

## INSTALLATION and REMOVAL INSTRUCTIONS

### MAV FLANGE COUPLING SERIES LC7161 with INTERNAL LOCKING ASSEMBLY MAV 7161

#### GENERAL RECOMMENDATIONS and WARNINGS

- Before installing or handling this product, read instructions carefully and completely. Due to possible danger to persons or machinery resulting from improper use of this product, it is very important to follow correct procedures. Proper installation, maintenance and operation procedures must be observed. All instructions included in this manual must be followed carefully. Handling, installation and removal of this product must be done by skilled personnel, familiar with the product, the application and all hazards involved.
- Suitable safety devices should be provided and applicable safety rules should be observed as specified in safety codes. Those are neither the responsibility of MAV S.p.A., nor are provided by MAV S.p.A.
- Contravention of install and safety instructions will void all claims under warranty.
- During storage or handling operations, use only tested and approved handling and/or lifting tools. Make always sure that components of Flange Coupling are secured against slipping, falling or rolling.
- Prior to initiating installation or removal procedures, check to ensure that no loads are acting on the Coupling, shafts or any connected components. Motor and drive train must be switched off and secured against accidental activation.

#### Composition

Flange Couplings MAV LC7161 are supplied ready for installation and are composed of:

- two Locking Assemblies MAV 7161, with rings and screws oiled at factory. Each MAV 7161 is supplied assembled into each coupling flange at factory;
- one male coupling flange, oiled at factory;
- one female coupling flange, oiled at factory;
- one set of flange bolts (screws + nuts), oiled at factory.

