CONTENTS

09-010 MAINTENANCE

No preventive maintenance is needed for the disk drive. However, it may be necessary to adjust or exchange field-replaceable units. To find a failing unit, use diagnostic programs and MAPs. Verify repairs by running diagnostic programs.

CAUTION
Do not turn the spindle unless specifically instructed to do so. Head damage can occur.

09-020 DISK ENCLOSURE

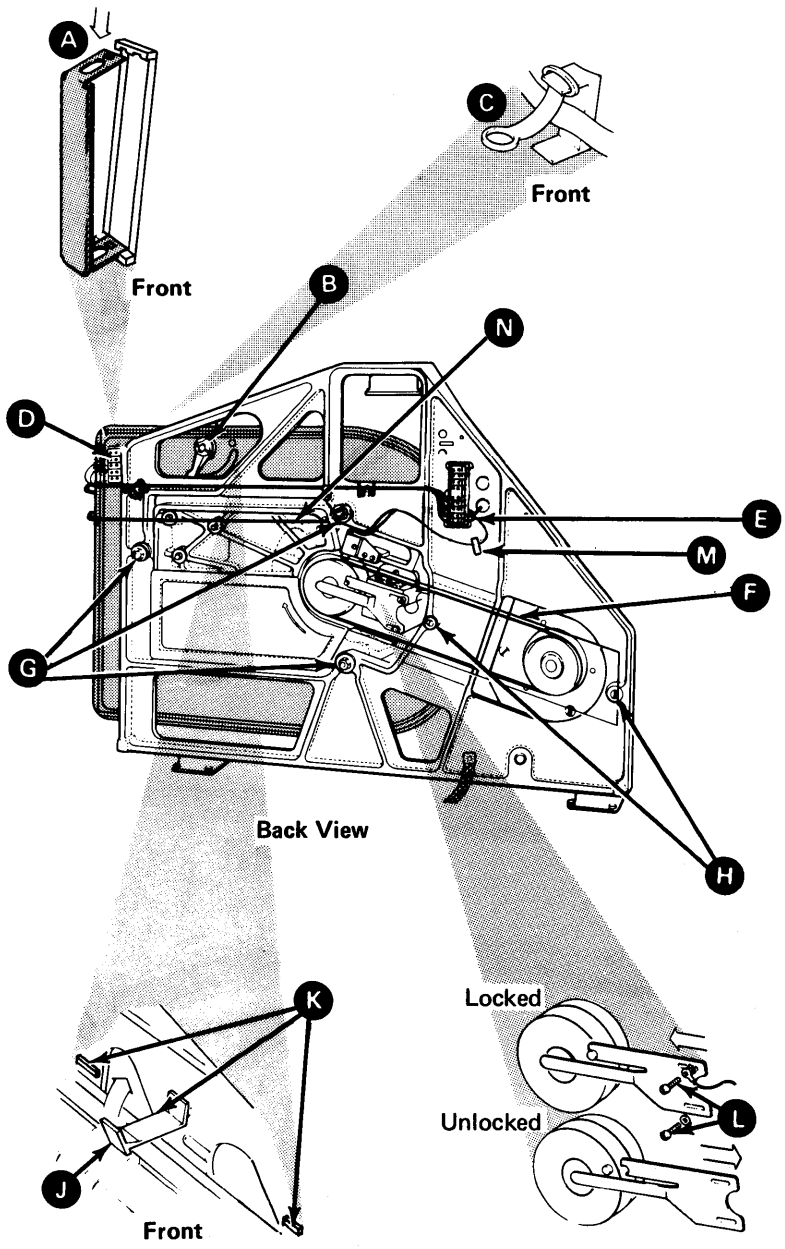
Removal

Note: If possible, before removing the disk enclosure, have the customer remove his data from the disk, then initialize the disk to destroy customer data.

DANGER
The disk enclosure weight is 12.5 kg (27 pounds). Clear a space for the disk enclosure before removing the disk enclosure from the machine.

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for the location of CB1).
3. Remove the disk enclosure card socket cover (A) by pressing the top of the cover.
4. Release the cable straps (C).
5. Note the sockets that the cards and cables are plugged into; and remove the cards and cables from the disk enclosure card sockets.
6. Lock the actuator with the actuator lock (B) by moving the handle to ON.
7. Remove the belt guard by loosening the two screws (H) and lifting it off.
8. Loosen the two screws (L) that hold the spindle locking arm and slide the locking arm toward the disk spindle.
9. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
10. Tighten the screws on the spindle locking arm.
11. Lift the motor and pivot it toward the disk enclosure to release the tension on the belt, and remove the belt (F).
12. Remove the safety cover on TB1 (E).
13. Disconnect the disk speed transducer at TB1 (E) – terminal 7 (black wire) and terminal 8 (white wire).
14. Unscrew the transducer cable clamp (M).
15. Disconnect the two wires from TB2 (D).
16. Disconnect the disk enclosure ground wire (N).
17. Ensure the disk enclosure holding clip (J) is engaged.
18. Remove three nuts and spring washers (G).
19. Lift the disk enclosure holding clip. Note the three disk enclosure locating guides (K); you must use them when you reinstall the disk enclosure.
20. Slowly take the disk enclosure away from the subframe.
21. Stand the disk enclosure on its three mounting studs.


A
Front
C
Front
B
N
D
E
M
F
G
Back View
H
K
Locked
Unlocked
L
J
Front

Replacement

1. Ensure the disk speed transducer and the disk enclosure ground wire are free. Place the disk enclosure on the subframe using the locating guides (L) to position the disk enclosure, and push the studs all the way into the nylon bushings. Check that the holding clip (K) is in place.

2. Reinstall the three spring washers and nuts (J).

   CAUTION
   Do not overtighten. Overtightening can cause the washer to bind on the stud; overtightening can also cause the stud to unscrew from the subframe the next time the nut is loosened.

   When tightening the nuts, there is some resistance as pressure is put on the nylon bushing. Stop tightening when the spring washer is flat.

3. Connect the disk enclosure ground wire (P) (washer between the ground wire and the frame).

4. Reconnect the two wires to TB2 (D).

5. Connect the disk speed transducer at TB1 (E) –terminal 7 (black wire) and terminal 8 (white wire).

6. Install the transducer cable clamp (F).

7. Install the safety cover on TB1 (E) (holes to the left).

8. Check the disk speed transducer for a gap of 0.152 mm ± 0.0508 mm (0.006 inch ± 0.002 inch). See paragraph 09-080 *Disk Speed Transducer, Replacement and Adjustment.*

   CAUTION
   Ensure that the belt does not touch the disk speed transducer.

9. Lift the motor and pivot it toward the disk enclosure and reinstall the belt (G) (smooth side against the pulleys). Center the belt on the pulleys.

10. Loosen the two screws (M) holding the spindle locking arm, and slide the locking arm away from the disk spindle.

11. Ensure that the antistatic brush and the center pin (N) of the spindle touch.

    Note: If there is a worn spot on the spindle antistatic brush, put the spot back on the same place on the spindle.

12. Tighten the screws on the spindle locking arm.

13. Check that the antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center pin (N) of the spindle. Adjust, if necessary, by removing and bending the brush.

14. Install the belt guard (H). Do not let the disk speed leads get under the belt guard. Slide the belt guard all the way to the left and tighten the screws.

    CAUTION
    Do not bend or break the pins when plugging in the cables and cards. Broken pins make it necessary to exchange the disk enclosure.

15. Connect the cables to the card sockets; reinstall the cards in the card sockets. See paragraph 09-120 for cable and card locations.

16. Strap the cables (B).

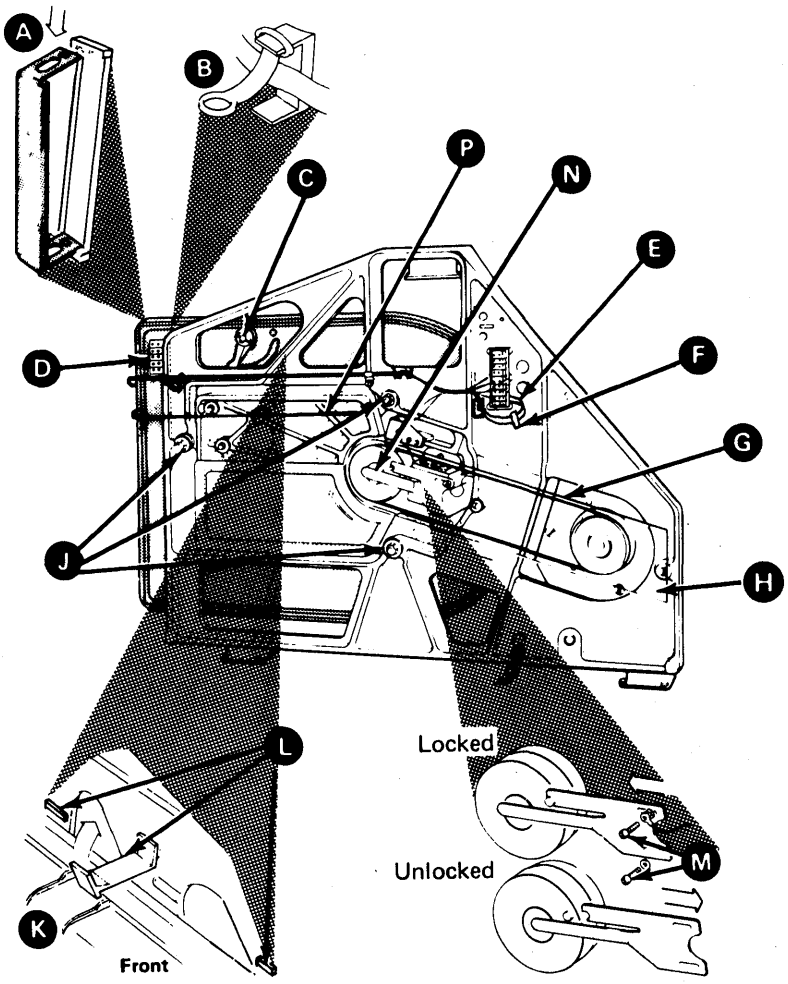
17. Install the card socket cover (A).

18. Unlock the actuator lock (C) by moving the handle to OFF.

CAUTION
Before operating the disk, wait 30 minutes for it to reach room temperature.

19. Do the actuator speed adjustment (see paragraph 09-140).

Before returning the system to the customer, identification, data, and other control information must be written on the new disk. See section *99-000 Diagnostic Service Guide* for instructions to initialize the disk.



09-030 DISK DRIVE MOTOR

Note: This paragraph describes how to remove and reinstall the old style motor and the new style motor. See the figures to determine the style.

