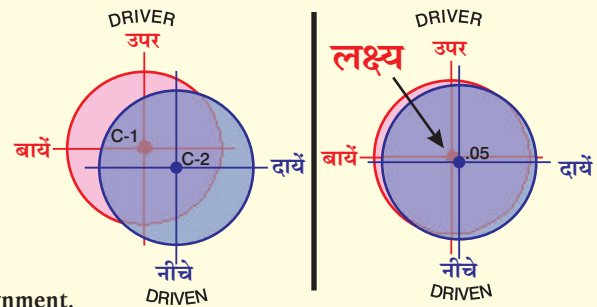


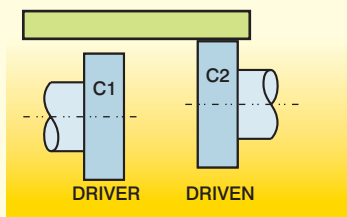
IMPROPER SHAFT ALIGNMENT

In rotating machines coupled to a prime – mover, improper Shaft Alignment contributes directly or indirectly to over 40% of failures of bearing, seals, spiders, couplings etc. This includes Pumps, Gearboxes, Compressors, Turbines, Generators. It is a tricky subject, most often not understood properly; hence avoided by technicians. Both the tool used and the technique employed is equally important. The technique can be learnt provided the proper tool is available. It is like DRIVING A CAR, you first need to have a good condition car, driving is a matter of training & practice.

Briefly we describe techniques used in Industry to do shaft Alignment.



1) STRAIGHT EDGE/HACKSAW BLADE (ABSOLUTELY CRUDE)



	RADIAL	AXIAL	RATING 1/10
Accuracy of method	0.2 to 0.5	0.2/0.5	
Alignment Required	0.05mm	0.05mm	
Cost	A few Rupees		

2) MAGNETIC VEE BLOCK + VERNIER : Radial Readings are taken by a Magnetic vee block, Axial by Vernier Ref. Fig 2.

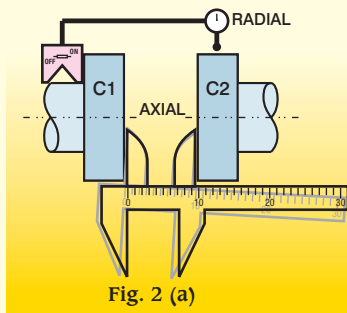


Fig. 2 (a)

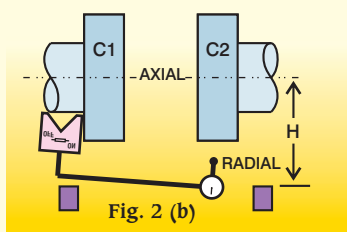


Fig. 2 (b)

- DIFFICULTY :**
- Requires minimum ground clearance 'H' of 150mm, not suitable for small motors.
 - Not suitable for couplings not having spacer. Only radial reading can be taken in this case. This includes Lovejoy, Pin-bush, Tyre etc.
 - Magnetic Vee Block can tilt at 180° due to weight. This gives a wrong Reading Ref. Fig. 2 (b). Sometimes the Vee block falls off. MAGNETIC VEEB BLOCK IS NOT SUPPOSED TO BE ROTATED. It is made for applications when magnetic vee block is fixed to a datum & job to be measured is moved /rotated.
 - Accuracy of Axial Reading depends on skill of operator. Ref. Fig.-2(a)

	RADIAL	AXIAL	RATING 4/10
Accuracy of method	0.3/0.4	0.2	
Alignment Required	0.05mm	0.05mm	
Cost	2,000 to 3,000 Rupees + cost of Vernier.		

3) FABRICATED CLAMPS :

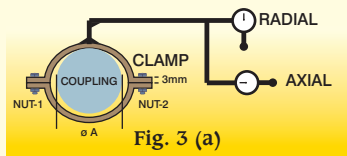


Fig. 3 (a)

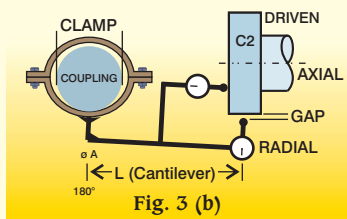


Fig. 3 (b)

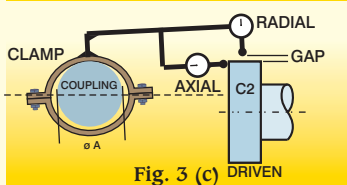


Fig. 3 (c)

A clamp is fabricated from a 2.0mm/3.0mm sheet Ref. Fig. 3

- DIFFICULTY:**
- You need a separate clamp for each type of Coupling. ØA is as per coupling hub. Storing and retrieving this clamps is a problem
 - Not suitable for couplings not having spacer. Only radial reading can be taken in this case. This includes Lovejoy, Pin-bush, Tyre etc.
 - RIGIDITY OF CLAMP IS VERY LOW. Gives high sag. This means a wrong Radial reading. Ref. Fig. 3 (b).
 - Repeatability of readings is low. Each time you tighten NUT-1 & NUT-2 reading changes Ref. Fig. 3 (c).