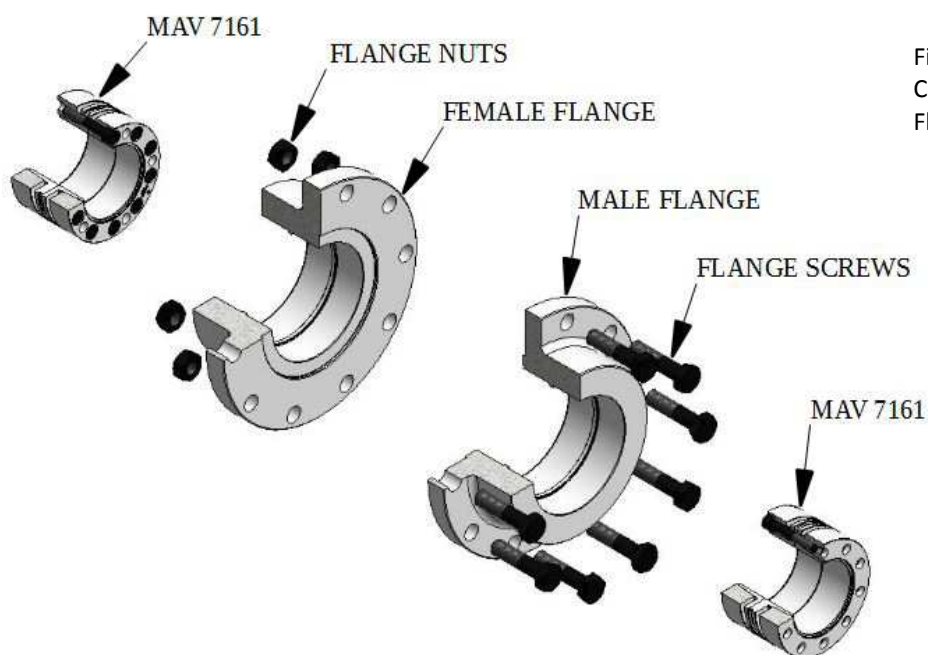


Figure 1.  
Composition of complete  
Flange Coupling LC7161

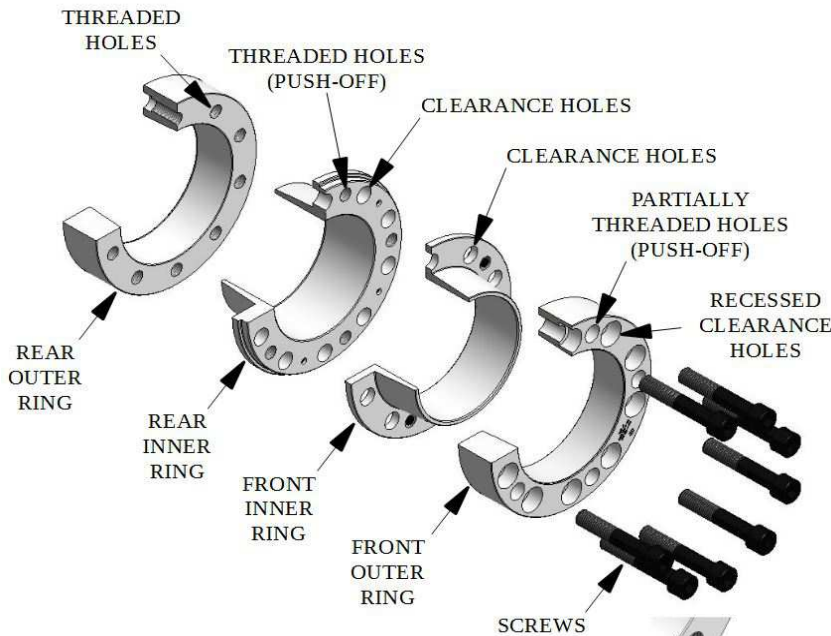
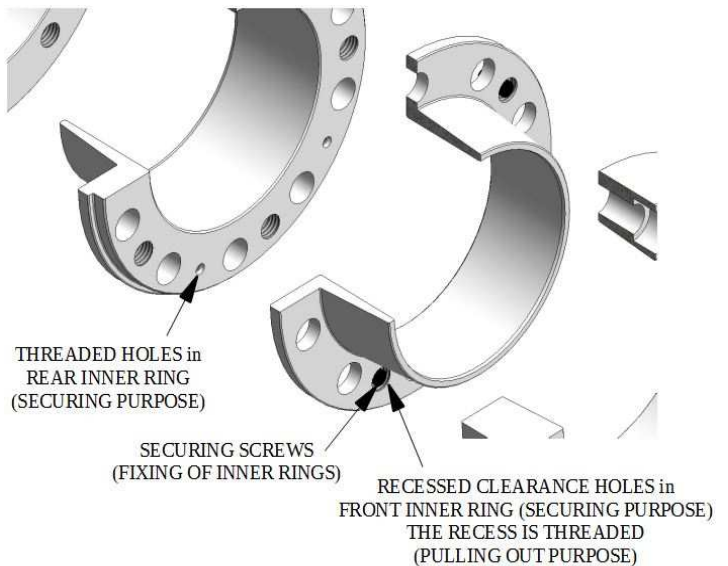


Figure 2a.  
Composition of Locking  
Assembly MAV 7161

Figure 2b.  
Locking Assembly MAV 7161  
Detail of inner rings



## Use

- Flange Couplings MAV LC7161 provide a frictional **rigid connection between two shafts. Tight alignment of drive and driven shafts is required.**
- Application loads are transmitted via friction across fitting surfaces of shaft, Locking Assembly MAV 7161 and flange bore. These surfaces shall be lubricated with a film of ordinary machine oil (mineral/synthetic base oil with low content of additives). **DON'T USE low friction lubricants** based on MoS<sub>2</sub>, graphite, copper and other similar components (e.g., Molykote, Never-Seeze or similar products), **as they will greatly reduce the capacity of the connection.**  
Application loads are then transmitted via friction across mating faces of the flanges (bolted connection). These faces shall be carefully solvent-cleaned from any trace of lubricant, to obtain a lubricant-free and dry steel-on-steel contact. **Any lubricant on mating faces of the flanges will greatly reduce the capacity of the connection.**  
Flange bolts shall be lubricated with a film of ordinary machine oil (mineral/synthetic base oil with low content of additives). **DON'T USE low friction lubricants** based on MoS<sub>2</sub>, graphite, copper and other similar components (e.g., Molykote, Never-Seeze or similar products).
- Recommended tolerances of shafts: according to customer's specs.
- Recommended surface finish of shafts:  $0.8 \leq Ra \leq 3.2 \mu m$ .
- Tight clearance fits are typical of all functional surfaces. Mounting of all parts to be achieved **WITHOUT HEATING or ANY OTHER FORCED INSTALLATION.**

## INSTALLATION

Each coupling half, composed of one Locking Assembly MAV 7161 and one flange, is assembled at factory.

