WORKSHOP MANUAL

Rubber-Tyred Roller

VP 2400

Stavostroj, a.s. Nové Město nad Metují

ECOLOGICAL AND HEALTH PROVISIONS

In repairing the machine, observe rules of environment and health protection, laws, notices, and regulations valid in the territory of use.

HEALTH PROVISIONS

- Oil products, coolants, battery content, and lacquers with thinners are injurious to health, and may cause severe injuries when in contact with the body.
- It is therefore necessary to observe safety and health protection instructions and use personal protection when handling these products.
- Workers handling these products must obey general rules of protection and follow instructions issued by the manufacturers of such products.
- We draw your attention primarily to
  - eye and skin protection when handling batteries
  - skin protection when handling oil products, lacquers, and coolants
  - washing your hands after work and before meals, application of special skin creams
  - instructions supplied with the cooling systems.
- Keep oil products, coolants, battery fills, lacquers with thinners, cleaning and preservation chemicals in original containers properly described on the outside. Do not allow their storage in unmarked bottles and other containers to avoid danger of substitution, mainly for food or drink.
- Should the skin, mucous membranes, or eyes come in contact, or should vapors be inhaled, apply first aid immediately. In case of accidental consumption, see your doctor immediately.

ECOLOGICAL PROVISIONS

- Contents of some systems and some of the parts become waste bearing risks to the environment, when discarded.
- This category includes mainly
  - organic and synthetic lubricants, oils, and fuel
  - coolants
  - batteries and their contents
  - cleaning and preservation chemicals
  - all removed filters and cartridges
  - all removed hydraulic and fuel hoses, rubberized metal parts, and other parts soiled by above-mentioned chemicals.
- Such parts and chemicals must be handled in accordance with national standards for the protection of the environment and health.
- When replacing hydraulic, fuel, and cooling systems, seepage of liquids in the ground must be prevented by suitably placing catch basins underneath, and openings must be plugged.
- Apply sawdust, Vapex, etc. to places of seepage in the ground.
- Remove soiled ground to prevent continuous seepage, and transfer contaminated soil to further liquidation.

2. DISASSEMBLY OF THE ENGINE

Perform all work prior to and during disassembly and assembly in accordance with the introductory chapter on Safety, and comply with ecological and health protection rules and regulations.

Preparatory work

- Place the machine horizontally on a firm surface.
- Wedge front wheels on both sides.
- Turn the battery breaker off – brakes are automatically applied.
- Place a sign on the steering wheel "MACHINE BEING REPAIRED".

Remove the protective frame ROPS

- Remove cover plates 1 behind the seat in front of the fuel tank, **Fig. C/1**.
- Install lifting loops on ROPS frame, hook up by hoist of at least 450-kg carrying capacity.
- Unfold lid 2.
- Unscrew nuts 1 on the right and left side that attach ROPS to the frame of the machine, **Fig. C/2**.
- Insert bolts so that they be outside the holes in the machine frame.
- Lift the frame out of the machine.

Remove the cabin

Attention – disconnect electrical wiring between the cabin and the machine, Fig. C/3.

