

Instructions

Pump Motor Bearing Replacement Kits

Description	Item Number
Bearing Replacement Kit	A301-51-805
Bearing Replacement Kit	A305-51-805



Important safety Information

- Vacuum pumps are potentially dangerous if incorrectly used, repaired or maintained, so please approach the repair or maintenance with caution.
- Any incorrectly fitted spare parts could damage your pump and could be potentially dangerous.
- Never allow unqualified personnel to attempt to remove or replace any part of the pump.
- If you have any doubts about the servicing procedures or the products capabilities please contact Edwards.
- Before returning any equipment to Edwards for repair please follow the Edwards HS1 procedure and complete an HS2 declaration form to warn of any substances used or produced in the equipment that can be dangerous. The procedure and forms are included with the pump instruction manuals and can be downloaded together with Edwards local contact details from www.edwardsvacuum.com
- Always conform to service schedules unless adverse conditions necessitate more frequent servicing.
- Report any defect before an accident or consequential damage can occur.
- Observe local and country specific regulations, norms and guidelines.
- Never allow anyone to remove large or heavy components without adequate lifting equipment.
- Before maintenance work is begun, ensure the pump is switched off and isolated from the mains.
- The pump may have been exposed to processes which use hazardous substances or produces by-products which are dangerous to human health and safety, for example, chemically active, biologically active or radioactive substances.
- Before working on a pump, ensure that the correct personal protective equipment is available and being used. Always wear safety goggles. Wear a breather mask with positive air pressure and take other precautions if you believe the pump may be contaminated with hazardous substances and dusts.
- When applying sealants and lubricants, prevent contact with the skin by wearing suitable gloves.
- Seals may contain fluoroelastomer, which when properly handled is not dangerous but which may produce a toxic and corrosive residue (hydrogen fluoride or hydrofluoric acid) in the event of excessive heat or fire depending on the circumstances of degradation and other materials involved.
- On completion of maintenance, check the pump functions correctly and that all guards and protection devices are fitted and working correctly and that the pump is electrically safe.
- If the pump is used for handling hazardous substances check the pump for leak-tightness before use.
- Dispose of waste oil and any process by-products in accordance with local and national safety and environmental requirements. It is usually illegal to dispose of waste oil into drains or water courses, or to bury it.

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1 Introduction

1.1 Scope and definitions

This manual provides installation instructions for the Edwards Pump Motor Bearing Replacement Kits. You must use the Kits as specified in this manual.

Read this manual before you use a Kit. Important safety information is highlighted as WARNING instructions; you must obey these instructions. The use of WARNINGS is defined below.



WARNING

Warnings are given where failure to observe the instruction could result in injury or death to people.

1.2 Bearing maintenance

The bearings are supplied packed with grease. This grease is sufficient to lubricate the bearings for at least 30,000 hours (approximately 3 years) of continuous operation in normal operating conditions.

It is Edwards service policy to change the bearings as part of a major service of a pump.

1.3 Applicability

The Kits can be used to replace bearings in the motors listed in [Table 2 \(page 2\)](#).

1.4 Use of the Kits

Unpack and inspect the Kit: check that you have received the items listed in [Table 1](#), and that all of the items are undamaged. Do not use a Kit if any item is missing or is damaged.

If the Kit is undamaged and you have received all of the necessary items, replace the motor bearings as described in [Section 2](#).

Table 1 - Contents of the Pump Motor Bearing Replacement Kits

Kit Item Number	Quantity	Description	Check (✓)
A301-51-805	2	Deep-groove ball bearing	☐
	3	Copper sealing washer *	☐
A305-51-805	2	Deep-groove ball bearing	☐
	3	Copper sealing washer	☐

* Only required for flange-mounted motors: refer to [Figure 3](#).

