

Instruction Manual

Drystar® GV80/160/250/400-EH250/500A Booster Connection Kits and GV160-EH1200 Booster Connection Kits

Description	Item Number
GV80-EH250 Booster Connection Kit	A505-59-000
GV80-EH500A Booster Connection Kit	A505-60-000
GV160-EH250 Booster Connection Kit	NCD-086-000
GV160-EH500A Booster Connection Kit	NCD-087-000
GV160-EH1200 Booster Connection Kit	NCD-088-000
GV250/400-EH250 Booster Connection Kit	A505-70-000
GV250/400-EH500A Booster Connection Kit	A505-73-000



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Associated publications

Publication title	Publication number
Vacuum pump and vacuum system safety	P400-40-100

1 Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the GV80/160/250/400-EH250/500A Booster Connection Kits and the GV160-EH1200 Booster Connection Kit (all of which are abbreviated to Connection Kit in the remainder of this manual). You must use the Connection Kit as specified in this manual.

Read this manual before you install the Booster Connection Kit. Important safety information is highlighted as WARNING and CAUTION instructions; you must obey these instructions. The use of WARNINGS and CAUTIONS is defined below.



WARNING

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

CAUTION

Cautions are given where failure to observe the instruction could result in damage to the equipment, associated equipment and process

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

1.2 Description

Use a Connection Kit to connect an Edwards EH mechanical booster pump to a GV dry pump, to form a combination pumping system: refer to the front cover for the Item Numbers of the Connection Kits described in this manual.

The Connection Kit contains all of the components necessary to connect the outlet of the EH pump to the inlet of the GV pump, and (on the GV160-EH1200 Connection Kit) all of the components necessary to support the EH pump on the GV pump.