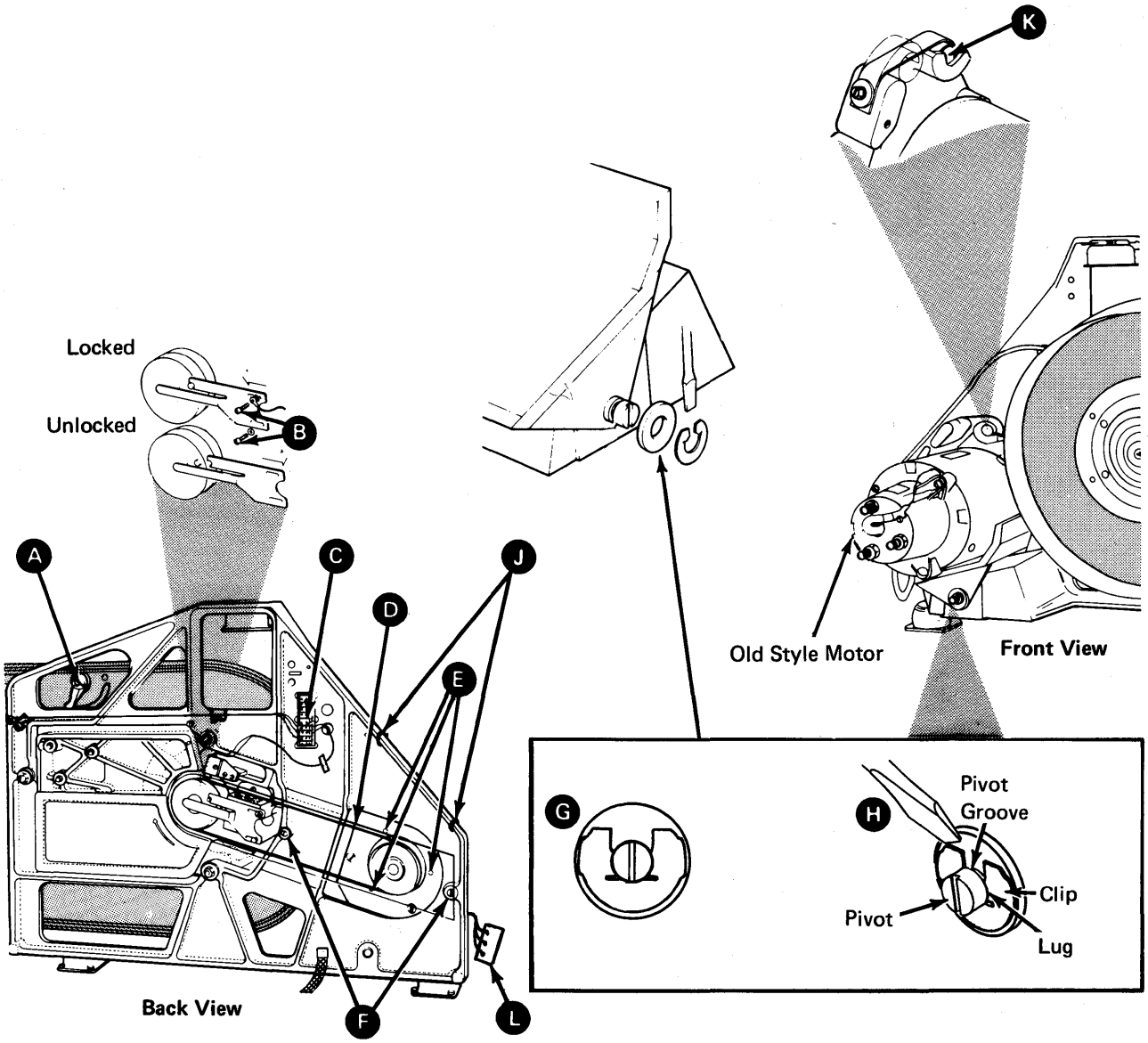
Old Style Motor Removal

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for the location of CB1).

   DANGER
   CB1 must be off to remove AC voltage from ACTB3 and ACTB4.

3. Lock the actuator with the actuator lock (A) by moving the handle to ON.
4. Remove the belt guard by loosening the two screws (F) and lifting the belt guard off.
5. Loosen the two screws (B) holding the spindle locking arm, and slide the locking arm toward the disk spindle.
6. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
7. Tighten the screws on the spindle locking arm.
8. Lift the motor and pivot it toward the disk enclosure to release tension on the belt, and remove the belt (D).
9. Remove the safety cover and remove the motor wires from ACTB3 lower drive, or ACTB4 upper drive (L) – terminal 1 (blue wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).
10. Remove the safety cover and remove the brake wires from TB1 (C) – terminal 5 (black wire) and terminal 6 (yellow wire).
11. Remove the cable straps (J) that hold the brake cable.
12. Release the motor tension spring by placing the blade of a screwdriver in the roller (K) and lift the roller and tension spring off the motor mounting bracket.
13. Remove the clip and washer by turning the clip to the position shown in (G); push the lugs into the groove of the pivot. Put the blade of a screwdriver on top of the clip (H), and push the clip off.
14. Pivot the motor toward the disk enclosure. Slide the motor away from the the main frame and lift the motor upward to clear the pivot and subframe.
15. Remove the motor from its mounting bracket by removing the three screws (E).


Locked
Unlocked
B
A
C
D
J
E
F
L
Back View
K
Old Style Motor
Front View
G
H
Pivot
Groove
Clip
Pivot
Lug

Old Style Motor Replacement

DANGER
CB1 must be off to remove AC voltage from ACTB3 and ACTB4.

1. Install the motor in its mounting bracket. Ensure that the motor cool air holes face upward and the motor cable is at the bottom left. Install the three screws (D) that hold the motor in the mounting bracket.

2. Put a very thin layer of grease on the pivot points of the motor assembly.

3. Lift the motor assembly into position and slip the tapered pin on the mounting bracket into the hole in the subframe. At the same time, place the brake end of the motor assembly on the pivot.

4. Install the washer and clip (H), and tighten the pivot (J).

5. Place the blade of a screwdriver into the roller (F) and lift the roller and tension spring into the motor mounting bracket.

6. Pivot the motor against the tension springs to ensure correct position of the spring loop and roller.

7. Install the motor wires on ACTB3 lower drive, or ACTB4 upper drive (G) – terminal 1 (blue wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).

8. Install the brake wires on TB1 (B) – terminal 5 (black wire) and terminal 6 (yellow wire).

9. Install the safety cover on TB1 (holes to the left).

10. Install the cable straps (L) that hold the brake cable.

CAUTION
Ensure that the belt does not touch the disk speed transducer.

11. Lift the motor and pivot it toward the disk enclosure and reinstall the belt (K) (smooth side of the belt against the pulleys). Center the belt on the pulleys.

12. Loosen the two screws (C) that hold the spindle locking arm. Slide the locking arm away from the disk spindle.

13. Ensure that the antistatic brush is touching the center of the disk spindle.

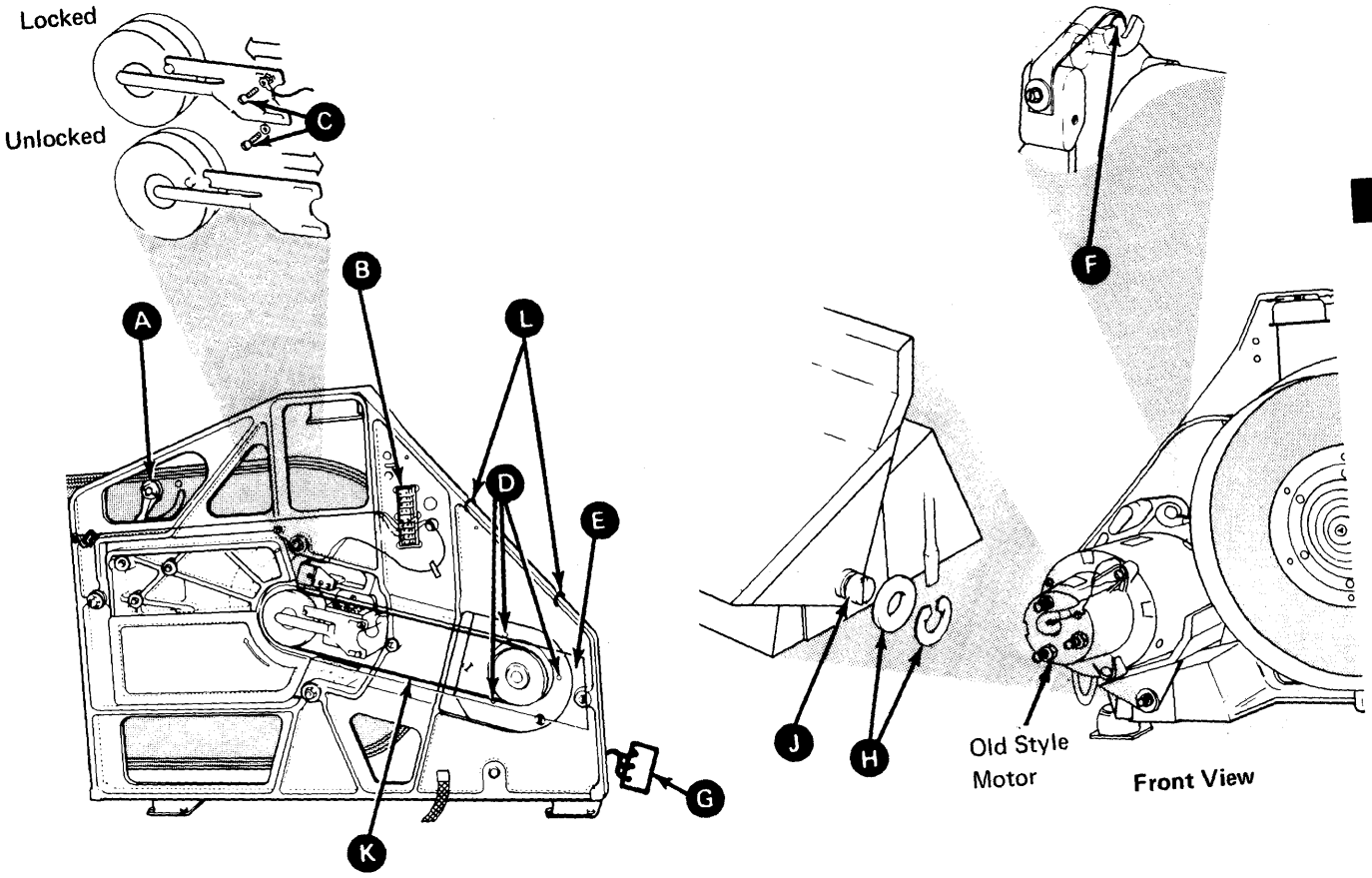
    Note: If there is a worn spot on the spindle antistatic brush, put the spot back on the same place on the spindle.

14. Tighten the screws on the spindle locking arm.

15. Check that the spindle antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center of the disk spindle. Adjust, if necessary, by removing and bending the brush.

16. Install the belt guard (E). Slide the belt guard all the way to the left and tighten the screws.

17. Unlock the actuator lock (A) by moving the handle to OFF.


Locked
Unlocked
A
B
C
D
E
F
G
H
J
K
L
Old Style
Motor
Front View

New Style Motor Removal

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).

2. Set CB1 off (see paragraph 05-310 for the location of CB1).

   DANGER
   CB1 must be off to remove AC voltage from ACTB3 and ACTB4.

3. Lock the actuator with the actuator lock (A) by moving the handle to ON.

4. Remove the belt guard by loosening the two screws (E) and lifting it off.

5. Loosen the two screws (B) holding the spindle locking arm, and slide the locking arm toward the disk spindle.

6. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.

7. Tighten the screws on the spindle locking arm.

8. Lift the motor and pivot it toward the disk enclosure to release tension on the belt, and remove the belt (D).

9. Remove the safety cover and remove motor wires from ACTB3 lower drive or ACTB4 upper drive (F) – terminal 1 (black wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).

10. Remove the safety cover and remove the brake wires from TB1 (C) – terminal 5 (black wire) and terminal 6 (yellow wire).