Table 2 - Applicability of Pump Motor Bearing Replacement Kits

Pump	Motor Item Number	Item Number of applicable Pump Motor Bearing Replacement Kit
CDP40	A071-13-004 A071-13-005 A071-13-006	A301-51-805 A301-51-805 A301-51-805
QDP40	A071-13-020 A071-13-070	A301-51-805 A301-51-805
CDP80	A071-15-004 A071-15-005 A071-15-006 A071-15-009 A071-15-010	A305-51-805 A305-51-805 A305-51-805 A305-51-805 A305-51-805
QDP80	A071-15-020 A071-15-070	A305-51-805 A305-51-805
EH250/500A	A071-12-003 * A071-12-004 *	A301-51-805 A301-51-805
QMB250F/500F	A071-13-021 * A071-13-071 *	A301-51-805 A301-51-805
EH1200	A071-14-001 * A071-14-002 *	A305-51-805 A305-51-805
EDD1200	A071-15-002 * A071-15-003 *	A305-51-805 A305-51-805
QMB1200F	A071-15-021 *	A305-51-805

* Only required for flange-mounted motors. Flange-mounted motors have an endshield as shown in [Figure 3](#).

2 Pump motor bearing replacement

2.1 Safety



WARNING

Obey the safety instructions given below and take note of appropriate precautions. If you do not, you can cause injury to people and damage to equipment.

- A suitably trained and supervised technician must replace the motor bearings.
- Wear the appropriate safety-clothing when you come into contact with contaminated components.
- Do not use wire brushes or other sharp tools to clean components.

2.2 Determine the type of motor

Before you start the replacement procedure, check that the Item Number of the pump motor (shown on the data plate on the stator frame or the terminal-box) is one of the numbers listed in [Table 2](#), and that you have the correct Kit.

If the Item Number is not listed in [Table 2](#), the Pump Motor Bearing Replacement Kit is not suitable for use with your pump; refer to your supplier or Edwards for advice.

If the Item Number of the pump motor is listed in [Table 2](#), check whether the motor is water-cooled or air-cooled:

- Water-cooled motors have a smooth exterior case, a terminal-box on the end of the motor and two cooling-water pipes which enter the case.
- Air-cooled motors have cooling fins on the exterior of the case and have a terminal-box on the side of the motor.

2.3 Remove the shaft-seal sleeve

Note: When a shaft-seal sleeve is fitted, adhesive is used to secure the sleeve to the drive-shaft. You may have to heat the sleeve to a temperature of 150 to 200 °C before you can remove the shaft-seal sleeve from the drive-shaft.

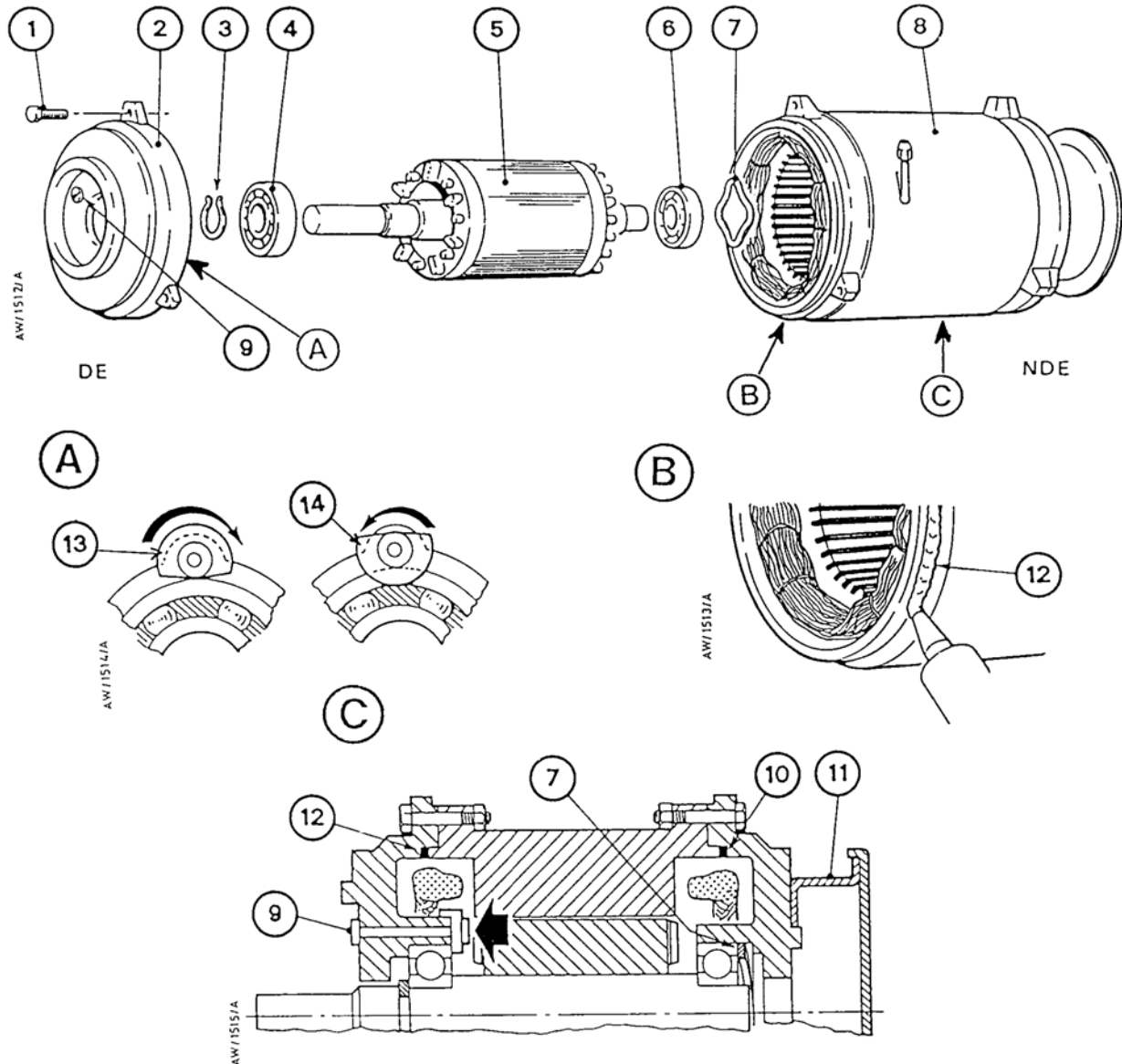
1. Insert a bolt into the threaded end of the motor drive-shaft to protect the drive-shaft.
2. Fit a bearing puller over the shaft and engage the jaws of the puller into the sleeve groove which faces the motor. Use the bearing puller to remove the shaft-seal sleeve.
3. Replace the motor bearings:
 - If you have a water-cooled motor, use the procedure in [Section 2.4](#).
 - If you have an air-cooled motor, use the procedure in [Section 2.5](#).

