Contents

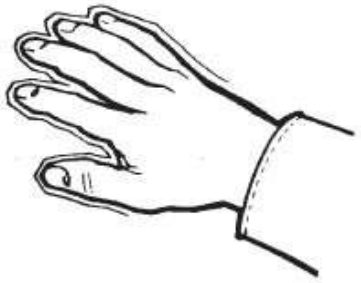
Shop Manual MT26/MT31

0.2.2 Vibrations

When using vibrating tools e.g. chisel hammer, impact drill, impact nut runner, grinder injuries may be sustained by transition of tool vibrations to the hands.

Risks
Vibrations may cause vascular spasms (prickling and pain) in the surface veins. The fingers turn white, cold and senseless. Also nerves, muscles, bones, sinews and joints may be injured.

The risk of injury is believed to increase by smoking and also by low temperatures e.g. if the tools are cold or if the hands are exposed to chilling air.



The injuries become apparent especially when the fingers are cold, often when not working.
Vibration injuries are curable if taken care of in time.

Protective measures
Use heavy gloves. Gloves provide some protection against vibrations and low temperatures.
Alternate between vibration-free and vibrating jobs to provide the body with a possibility to rest from vibrations. By varying the work posture and grips, the body is not one-sidedly exposed to vibrations.
Avoid smoking before and during the work to help the blood circulation as much as possible. If you notice any signs of vibration injury consult a doctor.

Protection against vibration
• Heavy gloves
• Alternate jobs
• Do not smoke before and during the work

0.2.3 Injurious Noise

Rule of thumb: Noise that is louder than 85 dB (A) and that prevails for more than 8 hours is classed as injurious. (Some countries have other limits.) High frequency noise (high-pitched) is more injurious than low frequency noise (low-pitched) of the same amplitude.

Risks
Partial deafness, in difficult cases impaired hearing beyond cure. It is impossible to train your tolerance to noise. You may believe that you are doing that if you notice less of the noise after some time.
IN THAT CASE YOU ARE REALLY IN DANGER.
Probably your sense of hearing is already impaired.

Protective measures
With noise absorbers on roof and walls and screens between work places it is easier to limit the propagation of noise. Against injurious noise you have to protect yourself with ear muffs. Ear muffs must be tested and approved.

Protection against noise:
• Use ear muff

How to read fault codes from the ECU control unit

Reading fault codes for the ECU control unit:

The instructions below explain how to read fault codes in the form of flashes from the diagnostics switch.
You can see how to interpret the flash codes on the next page.
How to read fault codes from the diagnostics lamp

1 Switch on the ignition.

2 Press the diagnostics switch for at least one second. Diagnostic lamp will light up.

3 A fault code will be flashed out on the diagnostics upper lamp for the control unit.

This flash code consists of
long flashes (about 1 second long)
and
short flashes (0.3 seconds long).

Long flashes are equivalent to tens and short flashes to units.

Example: long - long - short - short - short - short - short = fault code 25.

See the example on the right.

= 25

Repeat this procedure until the first flash code is repeated.
This means that the entire fault code memory has been flashed up.
If the fault code memory is empty, only one long flash about four (4) seconds long is given.

See the example on the right.

= 4 s

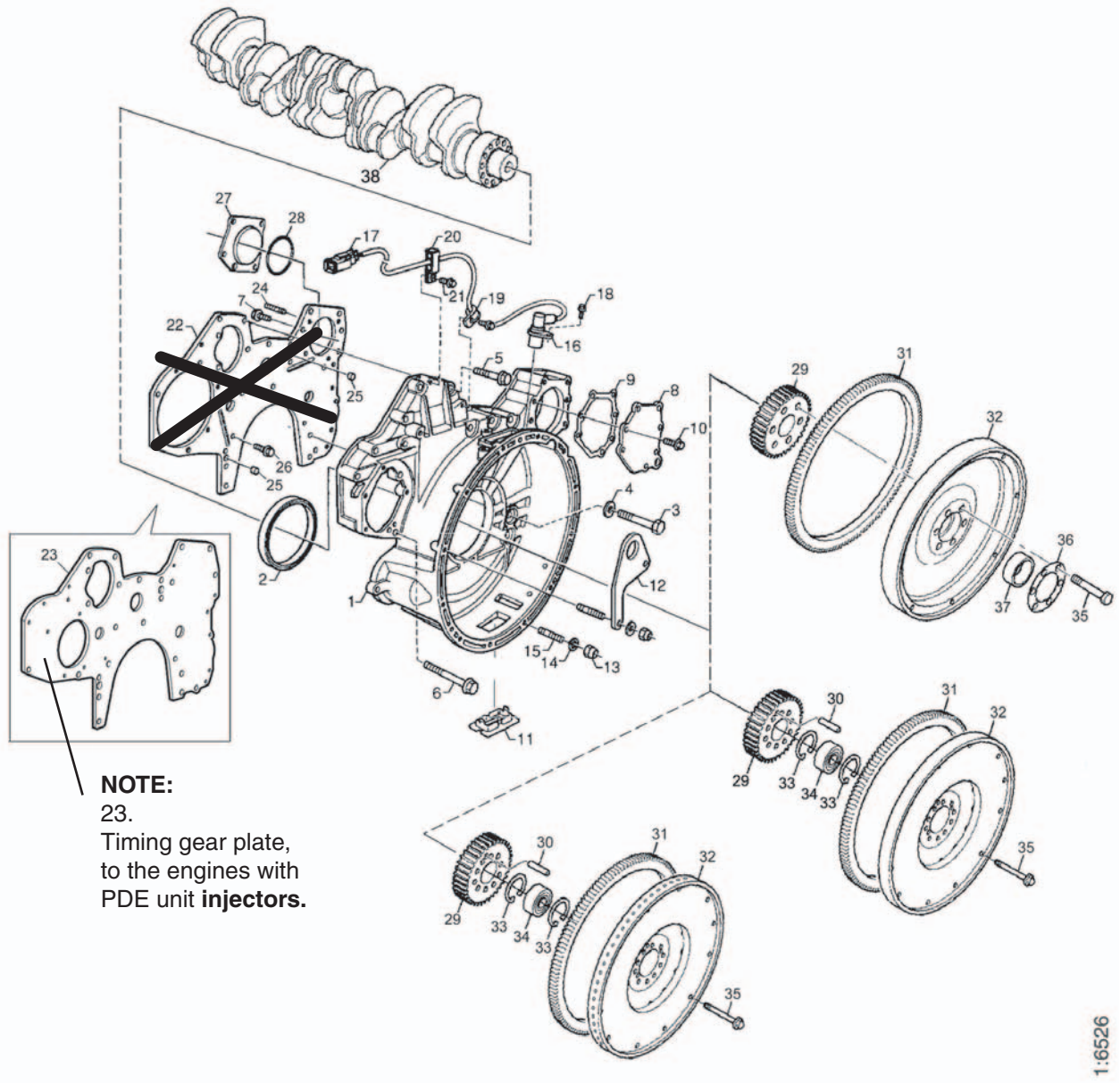
4 See the **flash code table** for a description and localisation of the fault.

