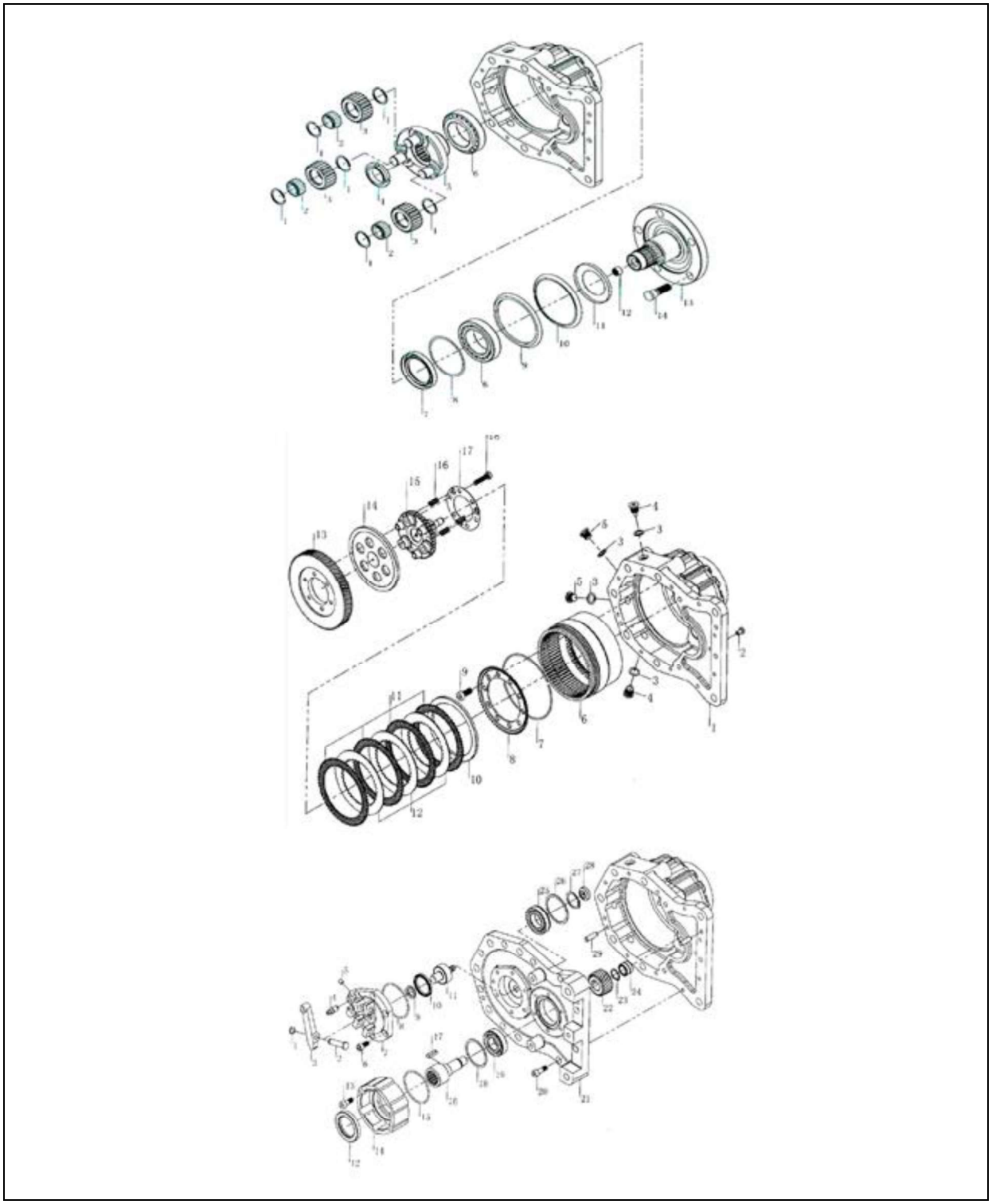
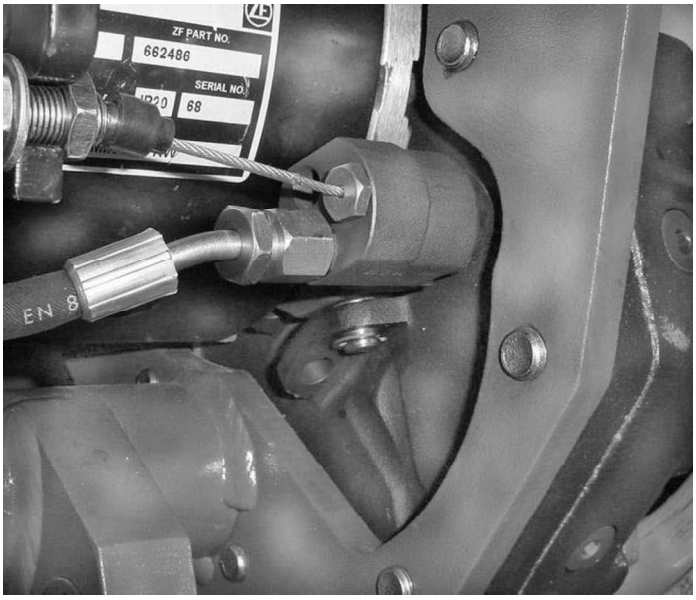
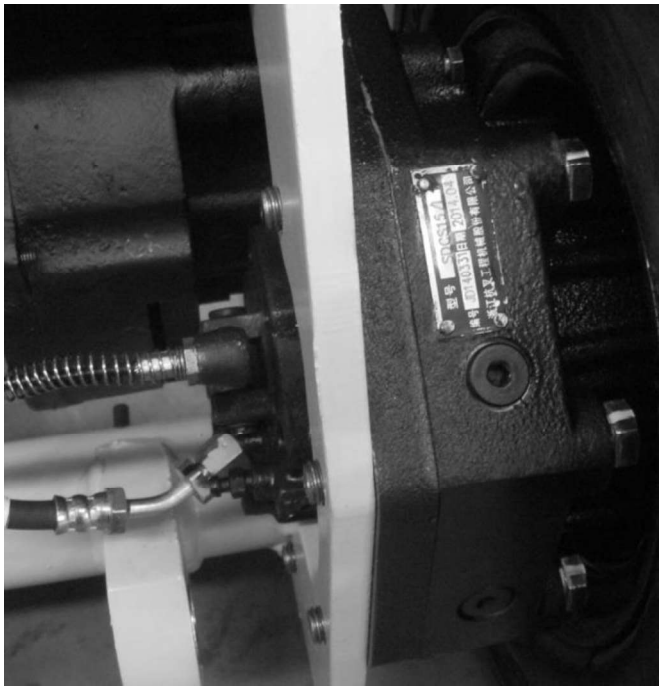


