WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.
INSTALLATION

1. Remove the plastic plugs that protect the threaded holes in the sides of the reducer housing and install the lifting brackets supplied with the reducer.

2. Determine the running position of the reducer. (See Fig. 1). Note that the reducer housing has been machined for pipe plugs; around the sides of the reducer for horizontal applications and in each face for vertical applications. The plugs must be arranged relative to the running position as follows:

**Horizontal Installations** — Install the magnetic drain plug in the hole closest to the bottom of the reducer. Throw away the tape that covers the filler/ventilation plug in shipment and install plug in topmost hole. Of the remaining plugs on the sides of the reducer, the lowest one is the minimum oil level plug.

**Vertical Installations** — Install the filler/ventilation plug in the hole provided in the top face of the reducer housing. Use the hole in the bottom face for the magnetic drain plug. Of the remaining holes on the sides of the reducer, use a plug in the upper housing half for the minimum oil level plug.

The running position of the reducer in a horizontal application is not limited to the four positions shown in Figure 1. However, if running position is over 20° either way from sketches, the oil level plug cannot be safely used to check the oil level, unless during the checking the torque arm is disconnected and the reducer is swung to within 20° of the positions shown in Figure 1. Because of the many possible positions of the reducer, it may be necessary or desirable to make special adaptions using the lubrication fitting holes furnished along with other standard pipe fittings, stand pipes and oil level gages as required.

**FIG. 1 — Mounting Positions**

B: Breather, D: Drain, L: Oil Level Plug, P: Plug

**Note:**

TDT12, TDT13 and TDT14: Refer to instruction manual (499629) packed with tapered bushings for installation then go on to item 9 below.

**TDT15 only:**

3. Place the inboard bushing on the shaft and position it 3¾” away from the bearing.
4. Place output hub key on shaft and in bushing. Stake key in position.
5. Hoist reducer into position and slide it onto shaft aligning hub keyway with key.
6. Align unthreaded holes of inboard bushing with threaded holes of bushing back-up plate. If necessary, rotate the bushing back-up plate to align holes. Insert screws and tighten lightly.
7. Place the outboard bushing in position on the shaft aligning the bushing keyway with the key. Align the unthreaded holes in the bushing with the threaded holes in the back-up plate, rotating the back-up plate if necessary. Insert bushing screws and tighten lightly.
8. Tighten the screws in both bushings alternately and evenly to 1600 inch-pounds wrench torque.

**FIG. 2**

9. Install sheave on input shaft as close to reducer as possible.
10. Install motor and V-belt drive so belt pull will be roughly at right angles to the center line between driven and input shaft. (See Fig. 2.) This will permit tightening V-belt drive with the torque-arm.
11. Install torque-arm adaptor plates on the input end of the reducer.
12. Install torque-arm fulcrum on a rigid support so that the torque-arm will be approximately at right angles to the center line through the driven shaft and the torque-arm anchor screw. (See Fig. 2.) Make sure that there is sufficient take-up in the turnbuckle for belt tension adjustment when using V-belt drives.
13. Retighten bolts and pipe plugs after a few days operation. This prevents oil leakage.

LUBRICATION

Important: Since reducer is shipped without oil, it is necessary to add the proper amount of oil before running. Use a high grade petroleum base, rust and oxidation inhibited (R & O) gear oil — see tables. Follow instructions on reducer nameplate, warning tags, and in the installation manual.

Under average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every 6 months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug and refill to proper level with new lubricant. Caution: Too much oil will cause overheating and too little will result in gear failure. Check oil level regularly.

Under extreme operating conditions, such as rapid rise and fall of temperature, dust, dirt, chemical particles, chemical fumes, or oil sump temperatures above 200° F., the oil should be changed every 1 to 3 months depending on severity of conditions.
Table 1 – Oil Volumes

<table>
<thead>
<tr>
<th>REDUCER SIZE</th>
<th>t Position A</th>
<th>t Position B</th>
<th>t Position C</th>
<th>t Position D</th>
<th>t Position E</th>
<th>t Position F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fluid Ounces (Approx)</td>
<td>Quarts (Approx)</td>
<td>Quarts (Approx)</td>
<td>Fluid Ounces (Approx)</td>
<td>Quarts (Approx)</td>
<td>Quarts (Approx)</td>
</tr>
<tr>
<td>TDT12</td>
<td>1884</td>
<td>58 1/4</td>
<td>55 7/8</td>
<td>1216</td>
<td>38</td>
<td>36</td>
</tr>
<tr>
<td>TDT13</td>
<td>2752</td>
<td>86</td>
<td>81 1/4</td>
<td>1984</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>TDT14</td>
<td>3840</td>
<td>120</td>
<td>114 3/4</td>
<td>2816</td>
<td>88</td>
<td>83</td>
</tr>
<tr>
<td>TDT15</td>
<td>6304</td>
<td>197</td>
<td>186 3/4</td>
<td>4416</td>
<td>138</td>
<td>131</td>
</tr>
</tbody>
</table>

† Refer to Fig. 1 on page 2 for mounting positions.

