
IBM

**DLT™ Tape Drive Self
Maintainer Service Procedures**

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DLT™ TAPE DRIVE SELF MAINTAINER SERVICE PROCEDURES

The following procedures may be performed by certified self maintainers of DLT tape products:

1. Tape Drive Leader Reattachment and/or Replacement.
2. Manual Rewind of Cartridge.
3. Replacement of Broken Write Protect Lever Arm.

Warranty of tape drive products will remain in effect if the repair is limited to the procedures outlined and are performed in accordance with Quantum standards.

Only Quantum replacement parts may be used.

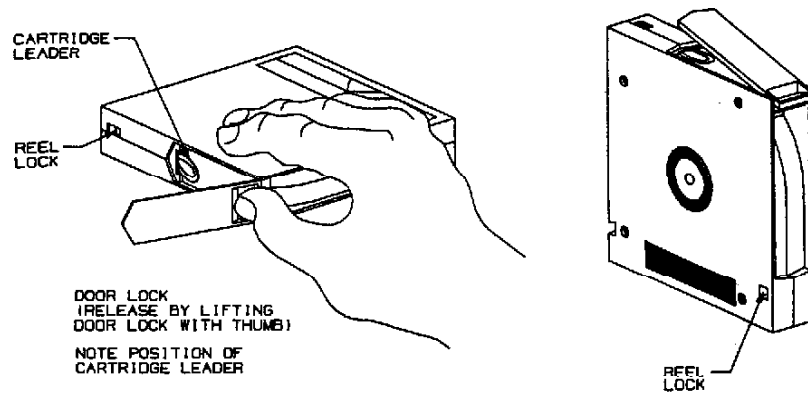
Electro-Static Discharge (ESD) precautions must be used for all service on DLT Tape Drives.

DLT Tape Drive Inspection

DLT Tape Drives that require service for a detached take-up leader should be inspected for the following conditions prior to re-attachment of the leader.

1. Inspect the cartridge for broken, unseated, or mis-aligned cartridge leader. Refer to Figure 1 for the cartridge door opening and correct position of the leader buckling loop. Verify that the leader loop has no cuts or damage.
2. Check the cartridge for a broken reel lock, especially if the cartridge has been dropped. Reel locks should be visible through the two openings referenced in Figure 1. Shake the cartridge to verify that no internal parts rattle indicating damage.

**DO NOT USE A CARTRIDGE THAT APPEARS TO HAVE DAMAGE TO THE
CASING, LEADER, OR REEL LOCKS.**



Note Position of the Cartridge Leader

Figure 1 Cartridge / Leader Inspection

3. Check for the proper floor spring. The floor spring is visible under the floor plate of the drive when the cartridge is removed. It is located at the rear of the receiver and in front of the first roller. See Figure 2.

DLT Tape Drive	Floor Spring Color
Loader/Library	Blue
Standalone	Silver

THE FLOOR SPRINGS ARE NOT INTERCHANGEABLE.

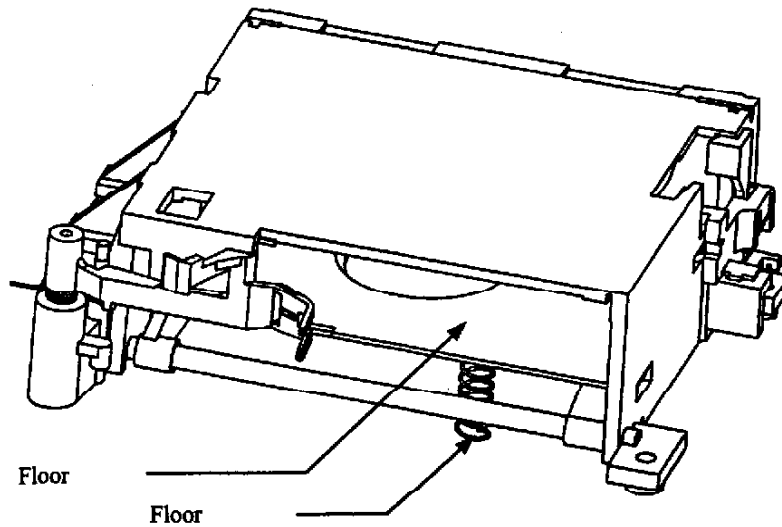


Figure 2 Location of Floor Spring

4. Inspect the Drive Take-Up Leader for damage to the mushroom tip. It must not be bent or visibly cut.

DLT Tape Drive Leader Re-Attachment / Replacement Procedure

(For Tape Path refer to Figure 5 and Figure 10.)

