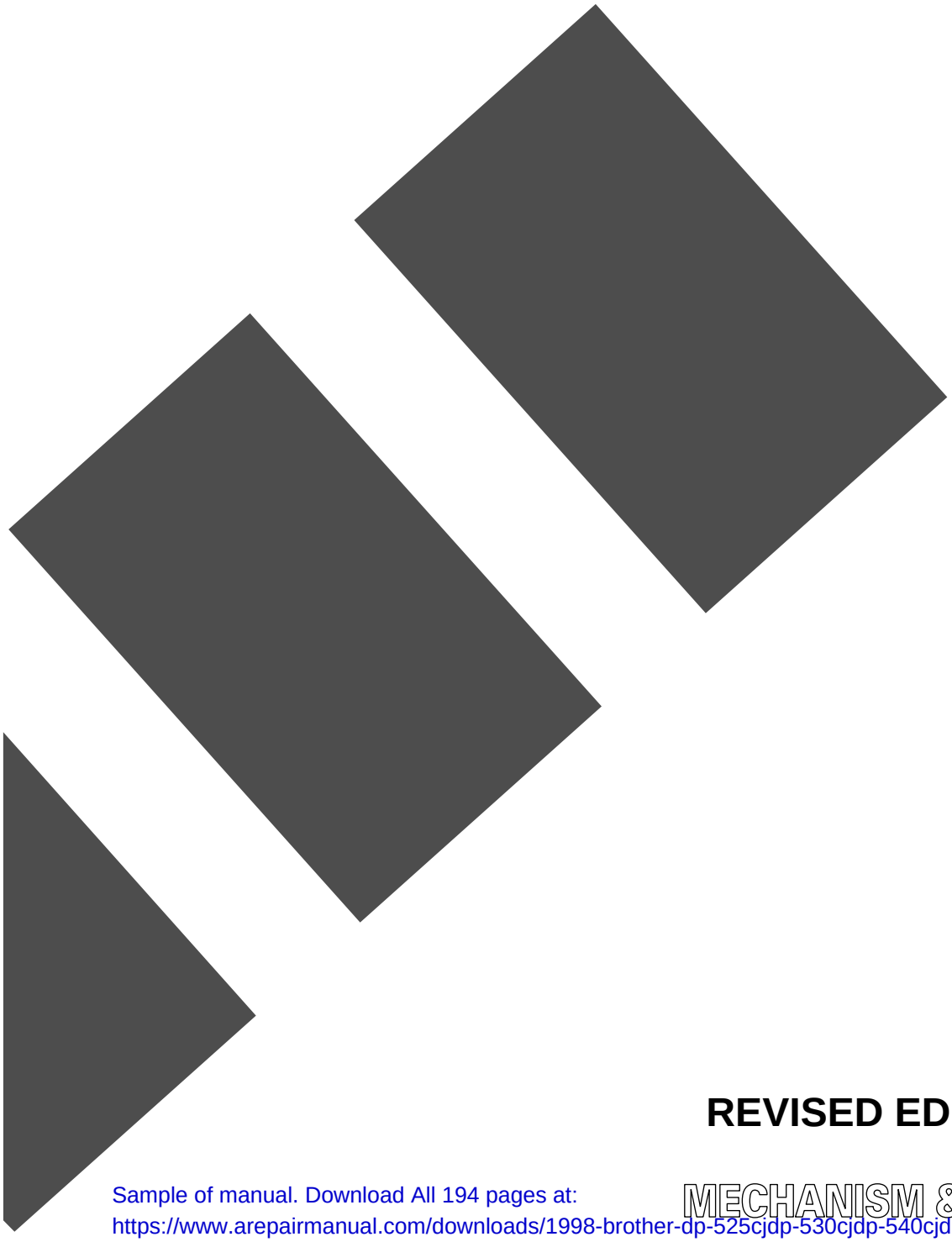
brother®

WORD PROCESSOR
SERVICE MANUAL

MODEL:DP-525CJ/DP-530CJ/DP-540CJ/DP-550CJ
LW-800ic/LW-810ic/LW-810icBL/LW-840ic



REVISED EDITION

MECHANISM & ELECTRONICS

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PART I THEORY OF OPERATION

CHAPTER 1 MECHANICAL THEORY

1. Ink Jet Printer

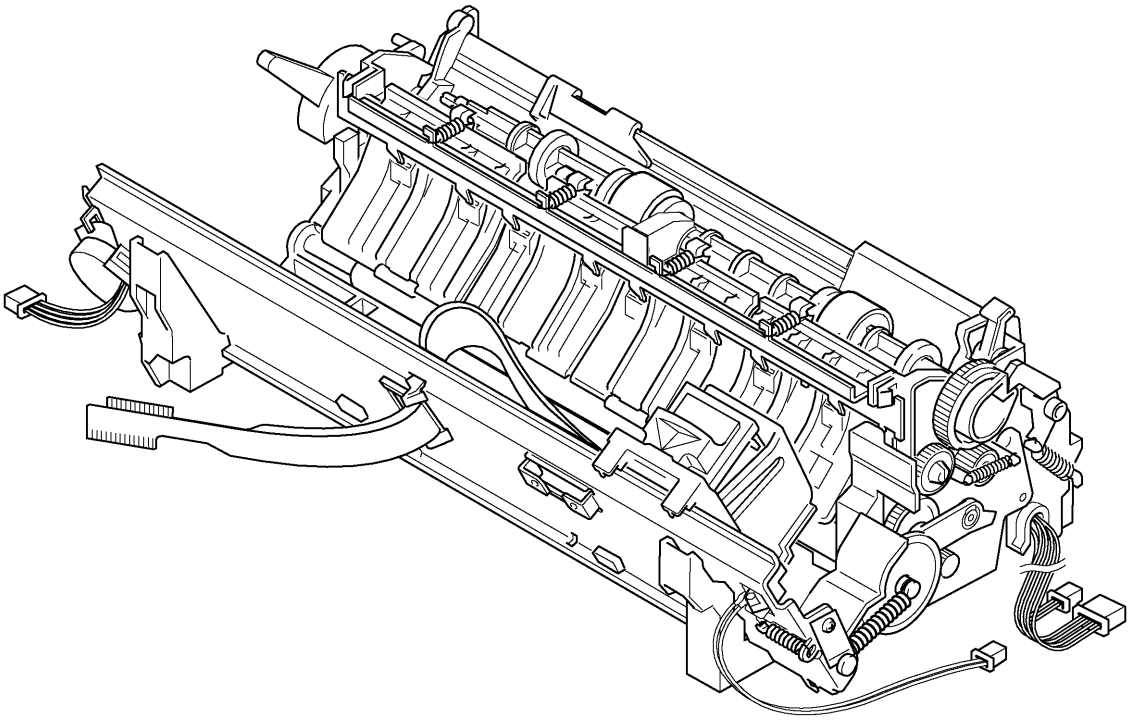

Fig. 1.1 Ink Jet Printer Assembly

1.1. Ink Jet Printer System Configuration

The ink jet printer contains the following components:

- Carriage assembly
- Carriage motion control system
- Paper feed mechanism
- Maintenance station
- Sensors

The outline of these components are described below.