5 The PC-based diagnostics tool must to be used to gain further information on the fault code.

6 A single, very long flash (4 s) means that there are no fault codes stored in the memory.

= 4 s

Flywheel and flywheel housing



1. Flywheel housing
2. Seal
3. Bolt
4. Washer
5. Flange bolt
6. Flange bolt
7. Flange bolt
8. Cover
9. Gasket
10. Flange bolt
11. Cover
12. Lifting eye
13. Hexagon nut
14. Washer
15. Stud
16. Rotation speed sensor
17. Contact housing
18. Flange bolt
19. Clamp
20. Clamp
21. Bolt
22. Timing gear plate,
    engines with injection pump
23. Timing gear plate,
    engines with PDE unit injectors
24. Stud
25. Pin
26. Flange bolt
27. Cover
28. O-ring
29. Crankshaft gear PF
30. Pin
31. Ring gear
32. Flywheel
33. Circlip
34. Ball bearing
35. Bolt
36. Washer
37. Guide sleeve
38. Crankshaft

Cold engine

Effect	Cause	Troubleshooting	Action
Instrument indicates low temperature	Defective sensor/instrument	Check that sensor and instrument match each other (120 and 150 °C) Check with a separate instrument	
	Thermostat jammed in open position	Check operation of thermostat	

Coolant loss

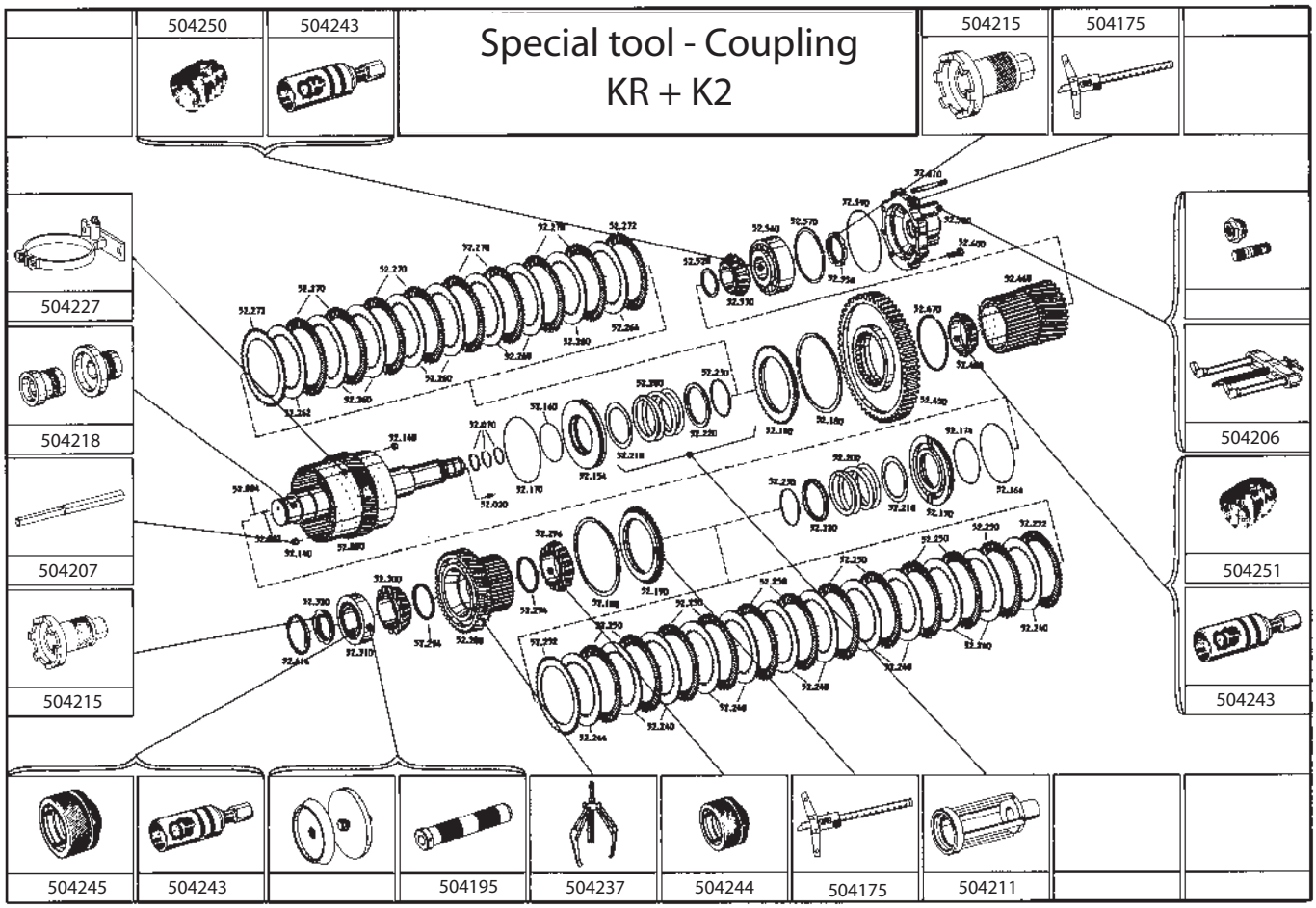
Effect	Cause	Troubleshooting	Action
	Defective cylinder head gasket (external leakage)		
	External leakage		
Coolant pressed out of radiator on DSI engines	Turbocharging pressure enters cooling system via leaking charge air element	Test pressure (air 0.5 bar, liquid 4 bar)	
	Crack in cylinder head (not cracks between valve seats)	**If the fault is hard to trace:** Change all cylinder heads for exchange cylinder heads. (Or test pressurize all cylinder heads. Heat the cylinder heads before pressurizing them.)	
	Cracked cylinder liner	Grey oil = Coolant in oil Locate the leak by removing the oil sump and pressurizing the cooling system while turning the engine over by hand	

Polluted coolant

Effect	Cause	Troubleshooting	Action
	Faulty inhibitor		Clean the cooling system and fill it with coolant as described in the maintenance instructions
	Overdosed corrosion inhibitor		

Fault Code (hex)	MEANING OF THE FAULT CODE Possible reason for fault detection	Reaction of the TCU	Possible steps to repair	Remarks
BB	SLIPPAGE AT CONVERTER LOCKUP CLUTCH TCU calculates a differential speed at closed converter lockup clutch. If this calculated value is out of range, TCU interprets this as slipping clutch. *low pressure at converter lockup clutch* *low main pressure* *wrong signal at engine speed sensor* *wrong signal at turbine speed sensor* *wrong size of the sensor gap* *clutch is defective*		Check pressure at converter lockup clutch Check main pressure in the system Check sensor gap at engine speed sensor Check sensor gap at turbine speed sensor Check signal at engine speed sensor Check signal at turbine speed sensor Replace clutch	
BC	OVERSPEED OUTPUT TCU messures an transmission output speed above the defined threshold	No reaction OP-Mode: normal		
BD	S.C. TO GROUND AT ENGINE BRKAE SOLENOID TCU detected a wrong voltage at the output pin, that looks like a s.c. to vehicle ground *cable is defective and is contacted to vehicle ground* *engine brake solenoid has an internal defect* *connector pin is contacted to vehicle ground*	No reaction OP-mode: normal	Check the cable from TCU to the engine brake solenoid check the connectors from difflock solenoid to TCU check the resistance [1] of difflock solenoid	[1] see chapter 4
BE	S.C. TO BATTERY VOLTAGE AT ENGINE BRAKE TCU detected a wrong voltage at the output pin, that looks like a s.c. to battery voltage *cable is defective and is contacted to battery voltage* engine brake solenoid *has an internal defect* *connector pin is contacted to battery voltage*	No reaction OP-mode: normal	Check the cable from TCU to the engine brake solenoid check the connectors from engine brake solenoid to TCU check the resistance [1] of engine brake solenoid	[1] see chapter 4

Dismantle multi-disc clutch KR/K2



Fasten clutch by means of clamping ring (arrow) on the assembly car.

(S) Clamping ring 504226
or
(S) Clamping ring 504227

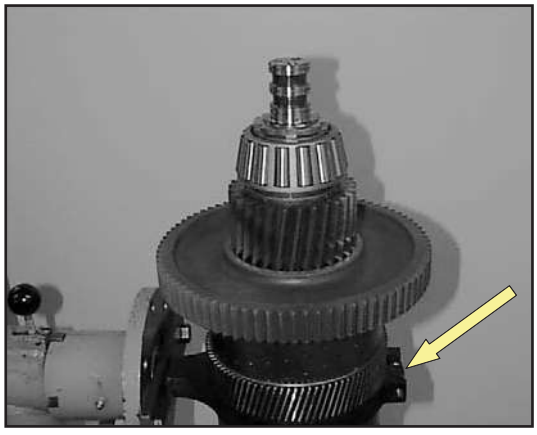


Figure 198

Expand the two snap rings.
Introduce ball bearing with the annular groove showing upwards until the upper snap ring is engaged in the groove of the ball bearing.

(S) Clamping pliers 504730


Figure 404

Insert gear wheel until contact is obtained.

(S) Mallet 504196

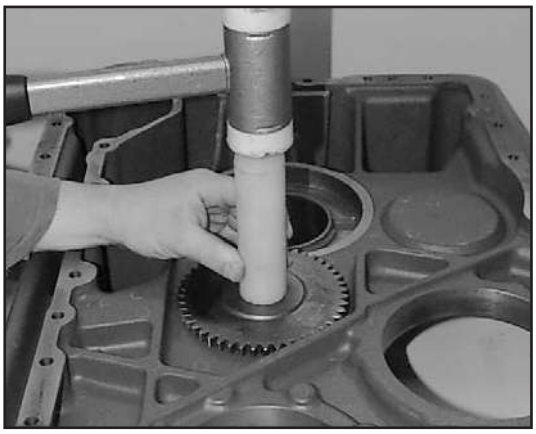


Figure 405

Fix gear wheel by means of circlip.

(S) Set of external pliers 504231


Figure 406

Adjust bearing pre-load of differential bearing 0,0 ... 0,1 mm (Figure 407 ... 409):

Determine measure I, from the mounting face to the locating face of the bearing outer race.

Measure I e.g.. ..... 66,36 mm

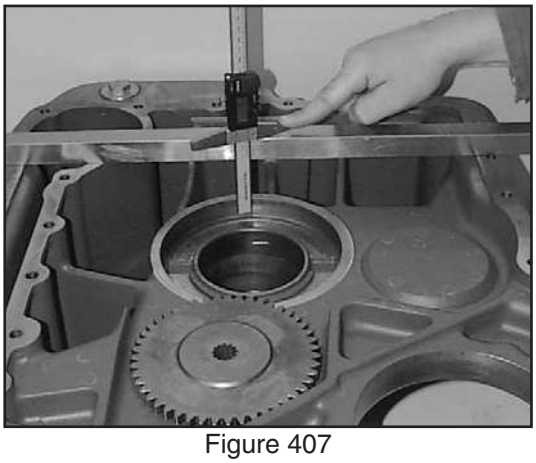


Figure 407

Heat bearing bore (about 90° C).

(S) Hot-air blower 230 V 504193
(S) Hot-air blower 115 V 504194

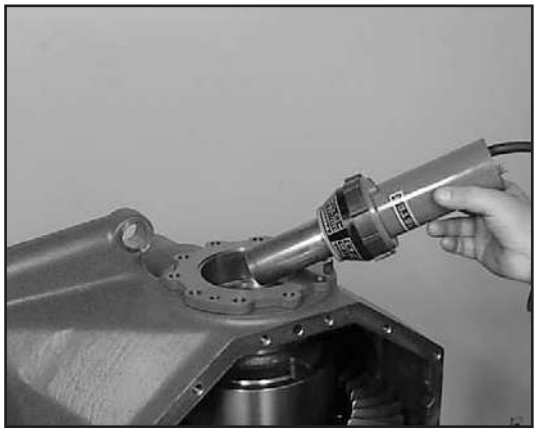


Figure 624

Introduce the flange shaft and fasten it uniformly by means of hex. head screws.
Torque limit (M12/8.8) ..... 79 Nm

LH and RH seal retainer are different !
Pay attention to the installation position and the radial installation location, see the markings, applied at the disas-sembly !

Now, install opposite flange shaft accordingly (Fig. 620 ... 625).

After the assembly of the two seal retainers, relax the differential bearing by tapping (use plastic mallet) !

(S) Plastic mallet 504196

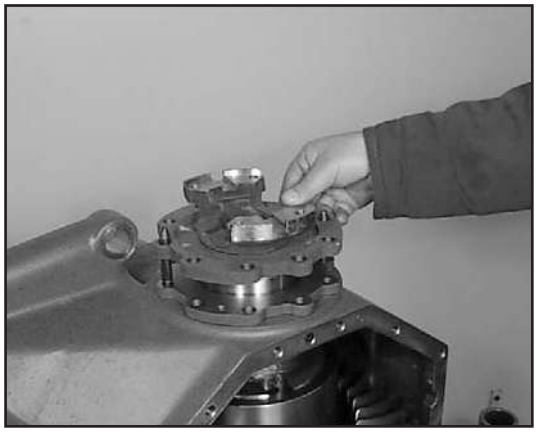


Figure 625

Wet mounting face with sealing compound Loctite (Type-No. 574).
Install two adjusting screws and position cover against shoulder.

Pay attention to the radial installation location !

(S) Adjusting screws 504186

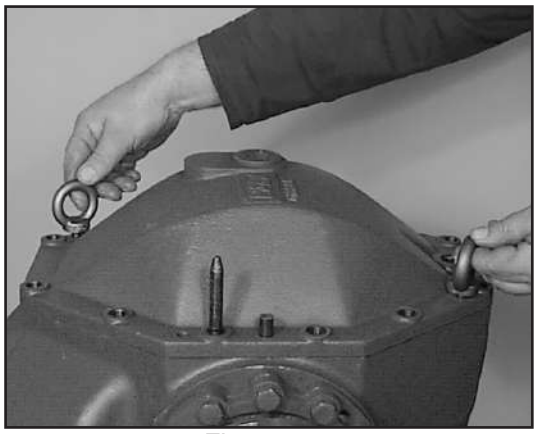


Figure 626

Locate cover by means of hex. head screws (do not tighten) and drive the two roll pins flush-mounted in.

Now, tighten the cover finally, using hex. head screws.

Torque limit (M12/10.9) ..... 115 Nm

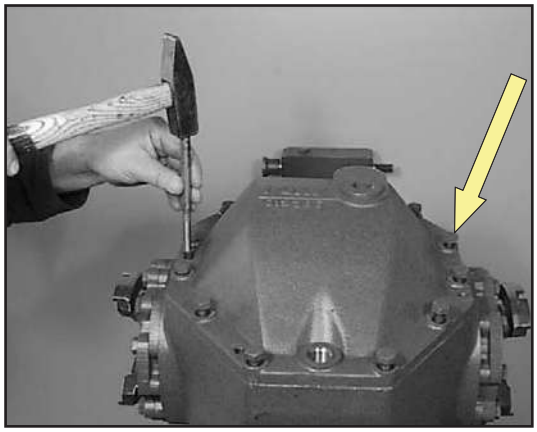


Figure 627

Manual transmission

Disassembly

Fasten the complete transmission on the assembly car.

(S) Assembly car	504213
(S) Support	504214

Remove all oil lines.

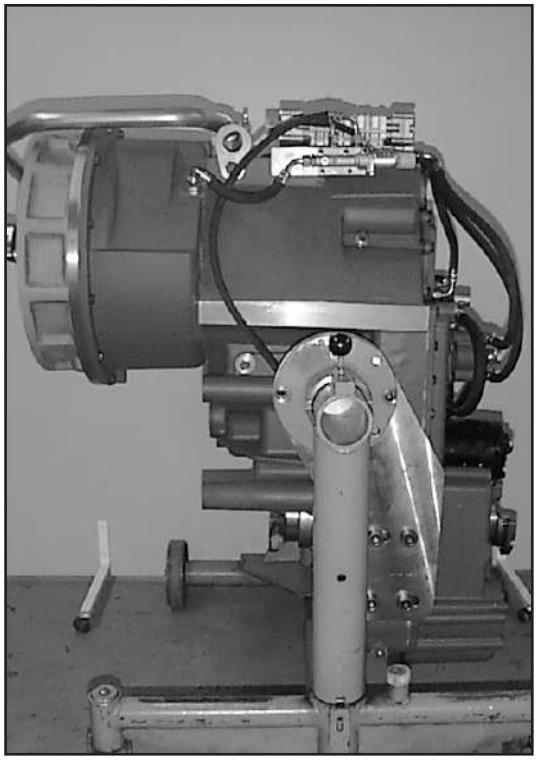
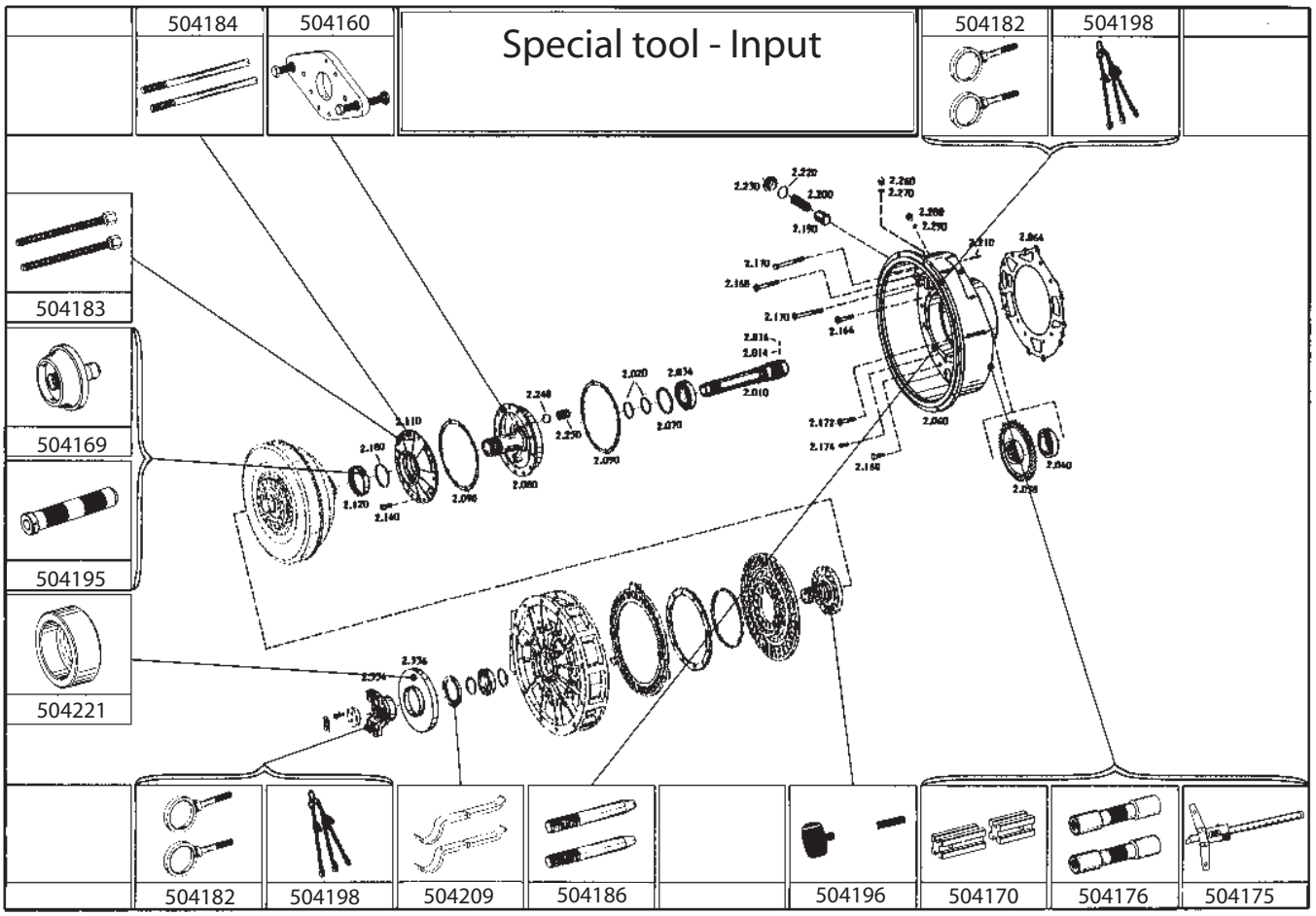


Figure 120



Multi-disc clutch-K3

The following sketch or table show plate stacking and installation position of the components!

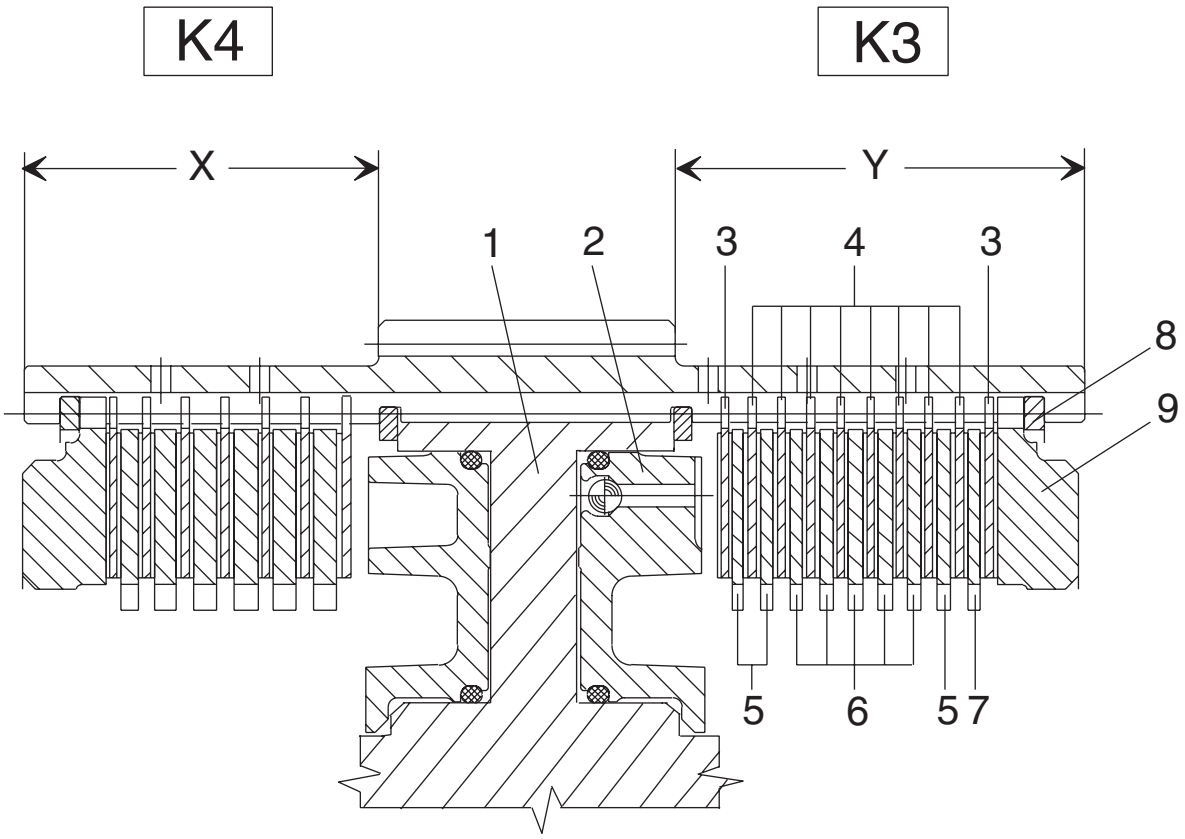


Figure 259

Item.	Designation	Quantity	s (mm)	Remark
1	Plate carrier	1		
2	Piston	1		
3	Outer plate	2	1,85	One-,side coated
4	Outer plate	8	2,5	Coated on both sides
5	Inner plate	3	2,5	
6	Inner plate	5	3,0	
7	Inner plate	1	2,5 ... 4,0	Optional
8	Snap ring	1	2,55 ... 3,10	Optional
9	End shims	1		
Number of friction surfaces: 18				
Plate clearance: 2,6 ... 2,8 mm				

Outer plates Item 3 with the uncoated side facing the piston or the end shim!
The respective clutch side can be recognized by the length of the plate carrier, see sketch!
K3 = Measure Y (long plate carrier side)
K4 = Measure X (short plate carrier side)

3.6.1.3 Front Brake Calipers

The two front wheel brake units are equipped with two calipers on each hub.

Removal
Rise both front wheels off the ground using a floor jack or a crane.
Place dumper on safety stands.
Remove actual wheel (Ref. 3.4.1)

WARNING!
Be aware of the risk of injury to people and equipment when handling heavy objects!

Thoroughly clean the front axle and the area around for any accumulated dirt.
Disconnect the brake lines connected to each caliper. Plug lines as they are disconnected.
Unscrew the six bolts securing each caliper to the front axle drive assembly.
If caliper is going to be replaced with another unit, keep the line connectors.

Installation
Replace brake and bleeding line connectors if missing.
Position the caliper on the front axle drive assembly and tighten the four bolts.
Connect the brake lines to each caliper.
Bleed the brake circuit. (Ref. 3.6.1.6)
Replace wheel. (Ref. 3.4.1)

Control
Check that all connections are located as before removal, and rotate wheel to make sure there is no binding parts.
Lift dumper, remove stands, and lower to ground.
Check wheel nut torque. (Ref. 3.4.1)
Perform a test drive to see that maintained equipment is functioning as required.

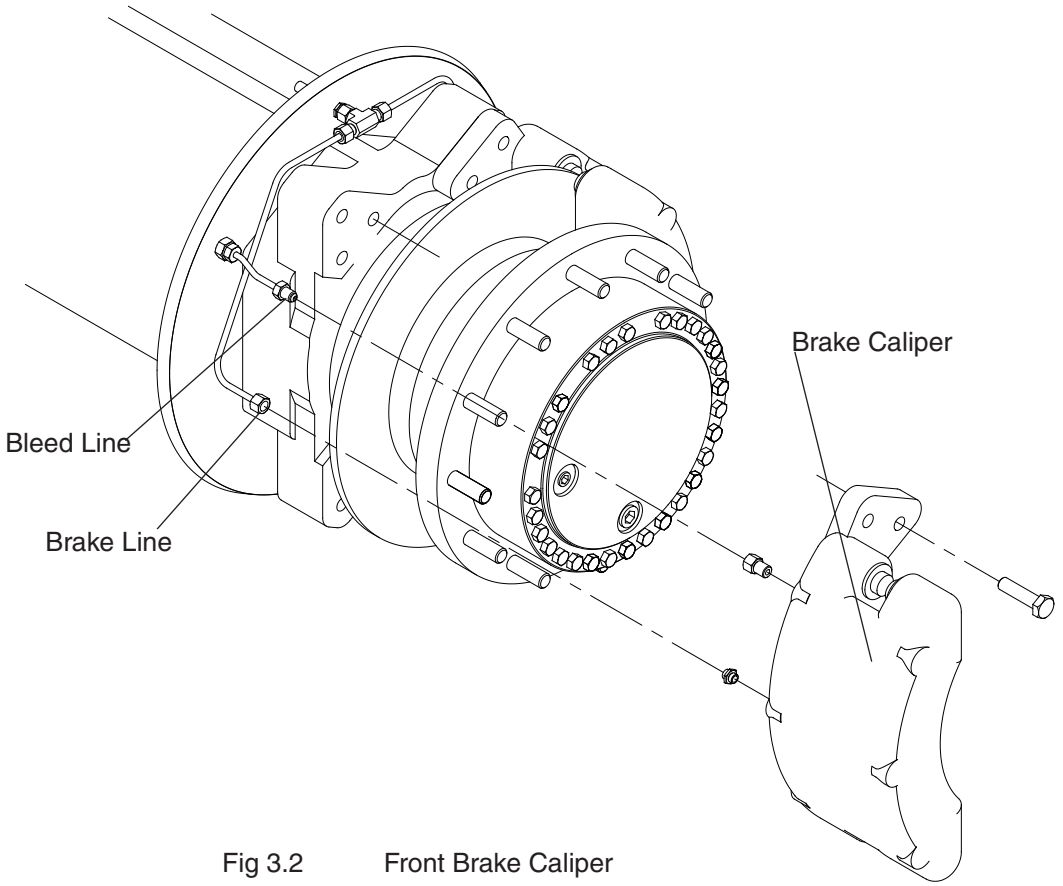
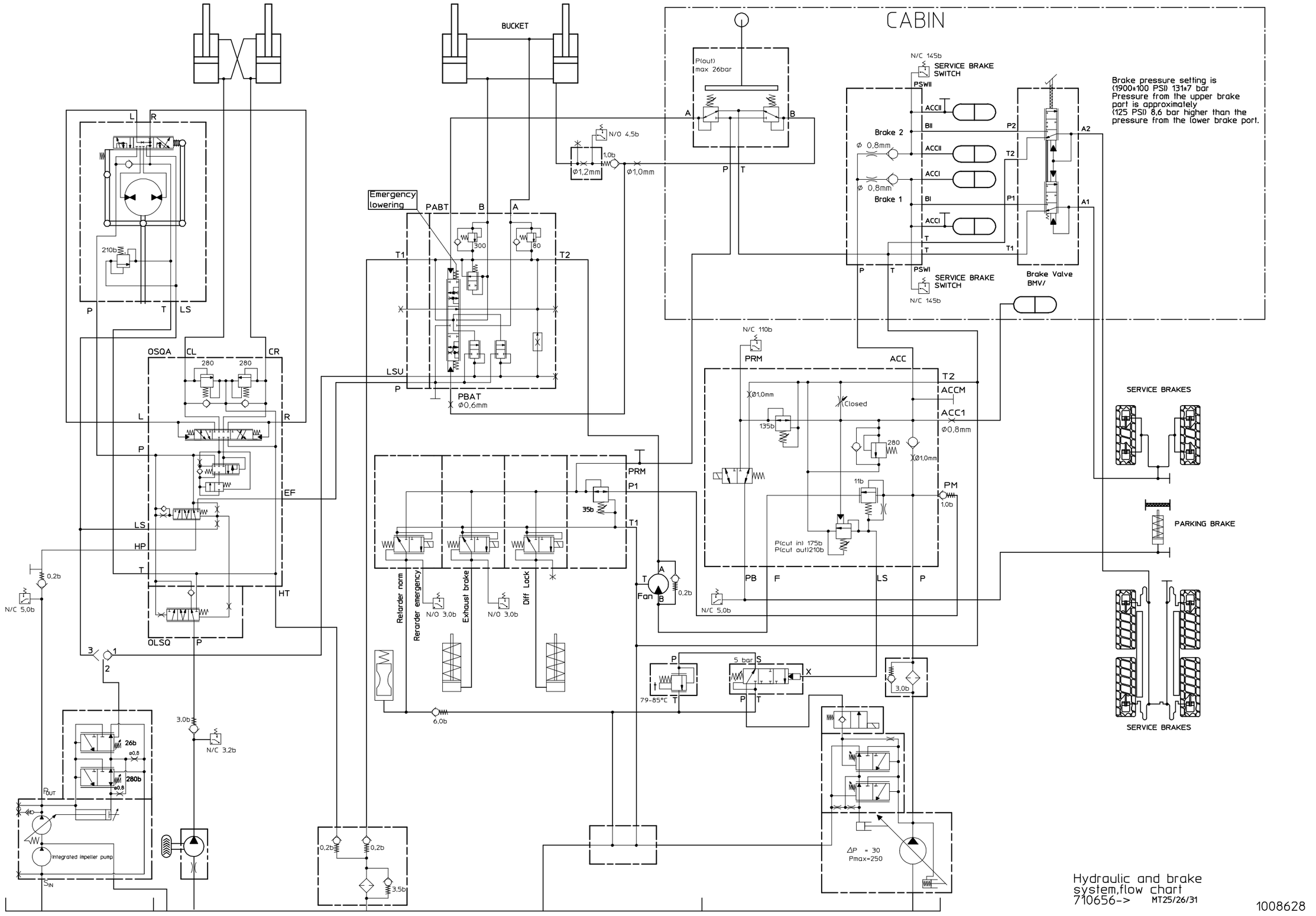
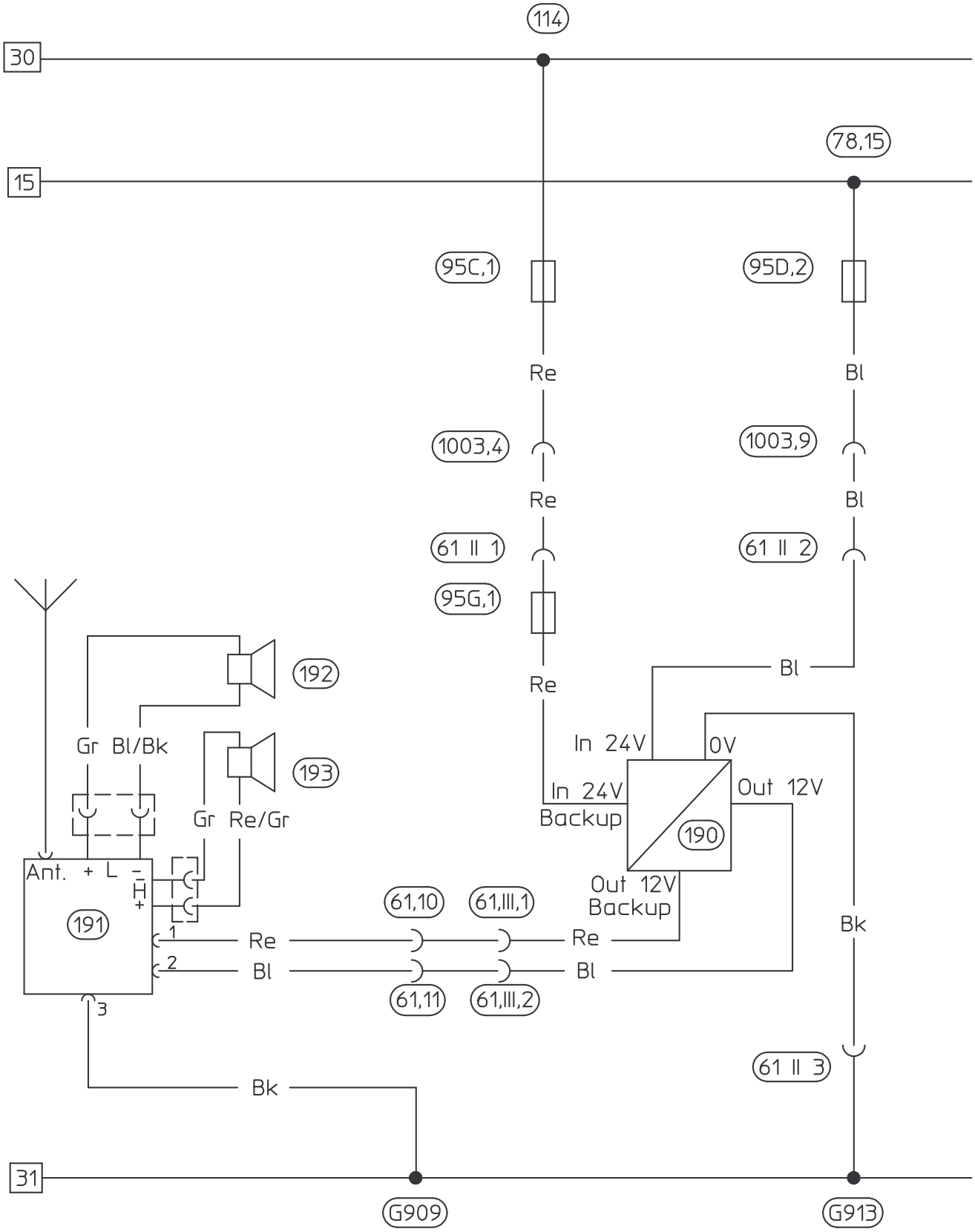


Fig 3.2 Front Brake Caliper

Hydraulic circuits



Circuit 13 Radio



9 Optional Equipment

The MOXY trucks are usually equipped with a number of options.
For maintenance purposes the more complex of these options will be described in this chapter.

9.1 Automatic Tail Gate

The optional automatic tail gate is closed when dumper body is down in transport position, and opens as the body is tilted.
The tail gate consists of the gate itself, and two arms pivoting in the tail gate bearings.

Removal
Thoroughly clean the tail gate and area around for any accumulated dirt
Dumper body must be in the down position for removal of the tail gate.
Secure the tail gate to the dumper body by using heavy clamps.

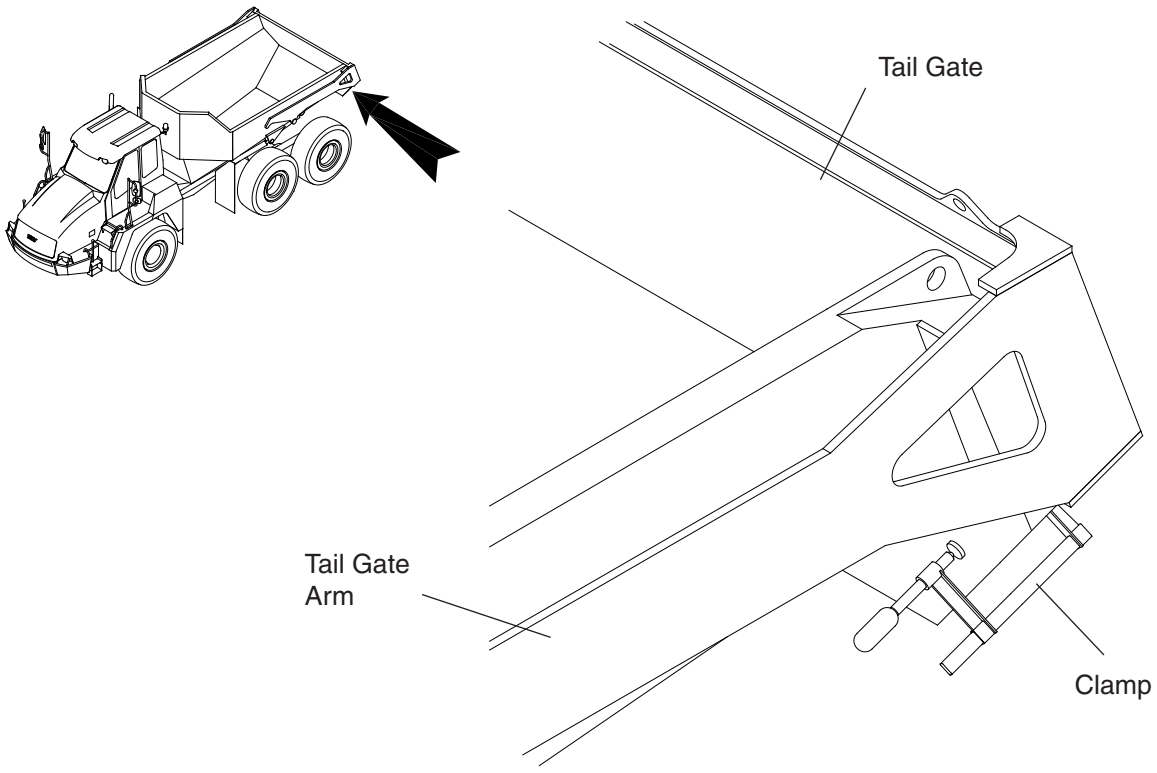


Fig 9.1 Securing Tail Gate