

## Limitations in Vertical Adjustments

*MTBM = Machine To Be Moved*  
*STAT = Stationary machine*

*Can't lower MTBM and can't move STAT?*

This note will help you obtain the best alignment possible when the MTBM cannot be lowered, or the STAT cannot be raised or lowered. Depending upon the geometry of the equipment, the type of misalignment, and the suggested Opt-align feet corrections, either offset or angularity can be corrected.

- 1) VO and VA are negative. Offset can be corrected, and angularity reduced or corrected.
- 2) VO and VA are positive. Angularity can be corrected and offset reduced or corrected.

### Overview

Take alignment readings in the usual manner using the alignment recording form. Record feet corrections and coupling results. If vertical misalignment exists, and insufficient shims prevent lowering the MTBM, compensatory targets can be calculated and entered in the Optalign which will calculate and display new shimming values to improve vertical alignment.

### Note

This procedure should be used only when there is not sufficient time to correct the source of the limitations. Arrangements should be made to correct any problems if acceptable alignment is not obtainable.

**LUDECA, INC.**  
1425 NW 88th Avenue  
Miami, FL 33172

Phone: (305) 591-8935  
Fax: (305) 591-1537

Dimensions are defined in the sketch for use in the calculations.

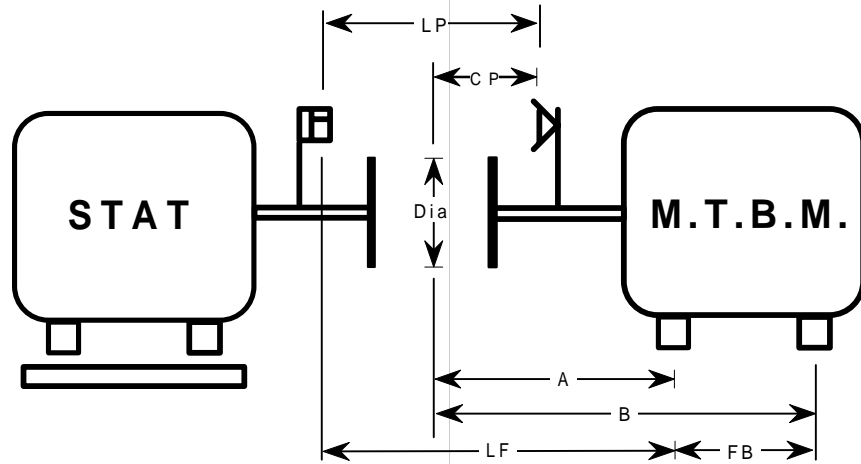
LP = Laser-to-prism  
 LF = Laser-to-front foot  
 FB = Front-to-back foot  
 CP = Coupling-center-to prism  
 DIA = Coupling diameter

A = Coupling-center to-front-foot  
 $A = LF - LP + CP$   
 B = Coupling-center to-back-foot  
 $B = A + FB$

Optalign Results  
 VO = Vertical Offset  
 HO = Horizontal Offset  
 VA = Vertical Angularity  
 HA = Horizontal Angularity  
 VF = Front Foot shimming  
 VB = Back Foot shimming

Optalign Targets  
 VOt = Vertical Offset target  
 HOt = Horizontal Offset target  
 VA<sub>t</sub> = Vertical Angularity target  
 HA<sub>t</sub> = Horizontal Angularity target

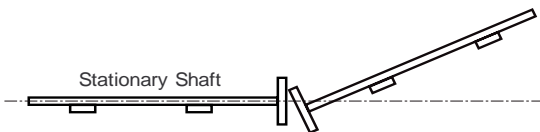
$-VA_{max}$  = Maximum negative allowable vertical angularity



### Alignment Procedure

- 1) **ON**, **/**, **ENT**
- 2) Enter machine dimensions.
- 3) Zero system at 12 o'clock.
- 4) Take alignment readings.
- 5) **RUN**, record feet corrections.
- 6) **EQ**, enter coupling center to prism distance, **ENT**
- 7) Enter 10" DIA. **1**, **0**, **ENT**
- 8) **RCL**, **RCL**, **RCL**
- 9) Record coupling results (VO, HO, VA, HA).