Fig. C/1

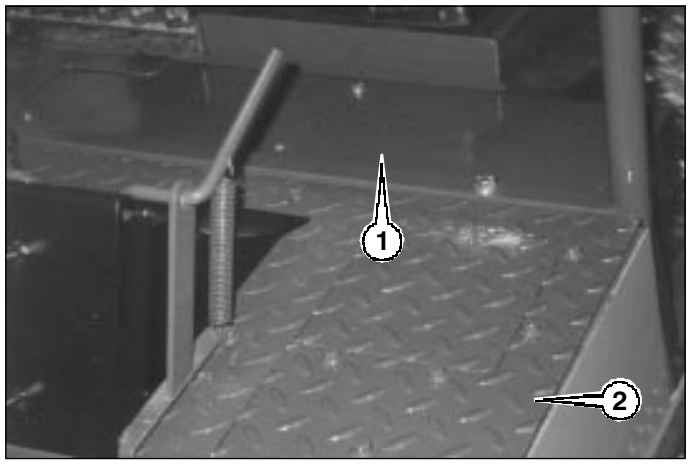


Fig. C/2

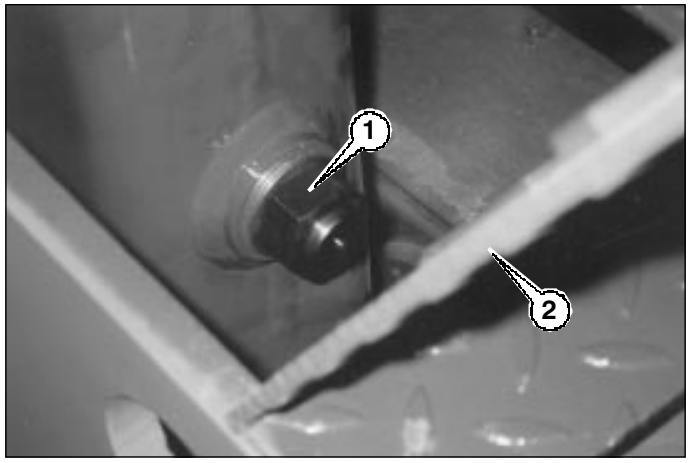
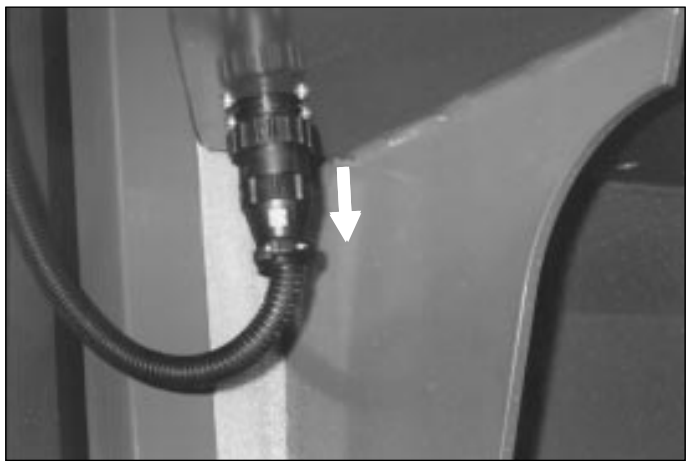


Fig. C/3

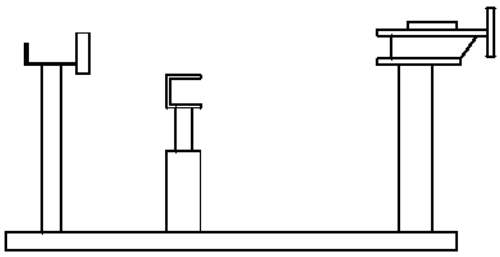


7. FIXTURES

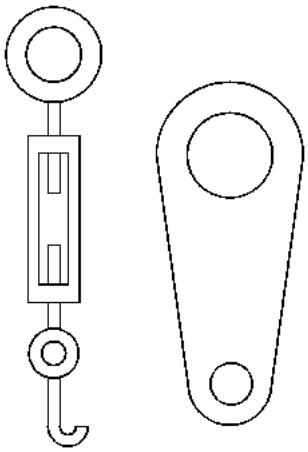
no. 1. Assembly (92-655-058) - extension

no. 2 Handling (92-645-207) - adjustable hook-up chain GUNEBO

no. 3 Assembly (64-298-461) – support for engine with gearbox assembly



no. 4 Handling (64-373-0140) - hook, turning spanner



- Insert press-out bolts M 16 into 2 holes M 16, and by their gradual tightening remove cover 12, **Fig. D/13**.
- Remove sealing ring 33 from the cover, washers 20, 21, ring 19, and O-ring 32, **Fig. D/14**.
- Turn the housing using hoist by 180 degrees (cover 13 up), from the opposite side do 1-5. Watch for leaking residual oil.
- Remove bolts 44, 45. Insert two press-out bolts M 16 into holes M 16 and by gradual tightening remove cover 13 **Fig. D/15**. Insert hooks into holes M16 after press-out bolts have been removed, and using a suitable handling device place it on the working bench. While replacing bearing 29, press out or knock out the outer ring of the bearing from cover 13 using a bronze rod.
- On the shaft 4 anscrew fixture no. 4, hook and remove assembly using hoist from the housing, **Fig. D/16**.
- Unscrew bolts 46 and press out gear 6 and inside rings of bearing 29. For replacement of the other bearing 29, knock out from the housing assembly using a bronze rod the outer ring. Remove cover 17 with seal 18, **Fig. D/1**.