Note: If reducer position is to vary from those shown in Figure 1 either more or less oil may be required. Consult factory.

U. S. Measure: 1 quart = 32 fluid ounces = .94646 liters.

Table 2 – Oil Recommendations for Average Operating Conditions

<table>
<thead>
<tr>
<th>Ratio and Output RPM</th>
<th>Room Temp. ° Fahr.</th>
<th>S. A. E. No.</th>
<th>AGMA Lub. No.</th>
<th>ASTM SUS @ 100° F.</th>
<th>Metric Equiv. cSt @ 37.8° C.</th>
</tr>
</thead>
</table>
| 25:1:1  
30:1  
15:1 | — Up to 45 rpm | — 25° thru 60° | 10W40 | — | — |
| — 6° thru 100° | 40 | 4 | 636 to 765 | 135 to 165 |
| 101° thru 180° | 50 | 5 | 918 to 1122 | 198 to 242 |
| — 25° thru 60° | 10W30 | — | — | — |
| — 6° thru 100° | 30 | 3 | 417 to 510 | 90 to 110 |
| 101° thru 180° | 40 | 4 | 626 to 765 | 135 to 165 |

NOTE:

Pour point of lubricant selected should be at least 10° F. lower than expected minimum ambient starting temperature.

Extreme pressure (EP) lubricants are not recommended for average operating conditions.

Special lubricants may be required for food and drug industry applications where contact with the product being manufactured may occur. Consult a lubrication manufacturer representative for his recommendation.

Do not use oils containing slippery additives such as graphite or molybdenum disulphide in the reducer when backstop is used. These additives will destroy sprag action.

MOTOR MOUNTS

The motor mount must be installed on output end of reducer as shown in Figure 5.

Note: The T-A motor mount is not recommended for applications requiring the use of TRI-MATIC® Overload Release.

Remove two or three (as required) housing bolts on output end of reducer. Install back support 1 and front support 2 with new housing bolts 8. Install mounting bolts 3.

Install mounting plate 5 with adjusting studs 4 as shown in Figure 5.

Assemble one motor rail 6 by loosely bolting through the two front holes on each side of mounting plate (See Figure 5) with mounting rail bolts 7.

Measure the distance between front and rear mounting holes of motor. Position the rear motor rail to this distance and loosely bolt to the mounting plate.

Center the motor on the motor rails. Use a plain washer under each slot in the motor rails when the motor mounting bolts are less than 3/8" diameter. Bolt motor snugly to motor rails.

Install motor sheave and reducer sheave on their shafts as close as possible to the motor and reducer housings. Note: The motor rails may be moved forward or backward from the position shown in Figure 5 to permit alignment of the V-belt sheaves. It is permissible for the front motor rail to extend beyond the mounting plate 5. Align the V-belt sheaves carefully and tighten all bolts securely.

Install V-belts and adjust belt tension. Figure 5 shows the motor near the minimum belt center position. To increase the center distance, loosen the four nuts "A" on the adjusting studs and tighten the four nuts "B" alternately and evenly until the belts are properly tensioned.

Check all bolts to see that they are securely tightened.
PARTS FOR TORQUE-ARM SPEED REDUCER

NOTE: The two digit numbers are for reference use. Order parts by the six digit part numbers in the Parts List whenever possible. Each six digit number is a complete identification of the part or assembly.
ORDERING PARTS:

When ordering parts for reducer specify Reducer Size number, part name, part number and quantity.

It is strongly recommended that when a pinion or gear is replaced, the mating gear or pinion also be replaced.

If the large gear on the output hub must be replaced, it is recommended that an output hub assembly of a gear assembled on a hub be ordered to secure undamaged surfaces on the output hub where the oil seals rub. However, if it is desired to use the old output hub, press the gear and bearing off and carefully examine the rubbing surface under the oil seal for possible scratching or other damage resulting from the pressing operation. To prevent oil leakage at the oil seals, the smooth surface of the output hub must not be damaged.

If any parts must be pressed from a shaft or the output hub, this should be done before ordering parts to make sure all none of the bearings or other parts are damaged in removal.

Because old seals, wear rings or housing gasket may be damaged in disassembly, it is advisable to order replacements for these parts.

If replacing a bearing or a shaft, it is advisable to order a set of shims for adjustment of bearings on the shaft assembly. If replacing a housing, a set of shims should be ordered for each shaft assembly because the adjustment of the bearings on each shaft assembly is affected.