2.4 Replace the motor bearings (water-cooled motors)

Refer to [Figure 1](#) in the following procedure.

1. Undo and remove the 3 bolts (1) which secure the endshield (2) to the stator frame (8). Ensure that you do not lose the 3 captive nuts in the stator frame.
2. Remove the rotor assembly (5) and endshield (2) from the stator frame (8). If necessary, gently lever the lugs on the stator frame to separate the endshield from the stator frame. On flange-mounted motors (refer to [Figure 3](#)), you can gently tap the back face of the flange to separate the endshield from the stator frame.
3. Turn the 2 bearing retaining clamps (9) to the open position (see [Figure 1](#), detail A) and remove the endshield (2) from the drive end bearing (4).
4. Remove the circlip (3).
5. Insert a bolt into the threaded end of the drive-shaft (to protect the drive-shaft from damage) and use a bearing puller to pull the bearings (4, 6) off of the drive-shaft. Ensure that you do not damage the drive-shaft. Safely dispose of the bearings.
6. Use dry, compressed air to remove dirt which has accumulated in the endshields, in the stator frame and on the rotor assembly. If compressed air is not available, use a suitable bristle brush or cloth.
7. Place the new bearings (4, 6) in position on the ends of the shaft. Apply pressure evenly around the inner race of the bearings to fit the bearings onto the drive-shaft. When correctly fitted, the bearings will abut against the shaft shoulder.
8. Refit the circlip (3).
9. Remove and safely dispose of the endshield sealing gasket (if fitted).
10. Thoroughly clean and degrease the endshield (2) and the mating faces of the spigots on the stator frame. If necessary, use a suitable cleaning solution. Ensure that all of the old sealing gasket (if fitted) is removed.
11. Stand the stator frame (8) vertically on the terminal-box (11). Apply a continuous bead (2 to 3 mm wide) of Loctite Tempflex 544 (non-corrosive silicon sealant) to the corner of the spigot (see [Figure 1](#), detail B). Apply a similar bead to the corner of the endshield location register.
12. Slide the endshield (2) over the drive-shaft so that the bearing (4) engages in the bore of the endshield.
13. Turn the 2 bearing retaining clamps (9) to the closed position (see [Figure 1](#), detail A).
14. Ensure that the pre-load washer (7) is correctly fitted in the bearing bore of the non-drive end endshield. Insert the rotor assembly (5) and endshield (2) into the stator frame (8). Ensure that the bearing (6) engages in the endshield bearing bore.
15. Refit the endshield bolts (1) and tighten alternately and progressively to secure the endshield to the stator frame (8). On flange-mounted motors, use a copper sealing washer under the head of each endshield bolt (refer to [Figure 3](#)).
16. Immediately wipe off any excess sealant. Alternatively, trim of any excess sealant when the sealant has cured.
17. Check for correct reassembly as described in [Section 2.6](#).
18. After you have reassembled the motor, leave the motor for at least 2 hours to allow the sealant to cure before you start up the pump.