	RADIAL	AXIAL	RATING 6/10
Accuracy of method	0.1/0.2	0.1/0.2	
Alignment Required	0.05mm	0.05mm	
Cost	Eg.-1 Rupees 400 x 12 clamps = 4800 (A few hundred Rupees x number of clamps made)		

4) Aluminum Vee blocks with Studs & *Spirit levels Ref. Fig. 4

THIS GIVES EXCELLENT REPEATABILITY & ACCURACY. Fixture is rigid, versatile & precise. Suitable for non spacer couplings like Lovejoy, Pinshe, Tyre etc. by using additional vee block

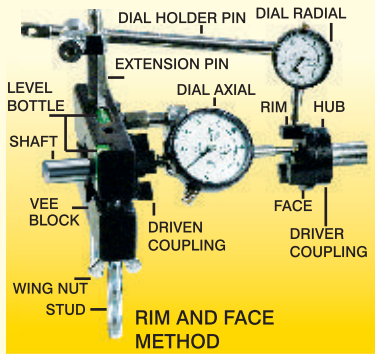


Fig. 4

	RADIAL	AXIAL	RATING 9/10
Accuracy of method	0.05	0.05	<div style="width: 90%; background-color: #90EE90; border: 1px solid black;"></div>
Alignment Required	0.05mm	0.05mm	<div style="width: 10%; background-color: #FF0000; border: 1px solid black;"></div>

Cost 4,000 to 8,000 **लेकीन पैसा वसूल**

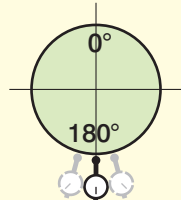


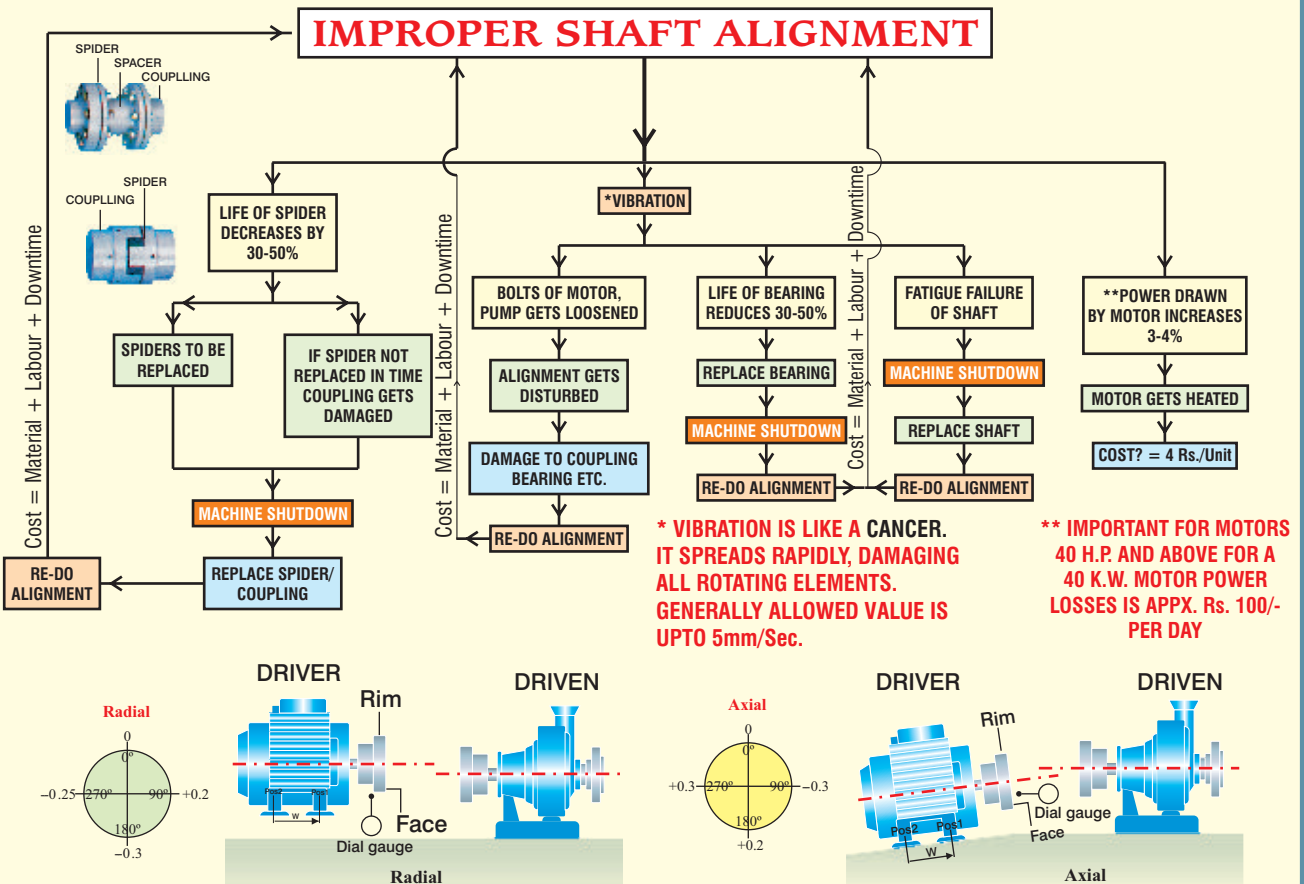
Fig. 4 (b)

* Spirit levels facilitates measuring 90°, 180°, 270° reading precisely, since in a round object measuring at 180° or at 170° or at 185° mens different readings. Ref. Fig. 4 (b) THIS FEATURE IS UNIQUE TO THIS CLAMP

** You can use digital dials instead of analogue. This makes the procedure very easy. Cost of digital dials is appx. Rupees 6000 each

5) LASER ALIGNMENT: There are no dials, you only need to rotate 0-180° & all readings are available on digital output screen, very accurate, very precise, very costly

	RADIAL	AXIAL	RATING 10/10
Accuracy of method	0.01	0.01	<div style="width: 100%; background-color: #90EE90; border: 1px solid black;"></div>
Alignment Required	0.05mm	0.05mm	<div style="width: 100%; background-color: #90EE90; border: 1px solid black;"></div>
Cost	A few Lakhs		



At the heart of a rotating machine having couplings is Alignment. The savings which accrue by doing proper alignment is beyond your imagination.

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