1. Carriage Assembly

   The carriage assembly consists of the carriage and ink cartridge (the cartridge contains the ink jet nozzles). The carriage consists of the head locker and locker spring, the rubber pad, and the flat cable.

2. Carriage Motion Control System

   The carriage motion control system consists of the carriage motor, motor pulley, timing belt, idle pulley, and the idle pulley holder and holder spring.

3. Paper Feed Mechanism

   The paper feed mechanism consists of the paper feed system, paper eject system, and the paper setting system.

4. Maintenance Station

   The maintenance station consists of the MS holder, the MS carriage assembly (carriage, rubber cap, plunger, compression spring, and extension spring), the wiper, and the felt form ink absorbers (in spitting trough and under carriage assembly).

5. Sensors

   There are two sensors in the printer assembly: the carriage home position sensor (attached to the top right end of the CA frame) and the paper end sensor (attached to the bottom of the PF base at the right rear).

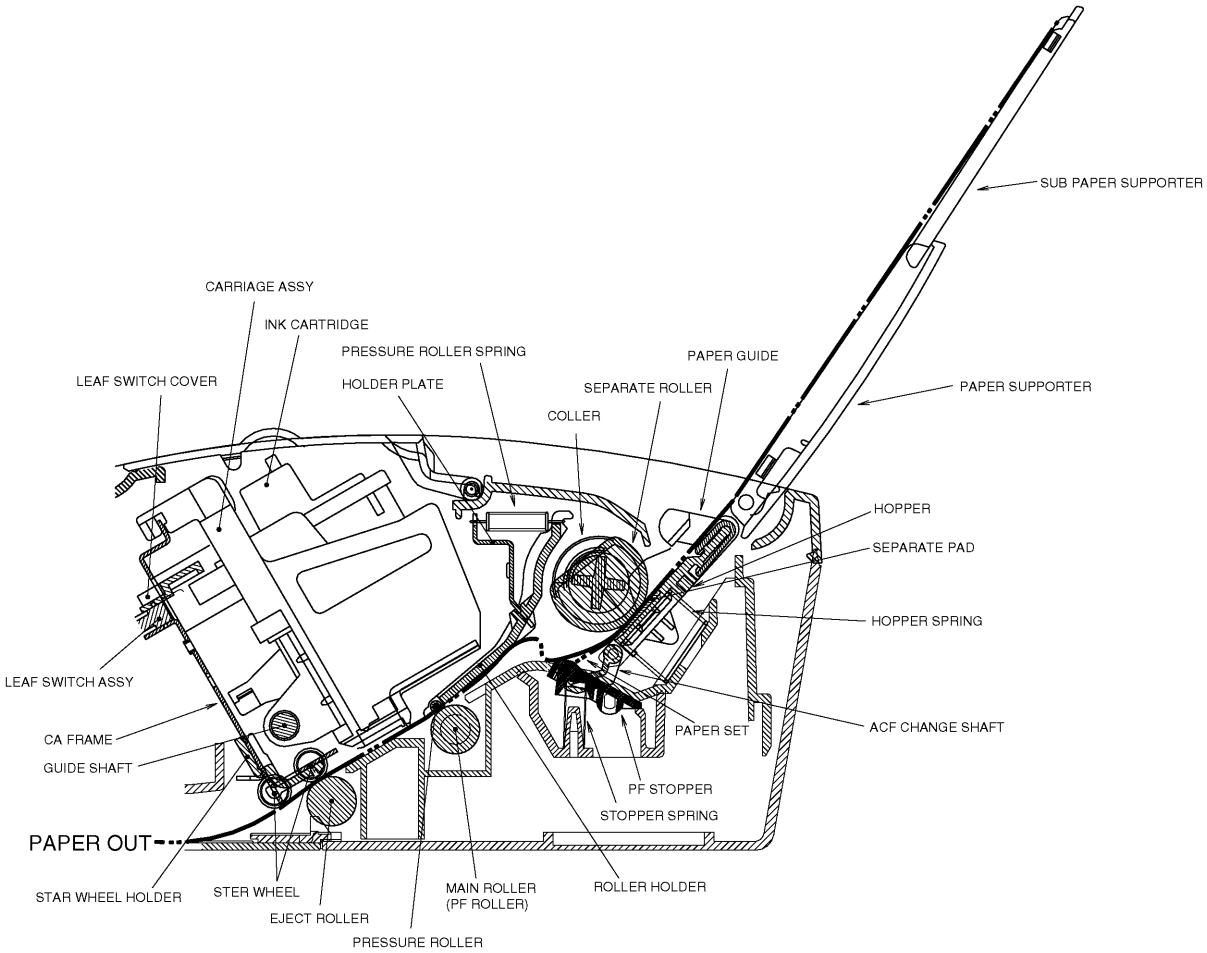

Fig. 1.2 General View of Printing Mechanism

1.2. Ink Jet Operation

1.2.1. Paper Feed Mechanism

The paper feed mechanism consist of the paper feed system, paper eject system, and the paper setting system.

(1) The paper feed system consists of the ACF shaft gear, separate roller, ACF shaft locker, locker spring, idle gears 1, 2, 3, and 4, PF roller gear, changer lever 1 and 2, spring, and the line feed motor.
Paper feed system ACF(Auto cut-sheet feeder)
When the paper feed motor is driven in the opposite direction (reverse rotation) of the paper feeding, the change lever 1 moves to engage the ACF shaft gear via the idle gear. The separate roller rotates in the paper separation direction (normal rotation) and separates a sheet of paper. The separate roller rotates with paper feeding operation and returns to the initial position. Separated paper is fed to contact PF roller and the pressure roller by the separate roller where the top of the paper is registered.

