

# **Service Manual for Stacked Drying Tumbler**

**(30 Pound Capacity)**

**(For Models Prior to Serial No.  
DTCK9401011756)**

**KEEP THIS MANUAL FOR FUTURE REFERENCE**

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**IMPORTANT:** Warranty is void unless drying tumbler is installed according to the installation manual. Compliance with minimum specifications and requirements detailed therein, and with applicable local codes is a **MUST**. Because of varied requirements, applicable local codes should be thoroughly understood and all pre-installation work arranged for accordingly.

Installation must also conform with American National Standard Z223.1-1984 "National Fuel Gas Code" and Standard ANSI/NFPA 70-1984 "National Electrical Code" in the U.S.A., Standards CAN1-B149.1 OR CAN1-B149.2 installation codes for gas burning appliances and equipment in Canada and/or local codes.

**▲ WARNING**

**FAILURE TO INSTALL, MAINTAIN, AND/OR OPERATE THIS MACHINE ACCORDING TO MANUFACTURER'S INSTRUCTIONS MAY RESULT IN CONDITIONS WHICH CAN PRODUCE SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE.**

**NOTE:** The **WARNING** and **IMPORTANT** instructions appearing in this manual are not meant to cover all possible conditions and situations that may occur. It must be understood that common sense, caution and carefulness are factors which **CANNOT** be built into this tumbler. These factors **MUST BE** supplied by the person(s) installing, maintaining or operating the tumbler.

Always contact your dealer, distributor, service agent or the manufacturer on any problems or conditions you do not understand.

**FOR YOUR SAFETY**

**IF YOU SMELL GAS**

1. Open windows
2. Don't touch electrical switches
3. Extinguish any open flame
4. Immediately call your gas supplier

**CONSIGNES DE SÈCURITÉ**

**Si vous sentez une odeur de gaz:**

1. Ouvrez les fenêtres
2. Ne touchez pas aux interrupteurs électriques
3. Eteignez toute flamme nue
4. Contactez immédiatement votre compagnie de gaz

**FOR YOUR SAFETY**

**Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**

**CONSIGNES DE SÈCURITÉ**

**Il est interdit d'entreposer ou d'utiliser des liquides inflammables ou dégageant des vapeurs inflammables, à proximité de tout appareil fonctionnant au gaz.**

**IMPORTANT:** Purchaser must consult the local gas supplier for suggested instructions to be followed if the tumbler user smells gas. The gas utility instructions plus the warning note directly above must be posted in a prominent location near the tumbler for customer use.

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# REPLACEMENT PARTS INFORMATION

If replacement parts are required, contact the source from whom you purchased your tumbler or, contact RSPC, Shepard Street, P.O. Box 990, Ripon, Wisconsin 54971-0990, for the name and address of the nearest authorized parts distributor.

## IMPORTANT Rules For Personal Safety

(Save these instructions)

### **▲ WARNING**

**To reduce the risk of fire, electric shock, serious injury or death to persons when using your tumbler, follow these basic precautions:**

**DO NOT ALLOW CHILDREN TO PLAY IN, WITH OR AROUND THIS TUMBLER. SERIOUS INJURY MAY RESULT IF A CHILD SHOULD CRAWL INSIDE AND THE TUMBLER IS STARTED. THIS IS A SAFETY RULE FOR ALL APPLIANCES.**

- Read all instructions before using the tumbler.
- Install this tumbler according to the installation instructions. All connections for gas supply, electrical power and grounding must comply with local codes and be made by licensed personnel when required.
- To minimize the possibility of electrical shock, make sure the tumbler has been properly grounded in accordance with the installation instructions.
- Because of hazards under certain conditions **DO NOT USE** an extension cord.
- **ALWAYS** disconnect the electrical power to the tumbler before servicing.
- To prevent damage which may result in fire or shock hazard, **DO NOT** expose this tumbler to rain or excessive moisture.
- Should your tumbler require service, **DO NOT** attempt to repair or replace any part or parts of your tumbler. All servicing should be referred to a qualified serviceman.
- **DO NOT** reach into the tumbler if the cylinder is moving.
- Before this tumbler is removed from service or discarded, remove the door to the drying compartment.
- Store laundry aids, dry cleaning solvents and disinfectants out of the reach of children (preferably in a locked cabinet) to help prevent poisoning or chemical burns.
- **DO NOT TUMBLE** fiber glass curtains and draperies unless the label says it can be done. If they are dried, wipe out the cylinder with a damp cloth to remove particles of fiber glass.

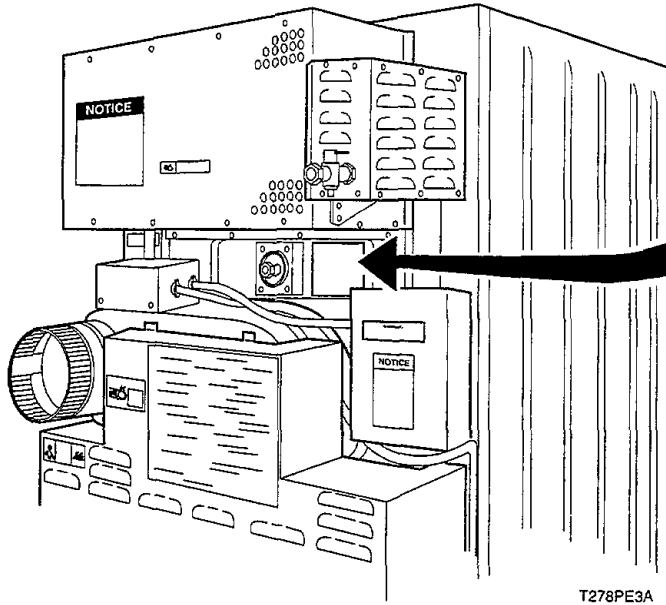
- **TO AVOID CREATING A FIRE, SPONTANEOUS COMBUSTION OR EXPLOSION HAZARD:**
  - **KEEP APPLIANCE AREA CLEAN AND FREE FROM COMBUSTIBLE MATERIALS.**
  - Towels or garments heavily soiled with a cooking residue, machine oils or grease, must be thoroughly washed in hot water using an extra amount of strong heavy duty detergent and a long wash cycle before drying.
  - Remove laundry immediately after tumbler stops.
  - **DO NOT** place anything on top of the tumbler or drape items over the front of the tumbler.
  - **DO NOT** use flammable dry cleaning solvents, gasoline, kerosene or other flammable cleaners in or near the tumbler.
  - **DO NOT** put fabrics treated with flammable cleaners into the tumbler until they have been thoroughly air dried and then hand washed.
  - **DO NOT** put plastics, anything containing wax or chemicals such as in mops and cleaning cloths, or anything dry cleaned at home with a dry cleaning solvent in the tumbler.
  - **DO NOT USE HEAT** for drying articles containing foam rubber or similarly textured rubberlike materials.
- **ALWAYS** clean the lint filter daily. A layer of lint in the filter reduces drying efficiency and prolongs drying time.
- **ALWAYS** read and follow manufacturer's instructions on packages of laundry and cleaning aids. Heed all warnings or precautions.

**ALWAYS FOLLOW THE FABRIC CARE INSTRUCTIONS SUPPLIED BY THE GARMENT MANUFACTURER.**

**▲ WARNING**

- **Install lockable door(s) to prevent public access to rear of tumblers.**
- **Never operate the tumbler with access panels open.**
- **Do not operate the tumbler with guards or parts missing, or with broken parts.**
- **Do not bypass any safety devices.**

# Serial Plate Location



**IMPORTANT**  
When writing for information on any tumbler, be sure to mention model and serial numbers. The model and serial numbers will be found on the serial plate as shown.

# SECTION I

## Service Procedures

### ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

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### 1. INTRODUCTION

**IMPORTANT:** References made to the left or right hand direction are taken from the operator's position facing the front of the tumbler.

#### SAFETY WARNINGS AND DECALS

Safety Warnings and Decals have been provided in key locations to remind you of important precautions for the safe operation and maintenance of your tumbler. Please take the time to review these warnings before proceeding with service work.

All decals have been designed and applied to withstand washing and cleaning. Decals should be checked periodically to be sure they have not been damaged, removed, or painted. Refer to the Parts Manual for ordering replacement decals.

### 2. LOADING DOOR ASSEMBLY (Figure 1)

- Open loading door.
- While supporting door, remove upper hinge bolt holding door to hinge bracket.

**NOTE:** Nylon washer must be in place on lower pin when reinstalling loading door.

- Remove door from bracket.

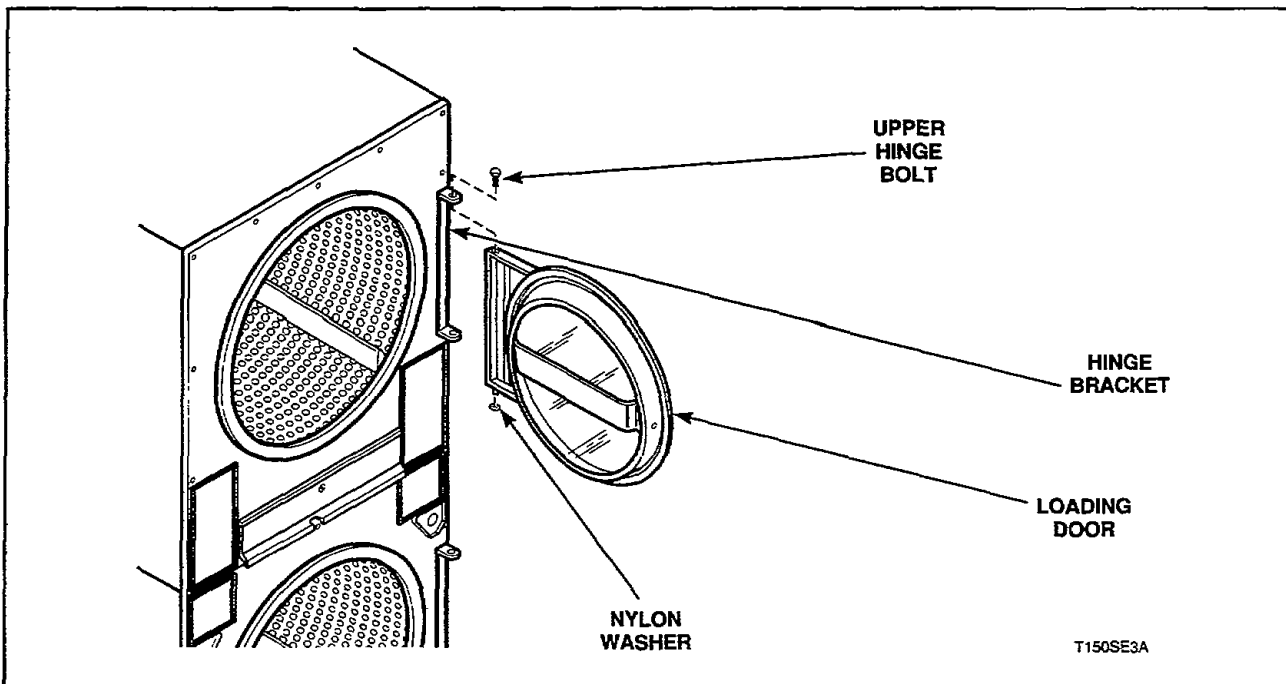


Figure 1

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

**3. DOOR HINGE (Figure 2)**

- Remove loading door assembly, paragraph 2.
- Remove nuts and screws holding hinge to door frame, Figure 2.

**4. DOOR BAR/HANDLE (Figure 3)**

- Open loading door.
- Remove screws holding door bar to loading door.

