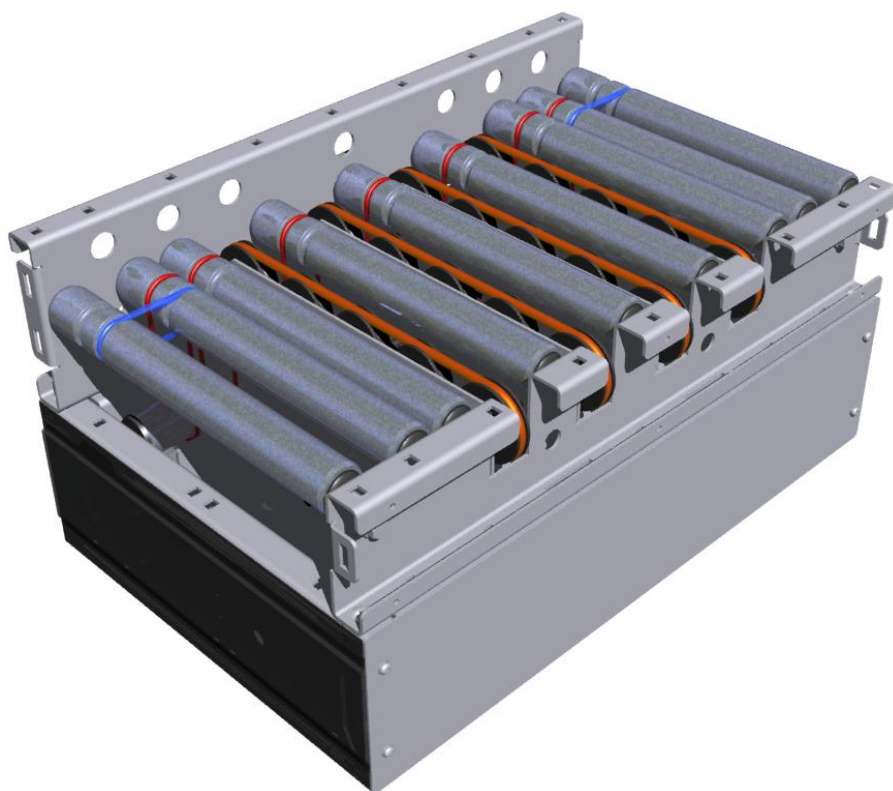




## **MAINTENANCE MANUAL**



### **SERIES 1000 24VDC MOTORIZED DRIVE ROLLER RIGHT-ANGLE TRANSFER**



**Hilmot Corporation**

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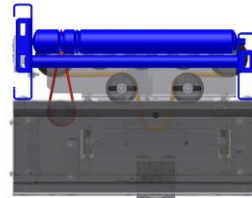
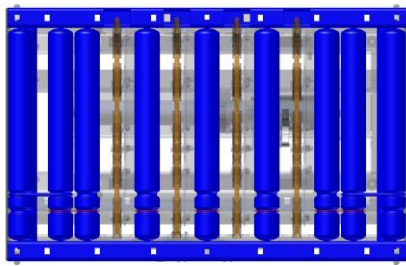
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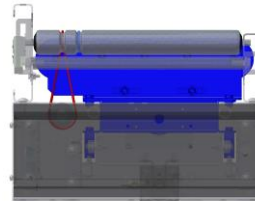
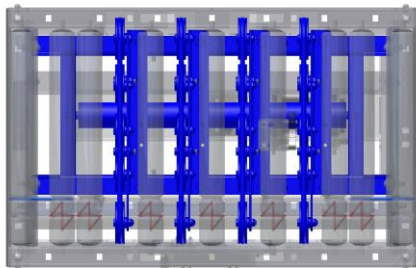


## **TRANSFER ASSEMBLY COMPONENTS**

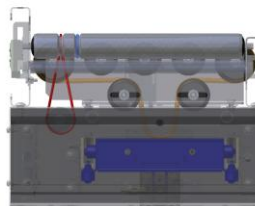
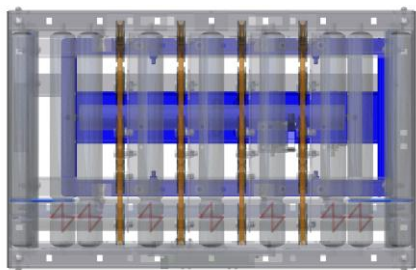
**CONVEYOR FRAME ASSEMBLY** – The conveyor frame assembly consists of the conveyor bed carrier rollers and conveyor frames.