Introduction

2 Technical Data

Dimensions

See Figure 1

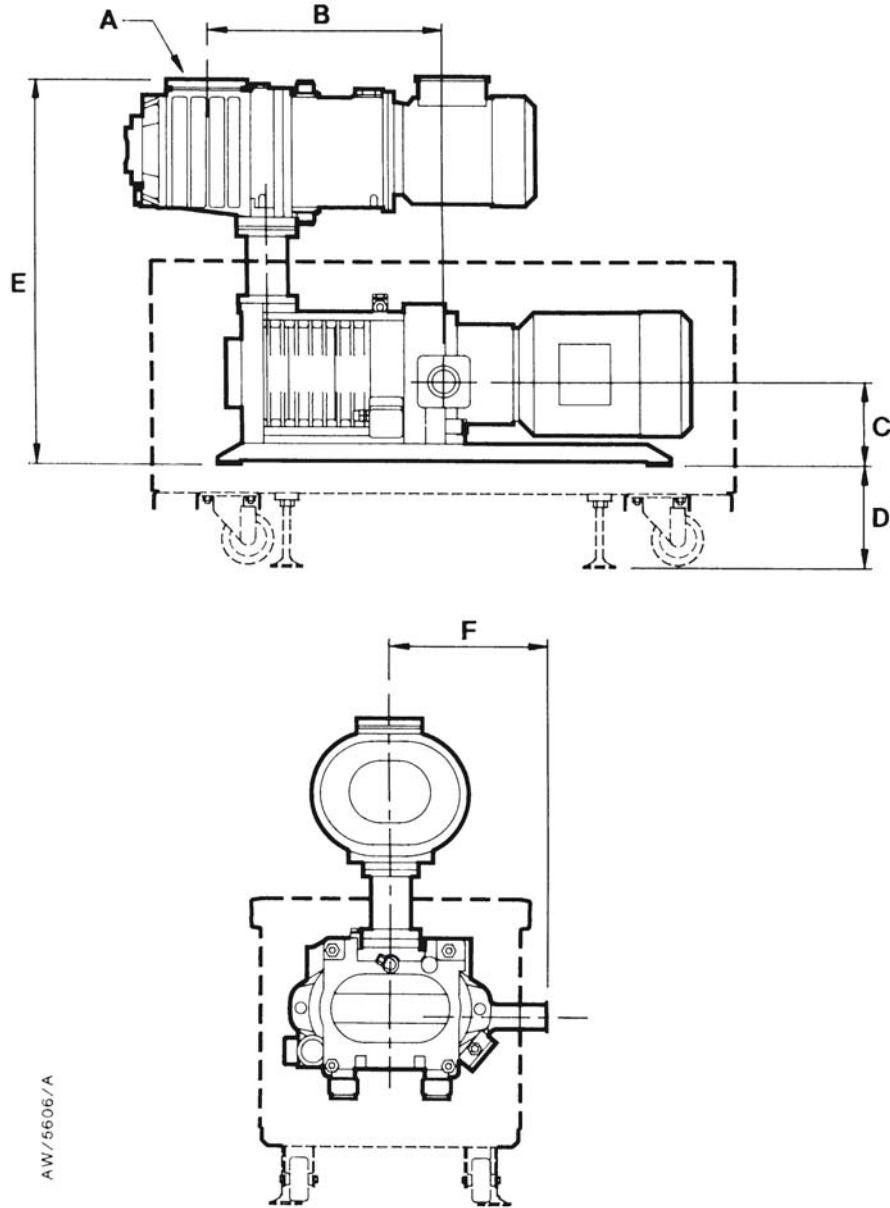
Masses

See Table 1

Table 1 - Masses of combination pumping systems

	EH250		EH500A		EH1200	
GV80	210 kg	463 lbs	230 kg	507 lbs	-	
GV160	295 kg	650 lbs	310 kg	683 lbs	385 kg	849 lbs
GV250	815 kg	1796 lbs	830 kg	1830 lbs	-	
GV400	885 kg	1951 lbs	900 kg	1984 lbs	-	

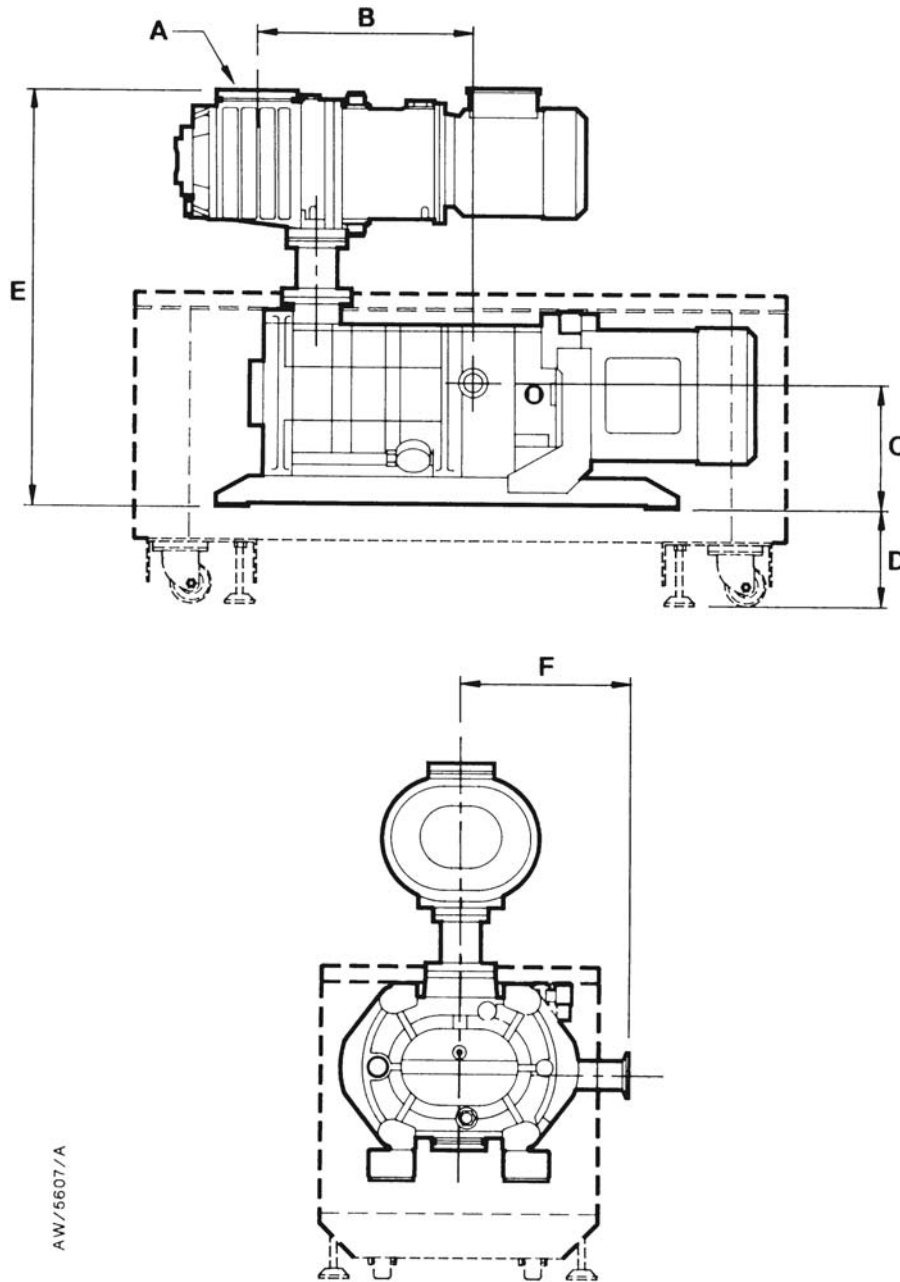
Figure 1 - Dimensions of GV80-EH250/500 combination pumping systems: refer to Table 2



