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Trip to Indiana Gear; Review of NO-TWIST Bevel Gear Drawings

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MORGAN CONSTRUCTION CO.
ROLLING MILL DEPT. MEMORANDUM

TO: As Noted
FROM: R. Smola and M. Knott
SUBJECT: Trip to Indiana Gear
Review of NO-TWIST Bevel Gear Drawings

DATE: 17 July 1967

DISCUSSION

1. The drawing meeting was held with R. Feldmeyer, Head of Process Engineering, and Al Kornmann.

2. Drawings
   a. Forging Drawings
      Our forging drawing had read "Matl: Forged Stl. 9310 Annealed 221/269 BHN".

      With the turned forgings supplied by Morgan, Indiana Gear had trouble with excessive hole growth, with bending distortion in the integral shaft bevels, and with cracking. They believe that the following heat treatment will take care of these troubles.

      "Matl: Forged Stl. 9310 Normalized at 1750°F, 223/269 BHN, after rough machining."

   b. Manufacturing & Inspection Procedure Drawings
      There are many changes on these drawings. They will make the drawing agree with the way the gears are being produced. Indiana Gear uses copper plating to mask the soft areas of the gear from being carburized. The drawing is being changed to reflect this. They also magnafux after stress relieving and again after phosphate coating the pinion. They find that these heat treatments occasionally open up cracks. We are placing the balancing notes at the end of the procedure, and are noting that for all but English manufacture the balancing is done by the mill builder after the gear is assembled on its shaft.

      The runout tolerances on the turned blanks are being relaxed. Also part numbers are to be etched on the turned blanks. Presently, when these blanks reach Indiana Gear with no identification, it is confusing because many
of them look alike.

c. **Part Dimension Drawing**

The recently added runout NOTE #1 was reviewed and not changed.

3. **Our Shop**

The runout tolerances on the turned blanks are relaxed. The critical surfaces are now being ground. They are marked "G" on the blank drawing. Indiana Gear does not care whether they are turned or ground. They do want them to tolerance. We should consider 100% inspection of critical dimensions.

A "G" is being added to one surface on the driven ring bevel blanks and to one surface on the integral shaft blanks.

4. **Purchasing**

It is important that the purchase order emphasize to the forging supplier that the forgings are to be normalized after rough turning. This was done on the last forgings ordered. Indiana Gear has not had experience with these yet.

5. **Miscellaneous**

a. We asked why the gears were baked after Parko Lubrizing. This is to drive out hydrogen. This is done on all parts RC 39 or harder. The temperature used is 275° F.

b. Davy & United asks for a tensile test certificate from the forging supplier. We do not think this is necessary and have not added it to the drawings for American manufacturer.

MJK/cac

Maurice J. Knott