Figure 1 - Water-cooled motor



DE Drive end
NDE Non-drive end

1. Endshield bolts (3 off, DE)
2. Endshield (DE)
3. Circlip
4. Bearing (DE)
5. Rotor assembly
6. Bearing (NDE)
7. Pre-load washer

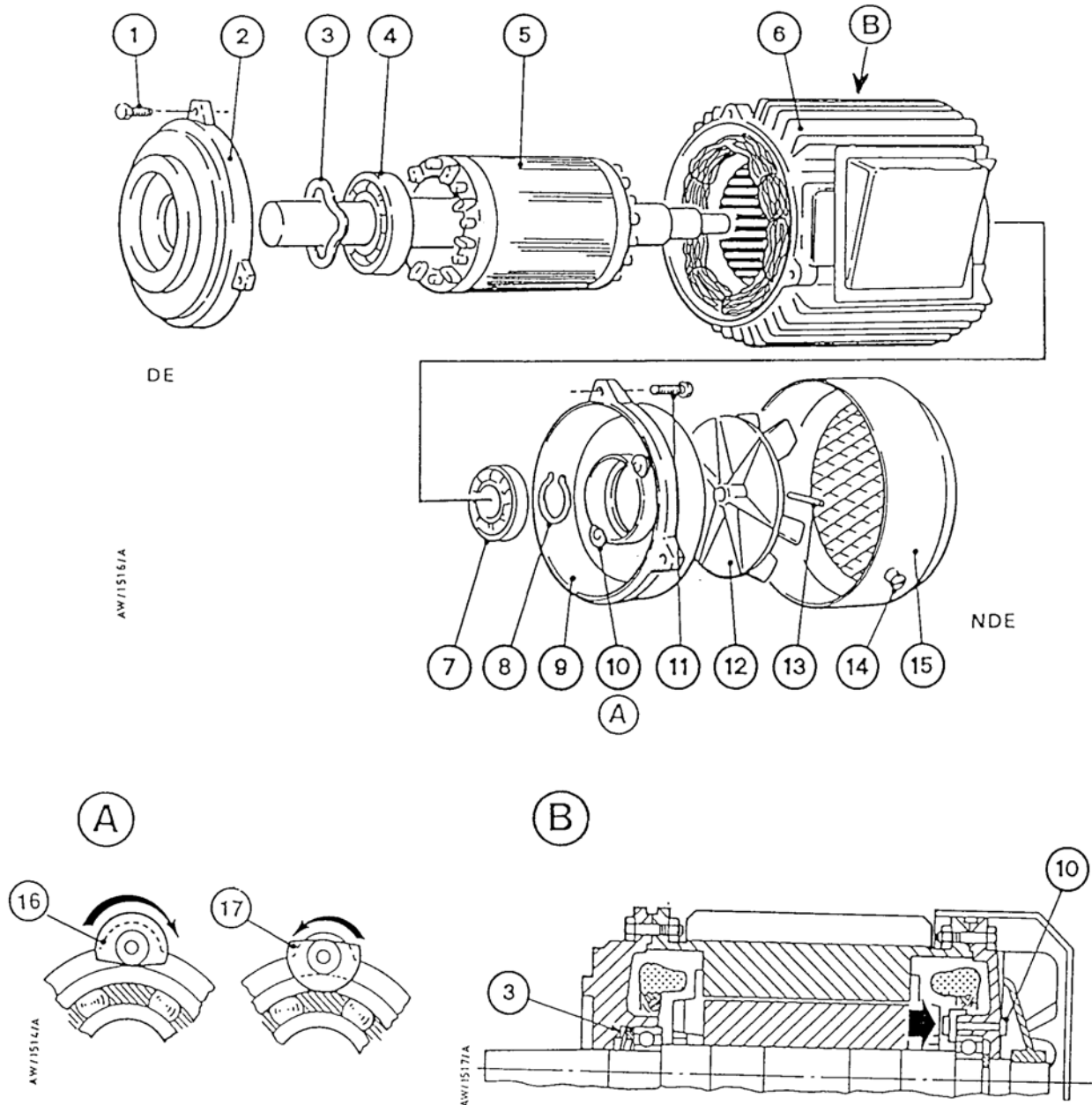
8. Stator frame
9. Bearing retaining clamps (2 off, DE)
10. Endshield gasket (NDE)
11. Terminal-box
12. Replacement sealant bead (DE)
13. Bearing retaining clamp (open)
14. Bearing retaining clamp (closed)

