

Gardner

Denver

TAMROTOR Compressors

Enduro 25

Repair instructions

List of contents

To the user	1
Safety	1
Before starting the repair work	1
Before starting the compressor	1
Technical specification	2
Disassembly	3
Assembly	4
Lubricants and tools that you need	6

To the user

Enduro air end is an oil injected single stage screw, which is designed for industrial air compressors.

Each Enduro air end is designed for its own capacity range.

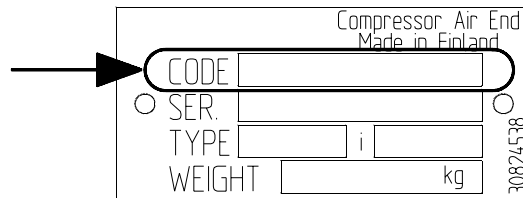
Don't exceed the max. pressure, power and rotation speed and don't use lower than the minimum rotation speed given in the technical data. The warranty of the air end is not valid if these values are exceeded.

Only the use of original spare parts guarantees long and reliable lifetime.

This instruction makes you acquainted with the repair of Enduro air end.

Read these instructions carefully before starting the repair work.

When ordering spare parts, please, give the codenumber from the plate connected to the air end.



Safety

Read always the safety instructions of the equipment, where the air end is used!

The cleanness in all repair work is of great importance. All the foreign particles in the air end shorten the life time of the bearings and the rotors.

Before starting the repair work

1. Disconnect the electric supply.
(in diesel driven compressors take care that the motor cannot be started)
2. Make sure that there is no pressure in the oil receiver and close the valve between the compressor and the air line.
3. The air end and oil is hot immediately after the compressor has been stopped. Give time for cooling.

Before starting the compressor

1. Assure that the oil used is correct (see oil recommendation), and that the oil level is correct.
2. Make sure that the rotation direction is correct by starting the compressor momentarily.
Ma [] ting time 2 seconds.



Running the compressor unit in the wrong direction causes damage.

Technical data

Rotor size		
- male ϕ	mm	155
- female ϕ	mm	122,84
Lobe combination		4/5
Male rotor driven		
Displacement volume	l/rev	2,5009
Male rotor speed		
- min	rpm	1200
- max	rpm	5500
Tip speed (male)		
- min	m/s	10
- max	m/s	45
Input power		
- max	kW	75
Working pressure		
- min	bar	3
- max	bar	13
Oil injection quantity	l/min	70 - 120
Weight	kg	about 112

On the repairing of the compressor air end use always special tools.

Disassembly

1. Clean the outside surfaces of the compressor unit from all dirt.
2. Place the compressor unit on a steady surface where the repair work can be carried out.
3. Remove the screws(19 and 30) of the outlet cover(28), and remove the cover.
4. Remove the screws(20) of the seal cover(3) , and remove the cover.
5. Mount a special tool to the drive shaft and lock it to the rotor housing.
6. Use a special tool to open the lock nuts(12 and 13) and make sure that the special tool prevents the shaft from turning.
7. Remove the screws(18) of the discharge flange(2) .
8. Remove the tool mounted to the drive shaft.
9. Remove the discharge flange using the threads in the flange.
(In older models remove the discharge flange by lightly tapping the drive shaft with a copper drift.
Note! Do not use a screw driver to pry off the flange.)
10. Remove the rotors from the body.
Note! Handle the rotors with care.
11. Note the positions of the ball bearings(10 and 11).
12. Use a suitable drift to remove the outer races of the bearings.
Note! A puller must be used for the bearing(7).
13. Use a puller to remove the inner races of the bearings.
Note! Take care not to damage the shaft when you remove the inner sleeve(14) of the shaft seal.
14. Remove the shaft seal from its housing. Note the position of the seal(15).
15. Remove the remains of the sealings from the covers, and wash all parts clean.