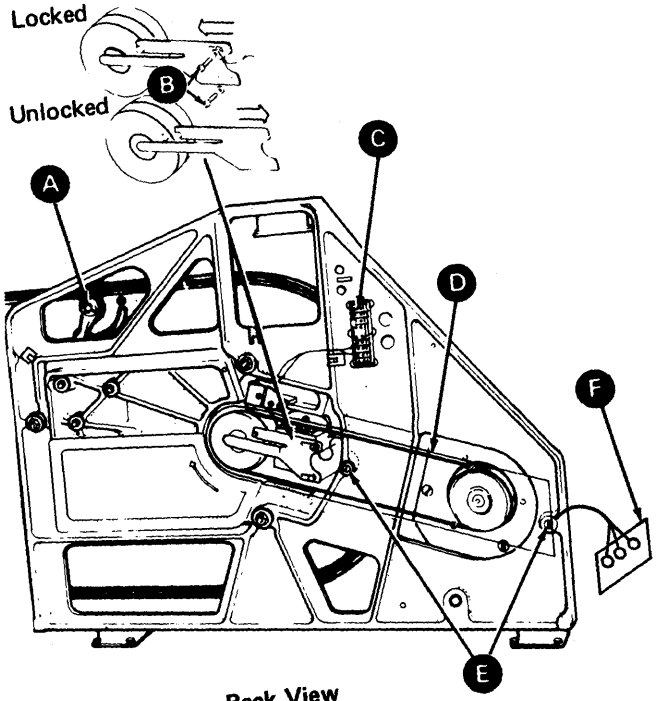
11. Remove the cable straps (G) (if present) that hold the brake cable.

12. Release the motor tension spring (H) by lifting it off the motor mounting bracket.

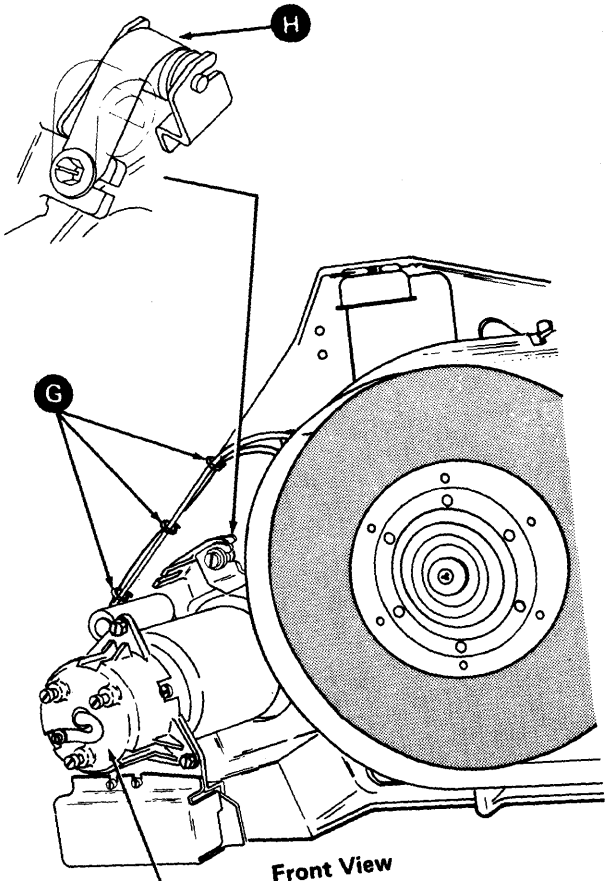
    Remove the nut, lock washer, flat washer, and insulating washer (J) on the motor pivot at the back of the subframe.

13. Pivot the motor toward the disk enclosure. Slide the motor away from the main frame and lift it upward to clear the pivot and subframe.

Notes:
1. The motor mounting plates form part of the motor assembly and should not be removed.
2. Keep the two plastic bushings (K) (one located in the motor pivot hole in the subframe, and one located in the motor mounting plate).

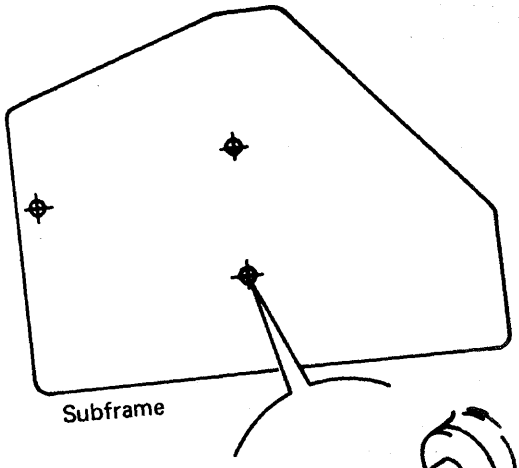


Back View

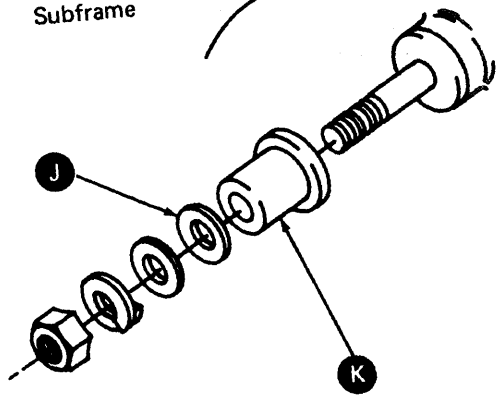


Front View

New Style Motor



Subframe



New Style Motor Replacement

Note: If a new style motor is installed in place of an old style motor, the motor pivot must be removed.

DANGER
CB1 must be off to remove AC voltage from ACTB3 and ACTB4.

1. Ensure that the two plastic insulating bushings (L) are installed in the motor pivot holes of the subframe casting and the motor mounting plate.

2. Set the motor on the pivot point and slide it into position.

3. Install the plastic insulating washer (K), flat washer, lock washer, and nut on the pivot at the back of the subframe. Tighten the nut until the lock washer is just flat, then unscrew the nut one-half turn.

   CAUTION
   New style and old style motor tension springs are not the same. The new style spring must be used with the new style motor. The old style spring must be used with the old style motor. The part number is on the new style spring.

4. Lift the loop end of the tension spring into place on the motor mounting bracket (H).

5. Pivot the motor against the springs to ensure correct position of the spring loop and roller (J).

6. Install the motor wires on ACTB3 lower drive, or ACTB4 upper drive (F) – terminal 1 (black wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).

7. Install the brake wires on TB1 (C) – terminal 5 (black wire) and terminal 6 (yellow wire).

8. Install the safety cover on TB1 (holes to the left).

9. Install the cable straps (G) (if present) that hold the brake cable.

10. **CAUTION**
    Ensure that the belt does not touch the disk speed transducer.

    Lift the motor and pivot it toward the disk enclosure and reinstall the belt (D) (smooth side of the belt against the pulleys). Center the belt on the pulleys.

11. Loosen the two screws (B) that hold the spindle locking arm. Slide the locking arm away from the disk spindle.

12. Ensure that the antistatic brush is touching the center of the disk spindle.

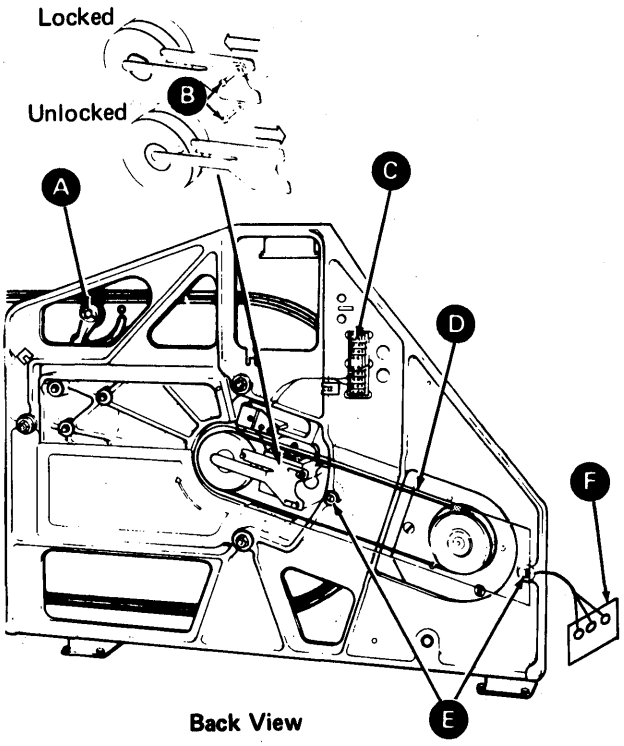
    Note: If there is a worn spot on the spindle antistatic brush, put the spot back on the same place on the spindle.

13. Tighten the screws on the spindle locking arm.

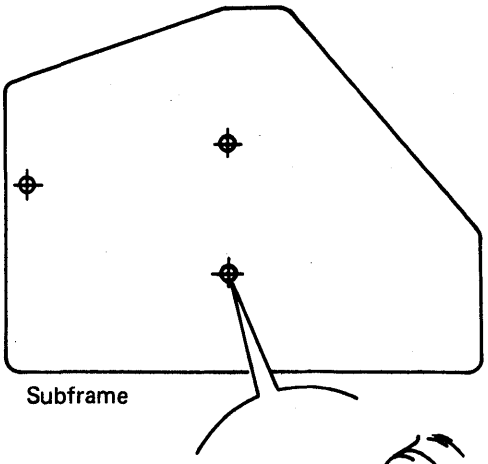
14. Check that the spindle antistatic brush has a pressure of 60 (+25 to -20) grams on the center of the disk spindle. Adjust, if necessary, by removing and bending the brush.

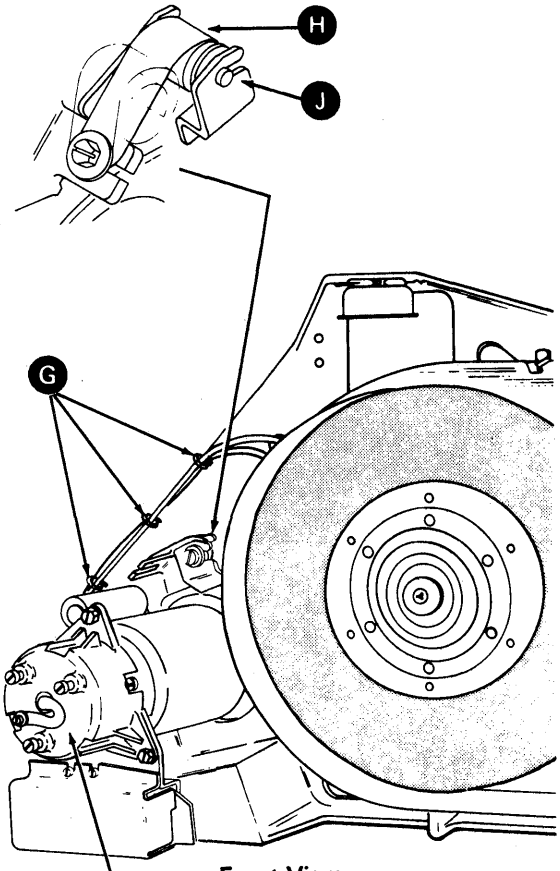
15. Install the belt guard and tighten the two screws (E). Slide the belt guard all the way to the left and tighten the screws.