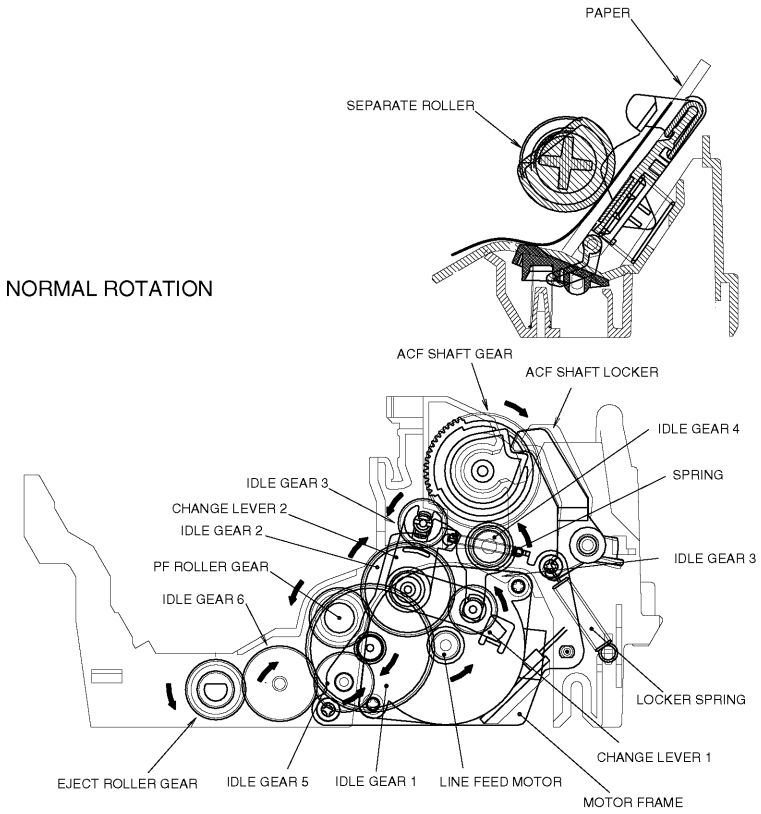

Fig. 1.3A Paper Feed Mechanism

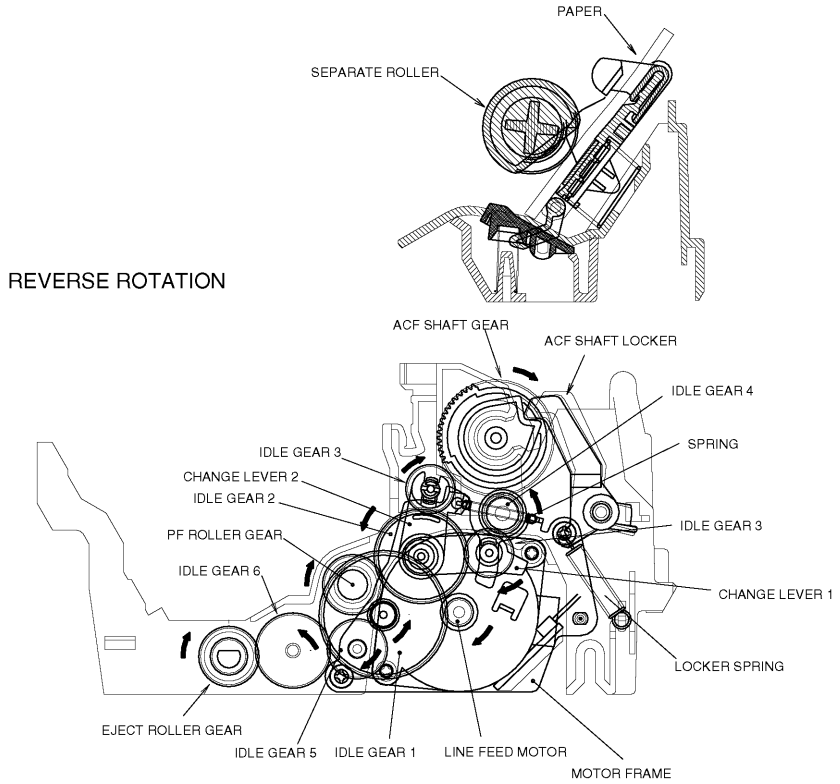

Fig. 1.3B Paper Feed Mechanism

(2) The paper eject system consists of the line feed motor, collar, idle gears 1, 5, and 6, PF roller gear, eject roller gear, pressure roller, roller holder, holder plate, pressure roller spring, star wheel holder, and the star wheel.
After paper is registered, the paper feed motor is driven in the paper feeding direction (normal rotation) and paper is fed by the PF roller and the pressure roller. After printing paper is ejected by the eject roller and star wheel.

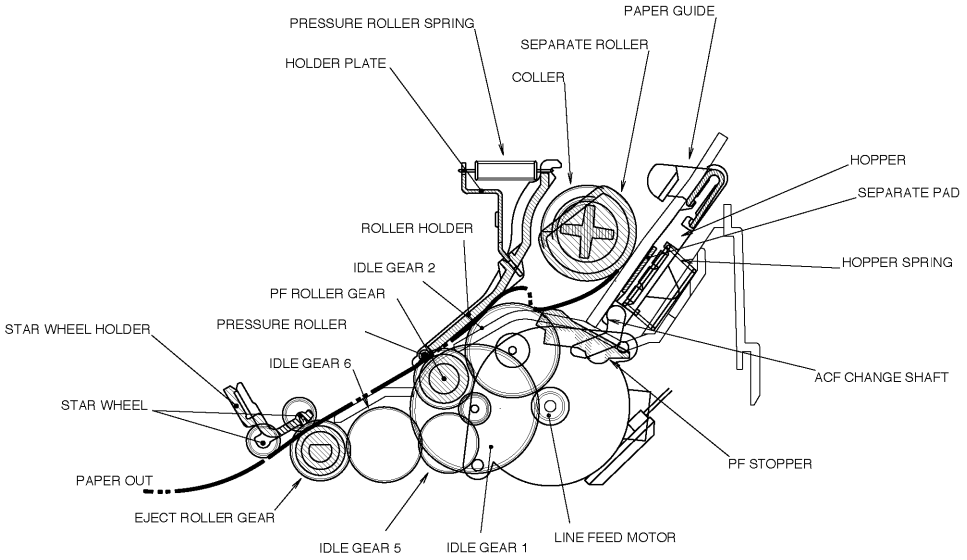

Fig. 1.4 Paper Eject System

(3) The paper setting system consists of the hopper, hopper spring, separate pad, collar, paper guide, ACF change lever, change spring, and the ACF change shaft. When inserting a thick paper, the ACF change lever should place at the front position.

24lb Thick Paper
Envelope
Label
Transparency etc.

