EDWIN LOWE LTD, BIRMINGHAM, UK.

WORKING NOTES ON SHAFT END FLOAT - WHEN USING BALL BEARING CARTRIDGES IN WELDED STEEL BELT CONVEYOR ROLLERS

SHAFT END FLOAT

Shaft end float is defined as the amount of free axial movement between the roller shaft and the roller tube – of a fully assembled and welded steel roller. This is a critical roller dimension, which must be very tightly controlled - in order to avoid possible damage to the roller, under operational conditions upon the conveyor belt.

BEARING HOUSING ASSEMBLY – DEPTH DIMENSION

The bearing housing assembly cartridge depth dimension – measured from the underside of bearing housing flange to the bottom inside bore of the steel bearing housing – is shown as dimension 'G' - upon our standard cartridge drawing.

SKETCH OF BALL BEARING CARTRIDGE BASED ROLLER – RECESSED WELD STYLE ***

1. Tube dimension 'T' is the linear dimension between the back faces of the opposing rebates machined within the roller tube inside diameter / bore.

2. Shaft dimension 'S' is the linear dimension between the opposing shoulders upon the shaft.

CALCULATING TUBE DIMENSION 'T' AND SHAFT DIMENSION 'S' – ROLLER SHAFT SHOULDER

1. Tube dimension 'T' would basically be dictated by the required roller face length, and by the amount of machined weld recess / rebate required within the tube inside diameter / bore necessary to accommodate the steel thickness of the bearing housing flange and of the required internal seam weld.

2. Shaft dimension 'S' would subsequently be dictated by the relationship between tube dimension 'T' and cartridge assembly depth 'G', as well as the required degree of roller shaft end float.

For example – assuming a shaft end float dimension of 1.00 mm / 0.040":

'S' = 'T' – minus (2 x cartridge depth G) + shaft end float dimension

= 'T' – minus (2 x cartridge depth G) + 1.00 mm / 0.040"

As stated - this example presupposes a maximum roller Shaft End Float dimension of 1.00 mm / 0.040". Where a reduced shaft end float dimension is required, then obviously this figure will change.

*** **SHAFT END FLOAT - BUTT WELDED STYLE**

Not shown in the sketch - but obviously this dimension - for the butt welded style roller - would be the linear dimension between the opposing outside prepared faces of the cut and faced roller tube.

ADDITIONAL COMMENTS - ROLLER SHAFT END FLOAT IN GENERAL

1. Generally speaking most big end users, of cartridge based rollers, prefer absolute minimum shaft end float - to minimise the "hammering" effect of either the shaft shoulder or equivalent circlip against the back face of the bearing inner race, within the cartridge, during operation of the conveyor. This is to minimise the risk of any peening effect (creating flat points) on the balls within the bearing races.

2. Therefore the smaller the shaft end float dimension, the lower the impact effect of such shaft movement upon the balls themselves.

3. However - shaft end float **cannot be set at zero** - it must be set at a positive dimension - i.e. a definite positive clearance between the shaft shoulder / circlip and the back face of the bearing inner race – within the finished welded roller.

   If this is not the case - then there is the follow on risk that heat expansion, etc of the shaft may physically create undesirable preload on the bearings within the ball race - leading to possible premature roller failure.

   Actual acceptable shaft end float dimensions and tolerances will obviously depend upon the customer concerned and the market application. However it is worth noting that some of our cartridge customers have regularly achieved shaft end float of 0.50 mm / 0.020" or even better in many cases.

4. In summary therefore - on the design front, the ideal is to aim for a positive shaft end float - but to keep this dimension as small as possible.