16. Unlock the actuator lock (A) by moving the handle to OFF.

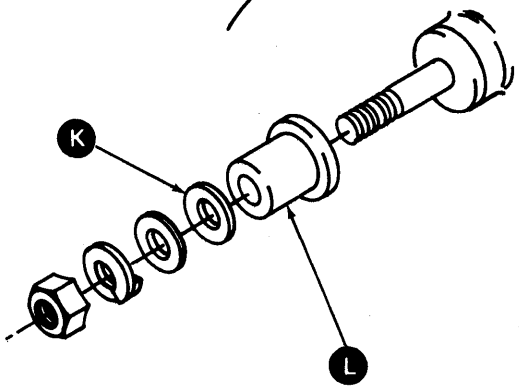


Back View





Front View



09-035 MOTOR START RELAY

Removal

Note: The motor start relay is used only on the new style motor.

1. Set Power to O (operator panel).

2. Set CB1 off (see paragraph 05-310 for the location of CB1).

> **DANGER**
> CB1 must be off to remove AC voltage from the motor start relay terminals.

3. Loosen the two holding screws of the start relay cover and slide the cover down, disengaging it from the motor assembly.

4. Mark the wires, then disconnect them from the relay.

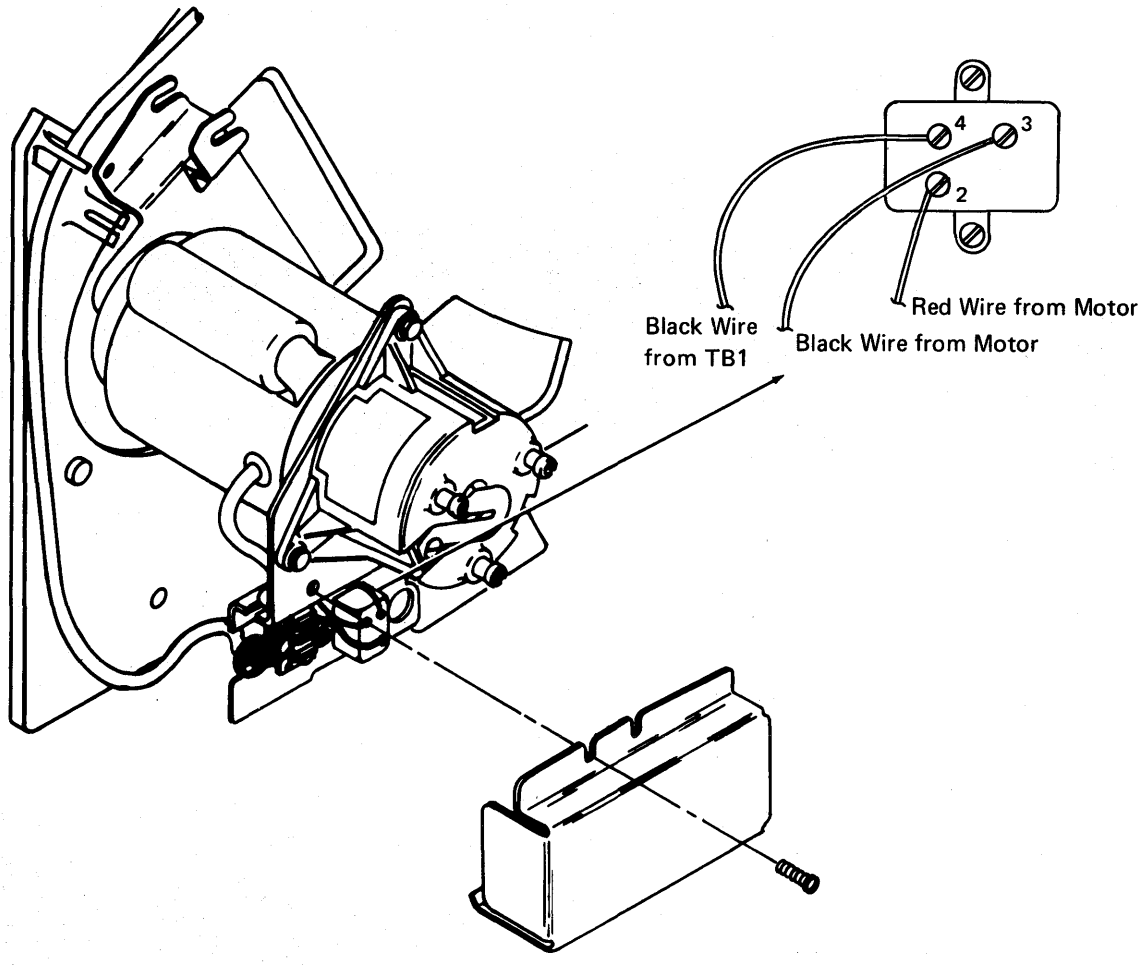
5. Remove the two relay holding screws, and lift out the relay.

Replacement

1. Install the motor start relay and holding screws.

2. Connect the wires to the relay.

3. Install the start relay cover and tighten the two holding screws.

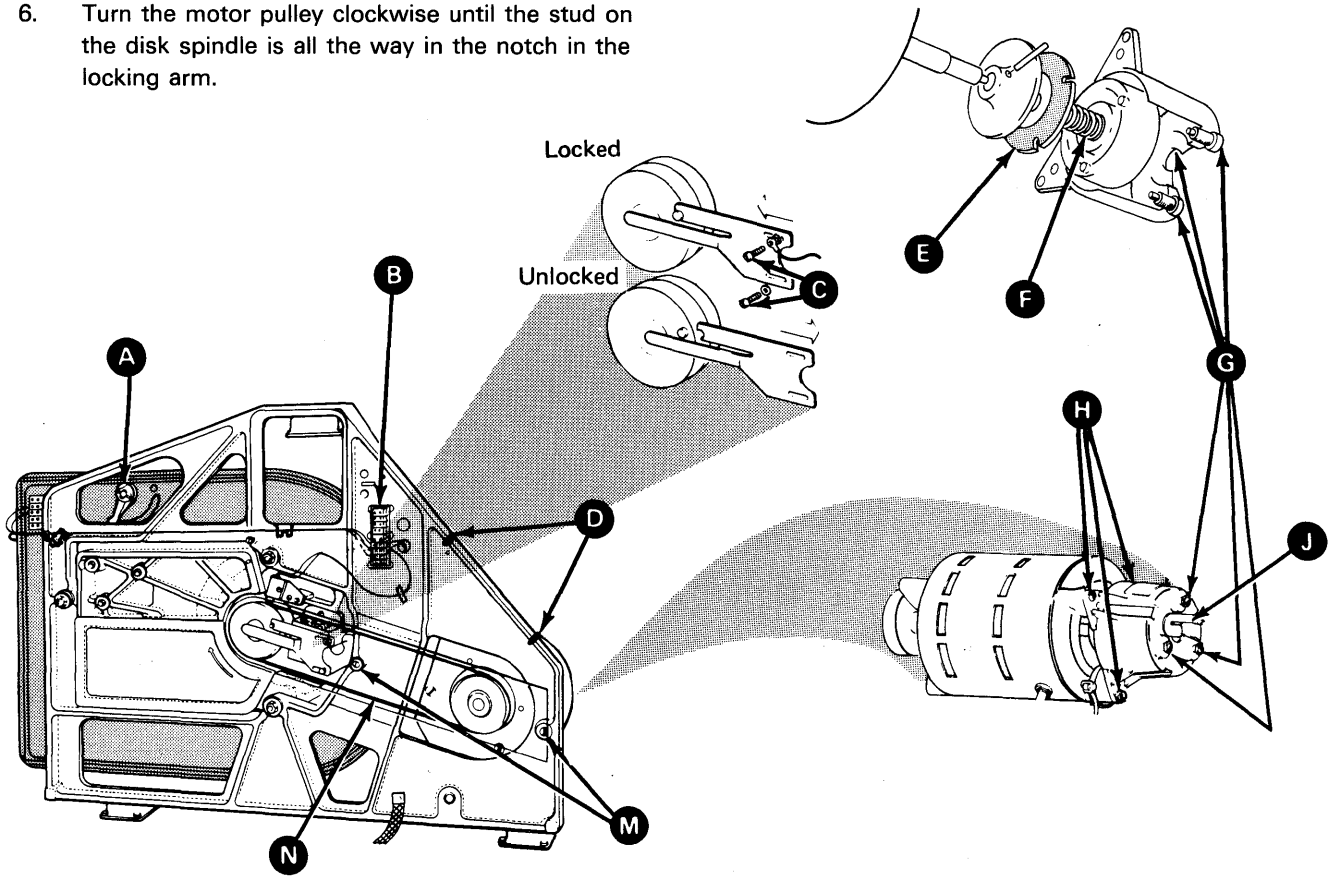


09-040 BRAKE COIL ASSEMBLY

Removal

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for the location of CB1).
3. Lock the actuator with the actuator lock (A) by moving the handle to ON.
4. Remove the belt guard by loosening the two screws (M) and lift the belt guard off.
5. Loosen the screws (C) that hold the spindle locking arm, and slide the locking arm toward the disk spindle.
6. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
7. Tighten the screws on the spindle locking arm.
8. Lift the motor and pivot it toward the disk enclosure to release the tension on the belt, and remove the belt (N).
9. Remove the brake wires from the right side of TB1 (B) – terminal 5 (black wire) and terminal 6 (yellow wire).
10. Remove the cable straps (D) that hold the brake cable.
11. Remove the screw (J) that holds the brake antistatic brush to the brake frame.
12. Remove the three screws (H) that hold the brake assembly to the motor.
13. Remove the complete brake assembly, (including the brake pad (E) and spring (F)) from the back of the motor.
14. To remove the brake coil assembly, remove the three brake adjustment locking screws (G), and remove the brake coil assembly from the brake housing.



Replacement

1. If the brake coil assembly was removed, insert the brake coil (H) into the brake housing, and fasten the brake coil with the three brake adjustment locking screws (E).

2. Loosen the brake adjustment locking screws (E). Turn the brake adjusting studs (F) counterclockwise until the brake coil is against the brake housing (G).

3. Check that the pin that holds the brake plate (C) to the motor shaft is not loose.

4. Check the brake pad (D) to see if it has deep scratches or if it is worn; exchange it, if needed.

5. Install the brake pad (D) and spring (N) on the motor shaft.

6. Install the brake assembly on the back of the motor. Ensure that the three notches (K) in the brake pad (D) are aligned with the three studs (J) on the brake coil.

   Note: The hazard label (P) should be up and to the right.

7. Install the three screws (L) that hold the brake housing to the motor, inserting the antistatic ground cable under the screw next to where the motor antistatic brush mounts. Before tightening the screws, the motor shaft must be located centrally in the brake housing.

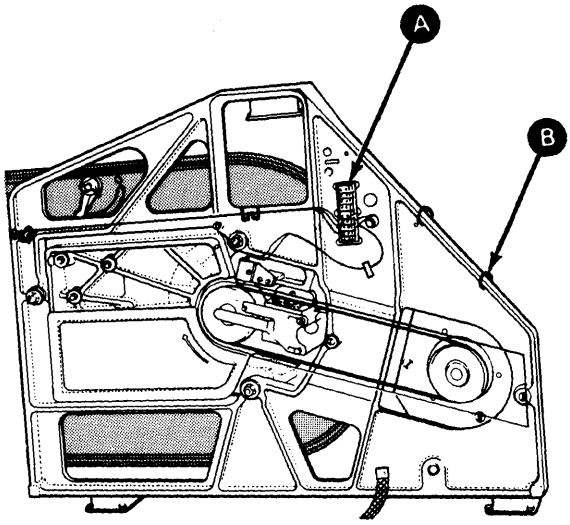
8. Tighten the three screws that hold the brake housing to the motor.