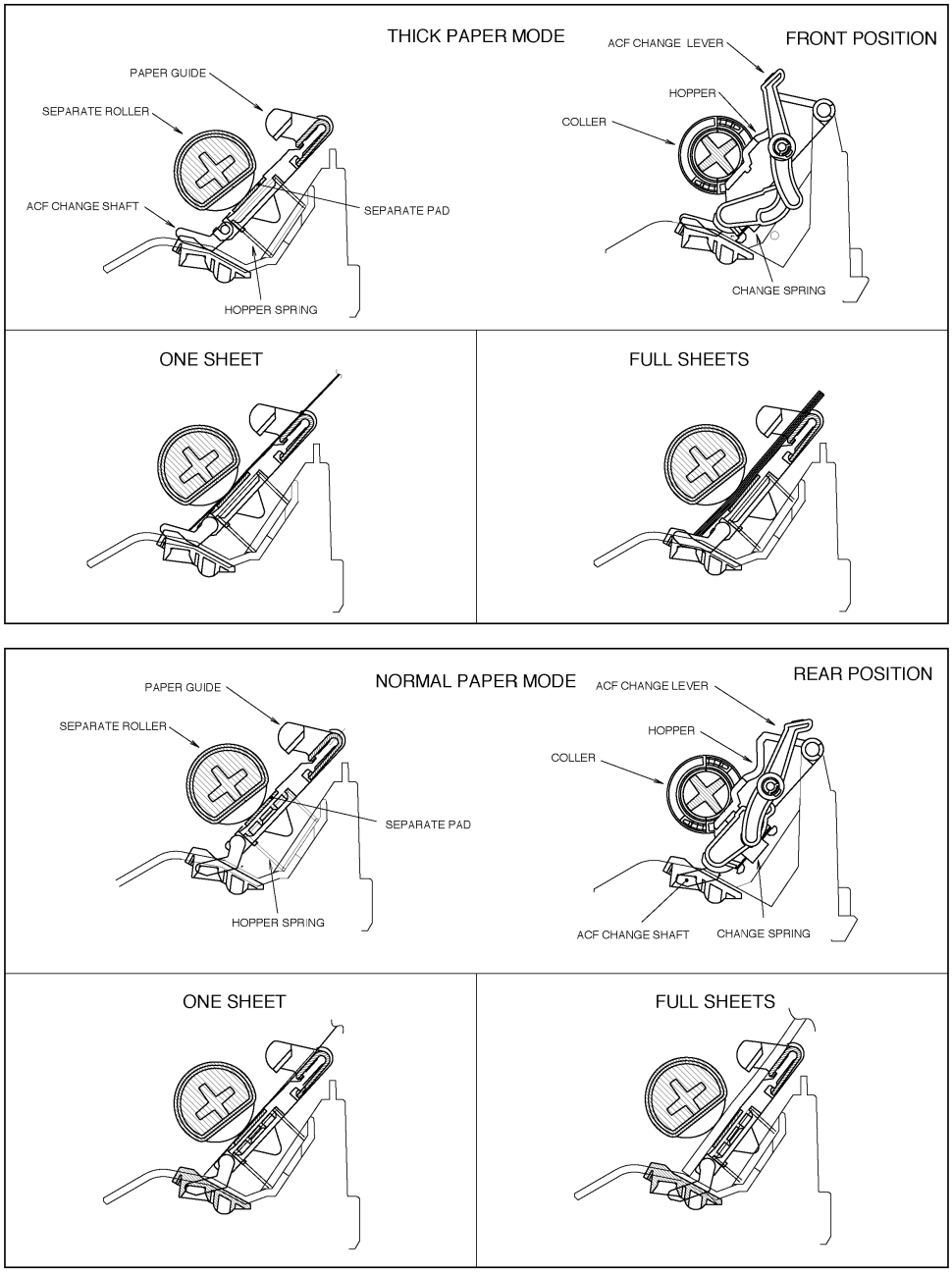

Fig. 1.5 Paper Setting System

1.2.2. Carriage Assembly

The carriage assembly consists of the carriage and ink cartridge (the cartridge contains the ink jet nozzles). The carriage consists of the head locker and locker spring, the rubber pad, and the flat cable. The flat cable connects to the main PCB. See Fig. 1.6.

The printer flat cable must be firmly in contact with the ink jet cartridge for printing to be enabled. The flat cable is located in the carriage by four alignment pins; proper alignment of the cartridge to the cable is established in three datums (reference planes/points): X, Y, and Z. When the cartridge is installed in the carriage, the flat cable contacts are compressed against the cartridge contacts by the rubber pad. See Figs. 1.7 and 1.8.