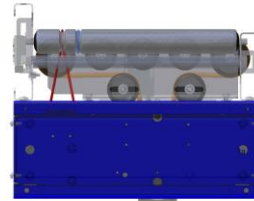
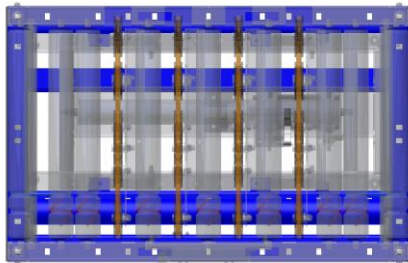
**LIFT ASSEMBLY** – The lift assembly consists of all of the components that move in a vertical direction. These parts include the strands, belt strand motorized roller, belts, wedge blocks, and lift frame weldment.



**SLED ASSEMBLY** – The sled assembly consists of all of the components that move in a horizontal direction. These parts include cam followers and sled frame weldment.



**FRAME ASSEMBLY** – The frame assembly consists of all of the parts that hold transfer together. A majority of the electrical and pneumatic components are attached to the frame assembly



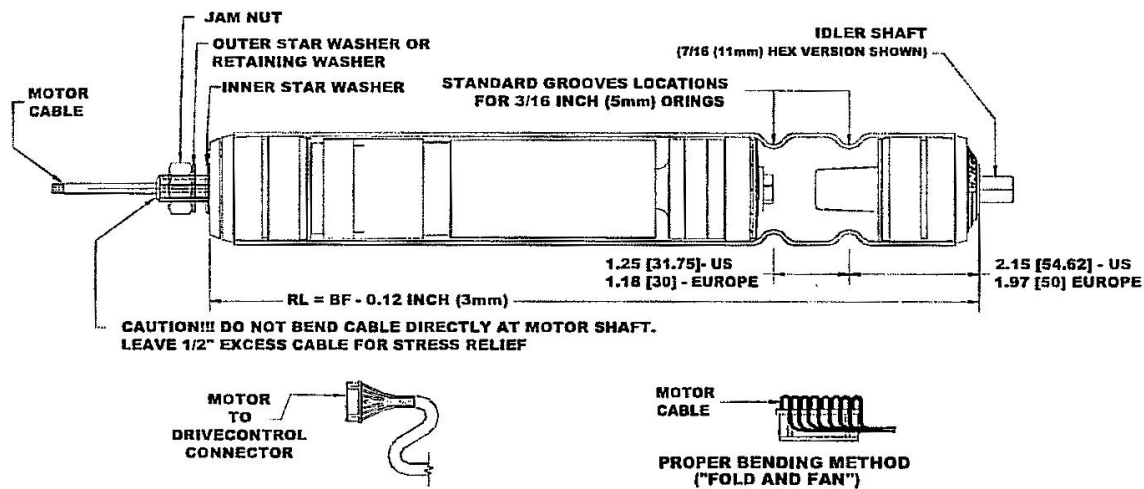
### **Motorized Drive Roller (MDR)**

The motorized drive roller (MDR) is the muscle of the conveyor zone. It provides the torque and speed required to move the product to the next zone. The MDR has the motor and gearing encapsulated inside the roller tube. There are two types of standard Hilmot MDR's: two grooves and no grooves. In *Figure 1* a standard motorized with two grooves is depicted. A no groove MDR has the same working components as the two groove roller minus the o-belt grooves. No groove MDR's are generally used in transfers, divert mechanism, chain sprocket, and timing belt sprocket conveyor.

Hilmot uses two different manufacturers for the motorized drive rollers INTERROLL and ITOH-DENKI.