Fig. D/14

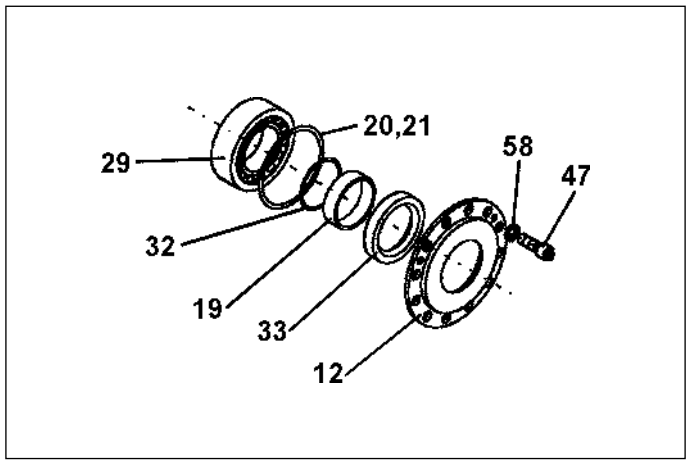


Fig. D/15

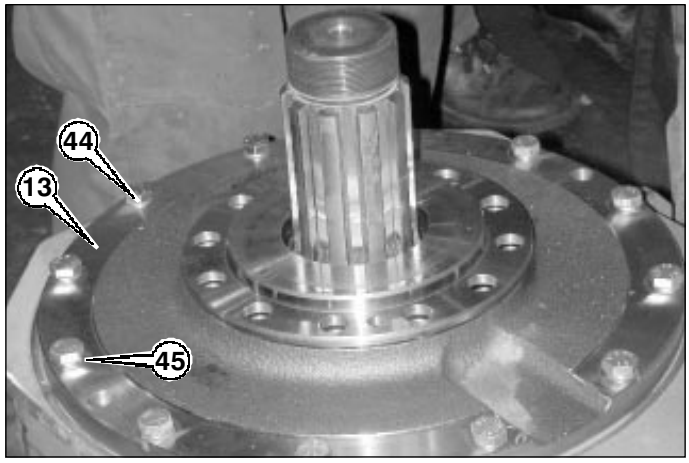


Fig. D/13

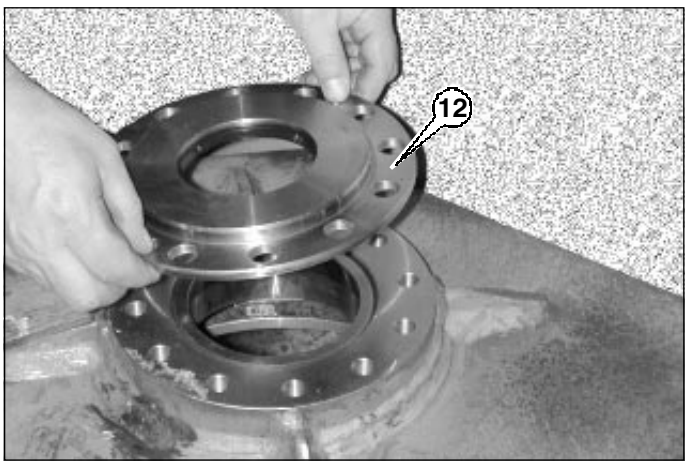
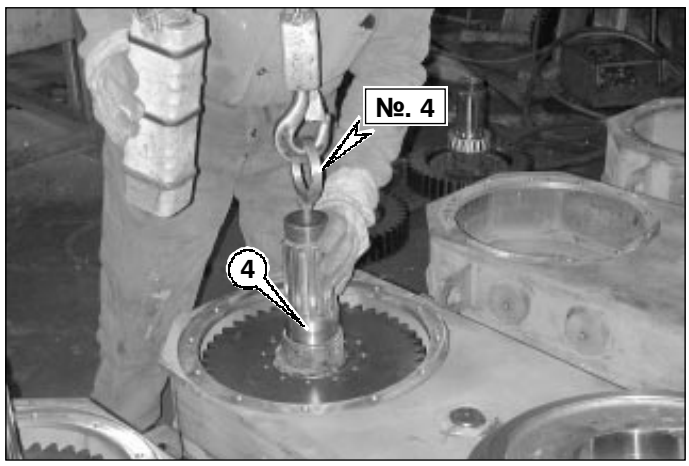


Fig. D/16



- Hook up gearbox 12 using fixture no. 2, on hoist in the opening of the axle bridge **Fig. D/46**. Watch for the centering pin 34!
- Insert bolts on the circumference, and tighten with torque per Table.
- Slide assembled half-axles 5 and 6 with outer rings of bearings 23 on sealing boots 2 and 3.
- Screw plug in the drain with sealing ring and dip stick.
- Place both housings with padding next to each other on a flat and firm surface to assemble the gearbox. Hook on the gearbox 3 and lift between the drive housings, **Fig D/47**. Equalize the axis of the sealing boot of the gearbox and the openings in housings 1 and 2. Slide the gearbox to the housing and bolt together. Support the gearbox suitably underneath the axle bridge 3. Hook up the second housing and lift, equalize the axis of the housing against the gearbox, slide and connect with bolts.

ATTENTION! When attaching the gearbox to housings 1 and 2, turn the pinion gear 7 against gaps in the idler gear 5.

- Press bearings 27 in lids 14, **Fig. D/48**. Apply LOCTITE to seating faces of covers 14 and openings in the housings 1, 2. Hit the cover lightly with a round bronze rod in the opening in the housing, and screw.

Note: For disassembly, two force-off openings are provided on lid 14.