### Case 1: VO & VA Negative



Optalign suggested back foot correction (VB) must be negative.

Set Optalign Targets

- 10) **EQ**, **ENT**, **ENT**
- a) Enter VOt = Maximum (positive) allowable offset, **ENT**

- b) Enter HOt = 0 **0**, **ENT**
- c) Enter VA<sub>t</sub> =  $(10 \times (VB + VOt)) \div B$ , (remember VB is negative) **ENT**
- d) Enter HA<sub>t</sub> = 0 **0**, **ENT**
- e) **RUN**, front shimming will display the optimum shimming value.

VF = optimum      VB = 0

Make suggested shimming and re-check alignment. If VA is still too large, increase VOt and repeat steps "a" to "e".

### Example 1:

LP = 5"      LF = 11"  
 FB = 12"      CP = 2"  
 DIA = 10"

Optalign Results:

VO = -6.5      VF = 0  
 VA = -8.5      VB = -10

If 1800 RPM

$A = 11 - 5 + 2 = 8$   
 $B = 8 + 12 = 20$

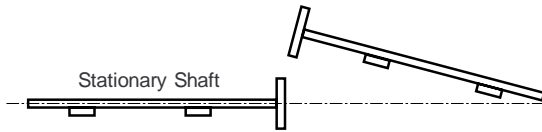
Maximum allowable offset = 2

$VA_t = -10 \times (-10+2) \div 20 = -4.0$

- a) VOt = 2.      **2**, **ENT**
- b) HOt = 0.      **0**, **ENT**
- c) VA<sub>t</sub> = -4.      **-4.0**, **ENT**
- d) HA<sub>t</sub> = 0.      **0**, **ENT**

e) **RUN**, Optalign will display  
 VF = 5      VB = 0

## Case 2: VO & VA Positive



Optalign suggested front foot correction (VF) must be negative.

Determine maximum negative gap allowed for DIA = 10", ( $-VA_{max}$ )

Calculate  $VOt = ((-VA_{max} \div 10) \times A) - (VF)$ . Proceed to 2.1 if VOt is positive. Skip to 2.2 if VOt is negative.

### 2.1 If VOt calculated is positive

Enter Optalign Targets

10) , **ENT** , **ENT**

a) Enter VOt = value calculated above, **ENT**

b) Enter HOt = 0 **0** , **ENT**

c) Enter VAAt =  $-VA_{max}$  , **ENT**

d) Enter HAAt = 0 **0** , **ENT**

e) **RUN** , VB will display optimum shimming value

VF = 0      VB = optimum

f) Make corrections, recheck alignment.

### Example 2:

LP = 5"      LF = 11"

FB = 12"      PC = 2"

DIA = 10"

#### Optalign Results:

VO = 8.5      VF = -5

VA = 4.0      VB = 0

If 1800 RPM

$A = 11 - 5 + 2 = 8$

Maximum allowable angularity = -3.0

$VOt = -3.0 \div 10 \times 8 - (-5) = -2.4 + 5 = 2.6$

a) VOt = 2.5      **2.5, ENT**

b) HOt = 0      **0, ENT**

c) VAAt = -3.0      **-3, ENT**

d) HAAt = 0      **0, ENT**

e) **RUN**, Optalign will display

VF = 0      VB = 8.5

### 2.2 If VOt calculated is negative

If VOt calculated is negative, further improvement can be made. It means the angularity target chosen is too big and offset target can be set to 0 or  $VO_{max}$ .

Enter Optalign Targets

10) , **ENT** , **ENT**

a) Enter VOt = 0 **0** , **ENT**

b) Enter HOt = 0 **0** , **ENT**

c) Enter VAAt =  $10 \times VF \div A$ , **ENT** (remember VF is negative)

d) Enter HAAt = 0 **0** , **ENT**

e) **RUN** , back shim will display optimum shimming value.

VF = 0      VB = optimum

f) Make corrections, recheck alignment.