

General instructions for Multiplate coupling



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1.0 INTRODUCTION

This document illustrates operating instructions for Eaton's Multi-FF series Multiplate quick disconnect coupling. This user manual also provides guidance about preventive maintenance of Multiplate coupling and steps for servicing in case of malfunction.

2.0 SAFETY INSTRUCTIONS

- It is recommended to wear hand-gloves while making connection or disconnection of Eaton's Multi-FF device.
- Hold top plate / movable plate on hose lines or on to a surface perpendicular to handle strips, to avoid finger entrapment during engagement with fixed plate.
- Once two plates / sub-systems are engaged, remove your hand off the plate and only rotate the handle. Do not put hand/fingers in between 2 plates.
- Ensure that fingers are not entrapped in between bottom/fixed plate and handle of the device during operation
- Ensure absence of pressure inside the Multi-FF before initiating disconnection of system or carrying out any maintenance work.

3.0 OPERATING CONDITIONS

This section covers general operating conditions to obtain long life of multiplate coupling without unpredicted failure. It is advisable to use multi plate coupling under same operation conditions.

The allowed operating temperature lies between -20°C to 100°C. This is operating temperature of multiplate coupling assembly and subjected to change based on seal material configuration of Coupling half. The permitted storage temperature lies between +10°C and +35°C.

The maximum operating relative air humidity should not exceed 75%. Similarly, it should not exceed 60% for storage.

Dust & vibration free environment will ensure correct functionality of multiplate coupling.

Maximum operating pressure for multiplate coupling is as follow. These are tested at 1:4 times operating pressure and it is advisable that system pressure for continuous service shall not exceed maximum operating pressure recommended below.

MultiFF Part number	No. of coupling ports	Coupling body size	Max. operating pressure
4MFC-10CUP15LS11	4	ISO 10	250 bar
4MFCE1-12CUP15L	4	ISO 12	350 bar
4MFC-12CUP15L	4	ISO 12	350 bar
4MFC-1015L	4	ISO 10	350 bar
4MFCE1-1015L	4	ISO 10	350 bar
6MFC-1015L	6	ISO 10	350 bar

4.0 DURABILITY AND LIFETIME

The durability and lifetime of the quick coupling system depend on the following:

- Environmental conditions
- Conditions of use
- Timely preventive maintenance
- Construction features of the on-site situation

