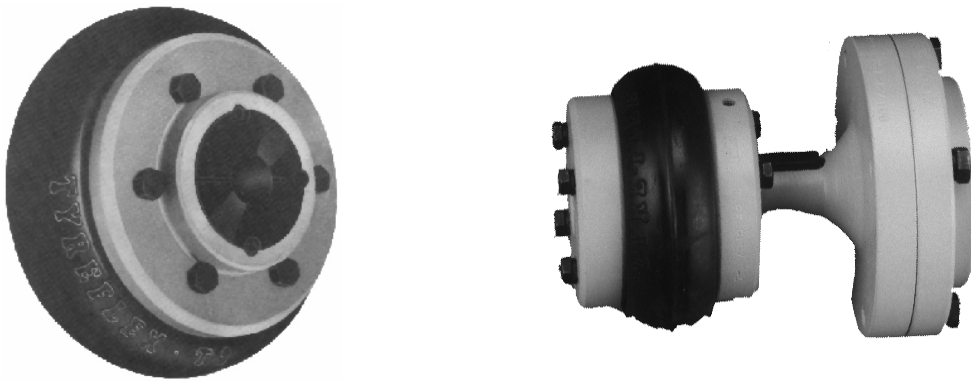


INSTALLATION INSTRUCTIONS

TYRE-FLEX COUPLING



**RATHI TRANSPOWER PVT. LTD.
PUNE - INDIA**

Amendments

Doc No: R-II-T-01/01-12/09AMD

REV. 1

Date: 25th DEC 2009

Sr.No.	Description	Old NO.	Rev. NO.	Nature of change	Effective Date
1					

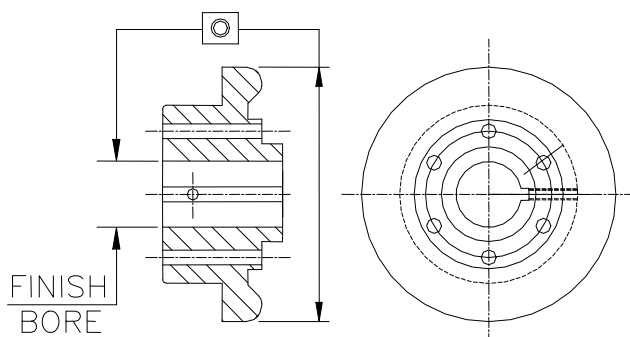
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INSTALLATION & ASSEMBLY INSTRUCTIONS

(1) BEFORE INSTALLATION

- a. After removing the coupling from packing, thoroughly inspect to ensure that they is/are as ordered & there no is transit damage or loss.
- b. Remove protective coating/lubricant from bores & keyways. Remove all the bolts & nuts and dismantle the assembly.
- c. Follow instruction given, if couplings are pilot bored. (Fig. 1)



(Fig. 1)

(2) MOUNTING PROCEDURE

Mount hubs/adapters (*) on their respective shafts with keys such that the shaft ends are flush with inner face of the adapter & tighten the set screw over the keys. Bring both the coupling hubs/adapters (along with equipments) closer so as to maintain gap 'M' as shown in fig. 2. In case of spacer type couplings, the gap 'M' is equal to the spacer length (spacer length is normally equal to the distance between shaft ends of the equipments). Refer fig. 3 Refer Dimension 'M' given in table A1 & A2 respectively.

- * FLANGE - Tyre-flex flange
- * ADAPTER - Used in RST or TS coupling

For normal applications the shaft ends should be flush with inner face of flange/adapter. They can protrude beyond the clamping ring of flange/adapter or remain inside if required but sufficient gap should be allowed to take care of end float of both shafts (i.e. axial misalignment). Refer fig. 2

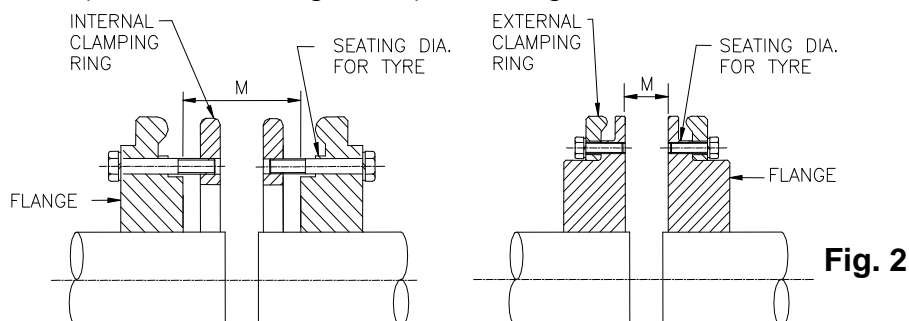


Fig. 2

Ensure that the effective length of key is sufficient for transmission of rated torque of Coupling.