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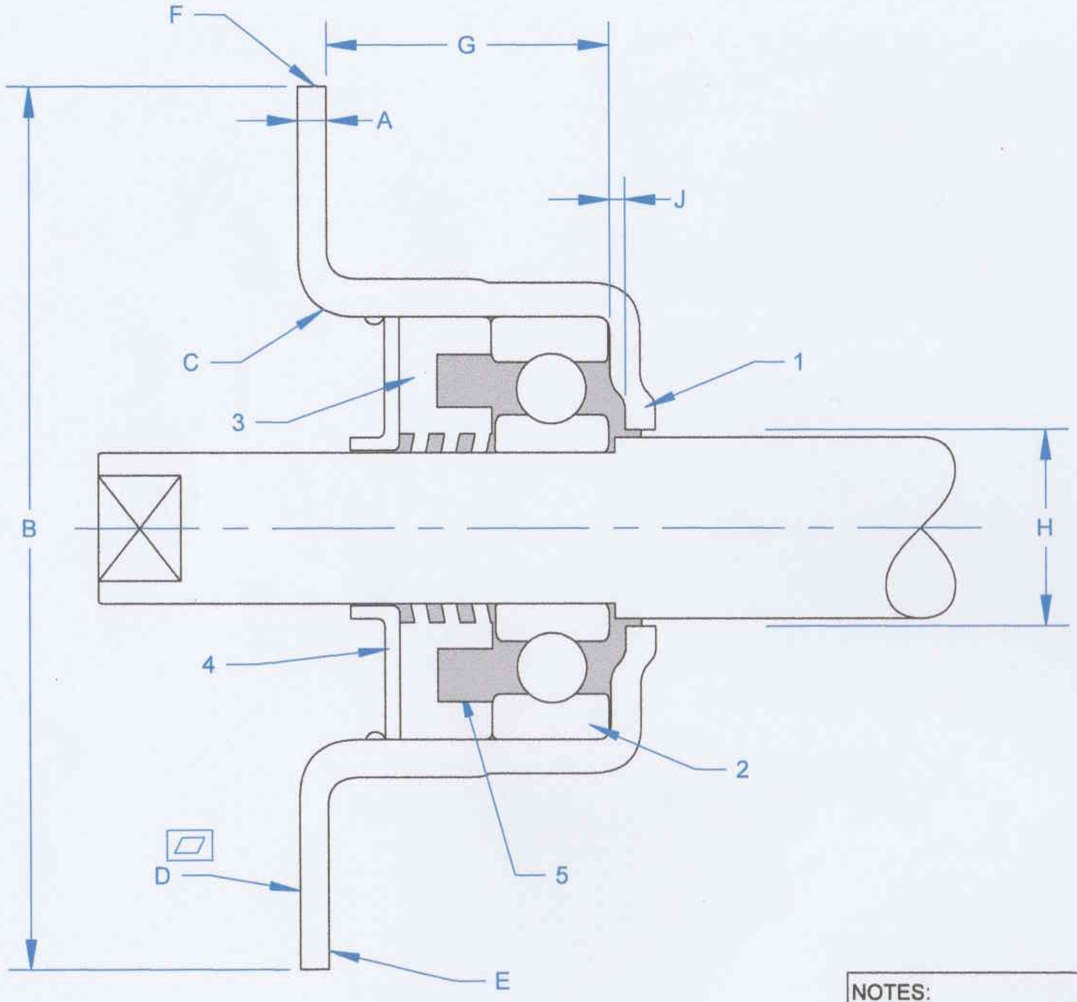
05.03.14



CODE	DESCRIPTION	DIMENSIONS mm	DIMENSIONS inches
A	MATERIAL THICKNESS		
B	FLANGE DIAMETER		
C	RADIUS FLANGE FACE / BORE / ID		
D	FLANGE FLATNESS		
E	FLANGE CONCENTRICITY-V-CENTRAL AXIS		
F	FLANGE EDGE CONCENTRICITY -V- CENTRAL AXIS		
G	INTERNAL DEPTH		
H	PIERCED HOLE DIAMETER		
J	BEARING CLEARANCE GAP		

1	PRESSED STEEL BEARING HOUSING	
2	DEEP GROOVE BALL BEARING	
3	POLYURETHANE MULTI-LIP SHAFT SEAL	
4	PRESSED STEEL ASSEMBLY RETAINING WASHER	
5	GREASE	

REVISION	DATE	DETAILS
1	07/08/13	1st Issue.

