

CHAPTER 1

LOADER MAINTENANCE

The loader mechanism on the Tracer/ST loads the diskette and inserts it into the drive, where it is recorded, formatted, or verified. When the drive is finished with the diskette, the loader mechanism removes it from the drive and places it in the correct bin.

This chapter describes the operation, maintenance, and problem diagnosis for the loader mechanism of 3.5" Tracer/STs. For specific information on the loader mechanism of 5.25" units, contact Trace Customer Support or refer to documentation for the Tracer 5 autoloader.

This chapter describes the following:

- Loader Mechanical Operation
- Adjustments and Maintenance
- Loader Diagnostics

CAUTION

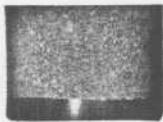
Be very careful when operating the Tracer/ST with the cover removed. Keep hair, jewelry, fingers, and loose clothing away from all moving parts.

Section 1-1: Loader Mechanical Operation

The Tracer/ST has four sensors which are wired to a sensor board on the left side of the unit (See Figure 1.1). These sensors monitor the movement of diskettes through the Tracer/ST. When the sensors report an unexpected condition, an error occurs (See Chapter 3 for more details about error states).

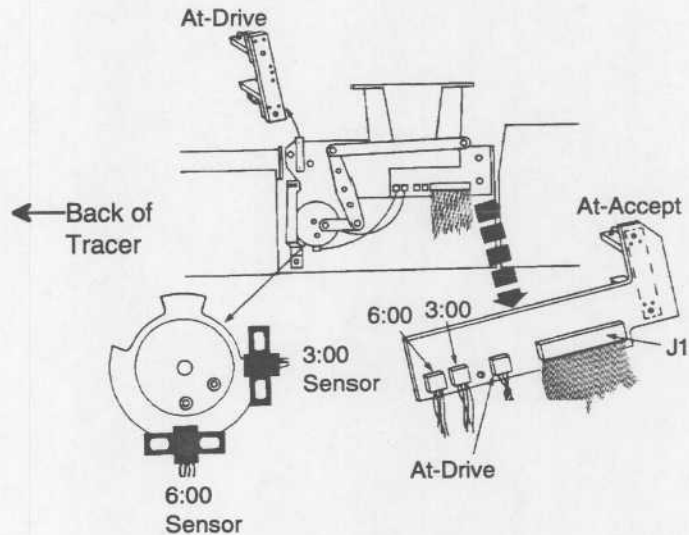
The At-Drive and At-Accept sensors monitor the movement of the diskette. The 3:00 and 6:00 sensors track the position of the crankwheel.

The crankwheel is responsible for most of the mechanical operation (See Figure 1.2). Behind the crankwheel is a small white roller which acts as a cam to engage various levers at different times to make the mechanisms work.



1-1: Loader Mechanical Operation—continued

The SENSORS feature under the **OPTION** menu displays the current status (BLOCKED or CLEAR) of all four sensors. Access the SENSORS feature by selecting the softkeys [Utility]:[Loader]:[Diags]. Press the softkey labeled -more- twice, and then press SENSORS. Test each sensor by blocking the space between the two blades. If the sensor is working normally, the LCD will indicate BLOCKED for that sensor.



**Figure 1.1: 3.5" Sensor Board and Sensors
(Tracer/ST Left Side View)**

1-1: Loader Mechanical Operation—continued

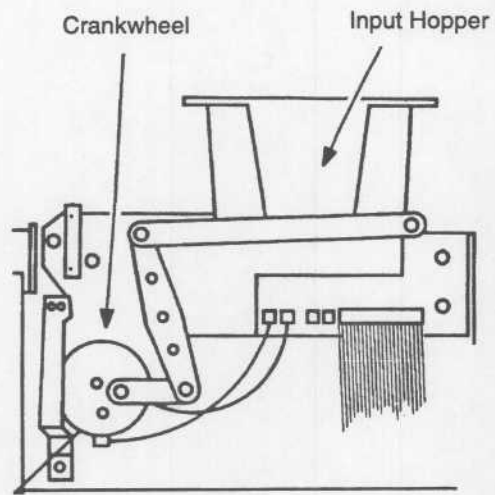


Figure 1.2: Right Side of the Tracer/ST

The crankwheel has three positions, described in terms of the hours on a clock (See Figure 1.3). As the crankwheel moves from one position to another it performs Pick, Poke, and Eject operations.