Fig. D/47

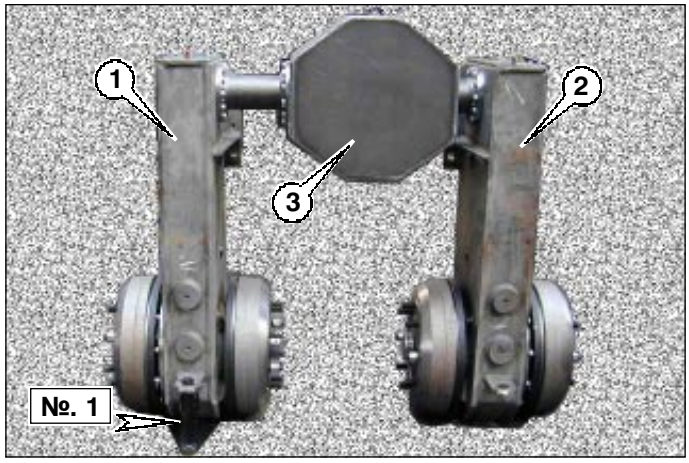


Fig. D/46

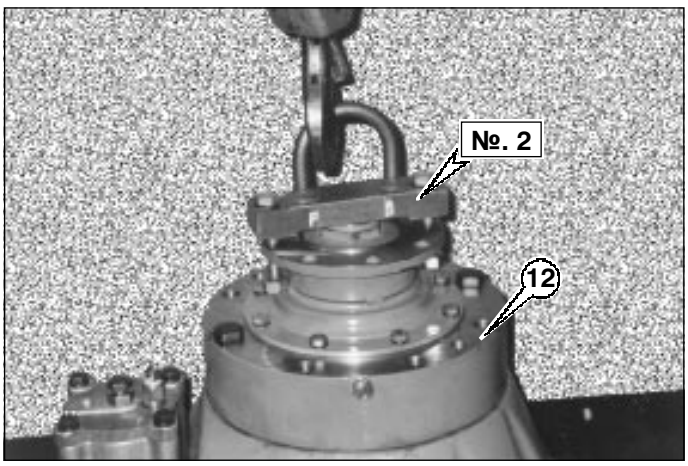
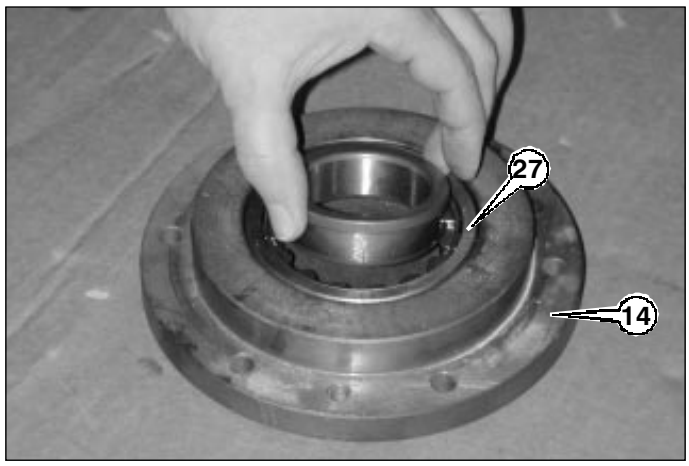