WARNING

This procedure should only be done by trained personnel. Damage to the leader, head or drive may occur if leader is not threaded properly in the tape path.

Nylon gloves must be worn to protect the leader surface from oils of the skin which can cause drive failure. The read/write elements of the DLT head can be contaminated or damaged and the drive functionality may be adversely affected.

It is important to determine the cause of the leader detachment. If it is due to a faulty or damaged cartridge, that cartridge must be identified and taken out of service. If the leader itself is physically damaged it must not be reused. Do not loosen or remove either of the two plastic tape guides or head; they are adjusted precisely at the factory.

1. Remove DLT tape drive from the enclosure. Observe ESD measures.
2. Locate the clear plastic dust cover over the take-up reel. Remove the warranty sticker, if applicable. Locate the two rectangular slots near the front of the plastic cover. Insert a small flat blade screwdriver into each slot, gently pry each tab, and lift the front of the cover. A third holding tab is located at the rear of the drive, which can be pried open with just the finger. See Figure 3.
3. With the cover removed, gently rotate the take-up reel until the leader "Mushroom" tip is exposed (rotate clockwise).
4. Wear nylon gloves.

Pull the leader to its full length and wipe the entire leader with a lint-free cloth pad dampened with isopropyl alcohol.

DO NOT USE SOLVENTS. WIPE ONLY THE LEADER. DO NOT TOUCH THE ROLLERS OR HEAD.

If the leader is not damaged and appears to be free of scratches it can be re-attached to the buckling mechanism of the drive; however, installing a new leader at this point is recommended.

5. Very carefully slide the leader in front of the head positioning the leader so that it enters the tape path and passes around all 6 rollers. Refer to the Tape Path diagram, Figure 10. Each roller has a flange that holds the leader in alignment and the mushroom end of the leader will protrude into the rear of the drive receiver.
6. Gently pull the leader to its full length. Position the leader so that the buckling link arm aligns to the rectangular slot in the leader and gently pull back the buckling arm with the index finger so that the hook engages the slot. Release the mechanism and verify that the mushroom tip is in front of the buckling mechanism.

7. You must now verify that the leader is completely in the tape path and that it is between the flanges of each roller. Rotate the take-up reel clock-wise about 1/8th turn (2 or 3 times) to seat the leader. Visually verify this.
8. Replace the dust cover.

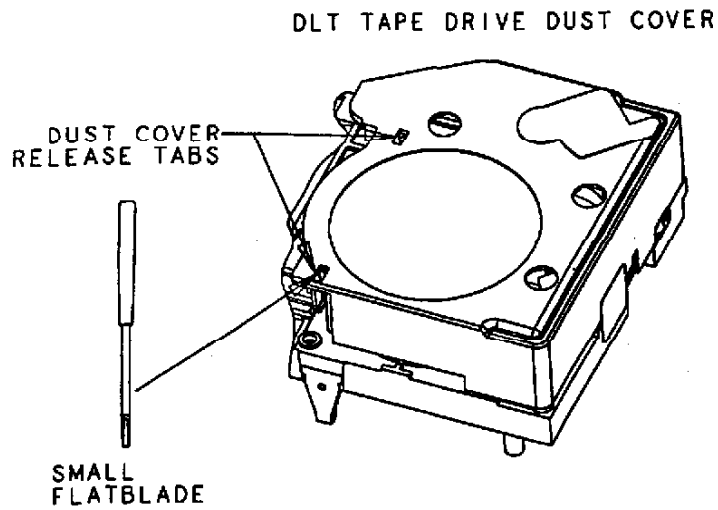


Figure 3 **DLT Tape Drive Dust Cover**

Note: Leaders are not interchangeable.