Male and female coupling halves may be bolted together at factory for shipping purpose. Should this be the case, separate the two halves before installation.

Each coupling half will be fixed first on each shaft.

The two coupling half assemblies will be aligned and finally bolted together.

### INSTALLATION OF EACH COUPLING HALF

1. Make sure that screws and rings of Locking Assembly MAV 7161, as well as shaft and flange bore contact surfaces are clean and lightly oiled. **DON'T USE low friction lubricants** based on MoS<sub>2</sub>, graphite, copper and other similar components (e.g., Molykote, Never-Seeze or similar products).
2. Check to ensure that slits of all locking rings are aligned. A light misalignment will be noticed in case staggered slits are machined in front and rear outer rings (see Figures 3a and 3b).

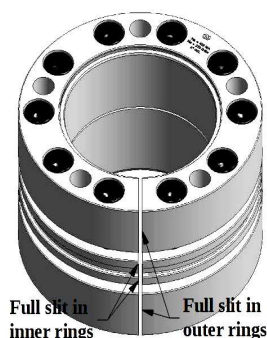


Figure 3a.  
Detail of slits alignment  
(full slit)

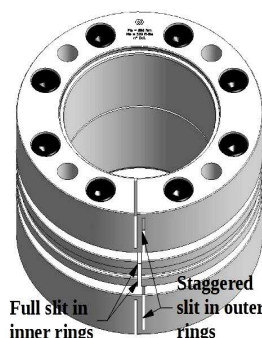


Figure 3b.  
Detail of slits alignment  
(staggered slit)

3. Loosen all screws by few turns, transfer some of them into push-off threads of front outer ring for hand-tightening. Lightly hammer the other screws. These operations might be necessary to ensure that rings are disengaged, for ease of installation.
4. By using suitable lifting equipment, slide the complete coupling half with the slits in the Locking Assembly MAV 7161 facing vertically downwards onto the shaft (Figure 4a), until the axial position as shown in Figure 4b is achieved. Relocate screws used for disengagement of rings.

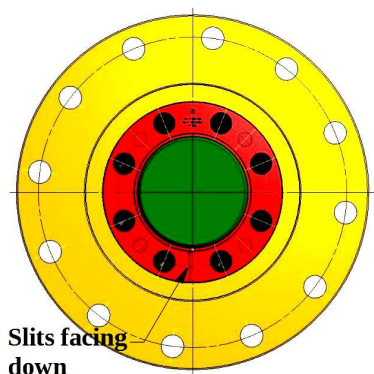


Figure 4a.  
Positioning of  
Locking Assembly  
MAV 7161

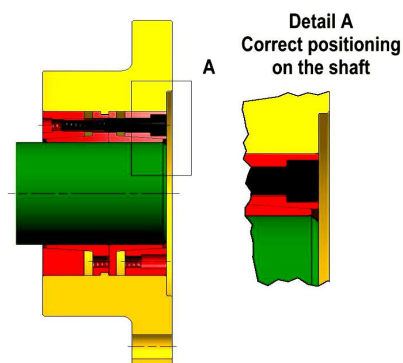


Figure 4b.  
Positioning of shaft

5. Hand-tighten 3 or 4 evenly spaced screws uniformly and crosswise, until a light connection is achieved.
6. Using dial indicators, check the runout of shaft and coupling flange as illustrated in Figure 5.  
Indicator #1 Runout max 0.015 mm TIR (total indicator reading) for every 100 mm shaft diameter.

Indicator #2 Runout max 0.035 mm TIR (total indicator reading) for every 100 mm flange outer diameter.

Indicator #3 Runout max 0.035 mm TIR (total indicator reading) for every 100 mm flange outer diameter.

Make sure runout values do not exceed listed limits. If runout is excessive, installation procedure shall be repeated from step 5.

7. Set a calibrated torque wrench approximately 5% higher than specified tightening torque. Torque screws in a crosswise pattern, using  $\frac{1}{4}$  turns for several passes until  $\frac{1}{4}$  turns can no longer be achieved.

According to Figure 6, start with the screw located at approx. 180° from slit; screws adjacent to slit to be torqued sequentially.

