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Mechanical Technology Incorporated Correspondence

Darle W. Dudley

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December 8, 1964

Mr. Maurice Knott
Morgan Construction Company
Worcester, Massachusetts 01605

Dear Maurice:

In answer to your letter of November 19, I have calculated the approximate helix modification needed for each of the three meshes at each stand. These values are shown on Table 1 enclosed. When we discussed this subject on the telephone recently, you stated that it would be quite desirable to make modifications to the 26 tooth roll pinions only and to use the same amount for each one. It looks quite feasible to do this.

The enclosed curve shows a recommended modification having an average value of .0012". On the graph sheet a note is also given which might be added to the drawing to define this modification. Your drawing should show the "driving" side of the tooth for both the RH pinion and LH pinion.

The amount of modification recommended fits all cases quite well except mesh 13a for stand No. 19. Even though the modification is too great in this case, there should be no problem as stand No. 19 is only handling about one-half the torque that is handled by stand No. 16. The same reasoning would apply for the other stands not listed since they have reduced torque as well as reduced requirements for modification.

I feel that it will be satisfactory to provide no modification at mesh No. 12. On stand No. 16 this mesh theoretically requires .00045" modification. This particular mesh has moderately high torque and therefore might be thought to need the modification. However, this particular mesh is running at a fairly slow pitch line speed of about 1500 FPM. At this particular speed, the oil film separating the teeth is very thin and there will be a good tendency for corrective wearing in. This mesh should wear in to a good fit quick enough to stay out of trouble (at high pitch line speeds in the range of 5,000 to 10,000 FPM, there is very little tendency for teeth to wear in a fit).

Also enclosed with this letter you will find new summary sheets for mesh No. 2 and mesh No. 3. These sheets show some values not given on the sheets enclosed with your letter. There are some slight differences in the modification data but these are not really significant. Notice that I have rounded off some of the numbers to fewer decimal points.
As you know, I have talked with Norman Wilson and we are planning to meet with you in Worcester on the 17th.

Sincerely yours,

Darle W. Dudley, Manager
Mechanical Transmissions

DWD/dk
Enclosures
Modify the helix angle and crown the pinion tooth within the limits of the crosshatched plot shown below. Modification is required on the driving side of the tooth and is optional on the other side of the tooth. Modification to be made by a smooth, convex curvature having no more than .0002" local variation.

D. W. Dudley  
Mechanical Technology Incorporated  
December 8, 1964
### TABLE 1

**THEORETICAL HELIX MODIFICATION**

**IN A FACE WIDTH OF 3-1/2"**

<table>
<thead>
<tr>
<th>Stand #</th>
<th>Mesh #</th>
<th>Total Modification, Ins.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>12</td>
<td>0.0045</td>
</tr>
<tr>
<td></td>
<td>13a</td>
<td>0.0124</td>
</tr>
<tr>
<td></td>
<td>13b</td>
<td>0.00133</td>
</tr>
<tr>
<td>17</td>
<td>12</td>
<td>0.00032</td>
</tr>
<tr>
<td></td>
<td>13a</td>
<td>0.00101</td>
</tr>
<tr>
<td></td>
<td>13b</td>
<td>0.00143</td>
</tr>
<tr>
<td>18</td>
<td>12</td>
<td>0.00008</td>
</tr>
<tr>
<td></td>
<td>13a</td>
<td>0.00122</td>
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<tr>
<td></td>
<td>13b</td>
<td>0.00117</td>
</tr>
<tr>
<td>19</td>
<td>12</td>
<td>0.00042</td>
</tr>
<tr>
<td></td>
<td>13a</td>
<td>0.00060</td>
</tr>
<tr>
<td></td>
<td>13b</td>
<td>0.00113</td>
</tr>
</tbody>
</table>

*Value represents deviation at the pitch line from a true helical spiral of 15°. Deviation is measured on a conventional lead checker with indicator set to read perpendicular to the surface.*

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D. W. Dudley  
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December 8, 1964