Figure 1-1





The brake rocker arm has three holes

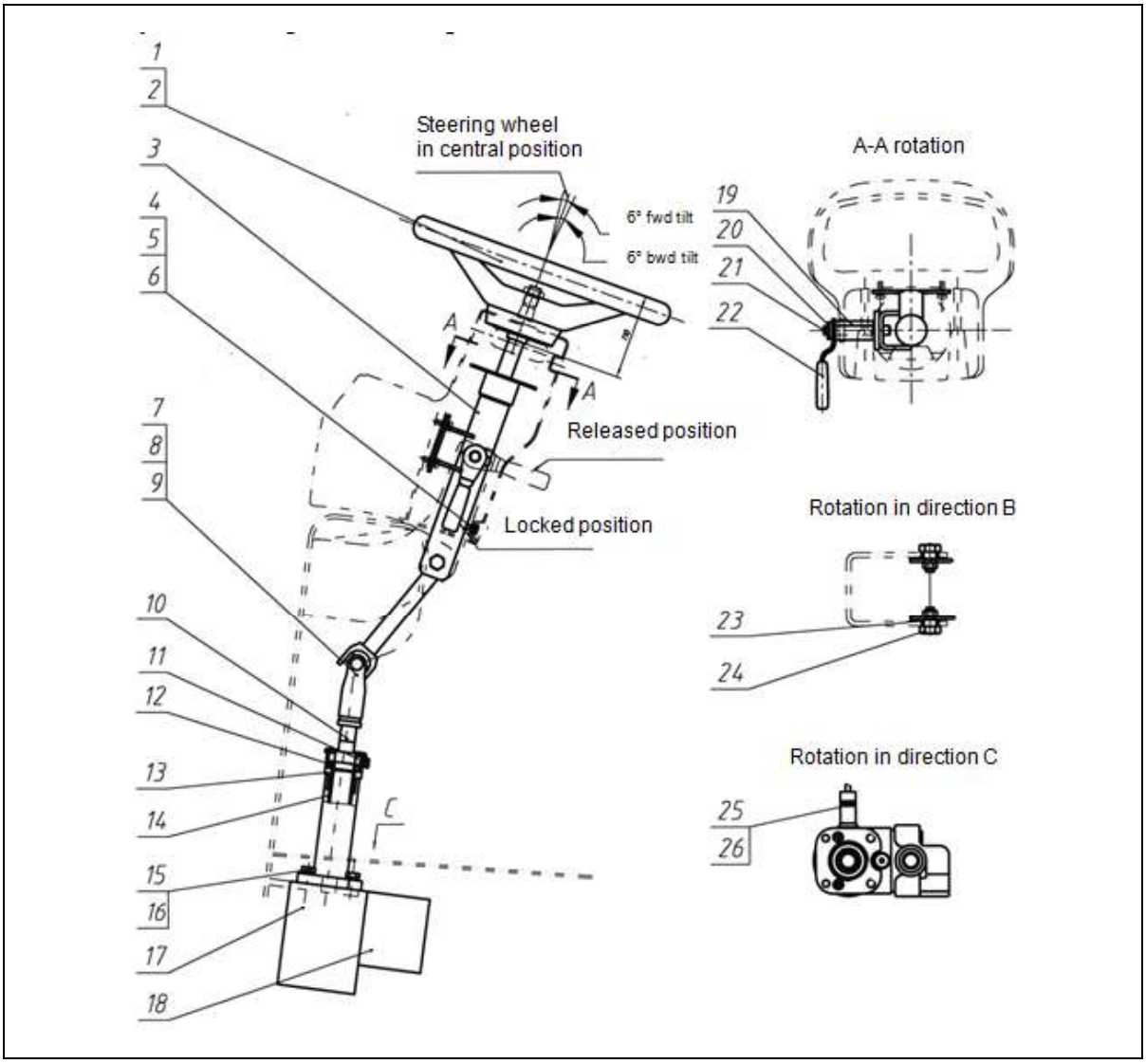
- Air bleed plug: after adding brake fluid, loosen the bleed plug to expel any trapped air.
- Hand brake cable connection head: connection head has a wear limit of 13 mm. Replace connection head once this limit is exceeded.
- Brake wheel cylinder inlet port: replace in the event of brake wheel cylinder leakage.