1-1: Loader Mechanical Operation—continued

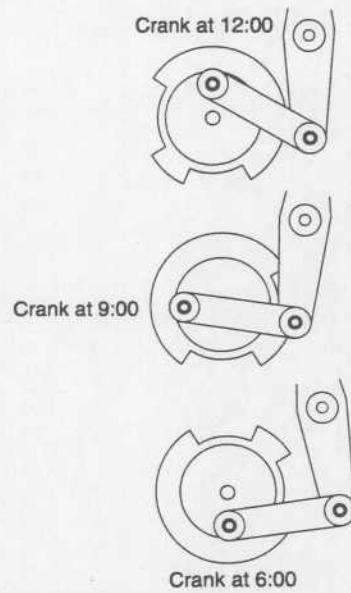


Figure 1.3: Crankwheel Positions

The mechanical operation proceeds as follows:

6:00—Home Position

This is the idle position of the crankwheel. The picker is ready to push the bottom diskette out of the input hopper (See Figure 1.4).

1-1: Loader Mechanical Operation—continued**6:00 to 3:00 to 12:00—Pick Motion**

The crankwheel rotates in counterclockwise direction. The picker bar (not visible) pushes a diskette from the input hopper to the roller bars. As soon as the crankwheel is in motion the rollers begin to spin forward (clockwise) to send the diskette to the drive. The diskette is sent to the front of the drive. When the crankwheel reaches the 12:00 position, the pick is complete.

As the crankwheel rotates from 6:00 to 12:00, the bottom stacker's two fingers are activated to raise to a full lift, which stacks the last diskette. At the end of an operation, the last diskette is stacked.

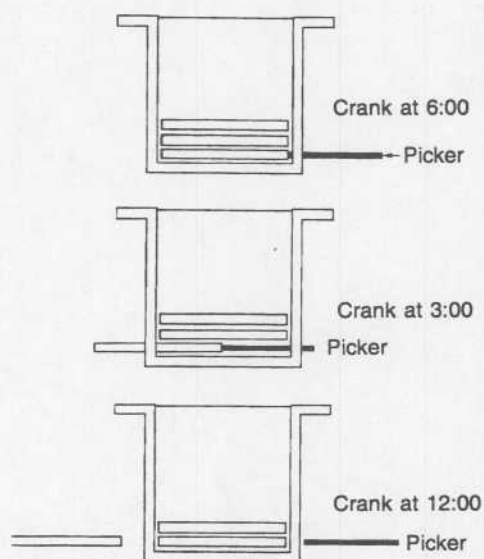


Figure 1.4: Diskette Picker Positions



1-1: Loader Mechanical Operation—continued

12:00 to 9:00—Poke Motion

The rollers bring the diskette to the drive, and the poker pushes the diskette into the drive (See Figure 1.5). The rollers stop spinning.

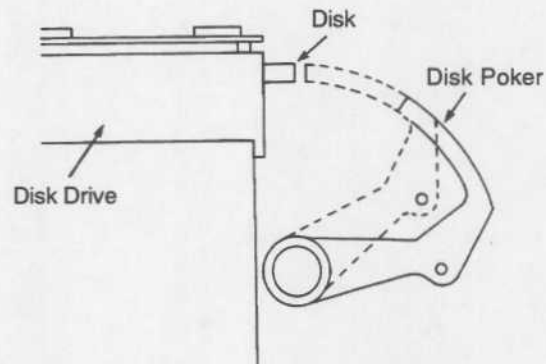


Figure 1.5: Diskette Poker Positions

9:00 to 6:00—Eject Diskette

The diskette release bar pushes the eject button on the diskette drive (See Figure 1.6), the diskette is ejected and the rollers, now spinning counterclockwise, send the diskette to the appropriate bin (accept or reject on duplicators and formatters; high-clip, low-clip, or reject on certifiers).

1-1: Loader Mechanical Operation—continued

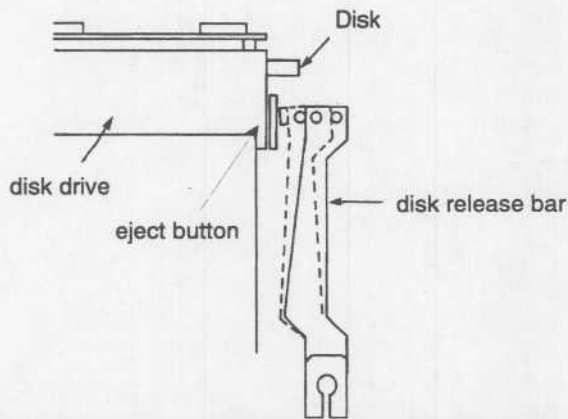


Figure 1.6: Diskette Eject Arm Positions

6:00 to 9:00—Reject Diskette

If a duplication error occurs and the diskette needs to be rejected, the crankwheel immediately rotates clockwise after ejecting the diskette, and the diskette is pulled back until it clears the At-Accept sensor. The stacker fingers are raised to a half lift position, and the diskette is rolled into the reject bin (slightly different on 3-bin Certifier-Formatters). When the diskette cannot be pulled back, or is pulled back too far, a jam occurs (See Subsection 4-2-1).