Fig. D/48



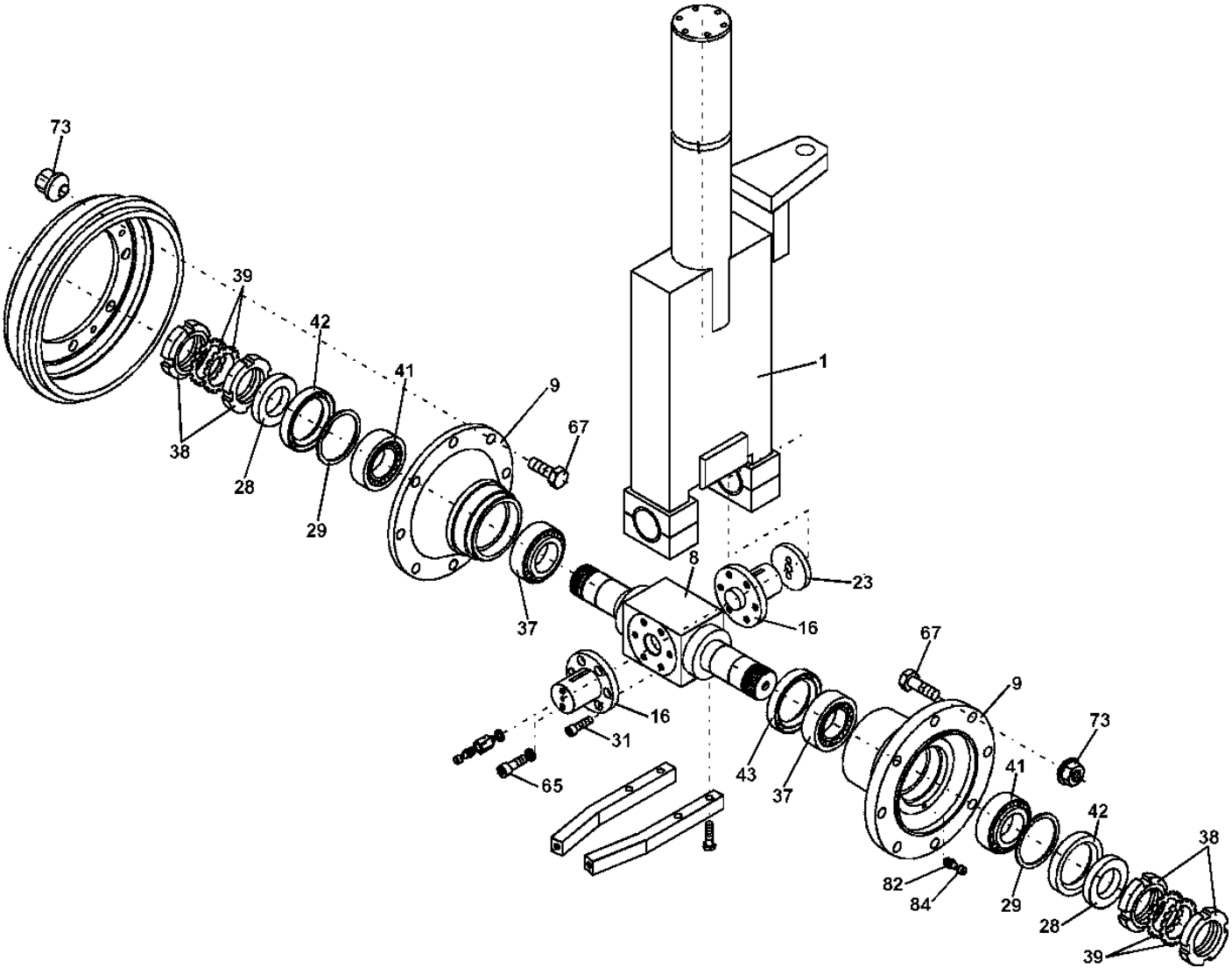
3. AXLE DISASSEMBLY

Preparatory work, disassembly and assembly must be done in line with the Safety Precautions and Instructions chapter. Observe ecological and health regulations.

3.1. PREPARATORY WORK

- Place the machine horizontally on a firm and flat surface.
- Place wooden block under rear wheels on both sides.
- Switch off batteries – the machine's brake has been set automatically.
- Place the sign "**THE EQUIPMENT IS OUT OF ORDER**" on he steering wheel.

Fig. E/2



4.3. ASSEMBLY OF FORK AND SHAFT ASSEMBLY WITH WHEEL HUBS

- Remove yokes 1A from the fork, remove bushings 1B and smear with grease, **Fig. E/27**.
- Insert bushings on pins 18, **Fig. E/28**.
- Assemble axle axis (pos. 8+9), hang by hook no.3, **Fig. E/26** on hoist.
- Insert shaft axle on forks into yokes, **Fig. E/29**.

Fig. E/27

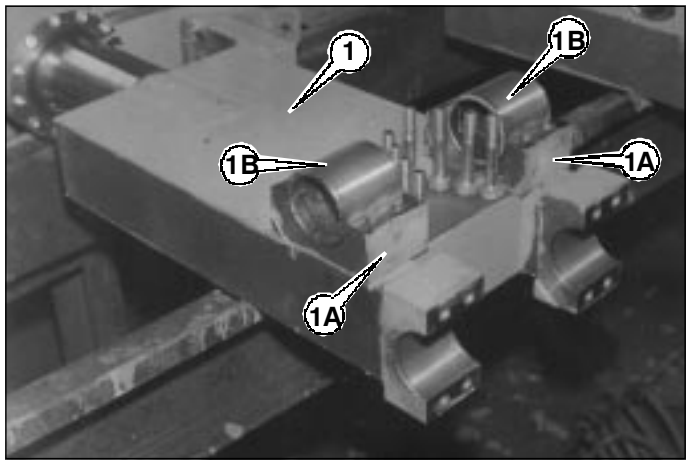
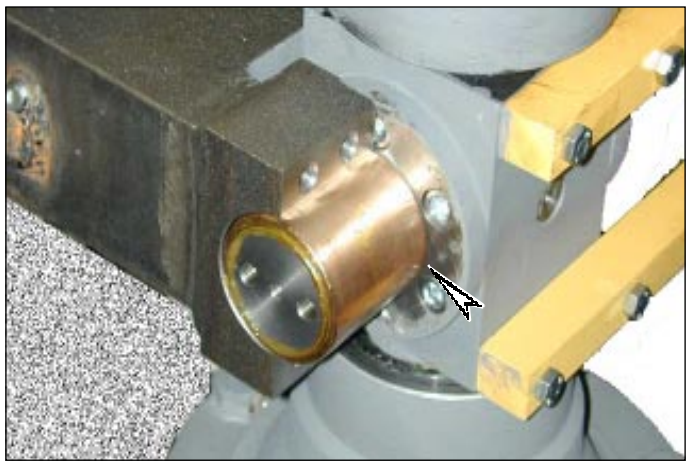


