

Instruction Manual

EMF Clean Application Oil Drain Kits

Description	Item Number
EMF Clean Application Oil Drain Kit for RV3 to RV12, Speedivac 2 and E2M0.7 to E2M12 pumps	A504-19-000
EMF/MF30 Clean Application Oil Drain Kit for E1/E2M18, E2M28 and E2M30 pumps	A504-20-000

Original Instructions



This page has been intentionally left blank.

Contents

Section	Page
1	Introduction 1
1.1	Scope and definitions 1
1.2	Description 1
2	Installation 3
2.1	Unpack and inspect 3
2.2	Fit the EMF Oil Drain Kit to RV3 to RV12 and to nRV4i to nRV14i pumps 4
2.3	Fit the EMF Oil Drain Kit to Speedivac 2 to E2M12 pumps 6
2.4	Fit the EMF/MF30 Oil Drain Kit to E1/E2M18, E2M28 and E2M30 pumps 8
3	Storage and disposal 11
3.1	Storage 11
3.2	Disposal 11
3.3	Return the equipment or components for service 11

Illustrations

Figure	Page
1	Release the gas ballast control 4
2	Fit the nozzle to the gas ballast adaptor 4
3	Fit O-rings to the gas ballast adaptor 4
4	Fit the gas ballast adaptor to the pump 5
5	Fit the EMF Oil Drain Kit to the RV pump 6
6	Fit the EMF Oil Drain Kit to Speedivac 2 to E2M12 pumps 7
7	Fit the gas ballast and hose adaptors to the E1/E2M18, E2M28 and E2M30 pumps 8
8	Fit the EMF/MF30 Oil Drain Kit to E1/E2M18, E2M28 and E2M30 pumps 9

Tables

Table	Page
1	EMF Oil Drain Kit component checklist 3
2	EMF/MF30 Oil Drain Kit component checklist 3
3	Oil return tube lengths 5

Trademark credits

Edwards and the Edwards logo are trademarks of Edwards Limited, Innovation Drive, Burgess Hill, West Sussex, RH15 9TW, UK.

This page has been intentionally left blank.

1 Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards Clean Application Oil Drain Kits (abbreviated to Oil Drain Kit in the remainder of this manual). You must use the Oil Drain Kits as specified in this manual.

Read this manual before you install and operate the Oil Drain 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.

The units used throughout this manual conform to the SI international system of units of measurement.

1.2 Description



WARNING

Do not use the Oil Drain Kit if you use the pump in processes in which condensible vapours or sodium azides are pumped.

- Notes:**
1. In normal operation, the oil-level will be at or below the level of the drain adaptor on the oil mist filter.
 2. When you fit a new oil mist filter, or when you fit a new mist filter element to the oil mist filter, the oil-level in the pump will fall as the oil saturates the mist filter element and fills trapped volumes in the oil mist filter.

When fitted, the Oil Drain Kit returns oil trapped in the oil mist filter to the pump, through the gas ballast port. This reduces oil loss from the pump and minimises the need to check the pump oil-level and to refill the pump with oil.

On a system in which the pump operates continuously, oil will only return to the pump when the pump inlet pressure is below approximately 4×10^4 Pa, 400 mbar. You will therefore need to check the oil level in the pump more frequently if the pump inlet pressure is above this pressure for a long time.

You can only use the Oil Drain Kit if the gases pumped do not contaminate the oil. The EMF/MF30 Oil Drain Kit (for the E1/E2M18, E2M28 and E2M30 pumps) is not suitable for use in processes in which sodium azides are pumped.

On RV3 to RV12 and Speedivac 2 to E2M12 pumps, the Oil Drain Kit is fitted in place of the gas ballast control.

When the Oil Drain Kit is fitted:

- On all pumps except the RV3 to RV12 pumps, the pump will vent to atmosphere when it is switched off.
- On the E1/E2M18, E2M28 and E2M30 pumps, oil will only be returned to the pump when the gas ballast control is open.

This page has been intentionally left blank.