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	A	B	C	D	E	F
GV80-EH250	ISO63	399 mm 15.7 in	143 mm 5.6 in	175 mm 6.9 in	624 mm 24.6 in	270 mm 10.6 in
GV80-EH500A	ISO100	301 mm 11.8 in	143 mm 5.6 in	175 mm 6.9 in	624 mm 24.6 in	270 mm 10.6 in

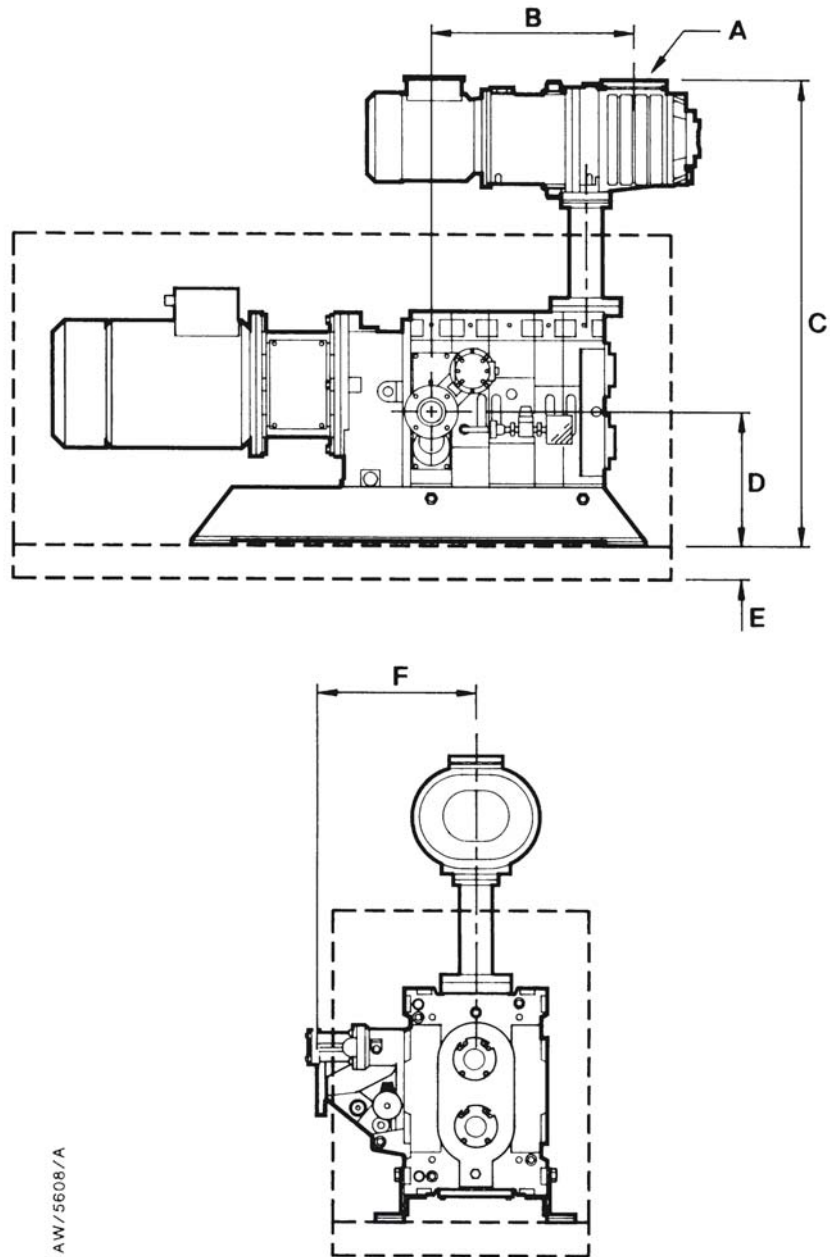
Figure 2 - Dimensions of GV160-EH250/500/1200 combination pumping systems: refer to Table