Fig. E/28

Fig. E/29



Linear hydraulic motor hv 80/40/200

Hydraulic linear cylinder transforms pressure to mechanical work in the cylinder with a linear motion.

Linear hydraulic motor consists of a cylinder and a piston, see **Fig. G/12**. Piston rings and collars provide sealing of surface inside the cylinder. The motor doesn't require any special maintenance or operation, only lubrication of pins at periods specified in the lubrication schedule.

When replacing seals, cleanliness of all parts is important. Observe ecological rules, should there be leaks of oil, described in chapter "Safety Regulations", section on repairs.

Technical data

Type		HV 80/40/200
Nominal pressure	MPa (PSI)	16 (2320)
Max. operational pressure (max. time 0,1 s)	MPa (PSI)	20 (2900)
Piston speed:		
Minimal	$m.s^{-1}$ (feet/sec)	0,01 (0,033)
Maximal	$m.s^{-1}$ (feet/sec)	0,5 (1,64)
Pushing force	N (lb)	75600 (16994)
Pulling force	N (lb)	55493 (12234)
Lift	mm (in)	200 (7,87)
Weight	kg (lb)	14,7 (32,4)

Tightening torque

	Connection piston rod 2, piston 3	Connection cylinder, lid nuts 1
Thread	M 30x2	M 85x2
Torque Nm (lb ft)	270 (199)	370 (273)

Priority valve

By including the valve in the hydraulic loop, energy saving is achieved. The valve operates as a three-way relieve valve that rectifies oil stream to the tank without any loss, when both steering wheels are idle. It operates independently of pressure in steering.

The loop includes also a logic valve, which opens the hydraulic loop following a signal from power steering when activated by the wheel motion.

Power steering tank no-05-25-5

The tank is made of steel plate, and includes cleaning cartridges, lid, oil level indicator, and venting.

Technical data:

Tank volume	l (gal US)	3 (0,8)
Through-flow, input	$dm^3.min^{-1}$ (gal US/min)	25 (6,6)
Weight of empty tank	kg (lb)	5 (11)
Filtering capacity	µm	10

- Slide the fork of the front axle 1 out of guiding bushings 2 to a distance of **Fig. G/20**.
- Place a ruler 2 to the hubs of wheels 1, and line up both axles to the ruler, see **Fig. G/21**.
- Extend piston rod of the linear hydraulic motor to L - 94 mm (3.7”) from end position as in **Fig. G/22**.
- Loosen clamping of ball joints on steering rods 36, and by turning steering rods adjust ball joints against conical holes in fork brackets 1, **Fig. G/23**.
- Press ball joints in the conical holes, and secure with a nut and a cotter pin.
- Fix steering rods at both ends by tightening the clamp.
- Connect hoses to hydraulic motors. Lubricate pins with grease to table in section 1.3.

