



SERVICE MANUAL

TRUCKS

L 385

Export Service Department

AKTIEBOLAGET

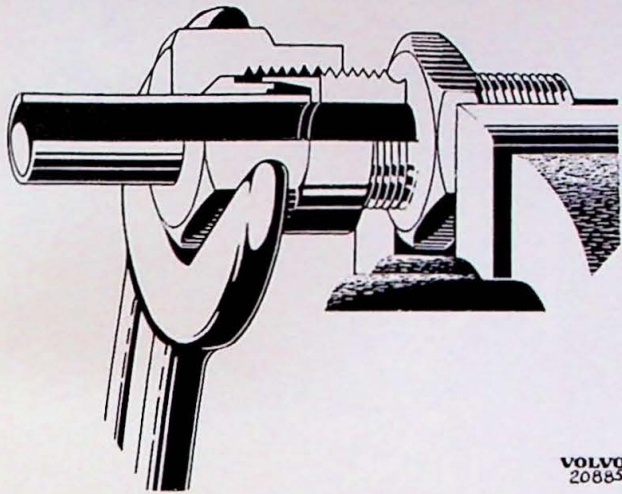
VOLVO

GÖTEBORG . SWEDEN

FAULT TRACING ON THE BENDIX HYDROVAC TEST BENCH

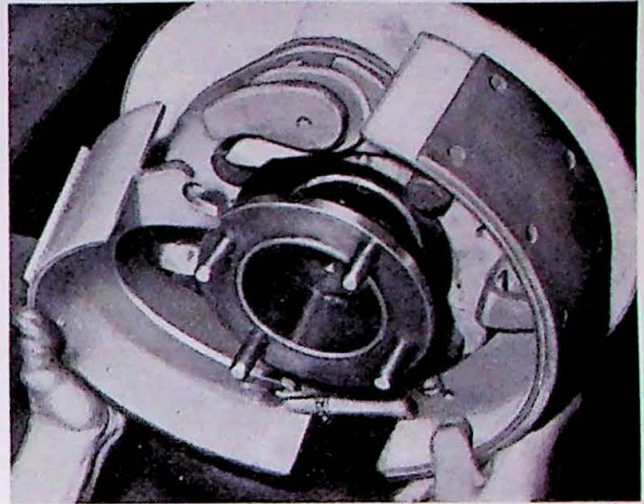
SUSPECTED FAULT	GAUGE READING	CHECK
1. Vacuum leakage (Hydrovac in rest position).	Both the constant and control vacuum gauge readings sink.	<ul style="list-style-type: none"> a. Leakage in the end, center piece or in the control valve housing washer. b. Cracked or broken end. c. The control valve does not seal against the seats. Replace. d. The attaching bolts on the end are not tightened sufficiently. f. The large spring in the control valve does not lie in the center.
2. Vacuum leakage in the Hydrovac when the brakes are applied.	<p>Constant vacuum gauge reading sinks.</p> <p>Hydraulic outlet pressure gauge reading sinks.</p>	<ul style="list-style-type: none"> a. Inspect the control valve and seats. b. Dry or defective leather packing on the vacuum plunger. c. Defective diaphragm in the control valve.
3. External hydraulic leakage.	The pressure reading sinks in the hydraulic inlet and/or outlet pressure gauges.	<ul style="list-style-type: none"> a. Faulty sealing between the pressure cylinder and end. b. The copper washer between the pressure cylinder and the end piece is not sealing.
4. Internal hydraulic leakage at high pressure.	The pressure reading sinks steadily on the hydraulic inlet pressure gauge.	<ul style="list-style-type: none"> a. The plunger packing on the control valve hydraulic plunger is defective. b. The plunger rod packing is defective.
5. Internal hydraulic leakage at high pressure.	The pressure reading sinks steadily on the hydraulic outlet pressure gauge.	<ul style="list-style-type: none"> a. Leakage in the control valve cylinder packing. b. Check the hydraulic seal rings in the pressure cylinder and control valves.

<p>6. The hydraulic pressure rises without any pressure being applied to the brake pedal.</p>	<p>Rapid pressure rise on the hydraulic inlet pressure gauge.</p>	<p>a. Check that the relief valve is functioning.</p>
<p>7. The Hydrovac will not return to its rest position.</p>	<p>The hydraulic gauge readings sink slowly or cannot return to zero. There are many reasons as to why the hydraulic pressure sinks slowly which are not determined by the gauge readings. The instructions on page 7-10 will help to give an efficient check.</p>	<p>a. The return spring in the vacuum cylinder is too weak. b. The leather packing on the vacuum plunger is too dry. c. The rubber seal rings are swollen as a result of using inferior quality brake fluid. d. Deformed vacuum cylinder. e. Dirty or deformed hydraulic plunger in the control valve.</p>
<p>8. The Hydrovac does not operate with the specified pressures.</p>	<p>One of or all the gauges do not correspond with the pressure table.</p>	<p>a. Rusty, dirty or deformed vacuum cylinder. b. The leather packing on the vacuum plunger is too dry or worn. c. The rubber seal rings are swollen as a result of using inferior quality brake fluid. d. Worn or damaged hydraulic packings. e. Dirt, rust, etc, has entered the pressure cylinder.</p>



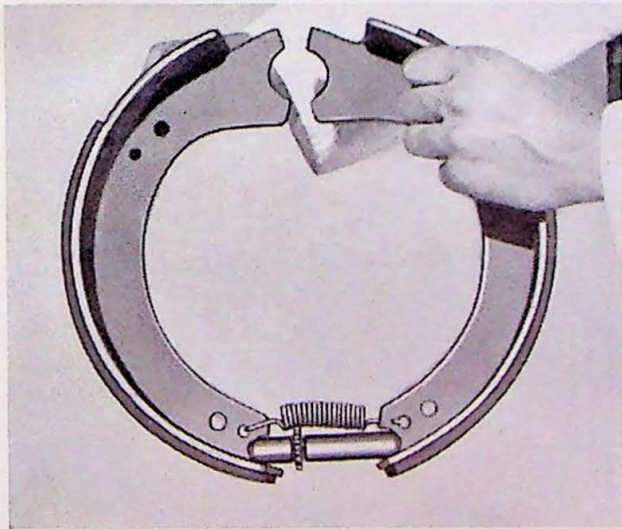
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Fig. 7—67. Fitting a cone.



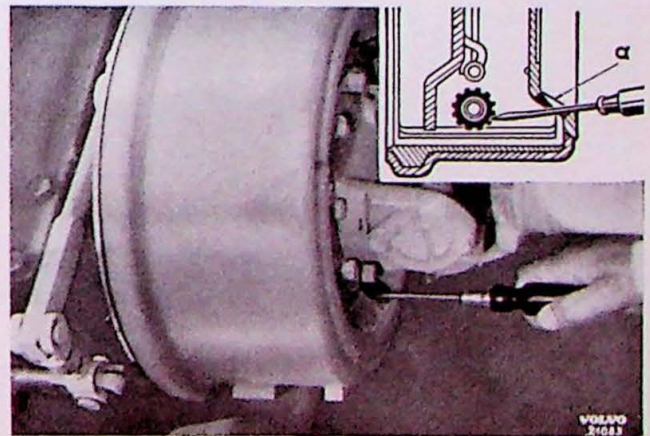
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Fig. 7—69. Fitting the brake shoes.



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Fig. 7—68. Fitting the brake shoes.

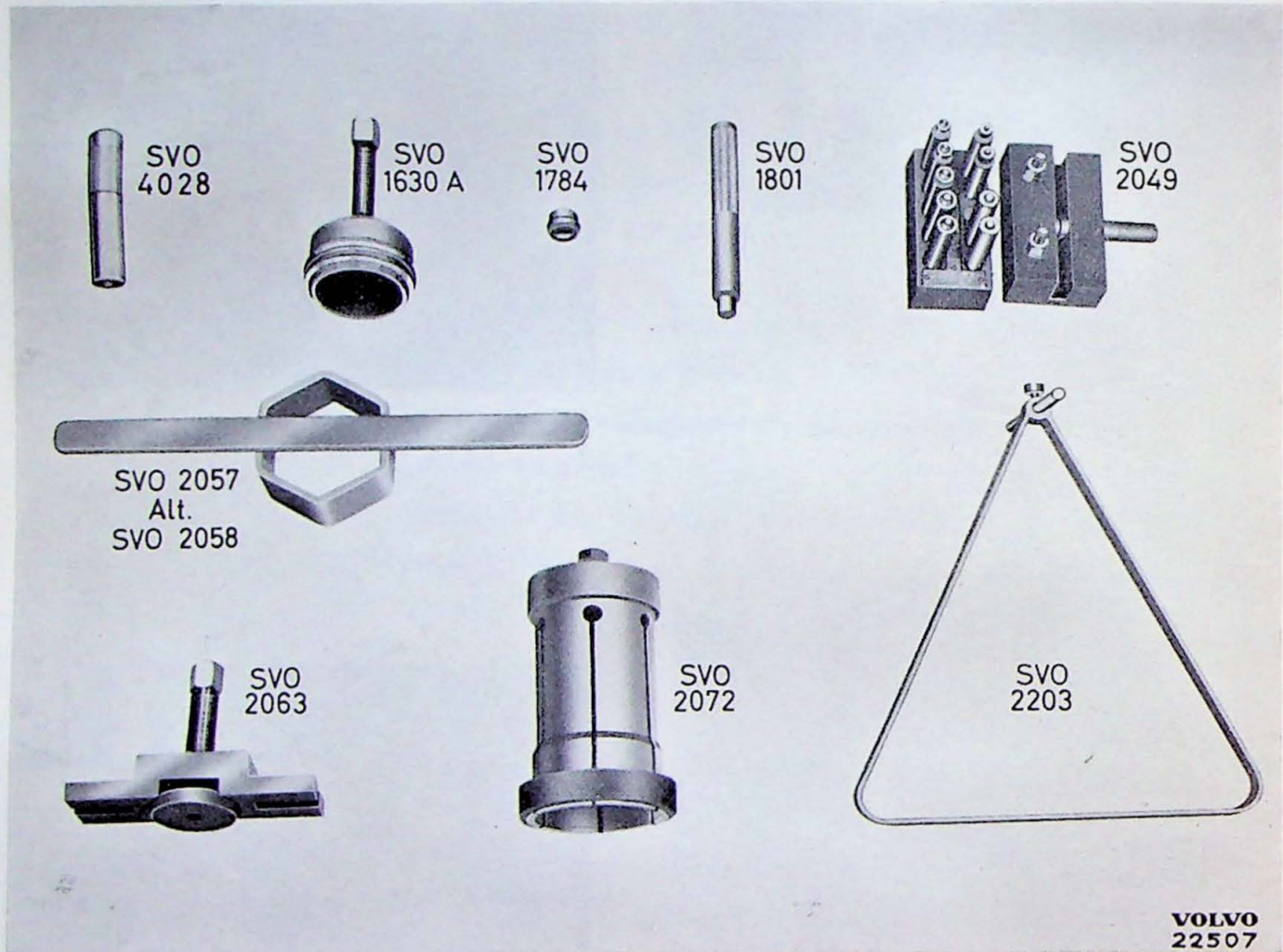


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Fig. 7—70. Adjusting the handbrake.

TOOLS

The following special tools are required when carrying out repair work on the brake system.



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Fig. 7—71.

- | | | | |
|-----------|------------------------------------------------|----------|--------------------------------------------------------------------|
| SVO 1224 | Tool for fitting of seal in vacuum pump. | SVO 2057 | Socket wrench for lock nuts on rear wheel hubs (two-speed). |
| SVO 1630A | Puller for front wheel hubs. | SVO 2058 | Socket wrench for lock nuts on rear wheel hubs (single reduction). |
| SVO 1784 | Tool for fitting of bushing in pedal assembly. | SVO 2063 | Puller for rear wheel hubs. |
| SVO 1801 | Standard handle. | SVO 2072 | Puller for inner races on inner front wheel bearings. |
| SVO 2049 | Tool for flaring of hydraulic brake pipes. | SVO 2203 | Fixture for brake shoe adjustment. |

Compressed air system

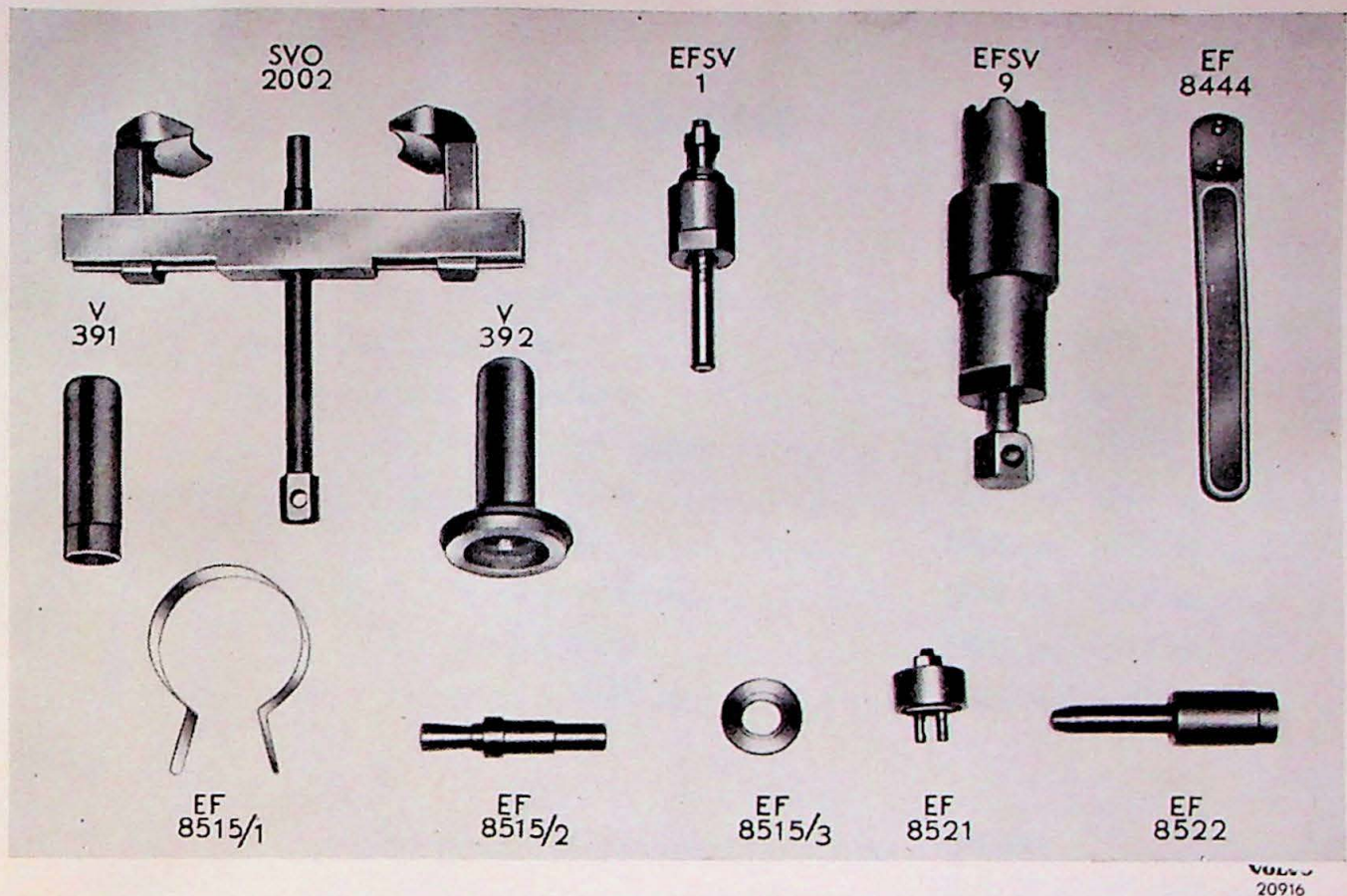


Fig. 7—72.

SVO 2002 Puller for pulley.

SVO 2117 Complete set of special tools for Bosch compressors and pressure regulators
(comprising the following tools):

Description	Ref. No. (Bosch)
Socket driver for ball bearing	V 391
Tool for seal cap	V 392
Reamer for valve seat, pressure regulator	EFSV 1
Puller for ball bearing	EFSV 9
Wrench for valve holders	EF 8444
Piston ring tool	EF 8515/1
Press tool for connecting rod bushing	EF 8515/2
Counter-ring for press tool	EF 8515/3
Puller for inlet valve seat	EF 8521
Driver for valve seats	EF 8522

SPECIFICATIONS

FOOT BRAKES

Brake drums, front wheels, diameter	406 mm (16")
" " , drive wheels, diameter	406 mm (16")
" " , trailing wheels, diameter	406 mm (16")
" " , largest permissible out-of roundness	0.1 mm (0.04")
Effective brake lining area, front wheels	1380 cm ² (214 sq. in.)
" " " " drive wheels	1965 cm ² (305 sq. in.)
" " " " trailing wheels	1380 cm ² (214 sq. in.)
" " " " total L 3850	3345 cm ² (519 sq. in.)
" " " " total L 3852	4725 cm ² (733 sq. in.)

Brake linings:

Type	Pressed
Dimension, front wheels	3.1/2"x3/8"x385 mm (15.5/32")
" drive wheels	5"x3/8"x385 mm (15.5/32")
" trailing wheels	3.1/2"x3/8"x385 mm (15.5/32")
Brake lining rivets, dimension	5.5x11.1 mm (7/32"x7/16")
" " " total number per shoe	16
Clearance between shoe and drum	0.25-0.30 mm (0.010"-0.012")
Pedal free play	about 10 mm (1/2")

Hydraulic System

Manufacture	Lockheed
Master cylinder, diameter:	
L 3850	1.3/4" (44.45 mm)
L 3852	2" (50.80 mm)
Wheel unit cylinders, front wheels, diameter	1.1/2" (38.10 mm)
" " " drive wheels, diameter	1.3/4" (44.45 mm)
" " " trailing wheels, diameter	1.1/4" (31.75 mm)
Minimum clearance between plunger and cylinder	0.03 mm (0.0012")
Maximum " " " " "	0.15 mm (0.0060")

Servo-system

Vacuum Servo

Manufacture and type	Bendix Hydrovac
Vacuum cylinder, diameter	9.1/2"
Vacuum tank, capacity	60 liters (2.12 cu.ft.)
Lowest permissible vacuum value	6 meters (236") water column
Test reading for the servo-system in the vehicle:	
Leakage at 7 meters (275") water column may not exceed	1 meter (39.4") water column in 15 seconds.

Test Readings for the Hydrovac on the Test Bench

The Hydraulic inlet and outlet pressures are measured in kg/cm^2 (p.s.i.) at 0.7 kg/cm^2 (10 p.s.i.) vacuum.

Vacuum cylinder diam.	Bendix No.	Opening point		Brakes fully applied	
		Hydr. inlet press. in kg/cm^2 (p.s.i.)	Hydr. outlet press. in kg/cm^2 (p.s.i.)	Hydr. inlet press. in kg/cm^2 (p.s.i.)	Hydr. outlet press. in kg/cm^2 (p.s.i.)
9.1/2"	375698	5.3-8.1 (75-115)	5.3-10.7 (75-155)	20-22 (284-312)	90-113 (1278-1605)
9.1/2"	375932	3.5-4.9 (50-70)	3.5-7.0 (50-100)	16-18 (227-256)	89-105 (1264-1491)

Vacuum Pump

Type	Gear type
Total number of teeth	9
Bearing radial clearance	0.02-0.086 mm (0.0008"-0.0034")
Gear axial clearance	0.026-0.102 mm (0.0010"-0.0040")

Compressed Air Servo

Type and make	Bendix Airpak
Compressed air cylinder, diameter	4.1/2"
Test value for compressed air system:	
Leakage at 4.5 kg/cm^2 (64 p.s.i.) may not exceed	0.1 kg/cm^2 (1.5 p.s.i.) during 10 minutes

Test Values for Airpak

Opening point, hydraulic inlet pressure	max. 3.5 kg/cm ² (50 p.s.i.)
Brakes fully applied, hydraulic inlet pressure ..	14-15.5 kg/cm ² (199-220 p.s.i.)
" " " " outlet pressure .	105-120 kg/cm ² (1491-1704 p.s.i.)

Compressor

Manufacture and model	Bosch SV/DTK 150x2/3
Type	Piston compressor
Max. pressure	10 kg/cm ² (142 p.s.i.)
Working pressure (in truck)	about 5 kg/cm ² (71 p.s.i.)
Capacity at 4.5-5.0 kg/cm ² (64-71 p.s.i.) and 1800 rev./min.	290 liters/min. (9.6 cu.ft./min.)
Number of cylinders	2
Bore of cylinders	70 mm (2.75")
Piston stroke	40 mm (1.57")
Capacity, total	300 cm ³ (18.3 cu.in.)
Piston rings:	
Number on each piston	3
Number of oil control rings on each piston	1
Piston ring gap measured in ring opening .	0.2 mm (0.008")
Oversizes	0.5 mm and 1 mm (0.020" and 0.040")
Piston pins:	
Diameter	16 mm (0.630")
Clearance in piston (fit)	Close running fit
Clearance in connecting rod bushing	Close running fit
Oil capacity (Added after reconditioning of compressor)	0.3 liters (3/4 U.S. pint)

Pressure Regulator

Cut-in pressure	4.8 kg/cm ² (68 p.s.i.)
Cut-out pressure, normal	5.3 kg/cm ² (75 p.s.i.)
Pressure difference between cut-in and cut-out	Lowest 0.2 kg/cm ² (3 p.s.i.)
Pressure difference between cut-in and cut-out	Highest 0.8 kg/cm ² (11 p.s.i.)
Time interval between cut-out and cut-in with pressure regulator in operation in truck	At least 1 minute

Relief Valve

Opening pressure 4.2-4.5 kg/cm² (60-64 p.s.i.)

Anti-freeze Pump

Anti-freeze capacity 1/4 liter (1/2 U.S. pint)

Quantity anti-freeze fed in per pump stroke .. about 2 cm³

Compressed Air Reservoir Tanks

Capacity 40 liters (1.41 cu.ft.)

Number of tanks 2

HANDBRAKE

Type Propeller shaft brake with internal expanding shoes.

Brake drum diameter 305 mm (12")

Brake linings:

Type Pressed

Dimensions, short lining 4"x1/4"x11" (280 mm)

" long lining 4"x1/4"x13.39" (340 mm)

Rivets for brake linings:

Number 18

Size 9/64"x7/16" (3.57 mm x 11.1 mm)

Clearance, brake lining - brake drum 0.8-1.0 mm (0.032"-0.039")