2. Steering System

The steering system consists of the steering device and the steering axle.

Steering Device

The steering device consists of the steering wheel, upper shaft assembly, universal joint, lower shaft assembly, bearings, snap rings, shaft pump, priority valve, lever, hydraulic switch and other components. The steering wheel forward/backward tilt angle can be adjusted. See Figure 2-1.

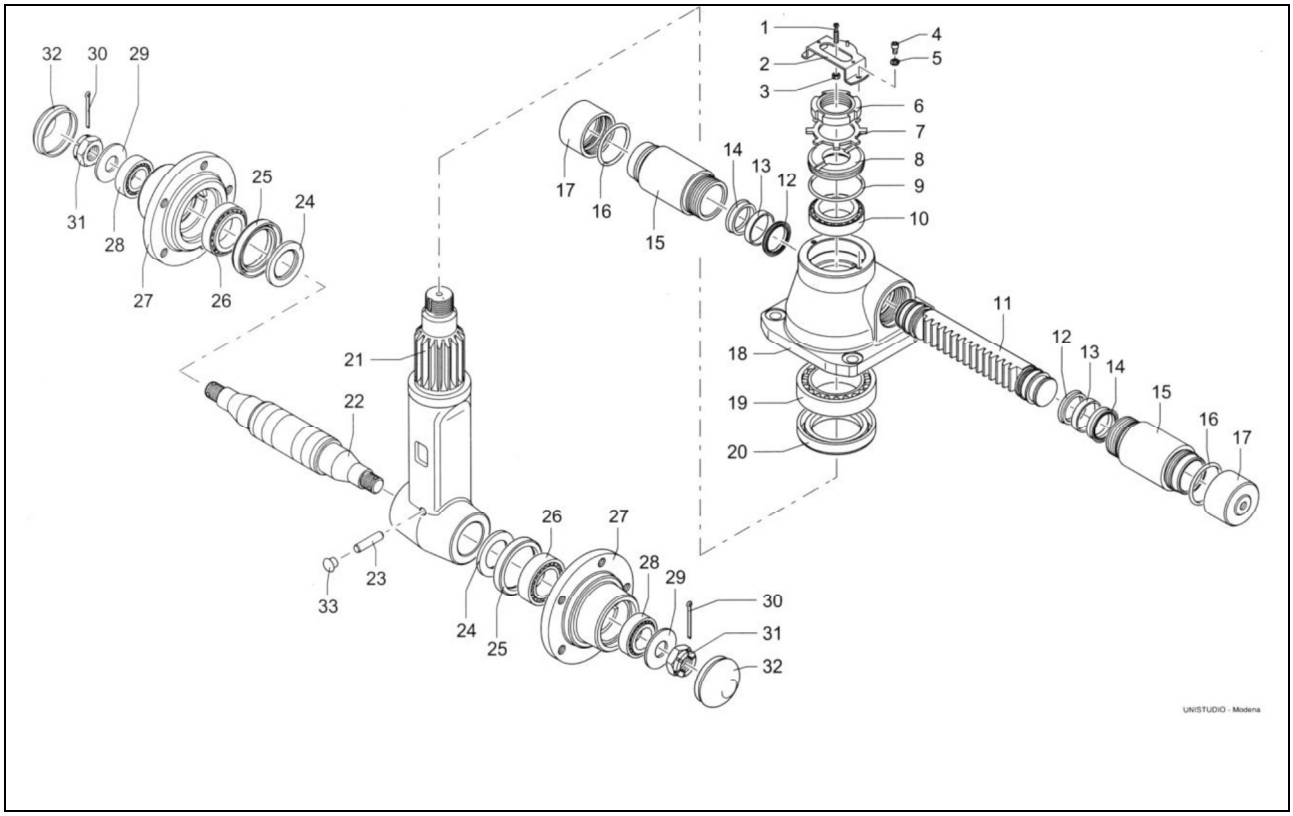


1. STEERING WHEEL	3.UPPER SHAFT ASSY	8.UNIVERSAL JOINT	10.LOWER SHAFT ASSY
12.BEARING	13.SNAP RING	14.SHAFT	17. PUMP
18. PRIORITY VALVE	19.BOLT	22.LEVER-TILT	26.HYDRAULIC SWITCH

Figure 2-1 Steering Device (Major Components)

Steering Axle

Italian-made steering axle with a compact structure, see Figure 2-2.



1.SCREW M6	2.BRACKET	3.NUT M6	4.SCREW M6
5.WASHER M6	6.NUT	7.GASKET	8.ADJUST NUT
9.O'RING	10.BEARING	11.SHAFT	12.SEAL RING
13.GUIDE SLEEVE	14.SEAL RING	15.CYLINDER BODY	16.SEAL RING
17.CYLINDER CAP	18.AXLE HOUSING	19.BEARING	20.SEAL RING
21.GEAR SHAFT	22.STEER AXLE SPINDLE	23.PIN	24.GASKET
25.SEAL RING	26.BEARING	27.HUB	28.BEARING
29.WASHER	30.COTTER PIN	31.NUT	32.HUB CAP
33.PLUG M10			

Figure 2-2 Steering Axle

The axle housing (18) is fixed to the rear of the vehicle frame. Forces acting on it from the ground are carried by the support bearings (10, 19). The adjusting nut (8) is used to adjust the preload of the bearings (10, 19). The cylinder body (15) is connected to the axle housing (18). The end sections of the shaft (11) acts like pistons; when hydraulic oil from the priority valve flows towards the cylinder body (15); it pushes the shaft (11) to the left or to the right. The shaft (11) engages with the gear shaft (21), which rotates the steer wheels left or right and turns the vehicle, with a maximum steering angle of 85° in both directions.

Precautions for Use:

- In the event of oil leakage from the cylinder body, check and replace the seal rings (12, 14, and 16). Also check the guide sleeve and cylinder body for damage.
- Periodically check the bearings (10, 19) and their seal rings (9, 20), and replace promptly if damaged. Also change grease on a regular basis.
- Periodically check the bearings (26, 28), and their seal ring (25), and replace promptly if damaged. Also change grease on a regular basis;
- Adjusting the preload of the steer wheels hub bearings: remove the counterweight and its cover panel, and then jack up the rear of the frame with an automotive jack so that the wheels are off the ground. Tighten nut (3) until the steer wheels hubs cannot be moved by hand, then rotate it 1/6 to 1/4 turn in the opposite direction.
- Adjusting the preload of the support bearings (10, 19): Remove counterweight and its cover panel, and then jack up the rear of the frame. Tighten nut (8) until the steering spindle cannot be moved by hand, then rotate nut (8) 1/6 to 1/4 turn in the opposite direction.

Problem	**Cause Analysis**	**Remedy**
Steer wheels will not turn	Pump damaged or faulty	Replace
	Clogged or damaged priority valve	Flush or replace
	Hose or connector damaged or pipe blocked	Replace or flush
Steering is hard	Diverter valve pressure too low	Adjust pressure
	Air in the oil line	Bleed off air
	Steering gear fails to centre, positioning spring broken or weak	Replace spring
	Excessive leakage inside steering cylinder	Check piston seal
Abnormal noise	Low oil tank level	Add oil
	Damaged steering gear shaft rack	Replace
	Damaged wheel bearing or support bearing	Replace
	Inadequate lubrication	Add grease
	Clogged suction pipe or oil filter	Flush or replace
Oil leak	Defective steering cylinder seal ring or damaged pipe or connector	Replace
	Damaged wheel hub bearing or support bearing or seal ring	Replace seal ring
Steering angles of left and right drive wheels (front wheels) do not match	Controller parameters incorrect	Adjust