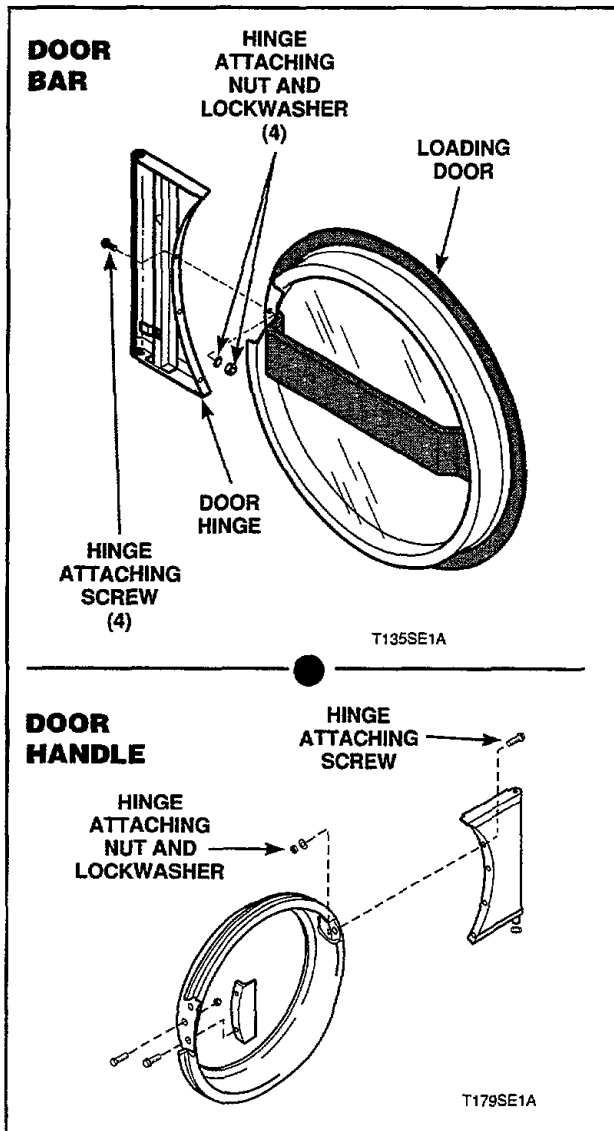


Figure 2

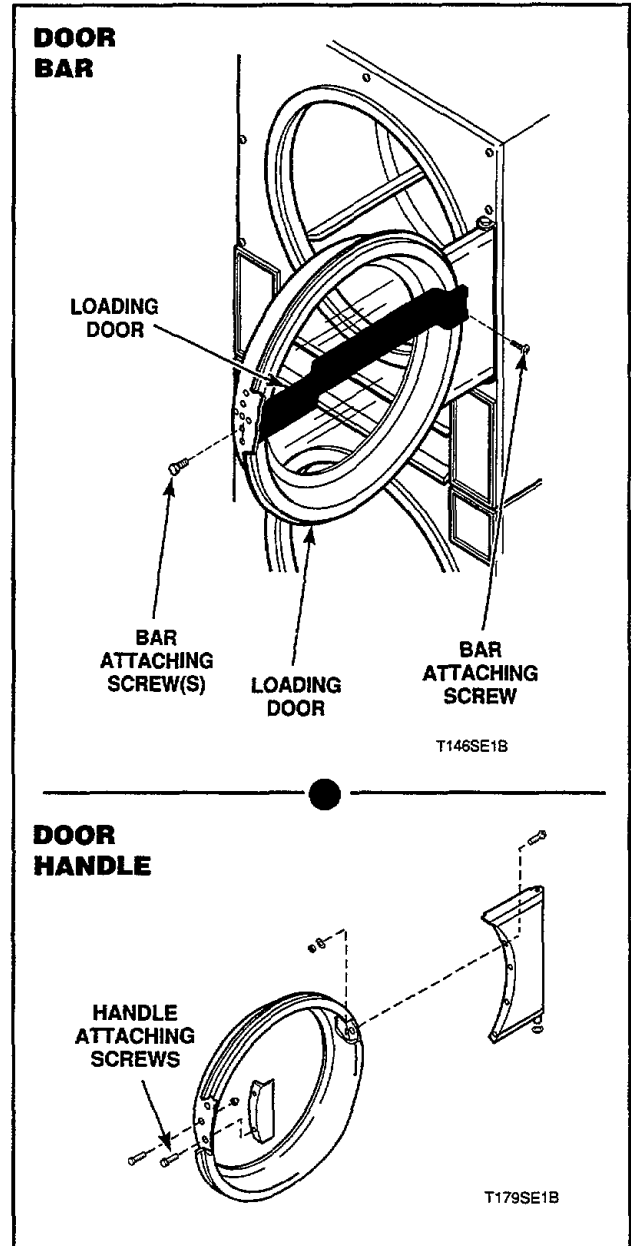


Figure 3



**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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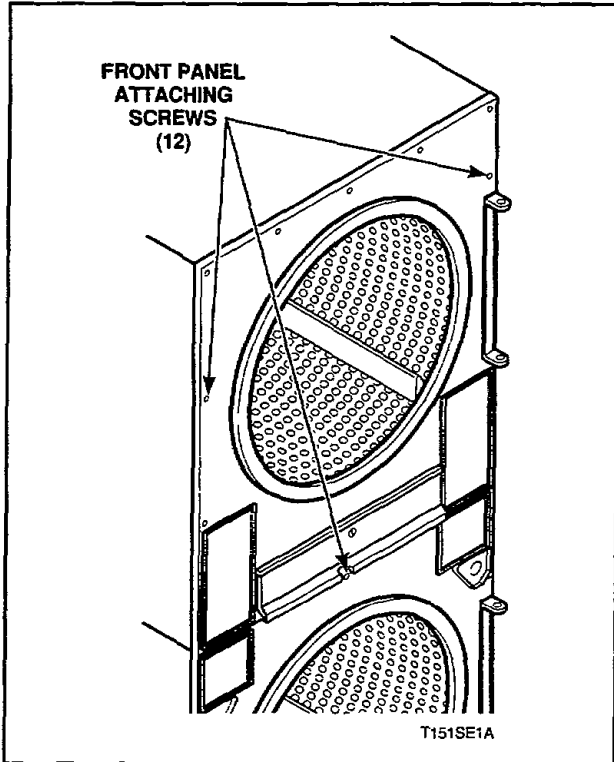


Figure 4

**5. FRONT PANEL (Figure 4)**

- Disconnect electrical service and shut off supply line gas valve.
- Remove loading door, paragraph 2.
- Unlock and remove lint drawer.
- Remove screws holding front panel to cabinet.
- While supporting front panel, tip the top forward slightly and lift up and out far enough to disconnect door switch wires, Figure 5, if required.

**NOTE:** Refer to wiring diagram when rewiring door switch.

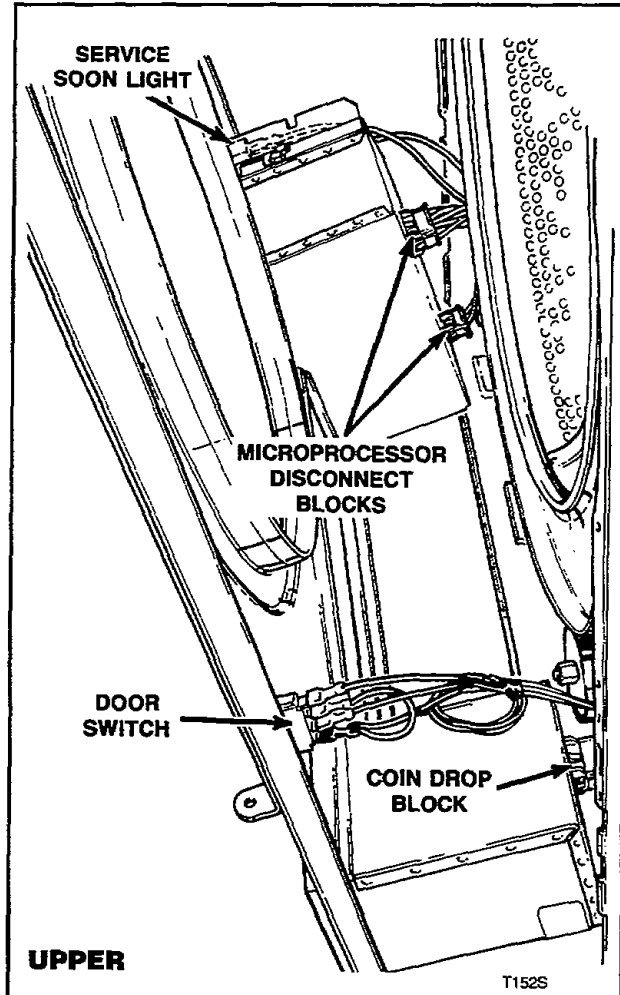


Figure 5

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

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**UPPER (Figure 5)**

- f. While supporting front panel, disconnect service soon light wires (if present) and microprocessor disconnect blocks.

**NOTE:** Refer to wiring diagram when rewiring service soon light wires.

**LOWER (Figure 6)**

- g. While supporting front panel, disconnect coin drop wires.
- h. Remove front panel.

**NOTE:** Refer to wiring diagram when rewiring coin drop wires.

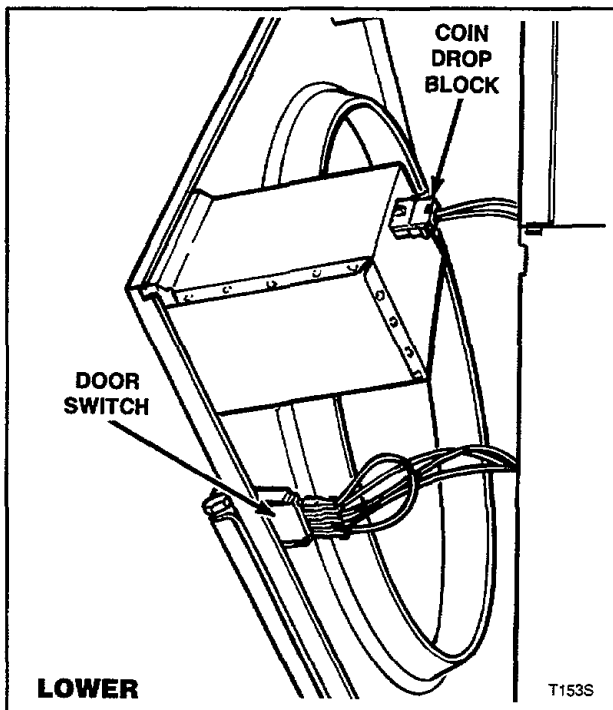


Figure 6

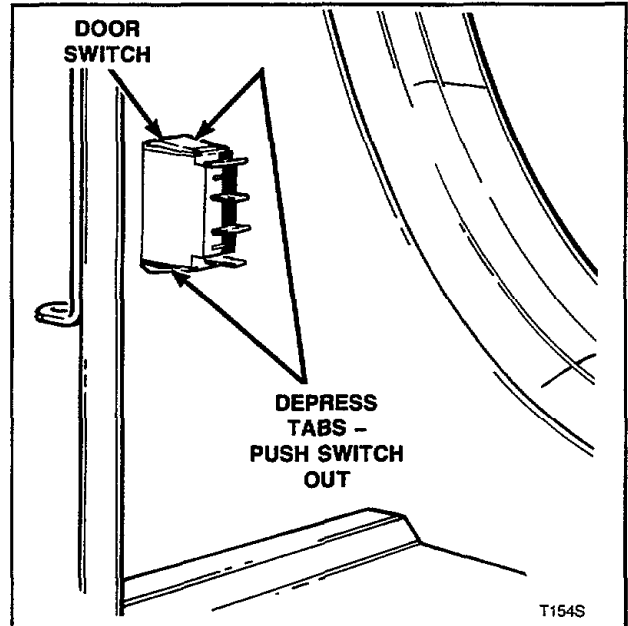


Figure 7

**6. DOOR SWITCH (Figure 7)**

- a. Disconnect electrical service to tumbler.
- b. Remove front panel, paragraph 5.
- c. Prior to Serial Number DTCK9308000527 depress tabs on top and bottom of switch and push switch out through front of panel.
- d. After Serial No. DTCK0728885ZH door switch is mounted on a bracket screwed to the inside of the side panel.

**NOTE:** Refer to wiring diagram when rewiring door switch.

**▲ WARNING**

To reduce the risk of serious injury the door switch **MUST** be reinstalled after service is complete.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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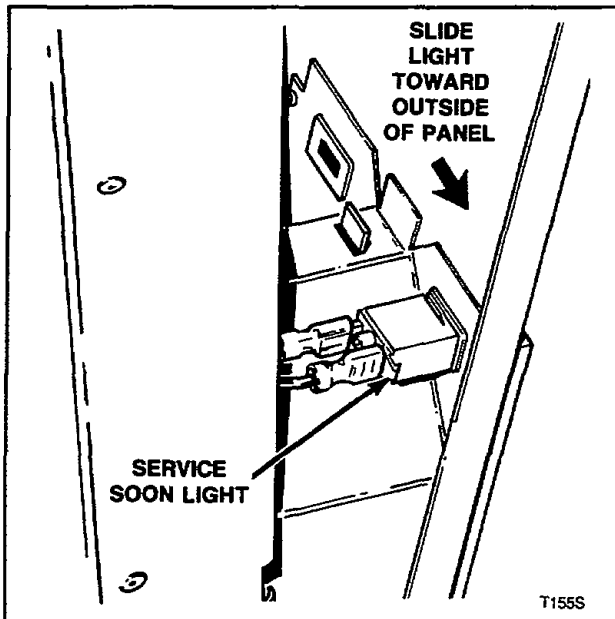


Figure 8

**7. SERVICE SOON LIGHT (Figure 8)**  
(Prior to Serial No. DTCK9211033714 only)

- Disconnect electrical service to tumbler.
- Open upper loading door.
- While supporting door, remove upper hinge bolt holding door to hinge bracket, *Figure 1*. Remove door.
- Unlock and remove upper lint drawer.
- Remove screws holding front panel to cabinet.
- While supporting front panel, tip the top forward slightly and lift up and out far enough to remove light socket.
- Remove light socket by sliding sideways towards outside of panel.
- Remove light by disconnecting wires from terminals.