REMOVING REDUCER FROM SHAFT:

1. Remove bushing screws.
2. Place the screws in the threaded holes provided in the bushing flanges. Tighten the screws alternately and evenly until the bushings are free on the shaft. For ease of tightening screws make sure screw threads and threaded holes in bushing flanges are clean.
3. Remove the outside bushing, the reducer and then the inboard bushing.

DISASSEMBLY:

1. Remove retaining rings from output hub. Remove bushing back-up plates.
2. Remove all bolts from housing. Open housing evenly to prevent damage to parts inside.
3. Lift shaft, gear, and bearing assemblies from housing.
4. Remove seals, bearing covers, seal carriers, backstop carrier and bearing cups from housing.

REASSEMBLY:

1. Output Hub Assembly: Heat gear to 325 to 350°F to shrink onto hub. Heat bearings to 270 to 290°F. To shrink onto hub. Any injury to the hub surfaces where the oil seals rub will cause leakage, making it necessary to use a new hub. Press output hub wear rings onto the hub until the distance from the hub end to the far side of the wear ring flange is 2 5/16" on TDT13; 2 7/16" on TDT14; or 3 5/8" on TDT15.
2. Countershaft Assembly: Shaft and pinion are integral. Heat gear to 325 to 350°F. To shrink on shaft. Heat bearing cones to 270 to 290°F. To shrink on shaft. Lift shaft, gear, and bearing assemblies from housing.
3. Input Shaft Assembly: Slide pinion on shaft. Heat bearing cones to 270 to 290°F. To shrink on shaft. Press input shaft wear ring onto shaft until the distance from the shaft end to the far side of the wear ring flange is 9 1/4" on TDT13; 12 3/4" on TDT14; or 14 3/4" on TDT15. Place a 3/8" diameter bead of Dow Corning RTV732 sealant on the face around the I.D. of the shell (sealant is to be between shim and reducer). Caution: If too much sealant is used, it will run into the bearing and too little sealant will result in an ineffective seal. Install bearing covers, output hub seal carrier and backstop carrier on right half of housing (as viewed in drawing). Put bearing cups in place. Make sure the cups are properly seated in the housing and are pressed against the countershaft bearing, output seal carrier and backstop carrier. Place housing on blocks to allow clearance for protruding end of output hub.
4. Mesh output hub assembly and countershaft assemblies together and place in housing half. Place input shaft assembly in position. Make sure rollars are properly seated in bearing cups. Make sure input pinion is central between bearings on input shaft. If not central re-engage gear teeth properly to make central.
5. Clean housing flange surfaces on both halves, making sure not to nick or scratch flange face. On size TDT15 place a new bead of gasket eliminator on flange face and spread evenly over entire flange leaving no bare spots. Note: TDT12, TDT13 and TDT14 were originally supplied with a housing gasket do not use gasket eliminator. Reorder gasket per part number given in parts list. Place other housing half into position and tap with a soft hammer until housing bolts can be used to draw housing halves together. Torque housing bolts per torque values listed in Table 3.
6. Install the output hub seal carrier and the shims previously removed. Note: If the housing, hub, bearing or carrier has been replaced use more shims than previously removed. Tighten the carrier cap screws. Rotate the hub while tightening these screws to assure that the bearing does not bind. If the bearing starts to bind, add more shims. Attach an indicator to the housing and set the gage on the top end of the output hub. Insert a pry bar under the other end of the hub and force it upward. The end play of the hub will be given by the indicator reading. Remove or add shims until the indicator reading is 'AA' in Table 3. Tighten screws per torque values listed in Table 3.
7. Using similar procedure adjust the bearings on one of the countershafts. (This can be accomplished by removing the plugs from the covers, placing a piece of rod or a dummy in the cover). Remove or add shims until indicator reading is 'BB' in Table 3. Tighten screws per torque values listed in Table 3. Then similarly adjust the bearings on the other countershaft.
8. Again using similar procedure adjust the bearings on the input shaft. (Backstop cover must be removed.) Remove or add shim stock until the indicator reading is 'CC' in Table 3. Tighten screws per torque values listed in Table 3.
9. Extreme care should be used in installing seals on input shaft and output hub to avoid damage which would result in oil leakage. This danger of damage and consequent oil leakage can be decreased by covering the key seat and retaining ring groove with Scotch tape or paper which can be removed subsequently. Chamfer or burr housing bore if end of bore is sharp or rough. Fill cavity between lips of seal with grease. Seals should be pressed or tapped, with a soft hammer, evenly into place in the housing, applying force only on outer corner of seals. A slight oil leakage at the seals may be evident during initial running in, but will disappear unless the seals have been damaged.

Table 3 — Torque Values

<table>
<thead>
<tr>
<th>TDT12</th>
<th>TDT13</th>
<th>TDT14</th>
<th>TDT15</th>
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<td>.001&quot; to .003&quot;</td>
<td>.001&quot; to .003&quot;</td>
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</table>

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