2.5 Replace the motor bearings (air-cooled motors)

Refer to [Figure 2](#) in the following procedure.

1. Undo and remove the 3 bolts (1) which secure the drive end endshield (2) to the stator frame (6). Ensure that you do not lose the 3 captive nuts in the stator frame.
2. Remove the endshield (2) from the stator frame (6). If necessary, gently lever the lugs on the stator frame to separate the endshield from the stator frame. On flange-mounted motors (refer to [Figure 3](#)), you can gently tap the back face of the flange to separate the endshield from the stator frame.
3. Undo and remove the 3 screws (14) which secure the fan housing (15) and remove the fan housing.
4. Knock out the fan locating pin (13) and remove the cooling-fan (12) from the drive-shaft on the rotor assembly (5).
5. Turn the 2 bearing retaining clamps (10) to the open position (see [Figure 2](#), detail A).
6. Remove the 3 endshield bolts (11) and remove the non-drive end endshield (9) from the drive-shaft. If necessary, gently lever the lugs on the stator frame to separate the endshield from the stator frame.
7. Remove the rotor assembly (5) from the stator frame (6).
8. Remove the circlip (8).
9. Insert a bolt into the threaded end of the drive-shaft (to protect the drive-shaft from damage) and use a bearing puller to pull the bearings (4, 7) off of the drive-shaft. Ensure that you do not damage the drive-shaft. Safely dispose of the bearings.
10. Use dry, compressed air to remove dirt which has accumulated in the endshields, in the fan housing, in the stator frame and on the rotor assembly. If compressed air is not available, use a suitable bristle brush or cloth.
11. Place the new bearings (4, 7) in position on the ends of the shaft. Apply pressure evenly around the inner race of the bearings to fit the bearings onto the drive-shaft. When correctly fitted, the bearings will abut against the shaft shoulder.
12. Refit the circlip (8) and refit the rotor assembly (5) into the stator frame (6).
13. Ensure that the pre-load washer (3) is correctly fitted in the bearing bore of the drive end endshield (2). Refit the endshields (2, 9) to the stator frame (6). Ensure that both bearings engage in the endshield bearing bores.
14. Turn the 2 bearing retaining clamps (10) to the closed position (see [Figure 2](#), detail A).
15. Refit the endshield bolts (1, 11) and tighten alternately and progressively to secure the endshields (2, 9) to the stator frame (6). On flange-mounted motors, use a copper sealing washer under the head of each endshield bolt (refer to [Figure 3](#)).
16. Check for correct reassembly as described in [Section 2.6](#).