**NOTE: Refer to wiring diagram when rewiring service soon light terminals.**

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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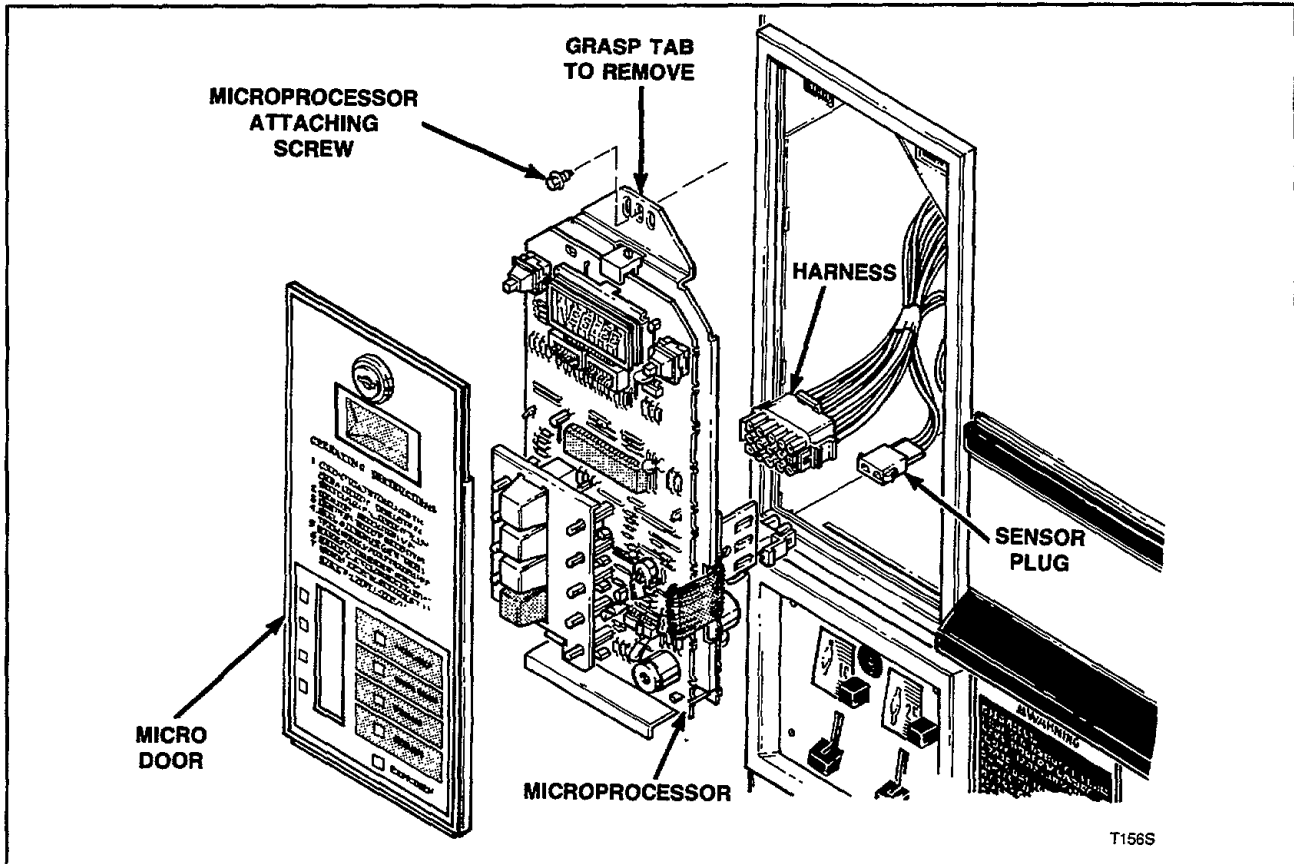


Figure 9

**8. MICROPROCESSOR**

- Disconnect electrical service to tumbler.
- Unlock and remove microprocessor door, *Figure 9*.

- Pull microprocessor out of housing and disconnect microprocessor quick disconnect blocks, *Figure 9*.
- Place microprocessor in a clean, dry location where it cannot be damaged.

**IMPORTANT: Microprocessor door MUST be reinstalled after servicing is completed.**

- Remove one screw attaching microprocessor to microprocessor housing bracket.

**IMPORTANT: When removing microprocessor, grasp *only* the top metal tab of the unit. DO NOT remove microprocessor by grasping sides. Do not touch circuit boards on the front or back side of microprocessor.**

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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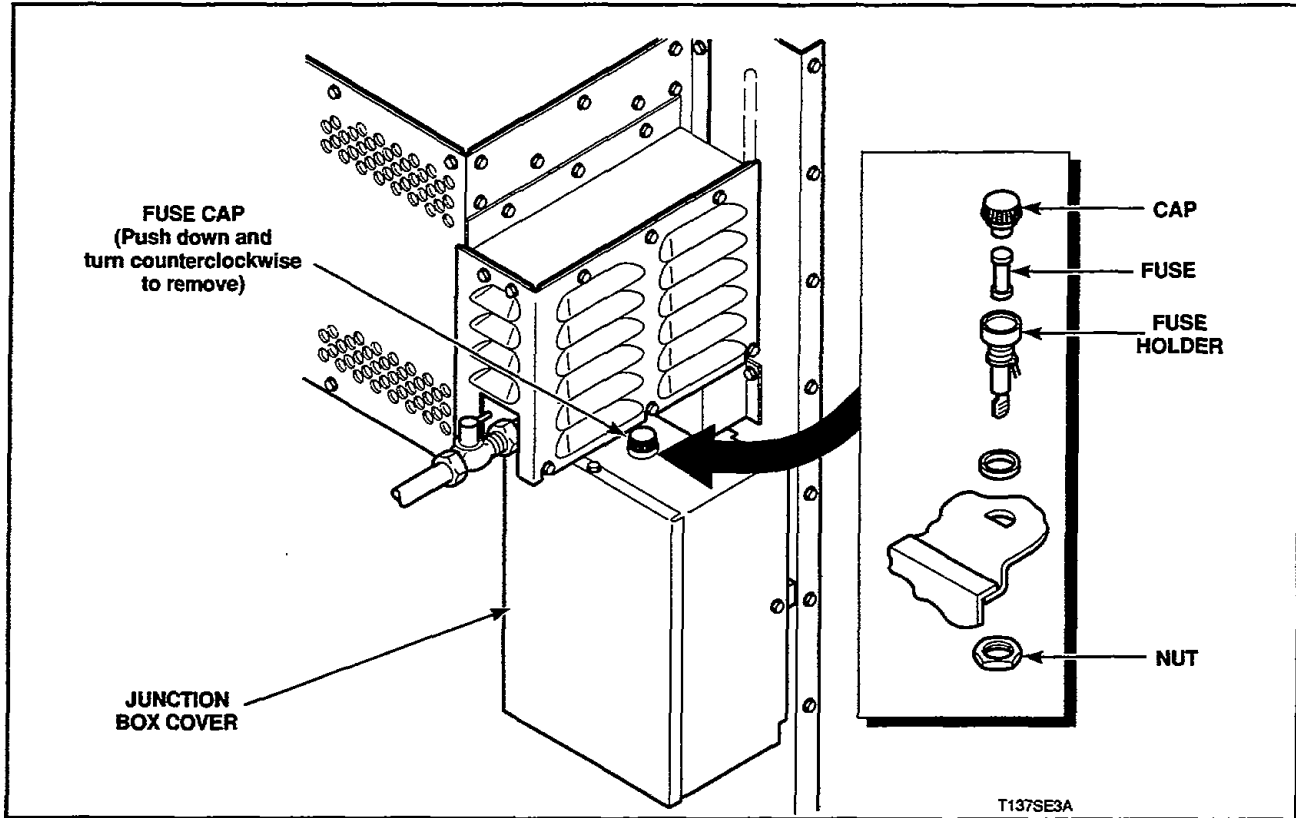


Figure 10

**9. FUSE AND FUSE HOLDER ASSEMBLY**

- Disconnect electrical service and shut off supply line gas valve.
- Fuse holder is located on the top of each junction box at the rear of the machine.
- Turn fuse cap counterclockwise to remove fuse, *Figure 10*.
- Remove fuse from fuse cap.

**NOTE:** Refer to wiring diagram when rewiring fuse.

- Remove junction box cover, *Figure 10*.
- Disconnect wires from fuse holder.
- Remove plastic retaining nut. Remove assembly.

### ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

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### 10. COIN DROP ASSEMBLY (Figure 11)

- Disconnect electrical service to tumbler.
- Unlock coin drop. Remove drop by tipping drop forward and lifting up and out.
- Disconnect wires to coin drop and ground terminal.

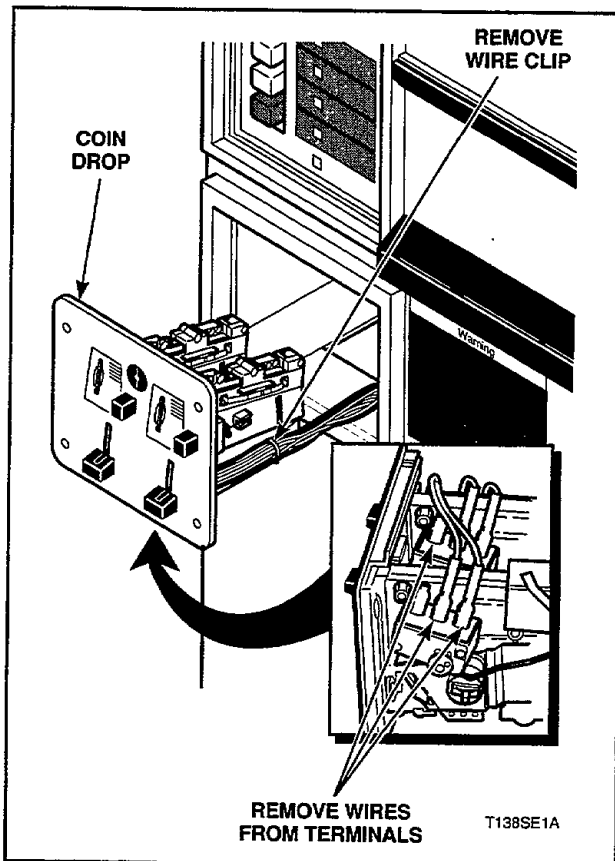


Figure 11

### 11. LINT SCREEN (Figure 12)

- Disconnect electrical service to tumbler.
- Unlock and remove lint drawer.
- Remove lint screen bracket screws and lint screen brackets.
- Remove lint screen.

