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Trip to MTI And Gleason In Connection with Stelco No-Twist Finishing Mill

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MORGAN CONSTRUCTION CO.
ROLLING MILL DEPT. MEMORANDUM

TO: As Noted
FROM: Maurice Knott
SUBJECT: Trip to MTI and Gleason in Connection with Stelco No-Twist Finishing Mill.

1. MTI (Darle Dudley, Neville Rieger, and Jorgen Lund)
   (a) The wooden model of the finishing mill was examined and photographed. These MTI men are going to make a judgment as to the amount of noise that will emanate from the stands and their supporting structure. Darle Dudley will shortly contact Norm Wilson.
   
   (b) Oil Film Whirl
   Lightly loaded oil film bearings (roll shafts of Stelco and Southwire) are subject to a vibration called oil film whirl. This is one of the reasons for Stelco's roll shafts being at 45° with the horizontal. A vertical shaft running idly is very subject to this trouble. The shafts at 45° are helped by the loading of the shaft weight.

   Our knowledge of this problem is only qualitative. MTI was asked for reading references. They say that they can calculate whether a particular shaft will whirl or not in less than a day's time.

   (c) Gear Lubrication
   The question of pressure level for the oil which will lubricate the high speed gears was raised. Darle Dudley's experience is that the pressure should not drop under 15 psi. Our nominal pressure should be such that in operation the pressure at the jets will not go under this value.

   (d) Gear Drawings
   The following gear drawings were left with Darle Dudley for his criticism.

   164523 Gear and pinion for 2 gear drive unit.
   164525 Shafts for 2 gear drive unit.
   164527 Roll pinions
   164575 Bevel gears - Stand #16 - Strands #2 and #4.
2. Gleason (Michael Fallon, Charles Wilson)

M. Fallon is the Gleason engineer handling the finishing mill bevel gears. He will recommend a tooth crowning that will result in good tooth contact under load.

(a) Information to M. Fallon
The purpose of the trip was to discuss the loading and deflections which will affect tooth contact. The other influence discussed was that of thermal expansion. We had estimated running temperatures for the shafts and housings.

Mr. Fallon has sufficient information for estimating the effect of deflections and bearing clearances. He has requested that we do more on running temperatures. This will be sent to him this week.

(b) V and H
"The V and H check is a practical way of accurately measuring the amount of relative displacement from the specified mounting position which the gears can withstand without causing load concentrations at the ends of the teeth." Gleason is going to study the gear unit and decide how much V and H to recommend. Then they will furnish the cutters to Indiana to produce this V and H. Apparently the tie between the cutter data and the V and H readings is not precise, and slight changes in cutter diameter may be required. Gleason will work this out with Indiana. This is their intention.

(c) Gear Drawings
Morgan drawing 164575, the bevel gears for stand #16, strands #2 and #4, was left with Mr. Fallon. He has already recommended that we request from Indiana the exact mounting distance for each gear and the backlash when so mounted, plus a tooth contact record for each pair. He also recommended that the Morgan engineer who will see the tooth contacts at Davy-United go to Indiana to see the tooth contacts first hand. He would also get a knowledge of what is probably wrong if the recorded contacts are not obtained.

(d) Mounting Procedure
At the gearing meeting of December 29th a mounting procedure was worked out. The driven bevels were to be shimmed to correct mounting dimension and the driving bevels were then to be shimmed to correct backlash. Mr. Fallon agreed that this is a good method when the driving bevel is the "gear" (large number) of the pair, but does not think it a good method when it
is the "pinion" (small member) of the pair. Specifically it is not a good method for stands #16 and #17. The small bevel needs to be precisely located and the backlash method is not a precise method, particularly on the small bevel.

Maurice Knott

MK!cac