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	A	B	C	D	E	F
GV160-EH250	ISO63	389 mm 15.3 in	197 mm 7.7 in	182 mm 7.2 in	722 mm 28.4 in	297 mm 11.7 in
GV160-EH500A	ISO100	291 mm 11.4 in	197 mm 7.7 in	182 mm 7.2 in	722 mm 28.4 in	297 mm 11.7 in
GV160-EH1200	ISO160	291 mm 11.4 in	197 mm 7.7 in	182 mm 7.2 in	790 mm 31.1 in	297 mm 11.7 in

Figure 3 - Dimensions of GV250/400-EH250/500 combination pumping systems: refer to Table 2



	A	B	C	D	E	F
GV250/400-EH250	ISO63	464 mm 18.3 in	996 mm 39.2 in	315 mm 12.4 in	133 mm 5.2 in	375 mm 14.8 in
GV250/400-EH500A	ISO100	366 mm 14.4 in	996 mm 39.2 in	315 mm 12.4 in	133 mm 5.2 in	375 mm 14.8 in

3 Installation

3.1 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 install the Connection Kit.
- Ensure that the installation technician is familiar with the safety procedures which relate to the products pumped. Wear the appropriate safety-clothing when you come into contact with contaminated components. Dismantle and clean contaminated components inside a fume-cupboard.
- If the GV pump has been in operation, vent and purge it, then switch it off and allow it to cool to a safe temperature before you start installation.
- Isolate the GV pump and other components in the process system from the electrical supply so that they cannot be operated accidentally.
- Recheck the direction of rotation of the GV pump if the electrical supply has been disconnected.
- Do not reuse 'O' rings and Co-Seals.
- Leak test the system after installation and seal any leaks found, to prevent the leakage of dangerous substances from the system, and the leakage of air into the system.
- Do not use the lifting bolts fitted to the EH mechanical booster pump to lift a GV-EH combination pumping system.
- When you refer to another instruction manual, ensure that you obey the WARNINGS and CAUTIONS in the manual.

3.2 Unpack and inspect

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

Check that you have received the items listed in the appropriate Table 2 to 4. If any item is missing, notify your supplier in writing within three days.

If the Connection Kit is not to be used immediately, replace any packing and protective covers and store in suitable conditions, as described in Section 5.1.

Table 2 - Checklist of components: GV80/160/250/400-EH250 Connection Kit

Qty	Description	Check (✓)
1	Flange adaptor: ISO63-ISO40	<input type="checkbox"/>
8	Bolts: M8 x 25	<input type="checkbox"/>
8	Spring washers: M8	<input type="checkbox"/>
1	'O' ring: Ø49.5 x 3.0 mm section	<input type="checkbox"/>

Table 3 - Checklist of components: GV80/160/250/400-EH500A Connection Kit

Qty	Description	Check (✓)
1	Flange adaptor: ISO63-ISO63	<input type="checkbox"/>
4	Bolts: M8 x 25	<input type="checkbox"/>
4	Spring washers: M8	<input type="checkbox"/>
1	'O' ring: \varnothing 78.74 x 5.33 mm section	<input type="checkbox"/>

Table 4 - Checklist of components: GV160-EH1200 Connection Kit

Qty	Description	Check (✓)
1	Flange adaptor: ISO100-ISO63	<input type="checkbox"/>
12	Bolts: M8 x 25	<input type="checkbox"/>
12	Spring washers: M8	<input type="checkbox"/>
1	'O' ring: \varnothing 4.38 x 0.21 inch section	<input type="checkbox"/>
1	Support plate	<input type="checkbox"/>
2	Support rods	<input type="checkbox"/>
1	Stud: M12	<input type="checkbox"/>
2	Bolts: M12 x 25	<input type="checkbox"/>
4	Plain washers: M12	<input type="checkbox"/>
2	Spring washers: M12	<input type="checkbox"/>
2	Nuts: M12	<input type="checkbox"/>

3.3 Prepare the GV pump



WARNING

Ensure that the GV pump is secured to the floor before you fit the Connection Kit. If you do not, the GV pump may move when you fit the EH pump, and the EH pump may fall.