2 Installation

2.1 Unpack and inspect

Remove all packing materials and protective covers and check the Oil Drain Kit. If the Oil Drain Kit is damaged, notify your supplier and the carrier in writing within three days; state the Item Number of the Oil Drain Kit together with your order number and your supplier's invoice number. Do not use the Oil Drain Kit if it is damaged.

Check that your package contains the items listed in Table 1 or 2. If any item is missing, notify your supplier in writing within three days.

If the Oil Drain Kit is not to be used immediately, replace the protective covers and store it in suitable conditions as described in Section 3.1.

Table 1 - EMF Oil Drain Kit component checklist

Quantity	Description	Check (✓)
1	Gas ballast adaptor	<input type="checkbox"/>
1	Bonded seal	<input type="checkbox"/>
1	Drain adaptor	<input type="checkbox"/>
1	Restrictor: 0.8 mm hole	<input type="checkbox"/>
1	Nozzle	<input type="checkbox"/>
1	Flexible oil-return tube	<input type="checkbox"/>
2	Hose clips	<input type="checkbox"/>

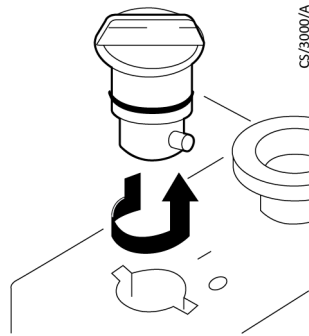
Table 2 - EMF/MF30 Oil Drain Kit component checklist

Quantity	Description	Check (✓)
1	Gas ballast adaptor: 1/4 inch BSP	<input type="checkbox"/>
1	'O' ring	<input type="checkbox"/>
2	Bonded seals	<input type="checkbox"/>
1	Banjo bolt	<input type="checkbox"/>
1	Hose adaptor	<input type="checkbox"/>
1	Drain adaptor	<input type="checkbox"/>
1	Restrictor: 0.8 mm hole	<input type="checkbox"/>
1	Flexible oil-return tube	<input type="checkbox"/>
2	Hose clips	<input type="checkbox"/>

2.2 Fit the EMF Oil Drain Kit to RV3 to RV12 and to nRV4i to nRV14i pumps

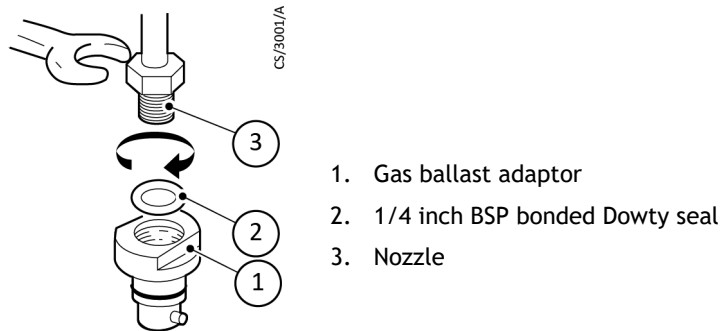
1. Switch off the pump. Remove the drain plug and the 1/8 inch BSP bonded Dowty seal from the oil mist filter and drain the oil from the mist filter. Retain the bonded Dowty seal for the drain adaptor and retain the drain plug for future use.
2. If necessary, refit/reposition the EMF with the drain adaptor facing the pump motor.
3. Take the 1/8 inch BSP bonded Dowty seal removed in Step 1 and use it to fit the drain adaptor (6) to the oil mist filter (4), see Figure 5.
4. Turn the gas ballast control to the high flow position (position II). Push the control down (against the spring), turn the control anti-clockwise to release it and remove the control from the pump, see Figure 1. Leave the spring in position in the gas ballast inlet.