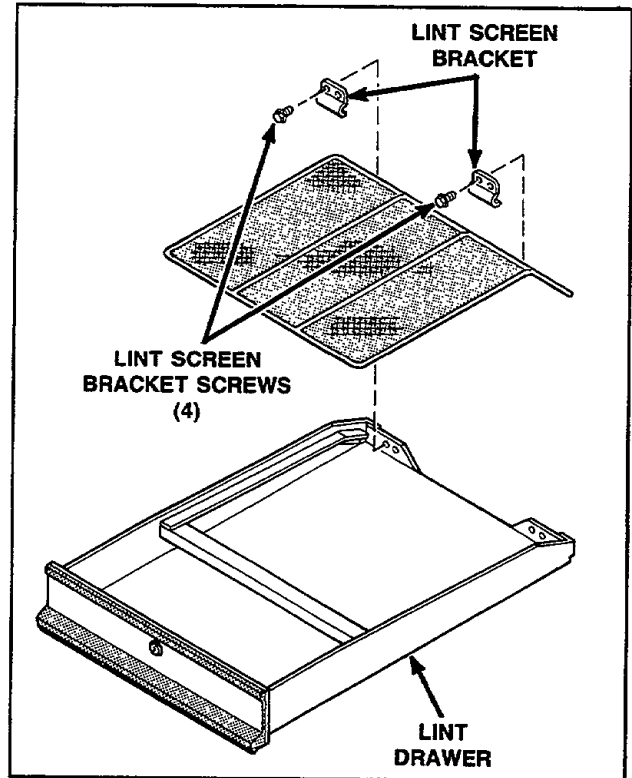


Figure 12

### 12. LINT DRAWER SEAL

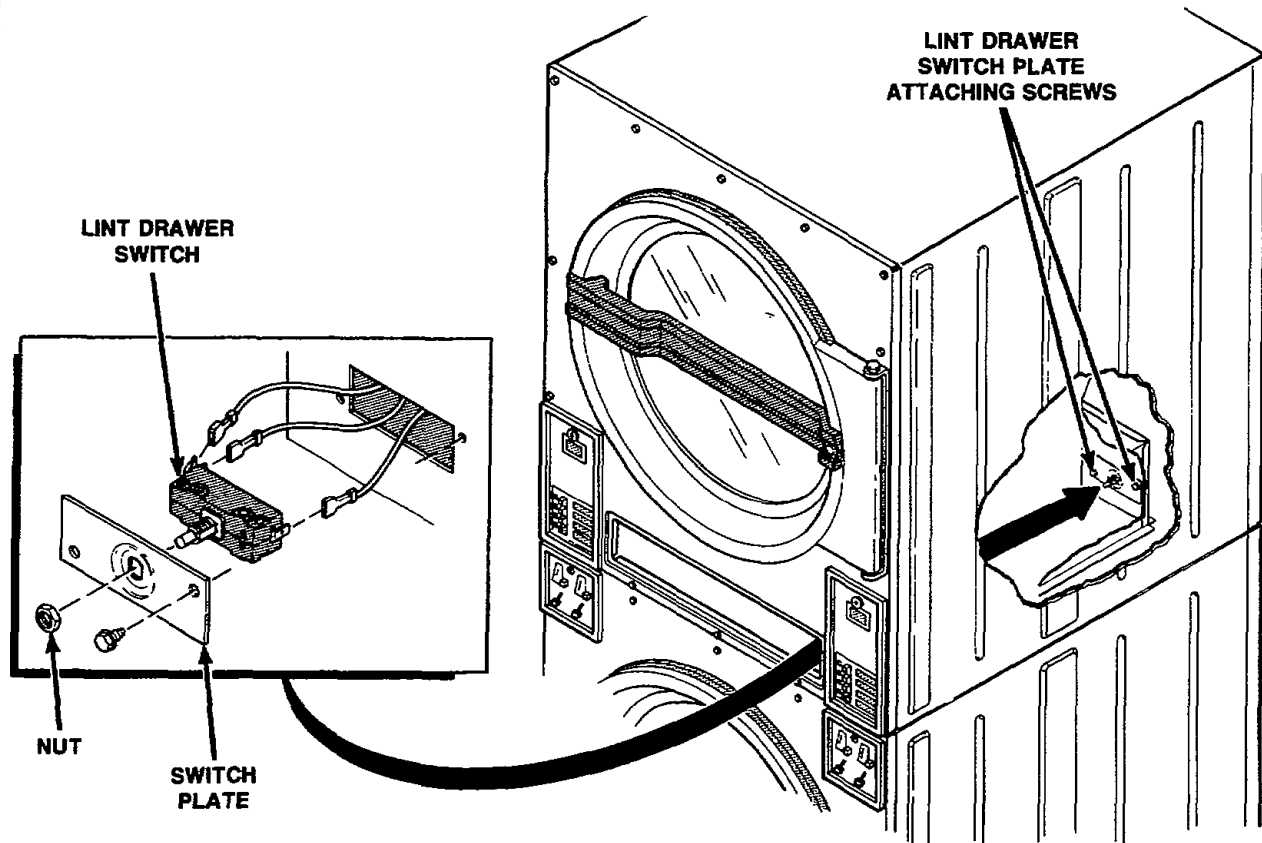
- Disconnect electrical service to tumbler.
- Unlock and remove lint drawer.
- Remove damaged or worn seal from front panel.
- Degrease area where new seal is to be placed.

### ▲ WARNING

For personal safety use degreaser/solvent only in a well ventilated area away from any open flames or sources of ignition.

- When installing new seal, make sure it is placed in depressed front panel area and does not extend into lint drawer opening cavity.

**Prior to Serial Number  
DTCK930800527**



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**After Serial Number  
DTCK9308000527**

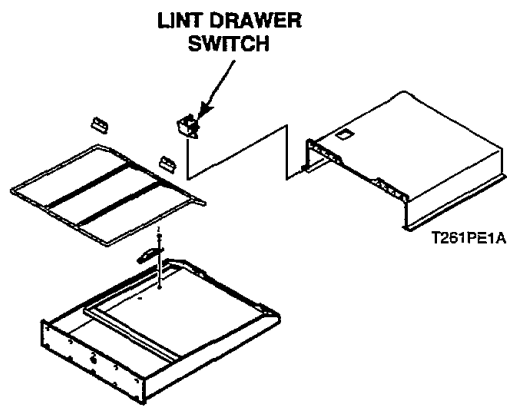


Figure 13

### ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

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#### 13. LINT DRAWER SWITCH

1. Prior to Serial Number DTCK9308000527 (Figure 13).
  - a. Disconnect electrical service to tumbler.
  - b. Unlock and remove lint drawer.
  - c. Remove two screws mounting lint drawer switch plate to rear of lint shroud.
  - d. Pull lint drawer switch plate assembly forward.
  - e. Disconnect wires to switch.
  - f. Remove nut holding switch to switch plate.
  - g. Remove switch.
2. After Serial Number DTCK93080 (Figure 13).
  - a. Disconnect electrical service tumbler.
  - b. Unlock and remove lint draw
  - c. Pull lint drawer switch out.
  - d. Disconnect wires to rocker s

#### 14. CYLINDER ROLLERS (Figure 14)

- a. Disconnect electrical service to tumbler.
- b. Remove loading door, paragraph 2.
- c. Unlock and remove lint drawer.
- d. Remove front panel, paragraph 5.
- e. Remove nuts from end of roller shafts.
- f. Lift cylinder up slightly and remove rollers from shafts.

(continued)

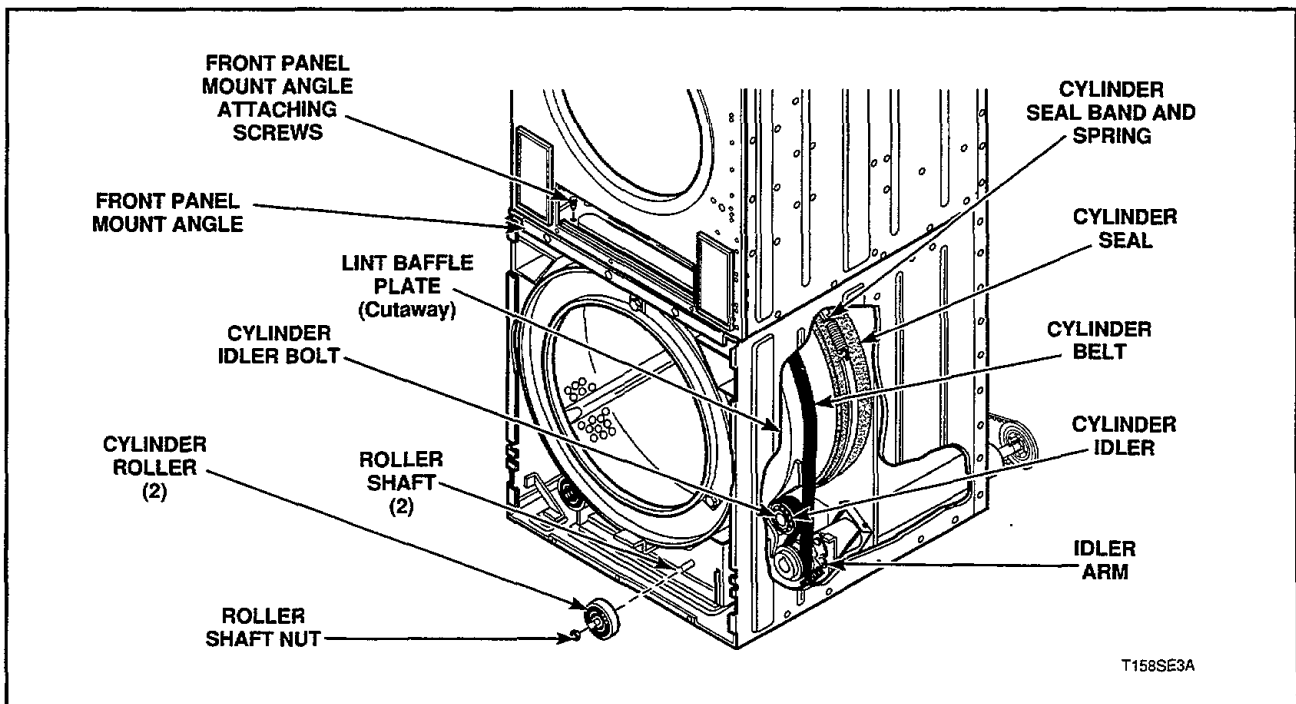


Figure 14



## **▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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### 15. CYLINDER BELT (*Figure 14*)

- a. Disconnect electrical service to tumbler.
- b. Remove loading door, paragraph 2.
- c. Unlock and remove lint drawer.
- d. Remove front panel, paragraph 5.
- e. Remove screws attaching lint baffle plate to lint shroud. Remove lint baffle plate, if present.
- f. Remove sweep sheet.
- g. Disengage belt from idler system by rotating idler arm down.
- h. Remove cylinder belt being careful not to pinch it. Lift up cylinder to create a gap between rollers and cylinder to allow belt to pass through.

**NOTE:** When installing cylinder belt, be sure belt is properly positioned around cylinder and on sheave and idler. Rotate cylinder clockwise by hand a few turns to align belt around belt path.

### 16. CYLINDER IDLER (*Figure 14*)

- a. Disconnect electrical service to tumbler.
- b. Remove loading door, paragraph 2.
- c. Unlock and remove lint drawer.
- d. Remove front panel, paragraph 5.
- e. Remove screws attaching lint baffle plate to lint shroud. Remove lint baffle plate, if present, and discard.
- f. Disengage belt from idler system by rotating idler arm down.
- g. Remove bolt holding cylinder idler to idler arm. Remove cylinder idler.

### 17. CYLINDER AND TRUNNION ASSEMBLY

- a. Disconnect electrical service to tumbler.
- b. Remove loading door, paragraph 2.
- c. Unlock and remove lint drawer.
- d. Remove front panel, paragraph 5.
- e. Remove screws attaching lint baffle plate to cabinet. Remove lint baffle plate and discard, *Figure 14*.
- f. Remove sweep sheet.
- g. Run the cylinder belt off idler.
- h. Remove upper portion of belt, leaving belt in place on lint shroud.
- i. Remove nuts from end of roller shafts.
- j. Lift cylinder up slightly and remove rollers from shafts.
- k. Remove palnut, jamnut and washer from end of trunnion shaft located at rear of unit, *Figure 15*.

#### LOWER STACKED MODEL ONLY

Unlock and remove top lint drawer. Remove screws attaching front panel mount angle to top unit base and remove front panel mount angle from bottom unit, *Figure 14*.

- l. Screw cylinder guide service tool, Part No. 263P4, on trunnion shaft threads to be used as a guide.
- m. Remove cylinder and trunnion assembly from unit.
- n. If tumbler is fitted with sweep sheets, remove them by disconnecting springs from left side of air duct roller support bracket. Remove the two mounting screws from the right side of air duct roller support bracket, and lift cylinder removing sweep sheet from around the cylinder.

**NOTE:** Care must be taken not to damage or remove the seals on the sweep sheet.

**NOTE:** When removing cylinder through front of cabinet, spread cabinet slightly so cylinder will clear cabinet sides. Be careful not to pull off cylinder seal when removing cylinder.