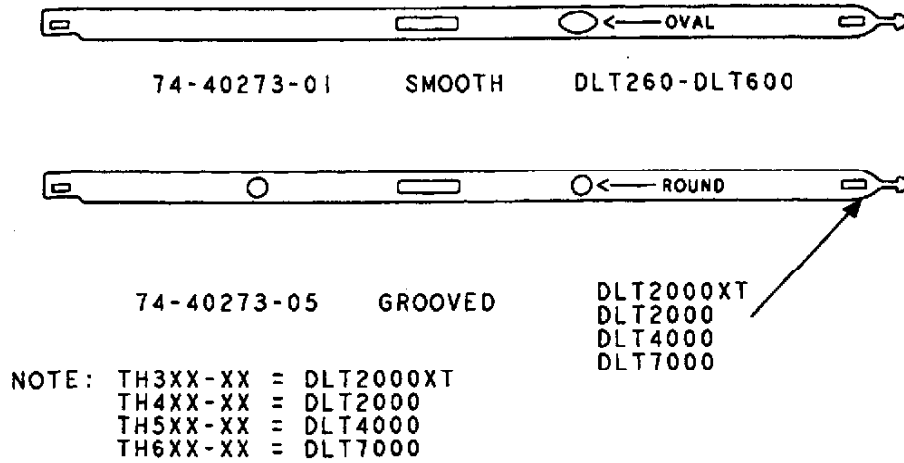


Figure 4 Leader Types

The above parts are available in kit form.

Quantum Order Number	Kit Description
TSXLD-01	DLT™ Leader Kit for 260/600
TSXLD-03	DLT™ Leader Kit for 2000XT/2000/4000/7000