Fig. G/21

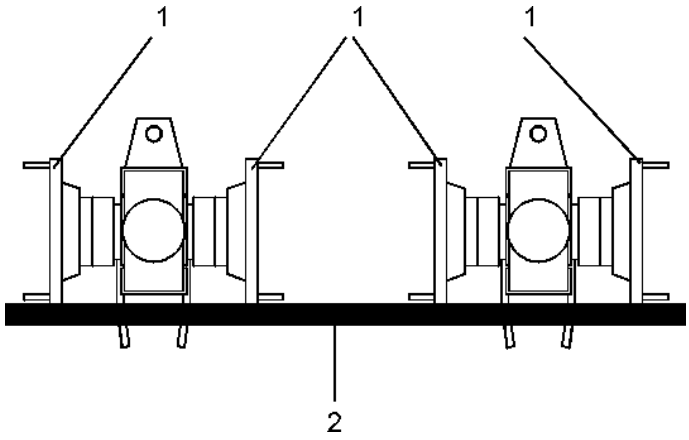


Fig. G/22

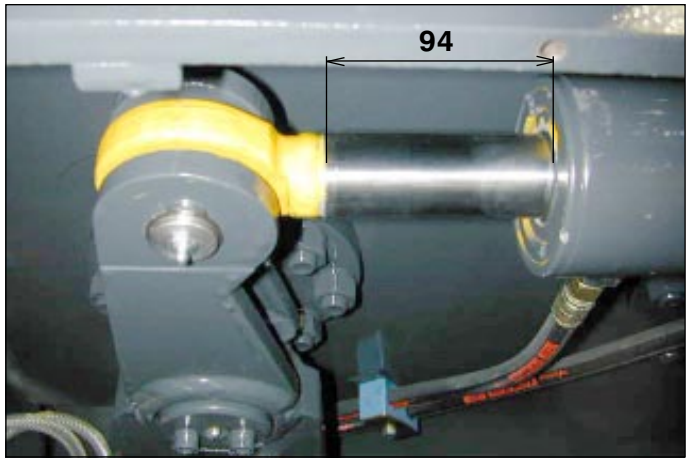


Fig. G/20

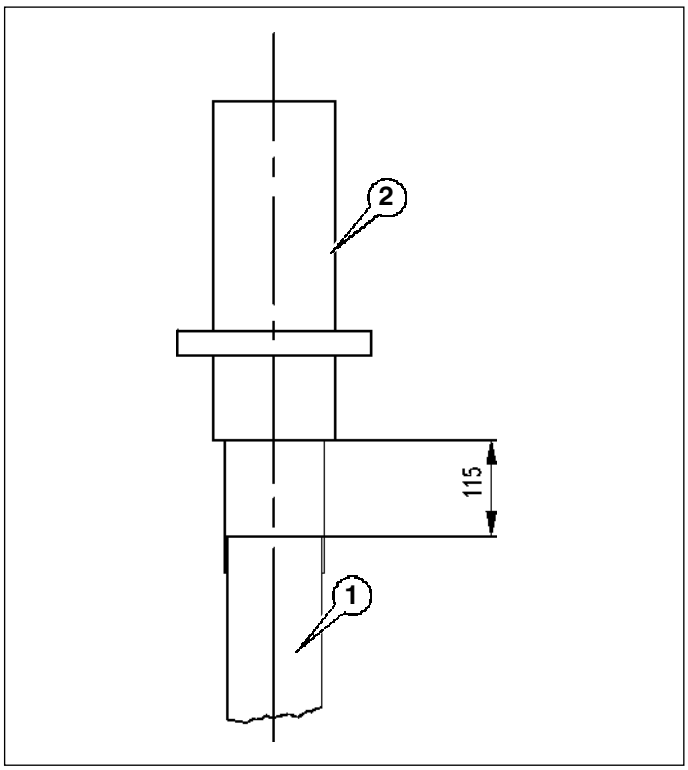
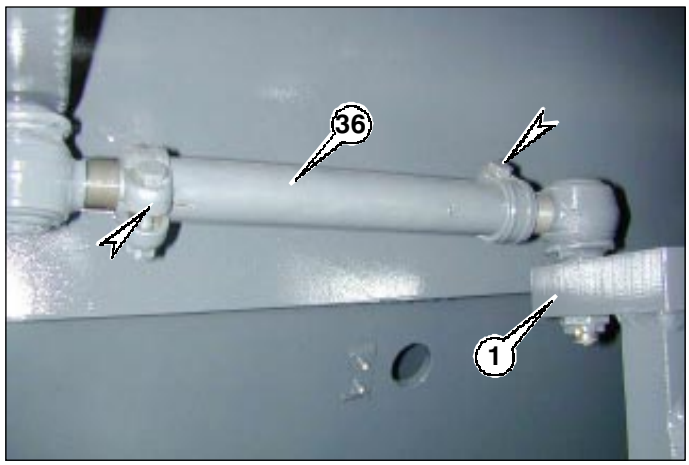


Fig. G/23



3.3. DISASSEMBLY OF BOOSTER

- Remove floor cover plates at the service place.
- Drain brake fluid into a ready basin by unscrewing plug 8 at the output of the booster and by stepping on the pedal several times.
- Remove hose 11 of the brake fluid input from the tank to the brake cylinder, disconnect wiring from switch 22.
- Remove bolts of input 58 from the brake to the booster, **Fig. H/6**.
- Remove booster from the frame.
- Remove brake fluid splitter 25 and reduction 5, **Fig. H/7**.

Installation of booster

- Install splitter and reduction on the booster.
- Screw booster on brackets on the frame.
- Screw fitting of air intake between the booster and the brake.
- Attach input hose of brake fluid.
- Pour brake fluid in the container, and vent the entire system, see 3.3.