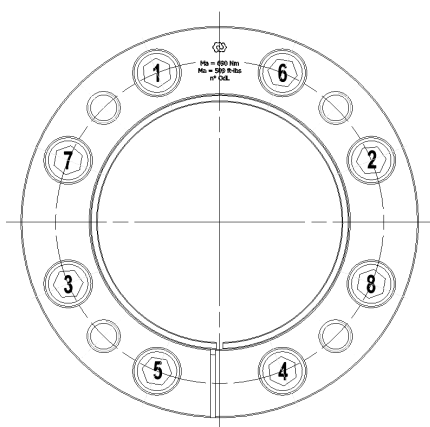


Figure 6. Detail of screws tightening pattern (as example)

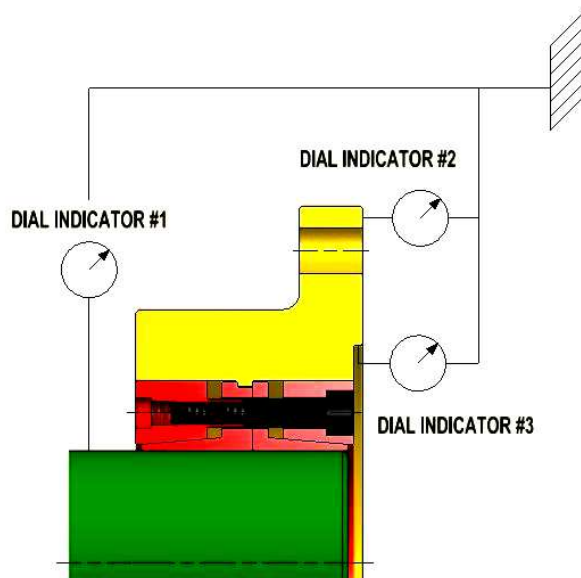


Figure 5. Coupling half installed – check of runout

8. Continue to apply overtorque for 2 or 3 more passes. This is required to compensate for a system-related relaxation of screws, since tightening of a given screw will always relax adjacent screws. Without overtorquing, an infinite number of passes would be needed to reach specified tightening torque.
9. Reset the torque wrench to specified tightening torque and check all screws. No screw should turn at this point, otherwise repeat step 8 for more passes.
10. Using dial indicators, check the runout of shaft and coupling flange as illustrated in Figure 5.

Indicator #1 Runout max 0.015 mm TIR (total indicator reading) for every 100 mm shaft diameter.

Indicator #2 Runout max 0.035 mm TIR (total indicator reading) for every 100 mm flange outer diameter.

Indicator #3 Runout max 0.035 mm TIR (total indicator reading) for every 100 mm flange outer diameter.

Make sure runout values do not exceed listed limits. If runout is excessive, installation procedure shall be repeated and flange runout rechecked.

Excessive runout may generate additional stress in the coupling half assembly, promoting its premature failure.

**RECOMMENDATION.** This kind of application is usually subjected to aggressive environment. Therefore, once tightening of coupling half assembly is completed, it is recommended to fully protect front and rear outer sides of the Locking Assembly MAV 7161 with a suitable caulking compound (typ. waxes or silicone based sealants). Slits, holes, screw heads and critical contact areas for releasing will be protected and removal operation will be facilitated.

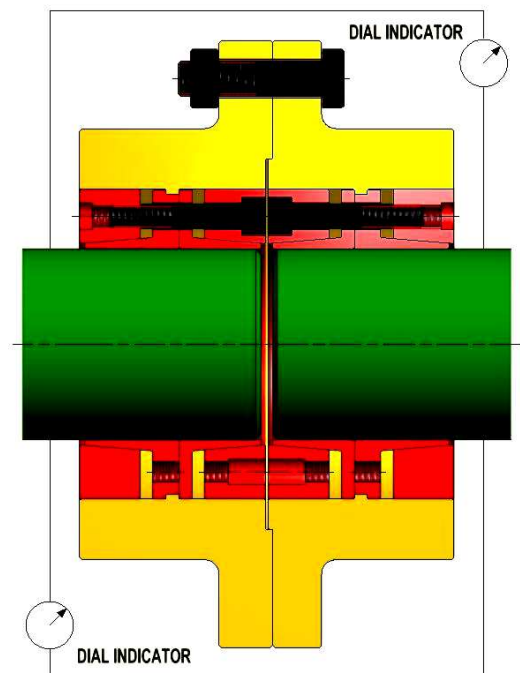
**Make sure that layer thickness of applied caulking compound will not protrude from flanges inner face, as well as shafts end. Approaching and correct positioning of coupling half assemblies and shafts shall not be restricted.**