1. If the GV pump has been in operation, vent and purge it with dry nitrogen or air, then switch it off and allow it to cool to a safe temperature before you continue.
2. Isolate the GV pump and the other components in your process system from the electrical supply, so that they cannot be operated accidentally.
3. If already connected, disconnect the GV inlet from your process system.
4. Ensure that the GV pump is securely bolted to the floor.

3.4 Fit an EH250/500A pump to a GV pump

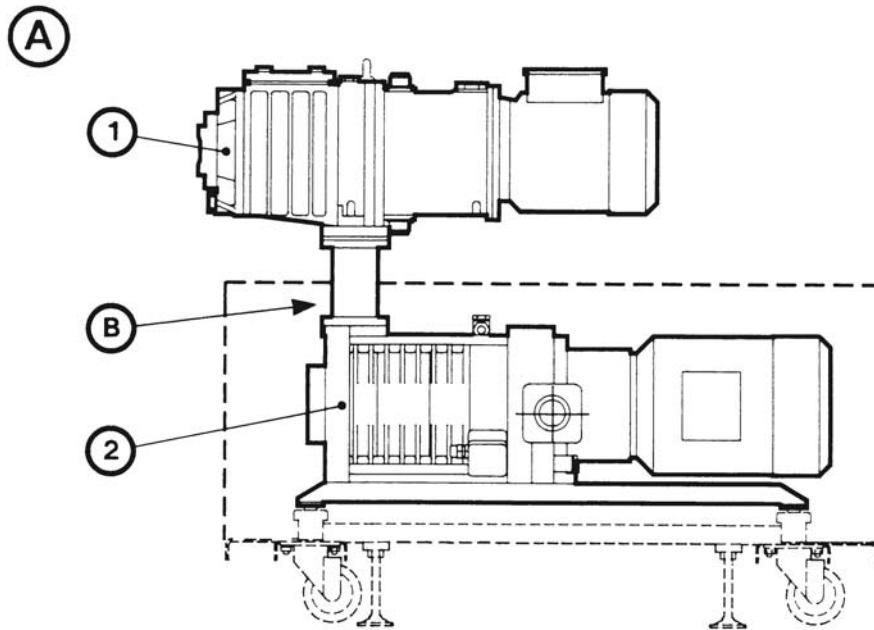
Note: If your GV pump has an acoustic enclosure, the top panel(s) of the enclosure must be fitted when you fit the EH pump.

Refer to Figure 4 and use the following procedure to fit an EH250 pump to a GV pump; where necessary, refer to the instruction manuals supplied with the GV pump and with the EH pump.

1. Undo and remove the bolts and washers which secure the blanking plate to the inlet of the GV pump(2), then remove the blanking-plate and the 'O' ring. Retain the bolts, washers and 'O' ring.

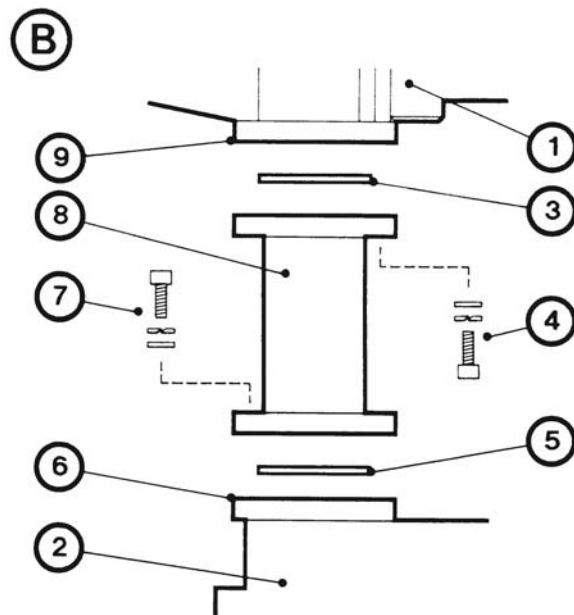
2. Use suitable lifting equipment to raise the EH pump (1) over the GV pump (2): refer to the EH pump instruction manual.
3. Refer to detail B. Wipe clean the sealing faces of the adaptor flange (8), the inlet (6) of the GV pump, and the outlet (9) of the EH pump.
4. Secure the adaptor flange (8) to the inlet (6) of the GV pump:
 - For an EH250 pump, use four of the M8 x 25 bolts and spring washers (7) supplied in the Connection Kit, together with the plain washers and 'O' ring (5) removed in Step 1.
 - For an EH500A pump, use the bolts, plain washers and 'O' ring (5) removed in Step 1.
5. Fit the 'O' ring (3) supplied in the Connection Kit to the top face of the adaptor flange (8).
6. Carefully lower the EH pump (1) so that the pump-outlet (9) aligns with the top of the adaptor flange (8), and so that the fixing-holes in the pump-outlet align with the fixing-holes in the adaptor flange.
7. Use the four M8 x 25 bolts and washers (4) supplied in the Connection Kit to secure the adaptor flange (8) to the EH pump-outlet (9).
8. Continue at Section 3.6.

