

## Reel Drive Assemblies

### Forward and Reverse Drive Motors

The reel drive clutches are pulley driven by two ¼-HP, 3-phase, 208-volt, AC motors (1140 RPM). One motor provides forward motion; the other, reverse motion.

The forward drive motor is in the lower right corner and is connected to the two center clutches by two V-belts adjacent to each other. The reverse drive motor is in the lower left corner and is connected to the two rear clutches by two V-belts (Figure 52).

#### CAUTION

Use extreme care when working inside the tape unit to avoid injury from the reel drive motors and belts. Whenever possible, the motors should be unplugged as a safety precaution.

### Reel Drive Clutches

Each tape reel mounts on a hub protruding from the upper front of the tape unit. This hub contains a rubber rim that grips the reel tightly when the knob in the center of the hub is tightened.

The hub is on a shaft controlled by three magnetic powder clutches: one for forward motion, one for re-

verse motion, and one for a brake. The innermost part of the magnetic clutch (Figure 53) is a rotor keyed to the reel shaft. Surrounding the rotor is the clutch housing, which is mounted on sealed bearings and is free to turn on the shaft. Each clutch housing (a three-groove pulley) is driven by a continuously running three-phase motor. Embedded in the clutch housing is a coil, with connections brought out to slip rings on one end of the housing.

Between the rotor and the housing is a mixture of iron powder and graphite. When current flows through the coil, flux is produced. The flux solidifies the iron and graphite mixture and causes the rotor and housing to be essentially locked together. Although the housing turns continuously through pulley action, the rotor does not move with it unless current is flowing through the coil. As current flows through the coil, the rotor begins to move with the housing, turning the hub and reel at the front of the machine.

Because of the gradual build-up of current in the coil (due to inductance), the torque transmitted is proportional to the current, producing a smooth acceleration. This smooth acceleration prevents tape breakage by not shocking the tape into motion. The