Figure 2 - Air-cooled motor

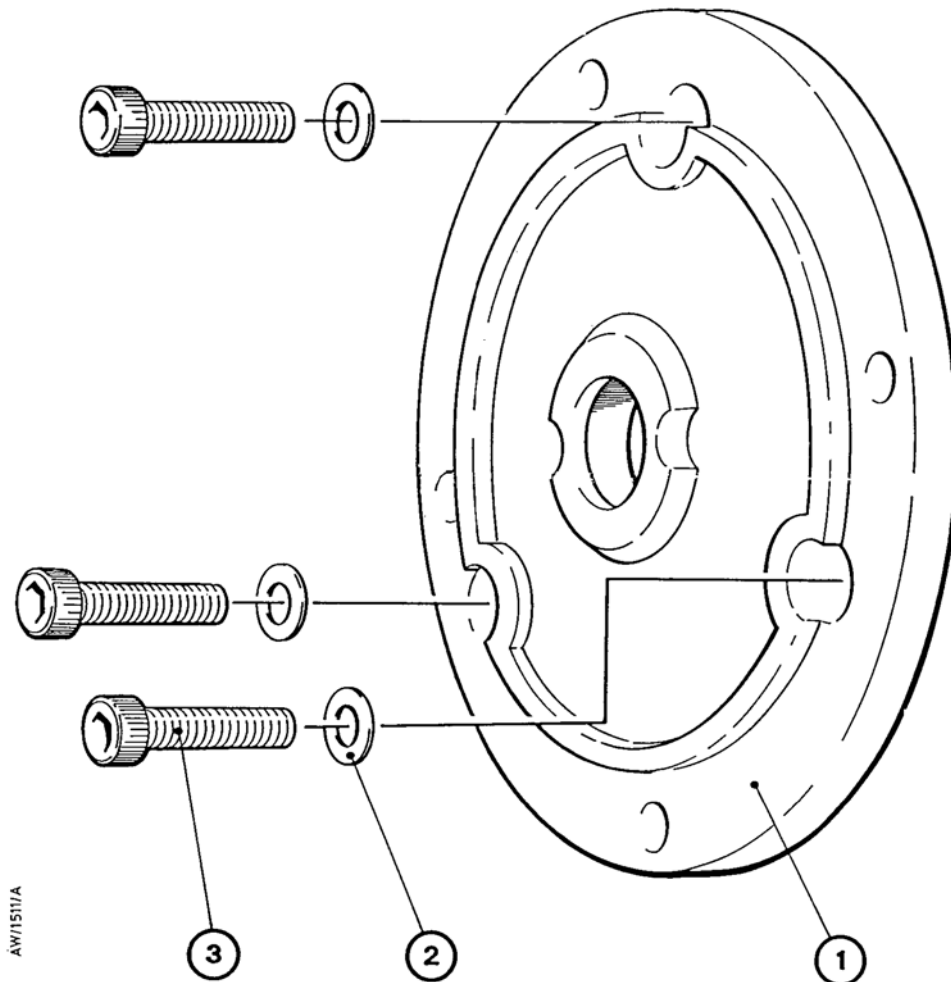


DE Drive end
NDE Non-drive end

1. Endshield bolts (3 off, DE)
2. Endshield (DE)
3. Pre-load washer
4. Bearing (DE)
5. Rotor assembly
6. Stator frame
7. Bearing (NDE)
8. Circlip
9. Endshield (NDE)

10. Bearing retaining clamps (2 off, NDE)
11. Endshield bolts (3 off, NDE)
12. Cooling-fan
13. Fan locating pin
14. Fan housing securing screws (3 off)
15. Fan housing
16. Bearing retaining clamp (open)
17. Bearing retaining clamp (closed)

Figure 3 - Endshield for flange-mounted motors



AW/1511/A

1. Flanged endshield (drive end)
2. Sealing washers (3 off)
3. Endshield bolts (3 off)

2.6 Check for correct reassembly

After you have replaced the bearings, use the following procedure to check that the motor is correctly reassembled:

1. Check that the drive-shaft rotates easily. If the drive-shaft is locked or is difficult to rotate, undo the endshield bolts (Figures 1 and 2, item 1) and then alternately and progressively tighten the bolts again.
2. On air-cooled motors, check that the cooling-fan (Figure 2, item 12) does not touch the fan housing (Figure 2, item 15). If the fan does touch the housing, use suitable tools to knock out any dents in the housing until there is sufficient clearance between the fan and the housing.

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Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must send us a completed Declaration of Contamination of Vacuum Equipment and Components - Form HS2. The HS2 form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

We provide instructions for completing the form in the Declaration of Contamination of Vacuum equipment and Components - Procedure HS1.

If you are returning a vacuum pump, note the following:

- If a pump is configured to suit the application, make a record of the configuration before returning the pump. All replacement pumps will be supplied with default factory settings.
- Do not return a pump with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from www.edwardsvacuum.com/HSForms/, follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to Edwards.

Note: *If we do not receive a completed HS2 form, we will not accept the return of the equipment.*

