

T SERIES METAL MEMBRANE COUPLING

Installation Instructions

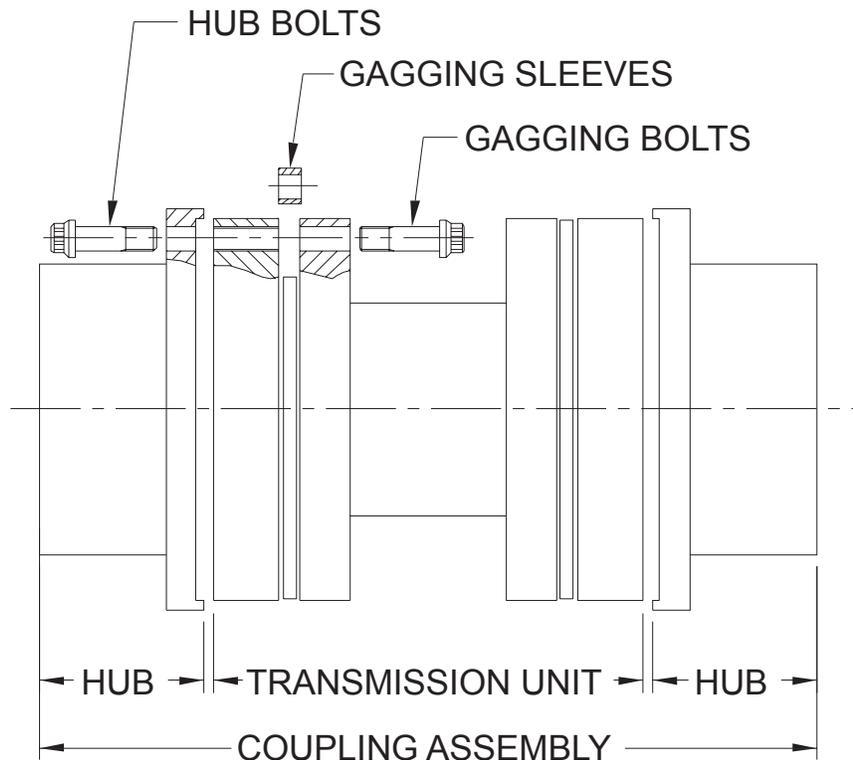
General Description

The TLC coupling is a precision-built 8-link coupling comprising two flexible disc assemblies connected by a torque tube. The flexing discs are stainless steel, the bolts high-tensile steel and the other components forged and machined carbon steel. Alternate materials are available and, if supplied, are listed on the assembly drawing.

Handling and Storage

- The coupling is normally dispatched with standard commercial packing. The packing case should contain a copy of the appropriate assembly drawing (if requested), the installation and maintenance instructions and a balancing certificate (if dynamic balancing required).
- During transport, handling and storage, the gagging sleeves (painted red for identification) should be in position.
NOTE: *Gagging sleeves are supplied only when required for the application, NOT with every coupling.*
- The coupling should be stored horizontally and should not be kept on end for long periods.
- Avoid shocks during handling and protect against corrosion if stored for long periods.
- On receipt and immediately before assembly, check that items are undamaged and that pilots and recesses are free from burrs.
If a balanced unit is supplied, note the location and orientation of any match marks.

FIGURE 1



Installation Procedure

1. Reference the assembly drawing(s) for all dimensions.
2. Inspect the coupling to ensure that it is undamaged and note any match marks that must be aligned when the coupling is installed.
3. Disassemble the coupling by removing the hub bolts on each end. Fit the appropriate hubs (and/or adapters) to the driver and driven shafts in the usual manner, ensuring that the shaft ends are flush with the faces of the hubs (Figure 2). For "interference fits," we recommend heating the hubs in oil or an oven and quickly positioning on the shafts (do not spot heat in excess of 350°F (177°C) as this may cause flange distortion).

If hubs are to be hydraulically fitted, refer to CI-01 for recommended procedure.

NOTE: If axial setting adjustments are necessary (see Step 5), corrections can be made on straight cylindrical shafts by overhanging the hub. Hub overhang must not exceed 0.13 inch (3.3 mm) and the shaft must never extend beyond the hub face. Axial adjustment of hubs is not recommended for tapered shafts.