Figure 1 - Release the gas ballast control



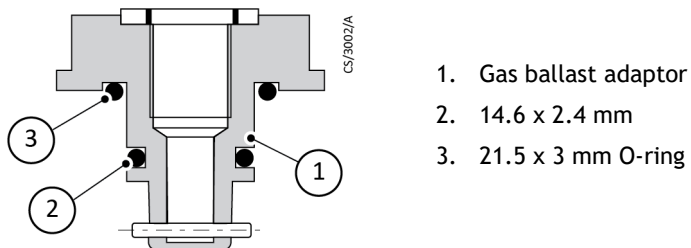
5. Using the 1/4 inch BSP bonded Dowty seal supplied, fit the nozzle (3) to the gas ballast adaptor (1) and tighten appropriately, see Figure 2.

Figure 2 - Fit the nozzle to the gas ballast adaptor



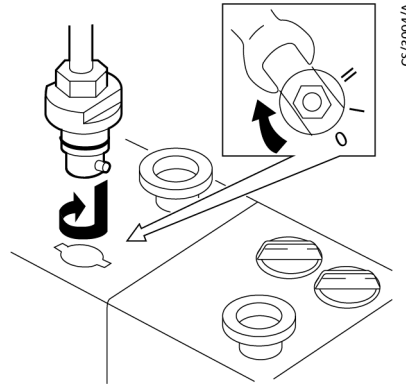
6. Locate O-ring 21.5 x 3 mm (3) and O-ring 14.6 x 2.4 (2) to the groove, see Figure 3.

Figure 3 - Fit O-rings to the gas ballast adaptor



- Fit the gas ballast adaptor (1) to the gas ballast inlet on the pump. Press the adaptor down (against the spring) and turn it clockwise until the flats on the gas ballast adaptor are in the line with the gas ballast '0' position marked on the top of the pump, see [Figure 4](#).

Figure 4 - Fit the gas ballast adaptor to the pump



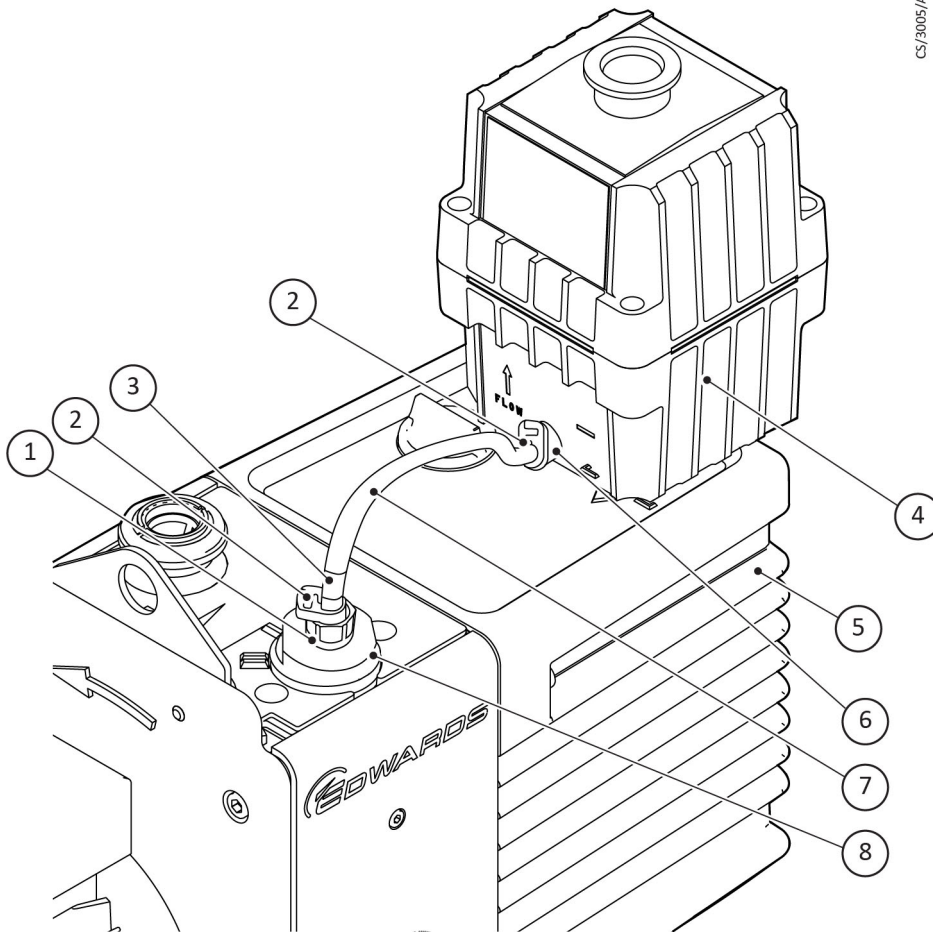
- Ensure the exhaust port is dry and free from oil before fitting mist filter (4), see [Figure 5](#).
- Cut the suitable length from the flexible oil-return tube. The routing of the tube ([Figure 5](#), item 7) must be approximately as shown in [Table 3](#). When fitted, the tube must not be taut and there must be no tight bends in the tube. Ensure that the ends of the oil-return tube are free of burrs and that they are squarely cut (that is, the cut faces are at a right-angle to the length of the tube). The minimum recommended length of the oil-return tube when the oil mist filter is placed directly on the exhaust of the pump is shown in [Table 3](#).

Table 3 - Oil return tube lengths

Pump type	Oil return tube length [mm]
RV3, RV5, nRV4i, nRV6i	100
RV8, nRV10i	150
RV12, nRV14i	160

- Fit the restrictor (3) into one end of the tube as shown in [Figure 5](#).
- Fit one end of the tube (7) to the drain adaptor (6) on the oil mist filter and slide on the x2 hose clips before attaching to the nozzle (1) on the gas ballast adaptor (8) as shown in [Figure 5](#).
- Use the hose clips (2) and tighten appropriately to secure the ends of the flexible oil return tube (7), see [Figure 5](#).

Figure 5 - Fit the EMF Oil Drain Kit to the RV pump



CS/3005/A

- | | |
|------------------------|-----------------------------|
| 1. Nozzle | 5. Pump |
| 2. Hose clips | 6. Drain adaptor |
| 3. Restrictor | 7. Flexible oil return tube |
| 4. EMF oil mist filter | 8. Gas ballast adaptor |

2.3 Fit the EMF Oil Drain Kit to Speedivac 2 to E2M12 pumps

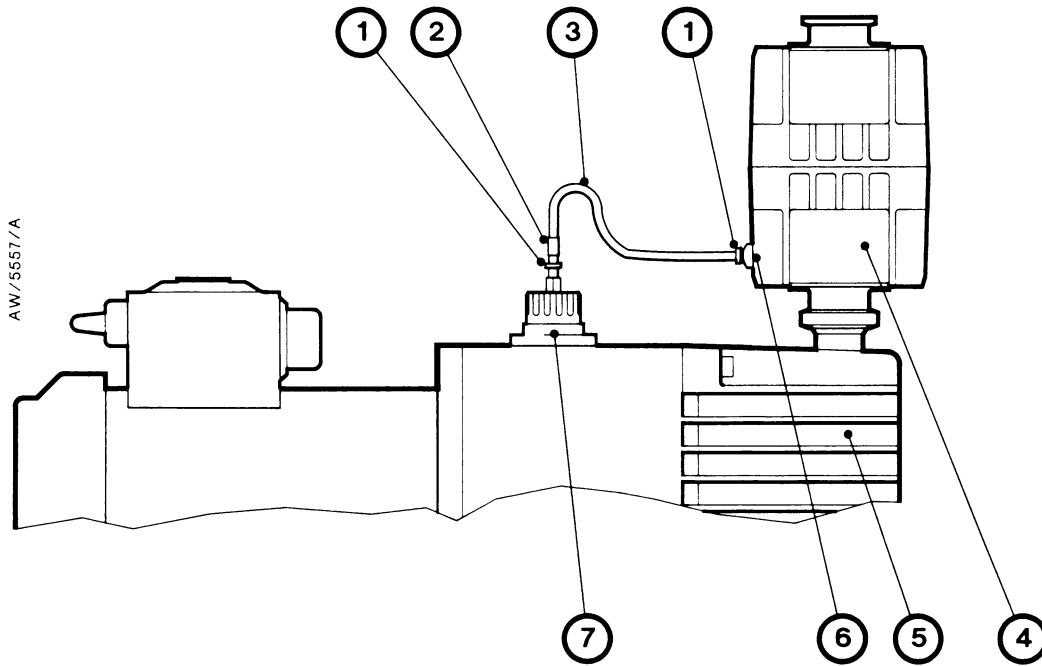
Refer to [Figure 6](#) in the following procedure. Where necessary, refer to the instruction manuals supplied with your pump and oil mist filter when you fit the Oil Drain Kit.

1. Switch off the pump. Remove the drain-plug from the oil mist filter and drain the oil from the oil mist filter. Remove the bonded seal and retain the drain-plug for future use.
2. Use the bonded seal removed in [Step 1](#) to fit the drain adaptor (6) to the oil mist filter (4).
3. Unscrew the gas ballast control and remove it from the gas ballast inlet on the pump. Remove the 'O' ring from the control and retain the control for future use. Remove the spring (or plunger on Speedivac 2 pumps) from the gas ballast inlet. Retain the spring (or plunger) for future use.
4. Use the 'O' ring removed in [Step 3](#) and fit the nozzle (7) to the gas ballast inlet on the pump.
5. Cut a suitable length from the flexible oil-return tube. The routing of the tube (3) must be approximately as shown in [Figure 6](#). When fitted, the tube must not be taut and there must be no tight bends in the tube. Ensure

that the ends of the oil-return tube are free of burrs and that they are squarely cut (that is, the cut faces are at a right-angle to the length of the tube).

6. Fit the restrictor (2) into one end of the tube as shown in Figure 6.
7. Fit the tube (3) to the drain adaptor (6) on the oil mist filter and to the nozzle (7) on the gas ballast inlet on the pump.
8. Use the hose clips (1) to secure the ends of the flexible oil return tube (3).

Figure 6 - Fit the EMF Oil Drain Kit to Speedivac 2 to E2M12 pumps



- | | |
|-----------------------------|------------------|
| 1. Hose clips | 5. Pump |
| 2. Restrictor | 6. Drain adaptor |
| 3. Flexible oil-return tube | 7. Nozzle |
| 4. EMF Oil mist filter | |

2.4 Fit the EMF/MF30 Oil Drain Kit to E1/E2M18, E2M28 and E2M30 pumps

Where necessary, refer to the instruction manuals supplied with your pump and oil mist filter when you fit the Oil Drain Kit.

1. Switch off the pump. Remove the drain-plug from the oil mist filter and drain the oil from the oil mist filter. Remove the bonded seal and retain the drain-plug for future use.
2. Refer to Figure 8. Use the bonded seal removed in Step 1 and fit the drain adaptor (5) to the oil mist filter (7).
3. Refer to Figure 7. Remove the circlip (4), wire mesh (3) and filters (2) from the gas ballast inlet on the pump; retain these for future use.
4. Fit the gas ballast adaptor (6) and 'O' ring (5) to the gas ballast inlet port on the pump, then use the banjo bolt (10) and the two bonded seals (7, 9) to fit the hose adaptor (8) to the gas ballast adaptor (6).
5. Refer to Figure 8. Cut a suitable length from the flexible oil-return tube. The routing of the tube (4) must be approximately as shown in Figure 8 and when fitted, the tube must not be taut and there must be no tight bends in the tube. Ensure that the ends of the oil-return tube are free of burrs and that they are squarely cut (that is, the cut faces are at a right-angle to the length of the tube).
6. Fit the restrictor (3) into one end of the tube as shown in Figure 8.
7. Fit the tube (4) to the drain adaptor (5) on the oil mist filter and to the hose adaptor (2).
8. Use the hose clips (1) to secure the ends of the flexible oil return tube (4).
9. Open the gas ballast control.