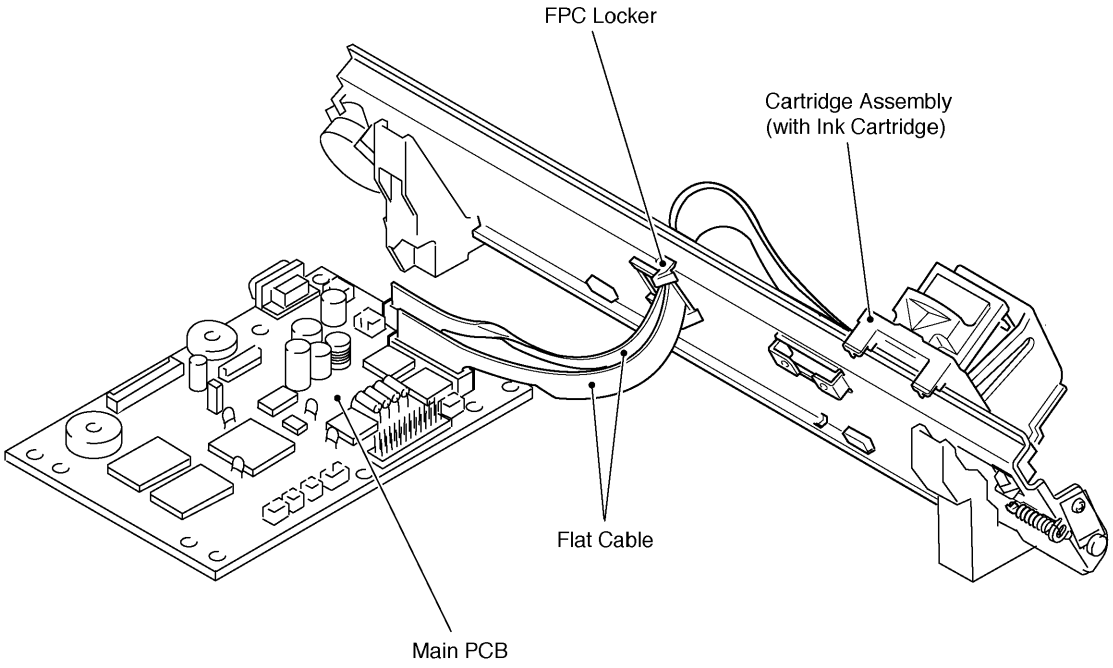

Fig. 1.6 Printer Flat Cable to Main PCB

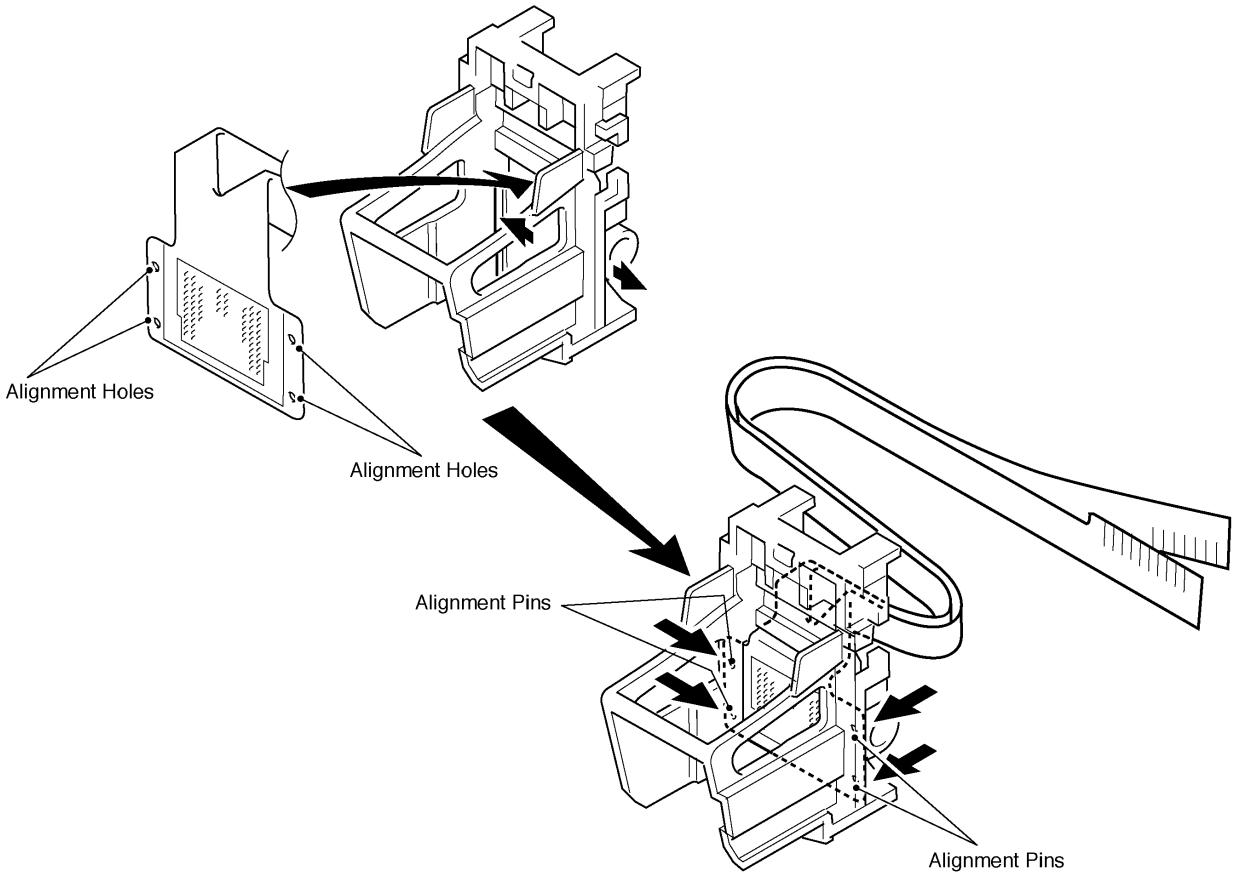

Fig. 1.7 Printer Flat Cable to Cartridge Alignment

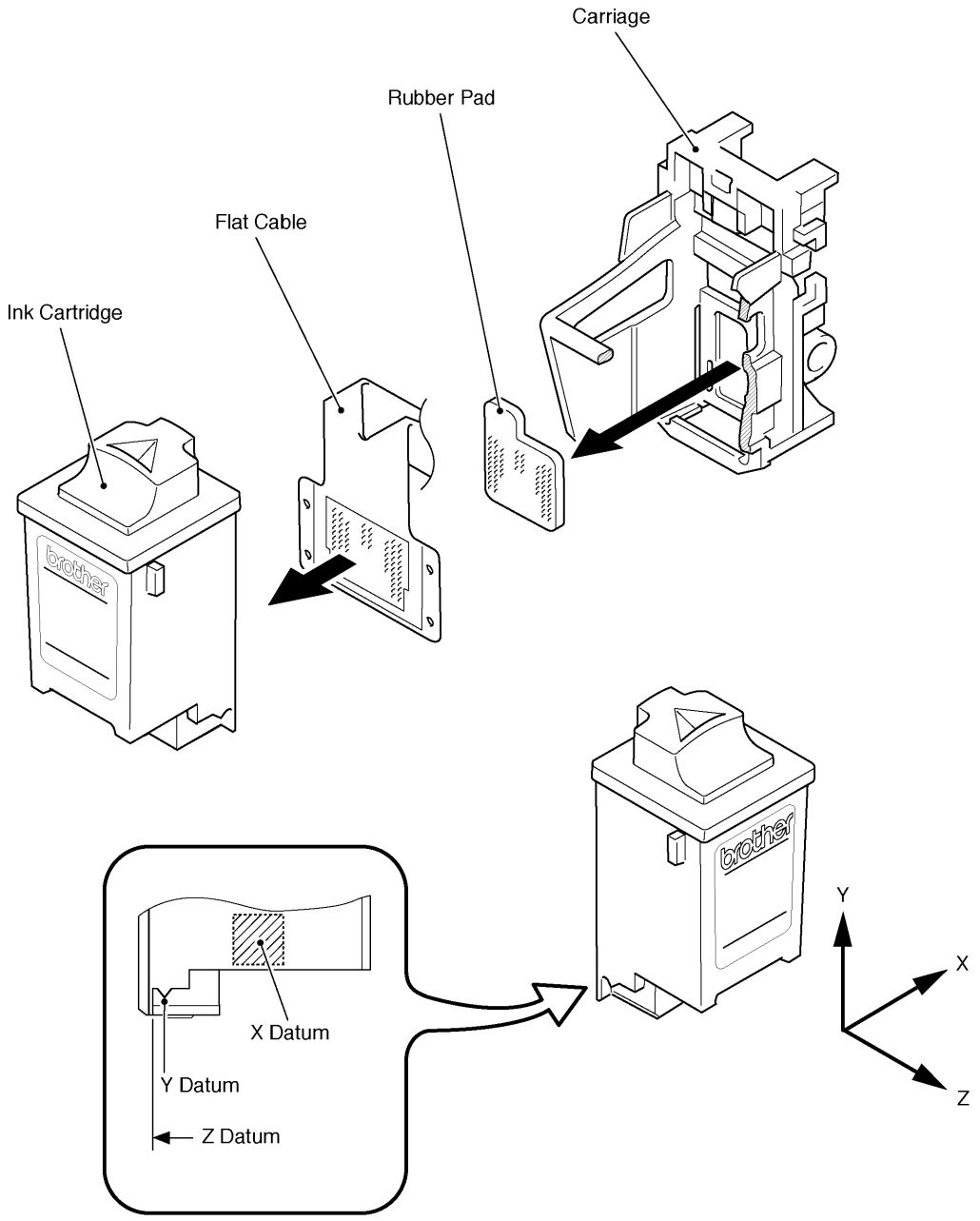

Fig. 1.8 Ink Jet Cartridge to Flat Cable Alignment

1.2.3. Carriage Motion Control

All operations related to carriage movement are driven by the CA motor. The CA motor assembly consists of a motor, a timing belt, an idle pulley, and an idle pulley holder and pulley holder spring: the motor and the idle pulley holder are mounted to the CA frame; the belt runs between the motor and the pulley. The pulley holder spring between the idle pulley holder and the CA frame sets belt tension. See Fig. 1.9.

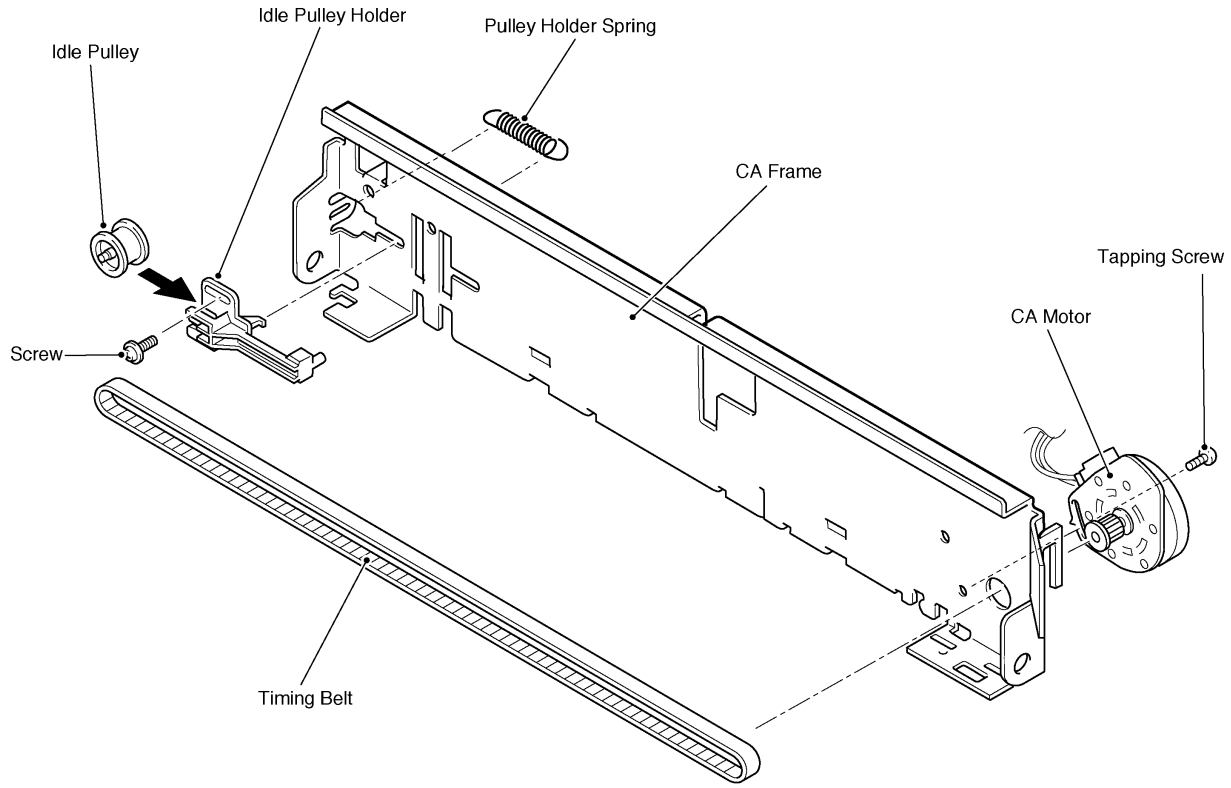

Fig. 1.9 Carriage Motion Control

1.2.4. Maintenance Station Operation

The maintenance station operation consists of spitting, wiping, capping, and purging. Table 1.1 shows a summary of maintenance operation for various printer states.

Table 1.1 Summary of Maintenance Operations

Printer State	Spitting	Wiping	Capping
Power-on	204	2	1
Beginning of print job	204 (after wiping)	1	0
Between pages of continuous printing	12	1	0
After 6 pages of continuous printing	204 (after wiping)	1	0
After 50 seconds of printing on the same page	12 (after wiping)	1	0
Purging	6,000 (after wiping)	1	1
Ink cartridge change	204 (after wiping)	1	1
If no cartridge motion for more than 30 seconds	0	1	1
Power-off	0	0	0

1.2.4.1. Spitting

Spitting is performed at machine power-on, after uncapping from the maintenance station to clear dormant nozzles, and during the printing process to ensure that infrequently used nozzles are available when required to print. There must also be spitting after a wipe cycle, except when the printhead is going to the cap position; otherwise wiping causes distorted printing if the wiper has experienced any wear.

The trough below he print line is intended to capture the ink during a spit cycle when no paper is present in the print area. The cup around the wiper is used when spitting is required and paper is present in the print area. Spitting with paper in print area occurs when a single page requires longer than 50 seconds to print. All spitting occurs in trough. At power on, any paper in the print area is ejected.

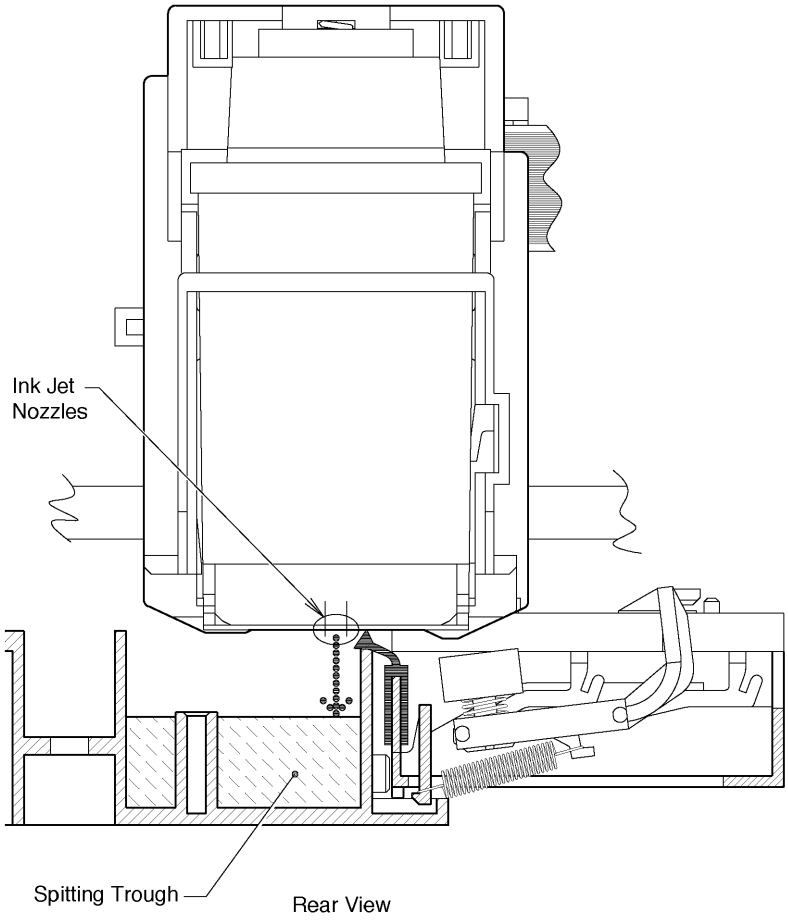

Fig. 1.10 Print Maintenance Operation - Spitting

1.2.4.2. Wiping

Wiping of the print head occurs when the cartridge moves across the wiper (in either direction). The printhead is wiped (twice) when power is turned on, when beginning a print job (after the print head has been capped for more than four minutes), after six pages of continuous printing, after 50 seconds of printing on the same page, and after purging or changing the ink cartridge.

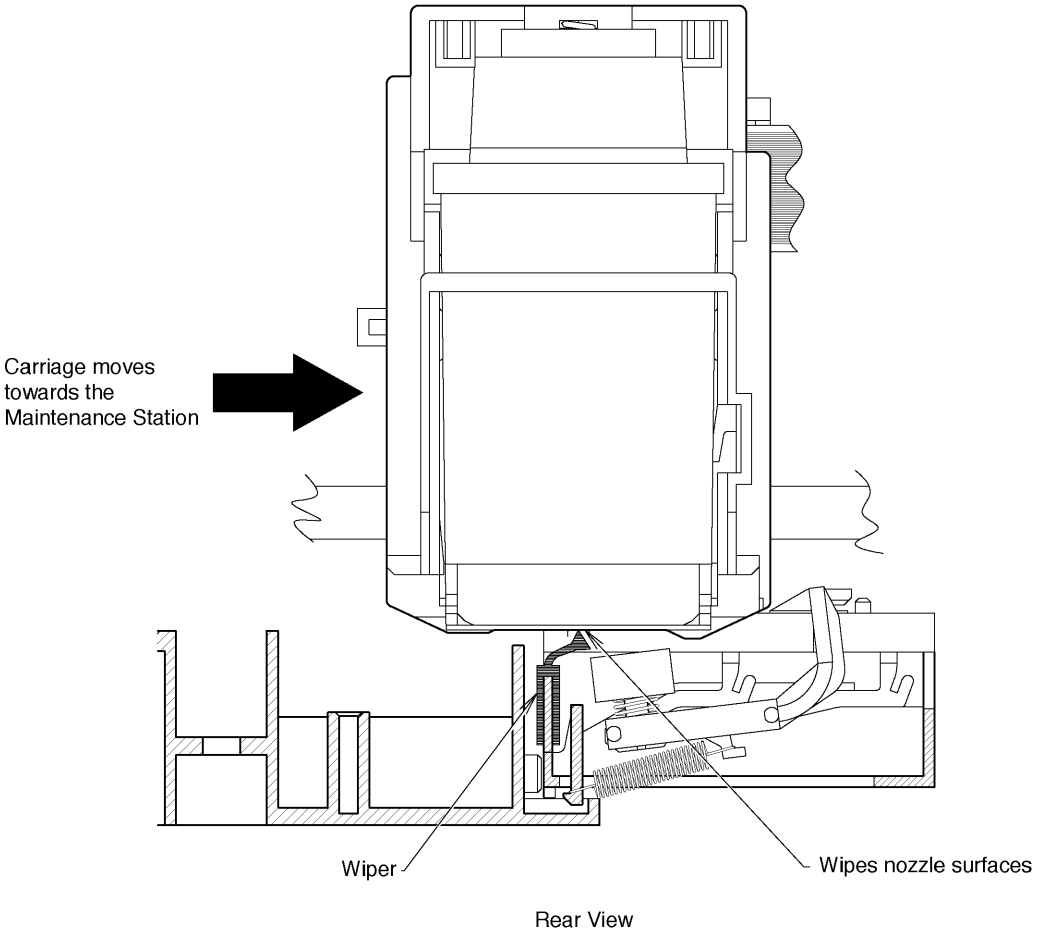

Fig. 1.11 Print Maintenance Operation - Wiping

1.2.4.3. Capping

Capping occurs by the movement of the carriage assembly to the maintenance station, which moves the MS carriage up to the ramp to align the rubber cap with the ink jet nozzles. The rubber cap prevents the ink from drying and causing the printhead to clog. The printer will automatically cap the printhead when the system is powered on, when no data is received for 30 seconds, and after purging or ink cartridge change.

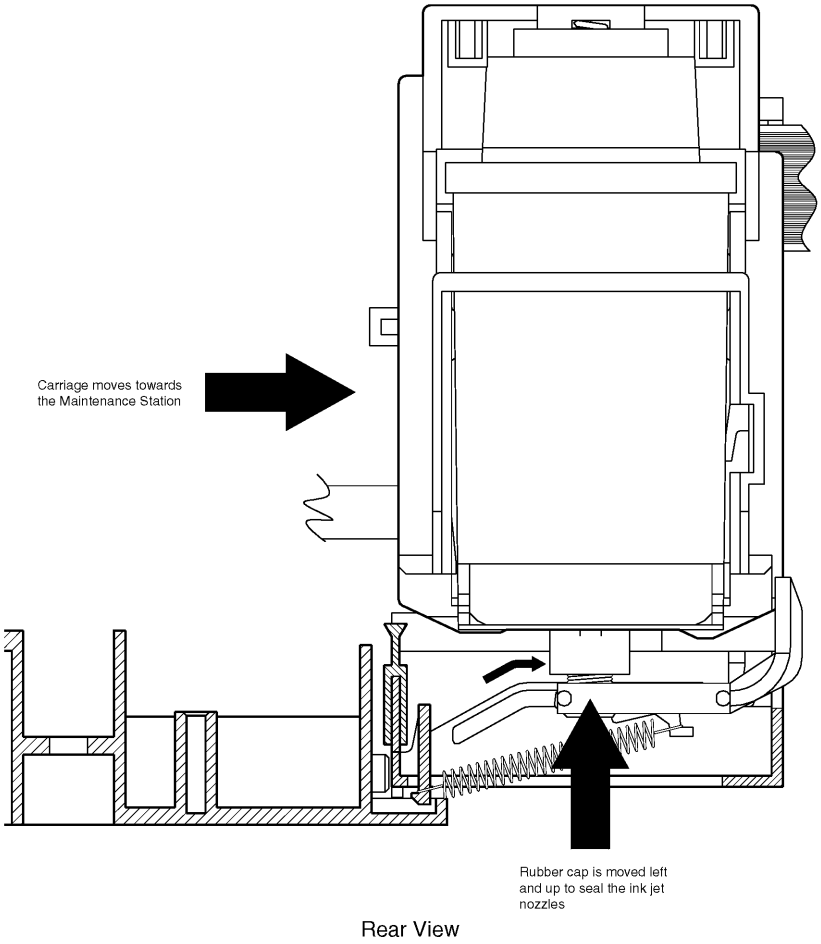

Fig. 1.12 Print Maintenance Operation - Capping

1.2.4.4. Purging

The purging function of the maintenance station is a combination of the wipe, cap, and spit operations. This initiates a sequence of 6,000 spits of each nozzle, in order to clear clogged ink from the nozzles. The ink is captured in the trough located below the print line. Purging is user-activated by pressing **CODE + SHIFT + INK CHG** from the keyboard. See 3. "Cleaning the Print head" in Chapter 5, MAINTENANCE, for instructions.

1.2.5. Sensors

There are two sensors in the printer assembly: the carriage home position sensor (leaf switch assembly, attached to the right end of the CA frame) and the paper end sensor (attached to the bottom of the PF base at the right rear).

1.2.5.1. Carriage Home Position Sensor

Upon power-up of the system or when the carriage is reset, the carriage moves to the right end of the printer assembly and activates the home position sensor (leaf switch assembly). See Fig. 1.13.

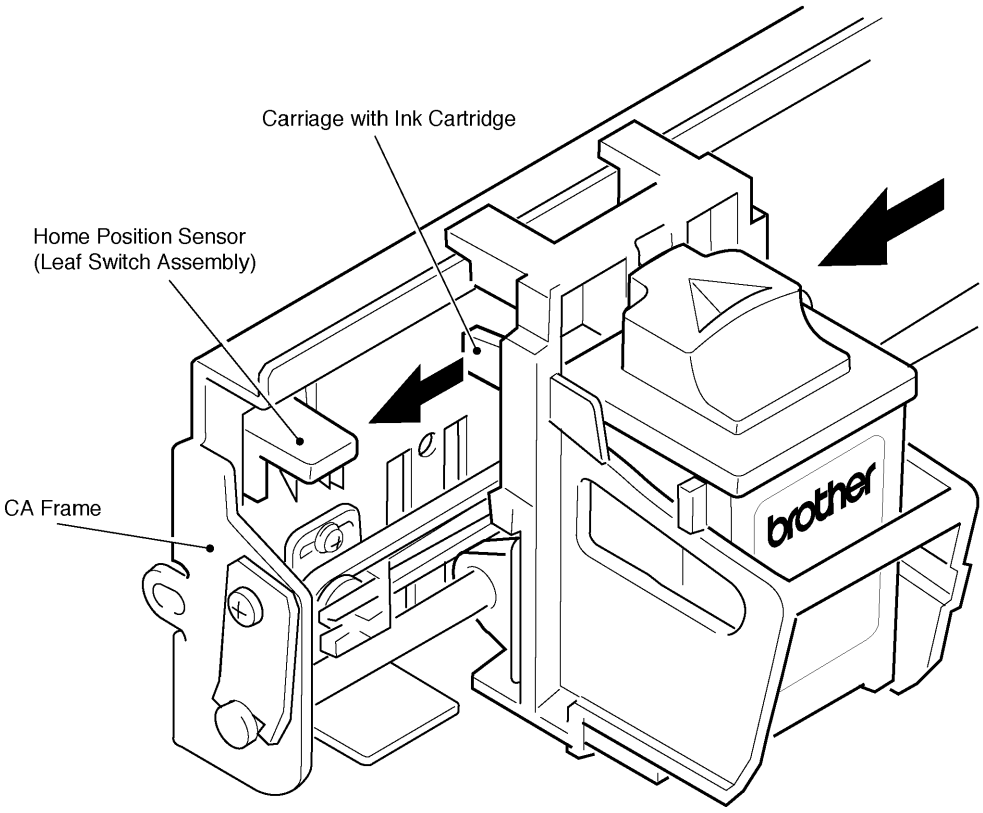

Fig. 1.13 Carriage Home Position Sensor

1.2.5.2. PE Sensor

PE sensor detects when the trailing edge of the paper passes the knob of PE sensor. PE sensor is 1C-1P Switch (normal open.) See Fig. 1.14.

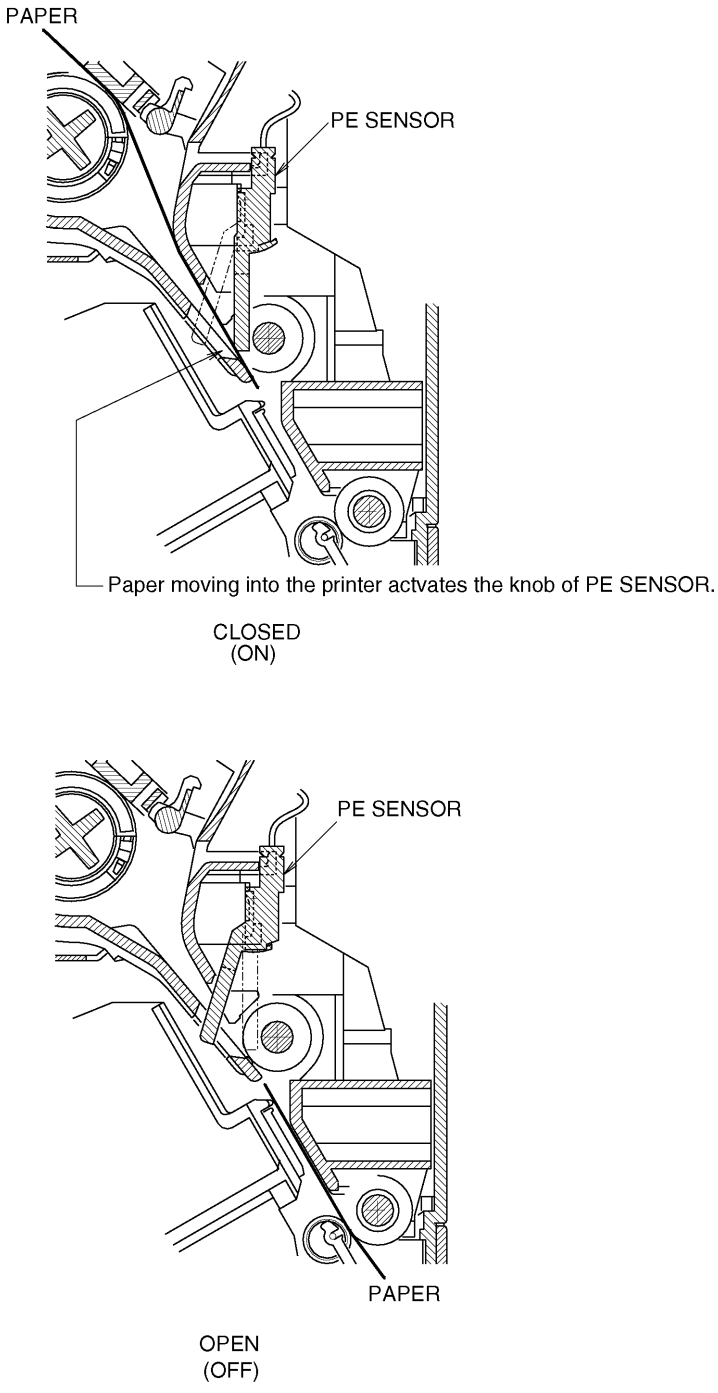

Fig. 1.14 PE Sensor Mechanism

1.3. INK CHG (Ink Change) Functions

There are two operator-initiated printer maintenance functions available from the keyboard: ink cartridge replacement and automatic printhead cleaning (purging).

1.3.1. Ink Cartridge Installation/Replacement

There is an ink cartridge installation/replacement function available from the keyboard. Pressing the key combination **CODE + INK CHG** moves the printhead from the maintenance station to the right end of the printer assembly. Pressing RETURN after installing or replacing the ink cartridge initializes the system: the cartridge activates the home position sensor switch and moves the printhead back to the maintenance station. See Chapter 5, MAINTENANCE, for ink cartridge replacement instructions.

1.3.2. Automatic Print head Cleaning (Purging)

With the ink cartridge installed, pressing the key combination **CODE + SHIFT + INK CHG** initiates print head purging. See Chapter 5, MAINTENANCE, for the instructions to manually clean the print head.

2. Keyboard

The keyboard assembly consists of the keyboard panel and keys, the FPC (flexible printed circuit) board, and the keyboard base plate.

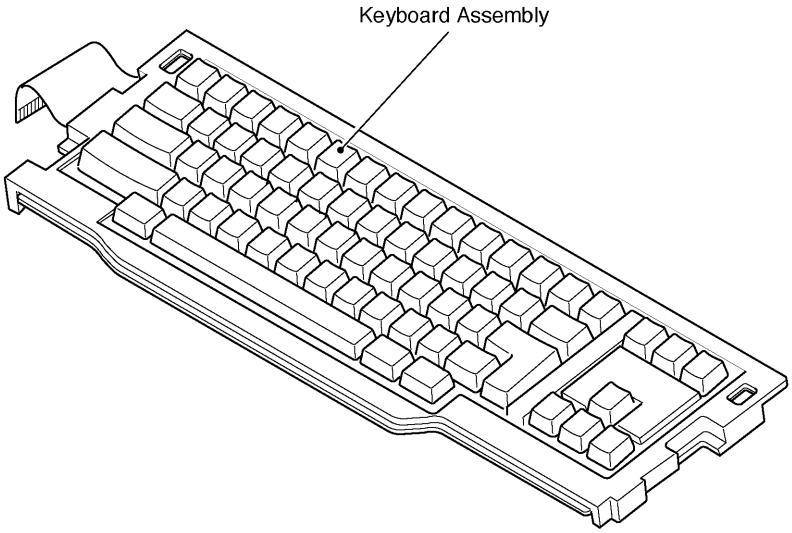

Fig. 1.15 Keyboard Assembly