(3) ALIGNMENT PROCEDURE

Alignment procedure is given separately for each type of alignment for simplicity. However combination of all 3 types of misalignments may be present at the same time.

(I) CHECKING PARALLEL ALIGNMENT

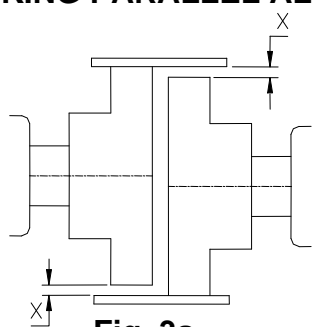


Fig. 3a

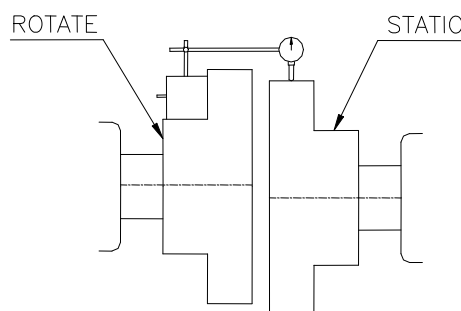


Fig. 3b

- ◆ **Using straight edge (fig 3a):** Align straight edge on OD of one flange, measure gap 'X' at 4 places 90° apart without rotating shafts. Gap 'X' should be less than the allowable initial parallel misalignment (P) mentioned in Table 'A1'.
- ◆ **Using dial gauge (fig 3b):** Fix dial gauge on hub OD of one of the halves & set plunger on the flange OD of another half. Rotate the coupling slowly to one complete revolution by taking dial gauge reading at 4 places 90° apart. The parallel misalignment is half of the Total Indicated Reading (TIR) of dial gauge which is equal to value of 'P' given in Table 'C1'.
- ◆ Follow the same procedure in case of spacer coupling as shown in fig. 3c.

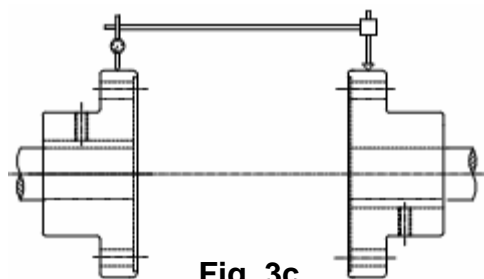
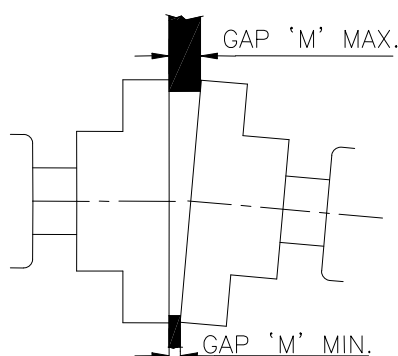
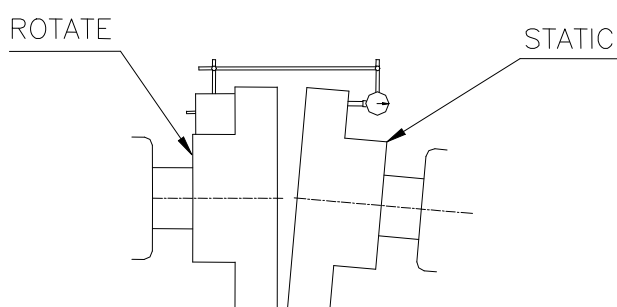


Fig. 3c

(II) CHECKING ANGULAR ALIGNMENT



(fig. 4a)

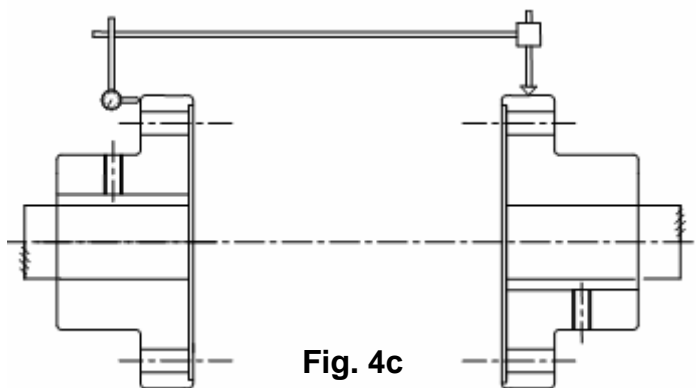


(fig. 4b)

- ◆ **Using straight edge (fig 4a):** Measure gap 'M' at 4 places 90° apart without rotating shafts. (Refer fig. 4a) The difference in max. & min. gap will be the Total

Indicated Reading (TIR), which will be the angular misalignment present (Refer table 'A1' for allowable TIR values in mm).