Figure 7 - Fit the gas ballast and hose adaptors to the E1/E2M18, E2M28 and E2M30 pumps

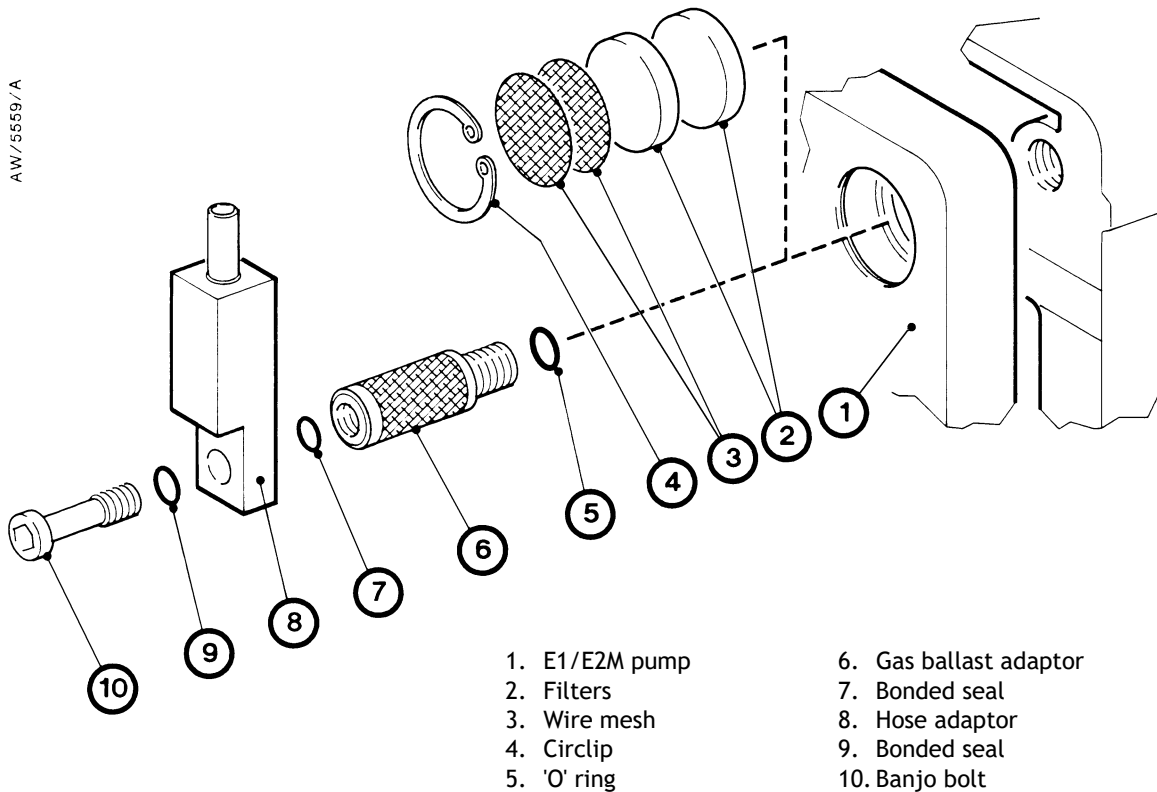
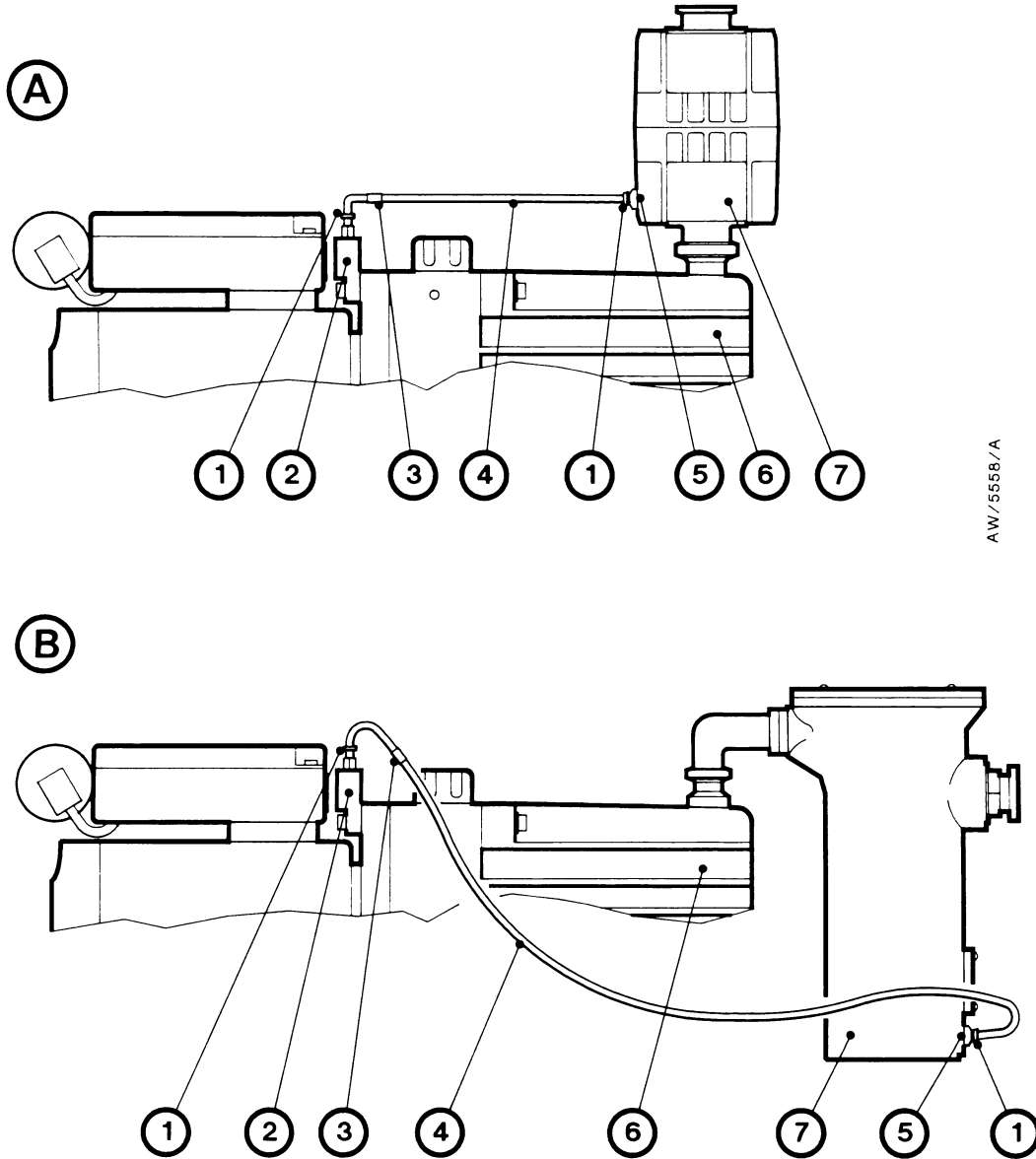


Figure 8 - Fit the EMF/MF30 Oil Drain Kit to E1/E2M18, E2M28 and E2M30 pumps



- 1. Hose clips
- 2. Hose adaptor
- 3. Restrictor
- 4. Flexible oil-return tube
- 5. Drain adaptor
- 6. Pump
- 7. Oil mist filter

- A. E1/E2M18 pump with EMF20
- B. E2M28 and E2M30 pump with MF30

This page has been intentionally left blank.

3 Storage and disposal

3.1 Storage

Store the Oil Drain Kit in cool, dry conditions until required for use. When required, install the Oil Drain Kit as described in [Section 2](#).

3.2 Disposal

Dispose of pump oil, the Oil Drain Kit and any components removed from it safely in accordance with all local and national safety and environmental requirements.

3.3 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.

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, your equipment cannot be serviced.*

This page has been intentionally left blank.

This page has been intentionally left blank.

This page has been intentionally left blank.

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.

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.*