## CONNECTION OF THE TWO COUPLING HALF ASSEMBLIES

11. Carefully remove any trace of lubricant (solvent cleaning) from mating faces of flanges, to obtain a lubricant-free and dry contact.  
Make sure that flange bolts are oiled. **DON'T USE low friction lubricants** based on MoS<sub>2</sub>, graphite, copper and other similar components (e.g., Molykote, Never-Seeze or similar products).
12. With suitable lifting equipment, move drive/motor assembly into position parallel and in line with driven shaft using centering surfaces as a guide.  
Centering surfaces should match without need of shrinking. Should it be necessary, don't proceed further with flanges connection (additional stress may be generated, leading to premature failure). Adjust and recheck again the position of coupling half assemblies until correct alignment is confirmed, allowing a clearance fit between centering surfaces.
13. Make sure that all flange bolt holes are aligned.
14. Install and hand tighten all flange bolts.
15. Set a calibrated torque wrench to specified tightening torque. Tighten all flange bolts while allowing the drive/motor assembly to move as required to draw coupling half assemblies together (flexible support). Continue tightening until flanges are mated and all flange bolts are torqued to specified tightening torque.
16. At this point, torque arm can be fastened to the bed frame and lifting equipment removed. For safety reasons (support of drive in case of emergency), it is recommended lifting equipment to be removed only after connection of Flange Coupling is completed.
17. Using dial indicators per Figure 7, make sure that runout values are within 0.070 mm TIR (total indicator reading) for every 100 mm shaft diameter.

**RECOMMENDATION.** This kind of application is usually subjected to aggressive environment. Therefore, once connection of the two coupling half assemblies is completed, it is recommended to paint the outside of Flange Coupling with a suitable varnish.

Figure 7. Flange Coupling installed – check of runout





## REMOVAL

### REMOVAL OF THE TWO COUPLING HALF ASSEMBLIES

1. Do not disconnect torque arm or tie rod until Coupling is completely disconnected.
2. Use suitable equipment to remove the weight of drive/motor assembly from Coupling and driven shaft. Lifting of drive must be done very carefully: make sure that loads are balanced to prevent swinging down of drive when Coupling is disconnected.
3. Loosen all flange bolts in sequence and remove them.
4. Separate the two coupling half assemblies.

### REMOVAL OF EACH COUPLING HALF (RELEASING OF LOCKING ASSEMBLY MAV 7161)

**IMPORTANT!** The final user must ensure that end of locking screws used for removal is ground flat and slightly chamfered to prevent damage to screws and collar threads during push-off. Screws with ground flat and chamfered end are not supplied by MAV. The final user has to take charge of machining of end of screws.

5. Remove rust, dirt, sealants if used, and make sure that axial movement of outer rings – necessary for release of the connection – is not restricted. Likewise, ensure that push-off threads are in good conditions.
6. Loosen all locking screws and transfer the required number into all push-off threads of front outer ring.
7. Release front outer ring by tightening all push-off screws in a crosswise pattern, not exceeding  $\frac{1}{4}$  turns for several passes. Remove front outer ring.
8. Remove securing screws used to fix the two inner rings. Screw the required number of locking screws into threaded recesses for pulling out of front inner ring. Remove front inner ring.
9. Transfer locking screws used for releasing of front outer ring into all push-off threads of rear inner ring.
10. Release rear outer ring by tightening all push-off screws in a crosswise pattern, not exceeding  $\frac{1}{4}$  turns for several passes. Don't remove rear outer ring and rear inner ring.  
**WARNING!** Rear outer ring and rear inner ring are now free: make always sure that intended rings are secured against falling, which may cause permanent injury.
11. Releasing operation is now completed. The coupling half is loose and can be removed from shaft.

## REUSE of USED COUPLINGS

Before reuse, all parts of the Coupling – flanges, rings of MAV 7161 and all screws and nuts – shall be disassembled and their conditions checked.