Section 1-2: Adjustments and Maintenance

This section contains instructions for the variety of adjustments, including routine preventive maintenance, which may be required to keep your loader mechanism functioning correctly. This section covers the following topics:

- Preventive Maintenance
- Bottom Stacker Adjustment

1-2-1: Preventive Maintenance

Trace recommends the following preventive maintenance measures to ensure that your Tracer/ST operates smoothly.

Every 8 hours of use

- Clean the drive and rollers thoroughly (procedures described in user's manual).

Every 25,000 diskettes

- Clean the tubing on all roller shafts. Use an ammoniated window cleaner or isopropyl alcohol. Be careful not to get any alcohol into the ball bearings.
- Remove contamination from the bearings and rollers.
- Remove any contamination from all sensors. Check to make sure all sensors are functioning properly.
- Blow or vacuum the loader.
- Check that the picker is parallel to input hopper wall.
- Check the drive belt for stretching and the weld for defects.



1-2: Adjustments and Loader Maintenance—continued

- Clean the external cover, hoppers, and drawer. Wipe with a clean, lint-free cloth; use mild soap solution if needed.

Every 100,000 diskettes

- Check all roller and ball bearings (both radially and axially) for excessive play.
- Check for noisy bearings while the Tracer/ST is running.
- Check that the bottom stacker finger height is centered in the middle of the white bar (See Subsection 1-2-2).
- Check that the bottom stacker fingers and diskette retainers are able to move freely.

Every 500,000 diskettes

- Clean tubing on all roller shafts and inspect for excessive wear. Replace tubing when it hardens, or when it has worn halfway through.

NOTE

No oil is required for normal operation of the Tracer/ST.



1-2: Adjustments and Loader Maintenance—continued

1-2-2: Bottom Stacker Adjustment

Another adjustment which may be necessary (depending on the amount of use) is adjustment of the bottom stacker assembly, which stacks duplicated diskettes in first-in, first-out order. If your diskettes are jamming frequently, you may need to make this adjustment.

1. To move the stacker fingers to their lowest position, press the **OPTION** button. Then press the softkeys labeled [Utility], [Loader], and [Diags]. Press POKE, then EJECT.
2. The stacker fingers will move to their lowest position. Examine the fingers. Their tips should fall exactly halfway between the narrow wall between the accept and reject slots (See Figure 1.7).
3. If the fingers appear to be at the correct height, resume ordinary operation. If your jamming continues, contact Trace Customer Support.

If the fingers are not where they should be, they need adjustment.

4. Remove the left side panel (as you face the Tracer/ST from the front) on the bottom stacker. This panel is also called an "end cap."

The end cap is held in place by a Velcro-type material. Grip and pull firmly on the edges of the end cap. If you must use tools, be careful not to damage the Tracer/ST.



1-2: Adjustments and Loader Maintenance—continued

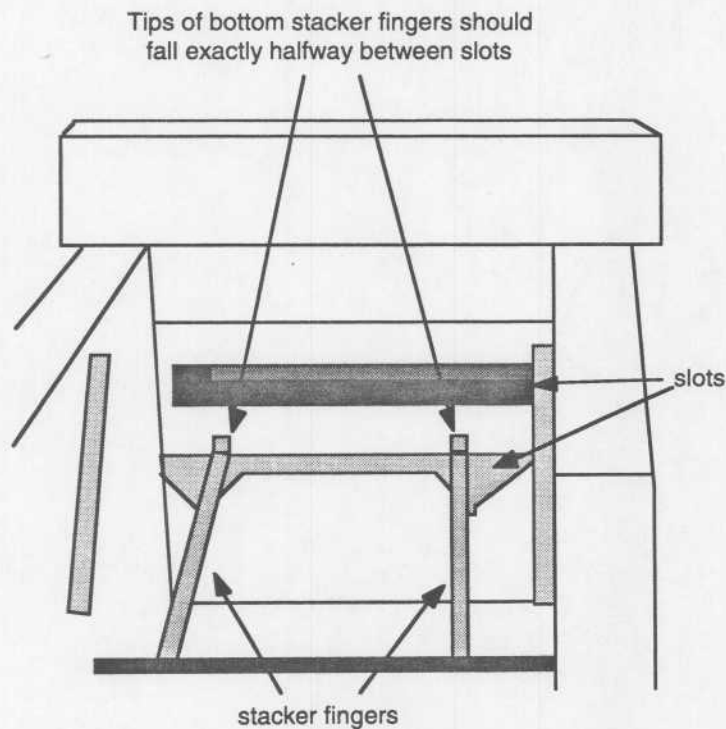


Figure 1.7: Optimal Stacker Finger Height

5. When the end cap is removed, loosen the Allen screw (shown in Figure 1.8) using a 9/64" Allen wrench until the stacker arms are in the proper position displayed in Figure 1.7 (pushing the rod towards the Tracer/ST causes the arms to go lower). Tighten the screw. Refer to Figure 1.8 for location of parts.