4. Check that the hub pilots and flange diameters are concentric to the center of rotation to within 0.004 inch (0.1 mm) total indicator runout (TIR) and that the hub face is square to the center of rotation to within 0.004 inch (0.1 mm) TIR (Figure 2). Refer to any specific requirements or standards for maximum allowable value.
5. Check the distance between shaft ends (DBSE) taking into account, where applicable, any axial movement that may occur in operation (e.g., thermal expansion, magnetic center location, etc.). The final operating distance must equal that shown on the assembly drawing.

NOTE: When equipment can not be moved to obtain the correct DBSE, axial adjustments are possible by overhanging hubs on cylindrical straight shafts (see Step 3). If hub adjustments are made, the mating face-to-face dimension (taking into account any axial movement that may occur in operation) must equal the overall free length of the transmission unit (Figure 3).

FIGURE 2

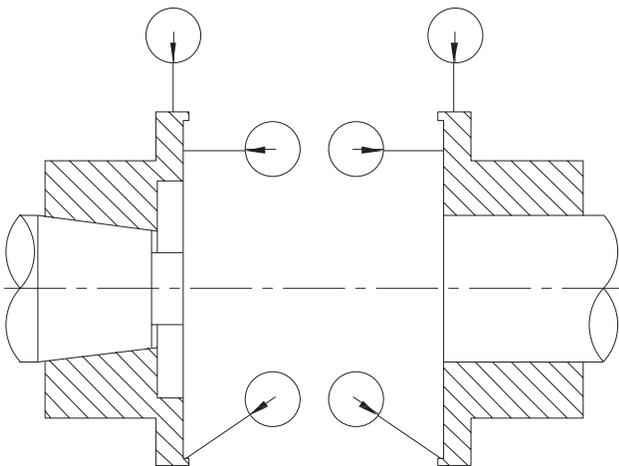
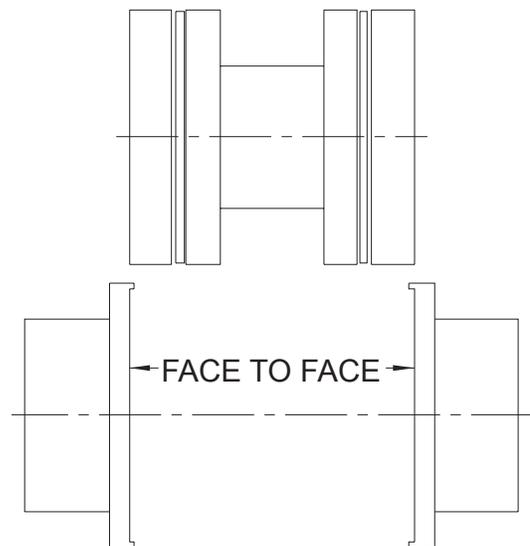


FIGURE 3



Installation Procedure (continued)**Shaft alignment**

Align the center lines of the driving and driven machine shafts as follows:

1. Move the equipment into position.
2. Check for any soft foot and correct before commencing alignment.
3. With one machine firmly bolted down, set the distance between shaft ends (DBSE) according to the drawing or catalog dimension.

IMPORTANT DBSE should be measured between the inner face of the hubs and should not be taken as the length of the transmission unit at its outer periphery. DBSE may not be equal to the precise distance between shaft ends. In particular, the faces of tape-bored hubs may not be flush with the shaft end.

4. Align the shaft center lines both horizontally and vertically, ideally using the shafts. However, if access prohibits this, then align using the hub bosses or flanges. John Crane recommends the reverse-periphery method for accurate alignment. This can be done using dial gauges or with a laser shaft alignment kit. Further details on recommended laser alignment vendors are available from John Crane on request.
5. Recheck the DBSE after the shafts have been aligned.
6. Axial shims (together with a shim carrier in some cases) may be supplied on applications where it is difficult to accurately set a predetermined shaft end separation (DBSE). This is often the case where one or both of the hubs are taper bored. Where this feature is supplied, the thickness of shims (plus carrier, if applicable) are added to the free length of the transmission unit so that the combined length is equal to the measured distance between the hub flange faces, making any allowance for known shaft movements.