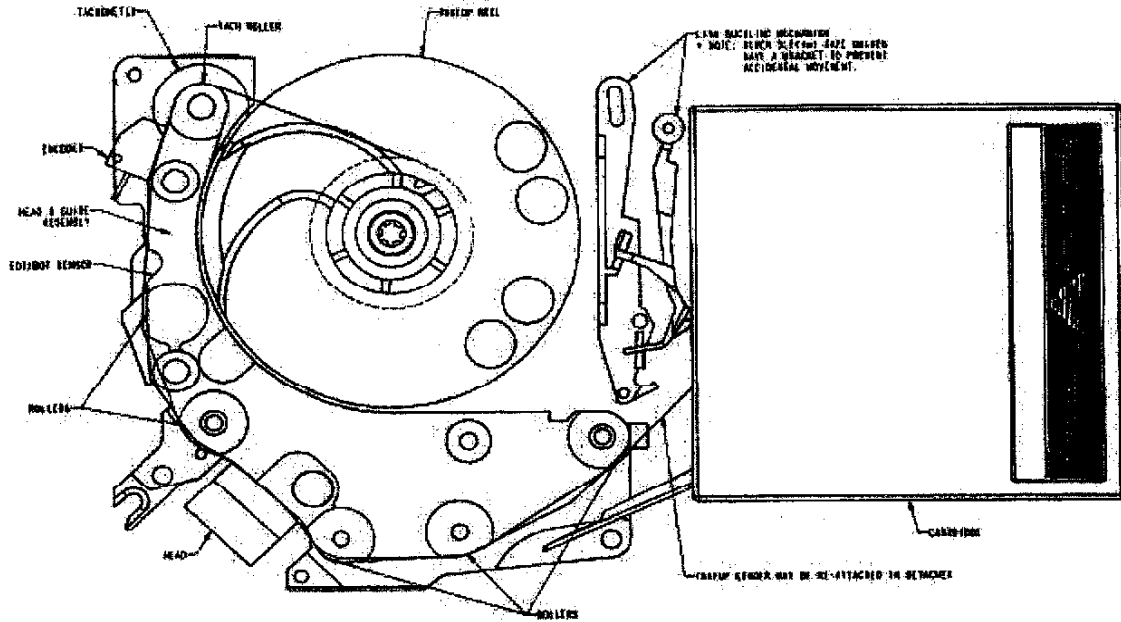


Figure 5 Tape Path

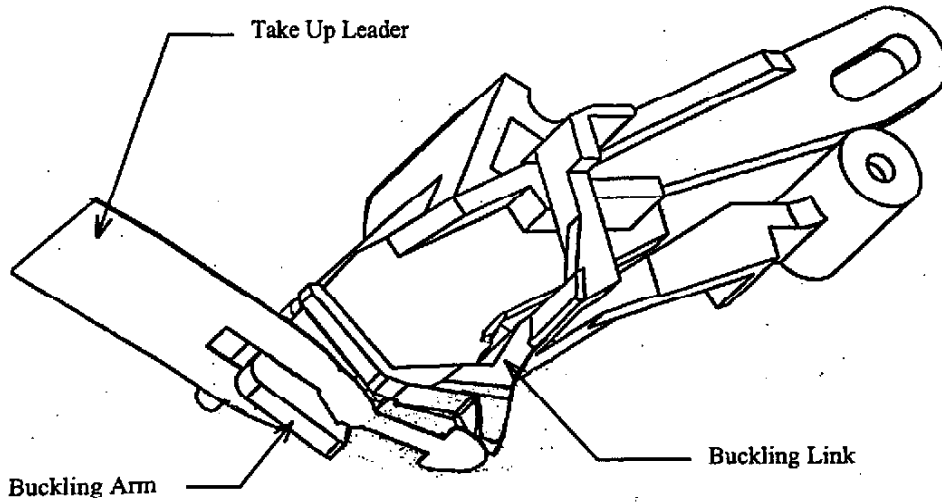


Figure 6 Correct Position of Take Up Leader / Buckling Link

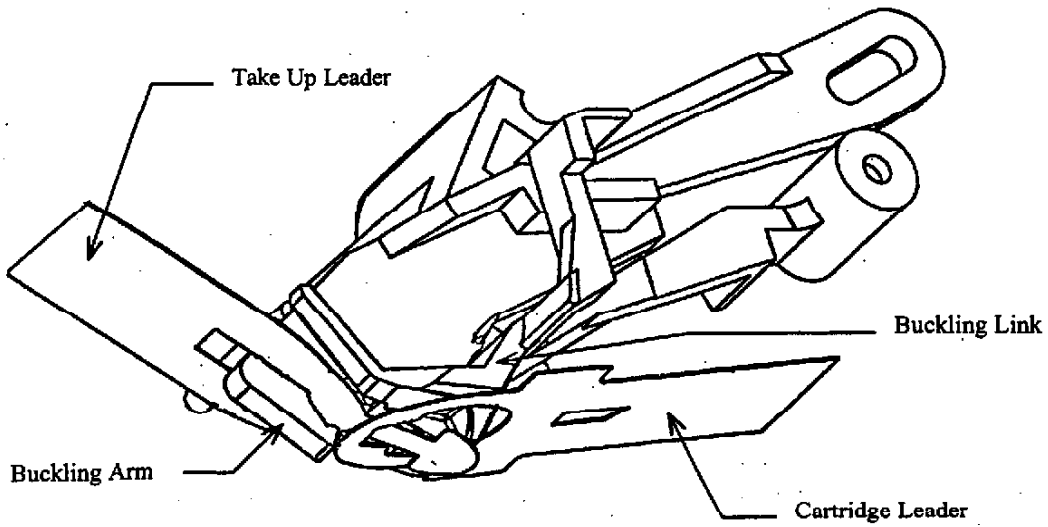


Figure 7 Take Up Leader Partially Installed in Cartridge

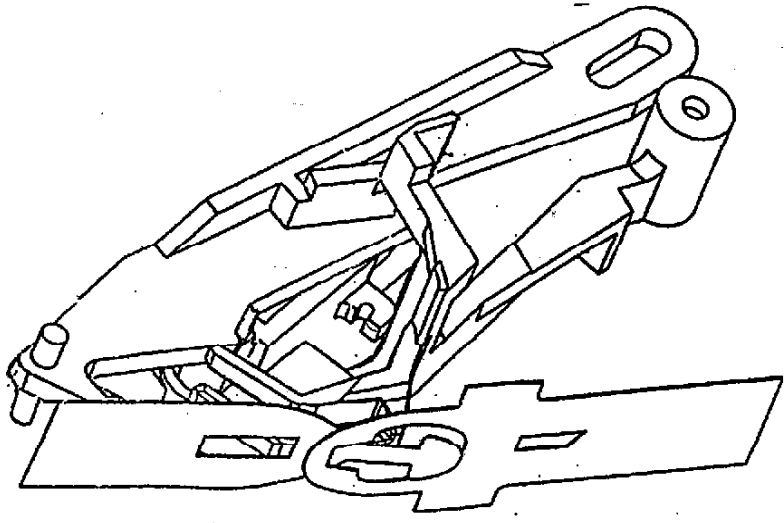


Figure 8 **Take Up Leader Engages into Cartridge Leader**

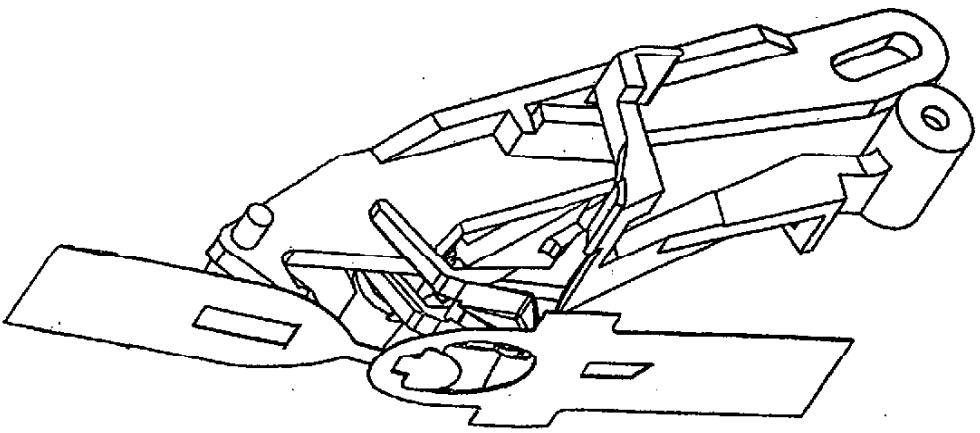


Figure 9 **Load Sequence Begins**

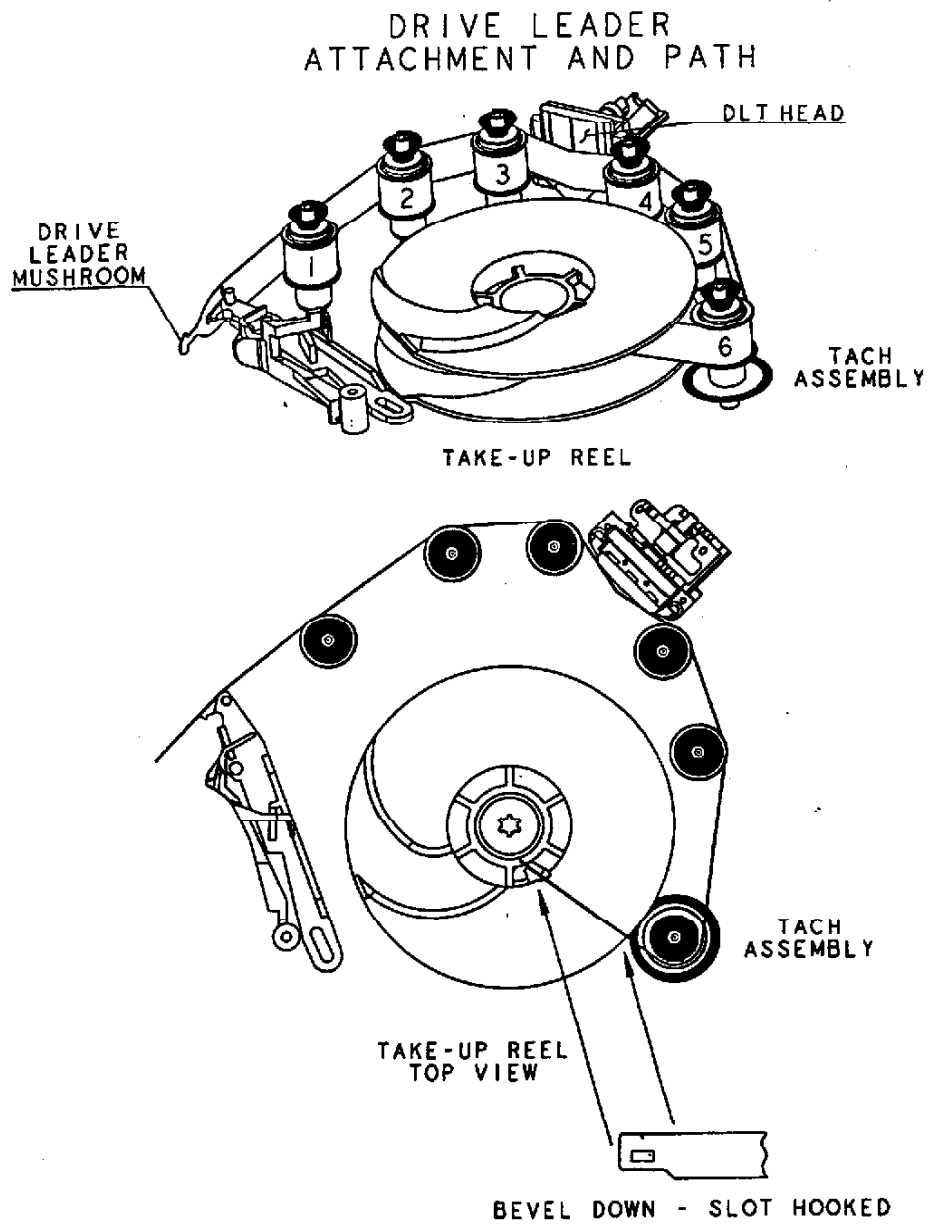


Figure 10 Drive Leader Attachment and Path

Manual Rewind Procedure

Tools required - Medium Phillips Screwdriver (#1)
Power Screwdriver optional

Observe standard ESD precautions.

In the event of a failure that prevents the library from unloading a cartridge from the DLT tape drive it may be necessary to perform a manual unload of the cartridge. This should only be done if it is imperative that the customer retain a cartridge that contains sensitive or proprietary data. If the customer does not need to retain the cartridge it should remain in the drive. This provides Quantum Certified Service Engineers more information to do a complete failure analysis.