**IMPORTANT:** After reinstalling cylinder and trunnion assembly, make sure band is in place on seal and seal is over seal partition along entire circumference. Test that cylinder turns freely and seal does not bind.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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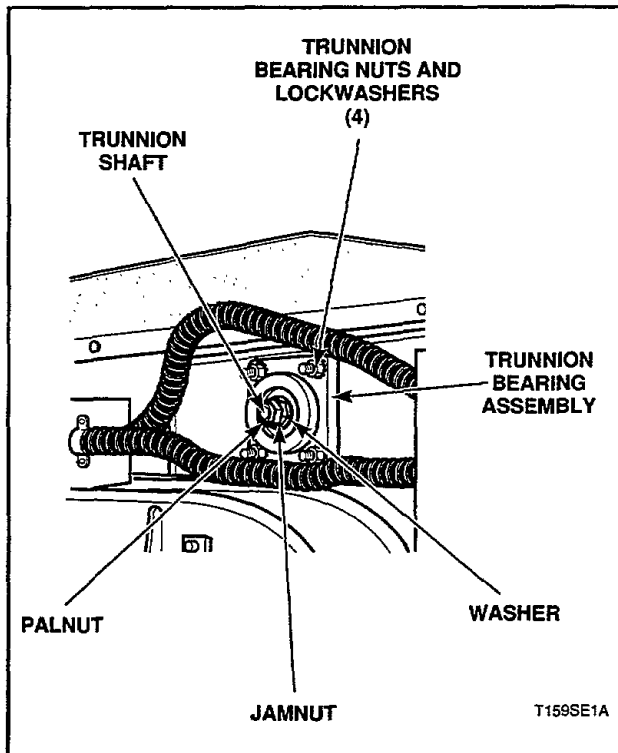


Figure 15

**18. TRUNNION BEARING ASSEMBLY (Figure 15)**

- Disconnect electrical service to tumbler.
- Remove palnut, jamnut and washer from end of trunnion shaft.
- Screw cylinder guide service tool, Part No. 263P4, on trunnion shaft threads to be used as a guide.
- Remove nuts and lockwashers holding bearing assembly on cabinet back.
- Remove trunnion bearing assembly.

**IMPORTANT:** Trunnion bearing assembly is a nonrepairable unit. If worn or damaged replace entire assembly.

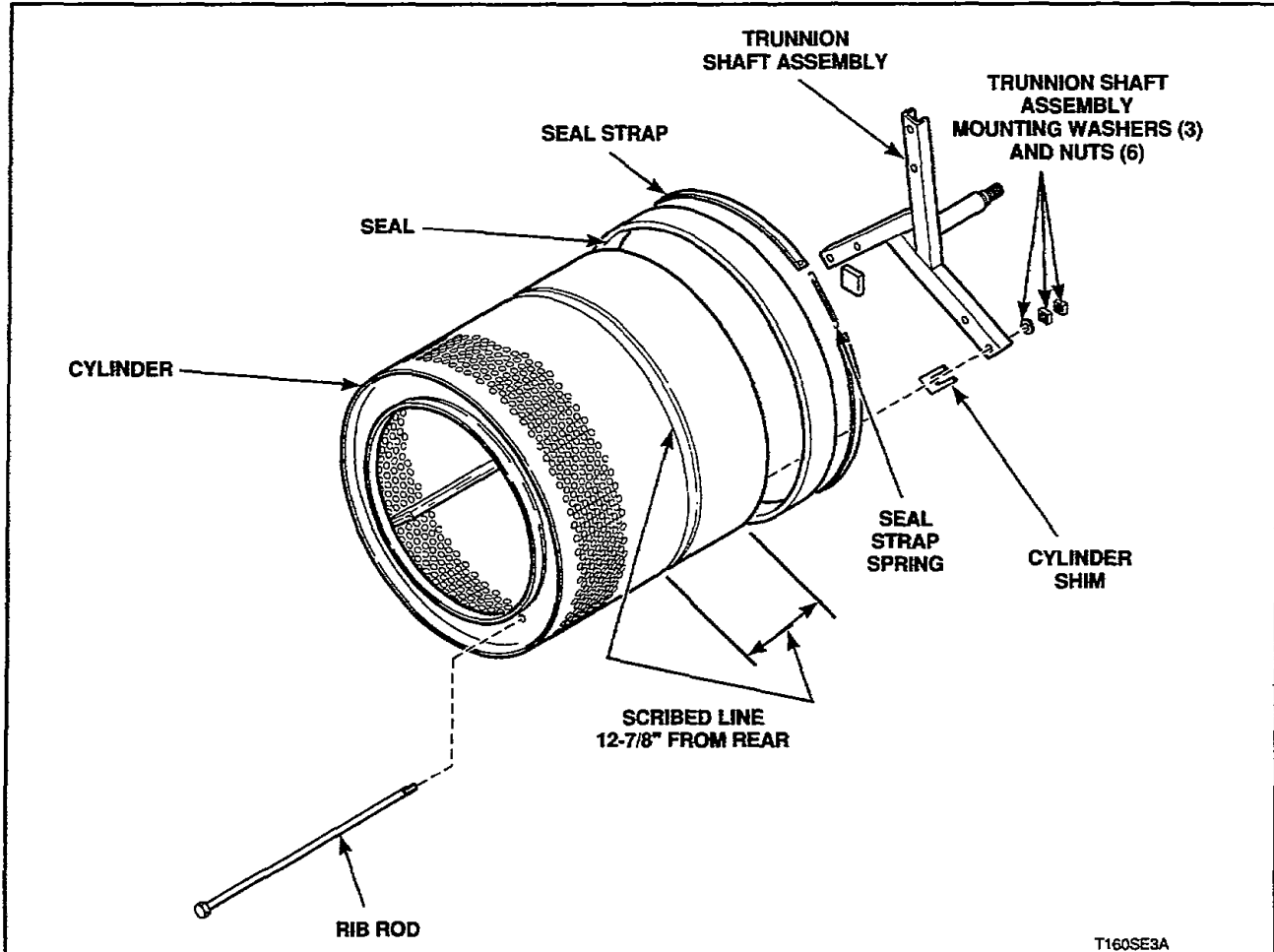
**NOTE:** Upon reassembly, use cylinder guide service tool to position trunnion shaft through bearing bore.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002



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Figure 16

**19. TRUNNION SHAFT ASSEMBLY (Figure 16)**

- Disconnect electrical service to tumbler.
- Remove cylinder and trunnion assembly, paragraph 17.
- Remove the three washers and six nuts holding trunnion shaft assembly to rear of cylinder, Figure 16.

**IMPORTANT:** When installing trunnion assembly on cylinder, the cylinder and shaft must be leveled. Refer to Figure 17 for an example of how to check for proper alignment of the shaft and cylinder. Measure the distance between the center of the trunnion shaft and the outer rim of the cylinder as shown. If any measurement is lower than the highest point, place shim or shims (M401402) between trunnion channel and cylinder back until the measurement is equal to the highest point.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**20. CYLINDER SEAL (Figure 16) AND FRONT CYLINDER SEAL**

- Remove cylinder and trunnion assembly, paragraph 17.
- Disconnect seal strap spring and remove seal strap.
- Break seal loose from cylinder. (Seal is held in place with adhesive).

**NOTE:** Cylinder should have a scribed line around perimeter of cylinder indicating where leading edge of seal is positioned. If scribed line is not apparent or is hard to recognize, scribe a new line. Line should be 12-7/8" from rear edge of cylinder. Front cylinder seal is secured to the front cylinder lip.

- Scrape any remaining adhesive from cylinder with a single edge razor blade while applying heat with a hair dryer or hot air gun.
- With degreaser/solvent, thoroughly clean area to be reglued.

**▲ WARNING**

**For personal safety use degreaser/solvent only in a well ventilated area away from any open flames.**

- Position new seal on cylinder with leading edge at scribed line, or front cylinder lip.
- Obtain a glue gun and load gun with hot melt adhesive sticks provided with cylinder seal.

**▲ WARNING**

**For personal safety DO NOT let hot glue contact skin. Hot glue may cause burns.**

**Read and follow glue gun manufacturer's operating instructions before using any glue gun.**

**IMPORTANT:** Use ONLY hot melt adhesive sticks provided with seal. Other adhesives or hot melts will not adhere to cylinder surface or will break down with heat.

- With nozzle of glue gun slightly under seal leading edge, apply a liberal amount of hot melt around cylinder perimeter following with hand pressure mating seal to cylinder. Hot melt should extend to seal edge or slightly beyond.

**NOTE:** DO NOT get adhesive on the face of the seal that comes in contact with moving parts.

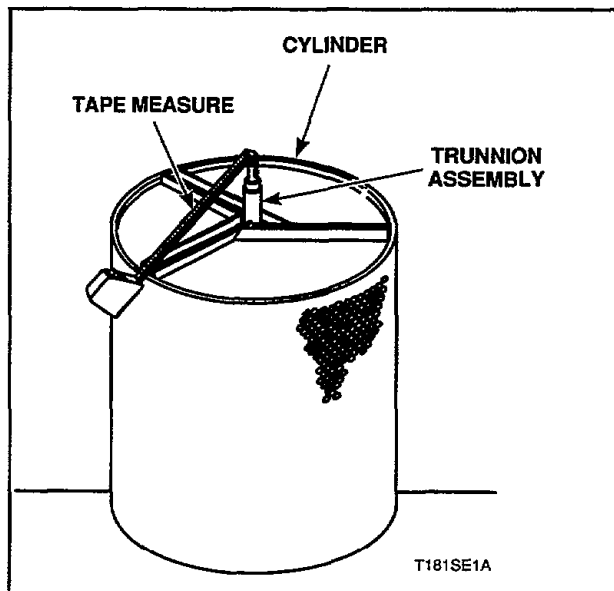


Figure 17

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

**21. ROLLER SHAFT (Figure 18)**

- Remove cylinder and trunnion assembly, paragraph 17.
- Remove snap ring and washer at back end of shaft.
- Slide shaft forward out of air duct roller support assembly.

**22. AIR DUCT ROLLER SUPPORT ASSEMBLY (Figure 18)**

- Remove cylinder and trunnion assembly, paragraph 17.
- Remove screws holding lint shroud to back of air duct roller support assembly.
- Remove nuts and lockwashers holding air duct roller support to base.
- Lifting up over the weld studs and pulling forward, remove air duct roller support assembly.
- Remove snap ring and washer at back end of roller shaft.
- Slide shaft forward out of air duct roller support assembly.

**IMPORTANT:** When reinstalling air duct roller support assembly on upper unit, be careful not to pinch main wire harness routed below assembly.