### **INTERROLL Motorized Drive Roller**

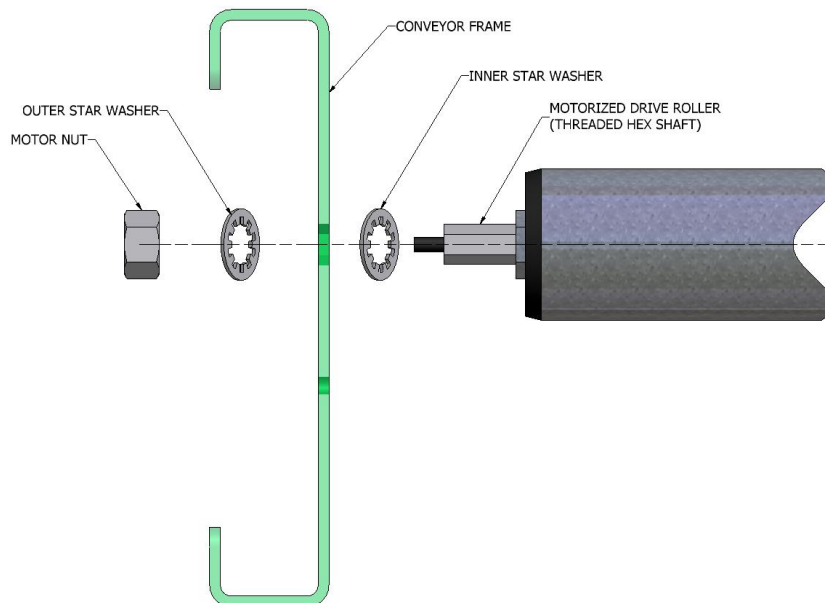
There are two types of INTERROLL motorized drive rollers: EC100 & EC110. Both types of rollers have the same mechanical dimensions. The difference is the EC110 has a higher torque output. *Figure 1* shows standard dimensions for INTERROLL motorized drive rollers.



**Figure 1: INTERROLL Motorized Drive Roller**

### **Replacement of INTERROLL Motorized Drive Roller**

1. Turn off and Lockout / Tag-out all power to the conveyor section.
2. By looking at the threaded shaft end; make sure that the Gear Ratio matches that of the roller that is being replaced. Standard Gear Ratios would include: 12:1, 16:1, 24:1, 36:1, 64:1, and 96:1. This is important if the conveyor system is comprised of more than speed.
3. The replacement roller should include :
  - a. Motorized Drive Roller
  - b. Hardware kit
    - i. star washers – qty. 2
    - ii. motor nut
    - iii. motor instructions
4. Install a star washer on the threaded motor shaft. Fold the wires perpendicular to the connector and fan the wires down the backside of the connector. When folding the wires over the top of the connector use care not to put too much stress on the connector pins and try not to overlap and wires on top of other wires. This will allow the connector to easily pass through the washer. Just simply bending the wires at the connector and forcing the star washer over the wire can cause damage to the insulation on the wires leading to failure of the MDR.
5. Utilizing the fold and fan method described above and also depicted in *Figure 1*, insert the MDR connector into the hex hole and gently pull the cable extending from the motor through.
6. Insert the threaded hex shaft into the hex hole. Push the spring loaded idler shaft inwards and line the roller up with the hole. Release the idler shaft and allow it to pop into the hole in the frame.
7. Install the outer star washer using the fold and fan method.



**Figure 2: Motorized Drive Roller (Exploded View)**

8. The motor nut threads on to the motorized drive roller shaft, and should be to the proper torque of: **30 ft-lbs +/- 5 ft-lbs (40.7 Nm +/- 6 Nm)**.

**Note:** Torque is critical. Failure to properly torque the MDR will result in the shaft spinning in the frame, twisting of the wires and failure of the MDR. Exceeding this torque specification will also result in the conditions above.

9. Tools required to achieve proper torque can be seen in *Figure 3*.

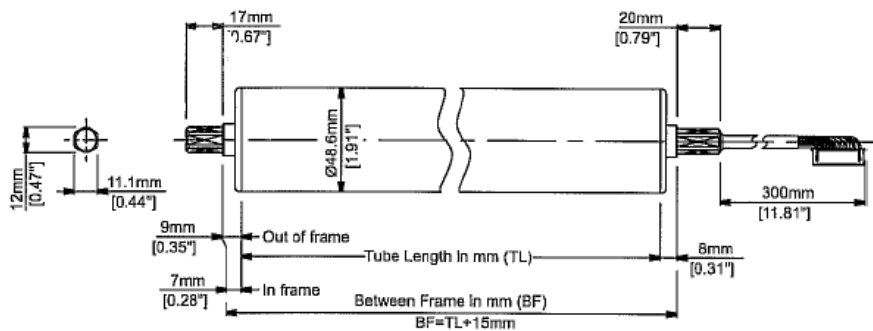
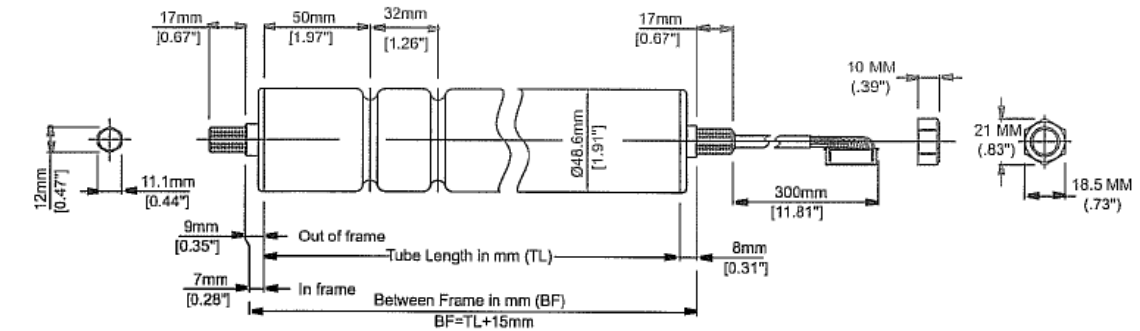


***Figure 3: Proper Torque Tools***

10. Plug the motor cable into the motor control card.
11. Turn on power to the conveyor section.

### ITOH-DENKI Motorized Drive Roller

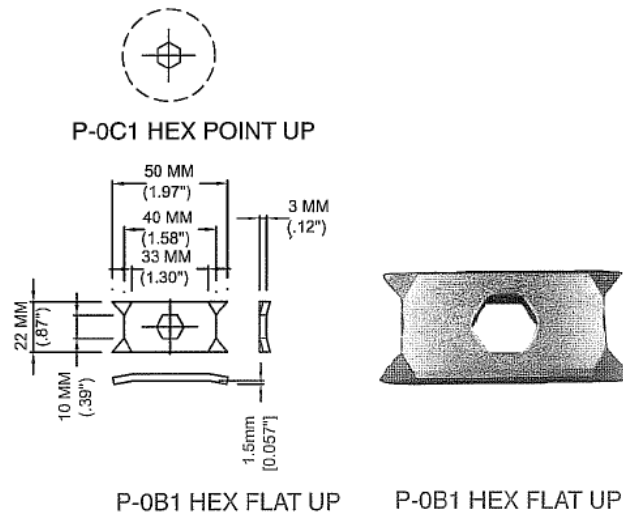
There are two different mechanical mountings for ITOH-DENKI motorized drive rollers. Hilmot transfers can use either the threaded hex shaft or the flat hex shaft as depicted in *Figure 4*.



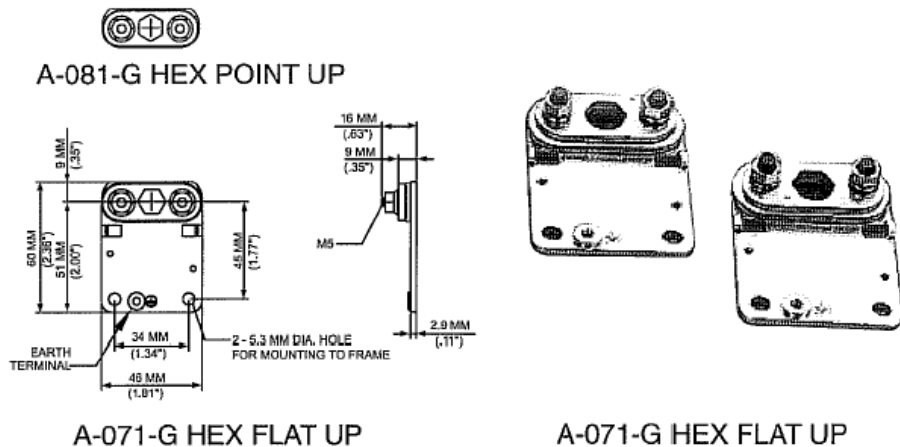
**Figure 4: ITOH-DENKI Motorized Drive Roller**