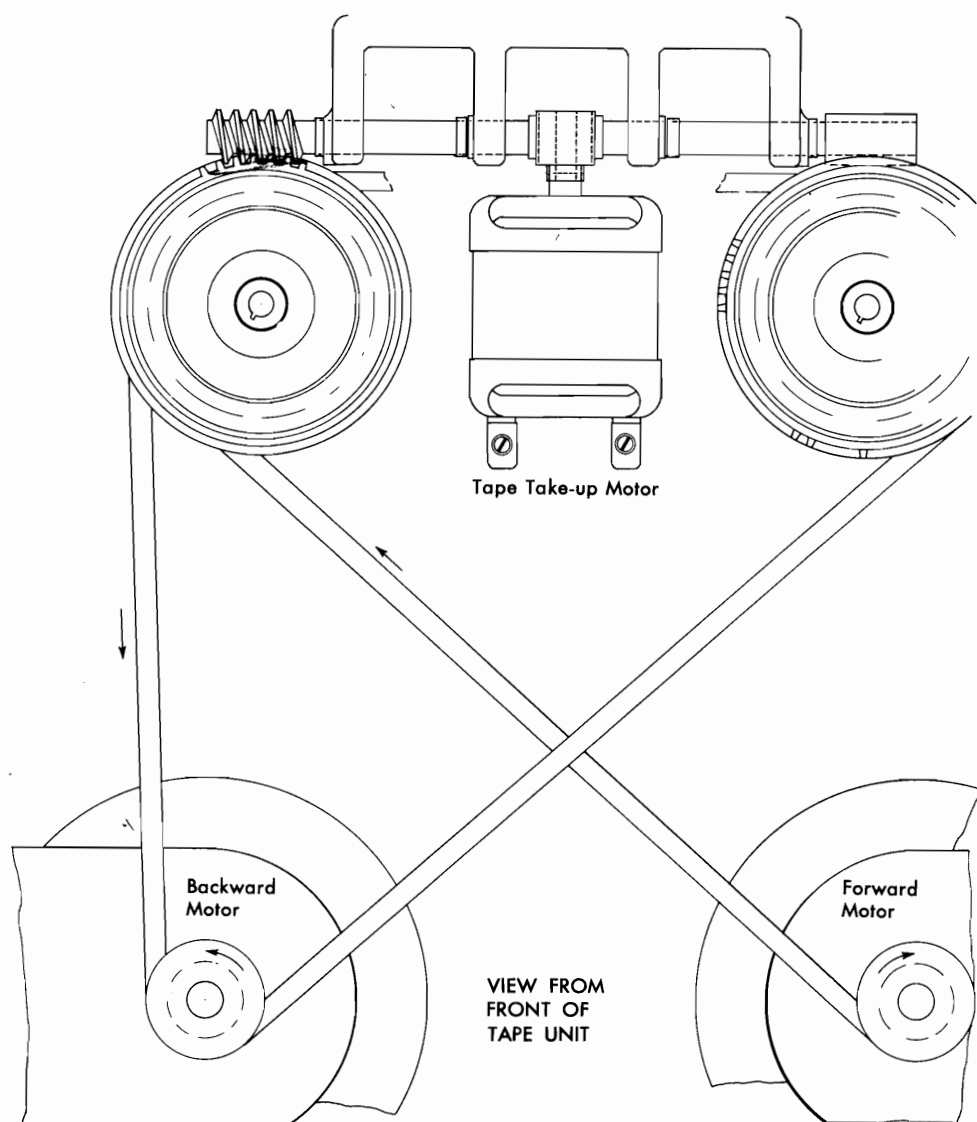


Figure 52. Drive Motors and Pulleys

magnetic powder clutch was selected for its ability to produce smooth acceleration and large torque with small control current. To hold the iron-graphite mixture in the flux gap, ridges are designed into the clutch parts. These ridges assist centrifugal force to keep the powder in the magnetic gap. The iron-graphite mixture polishes but does not wear clutch parts.

Three clutches are mounted on each shaft with all rotors keyed to the shaft. The front clutch has a stationary housing and is a brake. The middle clutch housing is driven clockwise and is the forward drive. The rear clutch housing is driven counterclockwise and is the reverse drive.

In the unload status, both brake clutches are energized and are controlled by a reel release switch located below and to the left of the file reel (Figure 17). When this switch is depressed, power is removed from both brake clutches to permit them to be turned manually.

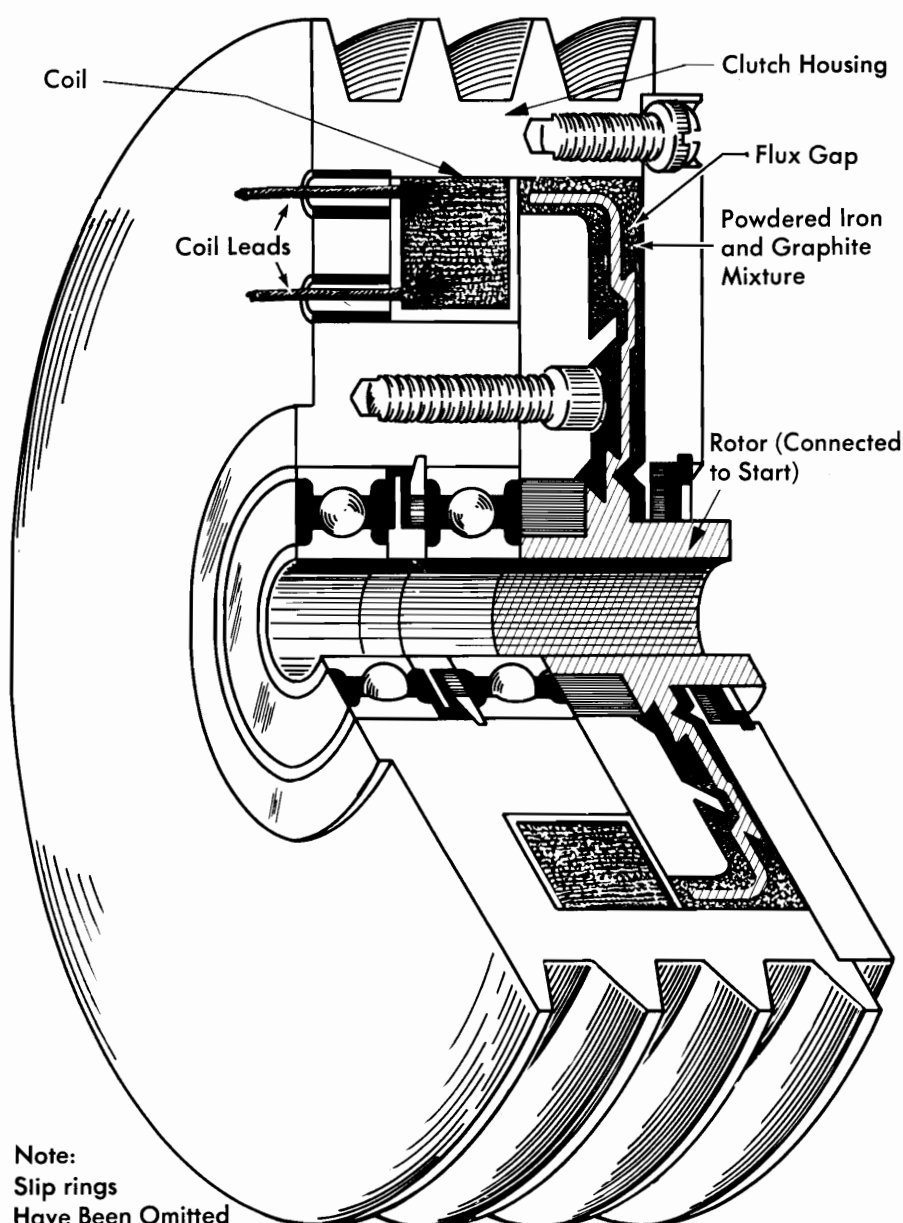


Figure 53. Magnetic Clutch

#### VISUAL INSPECTION AND OPERATIONAL CHECK

Check for worn or cracked brushes, loose Jones plugs, and frayed or broken wires. Check all clutches for powder leaks; powder leaks show up as a fine black powder on the covers and surrounding area. (Do not mistake black rubber deposits from drive belts as powder leaks.)

**Clutches:** Check that clearance between brush holder and slip ring is 0.040 to 0.068 inch.

**Reel Drive Hubs:** Inspect the rubber reel latch ring for uneven wear, breaks, cracks, dirt and elasticity.

**Reel Drive Shafts:** Check the reel drive shafts for lost motion due to loose or worn taper pins used to connect the reel drive hub to the reel drive shaft.

**Reel Drive and Brake Clutch Assemblies:** Check the reel drive clutch bearings for binding and excessive wear. Rotary motion should be smooth and free, with no lateral end play. Check the clutch commutator rings for carbon deposits and excessive pitting.

#### CLEANING

**Reel Drive Hubs:** Clean the rubber surface with a clean, lint-free cloth and approved cleaning fluid.

**Reel Drive and Brake Clutches:** Burnish the clutch commutator-rings with a fine crocus cloth, as required, to provide good electrical contact and to prevent arcing.

**Belts:** Belt tension should be 1/2-inch deflection with a 1/2-pound force applied in the center of the V-belt.

#### LUBRICATION

**Reel Drive Hubs:** If necessary, apply small amount of talcum powder on the rubber ring surface to prevent the tape reel from sticking.

**Reel Drive and Brake Clutch Assemblies:** Do not lubricate any portion of the clutch drive assembly; this may cause permanent damage to the clutches.

**Stop Clutch Worm Gear:** Apply IBM 20 grease as required.

Figure 54 shows the tape unit drive mechanisms.

#### MECHANICAL ADJUSTMENT

**Belt Alignment and Tensions:** Position the drive motors in their slotted holes for 0.5 inch belt deflection in the center. Deflection may be accurately checked by using a 0.5 inch spring scale.

**Clutch and Brake Shaft Assembly End Play:** End play on these shafts can be reduced by adjusting the nut on the involved end of the shaft.

#### CAUTION:

Do not make this adjustment too tight, as this will cause burned bearings and excessive drive motor load. If this adjustment does not eliminate shaft end play, replace the entire assembly.