5.0 MAINTENANCE

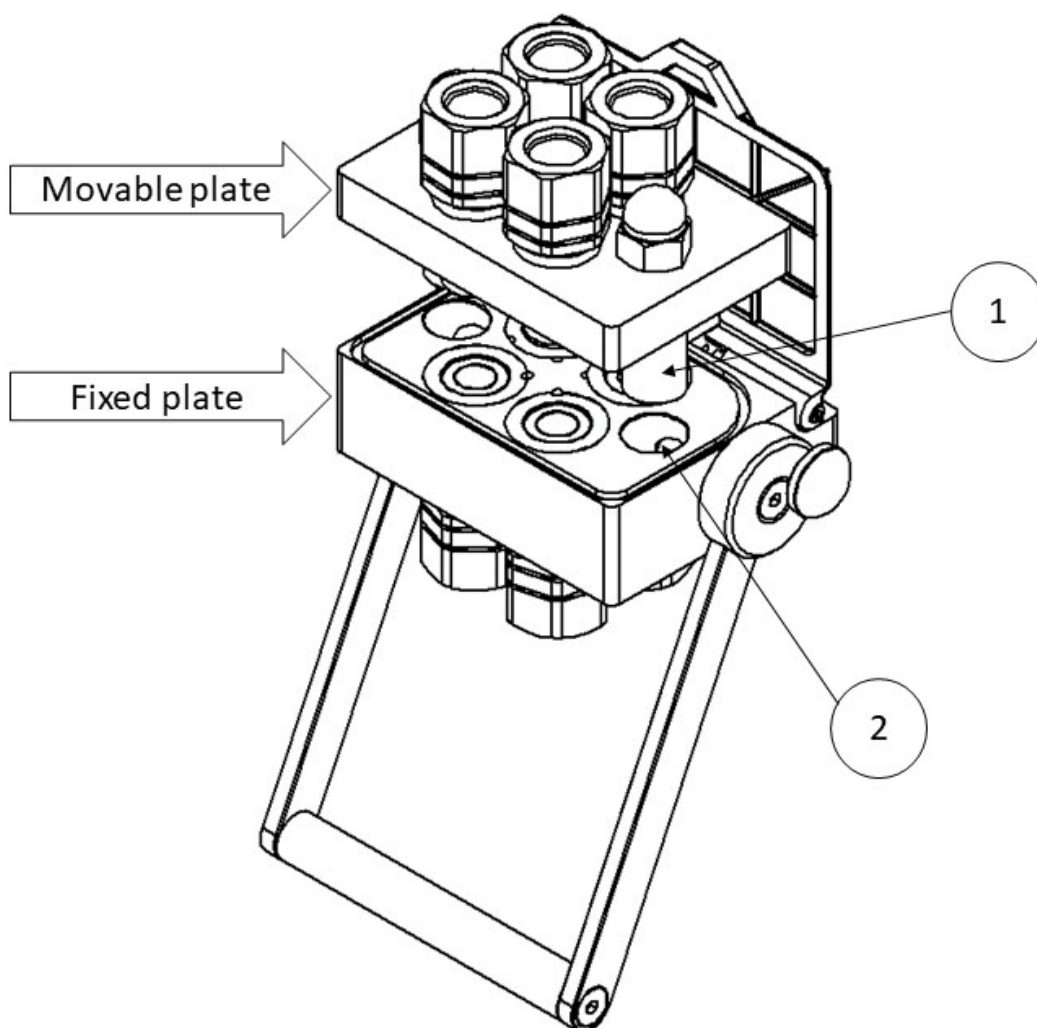
Components must be maintained after every 12 months storage period for the purpose of monitoring and repairs. Replacement with original parts will ensure correct functionality.

Clean your quick coupling system once a week or every 50 coupling-decoupling cycles. To do this, use the usual cleaning agents such as dry ice. After doing so, lubrication must be carried out.

Apply solid lubricant (grease) after every 6 months or 1000 coupling-decoupling cycles in critical areas listed below:

1. Racks on movable plate
2. Pinion in fixed plate

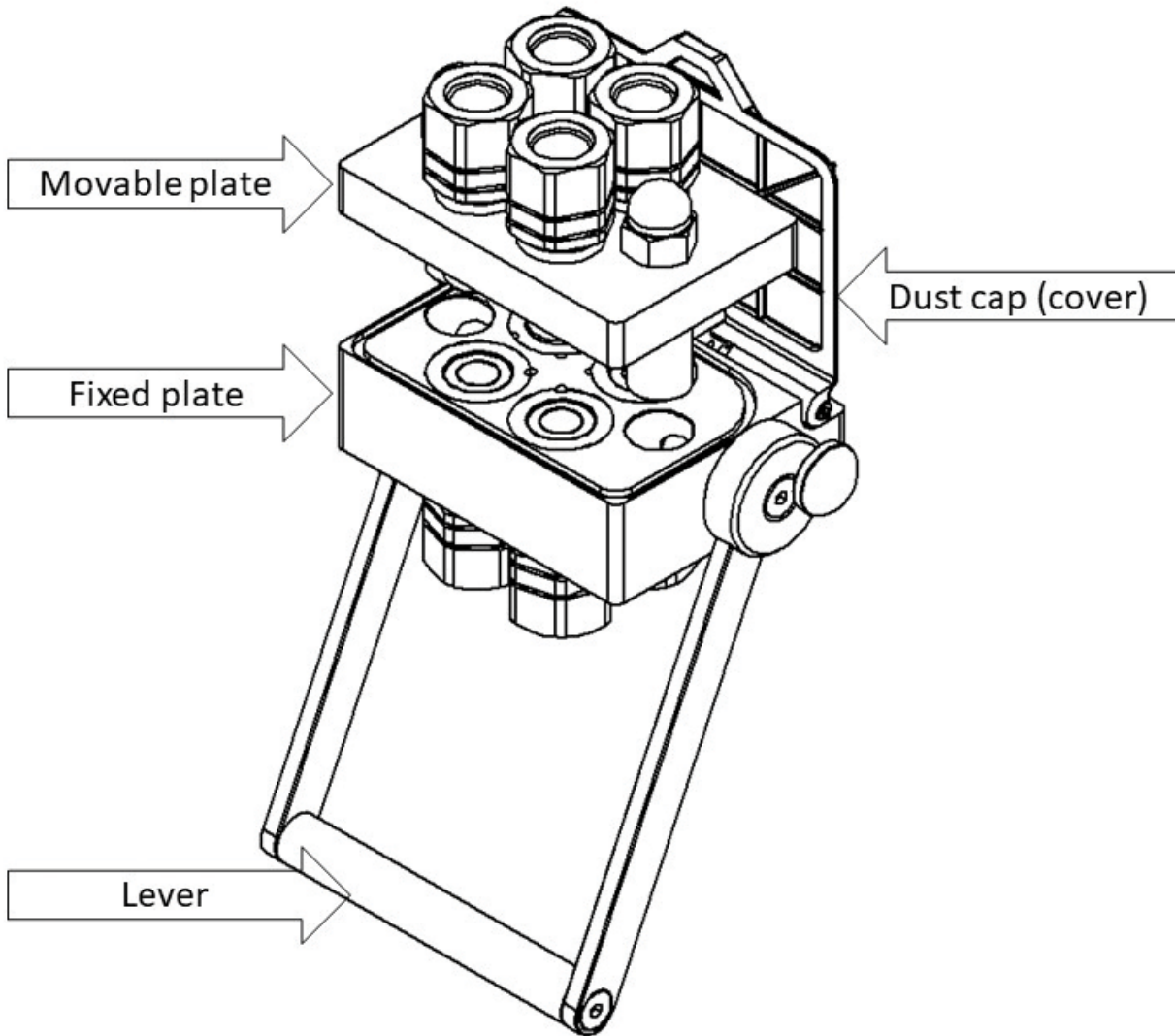
Figure 1.



6.0 PRODUCT DESCRIPTION

Multiplate coupling, marketed as Eaton's Multi-FF series product, is a system which enables connection and disconnection of 2 or more QDC's in a single operation. Briefly, this system would have two pre-assembled sub-systems, one comprising of male halves (plugs) and other one having equal number of female (socket) halves with centralized locking mechanism. These two sub-systems, when guided together with the help of handle operated mechanism, will connect all QDC's together and open the internal flow path.

Figure 2. Multiplate coupling assembly



7.0 INSTALLATION

The quick coupling systems are to be installed under the observations of general accident prevention regulation. In order to prevent damages to the quick coupling system or life-threatening injuries to people during the fitting of the quick coupling to the machine, the following points must be observed.