The threaded hex shaft motorized drive rollers uses the ninja motor bracket depicted in *Figure 5*. The flat hex shaft motorized drive roller uses the motor brackets depicted in *Figure 6*.



**Figure 5: Itoh-Denki Ninja Motor Bracket**



**Figure 6: Itoh-Denki Motor Bracket**

### Replacement of ITOH-DENKI Motorized Drive Roller

1. Turn off and Lockout / Tag-out all power to the conveyor section.
2. By looking at the corded end of the motorized drive roller; make sure that the part number matches the roller being replaced
3. Fold the wires perpendicular to the connector and fan the wires down the backside of the connector. When folding the wires over the top of the connector use care not to put too much stress on the connector pins and try not to overlap and wires on top of other wires. This will allow the connector to easily pass through the hex hole. Just simply bending the



- wires at the connector and forcing the through the hex hole can cause damage to the insulation on the wires leading to failure of the MDR.
4. Insert the threaded hex shaft or flat hex shaft into the hex hole. Push the spring loaded idler shaft inwards and line the roller up with the hole. Release the idler shaft and allow it to pop into the hole in the frame.
  5. The transfer MDR requires a motor bracket on both hex ends.
  6. Install the ninja motor bracket or standard motor bracket on the non-corded end and using the fold and fan method on the corded end.
  7. If the MDR has the threaded shaft the motor nut should be threaded on both ends of the MDR, and should be to the proper torque of: **21.7 ft-lbs +/- 10% (29.4 Nm +/- 10%)**.

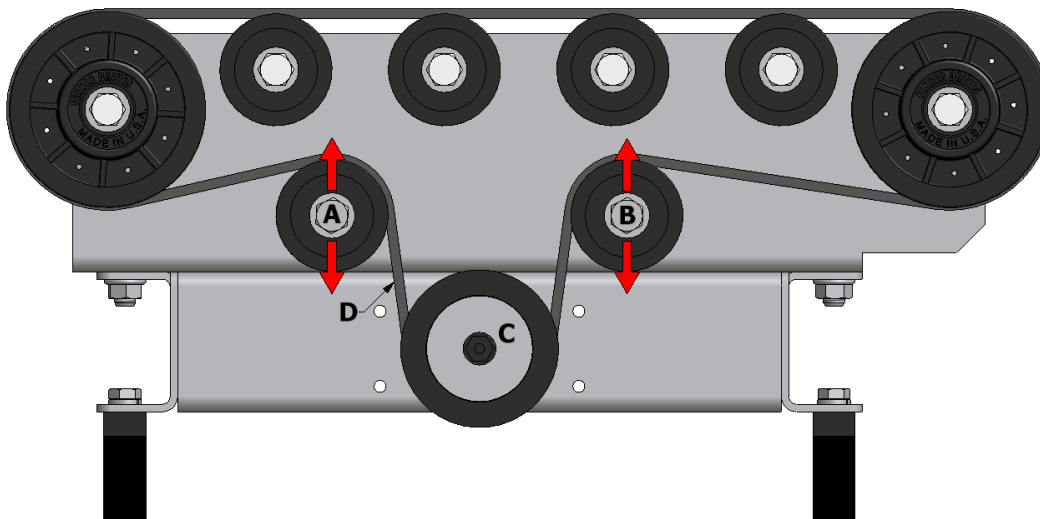
**Note: Torque is critical. Failure to properly torque the MDR will result in the shaft spinning in the frame, twisting of the wires and failure of the MDR. Exceeding this torque specification will also result in the conditions above.**

8. Tools required to achieve proper torque can be seen in *Figure 3*.
9. Plug the motor cable into the motor control card.
10. Turn on power to the conveyor section.