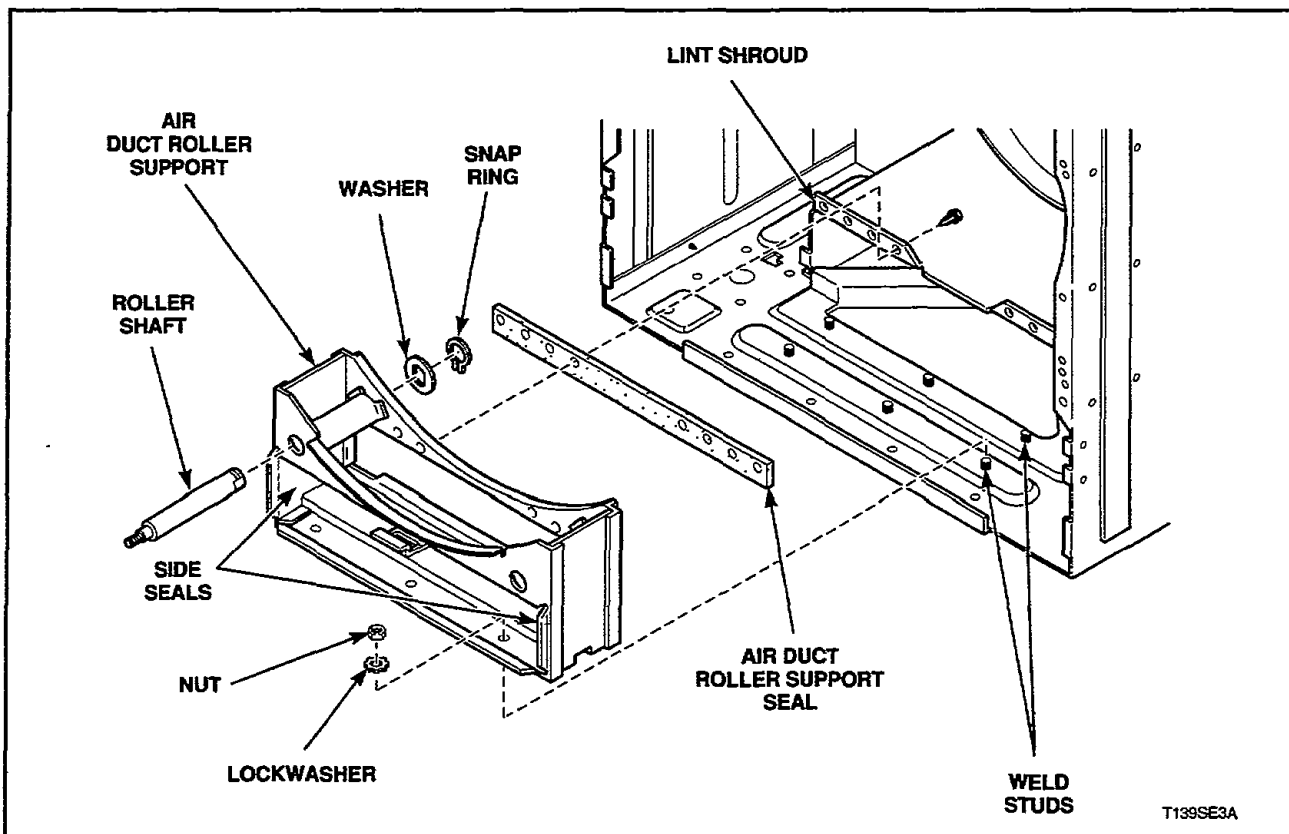


Figure 18

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

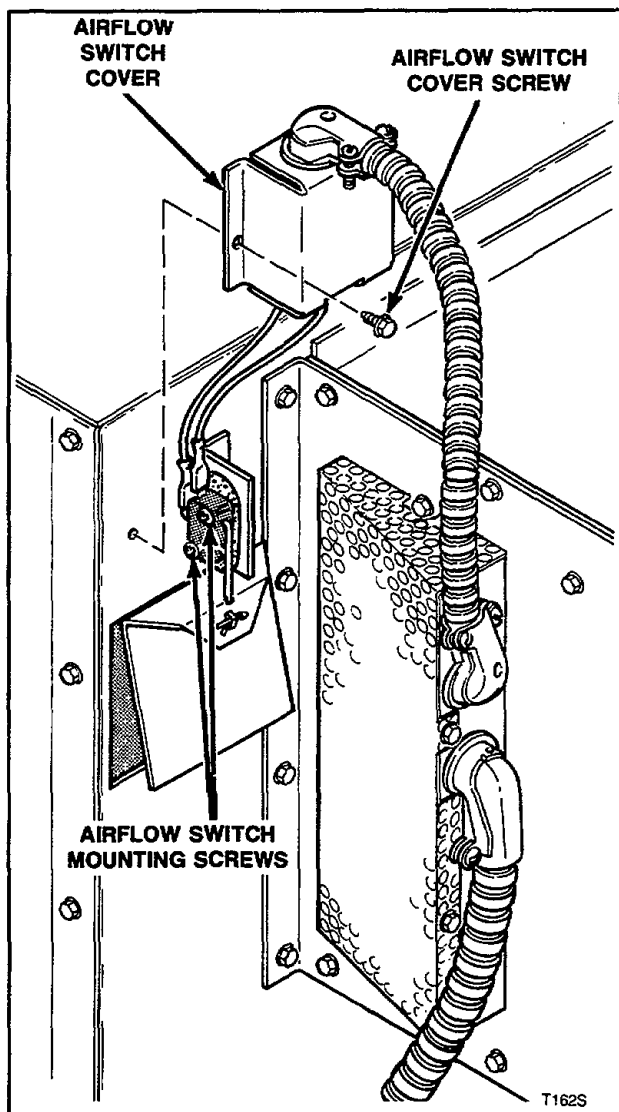


Figure 19

**23. AIR DUCT ROLLER SUPPORT SEALS (Figure 18)**

- Remove air duct roller support assembly, paragraph 22.
- Detach air duct roller support seal from back of roller support assembly.
- Side seals can be replaced without removing air duct roller support.

**IMPORTANT:** When reinstalling air duct roller support assembly on upper unit, be careful not to pinch main wire harness routed below assembly.

**24. AIRFLOW SWITCH (Figure 19)**

- Disconnect electrical service to tumbler.
- Remove airflow switch cover screws. Remove cover.
- Disconnect wires from switch.

**NOTE:** Refer to wiring diagram when rewiring switch.

- Remove screws and nuts holding switch to mounting bracket.

**25. STOVE HIGH LIMIT THERMOSTAT, RESET THERMOSTAT AND STEP DOWN THERMOSTAT**

- Prior to Serial Number DTCK9211033714 (Figure 20).
  - Disconnect electrical service to tumbler.
  - Remove screws attaching thermostat cover to stove. Remove cover.
  - Disconnect wires from appropriate thermostat.

**NOTE:** Refer to wiring diagram when rewiring thermostat.

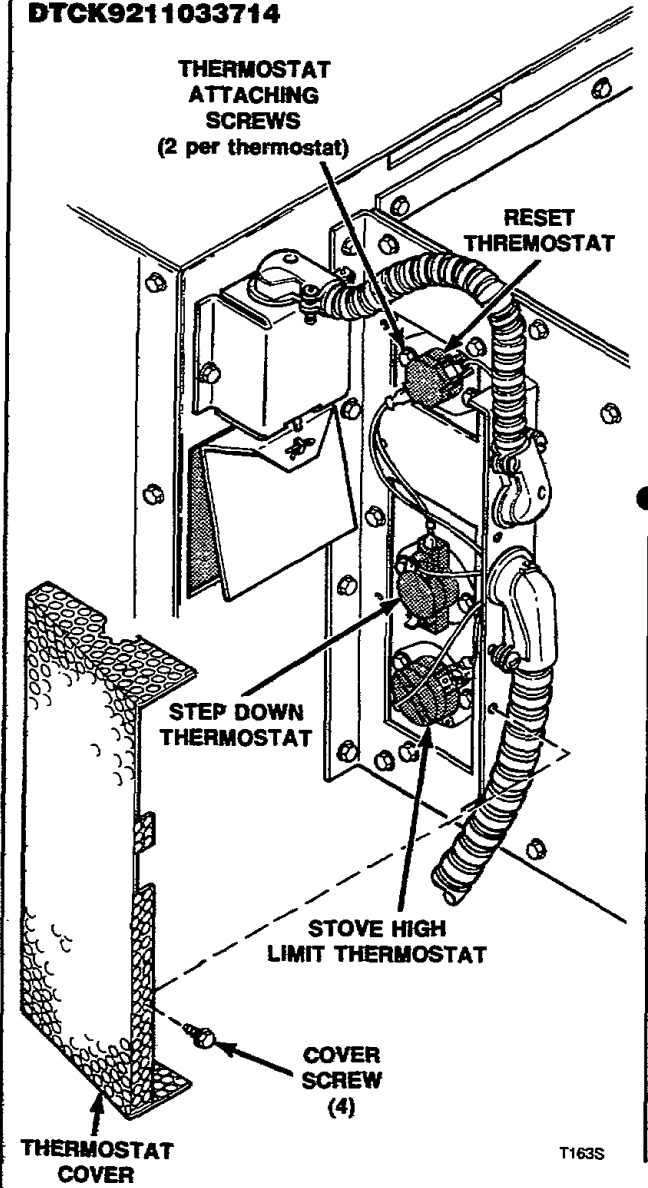
- Remove screws attaching thermostat to stove.

- After Serial Number DTCK9211033714 (Figure 20).
  - Disconnect electrical service to tumbler.
  - Remove screws attaching thermostat cover to stove. Remove cover.
  - Disconnect wires from high limit thermostat (reset thermostat and step down thermostat eliminated after Serial Number DTCK9211033714).

**NOTE:** Refer to wiring diagram when rewiring thermostat.

- Remove screws attaching thermostat to stove.

**Prior to Serial Number  
DTCK9211033714**



**From Serial Number  
DTCK9211033714**

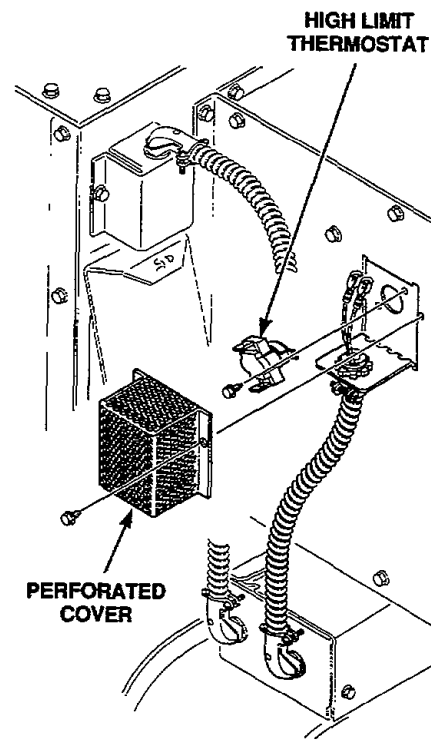


Figure 20

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**26. BURNER SYSTEM COMPONENTS**

**COMPLETE GAS VALVE ASSEMBLY**  
(Figure 21)

- a. Disconnect electrical service and shut off supply line gas valve.
- b. Remove top screws holding gas valve cover to cabinet and stove and loosen bottom screws.
- c. Remove gas valve cover.
- d. Remove junction box cover screw.
- e. Remove junction box cover.
- f. Disconnect gas valve wire connections.

**NOTE:** Refer to wiring diagram when rewiring gas valve.

- g. Disconnect gas valve pipe union nut attaching gas shut-off valve to gas valve nipple.
- h. Remove screws mounting gas valve to mounting plate.

**IMPORTANT:** When reinstalling gas valve, purge air and sediment from the gas service line before connecting it loosely to the tumbler. Purge remaining air until odor of gas is detected, then tighten connection. Use pipe compound resistant to action of L.P. gas on all pipe threads.

**▲ WARNING**

**Check all pipe connections for gas leaks with soap suds. DO NOT USE AN OPEN FLAME TO CHECK FOR GAS LEAKS!**

**IGNITER AND BURNER TUBE ASSEMBLY**  
(Figure 22)

- a. Disconnect electrical service and shut off supply line gas valve.
- b. Remove complete gas valve assembly. Refer to gas valve procedure in this paragraph.
- c. Remove screws attaching stove guard to bottom of stove. Remove guard.
- d. Disconnect high voltage lead from igniter.
- e. Remove screws mounting burner to stove.
- f. Remove screws holding plate to side of stove.
- g. Remove burner by lifting igniter end up towards top of stove and pulling burner towards gas valve end of stove. Remove burner from bottom of stove.
- h. Remove screws mounting igniter to burner.
- i. Remove igniter.