Fig. H/6

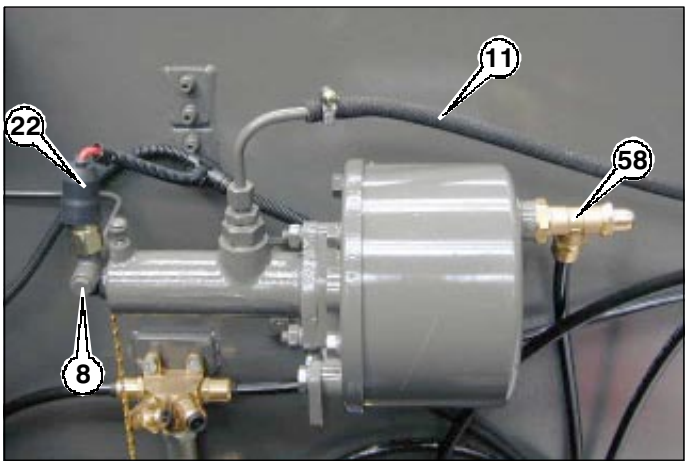
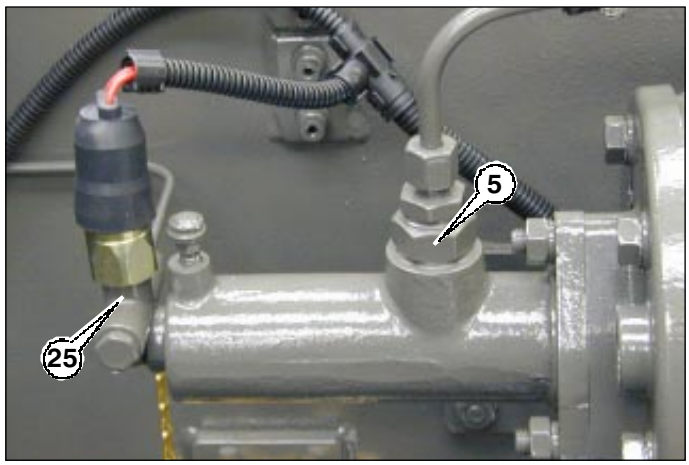


Fig. H/7



2.3. REAR AXLE WHEELS

outside wheels

- Wedge front wheels on both sides.
- Lift the rear end of the machine by suitable means, **Fig. K/3**, and support them on a pad above ground.
- Unscrew hose (2) from the axle shaft.
- Unscrew this hose also from the safety valve (4), thereafter also the valve from the tire.
- Remove wheel nuts and take off the wheel.

inside wheels

- Unscrew hoses (2) and (3) from rotor (1).
- Remove rotor (1) from the center shaft of the axle.
- Remove wheel nuts and take off the wheel.
- Unscrew hose (3) from the safety valve (4), thereafter also the valve from the tire **Fig. K/4**.

Fig. K/2

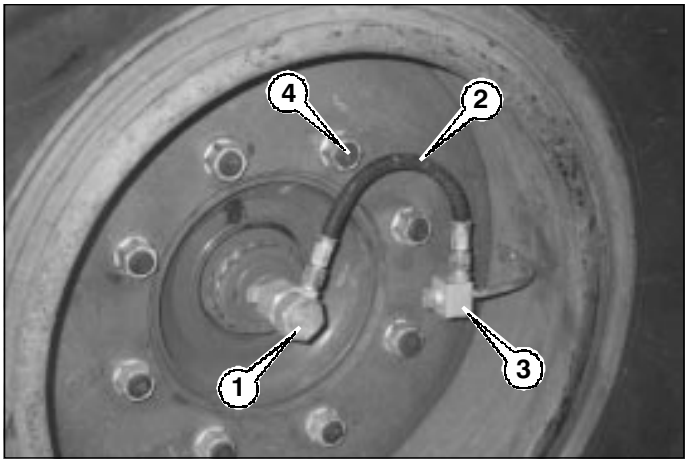


Fig. K/3

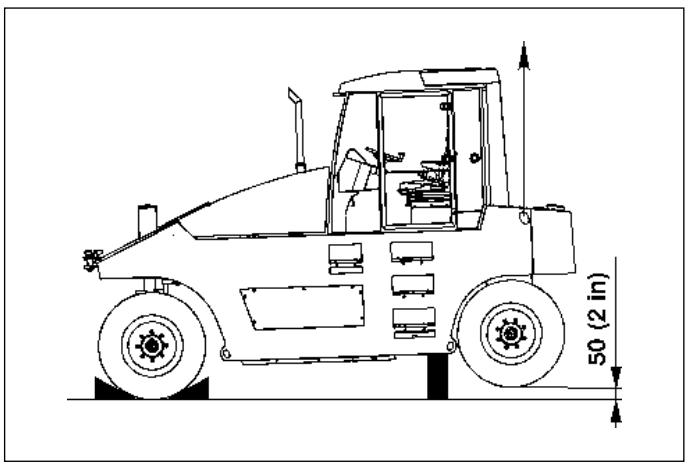


Fig. K/4