NOTE: Cartridges removed using this procedure will not have the same tape tension as a normally rewound cartridge and may not be usable.

With the tape drive removed from the library:

1. Turn the complete assembly on its side with the handle motor up and toward you. Ref. Figure 11.
2. Locate the Supply Motor Access hole and insert a medium Phillips screw- driver to engage the Supply Motor Screw.
3. Turn the screw counter-clockwise and observe the take-up reel. It should begin to turn.
 - a) If it does turn, check to see how much tape is wrapped around the take-up reel. If the take-up reel appears to have a lot of tape wrapped (more than 25 %) the procedure will go much faster if a power screwdriver is used. Watch the tape rewind while using a power screwdriver and stop when most of the tape has been rewound. Switch to the hand screwdriver watching for the Beginning of Tape hole and the plastic leader to appear. Continue to rewind with a hand screwdriver until the leader has seated in the cartridge and the supply motor ceases to turn.
 - b) If the Supply Motor does not turn when the screwdriver is turned counter clockwise, check to see if the cartridge leader is fully rewound and seated.
 - c) If the cartridge leader is not fully seated and the Supply Motor will not turn a motor obstruction or broken cartridge reel lock may be the cause. If either of these conditions exist it may not be possible to remove the cartridge without damaging the media.
 - d) If the cartridge leader is fully rewound it is necessary to lift the drive handle and open the interposer to remove the cartridge. The interposer must be pulled back to release the handle and allow it to be lifted. While slowly lifting the drive handle use a finger to prevent rapid ejection. This will help to ensure the leaders will unbuckle properly.
 - e) Inspect the cartridge for damage.
 - f) Return the failed tape drive to Quantum Corporation for repair.