1-2: Adjustments and Loader Maintenance—continued

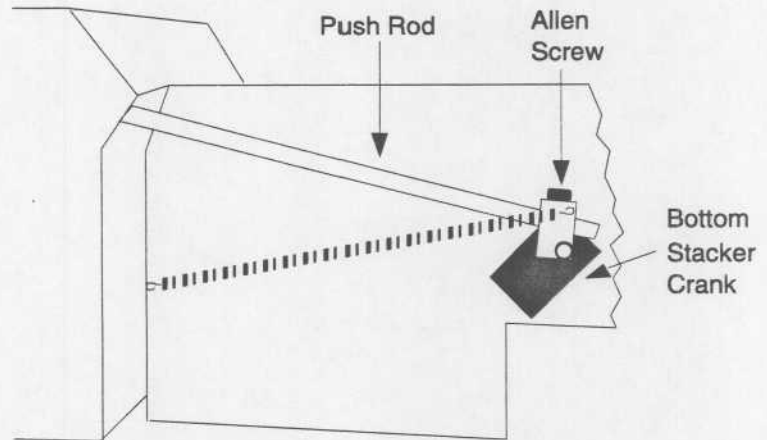


Figure 1.8: Adjusting Stacker Fingers

6. Replace the end cap. If your jamming persists, contact Trace Customer Support.
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Section 1-3: Loader Diagnostics

The Tracer/ST offers several software options which enable you to run the system mechanically without performing duplication and to isolate specific movements of the loader mechanism. This subsection describes the loader exercising functions.

CAUTION

Be very careful when operating the Tracer/ST with the cover removed. Keep hair, jewelry, fingers, and loose clothing away from all moving parts.

1-3-1: Cycle Loader

These three tests allow you to run the Tracer/ST without duplicating diskettes, to test the mechanics. The [Cycle] menu is located in the option menu tree, under [Utility]: [Loader]. The tests function as follows:

- ACCEPT Insert diskettes from the input hopper and eject them to the accept hopper (ACCEPTHI and ACCEPTLO for high- and low-clip accept bins on 3-bin Certifier-Formatters)
- REJECT Insert diskettes from the input hopper and eject them to the reject drawer
- NODISKS Go through the motions of inserting and ejecting diskettes, but with no diskettes in the system

ACCEPT and REJECT will run until the input hopper is empty, and then prompt the user to choose CONTINUE or QUIT using the softkeys. NODISKS runs until you press the **CLR/STOP** button.



1-3: Loader Diagnostics—continued**1-3-2: Individual Functions**

The individual functions also test the mechanics, by breaking the duplication cycle down into three separate motions: inserting diskettes, ejecting diskettes to the accept hopper, and ejecting diskettes to the reject drawer. The individual functions are listed on the [Manual] menu, which is located in the option menu under [Utility]: [Loader].

There are four options on the [Manual] menu, which perform the following functions:

INSERT	Insert one diskette from the input hopper
ACCEPT	Eject one diskette from the drive to the accept hopper (ACCEPTHI and ACCEPTLO for high- and low-clip accept bins on 3-bin Certifier-Formatters)
REJECT	Eject one diskette from the drive to the reject drawer
CLEAR	Clear all diskettes from the system

The system may issue an error message if you attempt to perform functions out of order (for example, if you press REJECT when there is no diskette in the drive). If an error message appears, press any key to clear the message.

1-3: Loader Diagnostics—continued**1-3-3: Crankwheel and Roller Movements**

The seven functions on the [Diags] menu perform even smaller motions of the various cranks and rollers in the loader mechanism. When you enter the menu, only the first three options are displayed. To see additional options, press the softkey labeled **-more-**. The **-more-** softkey will scroll through all available softkey options. [Diags] is located in the option menu tree, under [Utility]:[Loader]. These tests should only be performed when the input hopper is empty.

PICK	Push bottom diskette in input hopper to At-Drive roller (rear roller)
POKE	Push diskette into drive
EJECT	Hit eject bar on drive
CYCLE	Repeat PICK, POKE, and EJECT
FORWARD	Spin rollers toward drive for 2.5 seconds, pause, and repeat
BACKWARD	Spin rollers away from drive for 2.5 seconds, pause, and repeat
SENSORS	Display current status of all four diskette sensors on the LCD (CLEAR or BLOCKED)