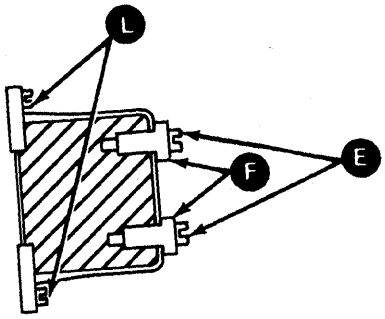
9. Install the cable straps (B) that hold the brake and AC cable.

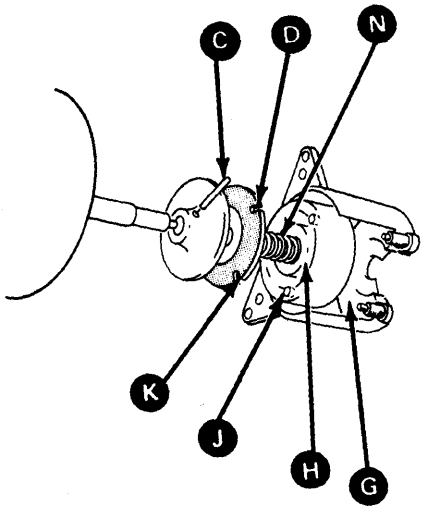
10. Install the brake wires from TB1 (A) – terminal 5 (black wire) and terminal 6 (yellow wire).

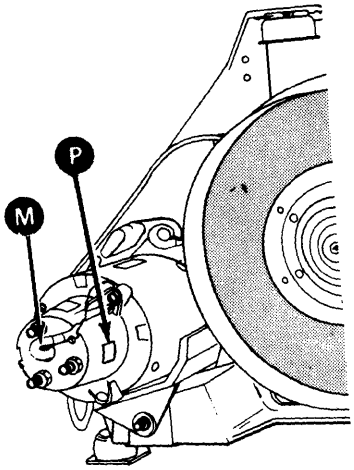
11. Install the motor antistatic brush (M).

12. Do the brake assembly adjustment (see paragraph 09-050), starting with step 9.


A
B


L
E
F


C
D
N
K
J
H
G


P
M

09-050 BRAKE ASSEMBLY

Note: If a new motor brake assembly is installed, ensure that the hazard label on the new motor brake assembly is in the correct language. Two sets of labels are in the System/34 ship group. Label part numbers are in the *5340 System Unit Parts Catalog.*

Service Check

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).
2. Check for 0.203 mm ± 0.127 mm (0.008 inch ± 0.005 inch) at gap (K).

Adjustment

1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for location of CB1).
3. Lock the actuator with the actuator lock (A) by moving the handle to ON.
4. Remove the belt guard by loosening the two screws (E) and lift the belt guard off.
5. Loosen the two screws (B) holding the spindle locking arm, and slide the locking arm toward the disk spindle.
6. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
7. Tighten the screws on the spindle locking arm.
8. Lift the motor and pivot it toward the disk enclosure to release tension on the belt, and remove the belt (D).
9. Remove the safety cover and remove the motor wires from ACTB3 (lower drive), or ACTB4 (upper drive) (M) – terminal 1 (blue or black wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).

DANGER
Ensure that the disconnected wires are away from ACTB3 (lower drive) or ACTB4 (upper drive).

10. Loosen the brake adjustment locking screws (H).
11. Turn the adjusting studs (J) clockwise (one turn at a time, each time tightening the locking screws) until the brake pad (G) is tight against the brake plate (F).
12. Back off the studs as evenly as possible (keep locking screws tight), and adjust for a 0.203 mm ± 0.051 mm (0.008 inch ± 0.002 inch) gap (K) between the brake pad and the coil. Check the three gaps in the brake housing frame.
13. Tighten the locking screws (H) and check that the adjustment (K) is now 0.203 mm ± 0.051 mm (0.008 inch ± 0.002 inch).
14. Set CB1 on.
15. Set Power to I (operator panel).

DANGER
220 Vac is present on ACTB3 and ACTB4.

16. With the brake coil activated, the gap (L) between the brake pad and the brake plate should be 0.203 mm ± 0.051 mm (0.008 inch ± 0.002 inch).
17. Turn the motor pulley to check if the motor is free from binds. Gap (L) should now be 0.203 mm ± 0.015 mm (0.008 inch ± 0.005 inch).
18. Set Power to O (operator panel).
19. Set CB1 off.

20. Install the motor wires from ACTB3 (lower drive) or ACTB4 (upper drive) (M) – terminal 1 (blue or black wire), terminal 2 (white wire), and terminal 3 (green/yellow wire).

21. Install the safety cover on ACTB3 (lower drive) or ACTB4 (upper drive) with the holes to the left.

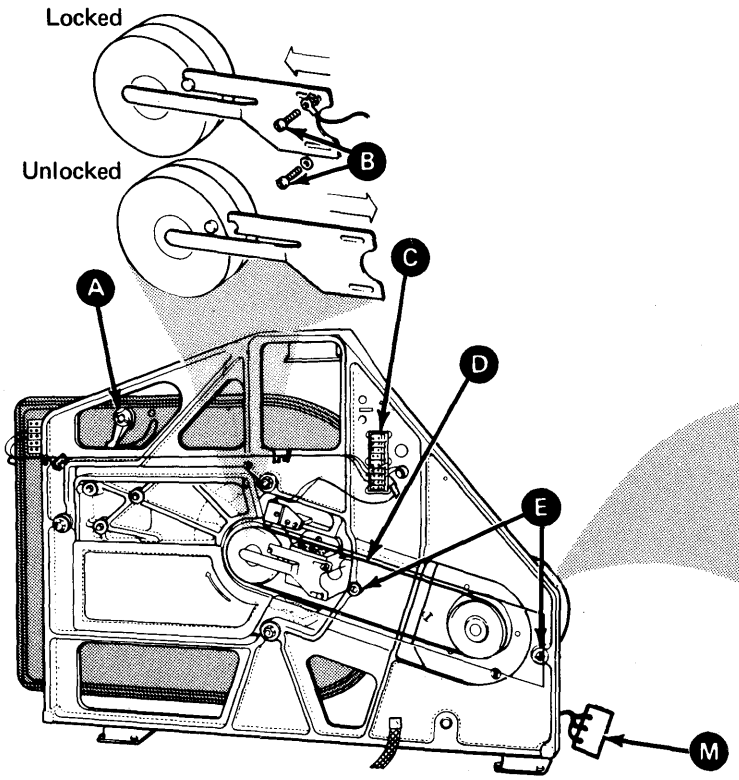
CAUTION
Ensure the belt does not touch the disk speed transducer.

22. Lift the motor and pivot it toward the disk enclosure and reinstall the belt (smooth side of the belt against the pulleys). Center the belt on the pulleys.

23. Check that the motor tension spring is in place on the motor mounting bracket.

24. Adjust the motor antistatic brush.

Note: If there is a worn spot on the motor antistatic brush, put the spot back on the same place on the motor shaft. Check for 60 (+25 to -20) grams. Adjust, if necessary, by removing and bending the brush.



25. Loosen the two screws (B) that hold the spindle locking arm. Slide the locking arm away from the disk spindle.

26. Ensure the spindle antistatic brush is touching the center of the spindle.

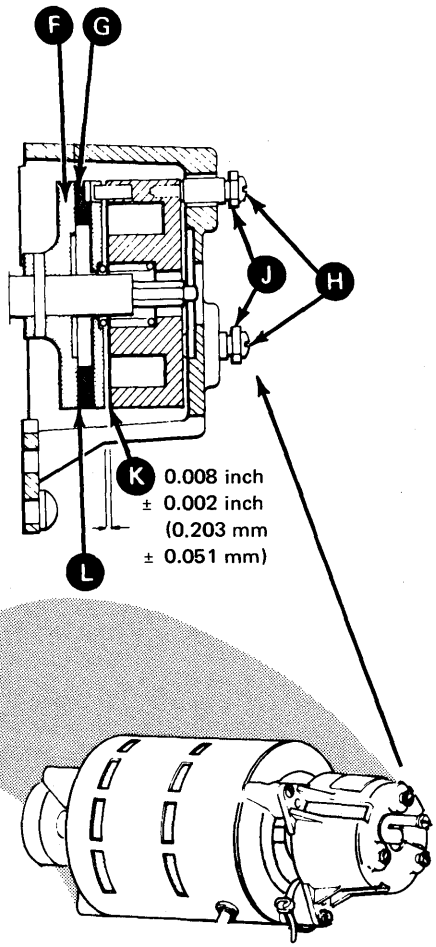
Note: If there is a worn spot on the antistatic brush, put the spot back on the same place on the spindle.

27. Tighten the screws on the spindle locking arm.

28. Check that the spindle antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center of the spindle. Adjust, if necessary, by removing and bending the brush.

29. Install the belt guard. Slide the belt guard all the way to the left, and tighten the screws (E).

30. Unlock the actuator by moving the handle (A) to OFF.



09-060 MOTOR ANTISTATIC BRUSH

Removal

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

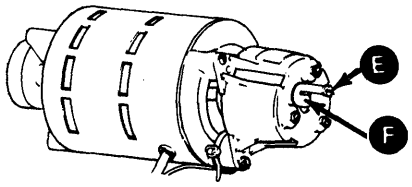
1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for the location of CB1).
3. Remove the motor antistatic brush by removing the screw (E) that holds the motor antistatic brush to the brake frame.

Replacement and Adjustment

1. Install the motor antistatic brush (F).

   Note: If there is a worn spot on the motor antistatic brush, put the spot back on the same place on the motor shaft.

2. Check the motor antistatic brush (F) for 60 (+25 to -20) grams. Adjust, if necessary, by removing and bending the brush near the screw hole (E).



09-070 SPINDLE ANTISTATIC BRUSH

CAUTION
Do not turn the disk spindle during the following procedures.

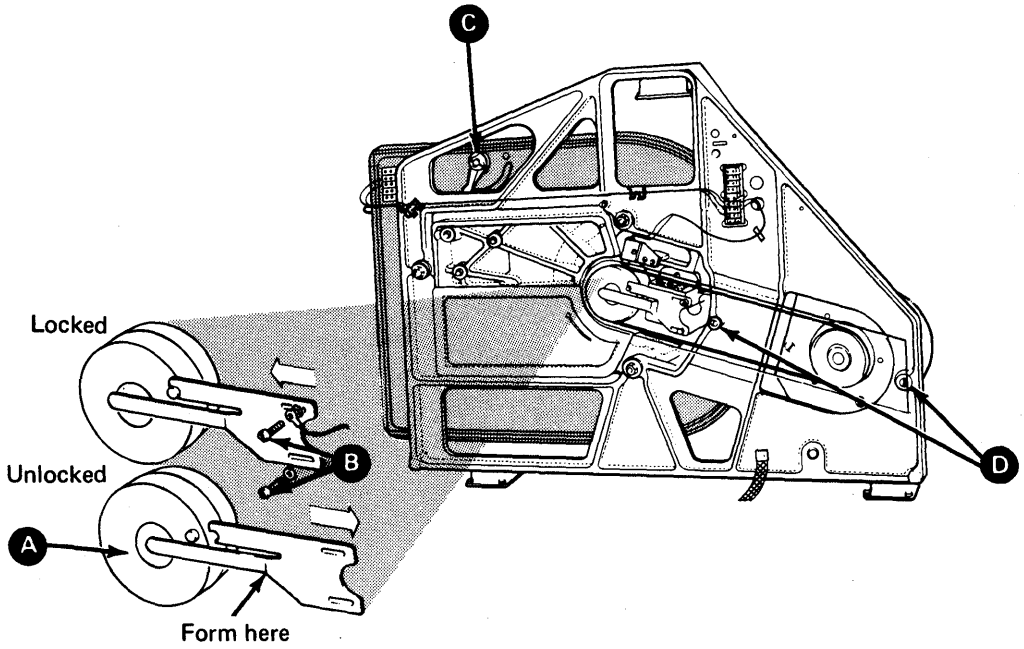
Removal

1. Set Power to O (operator panel).
2. Lock the actuator with the actuator lock (C) by moving the handle to ON.
3. Remove the belt guard by loosening the two screws (D) and lifting it off.
4. Remove the two screws (B) that hold the spindle locking arm; at the same time, disconnect the ground wire from under one of the screws.
5. Lift off the spindle antistatic brush.

Replacement and Adjustment

1. Install the spindle locking arm with the spindle antistatic brush centered over the center (A) of the disk spindle pulley.
2. Install the two screws that hold the spindle locking arm. At the same time, connect the ground wire to the antistatic brush with one of the screws. Put the washer between the ground wire and the brush.

   Note: If there is a worn spot on the antistatic brush, put the spot back on the same place on the spindle.
3. Check that the spindle antistatic brush has a pressure of 60 (+25 to -20) grams on the center of the spindle. Adjust, if necessary, by removing and bending the brush.
4. Install the belt guard. Slide the belt guard all the way to the left and tighten the screws (D).
5. Unlock the actuator by moving the handle (C) to OFF.



09-080 DISK SPEED TRANSDUCER

Removal

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

Note: If the disk enclosure is being exchanged, you get a new speed transducer with a new disk enclosure.

1. Set Power to O (operator panel).
2. Lock the actuator with the actuator lock (D) by moving the handle to ON.
3. Remove the belt guard by loosening the two screws (H) and lift the belt guard off.
4. Loosen the two screws (G) holding the spindle locking arm, and slide the locking arm toward the disk spindle.
5. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
6. Tighten the screws on the spindle locking arm.
7. Lift the motor and pivot it toward the disk enclosure to release tension on the belt, and remove the belt (J).
8. Remove the safety cover and remove the disk speed transducer wires from TB1 (F) – terminal 7 (black wire) and terminal 8 (white wire).
9. Remove the disk speed transducer assembly by removing the two screws (C).

Replacement and Adjustment

CAUTION
Be careful not to damage the disk speed transducer tip during replacement.

1. Loosen the transducer clamp screw (B). Ensure the tab on the transducer is in the notch in the bracket.
2. Install the transducer assembly with the two mounting screws (C).
3. Adjust the transducer for a gap of 0.152 mm ± 0.051 mm (0.006 inch ± 0.002 inch) (A) by moving the transducer in the clamp.
4. Tighten the transducer clamp screw (B).
5. Connect the transducer cable to TB1 (F) – terminal 7 (black wire) and terminal 8 (white wire).
6. Install the safety cover on TB1 (holes to the left).

   CAUTION
   Ensure that the belt does not touch the disk speed transducer.

7. Lift the motor and pivot it toward the disk enclosure and reinstall the belt (smooth side of the belt against the pulleys). Center the belt on the pulleys.
8. Loosen the two screws (G) that hold the spindle locking arm, and slide the locking arm away from the disk spindle.

9. Ensure that the antistatic brush is touching the center of the spindle.

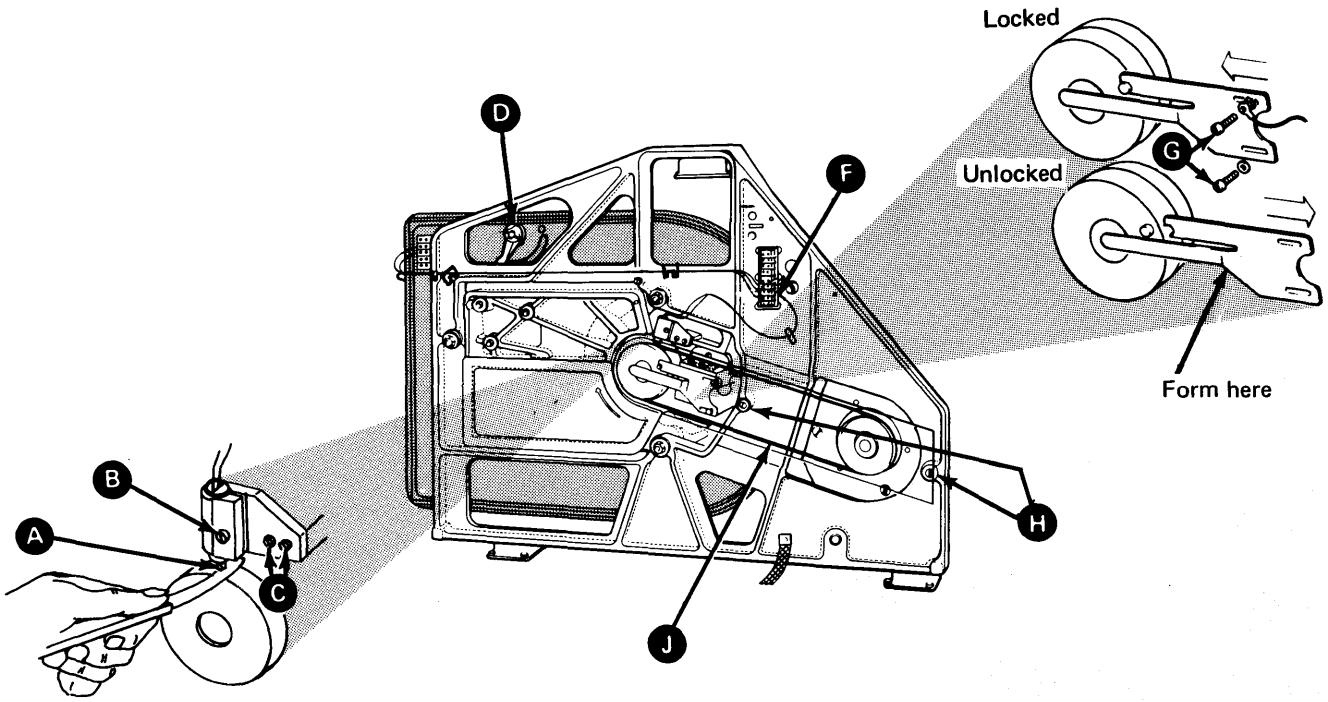
   Note: If there is a worn spot on the antistatic brush, put the spot back on the same place on the spindle.

10. Tighten the screws on the locking arm.

11. Check that the antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center of the spindle. Adjust, if necessary, by removing and bending the brush.

12. Install the belt guard. Slide the belt guard all the way to the left and tighten the two screws (H).

13. Unlock the actuator lock (D) by moving the handle to OFF.



09-090 MOTOR TENSION SPRING

Removal

Note: New style and old style motor tension springs are not the same. The new style spring must be used with the new style motor. The old style spring must be used with the old style motor. The part number is on the new style spring.

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

1. Set Power to O (operator panel).
2. Set CB1 off (see paragraph 05-310 for the location of CB1).
3. Place the blade of a screwdriver under the roller (C) and lift the roller and tension spring off the motor mounting bracket.
4. For the old style motor tension spring only:

   Remove the roller.

   CAUTION
   Ensure that the nut and lock washer do not fall into the motor.

5. Remove the nut and lock washer from screw (B).
6. Remove the screw and flat washer and tension spring by placing a screwdriver under the tension spring (D) and lift up.
7. Open the tension spring a small amount and press the screw (A) with the flat washer out of the hole.
8. For the new style motor tension springs only:

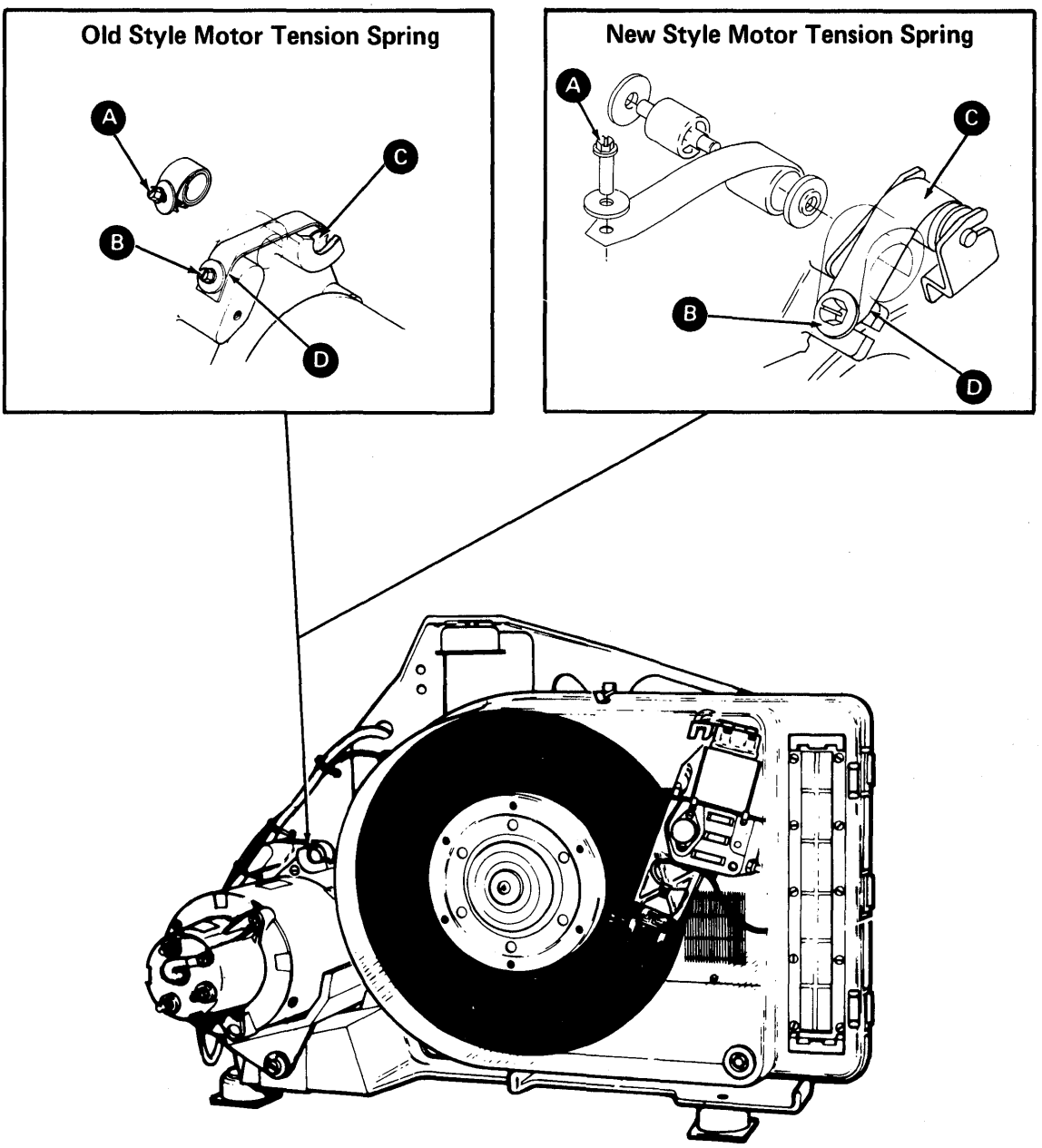
   Remove one of the washers from the roller end of the spring assembly and slide off the spring.