- ◆ **Using dial gauge (fig 4b):** Fix the dial gauge on flange OD on one of the halve & set plunger on the face of another half as shown (Refer fig. 4b). Rotate the coupling slowly to one complete revolution by taking dial readings at 4 intervals 90° apart. The Total Indicated Reading (TIR) will be the angular misalignment (Refer table 'A1').
- ◆ Follow the same procedure in case of spacer coupling as shown in fig. 4c.



III) CHECKING AXIAL MISALIGNMENT (End-Float)

- ◆ Deviation from standard DBSE due to axial movement of shaft is defined as axial misalignment. (End float). [For normal applications if the shaft ends should be flushed with inner face of flange. In some special cases the shaft ends may protrude beyond the inner face of flange or may remain inside if required.]
- ◆ The distance between two faces of coupling halves is to be maintained as specified. The variation in this distance should not exceed the permissible initial axial misalignment given in table 'A1'.
- ◆ Repeat the all above steps until the required permissible initial misalignment limits are achieved. Tighten foundation / base frame bolts & ensure the tightening of set screws over keys.

IMPORTANT - The misalignment capabilities shown in drawings & product literature allow for dynamic conditions & variations. For optimum service from the coupling, the installation misalignment (initial misalignment) should not exceed 25% of the maximum allowable misalignment limits. Allowance should be made for any anticipated movements, which will occur during operation (e.g. thermal movements)

IMPORTANT: The necessity for shields & guards varies with individuals installations. The owner or user must provide the required safety guards. Safety guards or shields are not furnished by us with these equipments.

(4) Permissible Misalignment:

TABLE 'A1'

Sr. No.	COUP. SIZE	PERMISSIBLE INITIAL MISALIGNMENT				DIST. BETWEEN FLANGES * (Std. gap 'M')	
		PARALLEL/ RADIAL 'P' (mm)	AXIAL (mm)	ANGULAR		T	TO
				(degree)	Total Indicated Reading (TIR)		
1	T-4	0.275	± 0.32	0.5°	0.7	21	-
2	T-5	0.325	± 0.42	0.5°	0.87	25	-
3	T-6	0.4	± 0.5	0.5°	1.09	30	-
4	T-7 / TO-7	0.475	± 0.58	0.5°	1.25	42	16
5	T-8 / TO-8	0.525	± 0.65	0.5°	1.45	44	21
6	T-9 / TO-9	0.6	± 0.75	0.5°	1.64	49	24
7	T-10 / TO-10	0.65	± 0.82	0.75°	2.82	54	20
8	T-11 / TO-11	0.725	± 0.92	0.75°	3.05	51	21
9	T-12 / TO-12	0.8	± 1.0	0.75°	3.45	54	25
10	TO-14	0.925	± 1.15	0.75°	4.07	-	22
11	TO-16	1.05	± 1.32	1°	6.02	-	8
12	TO-18	1.2	± 1.5	1°	6.95	-	22
13	TO-20	1.325	± 1.65	1°	7.48	-	30
14	TO-22	1.45	± 1.81	1°	8.27	-	27
15	TO-23	1.65	± 2.06	1°	9.28	-	30

* Gap 'M' in the above table is when angular & axial misalignments are zero.

Note: For permissible maximum misalignments, refer table 'A2'.

TABLE 'A2'

Sr. No.	COUP. SIZE	PERMISSIBLE MAXIMUM MISALIGNMENT				DIST. BETWEEN FLANGES	
		PARALLEL / RADIAL 'P' mm	AXIAL (mm)	ANGULAR		* (Std. gap 'M')	
				(degree)	Total Indicated Reading (TIR	T	TO
1	T-4	1.1	± 1.3	2°	2.86	21	-
2	T-5	1.3	± 1.7	2°	3.49	25	-
3	T-6	1.6	± 2.0	2°	4.36	30	-
4	T-7	1.9	± 2.3	2°	5.03	42	16
5	T-8	2.1	± 2.6	2°	5.83	44	21
6	T-9	2.4	± 3.0	2°	6.56	49	24
7	T-10	2.6	± 3.3	3°	11.32	54	20
8	T-11	2.9	± 3.7	3°	12.20	51	21
9	T-12	3.2	± 4.0	3°	13.84	54	25
10	T-14	3.7	± 4.6	3°	16.30	-	22
11	T-16	4.2	± 5.3	4°	24.10	-	8
12	T-18	4.8	± 6.0	4°	27.80	-	22
13	TO-20	5.3	± 6.6	4°	29.92	-	30
14	TO-22	5.8	± 7.25	4°	33.06	-	27
15	TO-23	6.6	± 8.25	4°	37.11	-	30

* Gap 'M' in the above table is when angular & axial misalignments are zero.

Important: At the time of installation, INITIAL misalignments should not exceed 25% of the permissible maximum misalignments.

Note: For permissible initial misalignments, refer table 'A1'.

(5) ASSEMBLY PROCEDURE

After ensuring that the equipments are aligned properly, follow the instructions as given below for assembly of couplings.

FOR T/TO-F/H

Open Tyre and fit it over the T/TO-F/H flanges ensuring that the Tyre beads are properly inserted between the T/TO-F/H flanges & the internal/external rings. It may be necessary to strike the outside diameter (i.e. circumference) of Tyre with a small mallet. When seated there should be a gap 'E' between the Tyre ends. Tighten clamping ring screws evenly (half turn a time) working round each flanges until the required screw torque is achieved. Refer table B for gap E and clamping screw tightening torque.

FOR RST

Clamp one clamping ring to T/TO flange mounted on shaft. Then insert the flange mounted RST shaft assembly (along with clamping ring) between RST adapter & T/TO flange and bolt it to the RST adapter. Fit the 'T' element as per above instructions. (Refer fig. 5)

FOR TS

Clamp one clamping ring to each T/TO to flange. Then insert them in between two adapters and bolt it to TS adapter as shown in fig. 6. Fit the 'T' element as per above instructions.

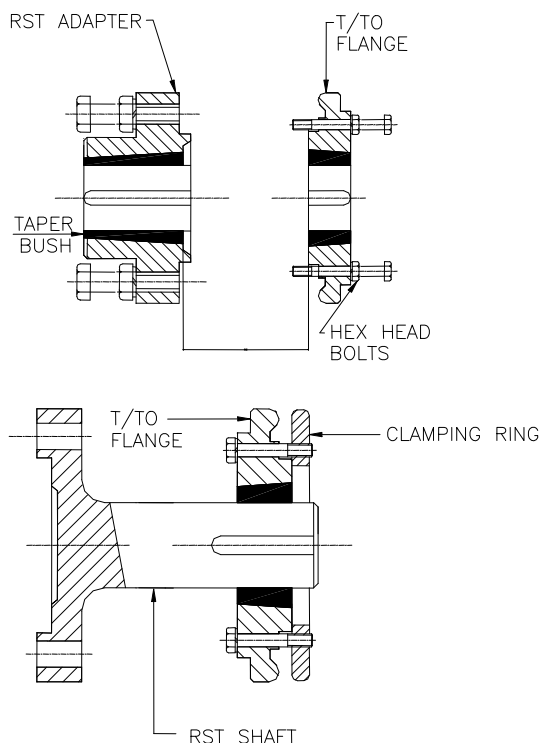


Fig. 5

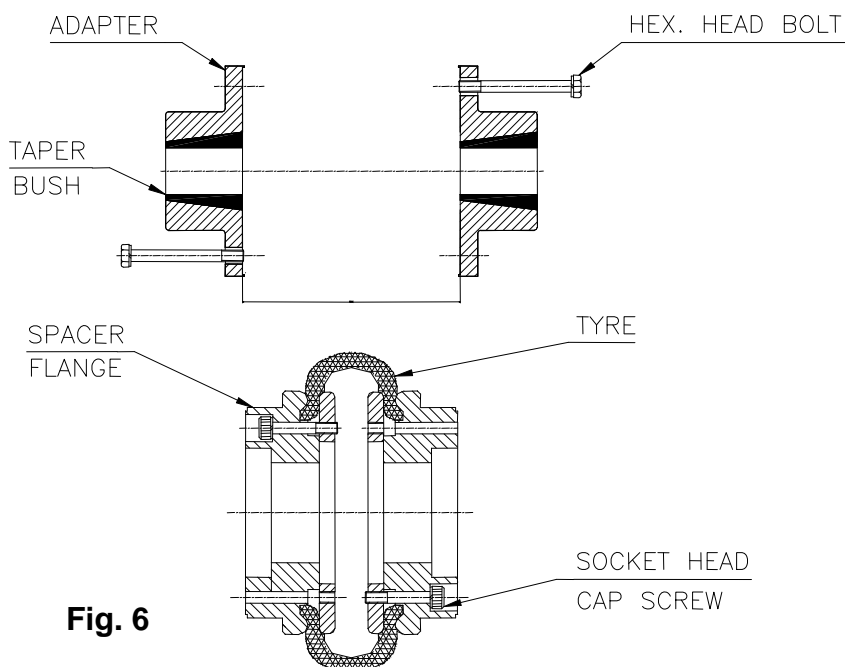


Fig. 6

IMPORTANT: If the supplied coupling is dynamically balanced, ensure that the match marks (e.g. nos., alphabets) are in straight line & unidirectional before bolting the spacer assy. with both the adapters. It is applicable to non-spacer couplings where match marks on hubs / adapters have to be matched.
The necessity of shields and guards varies with individual installations. The owner or user must provide the required safety guards. Safety guards or shields are not in our scope of supply.

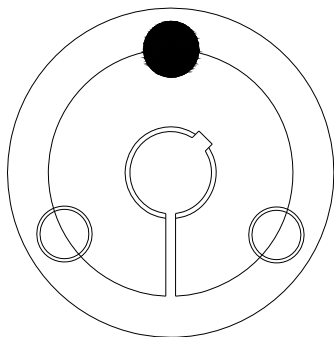
Use Loctite to prevent the loosening of threads, if required.

(6) RECOMMENDED TIGHTENING TORQUE

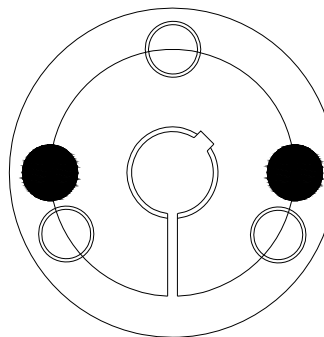
TABLE 'B'

SR NO	COUPLING SIZE	BOLT SIZE	TIGHTENING TORQUE (Nm)	END GAP 'E' (mm)