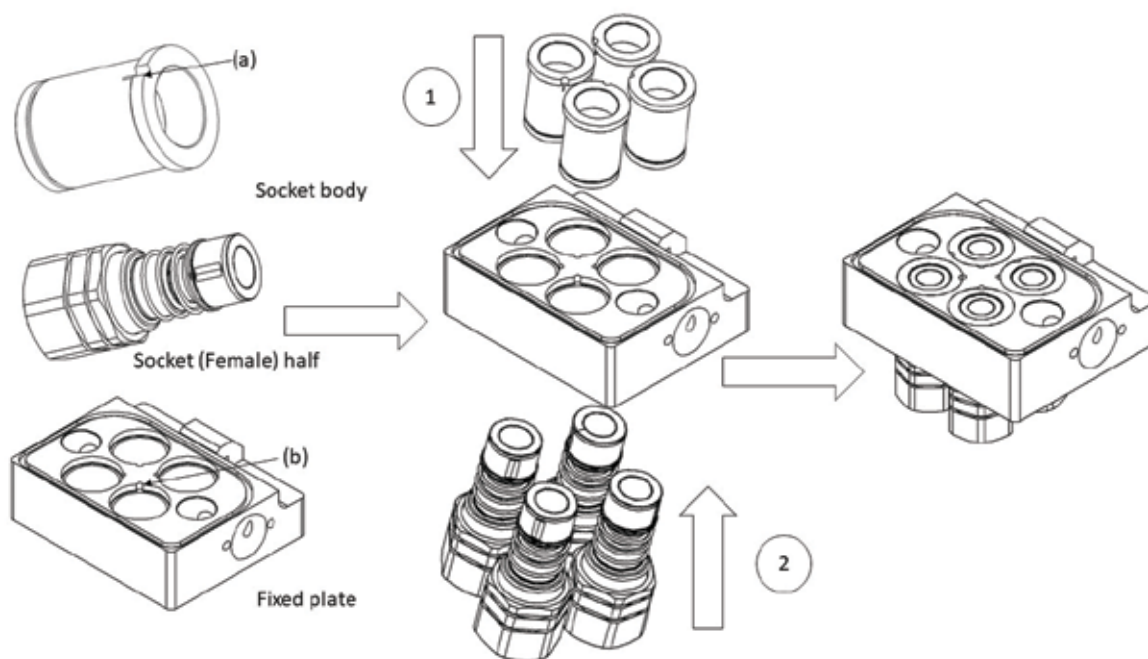
- Installation must be carried out by qualified person with all safety precautions.
- Multiplate coupling should be checked for damages in transit before installation.
- There should not be stumbling and falls of hydraulic or electrical lines that can create hazards.
- Refer to assembly drawings from EatonPowersource.com for installation thread details.

8.0 SERVICING

Key components of Eaton's Multi-FF can be easily serviced and replaced upon malfunction. Following sections and figures illustrates step-by-step guide for replacing these components with use of standard tools.

8.1 SOCKET HALF REPLACEMENT

Figure 3. Socket (female) half assembly on fixed plate



Socket (female) half assembly on fixed plate comprises of 2 sub-components,

1. Socket (Female) body
2. Socket (Female) half (without body)

Perform following steps for removing socket half (female) coupling from fixed plate:

- A. Align semi-circular slot on socket body (a) with that on fixed plate (b) by rotating the coupling half as shown in figure 3.
- B. Insert standard 4mm dia. pin / tool in this slot after alignment to block the rotation of socket half.
- C. Using standard wrench, hold hex on end connection of coupling and rotate in counter-clockwise direction to unscrew the sub-assembly.
- D. Remove sub-assembly and socket body from fixed plate.

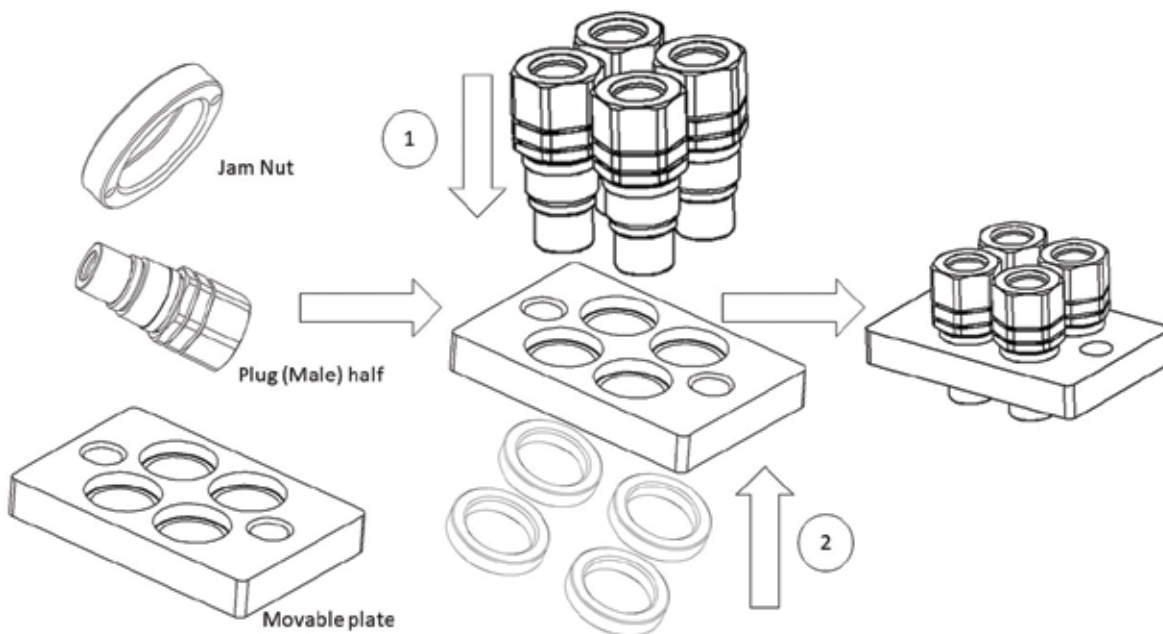
Perform following steps for assembly of socket half (female) coupling in fixed plate:

- A. Disassemble socket body from rest of the sub-assembly.
- B. Insert socket body in respective hole in fixed plate such that shoulder of the socket body is rested against counter-bore in plate.
- C. Align semi-circular slot on socket body with that on fixed plate by rotating the body.
- D. Insert standard 4 mm dia. pin / tool in this slot after alignment to block the rotation of socket body.
- E. Insert sub-assembly into socket body from bottom side, and screw threads in clockwise direction.
- F. Using standard wrench, hold hex on end connection of coupling and rotate in clockwise direction to apply torque as per below chart.

Coupling series	Coupling size	Coupling half	Torque in N-m
FF (ISO 16028)	ISO 6	Socket	60
FF (ISO 16028)	ISO 10	Socket	60
FF (ISO 16028)	ISO 12	Socket	90
FF (ISO 16028)	ISO 16	Socket	90
FF (ISO 16028)	ISO 19	Socket	100
FF (ISO 16028)	All	Plug	30

8.2 PLUG HALF REPLACEMENT

Figure 4. Plug (male) half assembly on movable plate



Plug (Male) half assembly on movable plate comprises of 2 sub-components:

1. Plug (Male) assembly
2. Jam Nut

Perform following steps for removing plug half (male) coupling from movable plate:

- A. Hold Nut in position by inserting a standard tool in slots provided on top surface, as shown in Figure 4 Jam Nut view.
- B. Using standard wrench, hold hex on end connection of coupling and rotate in counter-clockwise direction to unscrew the sub-assembly.
- C. Remove plug assembly and Jam Nut from movable plate.

Perform following steps for assembly of plug half (male) coupling in fixed plate:

- A. Insert plug body in respective hole in movable plate such that shoulder of the plug body is rested against plate surface.
- B. Install Jam Nut on plug half from opposite end of plate and screw nut in clock-wise direction.
- C. Hold Jam nut in position by using standard tool and inserting it in slots provided on Nut.
- D. Using standard wrench, hold hex on end connection of coupling and rotate in clockwise direction to apply torque as per above chart.