16. Check the parts:

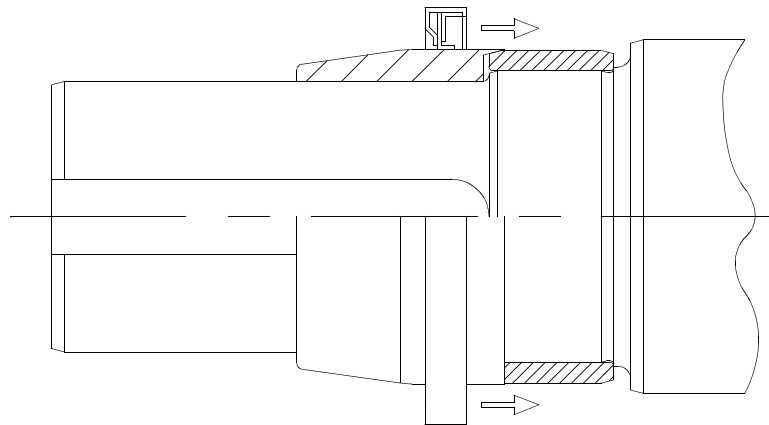
Part	Do not reuse if
Rotors	- ends have seizure marks
	- contact surface marks are uneven
	- rotors have scratches or dents
	- bearing seats are worn
	- rotors have touched body or end flanges
Body	- rotors have touched body
	- body shows signs of overheating (blue colour)
Discharge flange	- flange shows signs of overheating (blue colour)
	- rotors have touched flange
	- O-ring groove is damaged

17. Always fit new bearings and sealings.
Use original spare parts.

Assembly

1. Install the bearings(7 and 9) to the body.
Use Loctite 601 to lock the bearings in place and use assembly tool.
Lubricate the bearings.
2. Using a special assembly tool, mount the inner races of the bearings(8 and 9, and 7 and 9) onto the rotors.
3. Install the rotors to the body and lock the drive shaft with a special tool.
4. Use a special tool to install the bearings(8 and 9) to the discharge flange.
Use Loctite 601.
Lubricate the bearings.
5. Using grease install the O-rings(17 and 16) into their grooves. Mount the discharge flange.
6. Use spring pins(24, 2 pcs) to install the discharge flange.
7. Tighten the screws(18) in crosswise sequence to 180 Nm.
8. Install the ball bearings(10 and 11) of the discharge flange using the special tool.
Note! The thick side of the inner race outwards.
9. Install the lock nuts(12 and 13) with their own tools.
Apply Molykote 1000 to the threads.

10. Adjust end float:
 - Tighten the lock nuts lightly so that the clearance between the rotor ends and the discharge flange disappears. Do not overtighten.
 - Open the nuts (approx. 8-12°) so that the clearance between the rotor ends and the discharge flange is 0.03 to 0.05 mm. Move the rotors up and down to measure the clearance. Use a dial gauge. Note that the lock nuts need no separate locking.
11. Mount the outlet cover(28) with the gasket(4), and tighten the screws(19 and 30) to 25 Nm.
12. Install the protection ring(6) and the shaft seal(15) into the seal cover(3).
Use Loctite 542 and a special tool.
Note! The shaft seal lip should face inwards.
13. Install the inner sleeve of the shaft seal, using Loctite 601 and an assembly tool.
14. Install an assembly bushing for the shaft seal into the rotor shaft against the inner sleeve of the shaft seal and install the sealing housing carefully into its position (see drawing).
Remember also to install the gasket(5).
Note! The oil hole from the body to the sealing housing must be open.
Remove the assembly bushing carefully from the shaft.
15. Tighten the screws(20) of the seal cover to 25 Nm.
16. Pour in some oil through the intake and rotate the drive shaft a few times.
Plug and seal all openings.
Protect the drive shaft against corrosion.