Replacement

1. For the new style motor tension springs only:

   Place the spring on the roller, place the washer on the shaft, flat side first, and hand press into position.

2. Open the tension spring a small amount and press the screw with the flat washer on it through the hole (A) in the spring.
3. Press the screw into the hole (B).
4. Install the roller (old style), circular edge first, into the tension spring.
5. Place the blade of a screwdriver under roller (C) and place the roller and tension spring on the motor mounting bracket. Install the lock washer and nut, and tighten the spring.
6. Pivot the motor against the tension spring to ensure the spring loop and roller is in the correct place.


Old Style Motor Tension Spring
A
B
C
D
New Style Motor Tension Spring
A
B
C
D

09-100 SHOCK MOUNT (TOP ONE)

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

Removal

Note: Do not remove more than one shock mount at a time unless you are removing the subframe.

1. Set Power to O (operator panel).
2. Lock the actuator with the actuator lock by moving the handle (A) to ON.
3. Remove the belt guard by loosening the two screws (J) and lift the belt guard (F) off.
4. Loosen the two screws (K) holding the spindle locking arm, and slide the locking arm toward the disk spindle.
5. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
6. Tighten the screws on the spindle locking arm.

   CAUTION
   Do not remove the four locating screws (D).

   ---

7. Remove the four bracket mounting screws (E) (two on each side).
8. Remove the top screw (C).
9. Slide the bracket out and remove the four shock mount bolts, nuts, and washers (B).

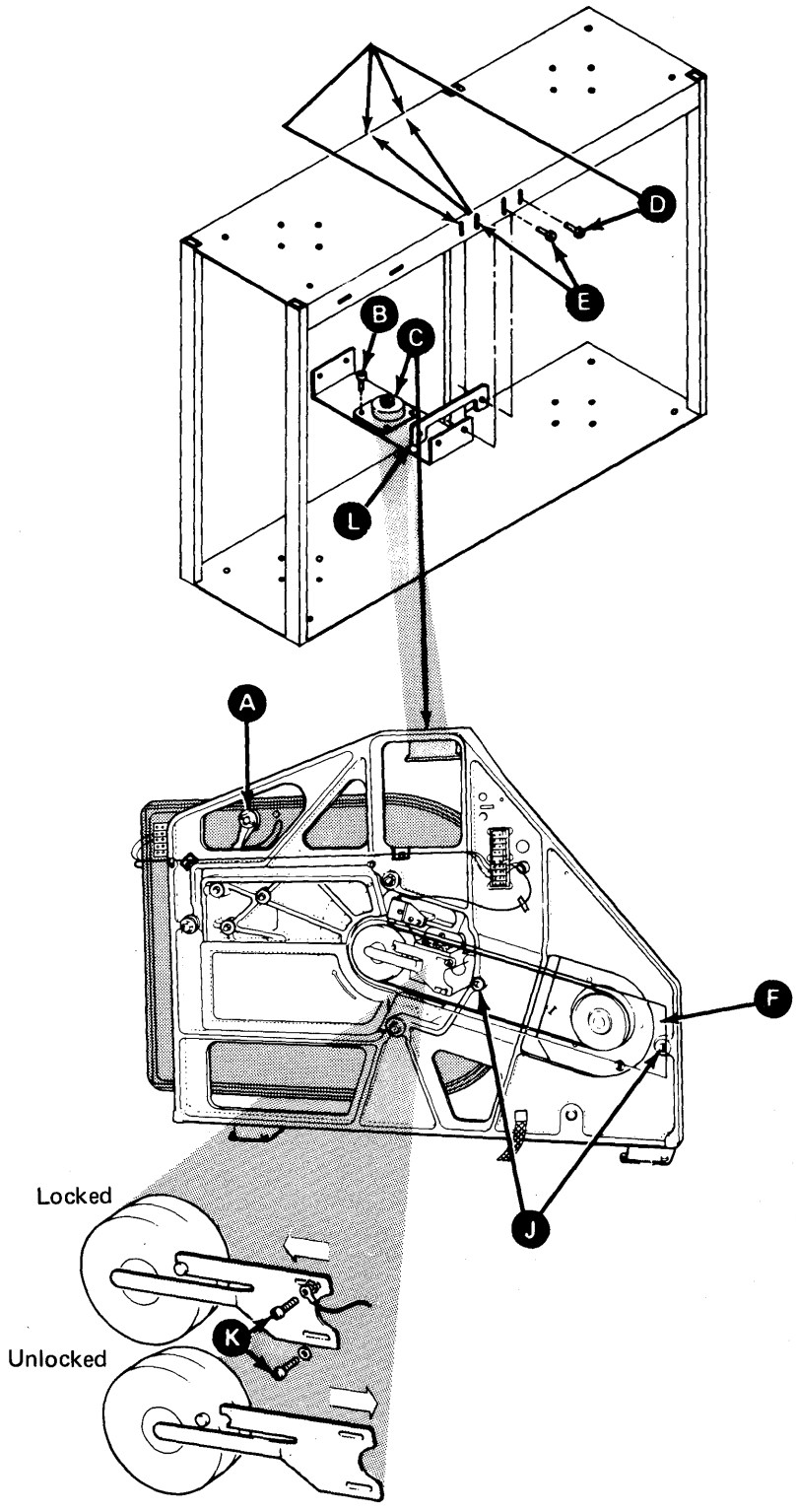
Replacement

Note: The upper and lower shock mounts have different part numbers.

1. Install the bracket and the four shock mount bolts, nuts, and washers (B).
2. Install the top screw (C).
3. Position the shock mount bracket in the machine up against the locating brackets (L).
4. While holding the bracket to the top of the machine against the locating brackets (L), install the four bracket mounting screws (E).
5. Loosen the two screws (K) that hold the spindle locking arm, and slide the locking arm away from the disk spindle.
6. Ensure that the antistatic brush is touching the center of the spindle.

   Note: If there is a worn spot on the antistatic brush, put the spot back on the same place on the spindle.

7. Tighten the screws that hold the spindle locking arm.
8. Check that the antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center of the spindle. Adjust, if necessary, by removing and bending the brush.
9. Install the belt guard (F). Slide the belt guard all the way to the left and tighten the screws (J).
10. Unlock the actuator by moving the handle (A) to OFF.


D
E
B
C
L
A
F
J
Locked
K
Unlocked

09-110 SHOCK MOUNTS (BOTTOM TWO)

CAUTION
Do not turn the disk spindle counterclockwise; head damage can occur.

Removal

Note: Do not remove more than one shock mount at a time unless you are removing the subframe.

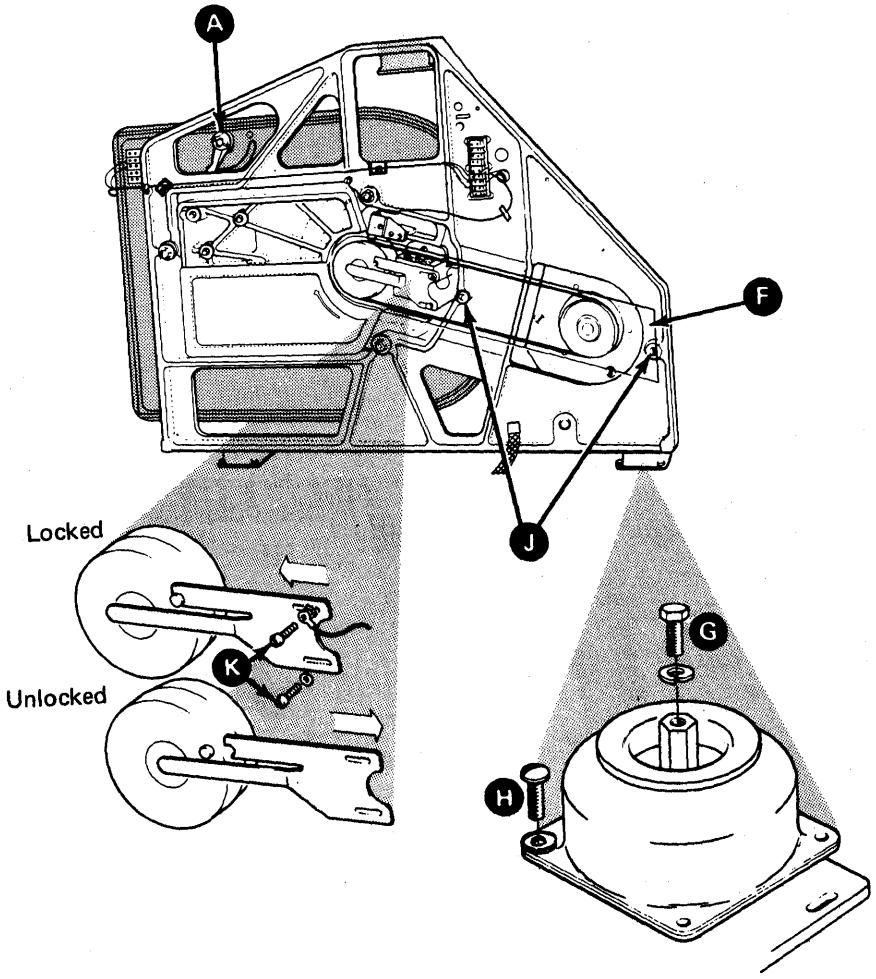
1. Set Power to O (operator panel).
2. Lock the actuator with the actuator lock (A) by moving the handle to ON.
3. Remove the belt guard (F) by loosening the two screws (J) and lift the belt guard off.
4. Loosen the two screws (K) that hold the spindle locking arm, and slide the locking arm toward the disk spindle.
5. Turn the motor pulley clockwise until the stud on the disk spindle is all the way in the notch in the locking arm.
6. Tighten the screws on the locking arm.
7. Remove the four screws and washers (H) that hold the shock mount to the machine frame.
8. Remove the top screw (G) from the shock mount.
9. Remove the shock mount.