**(continued)**



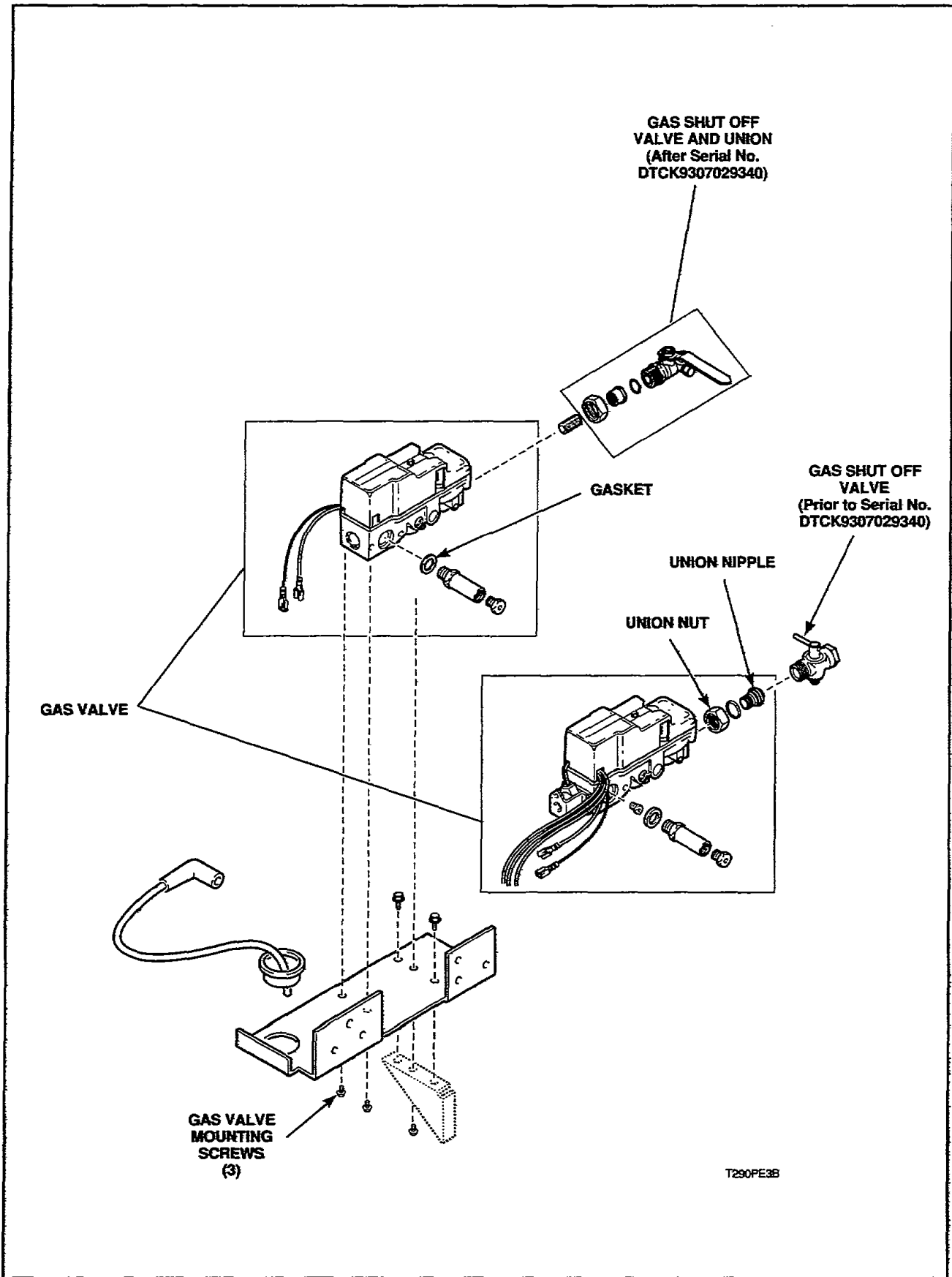


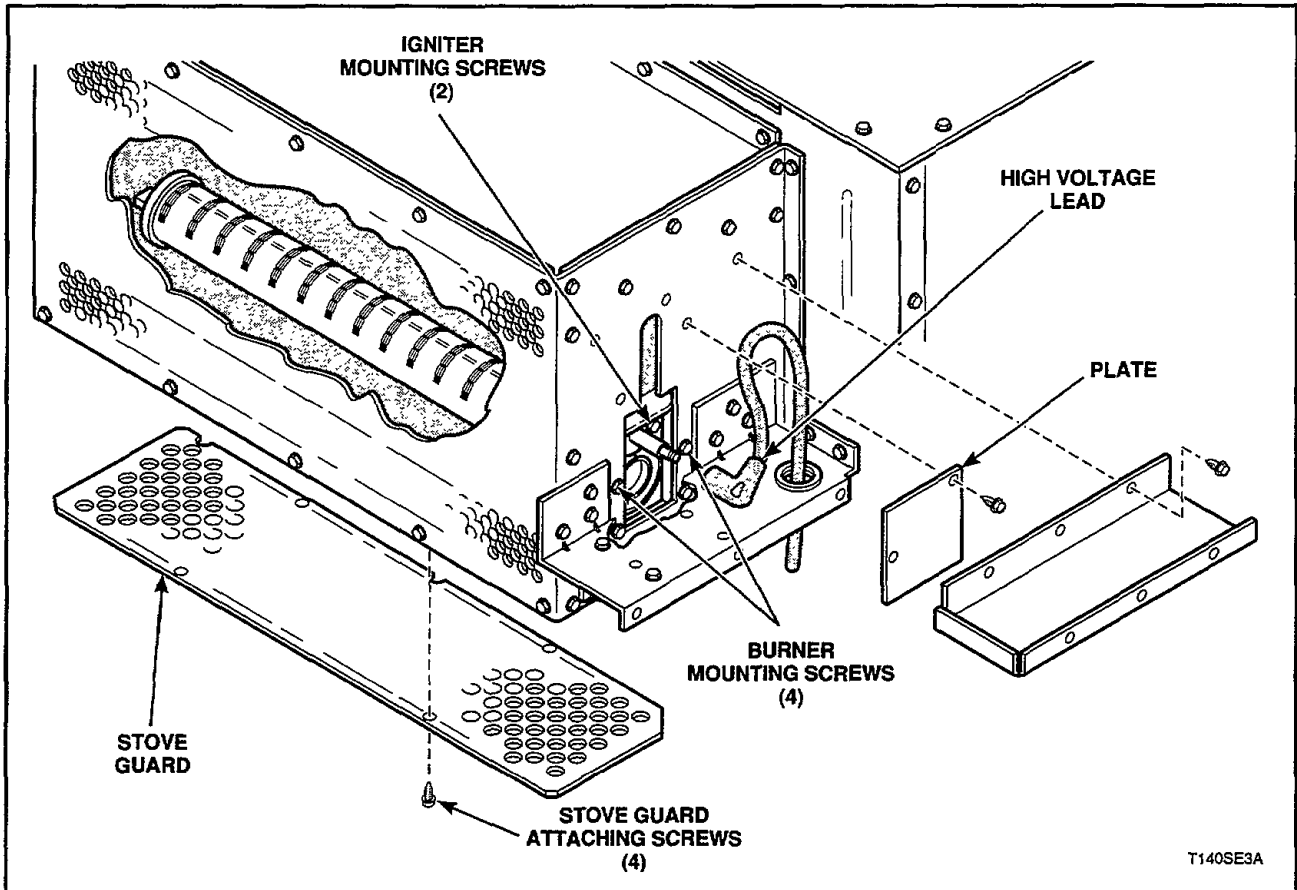
Figure 21

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

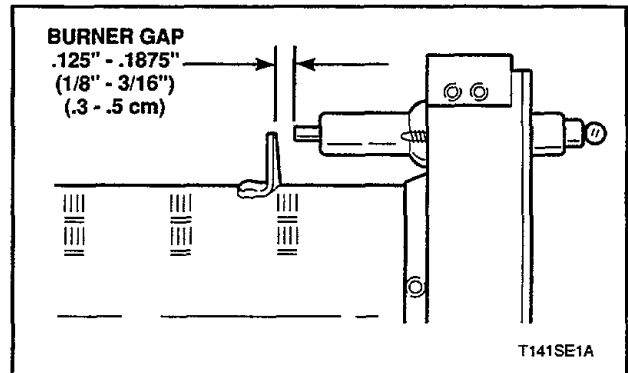
W002



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Figure 22

**IMPORTANT:** When reinstalling igniter on burner, gap between igniter and burner tab should be **.125" - .1875" (1/8" to 3/16") (.3 - .5 cm)**, *Figure 23*.



T141SE1A

Figure 23

## ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

### INSTANT ELECTRONIC IGNITION (Figure 24)

- Disconnect electrical service and shut off supply line gas valve.
- Remove screw attaching junction box cover to junction box. Remove cover.
- Disconnect wire harness.
- Remove high voltage lead.
- Remove screws attaching ignition control unit to junction box.
- Remove ignition control unit.

**IMPORTANT:** Remove circuit board and plastic back as a unit. Handle ignition control unit by sides of board only. DO NOT contact circuit boards with hands or metal objects. Place unit in clean, dry area away from work area to avoid damage.

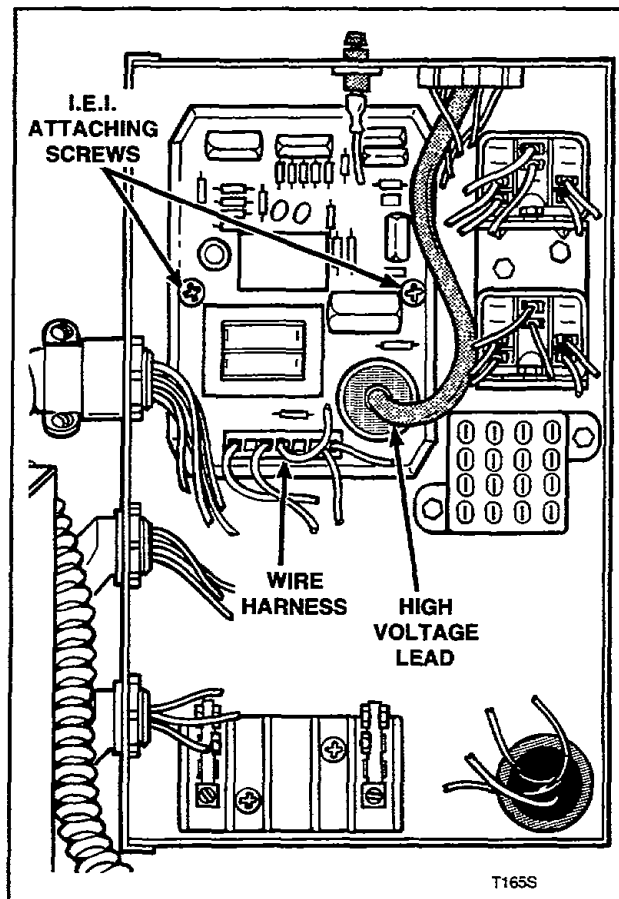


Figure 24

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**27. TEMPERATURE SENSOR (Figure 25)**

- Disconnect electrical service and shut off supply line gas valve.
- Remove screws attaching fan housing junction box cover.
- Remove cover from fan housing junction box.
- Disconnect two wires from temperature sensor terminals.
- Remove temperature sensor by turning counterclockwise.

**NOTE: Refer to wiring diagram when rewiring temperature sensor.**

**28. CABINET HIGH LIMIT THERMOSTAT (Figure 25)**

- Disconnect electrical service and shut off supply line gas valve.
- Remove two screws attaching fan housing junction box cover.
- Remove cover from fan housing junction box.
- Disconnect two wires from thermostat.

**NOTE: Refer to wiring diagram when rewiring thermostat.**

- Remove screws holding cabinet high limit thermostat to fan housing. Remove thermostat.

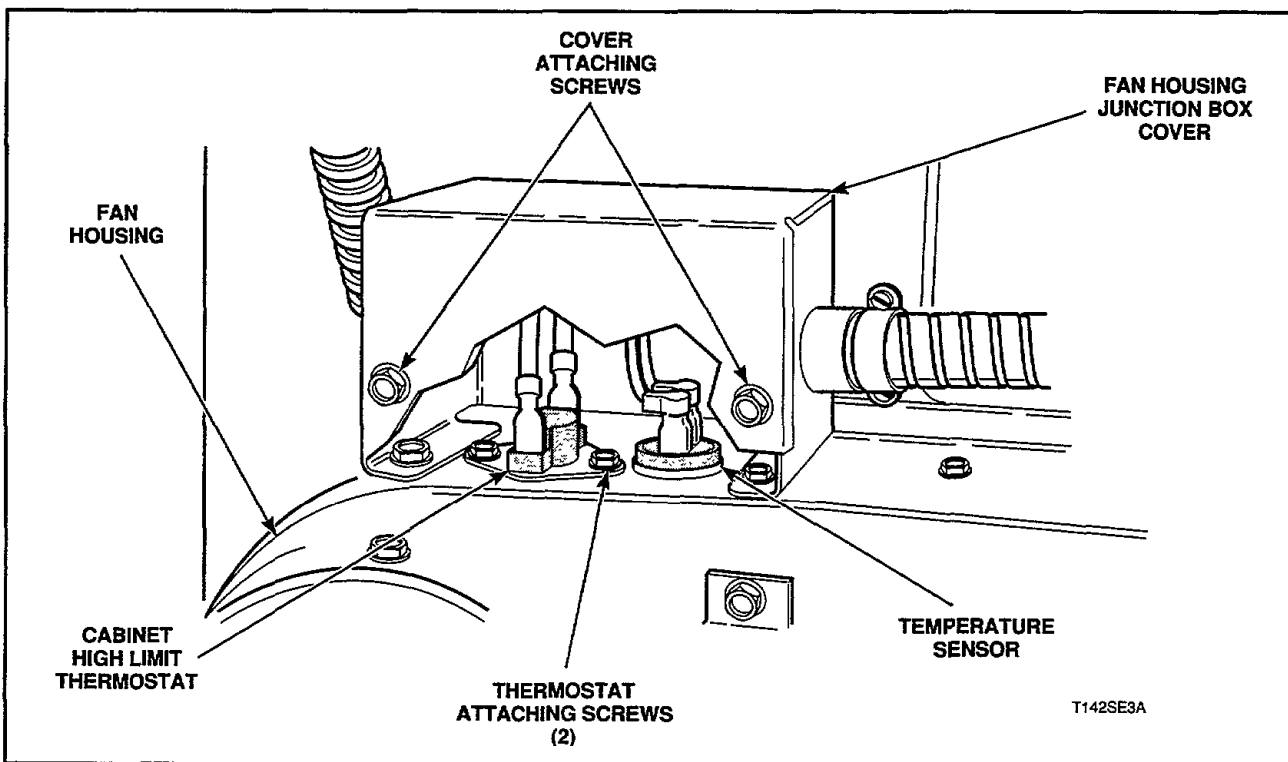


Figure 25

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**29. LATCH RELAYS (Figure 26)**  
(Prior to Serial Number DTCK9211033714 only)

- Disconnect electrical service to tumbler.
- Remove screw attaching junction box cover to junction box. Remove cover.
- Disconnect wires from both latch relay terminals.