NOTES:

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ALL DIMENSIONS IN MILLEMETERS

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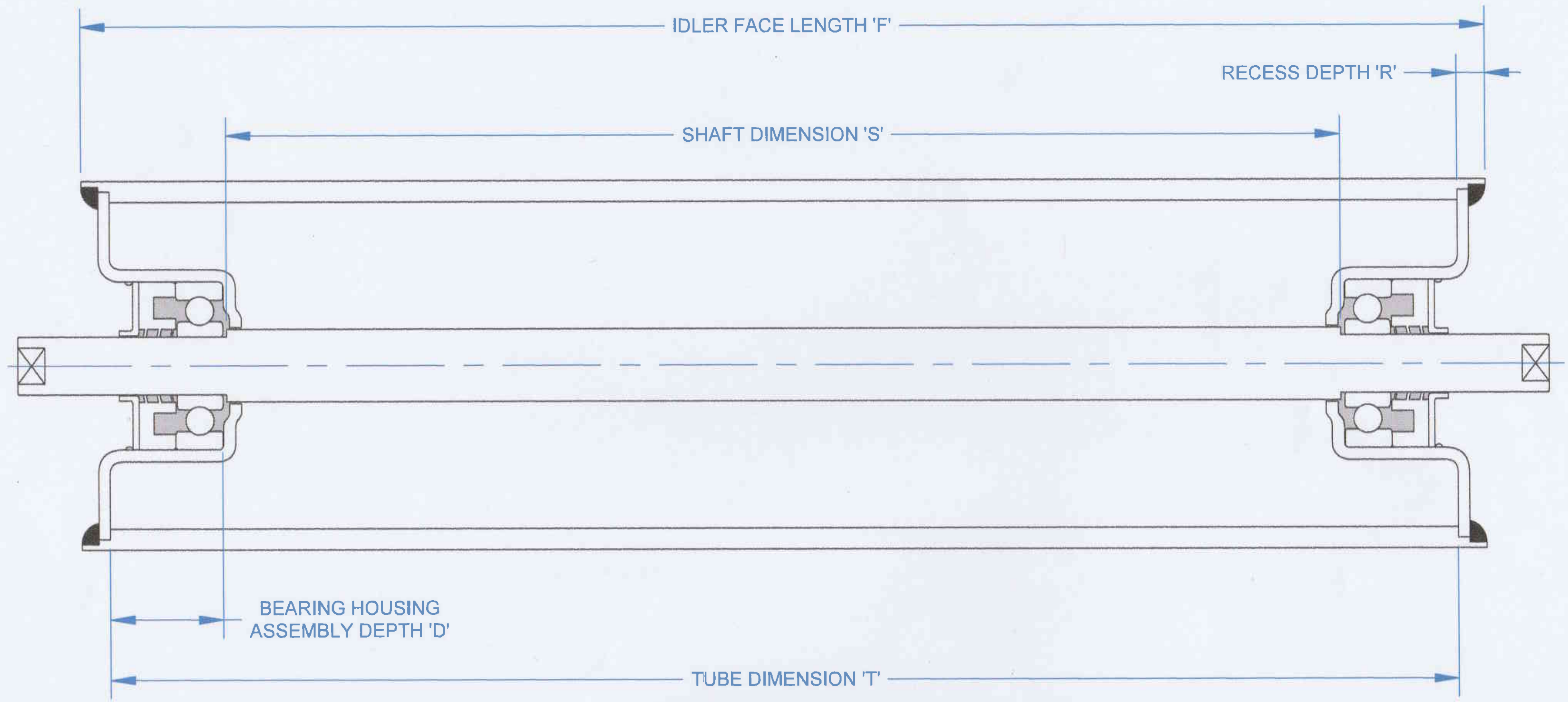
TITLE:
GENERAL OUTLINE - BEARING HOUSING ASSEMBLY / CARTRIDGE

SIZE:	DRAWN BY:	DWG NO:	REV:
A4	JM	- -	1
NOT TO SCALE	DATE: 07/08/13	SHEET: 1 OF 1	

REVISION	DATE	DETAILS
1	15/07/13	1st Issue.



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TITLE:

IDLER - CALCULATION OF SHAFT END FLOAT

SIZE:	DRAWN BY:	DWG NO:	REV:
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