### **Transfer - Timing Belt**

The timing belt needs to be tightened to a point where the current reading through the motor control card does not exceed 1.4 Amps at no load. The belt need not be extremely taunt to operate.

**I Over-tightening the belt may result in premature motorized drive roller failure.**



**Figure 7: Transfer Lift Assembly**

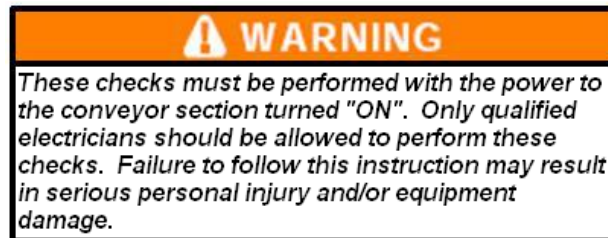


ITEM	DESCRIPTION
A	ADJUSTABLE IDLER PULLEY - A
B	ADJUSTABLE IDLER PULLEY - B
C	MOTORIZED DRIVE ROLLER
D	TRANSFER STRAND TIMING BELT

**Table 1: Transfer Belt Strand Adjustment Components**

### Transfer Belt Replacement

1. Turn off and Lockout / Tag-out all power to the conveyor section.
2. Disconnect motor roller cable from motor control card for the transfer strand belts.
3. First loosen the bolts and nuts at location B. Bolts need only to be loosened to the point that the pulley is allowed to move freely in the slot of the strand channel.
4. If the belt is still unable to be removed, it may also require loosening the bolt at location A.
5. Replace worn belt with new belt. **Note: the new belt may be slightly smaller than the old belt. The old belt being replaced will exhibit a small amount of permanent stretch due to tension & use.**
6. Tighten the bolt that holds the pulley at location A first.
7. Use the pulley at location B for the fine adjustment.
8. Plug the motor cable back into the motor control card & power up the conveyor.



9. The correct amount of tension on the belt will be correct when the current readings, using a digital multimeter, are between the range of 1.0 – 1.4 Amps at no load conveyor speed. The lower the current reading in the range the better. (*Figure 8 shows the proper location to measure the current.*)

**I Over-tightening the belt may result in premature motorized & carrier roller failure.**



*Figure 8: Proper Current Reading*

10. If the current is above 1.4 Amps, follow the loosening procedure in steps 3 & 4 above until the correct current is achieved.

### **Transfer – Conveyor O-belts**

1. Turn off and Lockout / Tag-out all power to the conveyor section.
2. Unplug the motor cable from the corresponding motor card.
3. Press one of the two manual override buttons on the solenoid to put the transfer lift mechanism in the up position.
4. Remove the transfer conveyor bed carrier rollers. **Note: Pay attention to the direction of the twist of the o-belts.**
5. Loosen the motorized drive roller nut or mounting bracket, and remove completely.
6. Depress the end of the motorized drive roller opposite the cord end, and pull up to clear the motorized drive roller of the transfer frame assembly.
7. Slide off the old o-belts. If the old belts are to not be used again the o-belts can be cut to aid in easier removal.
8. Slide on the new o-belts. The old o-belts may be slightly larger than the new o-belts due to the old o-belts permanent stretch.
9. Depress the end of the motorized drive roller opposite the cord end and move the roller in to place. **Note: Make sure the hex shaft pops through the hex hole in the transfer frame assembly.**
10. If replacing the motorized drive roller follow the motor replacement guides from above for the respective roller manufacturer. **Note: If the motorized drive roller is INTERROLL, replace the star washers (M12 Internal Tooth Lock Washer).**



11. Replace the transfer conveyor bed carrier rollers in the same way they were removed.  
**Note: The twist orientation of the o-belts should match that as seen in step 4 above.**
12. Plug the motor cable into the motor control card.
13. Turn on power to the conveyor section.



14. Run test product to ensure the conveyor bed carrier rollers are moving in correct direction. If the rollers are running in the opposite direction, the o-belts need to be twisted in the opposite orientation.

### Troubleshooting Help

If you need further assistance, please visit our website at <http://www.hilmot.com> or call our Customer Service Department at 262.544.9960 or toll free at 800.799.4492, Monday through Friday 8:00 am to 5:00 pm CT.