Figure 4 - Fit an EH250/500A pump to a GV pump (GV80-EH250 combination shown)



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- 1. EH pump
- 2. GV pump
- 3. 'O' ring
- 4. Bolts, spring and plain washers
- 5. 'O' ring
- 6. GV pump-inlet
- 7. Bolts, spring and plain washers
- 8. Adaptor flange
- 9. EH pump-outlet

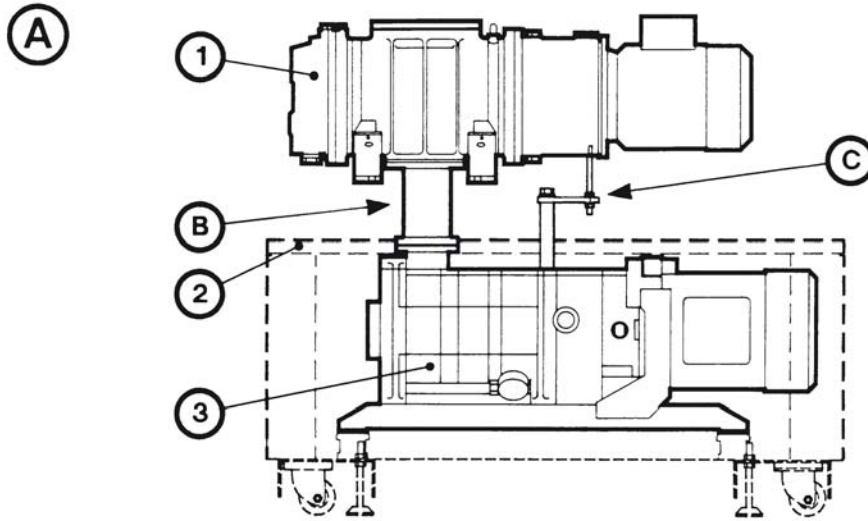


3.5 Fit an EH1200 pump to a GV160 pump

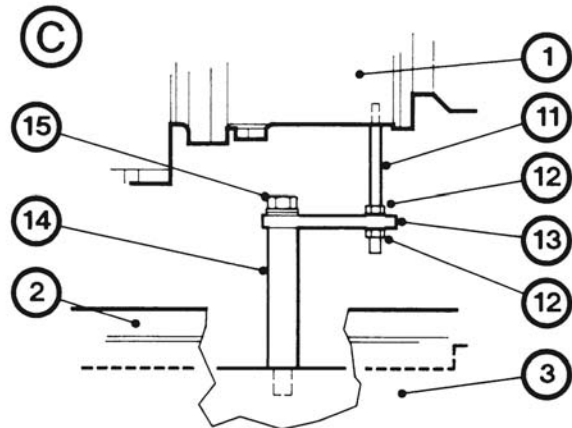
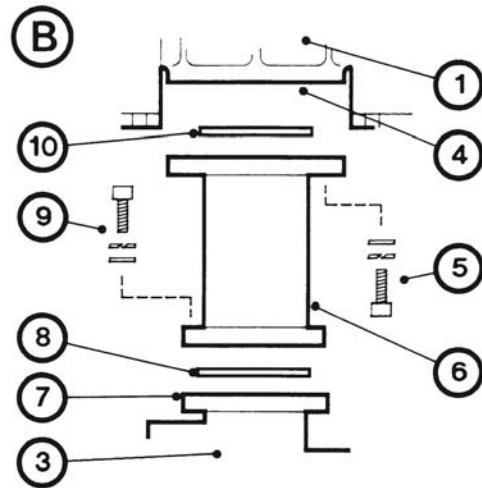
Refer to Figure 5 and use the following procedure to fit an EH1200 pump to a GV160 pump; where necessary, refer to the instruction manuals supplied with the GV pump and with the EH pump.

1. Use suitable lifting equipment to raise the EH pump (1) over the GV pump (3): refer to the EH pump instruction manual.
2. Remove the top panel (2) from the GV160 enclosure, then remove the two rear lifting-bolts (if fitted) from the GV pump (3).
3. Refer to detail C. Fit one end of the stud (11) into the M12 fixing hole in the base of the EH pump (1), then fit an M12 nut (12) to the other end of the stud.
4. Fit the two support rods (14) to the rear lifting-bolt holes on the GV pump (3).
5. Remove the two blank grommets from the leadthrough holes in the top panel (2) of the GV enclosure, then refit the top cover, so that the two support rods (14) pass through the leadthrough holes.
6. Fit the support plate (13) to the two support rods (14) and secure with the M12 x 25 bolts, and the plain and spring washers (15) supplied.
7. Refer to detail B. Undo and remove the bolts and washers which secure the blanking-plate to the GV pump-inlet (7), then remove the blanking-plate and the 'O' ring. Retain the plain washers and 'O' ring.
8. Wipe clean the sealing faces of the adaptor flange (6), the GV pump-inlet (7), and the EH pump-outlet (4).
9. Use the bolts and spring washers (9) supplied in the Connection Kit, together with the plain washers and the 'O' ring (8) removed in Step 7, to secure the adaptor flange (6) to the GV pump-inlet (7).
10. Fit the 'O' ring (10) supplied in the Connection Kit to the top of the adaptor flange (6).
11. Carefully lower the EH pump (1) so that the pump-outlet (4) aligns with the top of the adaptor flange (6), so that the fixing-holes in the pump-outlet align with the fixing-holes in the adaptor flange, and so that the stud (11) passes through the remaining hole in the support plate (13).
12. Adjust the M12 nut (12) on the stud (11), so that the EH pump is supported by the stud.
13. Use the four M8 x 25 bolts and washers (5) supplied in the Connection Kit to secure the adaptor flange (6) to the EH pump-outlet (4).
14. Fit an M12 nut and washer (12) to the bottom of the stud (11), to secure the stud to the support plate (13).
15. Continue at Section 3.6.

Figure 5 - Fit an EH1200 pump to a GV160



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- 1. EH1200 pump
- 2. Top panel of acoustic enclosure
- 3. GV160 pump
- 4. EH pump-outlet
- 5. Bolts and washers
- 6. Adaptor flange
- 7. GV pump-inlet
- 8. 'O' ring
- 9. Bolts and washers
- 10. 'O' ring
- 11. Stud
- 12. Nuts and washers
- 13. Support plate
- 14. Support rod
- 15. Bolts, plain and spring washers

3.6 Complete the installation



WARNING

Leak test the system after installation and seal any leaks found to prevent the leakage of dangerous substances out of the system, and the leakage of air into the system.

1. Complete the installation of the EH pump: refer to the instruction manual supplied with the EH pump.
2. Leak test the system and seal any leaks found: refer to the GV and EH pump instruction manuals.

Installation

4 Maintenance

When you maintain your GV-EH combination pumping system:

1. On a GV160-EH1200 system, ensure that the support rods, support plate and stud are securely fitted to the GV and EH pumps. Tighten any loose nuts and bolts as necessary.
2. Inspect the adaptor flange and check that it is not damaged or corroded; if the adaptor flange is damaged or corroded, you must replace it.
3. Check that the adaptor flange is securely fitted to the inlet of the GV pump and to the outlet of the EH pump. Tighten any loose connection.

5 Storage and Disposal

5.1 Storage

Refit any packing materials and protective covers and store the Connection Kit in cool, dry conditions.

When required for use, install the Connection Kit as described in Section 3.

5.2 Disposal

Dispose of the Connection Kit and any components safely in accordance with all local and national safety and environmental requirements.

Storage and Disposal