In order to disassemble rear inner ring and rear outer ring of MAV 7161 from coupling flange, push intended rings together towards flange's hub side (not towards flanged side) and take them away. **WARNING! Make always sure that intended rings are secured against falling, which may cause permanent injury.**

Permanent deformations, ovalizations, dents, corroded areas, are not admitted. In case of doubts, please contact MAV S.p.A. for advise.

If in good conditions, Couplings require thorough cleaning and re-lubrication before reuse.

1. Clean and re-lubricate all parts of the Coupling with a film of ordinary machine oil (mineral/synthetic base oil with low content of additives).
2. Insert rear inner ring into flange bore from hub side, until it bottoms against step shoulder in flange's bore (see Figure 8).
3. Insert front inner ring into flange bore from flanged side until it bottoms against step shoulder in flange's bore and face of rear inner ring (see Figure 8).

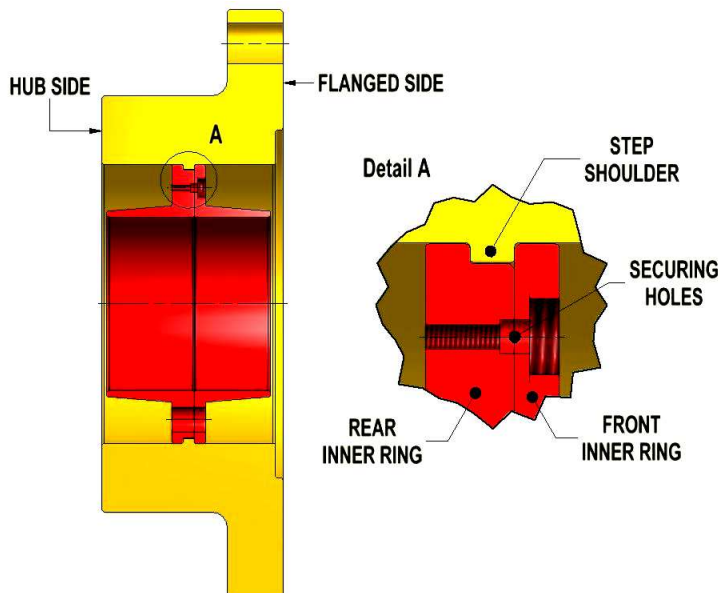


Figure 8. Re-assembling of inner rings of Locking Assembly MAV 7161

4. Make sure that clearance holes of front and rear inner rings are aligned, as well as securing holes and slits.
5. Make sure that faces of front and rear inner rings are in contact.
6. Insert fixing screws without tightening.
7. Make sure that bores of front and rear inner rings are concentric. Light hammering may help in this operation.
8. Tighten fixing screws at specified torque.

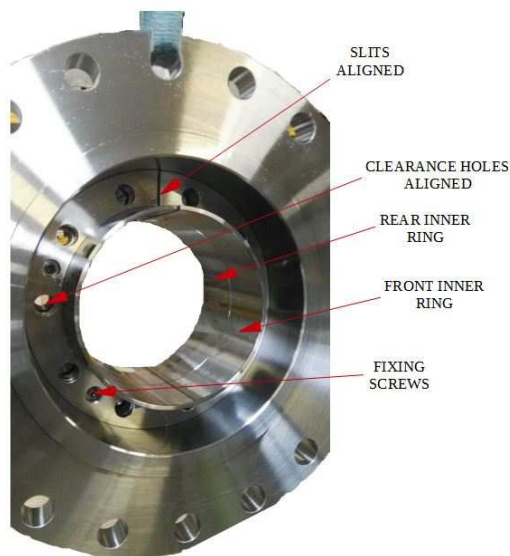


Figure 9. Re-assembling of each coupling half after step 8

9. Insert rear outer ring, making sure that threaded holes are aligned with clearance holes of front and rear inner rings. Slits shall be aligned as well.
10. Insert front outer ring, making sure that recessed clearance holes are aligned with threaded holes of rear outer ring. Slits shall be aligned as well.
11. Insert locking screws.



Figure 10. Re-assembling of each coupling half after step 11

12. Re-assembling operation of each coupling half is now completed.
13. Follow these instructions for a new installation.