NOTE: *It is best to measure the transmission unit when it is in a gagged condition.*

IMPORTANT The misalignment tolerances quoted in literature and on drawings allow for dynamic conditions and variations. For the best service from the coupling, John Crane recommends that installed misalignment is no more than 10% of the maximum allowable misalignment, with allowance being made for any anticipated movements which will occur during operation (e.g., thermal movements on hot pumps).

Installing transmission unit

1. Identify the driving and driven end of the transmission unit (if suitably marked) while removing the gagging screws and gagging sleeves (painted red for identification). Reinstall the gagging screws and compress (by tightening screws) each disc unit assembly by equal amounts until the overall length of the transmission unit is less than the hub flange separation, thus enabling the transmission unit to be inserted between hubs.

IMPORTANT Compress both ends equally; do not over-compress.

NOTE: *Short shaft separations do not permit the use of gagging screws on some sizes. For these applications, compression of the transmission unit is possible by hand for all small sizes and using clamps or similar tools for large units. Screwdriver slots are provided for prying the unit during installation.*

2. Check that all pilots and recesses are free of burrs. Bring the compressed transmission unit into position between the hubs, making sure to align any match marks. Loosely install one hub bolt at each end to help align bolt holes later.
3. Gradually remove gagging screws insuring that pilots and recesses are engaged parallel and square to the flange faces. Insert hub bolts and tighten to the torque values given in Table 1. In many cases, hub bolts are also used as gagging screws and must be reinserted as hub bolts.

IMPORTANT Do not tighten hub bolts with gagging screws installed.

4. With the coupling bolted in position, check that the "as-fitted" concentricities correspond with those achieved during alignment.

Tightening torques

The bolts are supplied pre-lubricated and no further lubricant should be applied. Table 1 below gives figures for normal use. Occasionally, for particular duties the figure may vary and, in such cases, the required torque values will be quoted on the assembly drawing(s) supplied with the coupling.

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TABLE 1. Torque - Ft. Lbs. (Nm)

Coupling Size	Standard Hub	Large Hub
0300	20 (27)	60 (81)
0500	40 (54)	95 (129)
0750	60 (81)	150 (203)
1050	95 (129)	150 (203)
1400	150 (203)	—
1500	150 (203)	270 (366)
1850	270 (366)	—
2000	150 (203)	95 (129)
2600	270 (366)	95 (129)
3000	370 (502)	—
3350	95 (129)	150 (203)
4200	370 (502)	—
4250	150 (203)	150 (203)
6000	560 (759)	—
6010	150 (203)	270 (366)
8500	270 (366)	270 (366)
9009	370 (502)	—
9012	370 (502)	—
9013	270 (366)	430 (583)
9015	560 (759)	—
9017	430 (583)	270 (366)
9021	270 (366)	430 (583)
9022	800 (1085)	—
9036	430 (583)	645 (875)
9049	645 (875)	—

Removal of Transmission Unit

Remove the hub bolts from each end of the coupling. Using the gagging screws (or hub bolts), install and compress (by tightening screws) each disc unit assembly by equal amounts until the transmission can be removed from between the hubs. If necessary, 'crack' the pilot fits using the hub bolts threaded into the tapped holes of each hub flange.

Maintenance and Inspection

- Under normal operating conditions, no servicing or maintenance should be necessary. Periodically, the bolts should be checked for tightness and the discs checked for any visible signs of distress. If the hubs or shafts have been disturbed for any reason, alignment must be checked. Any dismantling or remedial work on the disc units will invalidate the dynamic balance.
- In the event of failure it is essential that the root cause of failure is found and corrected before a new unit is put into service. The most likely faults will be excessive misalignment, extreme overload or a combination of both.
- It is recommended that all self-locking fasteners be replaced after 10 usages.



All rotating power transmission products are potentially dangerous. They should be used according to the manufacturer's recommendations and appropriate safety standards. It is the responsibility of the user to comply with any such standards.

T SERIES METAL MEMBRANE COUPLING

Installation Instructions

This section refers to couplings that bear the CE and ATEX required markings:

CE / ATEX Marking

All couplings that comply with CE and ATEX legislation will be marked as shown. This will be etched on the spacer element of the transmission unit if enough room is available.