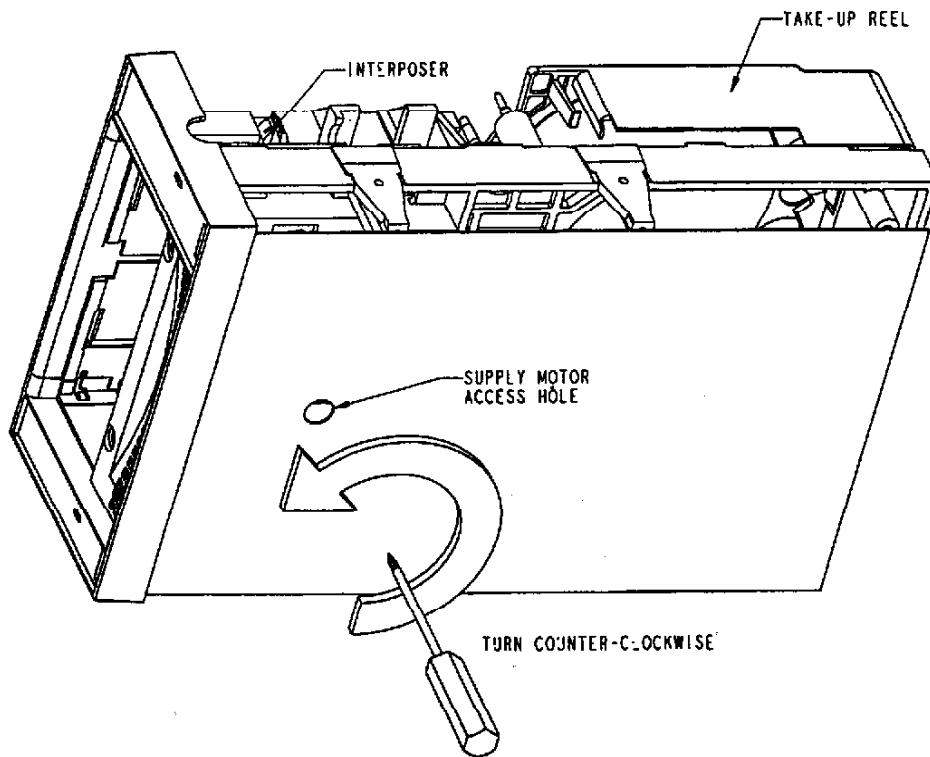


Figure 11 **Manual Rewind**

Write Protect Magnet Plate Replacement Procedure

The following procedure can be used to replace a broken Write Protect Magnet Plate. This procedure only applies to those DLT™ tape drives that utilize Hall Switch Assemblies for write protection. Older tape drives that use mechanical switches cannot be serviced. Drives with broken mechanical switches must be returned to the Quantum Service Center, Product Service Group.

The root cause of damage to the magnet plate is due to an attempted insertion of the cartridge before the tape drive has completed a successful power on self test (P.O.S.T.). Successful completion of P.O.S.T. is indicated to the operator if the following sequence is observed, assuming no cartridge is in the drive.

Left Side LED's - Go "ON" and then "OFF"

Right Side LED's - Go "ON" , Tape In Use blinks then Operate Handle stays "ON" steady.

Interposer opens, Audible "beep" is sounded.

If the drive handle is in the up or open position, the drive will not complete P.O.S.T.. The handle must be down for this initialization. The indication to the operator is that the LED marked Operate Handle will be blinking green. At this time the interposer is still closed.

NOTE

If the operator attempts to insert a cartridge while the handle is up and the "operate handle" is blinking, the magnet plate arm may be broken since this is the first point of contact in this position.