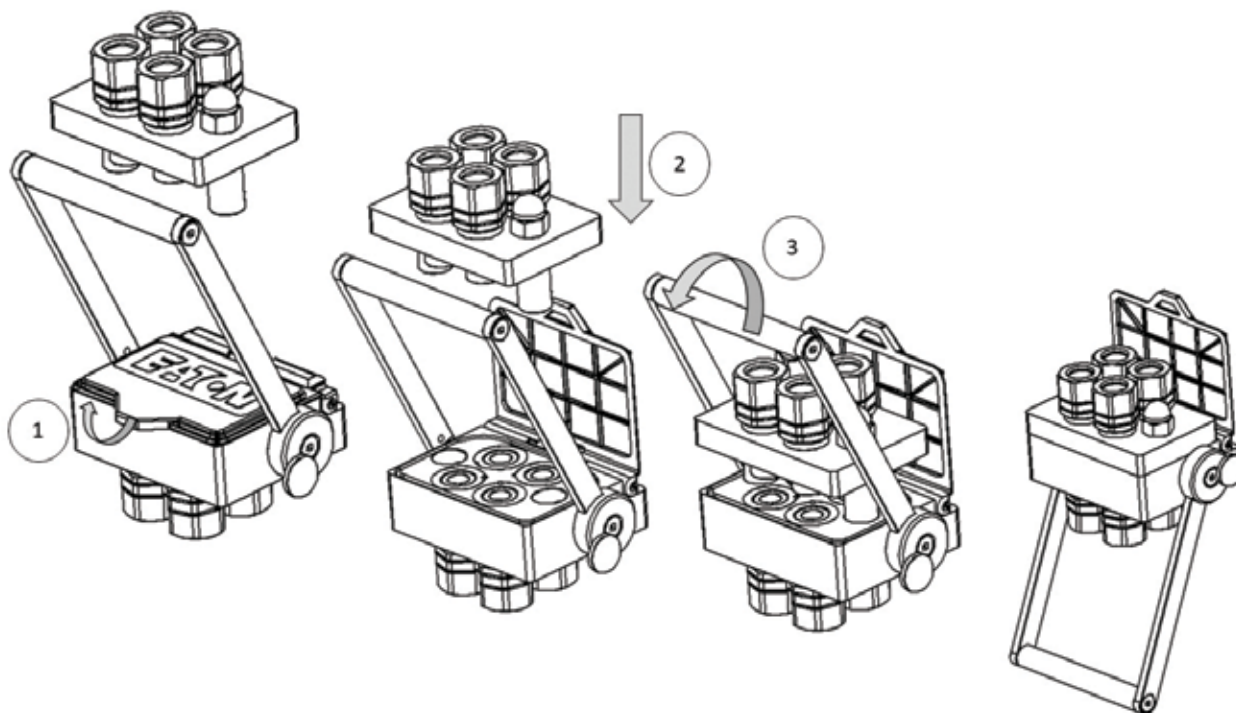
8.3 REPLACEMENT PART NUMBERS

Refer below table for ordering correct parts for replacement. Other end connections are also available upon request for plug and socket coupling assemblies.

MultiFF Part number	Plug coupling	Socket coupling	Dust cap seal
4MFC-10CUP15LS11	10FFPCUP12LS21	10FFS15LS21	4MFS21-10S11
4MFCE1-12CUP15L	12FFPCUP15LS21	12FFS15LS21	4MFS21-12
4MFC-12CUP15L	12FFPCUP15LS21	12FFS15LS21	4MFS21-12
4MFC-1015L	10FFP15LS21	10FFS15LS21	4MFS21-10
4MFCE1-1015L	10FFP15LS21	10FFS15LS21	4MFS21-10
6MFC-1015L	10FFP15LS21	10FFS15LS21	6MFS21-10

9.0 OPERATING

Figure 5. Operating multiplate coupling



As shown in figure 5, two plates of assembly play major role in operation of connection and disconnection. Fixed plate with lever and cover, and movable plate. Movable plate has plug (male) half and fixed plate has socket (socket) half.

1. First step is to open cover/dust cap and clean plate surface from any dust/foreign particles.

2. Second step is to move movable plate towards fixed plate in order to align mating parts.
3. Once two sub-systems are aligned, rotate the handle in counter-clockwise direction through 130° angle.
4. Verify that Red push button is moved away from plate, and “click” sound is heard to ensure connection is complete
5. Note that safety latch will prevent accidental disconnection of system.

With these simple steps, multiplate coupling will be ready for use. It is important to follow safety instructions provided in section 2.0 while operating Multi-FF.

For disconnection of Multi-FF, follow below listed steps:

1. Ensure that system pressure is bled-off to tank by switching to correct direction control valve position and attachment on equipment is grounded properly. Disconnection of Multi-FF coupling under pressure is not recommended.
2. After ensuring step 1 points, push the Red push button mounted on side face of fixed plate.
3. With red button still pushed inside, rotate the handle in clockwise direction through 130° angle, till “click” sound is heard and handle is rested in default position.
4. Remove movable plate from fixed one and park appropriately on attachment.
5. Ensure that dust cap / cover is closed to protect top surface of fixed plate from contamination.
6. During dust cap / cover is getting closed, ensure that seal band on fixed plate is in place. If seal band is lost or damaged, contact Eaton representative to order replacement Dust cap seal as per part number details provided in section 8.3.

Notes