A) Ambient temperature is standard (40°C max)

CE  I M2_C  II 2GD_C T6 (T85°C)  SL1 4LU, UK. XX

Where John Crane's Metastream metal membrane couplings are required for use in higher ambient temperatures, John Crane UK Ltd certifies that the equipment complies with the temperature classification range listed below in Table 2, and in all other respects complies with the type certificates.

TABLE 2

Ambient Range Marking		Group II, Category 2 GD **	Group I, Category 2 M2	Marking Option
Min.	Max.			
Unknown		T3 (T200°C)	Not Applicable	B
-55°C <	Ta < 150°C	T3 (T200°C)	Not Applicable	B
-55°C <	Ta < 90°C	T4 (T135°C)	150°C	C
-55°C <	Ta < 55°C	T5 (T100°C)	150°C	C
-55°C <	Ta < 40°C	T6 (T85°C)	150°C	A

B) Ambient temperature is (-55°C < Ta < 150°C) OR ambient temperature is unspecified, the equipment is not suitable for mining applications, Group I, Category 2.

CE  II 2GD_C T3 (T200°C)  SL1 4LU, UK. XX

C) Ambient temperature is (-55°C < Ta < 90°C)

When the ambient temp. is specified, 'T3' is replaced by the following 'T' mark (**) according to Table 2.

CE  I M2_C  II 2GD_C **  SL1 4LU, UK. XX

NOTE:

'XX' is the year of manufacture and will change. For example, for year 2016; XX = 16.

CE and EX marks must meet requirements of Annex II in Reg. (EC) No. 765/2008 and Annex II in Dir. 84/47/EEC respectively.

Operation in aggressive atmospheres

The following components contain non-metallic materials. Confirm compatibility or provide suitable protection if the coupling is to operate in an aggressive atmosphere.

- The hub electrical insulation (if supplied option) – reinforced thermosetting plastic
- Limited end float bearings (if supplied option) – PTFE based plastic

Temperature classification of John Crane's Metastream couplings

John Crane's Metastream metal membrane couplings, supplied in conformance with Directive 2014/34/EU, have to meet the classifications specified in Table 2 when used in accordance with instructions and information supplied.

T, L and H series couplings, using the disk type flexible elements, are covered by type examination certificate **Sira 02ATEX9403**.

M series couplings, using the diaphragm type flexible elements, are covered by type examination certificate **Sira 02ATEX9404**.



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Declaration of Conformity

EEC Directive 2014/34/EU of 26.02.2014
and resultant legislation and standards

We, the manufacturers – John Crane UK Ltd, – confirm that the explosion prevention requirements have been implemented for

Metastream® metal-membrane couplings

Equipment complies with the requirements of directive 2014/34/EU. It is in accordance with article 13. (a) of the directive and the fundamental Health and Safety requirements of Annex II, are fulfilled.

The current Type Examination Certificates for the couplings are:-

'T', 'L' & 'H' Series -	Sira 02ATEX9403
'M' Series -	Sira 02ATEX9404

The technical documentation is deposited with the designated notified body in accordance with article 13 (b) (ii) of the Directive 2014/34/EU.

SIRA Certification Services
Unit 6, Hawarden Industrial Park
Hawarden, Chester, CH5 3US
United Kingdom

Signed:

Date: 20th July 2016

S. Pennington
(Engineering Manager - Couplings)



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Declaration of Incorporation

E.C. Machinery Directive (2006/42/EC)

Section 1.0 - Machinery Description:
Flexible Power Transmission Ring and Diaphragm Form Membrane Couplings
Types:

'H', 'T', 'L' & 'M' Series

Section 2.0 - Applicable Harmonised Standards
ISO13709 (API 610) for centrifugal pumps
ISO14691 couplings for - General-purpose applications
ISO10441 (API 671) (opt) couplings for - Special-purpose applications

Section 3.0 - Declaration:
We, John Crane declare that under our sole responsibility for the supply of the machinery defined in Section 1.0 above, the said machinery parts are intended to be incorporated into other machinery or assembled with other machinery to constitute machinery as covered by this Directive.

The machinery parts, covered by this declaration must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Directive.

Signed:

Date: 20th July 2016

S. Pennington
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If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.