1	T-4	M6 X 1P	15	3
2	T-5	M6 X 1P	15	3
3	T-6	M6 X 1P	15	3
4	T-7	M8 X 1.25P	24	3
5	T-8	M8 X 1.25P	24	3
6	T-9	M10 X 1.5P	40	3
7	T-10	M10 X 1.5P	40	3
8	T-11	M12 X 1.75P	40	3
9	T-12	M12 X 1.75P	50	3
10	T-14	M12 X 1.75P	55	3
11	T-16	M16 X 2P	80	3
12	T-18	M16 X 2P	105	3
13	T-20	M20 X 2.5P	120	3
14	T-22	M20 X 2.5P	165	3
15	T-25	M24 X 3P	165	3

(7) Installation & removal of Taper Bushes



Sizes - 1008 to 3030



Size - 3525 to 5050

A) TO ASSEMBLE

1. Clean and de-grease the bore and taper surfaces of the bush and the tapered bore of the flanges/adapters. Insert the bush in the coupling flanges/adapters and line up the holes (half thread holes must line up with half straight holes)
2. Lightly oil the grub screws (bush size 1008 to 3030) or the cap screws (bush size 3525 to 5050) and screw them loosely in holes threaded in flanges/adapter shown thus O in diagram, do not tighten yet.
3. Clean and de-grease the shaft. Fit the coupling flanges/adapter with taper bush on shaft and locate in desired position.
4. When using a key it should first be fitted in the shaft keyway. There should be a top clearance between the key and the keyway in the bore.
5. Using a hexagon socket wrench, gradually tighten the grub/cap screws in accordance with the torques as listed in the Table 'C' of screw tightening torques.
6. When the drive has been operating under load for half to one hour check and ensure that the screw are not loosened. If found loose take appropriate steps.

B) FOR REMOVAL

1. Slacken all screws. Remove one or two according to number of jacking off holes shown thus ● in the diagram. Insert these screws in jacking off holes.
2. Tighten screw(s) uniformly and alternately until the bush is loose in the flanges/adapters and coupling is free on the shaft.
3. Remove coupling assembly from the shaft.

TABLE 'C'

Taper Bush Size	Screw tightening Torque(Nm]	Screw	
		Size	Qty
1008 1108	5.6	1/4" BSW	2
1210 1215	20	3/8" BSW	2
1610 1615	20	3/8" BSW	2
2012 2017	31	7/16" BSW	2
2517 2525	48	1/2" BSW	2
3020 3030	90	5/8" BSW	2
3525 3535	112	1/2" BSW	3
4030 4040	170	5/8" BSW	3
4535 4545	192	3/4" BSW	3
5040 5050	270	7/8" BSW	3