Lubricants and tools that you need

Lubricants

Lubricating oil	SAE 10W
Grease	Molykote 1000

Cement

Cement	Loctite 601
Cement	Loctite 542

Assembly tool set

Assembly tool set for Enduro 25 air end 308 474 98

assembly tools for inner race of bearing:
inlet end, male rotor roller bearing
inlet end, female rotor roller bearing
discharge end, male rotor bearings
discharge end, female rotor bearings

assembly tools for bearing to body:
inlet end, male rotor roller bearing
inlet end, female rotor roller bearing

assembly tools for bearing to discharge flange:
male rotor roller bearing
female rotor roller bearing

special tool for lock of rotors

drift for pins

special tools for lock nut:
male rotor
female rotor

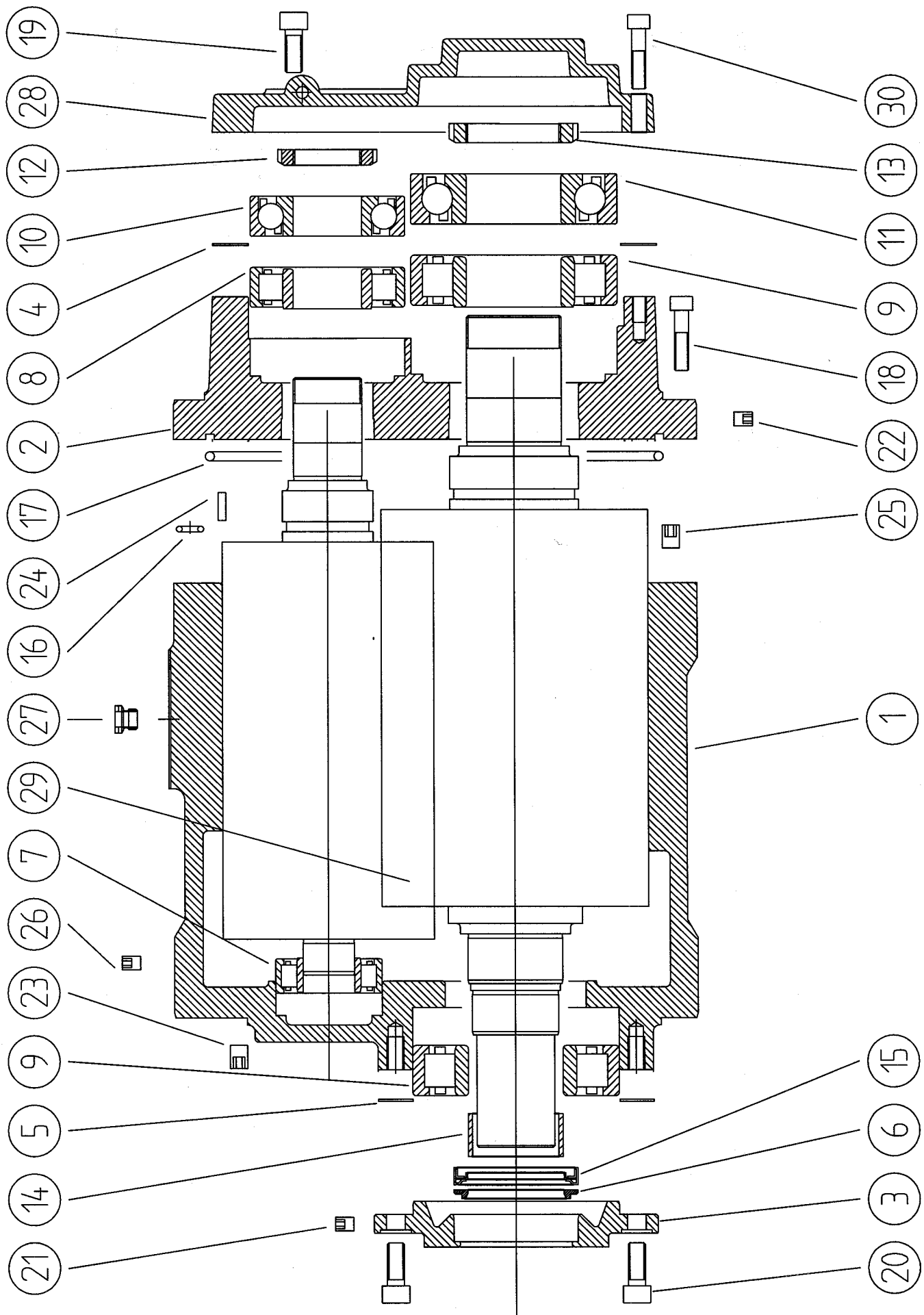
assembly tool for inner sleeve of shaft seal	308 518 78
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assembly bushing for shaft seal	034 236 78
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assembly tool for shaft seal	308 517 48
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**Varaosat
Reservdelar
Spare parts**