Replacement

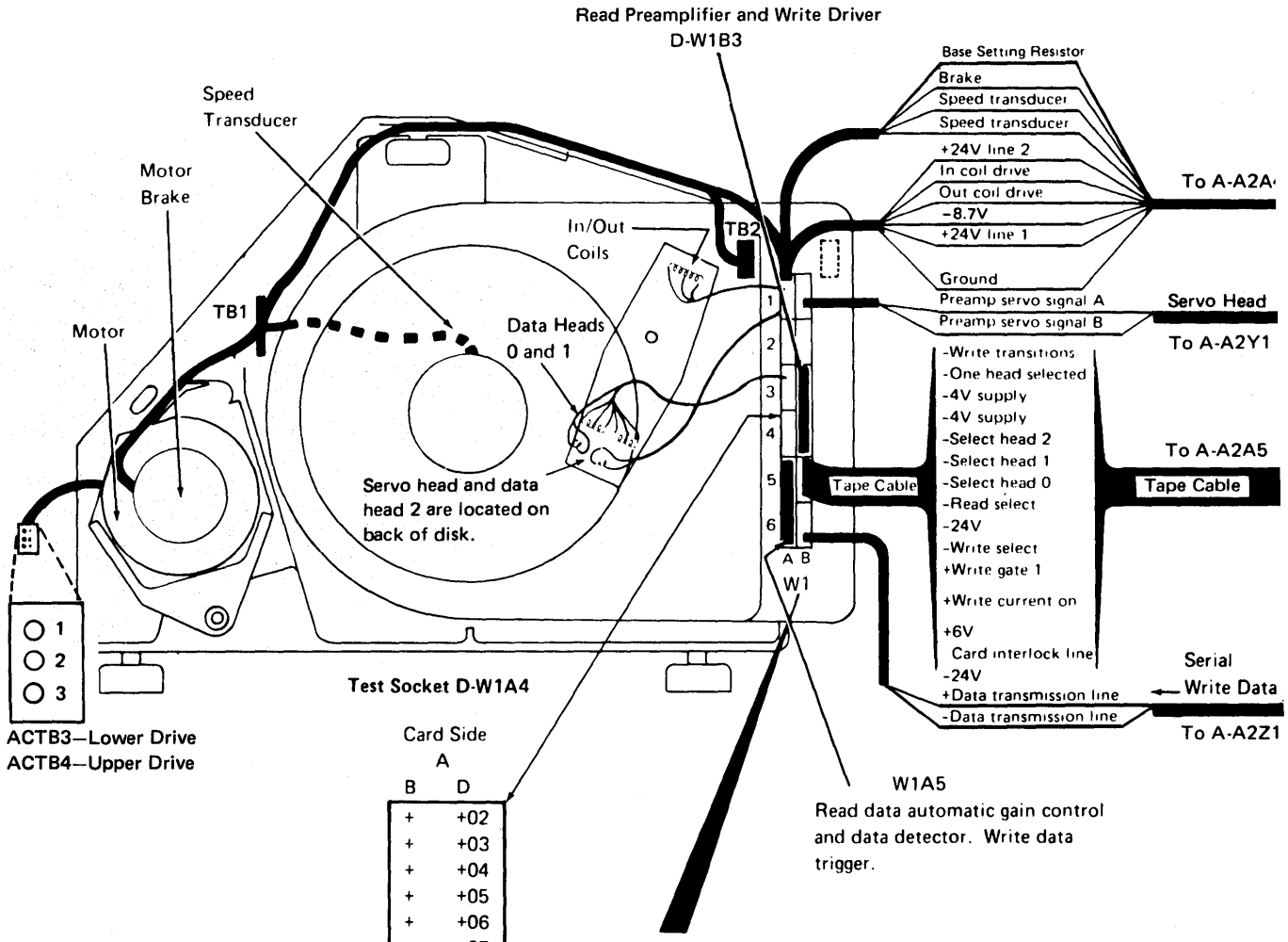
CAUTION
Ensure that the shock mount has the correct part number (the disk drive uses two types of shock mounts).

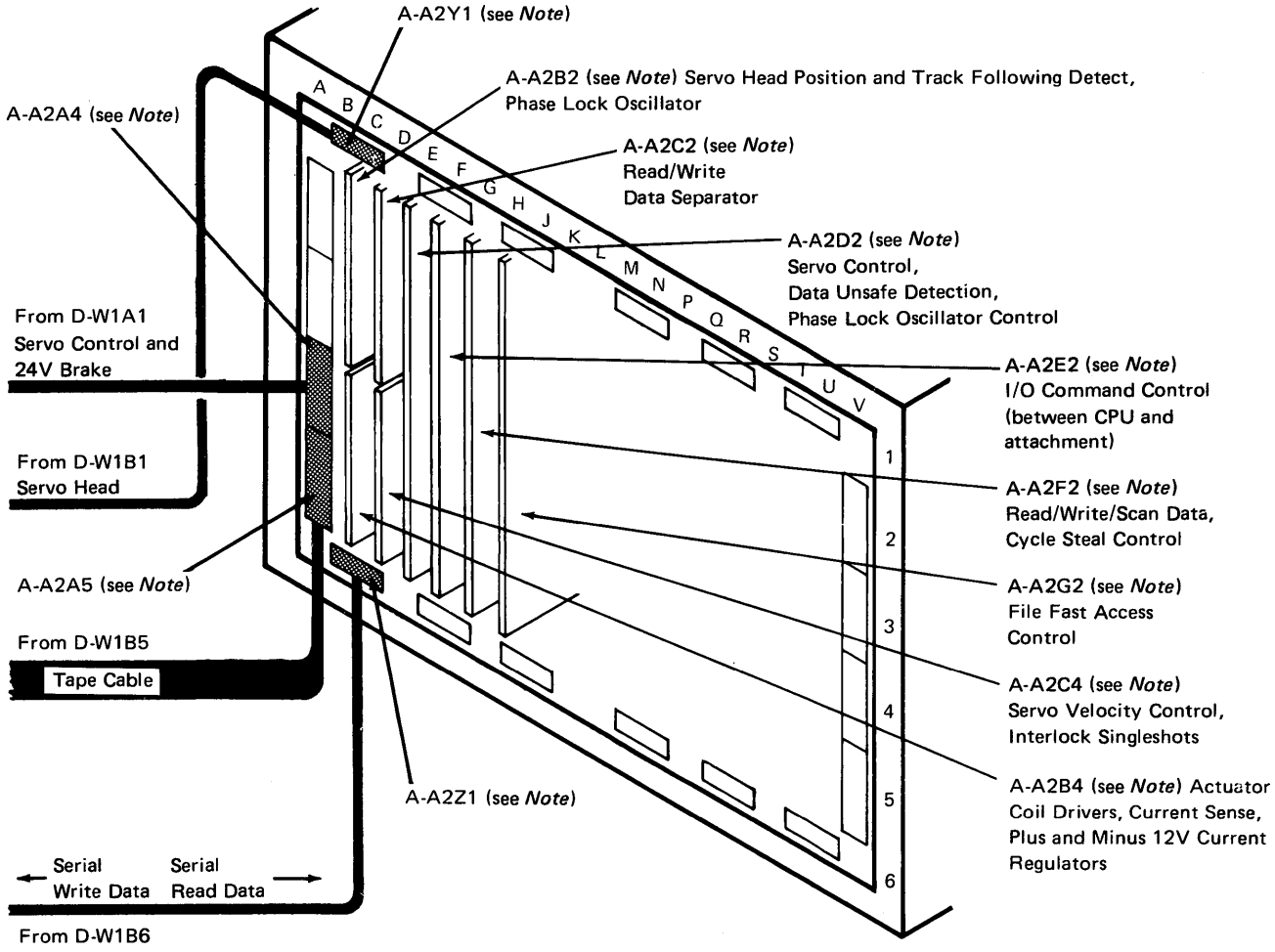
1. Install the replacement shock mount on the disk subframe using the top screws (G).
2. Install the screws and washers (H) that hold the shock mount to the machine frame.
3. Loosen the two screws (K) that hold the spindle locking arm, and slide the locking arm away from the disk spindle.
4. Ensure the spindle antistatic brush is touching the center of the spindle.

   Note: If there is a worn spot on the spindle antistatic brush, put the spot back on the same place on the spindle.
5. Tighten the two screws that hold the locking arm.
6. Check that the spindle antistatic brush has a pressure of approximately 60 (+25 to -20) grams on the center of the spindle. Adjust, if necessary, by removing and bending the brush.
7. Install the belt guard (F). Slide the belt guard all the way to the left and tighten the screws (J).
8. Unlock the actuator by moving the handle (A) to OFF.


A
F
J
Locked
K
Unlocked
G
H

DANGER
220 Vac is present on
ACTB3 and ACTB4.





Note: If file B is installed, the card locations are the same, but they are located in A-A3.

See FSL page AC350 (disk drive A) and FSL page AC360 (disk drive B) for the correct card and cable part numbers.

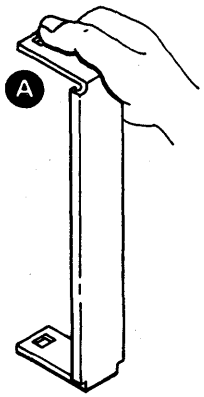
09-130 CARD SOCKETS

CAUTION
Do not bend or break the pins when removing or inserting cards. Broken pins make it necessary to exchange the disk enclosure.

The card sockets are located on the front right of the disk enclosure. To remove or reinstall cards, remove the card socket cover (A).

D-W1

	A	B
1	Speed Transducer, Brake Sense, and Actuator Drive Coil Cable	Servo Preamp Cable (coaxial)
2		
3		Read Preamp and Write Select Card
4		
5	Data AGC and Detector Card	Read/write Logic Cable (tape)
6		Read/write Data Cable (coaxial)



R/W = Read/write
AGC = Automatic Gain Control

See FSL page AC350 (disk drive A) and FSL page AC360 (disk drive B) for the correct card and cable part numbers.

09-140 ACTUATOR (ACCESS) SPEED ADJUSTMENT

Adjustment

Note: To verify a present adjustment, go to step 8. If the G2 card has been changed, start at step 1.

1. Locate the actuator control card (A2G2 disk drive A, A3G2 disk drive B) in the logic gate assembly. Note the 10 turn potentiometer and the two red light emitting diodes on the top half of the card (looking toward the end of the card opposite the board pin contacts). See paragraph 09-120 for cable and card locations.

2. To ensure a center range setting of the potentiometer adjust 10 turns clockwise, then five turns counterclockwise. This sets the actuator speed high enough to let the actuator seek home.

3. Load DIAGB1 and select Exercisers.

4. Select device:
   Disk drive A or disk drive B.

   Note: Only the devices specified in the machine configuration are in the menu. Disk drive B can be selected in step 5 if it is not in the machine configuration.

5. Select command 'Access Timing Module' (access speed adjustment test).

   Note: Command option 1 may be used to select disk drive A or disk drive B if they were not selected during step 4.

6. Select 'E'.

7. Adjustment:

   Note: The correct potentiometer setting is with the top light-emitting diode flashing continuously for 15 seconds and off for 2 seconds, and the bottom light-emitting diode flashing from 1 to 3 times during the 15 seconds.

   a. If both the light-emitting diodes are flashing, turn the potentiometer clockwise until the top light-emitting diode is flashing continuously for 15 seconds and off for 2 seconds, and the bottom light-emitting diode flashes 1 to 3 times during the 15 seconds.
   b. If both of the light-emitting diodes are off, turn the potentiometer counterclockwise until the top light-emitting diode is flashing continuously for 15 seconds and off for 2 seconds, and the bottom light-emitting diode flashes 1 to 3 times during the 15 seconds.

8. To verify correct seek operation after an adjustment has been completed, run the disk MDI MAPs for the disk drive that was adjusted (TA030 tests this function). If the adjustment is wrong, return to step 1.

09-150 DISK CONFIGURATION CHANGE

If it is necessary to change the machine configuration to a single drive machine to verify which drive is failing, do the following:

1. Set CB1 off (see paragraph 05-310 for the location of CB1).
2. Remove all file cables from the A-A3 board.
3. Jumper A-A2E2S13 to ground (A-A2E2U08).
4. Jumper A-A2F2J12 to ground (A-A2F2J08).
5. Connect the four cables from either the top or bottom disk to the attachment in the A-A2 board.
6. Disconnect the AC power to the disk drive not being used (see paragraph 09-030). If AC power is not removed, the brake will stop the motor and trip the thermal overload or if the motor does not stop, the brake can be destroyed.
7. Ensure that the leads from the motor not being used cannot contact the terminal block.

You can change the machine configuration and run the system as a 13.2-megabyte system.