Important: If the arm is broken off the Magnet Plate, the broken piece must be found. If it is not found it may lodge in the supply motor or receiver mechanics and cause further damage. The drive should be returned to Quantum.

Tool required - Phillips Screwdriver for drive removal only.

The tape drive should be removed from its enclosure (reference DLT™ Tape Products Service Manual) for this service procedure. The Magnet Plate is located on the Interposer Assembly and is under spring tension as shown in Figure 12.

Replacement Procedure

1. Release the spring at both ends and gently lift it off the Interposer.
Spring part number - TSXCK-S1
Cross reference Quantum part number 90-11267-01
2. Rotate the plate counter-clockwise approximately 90 degrees and lift it off the interposer.
3. Replace with new Magnet Holder Plate.

Magnet Holder Plate - TSXCK-MH

Cross Reference - Quantum part number 70-28859-01

4. Re-install the spring .
5. Verify the new lever has freedom of movement and can close fully.
6. Re-install the tape drive and verify power on self test.
7. Load a cartridge and verify that the Write Protect LED goes on and off as the cartridge write protect lever is activated.

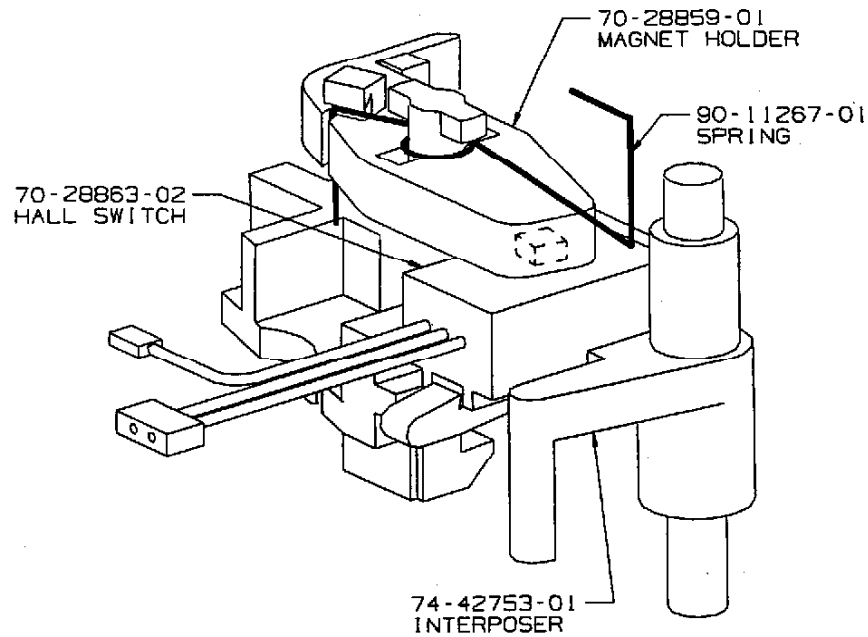


Figure 12 Interposer Assembly

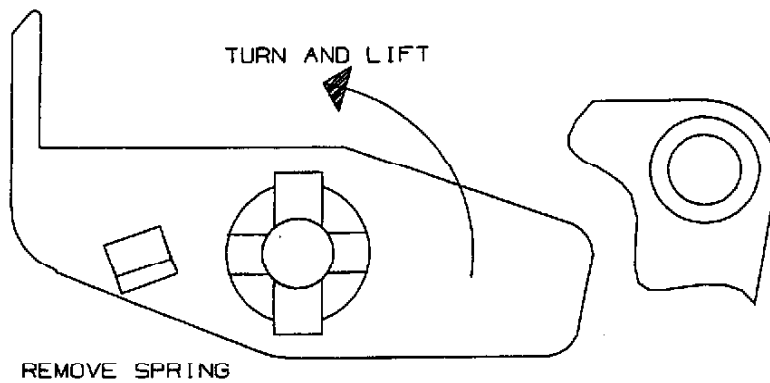


Figure 13 Magnet Plate and Torsion Spring Assembly to Interposer