**Enduro 25
040 210**



Viite N:o Det.Nr Ref.No	Tilaus N:o Reservdel Nr Order No	Kpl Antal Qty	Nimitys	Benämning	27.11.1997 Description
			KOMPRESSORI- YKSIKKÖ	KOMPRESSOR- ENHET	COMPRESSOR AIR END
			Yhteiset osat	Standard delar	Standard parts
1	040 211 08	1	Runko	Rotorhus	Rotor housing
2	040 212 38	1	Painelaippa	Avloppsgavel	Discharge flange
3	037 913 98	1	Tiivistekansi	Tätninglock	Seal cover
4	223 242 58	1	Tiiviste	Tätning	Gasket
5	308 091 18	1	Tiiviste	Tätning	Gasket
6	308 092 48	1	Suojarengas	Ring	Protection ring
7	870 894 89	1	Rullalaakeri	Rullager	Roller bearing
8	801 076 19	1	Rullalaakeri	Rullager	Roller bearing
9	872 847 39	2	Rullalaakeri	Rullager	Roller bearing
10	874 569 49	1	Viistokuulalaakeri	Kullager	Ball bearing
11	874 571 39	1	Viistokuulalaakeri	Kullager	Ball bearing
12	869 128 99	1	Lukitusmutteri	Låsmutter	Lock nut
13	874 555 29	1	Lukitusmutteri	Låsmutter	Lock nut
15	308 341 58	1	Akselitiiviste kok.p. sisältää osan 14	Axeltätning smst. innehåller delen 14	Shaft seal assy include item 14
16	879 088 49	2	O-rengas	O-ring	O-ring
17	872 846 09	1	O-rengas	O-ring	O-ring
18	445 863 50	4	Kuusiokoloruuvi	Insexkantskruv	Hex.socket screw
19	800 592 59	11	Kuusiokoloruuvi	Insexkantskruv	Hex.socket screw
20	802 805 59	6	Kuusiokoloruuvi	Insexkantskruv	Hex.socket screw
21	870 898 99	1	Tulpparuuvi	Plugg	Plug screw
22	872 198 19	4	Tulpparuuvi	Plugg	Plug screw
23	870 899 19	5	Tulpparuuvi	Plugg	Plug screw
24	815 318 69	2	Jousisokka	Fjäderpinne	Spring pin
25	448 595 80	1	Pidätinruuvi	Stoppskruv	Lock screw
26	807 047 79	2	Kuusiokolotulppa	Plugg	Hex.socket plug
27	308 322 68	1	Suutin	Munstycke	Nozzle
			Poikkeavat osat	Avvikande delar	Differing parts
			040 210 81		
28	039 670 08	1	Lähtökansi	Avloppskupa	Outlet cover
29	308 090 98	1	Roottoripari	Rotorpar	Rotor pair
			040 210 82		
28	039 671 28	1	Lähtökansi	Avloppskupa	Outlet cover
29	308 090 98	1	Roottoripari	Rotorpar	Rotor pair
30	801 471 99	2	Kuusiokoloruuvi	Insexkantskruv	Hex.socket screw
			040 210 83		
28	039 670 08	1	Lähtökansi	Avloppskupa	Outlet cover
29	308 090 91	1	Roottoripari	Rotorpar	Rotor pair
			040 210 84		
28	039 671 28	1	Lähtökansi	Avloppskupa	Outlet cover
29	308 090 91	1	Roottoripari	Rotorpar	Rotor pair
30	801 471 99	2	Kuusiokoloruuvi	Insexkantskruv	Hex.socket screw
*	503 402 43	1	Korjaussarja (sisältää osat / innehåller delar / include items 4, 5, 7-13, 15-17, 24	Reparationsatts	Repair kit