**NOTE: Refer to wiring diagram when rewiring latch relay.**

- Remove two screws attaching latch relay mounting bracket to junction box.
- Remove latch relay mounting bracket with latch relays attached. Remove appropriate relay from mounting bracket.

**30. BELT GUARD AND BELT GUARD SWITCH (Figure 27)**

- Disconnect electrical service to tumbler.
- Remove screws attaching belt guard front to belt guard.

**▲ WARNING**

**To reduce the risk of serious injury, belt guard front and belt guard switch MUST be reinstalled after servicing has been completed.**

- Disconnect wires from belt guard switch.

**NOTE: Refer to wiring diagram when rewiring belt guard switch.**

- Depress tabs on sides of switch and push switch out through belt guard.
- Support belt guard and remove attaching screws. Remove belt guard.

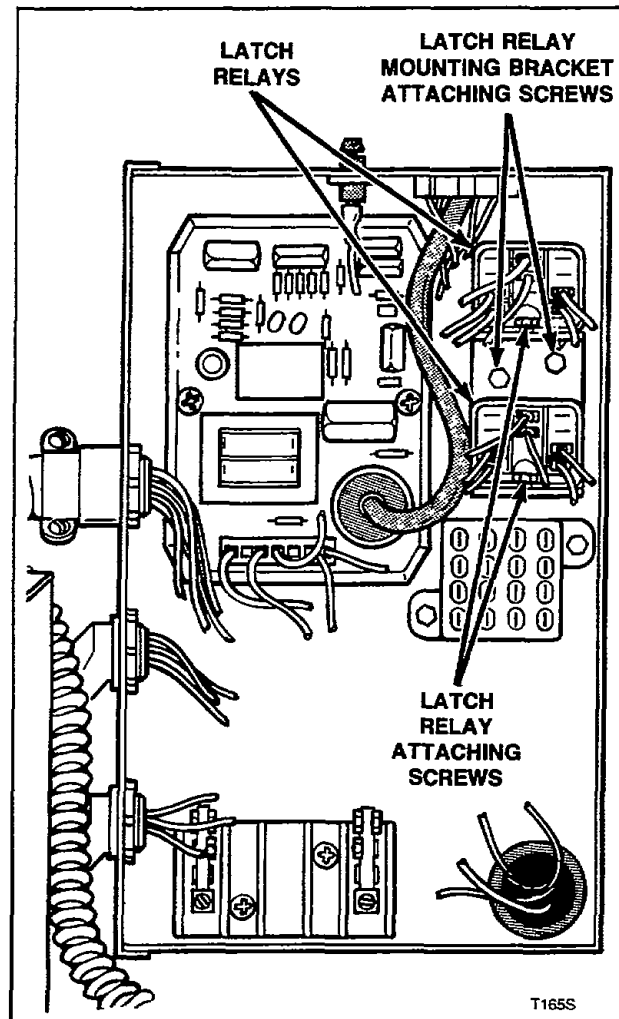


Figure 26

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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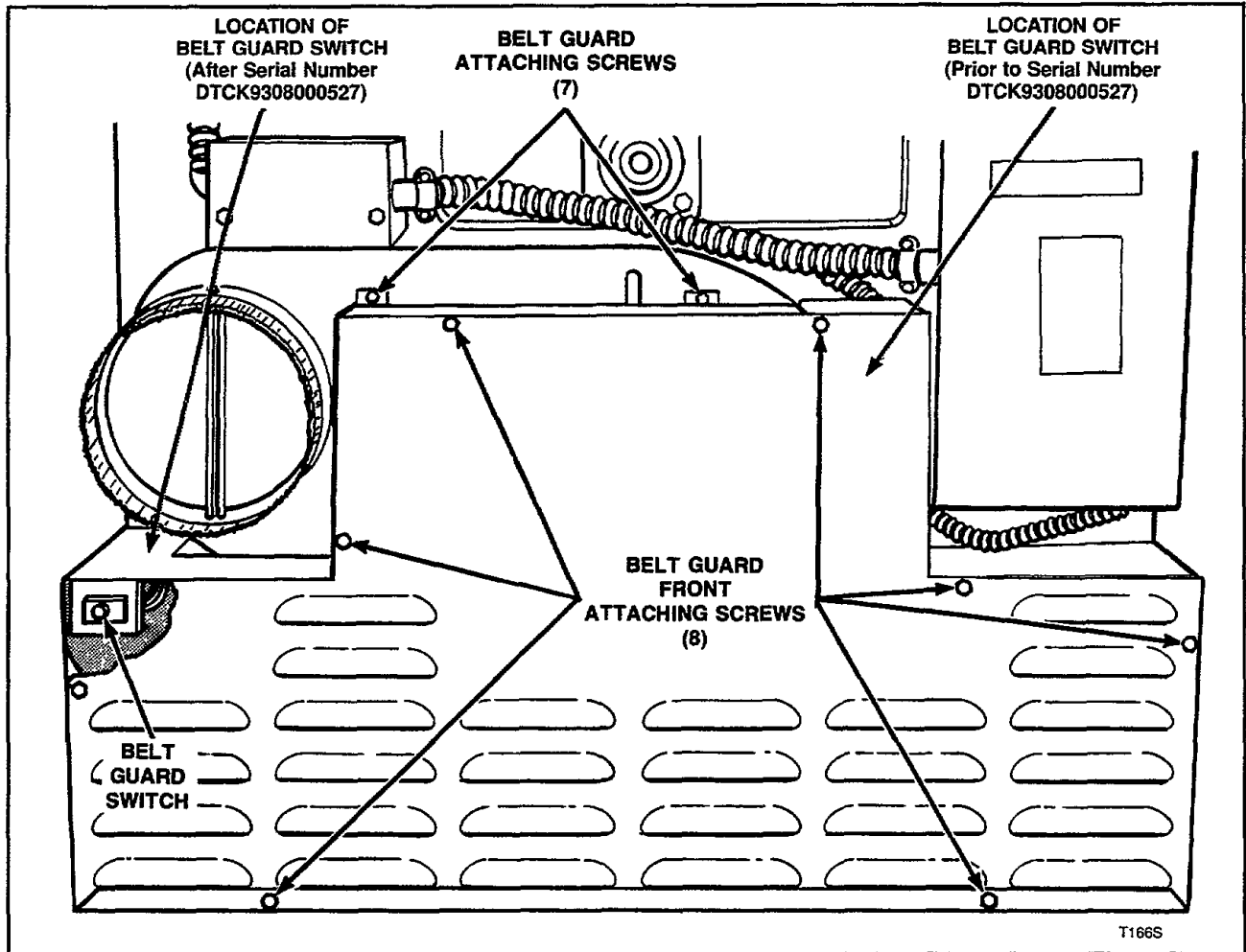


Figure 27

**31. DRIVE BELT**

- Disconnect electrical service to tumbler.
- Remove screws holding belt guard front to belt guard, *Figure 27*

**▲ WARNING**

**To reduce the risk of serious injury, belt guard front MUST be reinstalled after servicing has been completed.**

- Run belt off sheaves and idler, *Figure 28*.

**IMPORTANT:** Drive belt **MUST** be replaced with Belt No. 430054 for proper tumbler operation.

**NOTE:** The drive belt tension is automatically set by a spring loaded idler system. There is no adjustment. Refer to *Figure 28* for proper belt routing.

- Reinstall belt guard front.

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

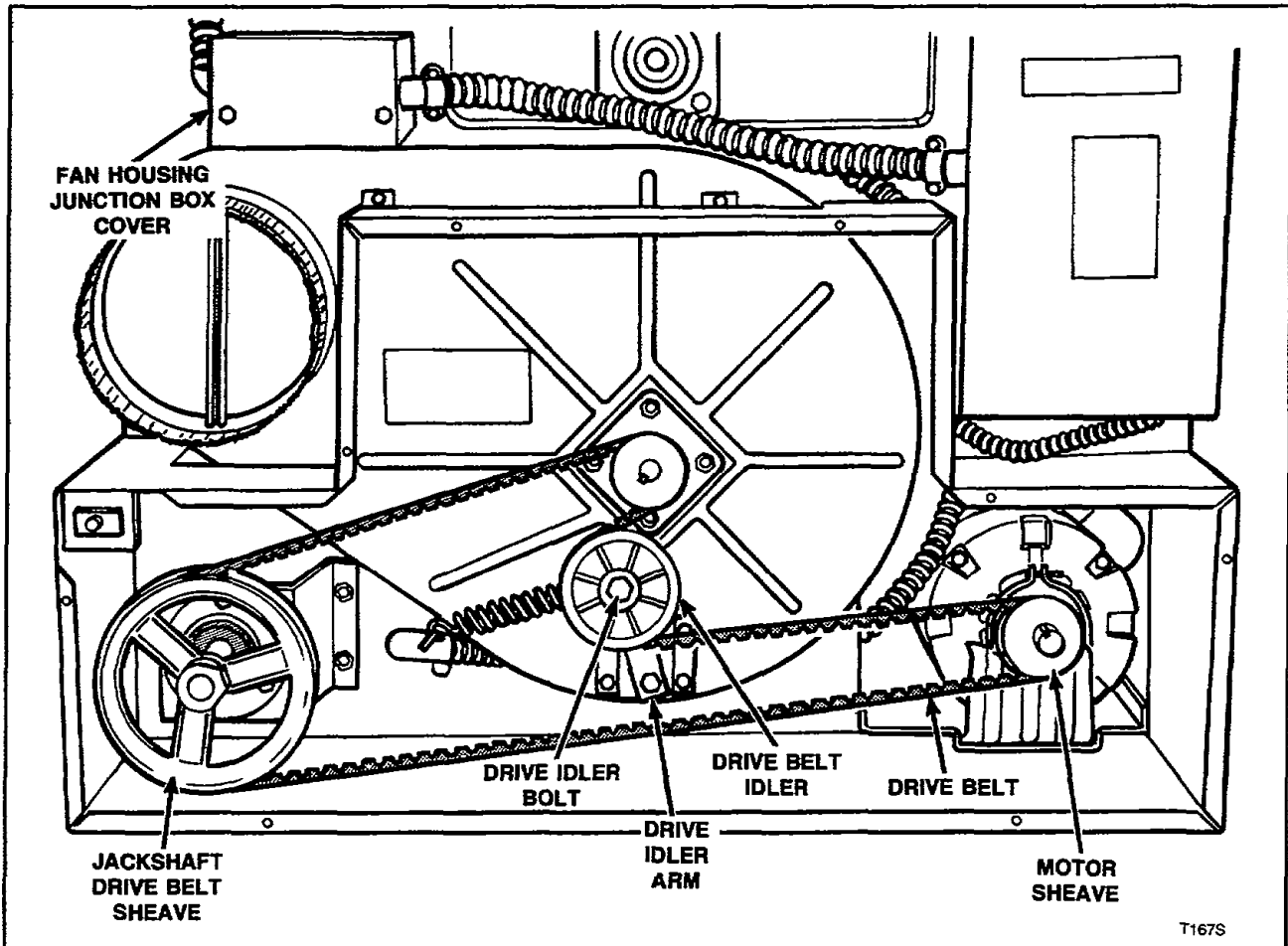


Figure 28

**32. DRIVE IDLER (Figure 28)**

- Disconnect electrical service to tumbler.
- Remove screws holding belt guard front to belt guard.

**▲ WARNING**

To reduce the risk of serious injury, belt guard front **MUST** be reinstalled after servicing has been completed.

- Run belt off sheaves and idler.
- Remove bolt holding drive idler to idler arm.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**33. FAN**

- Disconnect electrical service to tumbler.
- Remove belt guard, paragraph 30.
- Run belt off sheaves and idler, *Figure 28*.
- Remove screws from fan housing junction box cover and remove cover, *Figure 29*.
- Disconnect cabinet high limit thermostat and temperature sensor wires.
- Remove screws holding fan housing junction box to fan housing. Remove fan housing junction box.
- Remove 17 screws holding fan housing to cabinet back, *Figure 29*.
- With fan housing assembly off cabinet, hold fan while loosening palnut and jamnut, *Figure 30*.
- Remove palnut and jamnut from fan shaft. