Document Title: **Description**	Function Group: **000**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Description

Articulated hauler A40 consists of two main sections, the tractor unit and the load unit. The two units are joined by the frame joint which allows movement about a vertical axis for steering. The frame joint also allows the two units to twist and move in relation to each other along a horizontal axis.
The tractor unit consists of a six-cylinder diesel engine, transmission and dropbox as well as a drive axle. The cab is rubber-mounted to the frame. The frame is independently suspended in relation to the drive axle.

The load unit consists of a frame, elevation load body, as well as a front and rear drive axle, which are linked by the bogie suspension.

The hauler has constant 4-wheel drive with the possibility of engaging and disengaging
6-wheel drive. There is a longitudinal differential lock in the dropbox and there are differential locks on all drive axles.

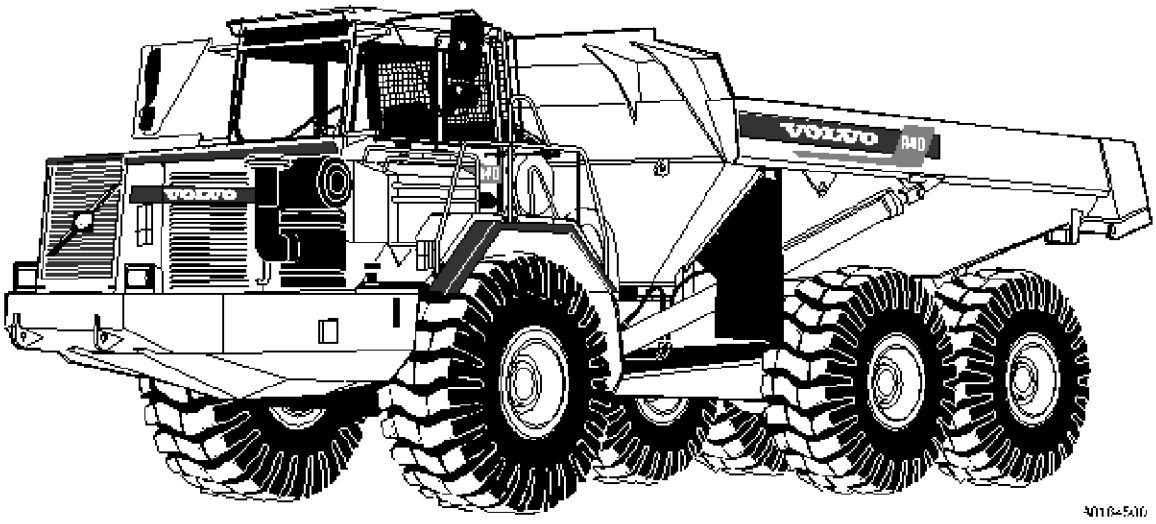


Figure 1

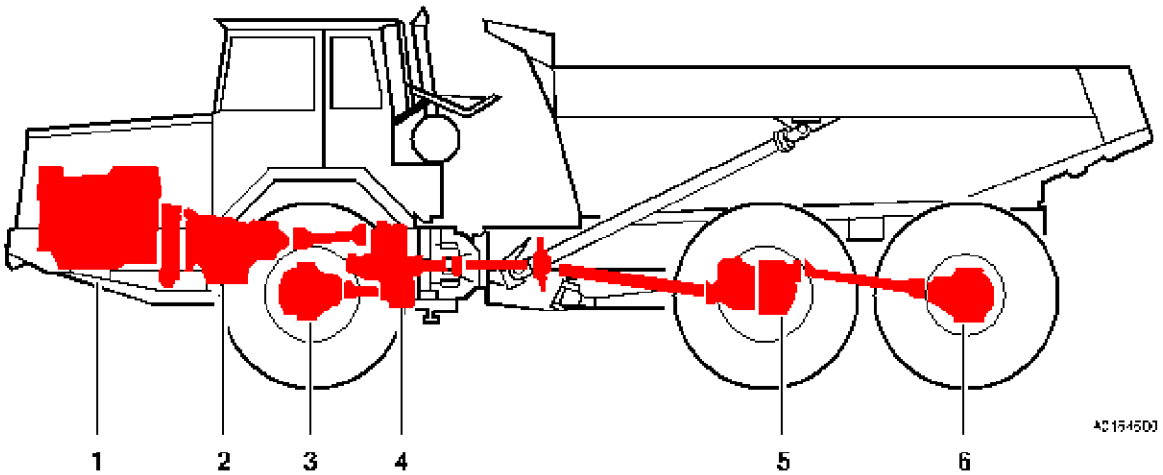


Figure 2
Type and "product no.", articulated hauler A40

Document Title: **Drive axles**	Function Group: **030**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Drive axles

Also refer to Service Manual "Drive axles AHW71".

	Tractor unit	**Front drive axle load unit**	
Make	Volvo	Volvo	Volvo
Type	AHW 71C	AHW 71D	AHW 71E
Product number	23746	23747	23748
Final drive	EVBM	EVBM	EVBM
Reduction ratio	3.56:1	3.56:1	3.56:1
Hub reduction	Planetary gear	Planetary gear	Planetary gear
Reduction ratio	4.833:1	4.833:1	4.833:1
Differential lock	Dog clutch	Dog clutch	Dog clutch

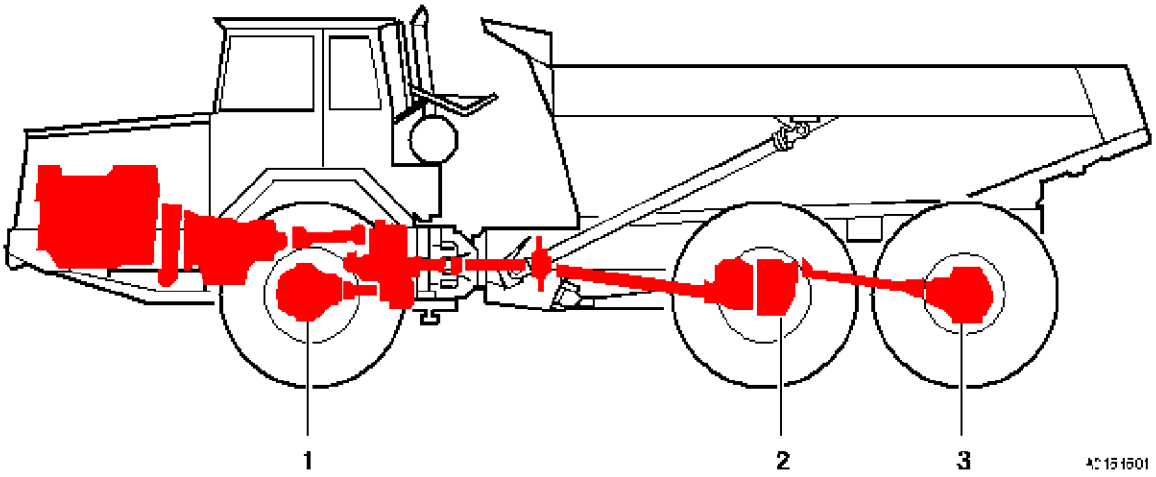


Figure 1
Drive axles

1. AHW 71C
2. AHW 71D
3. AHW 71E

VOLVO
Construction Equipment

Service Information

Document Title: **Oil and fluid change, intervals**	Function Group: **030**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Oil and fluid change, intervals

	Hour
Engine	250
Oil bath air cleaner	250
Transmission	500
Brake cooling oil	1000
Coolant	2000
Dropbox	2000
Drive axles	2000
Brake oil/Hydraulic oil	2000

Document Title: **Steering system**	Function Group: **030**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Steering system

Type	Hydro-mechanical articulated steering
Steering wheel turns, lock-to-lock	3.4 turns
Steering angle	2 x 45°
Time, steering angle	min. 25°/s
Steering gear	
Type	Rack and pinion gear

Hydraulic pump, engine dependent and ground dependent for secondary steering. See heading "Hydraulic system" on ---- not implemented: INTXREF ----: .

Control valve, steering	
Type	Slide (spool) valve
Steering cylinder	
Number of	2 double-acting
Damping cylinder for steering	
Damping spring, pre-load	2.2–3.8 mm (0.087–0.15 in)

VOLVO
Construction Equipment

Service Information

Document Title: **Time Guide**	Function Group: **070**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Time Guide

A40

1		**Standard parts, service**

16		**Lubricant, fuel, other fluid**
16206	2,00	Engine, changing oil and filter
16234	1,00	Hydraulic oil tank, changing oil and filter excl. cleaning tank
16236	1,50	Hydraulic oil tank, changing oil and filter incl. cleaning tank
16238	1,50	Transmission, changing oil and filter
16250	1,00	Dropbox, changing oil
16260	3,00	Axles, changing oil 6x6

17		**Service**
17001	0,75	Washing, external cleaning
17101	1,00	Arrival inspection
17102	1,25	Delivery inspection
17202	7,00	Guarantee inspection 100 hours
17204	10,00	Guarantee inspection 1000 hours
17302	0,50	Maintenance service, daily
17304	0,50	Maintenance service, 50 hours
17307	4,00	Underhållsservice, 250 timmar
17310	4,50	Maintenance service, 500 hours
17312	7,00	Maintenance service, 1000 hours
17314	16,00	Maintenance service, 2000 hours

2		**Engine with mounting and equipment**

21		**Engine**
21002	2,00	Compression test, engine at operating temperature
21070	8,50	Engine, removing
21071	48,00	Engine removed, general overhaul

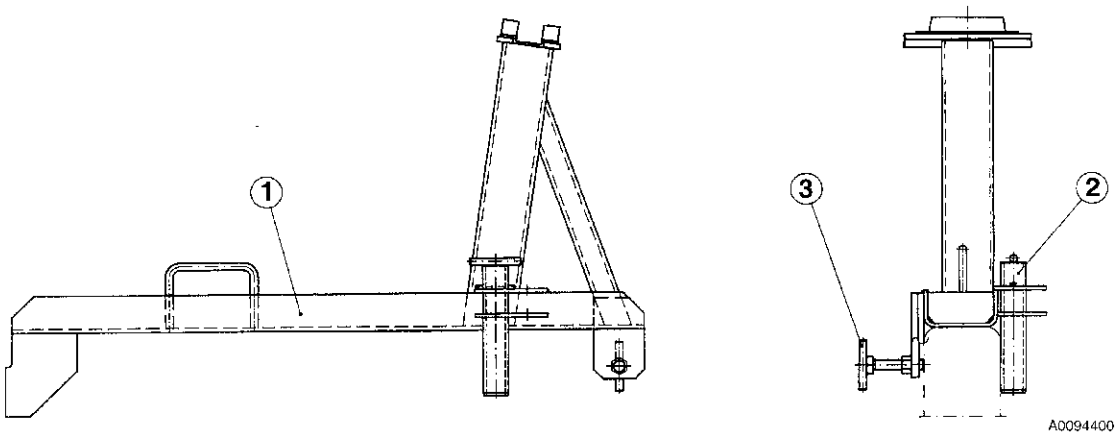


Figure 4
E1645, Load body support

1	Load body support, 1 pc.	see welding and detail drawing, Figure [?] and Figure [?]
2	Plug, 1 pc.	see detail drawing, Figure [?]
3	Lock bolt, 1 pc.	see detail drawing, Figure [?]

E1645-1, welding drawing

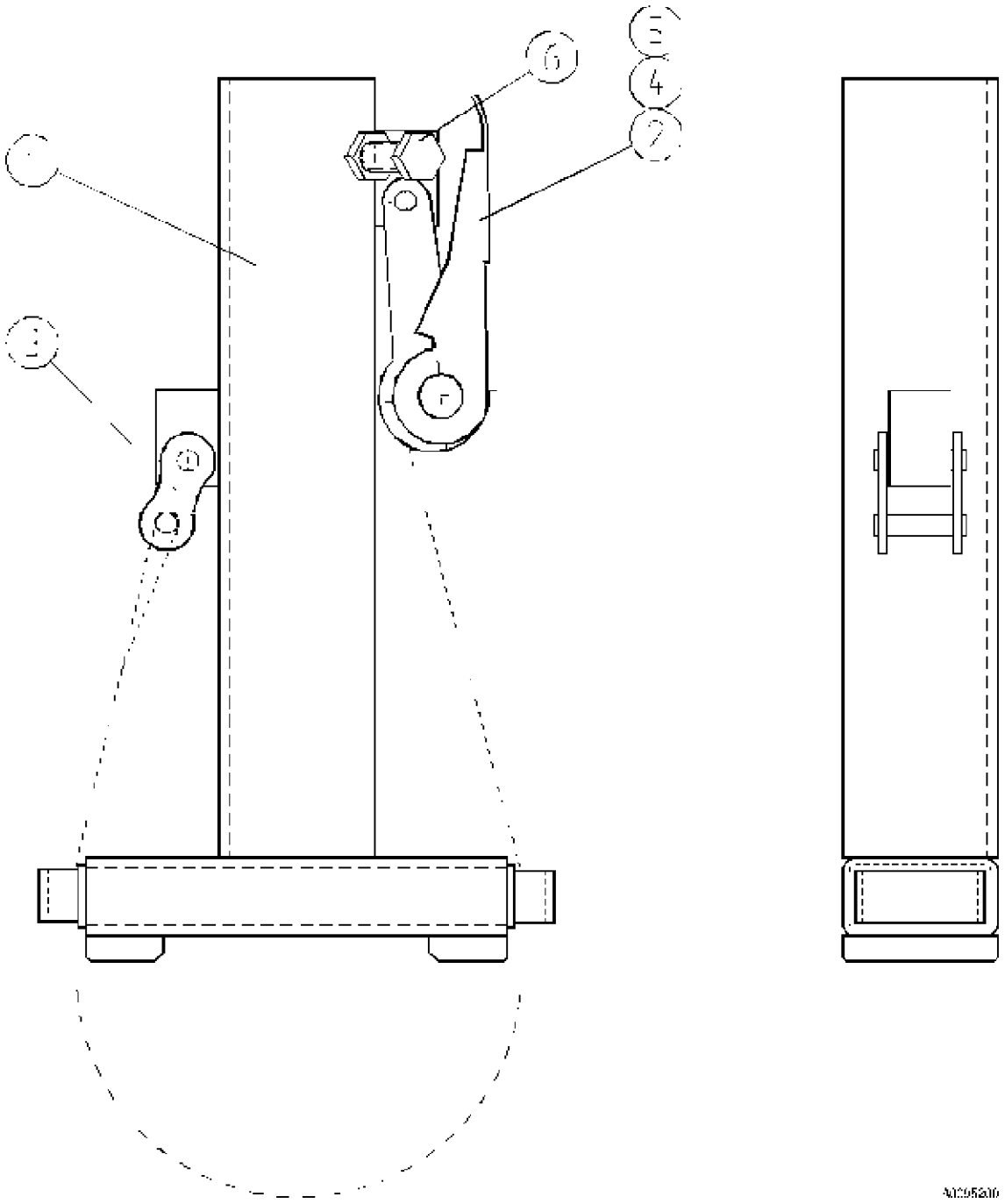
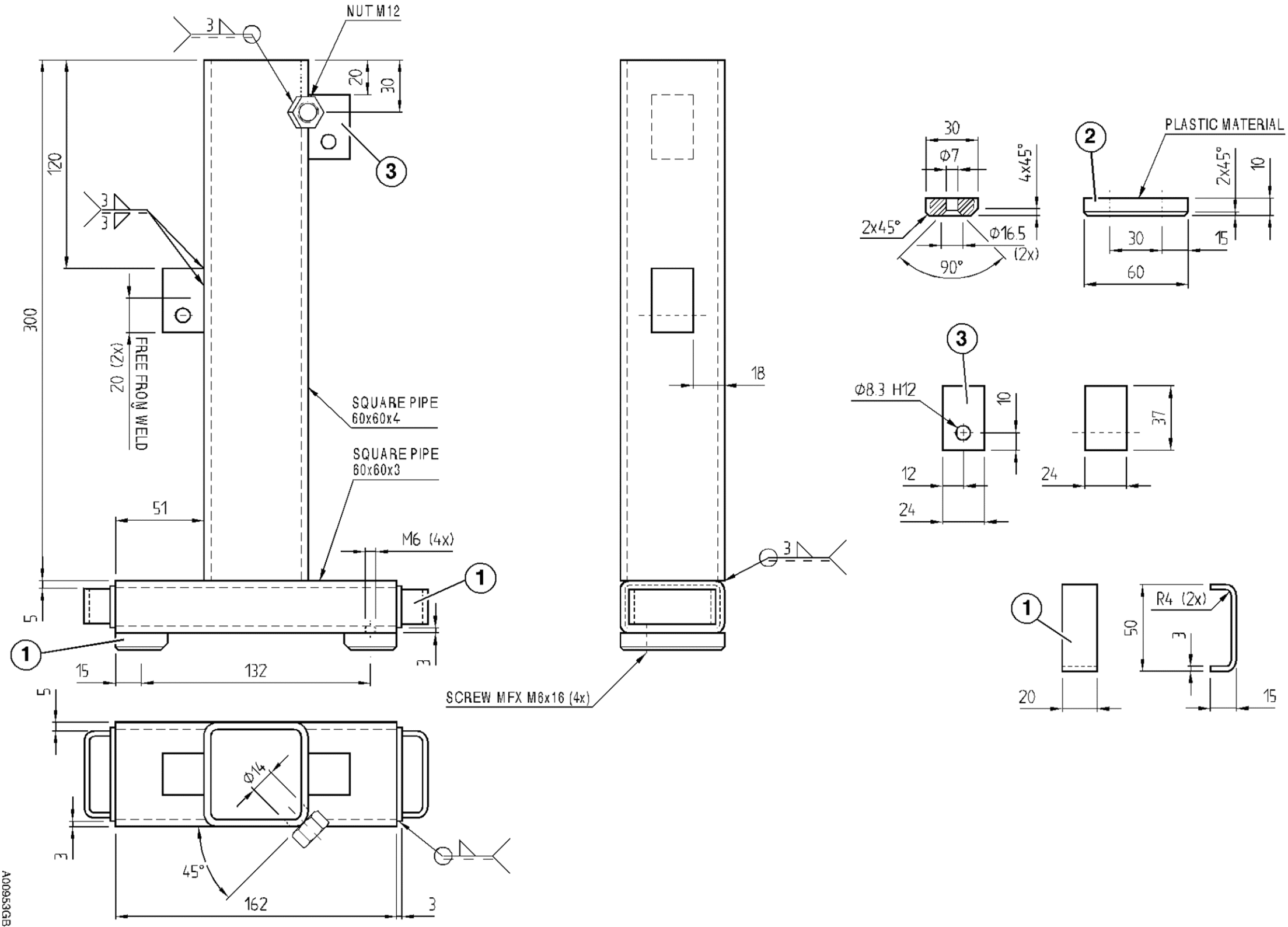


Figure 14
E1751-8, composite drawing

1. E1751-8
2. Lock lever
3. Straight coupling link with spring ISO 16B-1, 1"
4. CHB-bolt, steel 8x40
5. Split pin 2x25
6. Bolt M12x30

E1751-8, detail drawings


NUT M12
3
20
30
120
300
FREE FROM WELD
20 (2x)
SQUARE PIPE
60x60x4
SQUARE PIPE
60x60x3
51
M6 (4x)
5
15
132
3
18
SCREW MFX M6x16 (4x)
Ø14
45°
162
30
Ø7
4x45°
2x45°
Ø16.5
(2x)
90°
PLASTIC MATERIAL
2x45°
10
15
60
Ø8.3 H12
12
24
37
R4 (2x)
50
20
A00953GB

VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Charging of batteries	**173**	**Service Information**	**12.03.2013**
Profile:			

Charging of batteries

WARNING

Explosion hazard

During battery charging, an explosive mixture of oxygen and hydrogen is formed. A short-circuit, open flame or spark near the battery can cause a powerful explosion. **Always** turn off the charging current before disconnecting the charging clamps. Make sure that ventilation is adequate, especially if the battery is being charged in a confined space.

Corrosive sulphuric acid

The battery electrolyte contains corrosive sulphuric acid. Electrolyte spilled on bare skin should be removed immediately. Wash the affected area with soap and plenty of water. If electrolyte gets into your eyes or any other sensitive body part, rinse immediately with plenty of water and seek immediate medical attention.

VOLVO
Construction Equipment

Service Information

Document Title: **Capacities**	Function Group: **200**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Capacities

Capacity	**When changing**	**Total**
Engine, including filters and oil cooler	31 dm^3 (liters) (8.2 US gal)	42 dm^3(liters) (11 US gal)
Cooling system	138 dm^3(liters) (36.4 US gal)	140 dm^3 (liters) (37 US gal)
Fuel tank		460 dm^3 (liters) (121.4 US gal)

Document Title: **Engine and transmission, mounting**	Function Group: **210**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Engine and transmission, mounting

Op nbr 21074

Ratchet block 1500 kg (3308 lbs), 3 pcs.

Torque wrench 0–400 Nm (0–40 kpm) (0 - 295 lbf ft)

The combined engine and transmission unit weighs approx. 1830 kg (4035 lbs).

1. Connect the lifting device to the engine. Balance and angle up the engine and transmission.

2. Fit the propeller shaft before the unit is fitted in its final position.

3. Lower the unit and fit the engine mounts (front mounts first).
   Tightening torque, front: **220 Nm** (22 kpm) (162.3 lbf ft)
   Tightening torque, rear: **140 Nm** (14 kpm) (103.3 lbf ft).

4. Tighten the propeller shaft bolts.
   Tightening torque: **180 Nm** (18 kpm) (132.8 lbf ft).

5. Fit the components on the transmission:

   - transmission oil filters (two)
   - oil filler pipe
   - oil dipstick
   - hose to air filter.
   - retarder valve
   - electric cabling.

6. Remove the tensioning strap from the dropbox.

7. Fit the operator's seat, mats and floor plates.

   ⚠ CAUTION

   Markings for the air hoses on machines equipped with air suspended operator's seat.

8. Fit the hoses for all four hydraulic pumps.

9. Open the hydraulic oil tank shut-off valve.

Left side

10. Remove the lock on the stop control. Fit the throttle cable,
    tank shut-off cable and stop cable.

11. Fit the bracket plate for the anti-freeze reservoir for the brake system.

12. Fit the fuel hoses for the engine.

Document Title:	Function Group:	Information Type:	Date:
Engine, mounting	**210**	**Service Information**	**12.03.2013**
Profile:			

Engine, mounting

Op nbr 21070

Ratchet block 1500 kg (3308 lbs), 3 pcs.

Torque wrench 0–400 Nm (0–40 kpm) (0 - 295 lbf ft)

The engine weighs approx. 1360 kg (2999 lbs)

1. Grease the torque converter center pin. Check the distance between the torque converter and the transmission. If the distance A is greater than approx. 89 mm (3.5 in), see Figure [?], lift and carefully press back the torque converter. The torque converter may have to be removed to check the cause why it will not enter sufficiently.

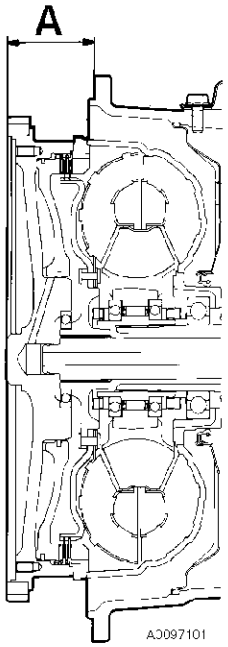


Figure 1

A. = approx. 89 mm (3.5 in)

2. Check that the position of the pin is according to Figure [?], and that there is a bolt hole at 12 o'clock.

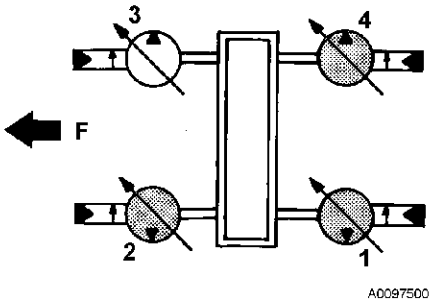


Figure 7
Hydraulic pumps on power take-off

F	Travel direction
1,2,4	Hydraulic pumps
3	Hydraulic pump (fan drive)

31. Remove the electric cabling for the front hydraulic pump 3 and disconnect the hoses for the front hydraulic pumps 2 and 3. Plug.

32. Connect the three ratchet blocks (1500 kg, 3308 lbs) to the three lifting eyes on the engine. See Figure [?].

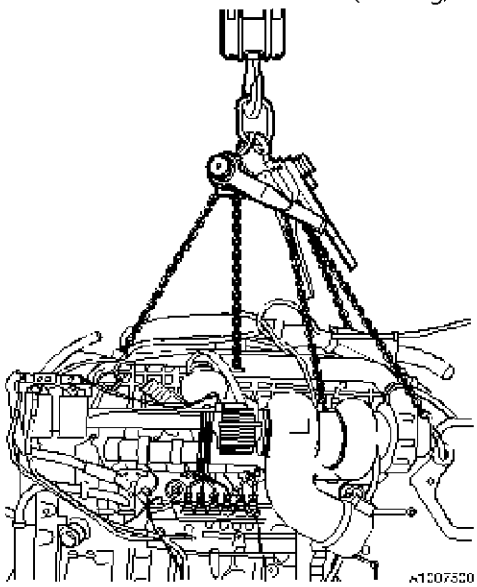


Figure 8
Connection of lifting tools

33. Loosen the four engine mounts, see Figure [?] and Figure [?].

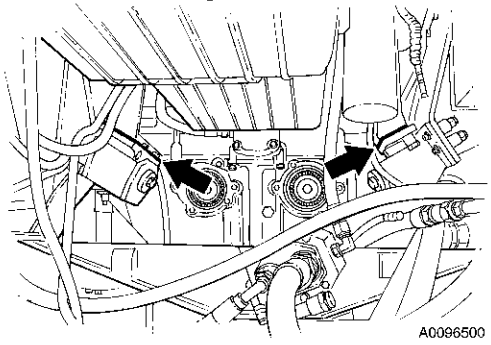


Figure 9
Parting rear engine mounts

Document Title: **General specifications**	Function Group: **220**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

General specifications

Oil pressure, minimum at low idle speed (warm engine)	50 KPa (0.5 bar) (7.25 psi)
Oil pressure, operating speed (warm engine)	300–550 KPa (3 bar–5.5 bar) (43.5–79.7 psi)
Piston cooling valve, opening pressure	300 KPa (3 bar) (43.5 psi)
Safety valve, full-flow filter, opening pressure	100–140 KPa (1–1.4 bar) (14.5– 20.3 psi) pressure-drop across filters
Safety valve, engine oil cooler, opening pressure	230 kPa (2.3 bar) (33.3 psi) pressure-drop across engine oil cooler

VOLVO
Construction Equipment

Service Information

Document Title: **Torque limitation, functional description**	Function Group: **230**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Torque limitation, functional description

The torque limiter is located on the rear part of the fuel injection pump. It limits the stroke of the fuel injection pump control rod, which prevents the engine from reaching maximum torque until a certain engine speed has been reached.

Sensor SE3 senses the engine speed, Figure [?]. When the engine speed is below 1400 rpm, the solenoid valve MA139 is not activated. This prevents the pre-charge pressure from reaching the torque limiter. Solenoid valve MA139 is located next to the rear part of the torque limiter.

The ECU activates the solenoid valve MA139 when it receives a signal from sensor SE3 that the engine speed exceeds 1400 rpm. Solenoid valve MA139 allows the pre-charge pressure to reach the torque limiter, which in turn allows the control rod to move to the full load position.

The solenoid valve remains activated until the engine speed drops below 1390 rpm.

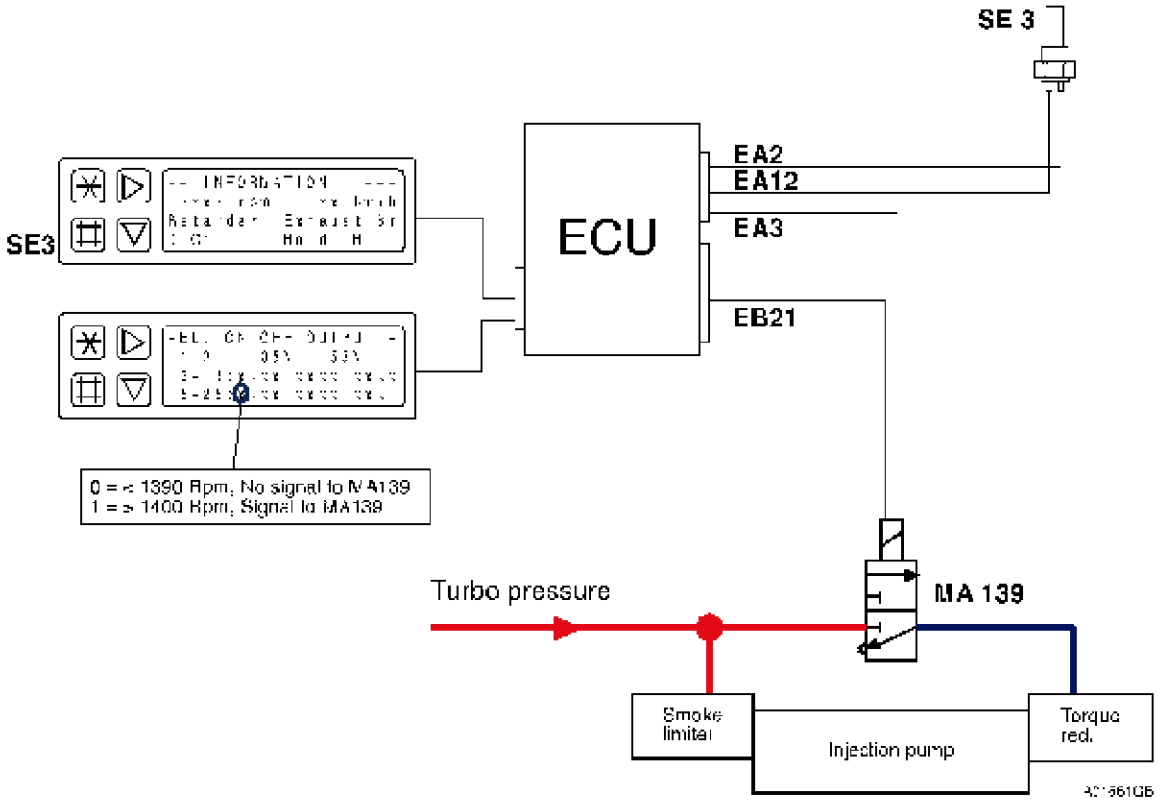
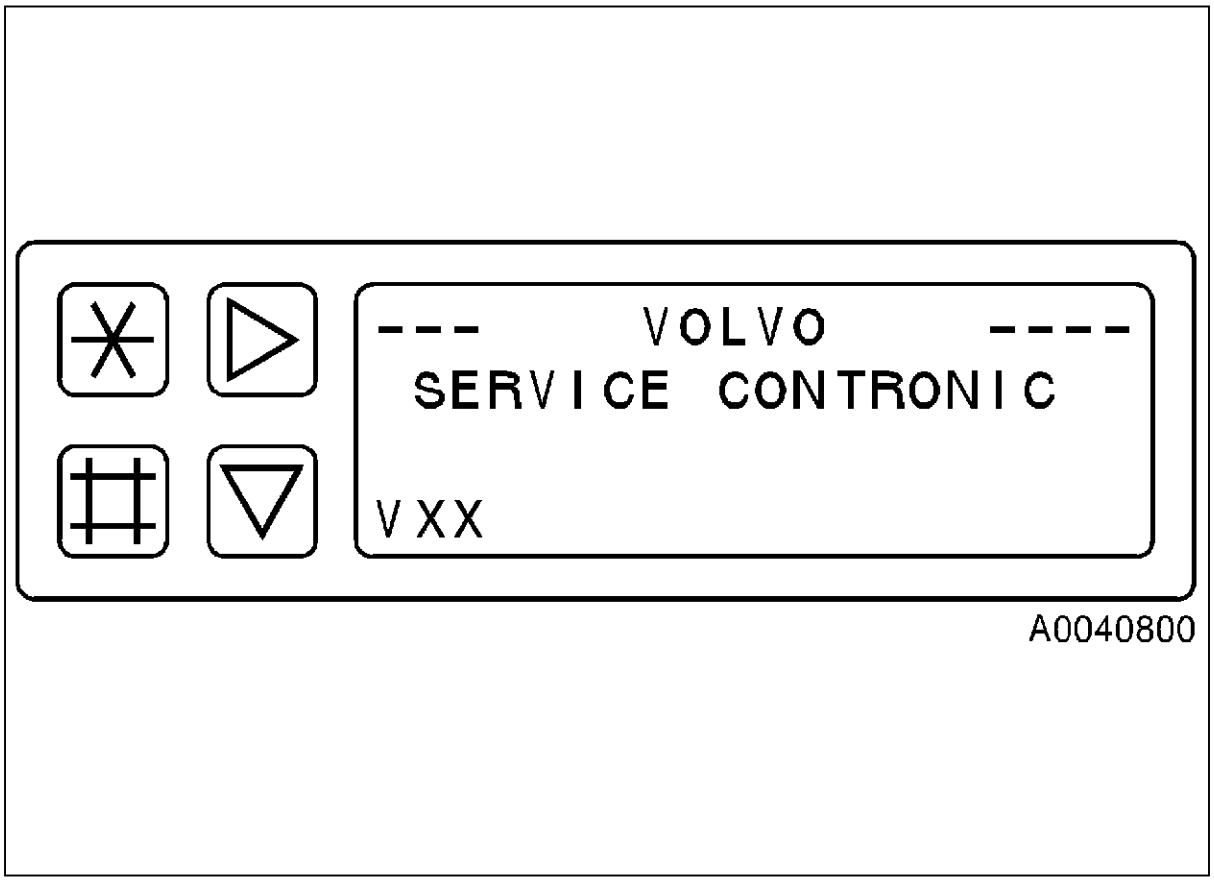


Figure 1



A0040800

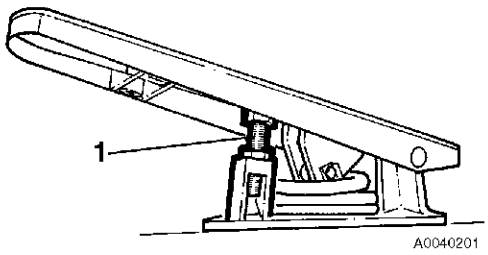


Figure 4
Throttle pedal

1. Stop bolt

WARNING

The fuel pressure lines (delivery lines) are pre-shaped and must not be altered in any way under any circumstances.

If a pre-shaped fuel pressure line is bent or deformed, there is a great risk that it will rupture. A damaged fuel pressure line must always be changed!

20. Fit the fuel pressure lines. Make sure that the area is clean and that the fuel pressure lines are not bent or altered in any way. Tighten the pressure line nuts.
    Tightening torque: **15–25 Nm** (1.5–2.5 kpm) (11–18.4 lbf ft).

21. Start the engine and make sure that there are no leaks.

28. Fit the new inductive sensor, Figure [?].

29. Adjust the sensor according to ---- not implemented: INTXREF ----: .

30. Plug in the connector for the inductive sensor.

31. Turn on the electric power with the battery disconnect switch.

32. Plug in the service display unit. Bring up the figure "Setup exhaust brake", Figure [?].

    Activate the exhaust retarder by pressing  .

Figure 7
Contronic service display unit, setup, exhaust brake (exhaust retarder)

33. Unplug the service display unit.

34. Fit the inner splash guard by the right front wheel.

35. Test-run the machine.

Document Title: **Radiator, adjusting**	Function Group: **261**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Radiator, adjusting

Op nbr 26110

=

The radiator must be positioned correctly in height and fore/aft so that it is not subjected to undue stresses.
The radiator should be filled with coolant when adjusting.

1. Park the machine in the service position on a level surface.
2. Open the engine hood.
3. Loosen the radiator attaching bolt (3), see Figure [?] .

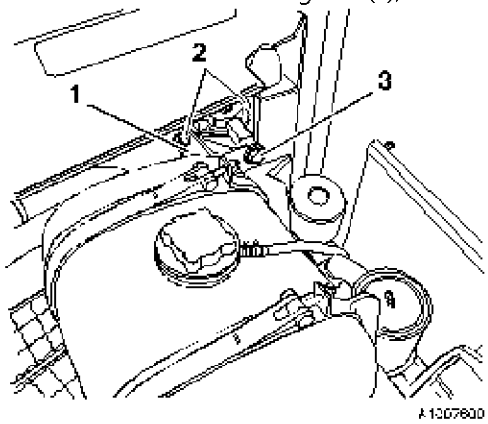


Figure 1

1. Bracket
2. Guide lugs
3. Attaching bolt

4. Swing out the radiator.
5. Swing in the radiator and check the height of the radiator. The radiator is correctly adjusted when the guide lugs slide up on the bracket and rest against the lower edges of the bracket, see Figure [?].
   For eventual adjustment, loosen the lock nut for the height bolt, turn the height bolt clockwise to raise the rear edge of the radiator or counter-clockwise to lower the rear edge of the radiator, see Figure [?].

13. Fit the lock plates (3, 4) and the bolts (2). Tighten the bolts and lock with the lock plate (3).

14. Apply locking compound (strong) 116 1053 on the outside of the seal ring (14). Press in the seal ring in the housing using drift 999 8361. See Figure [?].

CAUTION

Use locking compound (strong) 116 1053 between the seal ring (14) and the pump housing. Make sure that the support is up against the pump housing.

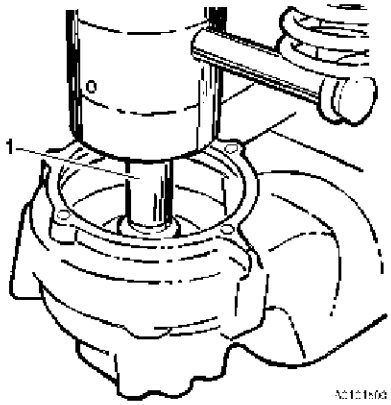


Figure 9
Pressing in seal ring

1. Drift part no. 999 8361

15. Place the impeller (9) on fixture 999 3756.
Place the pump housing on the impeller. Press the shaft into the impeller with a drift. See Figure [?].

CAUTION

Press until the shaft reaches the bottom of the tool.

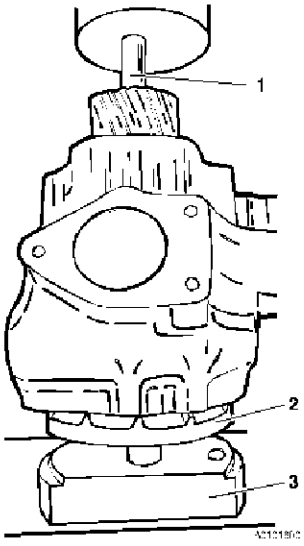


Figure 10
Pressing in impeller

1. Drift 14x100 mm
2. Impeller
3. Fixture part no. 999 3756

16. Check that the impeller (9) is pressed in to the correct position (24.5 ±0.2 mm, 0.9 ±0.008 in). See position B in Figure [?].

8. Check on the pressure gauge that the oil pressure has been 4.0 ±0.5 MPa (40 ±5 bar) (580 ±72.5 psi).

Low fan speed

9. Let the engine run at low idle.

10. Check the fan speed with the optic speed sensor against the reflective tape on the fan blade. The fan speed should be 400–700 rpm.

High fan speed

11. Disconnect a temperature sensor, for example, the sensor on the brake cooling oil tank. When checking the high fan speed, the motor speed should be min. 2000 rpm.

12. Check the fan speed with the optic speed sensor against the reflective tape on the fan blade. The fan speed should be min. 1650 rpm.

Adjusting fan motor low speed

13. The fan speed should be 400–700 rpm.

14. Adjust the stand-by pressure by turning on the pump pressure regulating valve 2, see Figure [?].
    Clockwise = to increase fan speed.
    Counter-clockwise = to decrease fan speed.

Document Title: **Troubleshooting**	Function Group: **300**	Information Type: **Service Information**	Date: **12.03.2013**
Profile:			

Troubleshooting

Methods and assistive devices

When a malfunction or failure is suspected or confirmed, it is important to identify the cause of the breakdown as well as the specific component causing the malfunction.

A malfunction is indicated by the red central warning light illuminating on the instrument panel at the same time as the buzzer sounds or by the LED flashing on the ECU.

In case of a central warning, the machine must be stopped immediately and a qualified service technician requested.

In order to make troubleshooting more effective and easier to perform, a number of assistive devices are available.

Most causes of malfunctions or failures in the gearshifting system can be confirmed using the Contronic service display unit. This includes cabling, external sensors and solenoids connected to the gearshifting system.

In case of a malfunction, an error code (ER indication) is shown on the service display unit, along with a value deviating from the normal. Error codes, possible causes as well as suitable actions are described on the following pages.

When an error code or a deviating value is displayed, resistance measurements are used to determine if the malfunction is a specific component (i.e. a sensor) or if it is the cabling to the same component that is causing the malfunction.

If the ER-code indicates an internal malfunction in the transmission, a resistance measurement should be performed in the connector located on the transmission. This is done to exclude the cabling between the ECU and the transmission.

Always check that the connectors EA, EB and EC are free from oxidation and that these are completely plugged in. If eventual ER-codes indicate that the malfunction is in the transmission, also check that the connector on the transmission is free from oxidation and other contaminants. Poor contacts or loose connections often show up as several different error codes being displayed at the same time.

Mechanical malfunctions can only be confirmed with the service display unit if the malfunction generates a symptom that can be detected by the sensors in the gearshifting system.

Pressure checks of respective gears can also be used as a complement to help pin-point the problem.

The following equipment is needed in order to perform the troubleshooting procedures described in this section:

- Contronic Information display unit
- Service display unit 999 3721
- Multimeter, 11 666 140
- Multi-pin breaker box, 11 668 002

Document Title:	Function Group:	Information Type:	Date:
Headlights, alignment	**352**	**Service Information**	**12.03.2013**
Profile:			

Headlights, alignment

Correct headlight alignment is essential, especially if the machine is operated on roads during dark hours. The headlights are of the asymmetrical type. Adjust the headlights with the adjusting screws (C).

Adjust the light-dark border (H) with the low beam on at the distance (L) from the headlights. Check the distance (B) between the concentrated light points when the high beams are on.

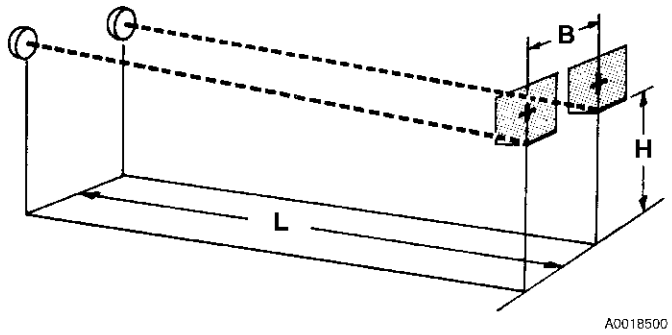


Figure 1

L = 5000 mm (198.6 in)
H = 1350 mm (53.1 in)
B = 1260 mm (49.6 in)

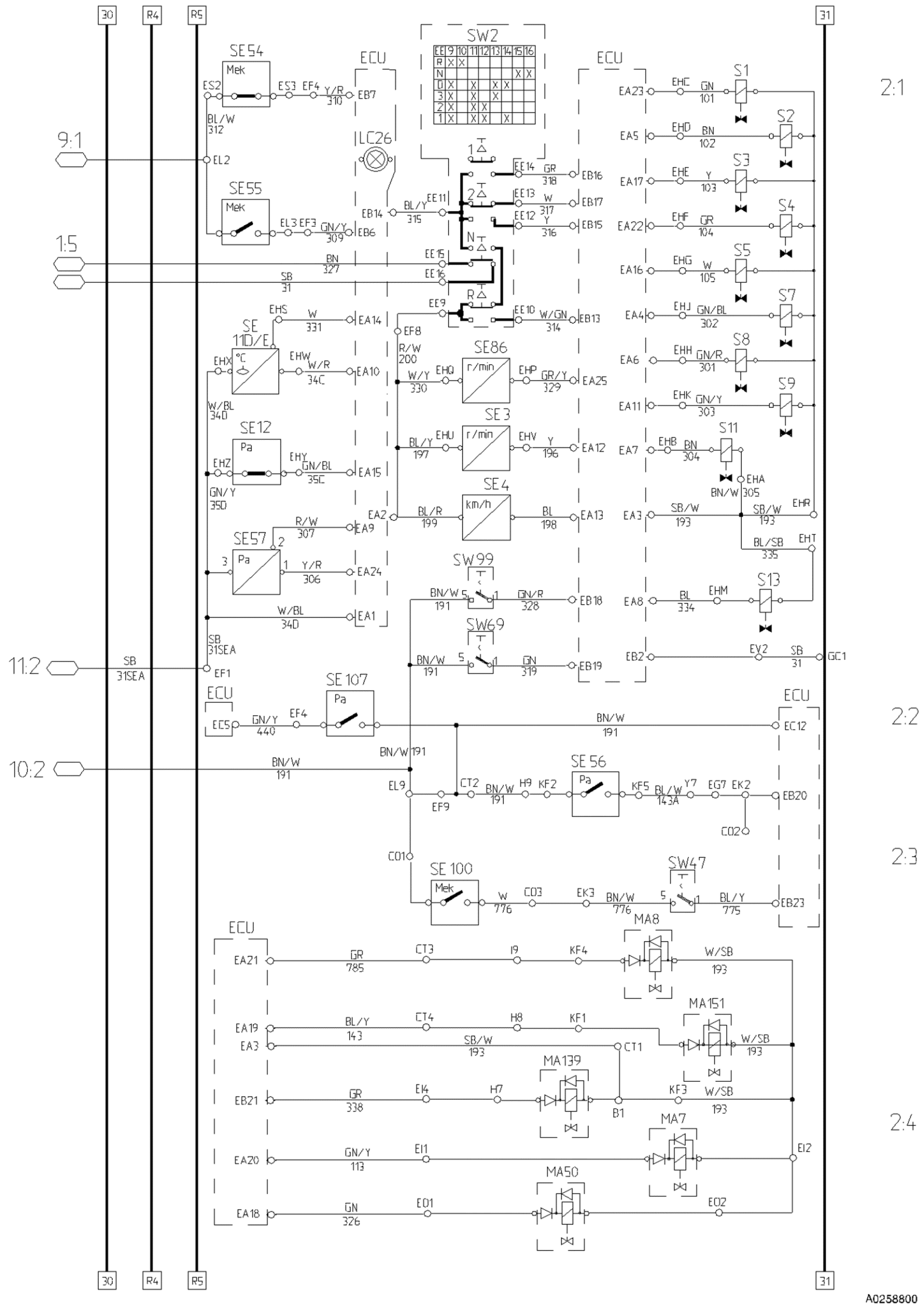

30
R4
R5
31
SW2
SE54
Mek
ECU
LC26
SE55
Mek
9:1
1:5
11:2
10:2
SE 110/E
SE12
Pa
SE57
Pa
SE86
r/min
SE3
r/min
SE4
km/h
SW99
SW69
SE 107
Pa
SE 56
Pa
SE 100
Mek
SW47
MA8
MA151
MA139
MA7
MA50
S1
S2
S3
S4
S5
S7
S8
S9
S11
S13
2:1
2:2
2:3
2:4
A0258800

Figure 2
Circuit 3

FA11	Fuse 5 A (preheating relay, electronic control unit)
RE10	Start relay, start interlock
SW2	Gearshift selector
S1	Gearshifting
S2	Gearshifting
S3	Gearshifting
S4	Gearshifting
S7	Gearshifting
S8	Gearshifting
RE6	Back-up light
MA50	Dropbox, low range

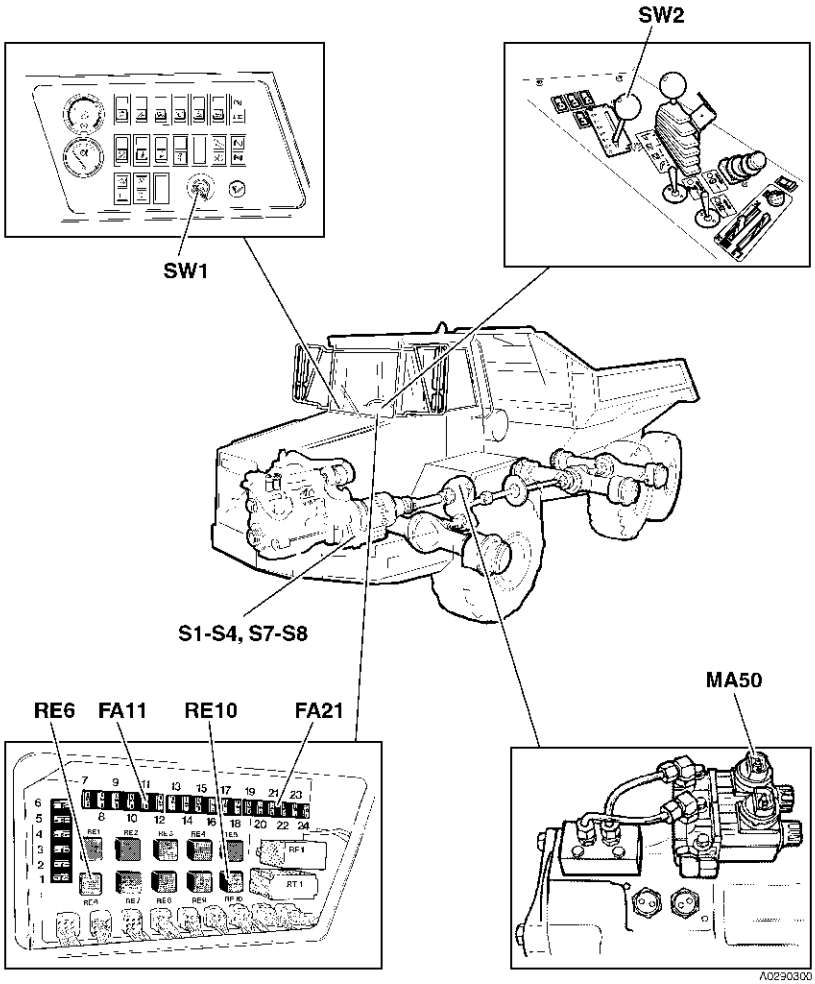


Figure 2
Circuit 4

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Circuit 5	**370**	**Service Information**	**12.03.2013**
Profile:			

Circuit 5

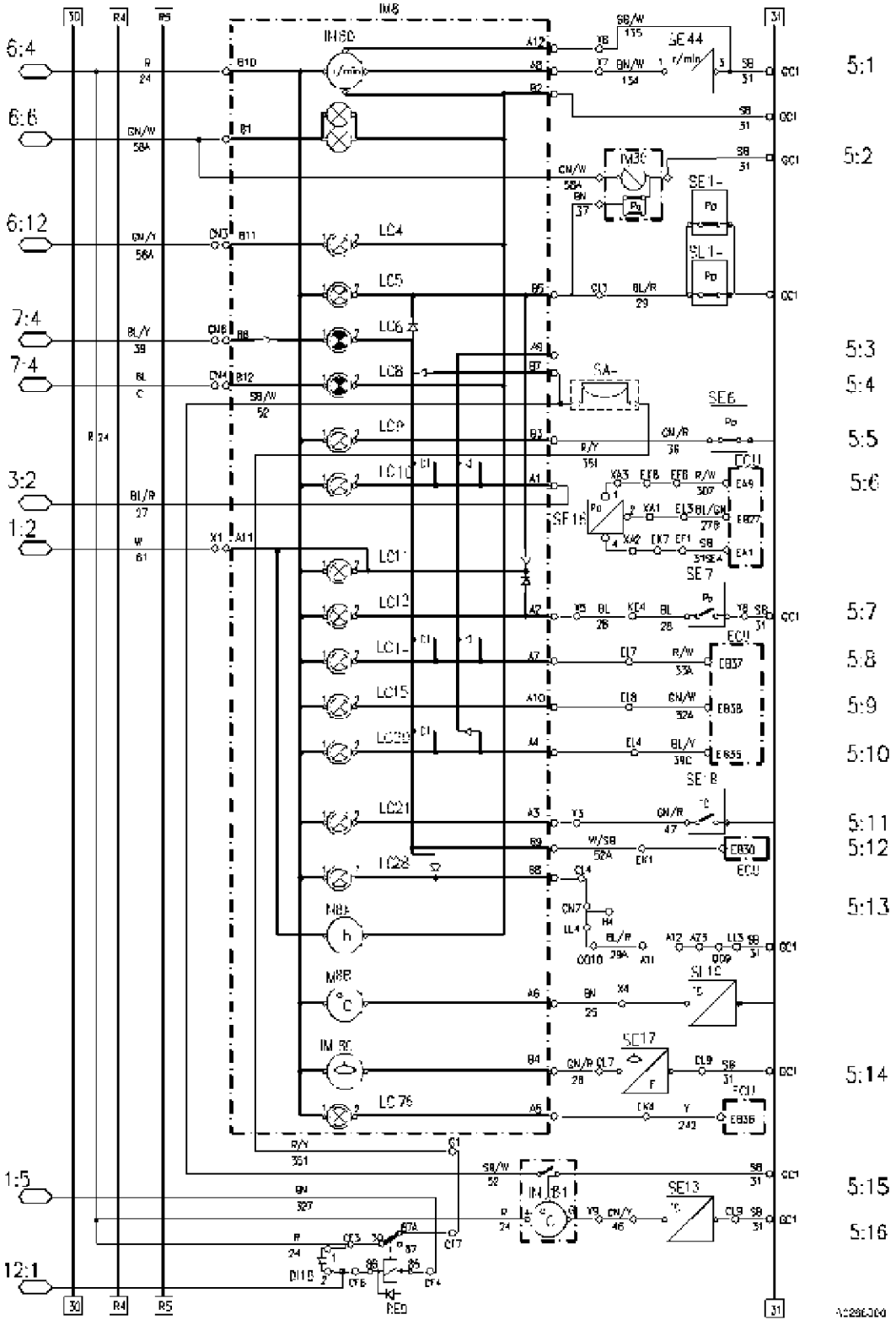


Figure 1
Wiring diagram (serial no. 1401–, US 60301–)

Circuit 5 (cont'd.)

Circuit 5:13	Spare
LC28	Not used
Circuit 5:14	Hour meter, engine temperature, fuel level
IM8A	Hour meter
SE1C	Engine temperature, instrument
IM8B	Engine temperature
SE17	Fuel sensor, tank
IM8C	Fuel gauge
LC76	Brake cooling oil temperature, high
Circuit 5:15	Retarder temperature
SE13	Temperature, retarder circuit
IM1	Temperature gauge, transmission
Circuit 5:16	Relay buzzer
RE9	Buzzer, cut-off (N-position)
DI16	Relay buzzer

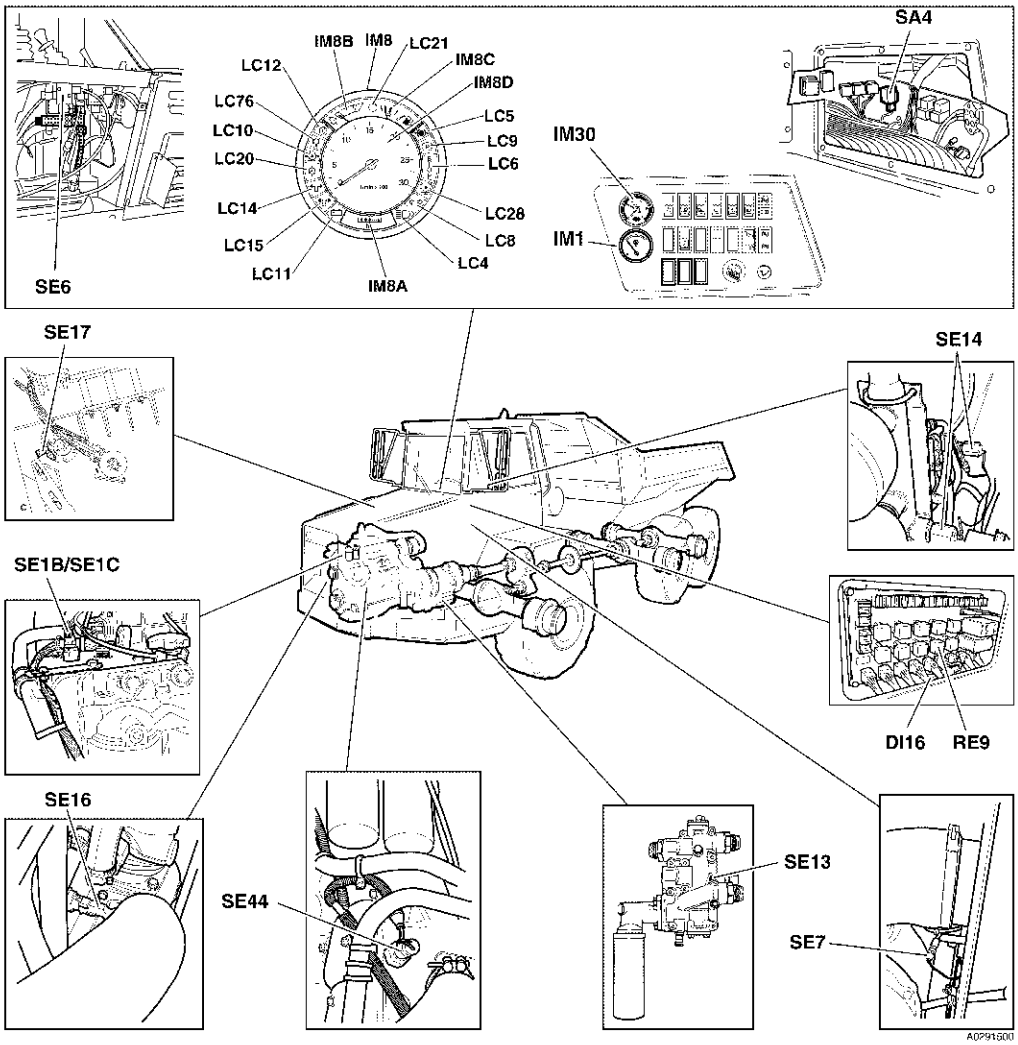


Figure 2

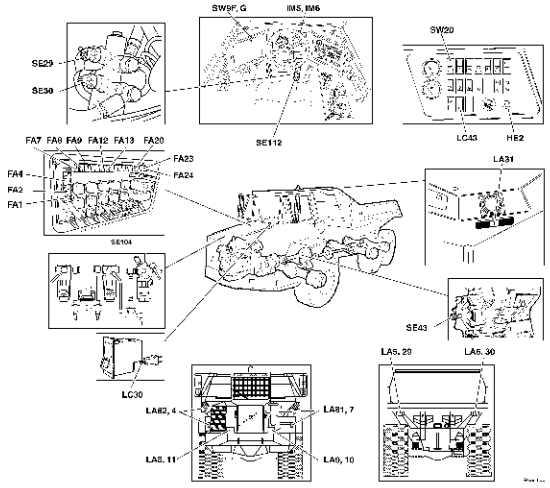


Figure 2
Circuit 6

Figure 2
Circuit 6

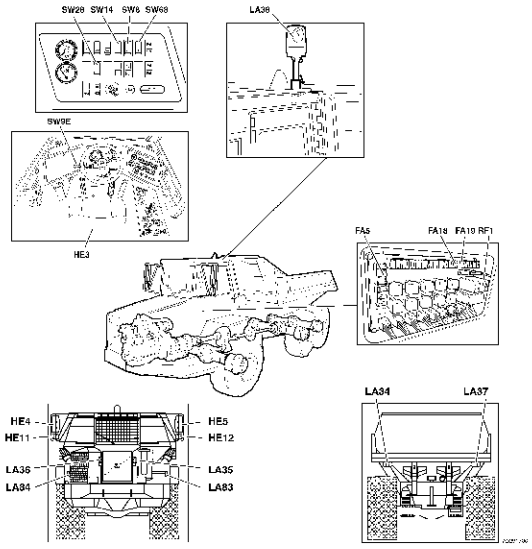
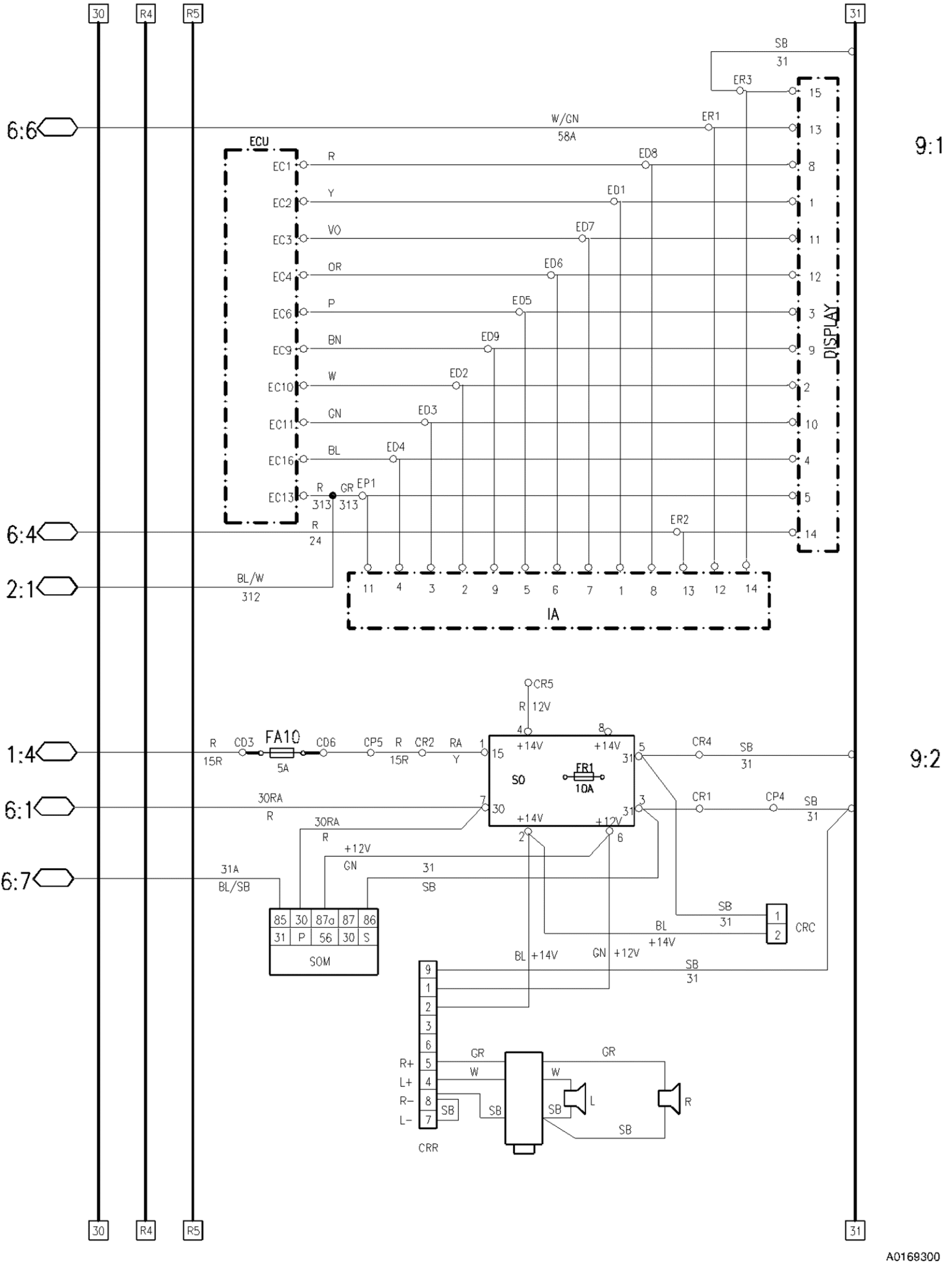


Figure 2
Circuit 7

Figure 2
Circuit 8


30
R4
R5
31
SB
31
ER3
15
6:6
W/GN
58A
ER1
13
9:1
ECU
EC1
R
ED8
8
EC2
Y
ED1
1
EC3
VO
ED7
11
EC4
OR
ED6
12
EC6
P
ED5
3
EC9
BN
ED9
9
EC10
W
ED2
2
EC11
GN
ED3
10
EC16
BL
ED4
4
EC13
R
313
GR
313
EP1
5
DISPLAY
6:4
R
24
ER2
14
2:1
BL/W
312
11
4
3
2
9
5
6
7
1
8
13
12
14
IA
CR5
R
12V
4
8
1:4
R
15R
CD3
FA10
5A
CD6
CP5
R
15R
CR2
RA
Y
1
15
+14V
+14V
5
31
CR4
SB
31
9:2
SO
FR1
10A
6:1
30RA
R
7
30
3
31
CR1
CP4
SB
31
+14V
+12V
2
6
30RA
R
+12V
GN
6:7
31A
BL/SB
31
SB
85
30
87a
87
86
31
P
56
30
S
SOM
SB
31
1
2
CRC
BL
+14V
BL
+14V
GN
+12V
SB
31
9
1
2
3
6
R+
5
L+
4
R−
8
L−
7
SB
CRR
GR
W
SB
GR
W
SB
L
SB
R
SB
30
R4
R5
31

A0169300

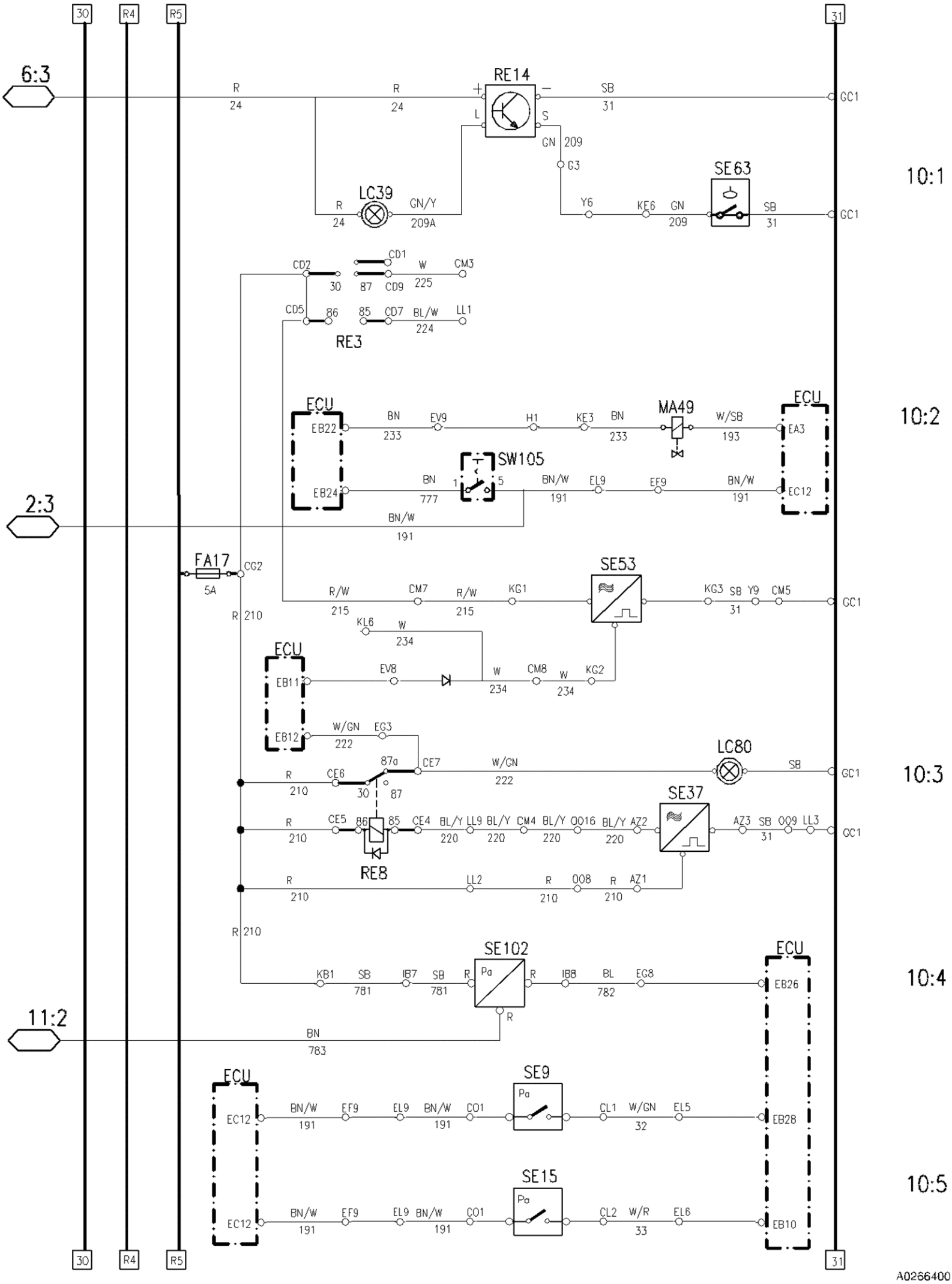

30
R4
R5
31
6:3
RE14
R 24
R 24
SB 31
GC1
L
S
GN 209
G3
LC39
R 24
GN/Y 209A
Y6
KE6
GN 209
SE63
SB 31
GC1
10:1
CD2
CD1
W 225
CM3
30
87
CD9
CD5
86
85
CD7
BL/W 224
LL1
RE3
ECU
EB22
BN 233
EV9
H1
KE3
BN 233
MA49
W/SB 193
EA3
ECU
10:2
SW105
EB24
BN 777
1
5
BN/W 191
EL9
EF9
BN/W 191
EC12
2:3
BN/W 191
FA17
5A
CG2
R 210
SE53
R/W 215
CM7
R/W 215
KG1
KG3 SB 31
Y9
CM5
GC1
KL6
W 234
ECU
EB11
EV8
W 234
CM8
W 234
KG2
EB12
W/GN 222
EG3
LC80
87a
CE7
W/GN 222
SB
GC1
10:3
R 210
CE6
30
87
SE37
R 210
CE5
86
85
CE4
BL/Y 220
LL9
BL/Y 220
CM4
BL/Y 220
OO16
BL/Y 220
AZ2
AZ3 SB 31
OO9
LL3
GC1
RE8
R 210
LL2
R 210
OO8
R 210
AZ1
R 210
SE102
KB1 SB 781
IB7 SB 781
R
Pa
R
IB8 BL 782
EG8
ECU
EB26
10:4
11:2
R
BN 783
ECU
EC12
BN/W 191
EF9
EL9
BN/W 191
CO1
SE9
Pa
CL1 W/GN 32
EL5
EB28
SE15
Pa
CL2 W/R 33
EL6
EB10
10:5
30
R4
R5
31
A0266400

Figure 1
Wiring diagram (serial no. 1401–, US 60301–)

Circuit 12

Circuit 12:1	Spare
Circuit 12:2	All differential locks + 6-wheel drive
LC3	Transverse differential lock, rear drive axles (2)
MA10	Differential lock rear drive axles
DI79	Longitudinal differential lock + 6-wheel drive
SW48	Foot control, all differential locks and 6-wheel drive
Circuit 12:3	Longitudinal differential lock + 6-wheel drive
SE20	Longitudinal differential lock dropbox
MA12	6-wheel drive
SW46	6-wheel drive
MA11	Longitudinal differential lock
LC22	Longitudinal differential lock
LC46	Longitudinal differential lock
Circuit 12:4	Transverse differential lock, front drive axle
MA9	Transverse differential lock, front drive axle
DI80	Transverse differential lock, front drive axle
SW147	Transverse differential lock, front drive axle
LC2	Transverse differential lock, front drive axle
LC47	Transverse differential lock, front drive axle
RE11	Longitudinal differential lock
Circuit 12:5	Lighting control panel
LA85	Lighting control panel

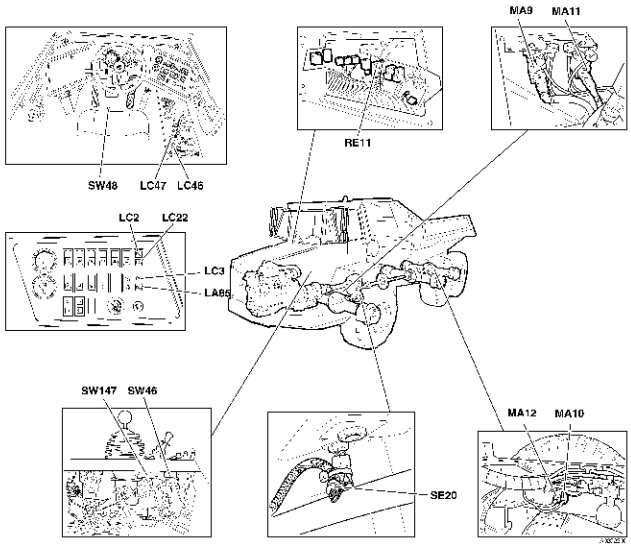


Figure 1
Wiring diagram (serial no. –1400, US –60300)

Circuit 1

Circuit 1:1	Fuse for radio
FH3	Fuse for radio
Circuit 1:2	Battery
BA1	Battery
BA2	Battery
SP	Connection point
FC3	Fuse 25A (cab)
FC4	Fuse 100A (preheating coil)
SW26	Battery disconnect switch
Circuit 1:3	Alternator
Circuit 1:4	Starter motor and ignition
FA 21	Fuse 15A (ignition, engaging solenoid motor)
SW1	Ignition
Circuit 1:5	Start circuit
RE10	Start relay, start interlock
Circuit 1:6	Preheating engine
FA 11	Fuse 5A (preheating relay, electronic control unit)
FA 22	Fuse 5A (preheating solenoid, time relay preheating)
FH1	Fuse 5A (preheating)
RT1	Time relay, preheating engine
RE20	Solenoid, preheating
HE1	Preheating coil, engine
LC13	Control light, preheating
SE1A	Engine temperature, preheating (thermostat housing)
Circuit 1:7	Key dependent relays
RE4	Ignition key, relay
RE5	Ignition key, relay

4	8:4		14	W/GN	1	14	W/GN	1		MA17, Compressor, air conditioning
5	8:2, 6:9, 6:10, 6:11, 6:12, 7:3		31	SB	1	31	SB	1		Ground connection
6	3:3		45	Y	1	45	Y	1		Sensor SE64, low hydraulic pressure, radiator fan
7	3:3		218	GR/W	1	218	W/GR	1		Sensor SE64, low hydraulic pressure, radiator fan
8	6:2		54	Y	1	54	Y	1		LA29/LA30, Brake lights
9	6:2		63	W/GN	1	63	W/GN	1		Feed, brake lights

Connector CA

Position on machine: Instrument panel, left, circuit board

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	3:6					7A	BL	1		RE1, Work lights, rear
2	3:6					8	BL	1		LA22/LA23, Work lights, rear
3	3:6					7B	BL	1		FA6, Work lights, rear
4	–					–	–	–		–
5	6:6					13	BN	1		LA31, Interior lighting
6	6:9					30C	R	1		FA4, Headlights and running lights
7	3:6					7B	BL	1		RE1, Work lights, rear
8	6:6					30E	R	1		IM5, Speedometer
9	6:2					63	W/GN	1		SE29, Brake lights

Connector CB

Position on machine: Instrument panel, left, circuit board

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	–					–	–	–		–
2	3:5					2	BL	1		LA18/LA19, Work lights, front
3	7:5					30A	R	1		LA38, Rotating beacon
4	3:5					1A	GR	1		RE2, Work lights, front
5	3:4, 4:1					102A	BN	1		RE6, Back-up light
6	–					–	–	–		–
7	3:4, 4:1					191	BN/W	1		RE6, Back-up light
8	–					–	–	–		–
9	3:4					10	BL	1		LA24, Back-up light

Connector CC

Position on machine: Instrument panel, left, circuit board

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	8:5					–	–	–		Relay position RE7 (spare)
2	6:11					56B	Y	1		LA8/LA9, Low beams

Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
1	11:2		31SEA	SB	1	31SEA	SB	1		Sensor ground, ECU
2	11:2		415F	GN/W	1	415F	GN/W	1		SE84, Axle temp. front axle
3	10:3		222	GN/W	1	222	GN/W	1		LC80, Body up
4	11:2		247	GN/Y	1	247	GN/Y	1		SE85, Axle temp. Front bogie axle
5	3:1		789	Y	1	789	Y	1		SE99, Brake cooling oil level (tank)
6	11:2		760	BN	1	760	BN	1		SE91, Axle temp. Rear bogie axle
7	2:3		143A	BL/W	1	143A	BL/W	1		SE56, Retarder
8	10:4		782	BL	1	782	BL	1		SE102, Brake pressure
9	–		–	–	–	–	–	–		–

Connector EH

Position on machine: Connector on transmission

			Plug-in side			Pin side				
Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
A	2:1		305	W/BN	1					Return
B	2:1		304	BN	1					+ to S11, Modulating valve
C	2:1, 4:1		101	GN	1					+ to S1, Gearshifting
D	2:1, 4:1		102	BN	1					+ to S2, Gearshifting
E	2:1, 4:1		103	Y	1					+ to S3, Gearshifting
F	2:1, 4:1		104	GR	1					+ to S4, Gearshifting
G	2:1		105	W	1					+ to S5, Gearshifting
H	2:1, 4:1		301	GN/R	1					+ to S8, Gearshifting, reverse gear
J	2:1, 4:1		302	GN/BL	1					+ to S7, Gearshifting, forward gear
K	2:1		303	GN/Y	1					+ to S9, Lock-up
L	2:1		–	BN	1					–
M	2:1		334	BL	1					+ to S13, Modulating valve
N	2:1		–	R	1					–
P	2:1		329	GR/Y	1					SE86, Turbine speed
Q	2:1		330	W/Y	1					Return
R	2:1, 4:1		193	W/SB	1					Return
S	2:1		331	W	1					SE11E, Oil level, transmission
T	2:1		335	BL/SB	1					Return
U	2:1		197	BL/Y	1					Return
V	2:1		196	Y	1					SE3, Input speed (transmission)
W	2:1		34C	W/R	1					SE11D, Oil sump temperature, transmission
X	2:1		34D	BL/W	1					Return
Y	2:1		35C	GN/BL	1					SE12, Lubrication oil pressure
Z	2:1		35D	GN/Y	1					Return

Connector EI

Position on machine: Instrument panel, left, ECU (9-pin connector)

9	–									

Connector L

Position on machine: Instrument panel, middle

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	8:1		–	BL/SB/Y	1	53	Y	1		MO2, Windshield wiper
2	–		–	–	–	–	–	–		–
3	8:1		–	BL/SB/W	1	53B	GR	1		MO2, Windshield wiper
4	8:1		–	BL/BN	1	31B	W/SB	1		RT5, Interval wiper relay
5	–		–	–	–	–	–	–		–
6	8:1		–	SB/BL	1	53A	W	1		SW9B, Interval wiper
7	8:1		–	BL/BN/SB	1	53J	W/BN	1		RT5, Interval wiper relay
8	8:1		–	Y/SB	1	53C	BL/Y	1		SW9C, Windshield washer
9	–		–	–	–	–	–	–		–

Connector LL

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	10:1		224	W/BL	1	–	–	–		Relay position RE3 (spare)
2	10:3		210	SB	1	210	SB	1		SE37, Body up
3	10:3, 5:13		31	SB	1	31	SB	1		Ground connection
4	5:13		29A	BL/R	1	29A	BL/R	1		Spare
5	–		264	R	1	264	Y	1		Spare
6	–		–	–	–	–	–	–		–
7	–		–	R	1	–	–	–		Spare
8	–		–	GN/Y	1	–	–	–		Spare
9	10:3		220	SB	2	220	BL/Y	1		SE37, Body up

Connector O

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	8:3		21	R	1	21	R	1		MO1, Cab fan, 1st speed
2	8:3		22	Y	1	22	Y	1		MO1, Cab fan, 2nd speed
3	8:3		23	W/R	1	23	R/W	1		MO1, Cab fan, 3rd speed
4	8:4		14	W/GN	1	37	GN/W	1		SE21, Thermostat, AC
5	–		–	–	–	–	–	–		–
6	8:4		38	SB/W	1	36B	W/SB	1		SW7, Condenser fan
7	8:3		31	SB	1	31	SB	1		Ground connection
8	–		–	–	–	–	–	–		–
9	–		–	–	–	–	–	–		–

Connector OO

9	7:4					49	R	1		Flashing hazard light

Connector CL

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	10:5		32	W/GN	1	32	W/GN	1		Sensor SE9, secondary steering system
2	10:5		33	R/W	1	33	W/R	1		Sensor SE15, primary steering system
3	5:2		29	BL/R	1	29	BL/R	1		Sensor SE14, low brake oil pressure
4	5:13		29A	BL/R	2	–	–	–		–
5	–		–	–		–	–	–		–
6	–		–	–		–	–	–		–
7	5:14		26	GN/R	1	26	R/GN	1		Sensor SE17, fuel level
8	6:4		41C	W/BL	1	41C	W/BL	1		Sensor SE20, longitudinal diff. lock
9	5:14		31	SB	1	31	SB	1		Ground connection

Connector CM

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	6:2		54	Y	1	54	Y	2		Brake lights
2	6:2		63	GN/W	1	63	GN/W	2		Brake lights
3	10:1		225	W	1	–	–	–		–
4	10:3		220	BL/Y	1	–	–	–		–
5	–		–	–	–	–	–	–		–
6	–		–	–	–	–	–	–		–
7	–		–	–	–	–	–	–		–
8	–		–	–	–	–	–	–		–
9	6:4		31	SB	1	31	SB	2		Ground connection

Connector CN

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	**Circuit no.**		**Marking**	**Colour**	**Number**	**Marking**	**Colour**	**Number**		**Function**
1	6:3		24	R	1	24	R	1		+ feed, control lights and instr.
2	6:6		58A	W/GN	1	58A	W/GN	1		Instrument lighting
3	5:2		56A	GN/Y	1	56A	GN/Y	1		Control light high beams
4	5:4		C	BL	1	C	BL	1		Control light, direction indicators
5	6:6		30E	R	1	30E	R	1		Speedometer
6	5:3		39	BL/Y	1	39	BL/Y	1		Central warning
7	5:13		29A	BL/R	2	29A	BL/R	1		–
8	–		264	Y	1	–	–	–		–

Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
1	1:6, 4:1		15E	R	1	15E	R	1		+ feed ECU
2	2:1, 4:1		31	SB	1	31	SB	1		Ground connection
3	1:5, 4:1		327	BN	1	327	BN	1		Start interlock
4	1:5, 4:1		31	SB	1	31	SB	1		Ground connection
5	3:4, 4:1		102A	BN	1	102A	BN	1		Relay RE6, tail lights
6	3:4, 4:1		191	BN/W	1	191	W/BN	1		Relay RE6, tail lights
7	–		–	–	–	–	–	–		–
8	10:2		234	W	1	234	W	1		Sensor SE53, exhaust retarder, ECU
9	10:2		233	BN	1	233	BN	1		Solenoid valve MA49, ECU

Connector FF

Position on machine: Under right control panel

			Plug-in side			Pin side				
Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
1	7:2		62	BL	1	–	62	1		Heated seat SW68, HE3
2	7:2		31	SB	1	–	31	1		Ground connection

Connector G

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
1	5:16		351	R/Y	1	351	Y/R	1		Relay RE9, buzzer SA4
2	–		–	–	–	–	–	–		–
3	10:1		209	GN	1	209	GN	1		Sensor SE63, coolant level
4	3:3		45	Y	1	45	Y	1		Control light LC40, engine radiator fan
5	3:3		217	GN	1	217	Y/R	1		Solenoid valve MA137, dumping oil
6	–		–	–	–	–	–	–		–
7	6:5		–	–	–	66	W/BL	1		–
8	6:6		31A	W/SB		31A	W/SB	1		Ground connection via fuse FH3
9	3:3		218	GR/W		218	GR/W	1		Sensor SE64, SE97 (hydraulic pressure, dumping)

Connector H

Position on machine: Instrument panel, right

			Plug-in side			Pin side				
Pin	Circuit no.		Marking	Colour	Number	Marking	Colour	Number		Function
1	10:2		233	BN	1	233	BN	1		Solenoid valve MA49, ECU
2	10:2		215	W/R	1	215	W/R	1		Feed sensor SE53
3	10:2		234	W	1	234	W	1		Sensor SE53, exhaust retarder, ECU
4	5:13		29A	BL/R	1	–	–	–		–

Document Title: **Control lights**	Function Group: **370**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Control lights

Marking	**Circuit no. in wiring diagram**	**Designation**	
LC2	6:3	Transverse differential lock, front drive axle	(serial no. –1400 US –60300)
LC2	12:4	Transverse differential lock, front drive axle	(serial no. 1401–, US 60301–)
LC3	6:5	Transverse differential lock, rear drive axles (2)	(serial no. –1400 US –60300)
LC3	12:2	Transverse differential lock, rear drive axles (2)	(serial no. 1401–, US 60301–)
LC4	5:2	High beams	
LC5	5:2	Low brake oil pressure	
LC6	5:3	Central warning	
LC8	5:3	Direction indicators	
LC9	5:5	Parking brake	
LC10	5:6	Engine oil pressure	
LC11	5:7	Charging	
LC12	5:7	Air filter	
LC13	1:6	Preheating engine	
LC14	5:8	Primary steering system	
LC15	5:9	Secondary steering system	
LC20	5:10	Malfunction, transmission	
LC21	5:11	Engine temperature, high	
LC22	6:4	Longitudinal differential lock	(serial no. –1400 US –60300)
LC22	12:3	Longitudinal differential lock	(serial no. 1401–, US 60301–)
LC26	2:1	Automatic gearshifting	
LC28	5:13	Spare	
LC30	6:8	Guide light switches	
LC39	10:1	Coolant level engine	
LC40	3:3	Engine radiator fan	
LC43	6:2	Service brake	
LC44	3:2	Oil pressure, dropbox	(serial no. –1400 US –60300)
LC45	3:1	Brake cooling oil tank	
LC46	12:3	Longitudinal differential lock	(serial no. 1401–, US 60301–)
LC47	12:4	Transverse differential lock, front drive axle	(serial no. 1401–, US 60301–)
LC76	5:14	Brake cooling oil temperature, high	
LC80	10:3	Body up	

Document Title: **Instruments**	Function Group: **370**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Instruments

Marking	**Circuit no. in wiring diagram**	**Designation**
IM1	5:15	Temperature gauge transmission
IM5	6:6	Speedometer
IM6	6:6	Tachograph
IM8	5:1	Combination instrument
IM8A	5:14	Hour meter
IM8B	5:14	Engine temperature
IM8C	5:14	Fuel gauge
IM8D	5:1	Tachometer
IM30	5:2	Air pressure gauge
DISPLAY	9:1	Information display unit

Document Title: **Specifications**	Function Group: **372**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Specifications

Fuses	**Current rating**	**Number**
Electrical distribution box	5 A	15
Electrical distribution box	15 A	9
Main fuse (engine compartment)	25 A	1
Slow glass fuse (electronic control unit, ECU)	4 A	1
Preheating coil	5 A	1
Main fuse, tachograph (battery compartment)	5 A	1

18. Socket for service display unit
19. Stop control

Figure 23

1. Seal
2. Cover

1. Fit the electric connections on the new speedometer.
2. Fit the cover over the electric connections.
3. Affix a new seal.
4. Fit the speedometer.
5. Fit the instrument panel.

Speedometer, changing

Removing

Mounting

	dumpings in order to count as a cycle)

The displayed values are reset by pressing the key .

Fig. 2.3 NEXT SERVICE

TIME FOR SERVICE starts to flash when 8 hours remain to the next scheduled service interval.

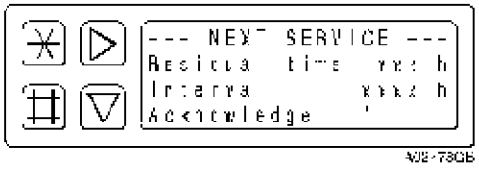


Figure 6
Figure 2.3

The following information is displayed on the unit:

Residual time xxx h	shows time remaining to next service
Interval xxxx h	shows next service interval (100, 250, 500, 1000, 2000 hours) to be performed according to pre-set service program.
Acknowledge *	Press and TIME FOR SERVICE stops flashing.

Fig. 3.1 DATE TIME

The following information is displayed on the unit:

Figure 7
Figure 3.1

1. Cursor

Date	shows today's date with year, month and day.
Time	shows time in hours and minutes.

The display has six different presentation alternatives that can be selected:

Alt. 1; 97-01-14	13:41
Alt. 2; 97-01-14	1:41 P
Alt. 3; 01.14.97	13:41
Alt. 4; 01.14.97	1:41 P
Alt. 5; 14.01.97	13:41
Alt. 6; 14.01.97	1:41 P

Setting of presentation alternative

	C, km/h, km, bar
	F, mph, mile, psi
Change language by pressing key	
Change unit combinations by pressing	

Selected language and unit combination are subsequently used in all display texts.

Fig. 1.13 MACHINE HOURS

The display shows the total number of engine hours.
The function is used, for example, to set the correct number of engine hours when changing ECU, so that the correct information is shown in fig. 2.3 and 2.13 regarding time remaining to next service and service intervals.

Move the cursor ^ by pressing

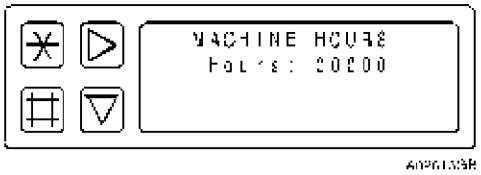


Figure 3
Figure 1.13

Advance the number by pressing

Fig. 1.14 SETUP BODY-UPGEAR LOCK

Can be used to lock the transmission in the gear (only 1-2 or 2-3) that is engaged when elevation of the load body starts. If elevation of the load body starts when operating in a higher gear, gearshifting is not locked.

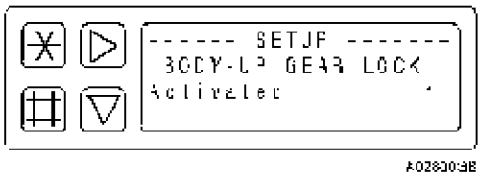


Figure 4
Figure 1.14

Activated	**Activated and deactivated by pressing**
Deactivated	

Fig. 2.11 INFORMATION 1

The following information is displayed on the unit:

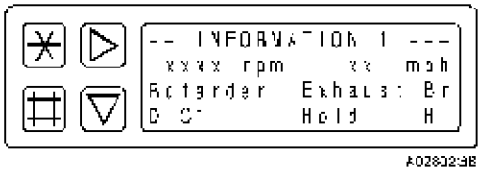


Figure 5
Figure 2.11

Erase Er record:	erase error record by pressing key . Then, fig. 6.18.2 is shown.

Fig. 6.18.2 ERASE ERROR RECORD

The following information is displayed on the unit after erasing warning/error code, see fig. 6.18.1.

Figure 23
Figure 6.18.2

Abort erase:	erasing can be aborted by pressing the key
Confirm erase:	confirm erasing by pressing key

Fig. 6.18.3 ERASE ERROR RECORD

If erasing of warnings/errors has been interrupted, the display shows the text "Erase memory aborted".

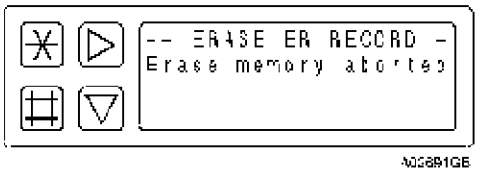


Figure 24
Figure 6.18.3

Fig. 6.18.4 ERASE ERROR RECORD

The display shows the text "Error memory erased" when warnings/errors have been erased.

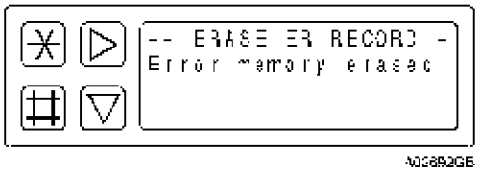


Figure 25
Figure 6.18.4

Fig. 7.11 AXLES/BRAKES

The following information is displayed on the unit:

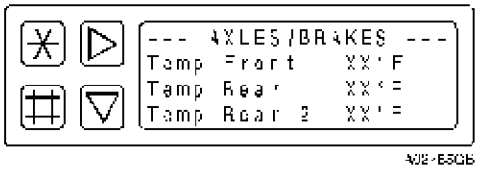


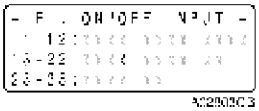
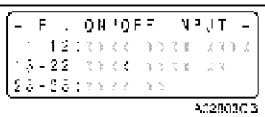
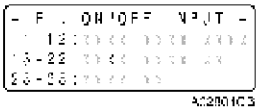
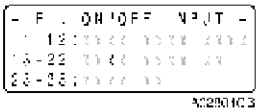
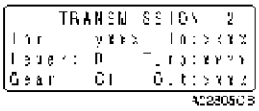
Figure 26
Figure 7.11

446 Transmission ER	Solenoid valve retarder on/off short-circuited to ground (MA151)	yes	
447 Transmission ER	Solenoid valve torque limitation short-circuited to ground (MA139)	yes	
448 Transmission ER	Solenoid valve exhaust retarder (exhaust brake) short-circuited to ground (MA49)	yes	
451 Transmission ER	Solenoid S1 open circuit or short-circuited to 24 V	yes	yes
452 Transmission ER	Solenoid S2 open circuit or short-circuited to 24 V	yes	yes
453 Transmission ER	Solenoid S3 open circuit or short-circuited to 24 V	yes	yes
454 Transmission ER	Solenoid S4 open circuit or short-circuited to 24 V	yes	yes
455 Transmission ER	Solenoid S5 open circuit or short-circuited to 24 V	yes	yes
456 Transmission ER	H/L solenoid valve on dropbox (MA7) open circuit or short-circuited to 24 V	yes	
457 Transmission ER	Solenoid S7 open circuit or short-circuited to 24 V	yes	yes
458 Transmission ER	Solenoid S8 open circuit or short-circuited to 24 V	yes	yes
461 Transmission ER	H/L solenoid valve on dropbox (MA50) open circuit or short-circuited to 24 V	yes	
462 Transmission ER	Solenoid valve retarder open circuit or short-circuited to 24 V (MA8)	yes	yes
463 Transmission ER	Solenoid S9 (Lock-up) open circuit or short-circuited to 24 V	yes	
464 Transmission ER	Solenoid S11 (modulation) open circuit or short-circuited to 24 V	yes	yes
465 Transmission ER	Solenoid S13 (modulation) open circuit or short-circuited to 24 V	yes	
466 Transmission ER	Solenoid valve retarder on/off open circuit or short-circuited to 24 V (MA151)	yes	
467 Transmission ER	Solenoid valve torque limitation open circuit or short-circuited to 24 V (MA139)	yes	
468 Transmission ER	Solenoid valve exhaust retarder (exhaust brake) open circuit or short-circuited to 24 V (MA49)	yes	
488 High engine speed	Engine speed too high to leave Neutral position		
489 High speed	Overspeeding (>2400 rpm)	yes	yes
491 Slipping ER□	Slipping, turbine speed higher than output speed	yes	yes
492 Slipping ER□	Slipping, turbine speed lower than output speed	yes	yes
493 Slipping ER□	Slipping, Lock-up, that is, engine speed not equal to turbine speed	yes	yes
498 Low voltage ER□	ECU supply voltage below 21.5 V	yes	yes

Document Title: **Troubleshooting chart**	Function Group: **400**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Troubleshooting chart

□) Error codes marked with an □ in the table are shown for as long as the malfunction exists. Other error codes are shown even if the malfunction is only temporary/intermittent, that is, they are stored and displayed until the ignition is turned off.

Error code	Symptom	Probable cause	Action	Service display, figure no.
403 Oil level in cooling oil tank - sender unit failure (sensor malfunction) SE99		Defective sensor SE99 or cabling to same.	Measure resistance in cabling and check sensor.	 Fig. 5.12 No. 16 Normal oil level; 0 Low oil level; 1
404 Oil level in cooling oil tank, low		Leakage	Check hoses and brake seals. Check oil level in axles.	 Fig. 5.12 No. 16 Normal oil level; 0 Low oil level; 1
405 (serial no. –1400, US –60300) Pressure in dropbox Sensor malfunction SE101		Defective sensor SE101 or cabling to same.	Measure resistance in cabling and check sensor.	 Fig. 5.12 No. 15 Open sensor circuit or started engine with normal oil pressure; 0 Started engine with low oil pressure; 1
406 (serial no. –1400, US –60300) Pressure in dropbox low			Check compressed air lines and pressure regulator. Pressure should be 0.3 bar (4.35 psi). Also check the relief valve in filler cap. Pressure should be 0.35 bar (5.1 psi).	 Fig. 5.12 No. 15 Open sensor circuit or started engine with normal oil pressure; 0 Started engine with low oil pressure; 1
411 Speed sender unit failure (sensor malfunction) SE4	If gearshift selector is moved to "N", transmission will remain in "N". Can be shifted from 2nd gear to gears 3-4-5-6 but shifts due to overspeeding engine.	Defective sensor or cabling to same.	1. Measure resistance EA 13 – 2. Correct value: see graph "Measuring resistance SE3, SE4 and SE86". 2. Measure EA13 and EA2 to frame (ground). There	 Fig. 6.12 Out: output speed

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Checking main, torque converter and lubrication oil pressure	**421**	**Service Information**	**24.03.2013**
Profile:			

Checking main, torque converter and

Op nbr 43702

999 3335 Hose, 1 pc.
999 3522 Quick-coupling (female coupling), 1 pc.

930032-8 Measuring nipple (male coupling), 1 pc. + gasket 945653-4

929260-8 Intermediate nipple (R3/8" – R1/4")

Pressure gauge, range: 0 – 2.5 MPa (0 –25 bar) (0 - 363) psi)

Pressure gauge, range: 0 – 1 MPa (0 –10 bar) (0 - 145 psi)

CAUTION

The oil must be at normal operating temperature when checking pressures.

WARNING

Hot oil can cause severe burns.

1. Before checking, lower the rear underbody skid plates (2) and (3), Figure [?].

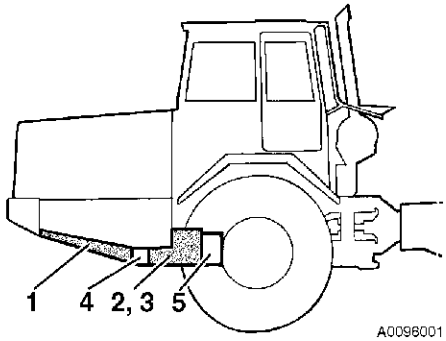


Figure 1
Underbody skid plates
2, 3 Rear underbody skid plates

2. The ECU must be disconnected if the transmission oil pressure is to be checked using manual gearshifting. Move the connectors EA and EB to connections (A) and (B), Figure [?].

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Measuring resistance of sensor for retarder temperature (SE13)	**421**	**Service Information**	**24.03.2013**
Profile:			

Measuring resistance of sensor for

Function	Checking points	Value ± 10%
Retarder temp SE13	On sensor	1030 ohm at 25 °C (77 °F)
–"–	–"–	316 ohm at 50 °C (122 °F)
–"–	–"–	81 ohm at 90 °C (194 °F)
–"–	–"–	37 ohm at 120 °C (248 °F)
–"–	–"–	21 ohm at 145 °C (293 °F)

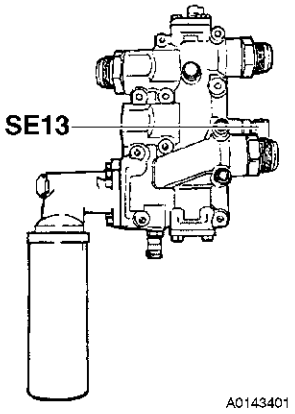


Figure 1
Measuring resistance of SE13

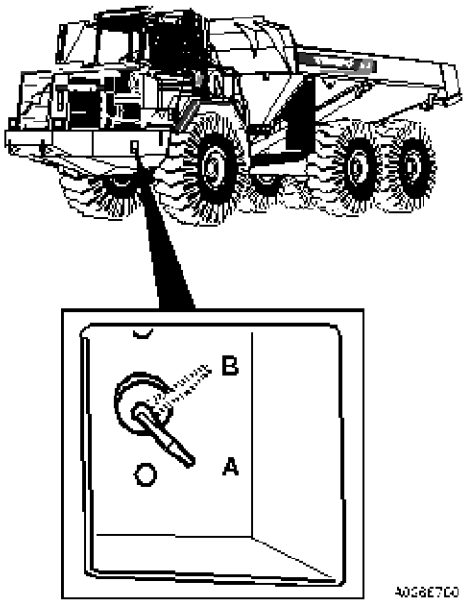


Figure 1

A	On
B	Off

2. Turn off the electric power with the battery disconnect switch, Figure [?] .

3. Remove the rear underbody skid plates (2) and (3) as well as the rear member (5), Figure [?].

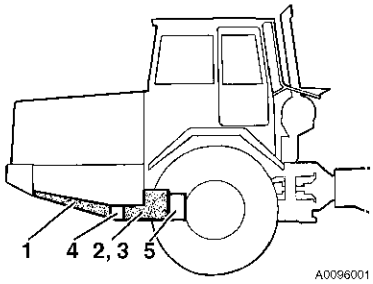


Figure 2
Underbody skid plates

1. Front underbody skid plate
2. Rear underbody skid plate, left
3. Rear underbody skid plate, right
4. Front member
5. Rear member

4. Remove the torsion bar, Figure [?].

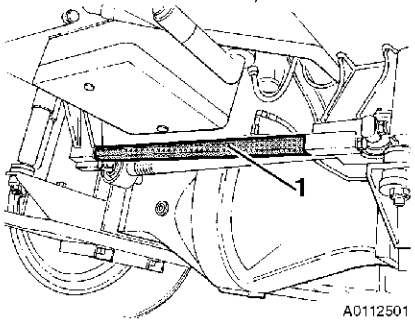


Figure 3

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Tightening torques	**421**	**Service Information**	**24.03.2013**
Profile:			

Tightening torques

	Nm	kpm	lbf ft
Flywheel housing – transmission	85	8.5	62.7

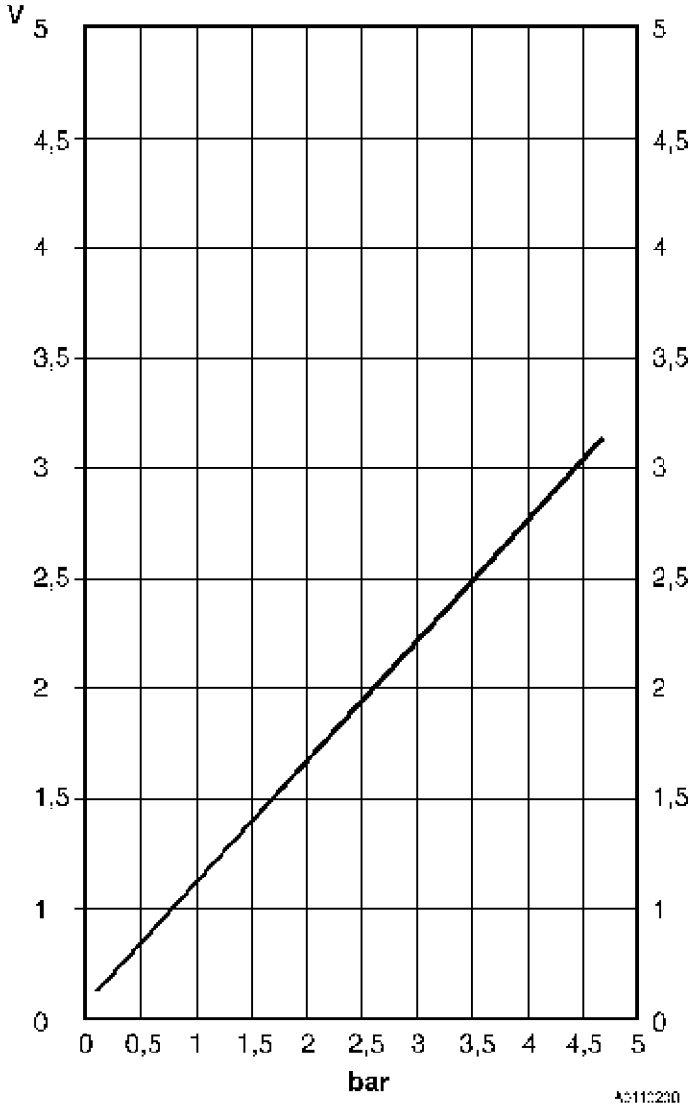


Figure 2

Feed voltage from EA9 = 5 V

Document Title: **Dropbox, removing**	Function Group: **434**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Dropbox, removing

Op nbr 43474

Ratchet block, 750 kg (1654 lbs), 2 pcs.

Torque wrench 0–400 Nm (0–40 kpm) (0–295 lbf ft)

The dropbox weighs approx. 400 kg (882 lbs).

WARNING

Hot oil can cause severe burns.

CAUTION

Plug all pipes, hoses and connections when removing.

Removing

1. Park the machine in the service position.
2. Turn off the electric power with the battery disconnect switch, see Figure [?].

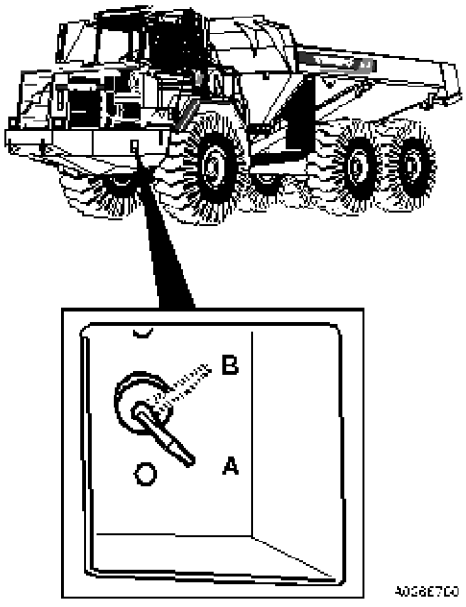


Figure 1
Battery disconnect switch

A. On
B. Off

3. Drain the dropbox oil.
4. Remove the operator's seat, mats and floor plates.

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Construction Equipment

Service Information

Document Title: **Capacities**	Function Group: **434**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Capacities

	when changing (liters)	**total (liters)**
Dropbox	8 (2.1 US gal)	12 (3.2 US gal)

VOLVO
Construction Equipment

Service Information

Document Title: **Tightening torques**	Function Group: **450**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Tightening torques

	Nm	kpm	lbf ft
Bolt flanges, propeller shafts, engine – dropbox	180	18.0	132.8
Hitch – 1st (front) bogie axle	180	18.0	132.8
Others	140	14.0	103.3

Propeller shafts

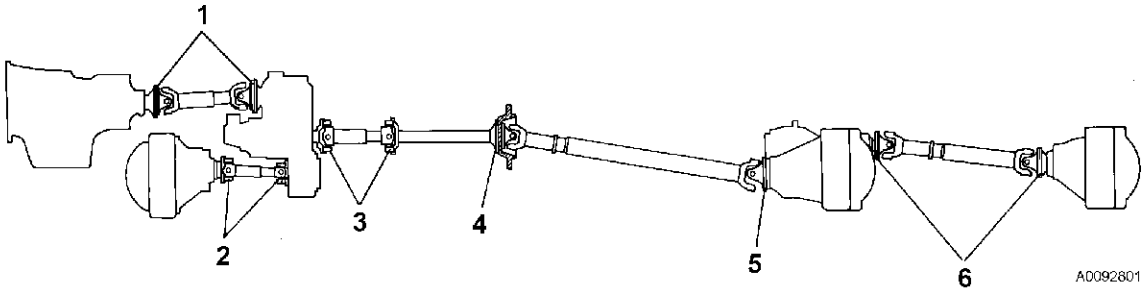

Figure 1
Tightening torques, propeller shafts

	Nm	kpm	lbf ft
1	180	18	132.8
2	140	14	103.3
3	140	14	103.3
4	180	18	132.8
5	180	18	132.8
6	140	14	103.3

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Construction Equipment

Service Information

Document Title: **Capacities**	Function Group: **460**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Capacities

	when changing (liters)	**total (liters)**
Hub reduction	7 (1.9 US gal)	7 (1.9 US gal)

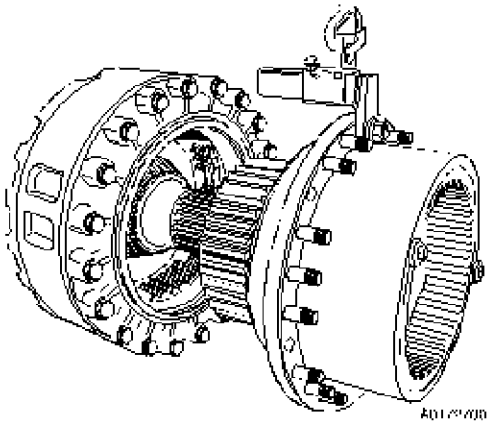


Figure 13

22. Change bearing, if needed. Lift up the hub and ring gear with the lifting device and carefully push the hub splines against the first brake disc, see Figure [?].

    - Angle the hub slightly down and very carefully rock it inward and upward while turning at the same time so that it enters one disc at a time.

CAUTION

Do not bump up against the inner seal. It may move out of place and the procedure must be repeated from the start.

CAUTION

When the hub is so far in that the two outer face seals are in contact, the hub must not be pulled out again. The seals adhere to each other by suction and will move out of position if the hub is pulled back out.

23. Fit support 999 3722 and pull the hub into place, see Figure [?].

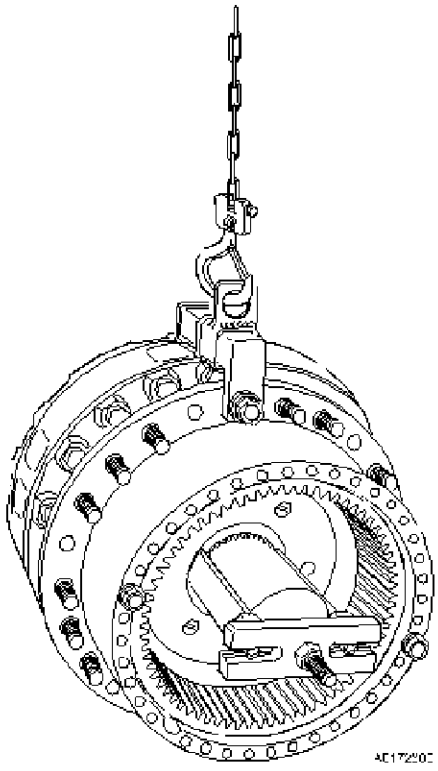


Figure 14

Document Title: **Specifications**	Function Group: **464**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Specifications

	Rear drive axle load unit
Make	Volvo
Type	AHW 71 E
Product number	23748
Final drive	EVBM
Reduction ratio	3.56:1
Hub reduction	Planetary gears
Reduction ratio	4.833:1
Differential lock	Dog-clutch

SF	Suction filter		
TV1	Modulating valve (flow limitation)		

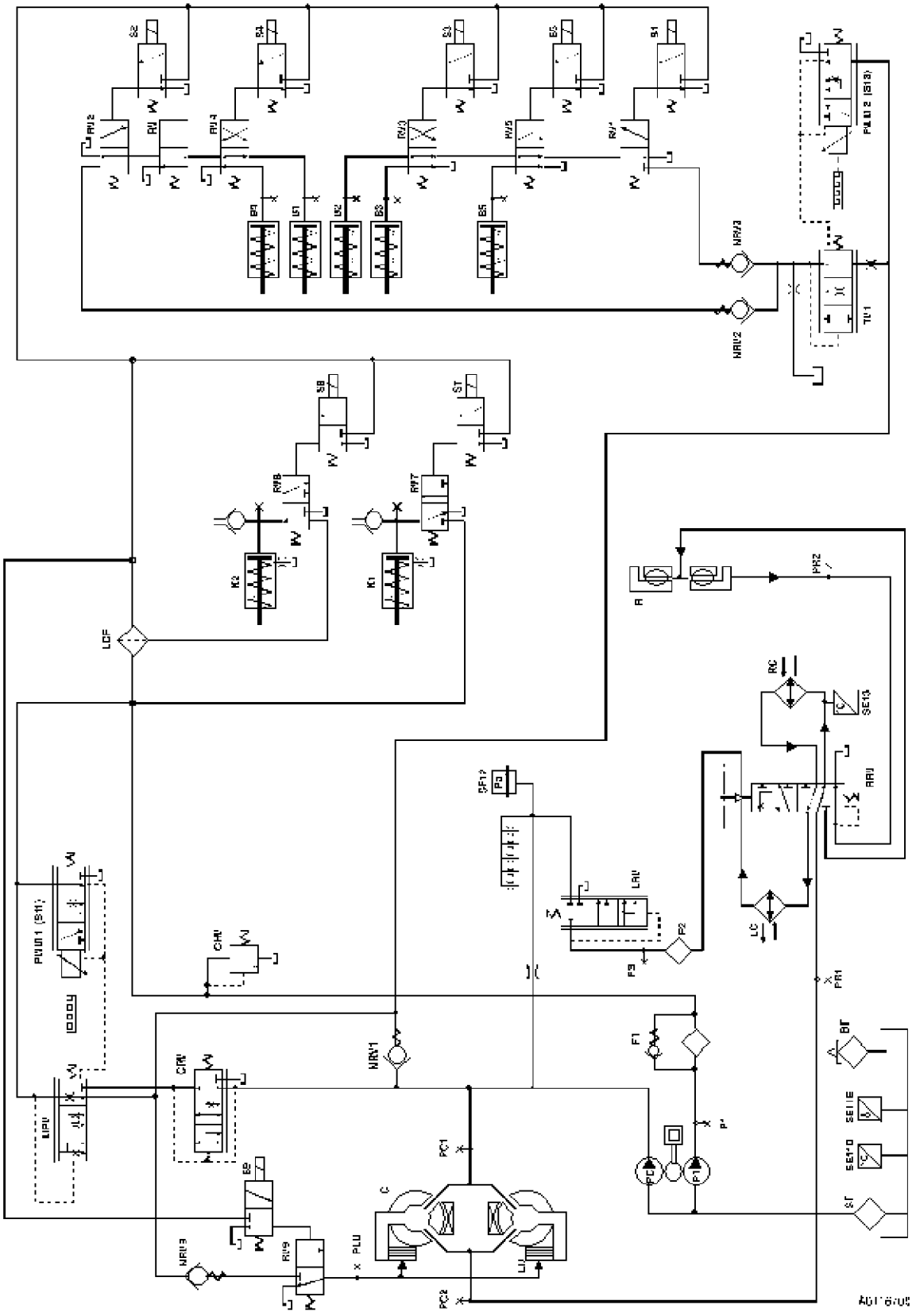


Figure 1

VOLVO
Construction Equipment

Service Information

Document Title: **Brake discs, changing**	Function Group: **516**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Brake discs, changing

Op nbr 51604

999 3722 Support
999 3840 Centering tool
999 3842 Plug (1 pc)
999 3843 Plug (1 pc)
999 3845 Checking tool (Pressurizing equipment)
E 1751 Hub lifting device
E 1752 Lifting device

947358 Puller bolt (3 pcs)

482 1970 Blind nut (2 pcs)

482 1971 Blind nut (1 pc)

482 1972 Blind nut (1 pc)

11 061 273 Blind nut (2 pcs)

11 668 005 Socket, hub nut 130

13 802 608 Plug (1 pc)

13 971 013 Guide pin (2 pcs) (cut-off bolt head)

Wheel forklift or similar equipment

Stand jacks or similar equipment

Ratchet block 750 kg (1654 lbs)

Lifting sling, 2 m (6.5 ft)

Thread protectors (Ø 10x35) (3 pcs)

Position numbers in brackets refer to Figure [?], Planetary gear with brake parts.

Removing

1. Park the machine on a firm and level surface. Block at least one wheel. Brake out the pressure from the brake system by slowly and fully depressing the brake pedal 25–30 times.

2. Lift the axle using two stand jacks (alt. hydraulic jack and axle stands), see Figure [?]. Make sure that the axle is as level as possible.

VOLVO
Construction Equipment

Service Information

Document Title: **Planetary gear with brake parts**	Function Group: **516**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Planetary gear with brake parts

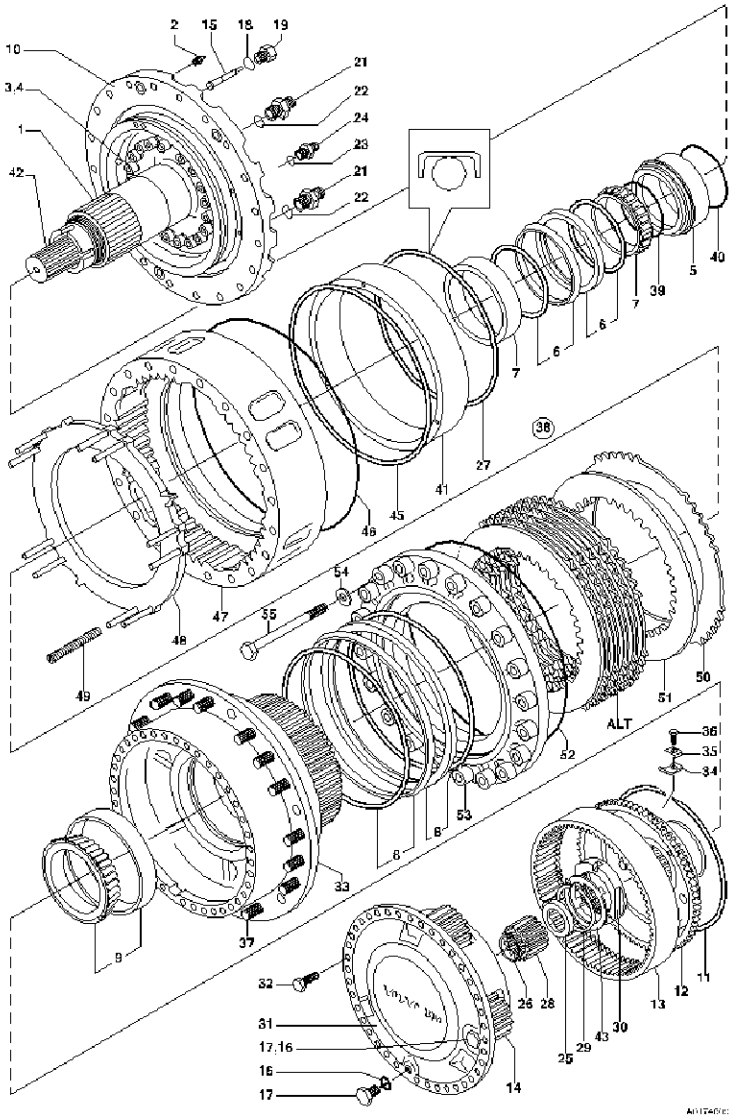


Figure 1
Planetary gear with brake parts

1	Spindle	20	–	39	O-ring
2	Air nipple	21	Nipple (cooling oil)	40	O-ring
3	Bolt	22	O-ring	41	Brake piston
4	Washer	23	O-ring	42	Drive shaft (stub axle)
5	Spacer ring	24	Nipple (brake oil)	43	Lock ring
6	Face seal	25	Wear ring	44	–
7	Bearing	26	Retaining ring	45	Brake piston seal

30. Measure the fiber discs (50, 51). If the measurement is below 6.25 mm (0.25 in), they must be changed. Otherwise, fit as they were before, alternating fiber discs and steel discs. Start with a steel disc. Rotational direction as before.

    CAUTION

    Brake disc spacings must be lined up directly in front of each other to ensure adequate flow of brake cooling oil.

31. Check that the O-ring (52) in the housing is in place.

32. Fit the outer end plate (53). Check the marking made when separating. Fit all bolts and tighten them to **430 Nm** (43 kpm) (317.2 lbf ft).

33. Check the two face seals (8) with accompanying O-rings. Change if needed.

    - Wipe the O-rings dry and fit them in place together with the face seals (metal rings). Wipe the seal rings clean and dry and lubricate them with a cloth and lubrication oil 97303-10. Make sure that the oil does not get onto other surfaces than the wear surfaces on the face seals.

      CAUTION

      The inner face seal is mounted on the O-ring which is located in a faintly marked groove. The face seal must not be touched or moved before being locked by the hub.

34. Change the bearing races in the hub, if needed.

35. Fit the two face seals in the hub. Wipe the face seals clean and dry and lubricate them using a rag and lubrication oil 97303-10. Make sure that the oil does not wet other surfaces than the wear surfaces on the face seals.

36. Check that the face seals are correctly positioned by carefully trying to loosen them. If they offer resistance, they are positioned correctly, locked in place by the O-rings **(does not apply to the inner seal)**.

    - Check that the face seal is correctly positioned (straight) in relation to the brake housing and hub by measuring with a sliding gauge all the way around, see Figure [?]. Max. deviation = 1 mm (0.04 in).

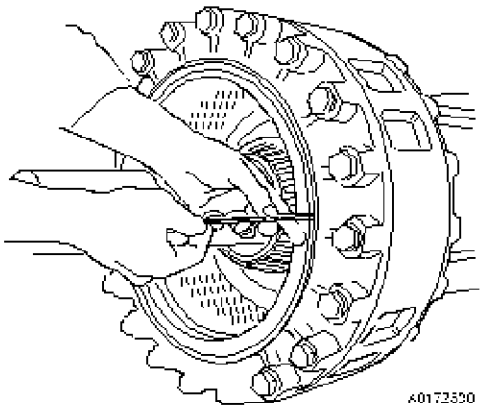


Figure 17

37. Mount the centering tool 999 3840 on the spindle, see Figure [?]. Make sure that the brake disc spacings are directly lined up to ensure adequate flow of brake cooling oil.

a. Depress the brake pedal slowly and firmly 10–15 times.
b. Secure the pedal in the depressed position.
c. Bleed the front axle, first by the wheels and then on the valve block located on the center of the axle.
d. Bleed by the relay valve on the load unit second accumulator bank.
e. Bleed the front bogie axle, first by the wheels and then on the valve block located on the center of the axle.
f. Perform the actions in step 9e on the rear bogie axle.

(If work only has been performed on one brake, bleed only the axle and the brake circuit which has been opened.)

10. Stop the engine and perform four full braking actions. Check on the pressure gauge that the pressure does not drop below 14.5 MPa (145 bar) (2103 psi) when the engine is running. If the pressure drops below this value, bleed air from the brake system or check the accumulators. See section "Accumulators, checking". (When the engine is running and the system pressure drops below 14.5 MPa (145 bar) (2103 psi), the warning light for low brake oil pressure lights up on the instrument panel.)

11. Brake out the system pressure completely by repeatedly depressing the brake pedal (approx. 20–30 times) until the oil flow through the foot brake valve has ceased. (The hissing sound can no longer be heard.) Remove the pressure gauge.

12. Refit the protective cover on the tractor unit accumulator bank.

13. Check the oil level in the hydraulic oil tank and top up if needed.

(200 bar) (2900 psi). If the system is opened without first releasing the pressure, oil under high pressure will jet out.

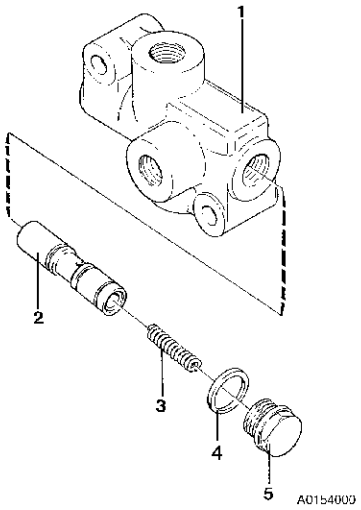


Figure 3
Dismantled relay valve

1. Valve housing
2. Valve slide
3. Spring
4. Gasket
5. Plug

VOLVO
Construction Equipment

Service Information

Document Title: **Foot brake valve, removed, reconditioning**	Function Group: **525**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Foot brake valve, removed, reconditioning

Op nbr 52509

The numbers in the text refer to Figure [?].
Foot brake valve = Valve.

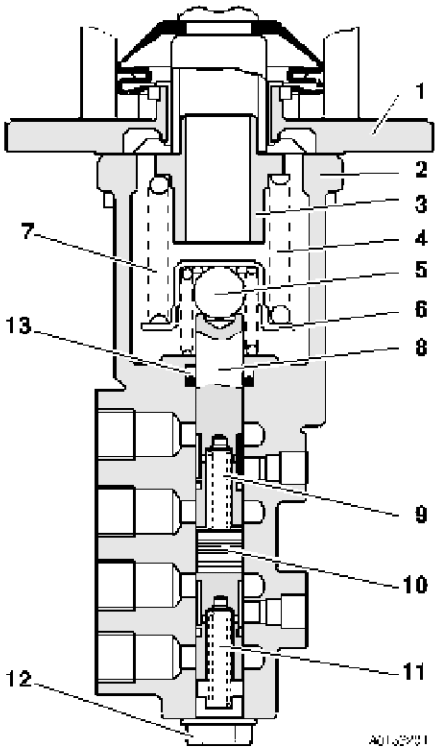


Figure 1
Brake valve

1. Bracket
2. Valve housing
3. Spring stop
4. Spring
5. Spring stop
6. Ball
7. Spring
8. Slide
9. Spring
10. Slide
11. Spring
12. Plug

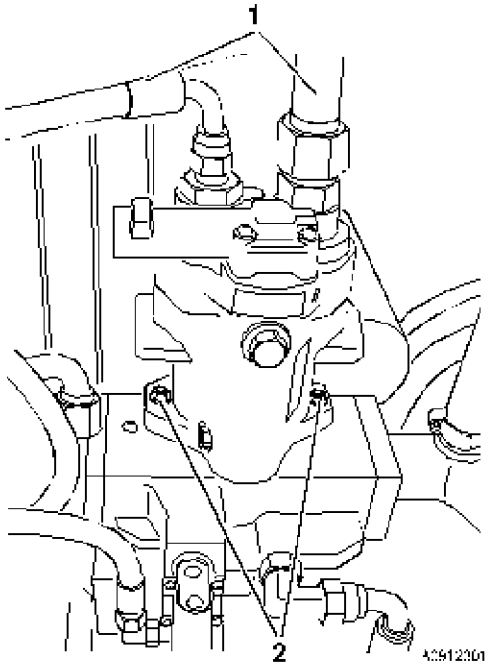


Figure 2

1. Hoses
2. Retainer bolts

4. Fit a new O-ring when the brake pump is mounted.

5. Check according to ---- not implemented: INTXREF ----: .

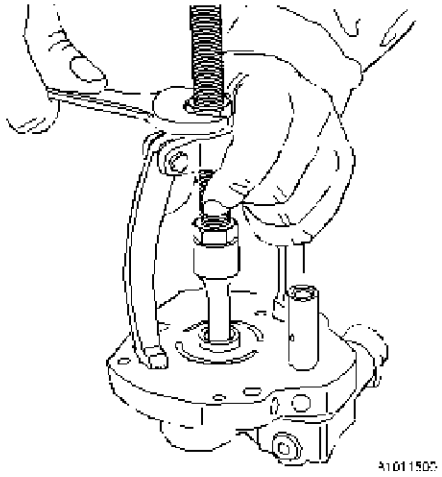


Figure 25

26. Remove the compensator.

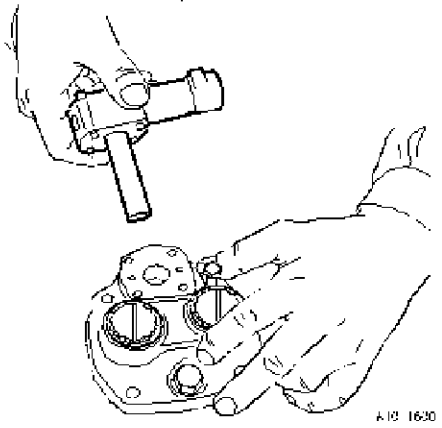


Figure 26

27. Measure the basic adjustment of the compensator. Note the measurement. Remove the seal.

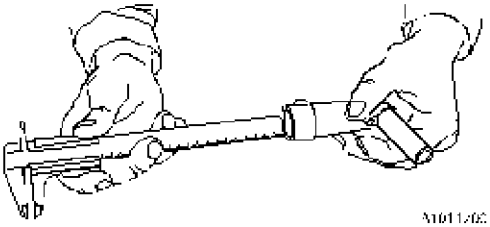


Figure 27

28. Remove the adjusting screw, spring and valve seat.

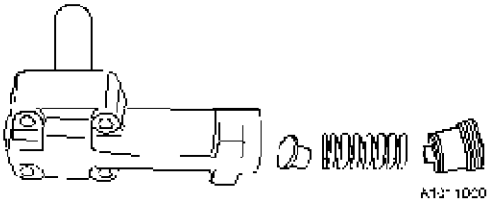


Figure 28

29. Remove the plug.

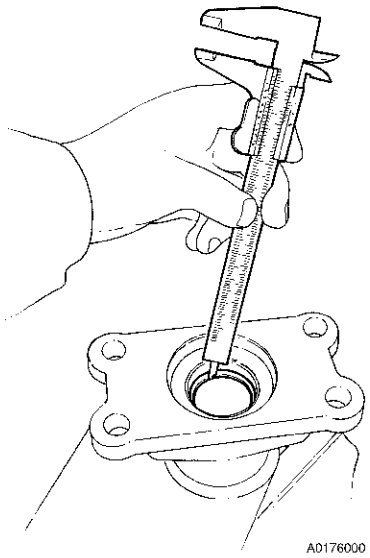


Figure 2
Measuring bushing position

7. Change the valve on caliper, see Figure [?].

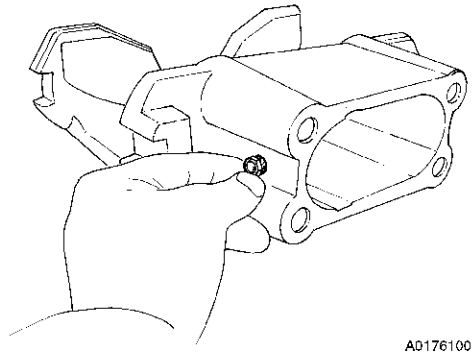


Figure 3
Installing valve

8. Lubricate the parts and fit the wear washer, shaft and seal in the housing.
9. Fit the piston on the shaft.
10. Fit the gasket against the housing.
11. Fit the large square seal in the caliper.
12. Grease the piston and cylinder in the caliper. Fit the piston with housing in the caliper as marked. Tighten the bolts.

counter-clockwise (clicking sound).

9. Apply and release the parking brake approx. 10 times.
10. Fit the cover plate over the parking brake.
11. Remove the load body support, lower the load body. Remove the blocking from the wheels.
12. Check functions.

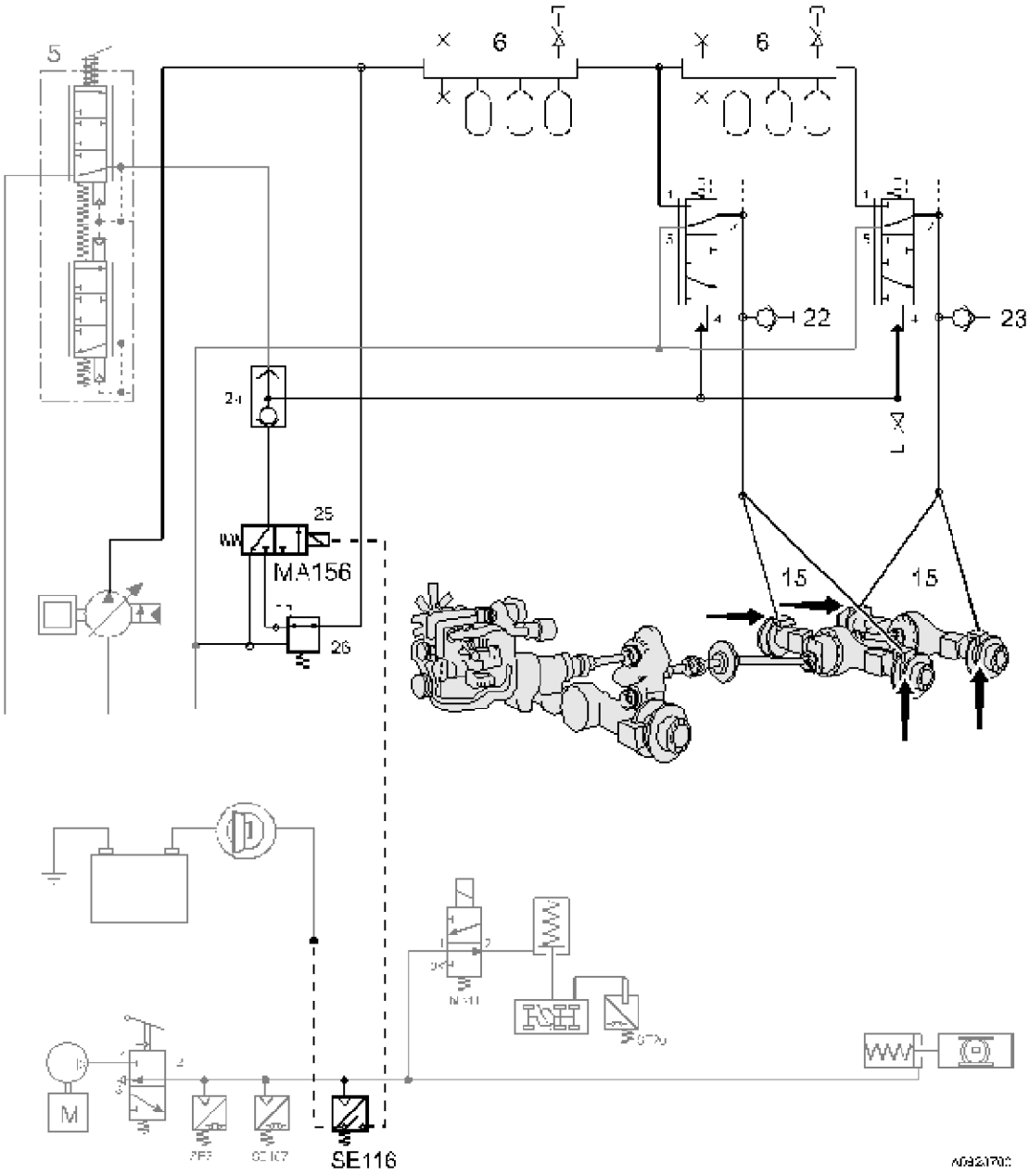


Figure 1
Load and dump brake. Engagement, position and included parts

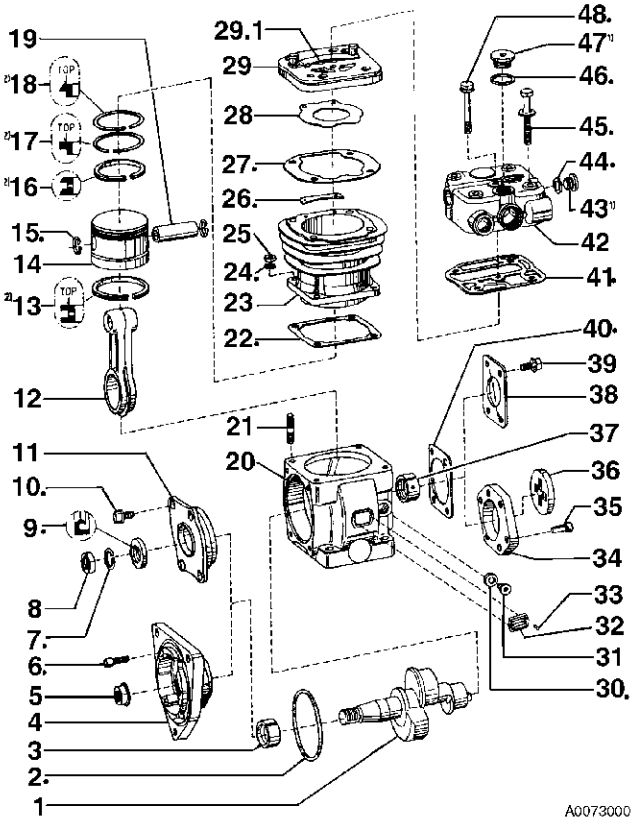


Figure 2
Exploded view of air compressor

1	Crankshaft	25	Nut M8, 4 pcs
2	•O-ring	26	•Gasket
3	Bearing bushing	27	•Gasket
4	End flange	28	Suction valve disc
5	Nut	29	Disc (reed) valve
6	•Cylinder bolt M8x45, 4 pcs, micro-capsuled	30	•Seal ring
7	•Spring ring	31	Lock bolt
8	Nut	32	Type plate
9	•Shaft seal ring	33	Groove rivet, 2 pcs
10	•Bolt M8x20, 4 pcs, micro-capsuled	34	Pump bracket
11	Bearing cap	35	Cylinder bolt
12	Connecting rod	36	Flange
13	Oil groove ring	37	Bearing bushing
14	Piston	38	Cover
15	•Stop ring	39	Bolt M8x20, 4 pcs
16	Piston ring	40	•Gasket
17	Piston ring	41	•Gasket
18	Piston ring	42	Cylinder head
19	Gudgeon pin	43	Lock bolt M14x1.5 or M22x1.5
20	Crankcase	44	•Seal ring
21	Stud	45	•Bolt M8x80, 4 pcs
22	Gasket	46	•Seal ring
23	Cylinder	47	•Lock bolt M26x1.5
24	•Spring ring	48	•Flange bolt

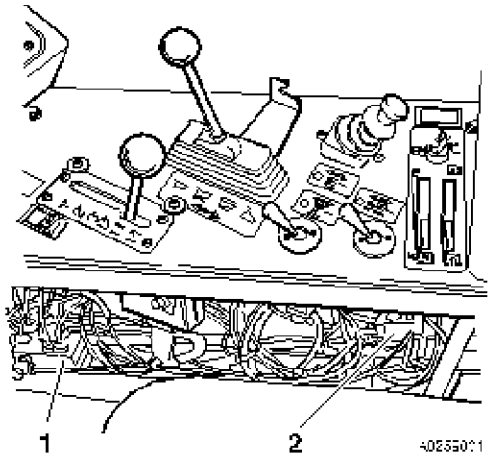


Figure 2
Pressure retaining valve (serial no. –1400)

1. Valve block
2. Pressure retaining valve

Correct overflow pressure: 650 kPa (6.5 bar) (94.3 psi)

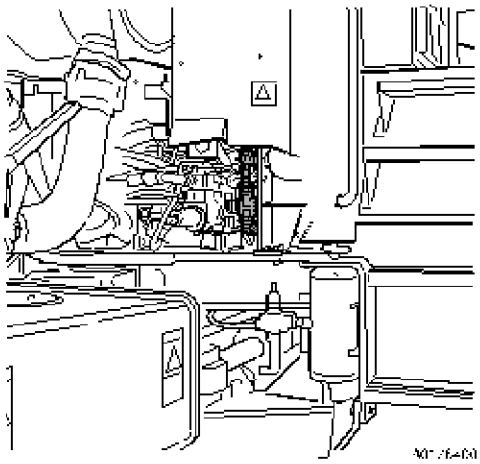


Figure 3
Pressure retaining valve (serial no. 1401–)

Document Title: **Description**	Function Group: **600**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Description

The A40 hauler is equipped with articulated steering and has a hydromechanical steering system with feedback between the load unit and the steering valve.

The steering system is connected in parallel with the dumping system and have common hydraulic pumps. However, the steering system has priority over the dumping system to safeguard the steering function at all times.

A ground dependent hydraulic pump in the steering system is used in a secondary function. This secondary steering pump always supplies oil to the primary steering system when the machine is on the move.

The steering valve, which has a closed neutral position (closed center), is operated by the steering wheel via a rack and pinion gear and a linkage system. The steering valve directs the oil to both steering cylinders when the steering wheel is turned and the linkage system moves the steering valve slide from the neutral position.

The steering valve slide is returned to the neutral position when the machine has changed direction according to the movement of the steering wheel, since the linkage system is connected to the steering joint. Conversely, the steering valve slide moves away from the neutral position if the steering angle is changed by external forces when the position of the steering wheel remains unchanged. Movement of the steering valve slide is limited by mechanical stops.

VOLVO
Construction Equipment

Service Information

Document Title: **Steering valve slide axial clearance, checking and adjusting**	Function Group: **643**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Steering valve slide axial clearance,

Op nbr 64310

Dial indicator with magnetic base

Pin tool, drill bit or similar Ø = 14 mm (9/16 in)

Numbers in brackets ( ) refer to Figure [?].

1. Park the machine straight.

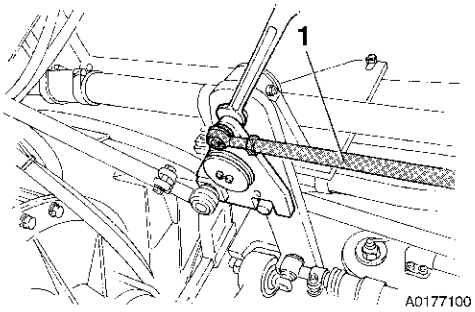


Figure 1

1. Control rod for steering valve

2. Remove the door pin, mat, operator's seat and floor plates.
   Turn away the plate with the brake pedal without removing its connections.

3. Remove the control rod (9) for the steering valve (6) from the rear levers (4).

4. Release the feedback rod (8) by the hitch.

5. Remove the cover plate over the accumulators by the steering valve.

6. Remove the hose and elbow nipple on the steering valve housing.

7. Fit the dial indicator with magnetic base.
   Place the indicator point against the end of the slide through the hole in the housing, Figure [?].

8. Check the axial clearance by pulling and pushing on the steering valve control rod (9).
   Correct axial clearance: 0.3 ±0.1 mm C on Figure [?] (0.012 ±0.004 in).

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Steering linkage, changing roller bearing in bracket (serial no. 1226–, US 60146–)	**643**	**Service Information**	**24.03.2013**
Profile:			

Steering linkage, changing roller bearing in bracket

Op nbr 64332

999 3678 Plate

Socket 4-KM6 (for round nut)

699 9048 Drift plate

699 9065 Drift plate

1. Park the machine in the service position on a level surface.
2. Remove the floor mats, operator's seat and rear floor plates (as an alternative, the bearing can be changed from the right wheel housing).
3. Remove the protective cover (1) on the bracket (2), see Figure [?].

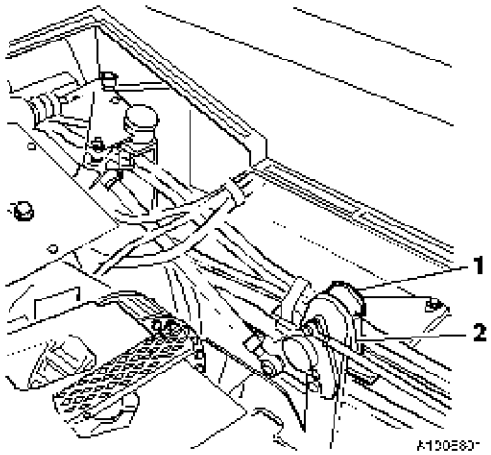


Figure 1
Steering linkage

1. Protective cover
2. Bracket

4. Bend down the lock plate for the round nut.
5. Remove the round nut, lock washer and the washer.
6. Fit a bolt (M10) in the pivot pin hole and pull off the lever with a puller, see Figure [?].

Document Title: **Specifications**	Function Group: **645**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Specifications

Control valve, steering	
Type	Slide valve
Steering cylinder	
Quantity	2 double-acting

Document Title: **Steering valve neutral position and valve slide axial clearance, checking**	Function Group: **645**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Steering valve neutral position and valve slide

Op nbr 64580

999 3522 Quick-coupling (female part), two pcs□
999 3352 Hose, two pcs

Pressure gauge 0–25 MPa (0–250 bar) (0–3625 psi)

□) Male part, part no. 930032, located on machine

1. Connect the pressure gauge 0–25 MPa (0–250 bar) (0–3625 psi) to the connections on the non-return valve block.

2. Start the engine and do not turn the steering wheel. When the steering wheel is turned carefully to the right or left, the pressure should increase.
   The valve slide is correctly centered.
   If the pressure drops when the steering wheel is turned in one direction, and increases when the steering wheel is turned in the opposite direction, the valve slide is not centered correctly. The machine will then have a tendency to "self-steer".
   Incorrectly centered valve slide in the steering valve is adjusted with adjusting washers A, see Figure [?].

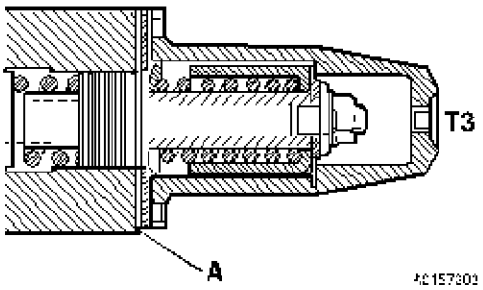


Figure 1

A. Position of adjusting washers

3. Also check the tendency to "self-steer" by suddenly steering the machine in both directions and then releasing the steering wheel. The steering movement should be interrupted when the steering wheel is released. Any tendency to "self-steer" may also be due to binding in the steering linkage, see ---- not implemented: INTXREF ----: .

4. Regarding axial clearance, see ---- not implemented: INTXREF ----: .

VOLVO
Construction Equipment

Service Information

Document Title: **Weights**	Function Group: **645**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Weights

	kg (approx.)	**lbs (approx.)**
Steering cylinder	60	132
Steering valve	28	62

6. Rubber spring
7. Torsion bars

Document Title: **Tightening torques**	Function Group: **710**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Tightening torques

Tractor unit

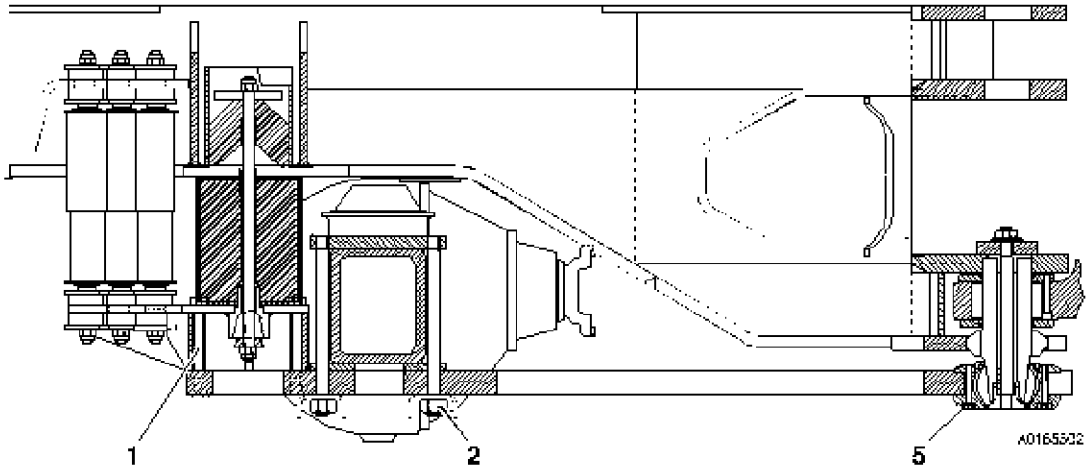


Figure 1
Tightening torques, tractor unit (See following figure)

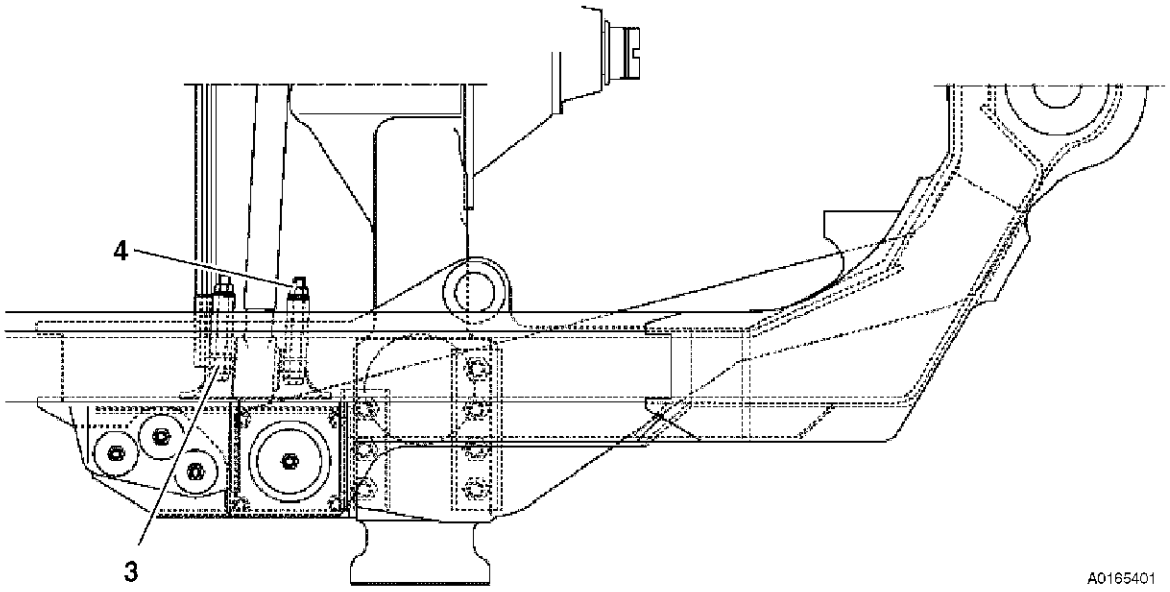


Figure 2
Tightening torques, tractor unit

See Figure [?] and Figure [?]	**Nm**	**kpm**	**lbf ft**
1	400	40	295
2	1900	190	1401
3	520	52	384

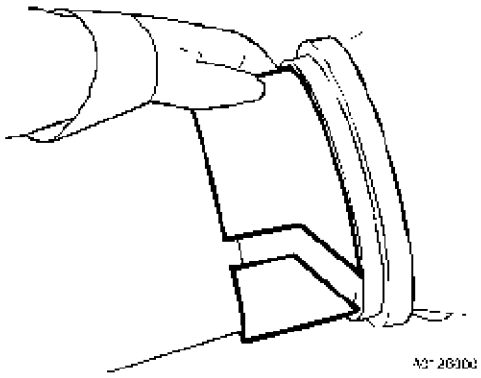


Figure 3

4. Thoroughly clean the hitch. Polish with emery cloth and break off sharp edges with a file, see Figure [?].

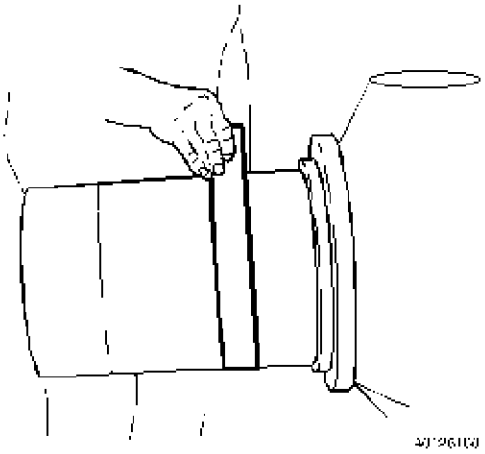


Figure 4

5. The inner wear ring has an internal bevel which should face the inner radius of the hitch. This is important to avoid breakage and fractures. See Figure [?].

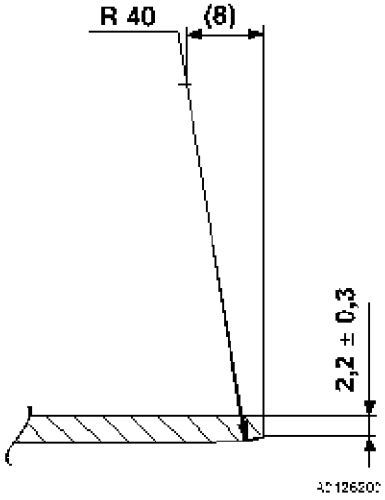


Figure 5

6. Heat both wear rings to 275–325 °C (527–617 ºF).

WARNING

VOLVO
Construction Equipment

Service Information

Document Title: **Tightening torques**	Function Group: **741**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Tightening torques

Hitch (steering and frame joint)

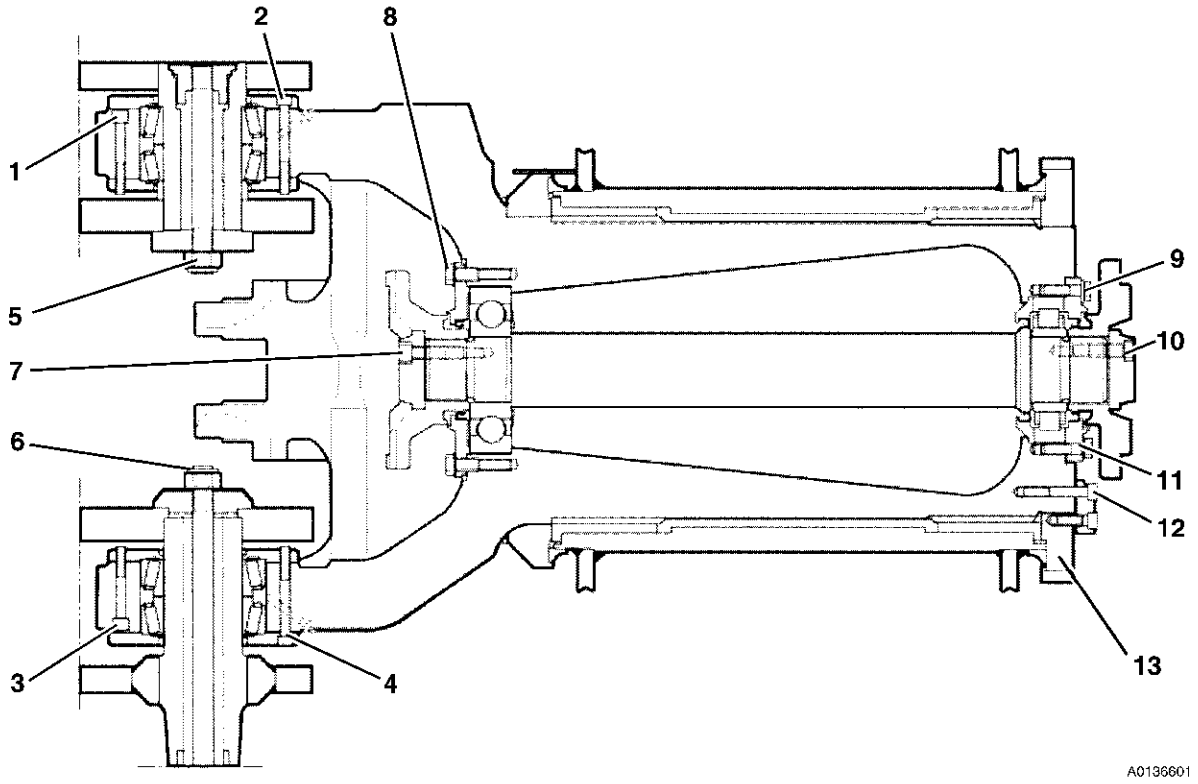


Figure 1
Tightening torques, hitch (steering and frame joint)

	Nm	kpm	lbf ft		Nm	kpm	lbf ft
1	53	5.3	39	8	110	11.0	81
2	53	5.3	39	9	110	11.0	81
3	53	5.3	39	10	135	13.5	100
4	53	5.3	39	11	110	11.0	81
5	750	75.0	553	12	110	11.0	81
6	750	75.0	553	13	1000–1500	100–150	737–1106
7	135	13.5	100				

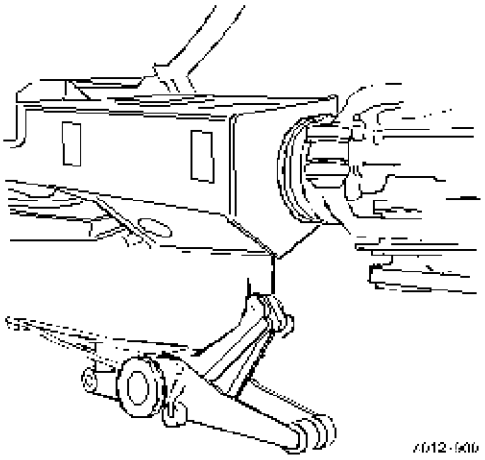


Figure 4
Securing load unit

Upper steering joint pin, removing

16. Remove the cover plate over the steering valve.

17. Remove the hose bracket from the steering joint.
Remove the lock (A) for the pin, Figure [?], and remove the caps.

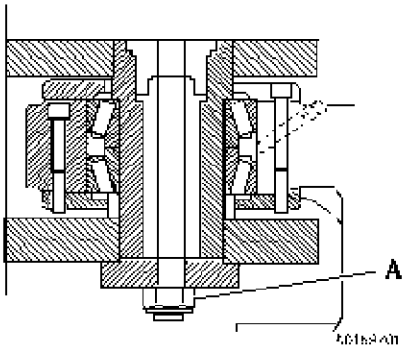
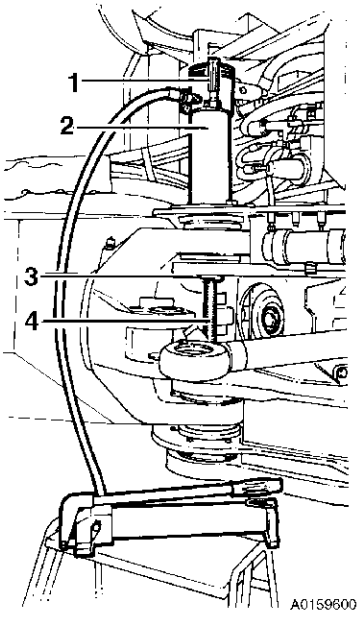


Figure 5
Upper steering joint pin

18. Pull out the steering joint pin with the tools according to Figure [?].



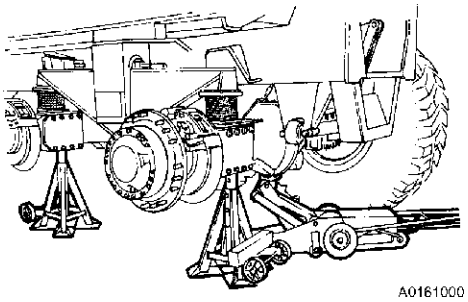


Figure 2

2. Remove the rear rubber spring from the bogie beam.

3. Lift up the rear axle, position an axle stand under the frame and lower the axle so that the rubber spring is in the clear and the axle rests on the axle stand.
   Remove the rubber spring

4. Remove the front rubber spring from the bogie beam and lower the axle on the axle stand.
   Remove the rubber spring

5. Remove the center nut (1) and plate (9) with the stud bolt (10).

6. Secure the bogie beam with a hydraulic jack.

7. Remove the plate (2) from the rear.

8. Turn the plate (9) with stud bolt (10), screw it in loosely against the bogie beam bracket with the bolts for the fitting (8).

   NOTICE

   This is done to secure the fitting when it releases.

   Position a piece of pipe between the inner plate (2) and the pin (6), that passes through the fittings, and press out the outer fitting (8) with the bolts for the plate.
   Remove the outer fitting, and repeat the procedure for the inner fitting.

   ⚠ CAUTION

   It is important that the inner fitting is secured with the iron plate so that it does not damage the propeller shaft when it releases.

9. Remove the plates, pin and the inner fitting.

10. Lower the bogie beam on the axles so that the bogie beam bushing is in the clear. If needed, lift the frame and lower the axles.

11. Grind off the punch marks that secure the rubber bushings (4 and 7).

12. Fit the tools and remove the bushing.

    ⚠ CAUTION

    Secure the puller, great pre-load.

    NOTICE

    The bogie beam has a hole right through towards the rubber bushing, which facilitates removal of the bushing.

Document Title: **Changing**	Function Group: **843**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Changing

Op nbr 84302

14 211 207 Locking strip tool

Op no. 84302	Front window pane, changing
Op no. 84312	Rear window pane, changing
Op no. 84313	Side window pane, changing
Op no. 84348	Door window pane, changing

Removing

1. Remove the locking strip, see Figure [?].

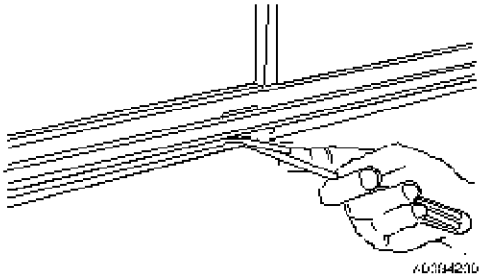


Figure 1
Removing locking strip

2. Push out the window pane.

3. Change the rubber strip, if needed.

Mounting

4. Fit the window pane from the side with the locking strip.
   Begin by positioning the window pane at the bottom edge. Then fit the pane in the window frame by fitting the strip over the pane, work by alternating between left and right sides with a small screwdriver.

   NOTICE

   A solution of soap and water may be used in order to facilitate installation.

5. Fit the locking strip with the tool 14 211 207, see Figure [?].

   CAUTION

   Turn the hook on the tool in the fitting direction.

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Fan motor, changing	**873**	**Service Information**	**24.03.2013**
Profile:			

Fan motor, changing

Op nbr 87306

Removing

1. Remove the cover over the heater unit.
2. Remove the bracket plate with fan unit.

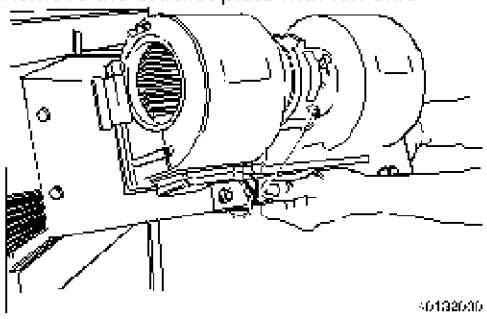


Figure 1
Bracket plate with fan unit

3. Remove the fan unit from the bracket plate.
4. Remove the fan housings (1), see Figure [?].

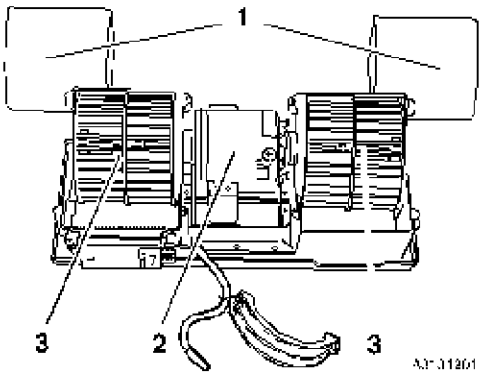


Figure 2
Fan unit

1. Fan housings (shrouds)
2. Engine
3. Fan rotors

5. Loosen and remove the bolts (5 bolts) that secure the motor (2).

NOTICE

One bolt is located on the back of the bracket plate.

13. Blind plugs for hose connections
14. Compartment for scales

Scales 981 2444

Technical specifications

Max. load, weight	100 kg (220 lbs)
Accuracy	20 g (0.7 oz)
Mains voltage	230 V, 50/60 Hz, or with battery 6F22U 9V (inside cover on side)

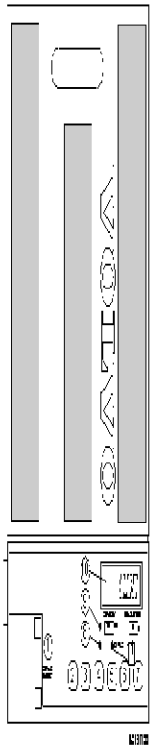


Figure 2
Scales 9812444

1. Controlled 230 V socket for connecting station
2. Push-button for rough setting, kilo
3. Push-button for fine setting, gram
4. Push-button for draining/filling
5. Push-button for connecting 230 V socket 1
6. Push-button, off
7. Push-button, on as well as reset of scales
8. Indicator light, draining
9. Indicator light, filling
10. Display
11. Indicator light, controlled 230 V socket, marked 230 VAC

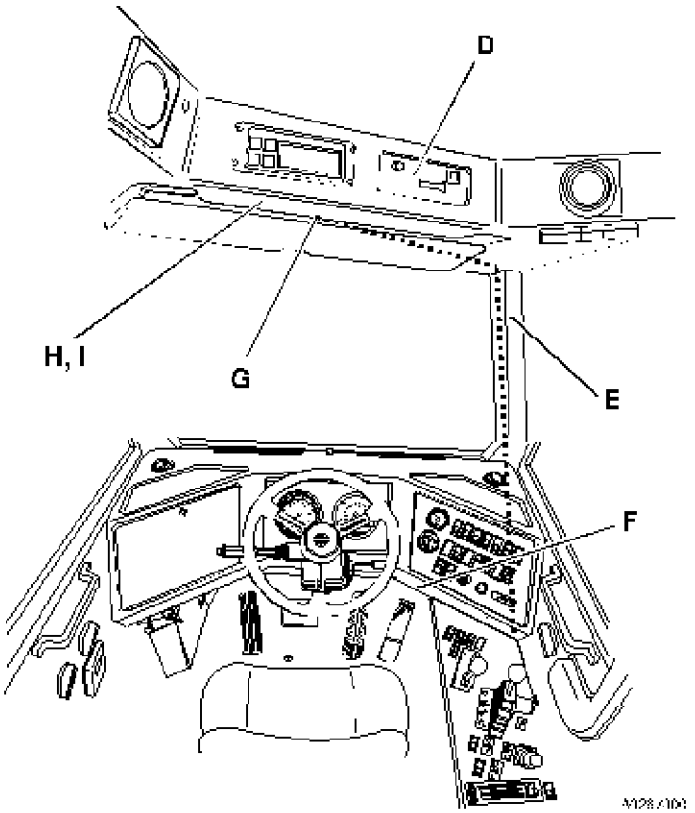


Figure 2

D	Radio
E	Cable harness in right post
F	Loose cable in cable harness from roof to connector CP. Cable red, marked +12V
G	Voltage converter
H	Connector CRC
I	Telephone/communications radio

Document Title: **Hydraulic pump**	Function Group: **900**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Hydraulic pump

The pump is a nine cylinder axial piston pump with variable displacement. The operating principle for such a pump is described in Figure [?] . As the drive shaft (7) rotates, the cylinder drum (3), pistons (4) and swash plate (5) rotate with it. The stroke of the pistons will then be dependent on the angle of the regulating plate (6).

When the pistons are in their innermost position, they pass concentric (kidney-shaped) grooves during their movement (11) in the valve plate (10). The oil is then sucked (or, more correctly, forced by atmospheric pressure) from the inlet port (12) via the inlet grooves (11) into the cylinder. When the pistons have passed their outermost positions and are on their way into the cylinder, the oil is forced out through the outlet grooves (2) and on to the outlet port (1).

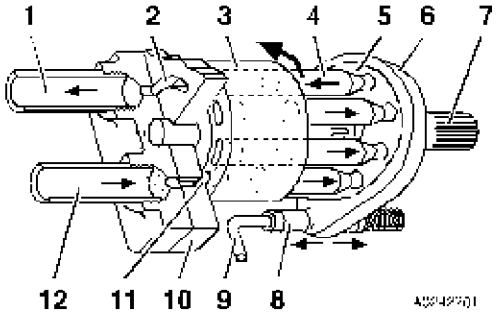


Figure 1
Hydraulic pump

1	Outlet port	7	Drive axle
2	Outlet groove in valve plate	8	Load-sensing piston
3	Cylinder drum	9	Load-sensing signal line
4	Piston	10	Valve plate
5	Swash plate	11	Inlet groove in valve plate
6	Regulating plate	12	Inlet port

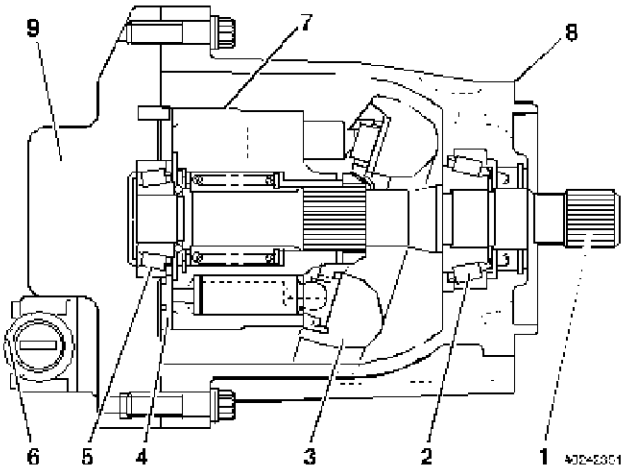


Figure 2
Hydraulic pump, cut-away view

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Construction Equipment

Service Information

Document Title: **Hydraulic system, bleeding air**	Function Group: **910**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Hydraulic system, bleeding air

Op nbr

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1. Always fill hydraulic oil through the hydraulic system return oil filter, where filtration takes place. In connection with oil change, always check the level glass on the hydraulic oil tank.

2. Before the engine is started, run the starter motor for at least 15 seconds with the stop control pulled out. Avoid high engine speeds and high pressures when warming up to operating temperature.

3. Air in the system is removed by steering the machine to both lock positions at least 5 times. The hoist cylinders should be run to maximum dumping angle at least 2 times.

4. The ground dependent hydraulic pump is bled by driving the machine forward at least 10 meters (33 feet). When installing a new hydraulic pump, the pump housing should be filled with hydraulic oil before the lines are connected.

5. When checking functions and pressures, perform all checks that require maximum pressure at the end of the test run.

   WARNING

   Hot oil can cause severe burns!

   CAUTION

   Maintain greatest possible cleanliness when servicing the hydraulic system. Obvious actions:

   - Wipe pipe and hose connections and remove any flakes of paint, etc., before disconnecting.
   - Plug all pipes, hoses, cylinders, etc., after disconnecting them and never connect a hose that has not been plugged without first flushing it clean with hydraulic oil.

Document Title: **Specifications**	Function Group: **916**	Information Type: **Service Information**	Date: **24.03.2013**
Profile:			

Specifications

Cooling oil pump, axles	
Type	Gear pump
Oil distributor, brake cooling oil axles and oil pump dropbox	
Type	Rotating flow distributor of gear type resp. gear pump
Proportional valve	When electric power is interrupted, max. pressure is achieved and there is no oil flow through the valve.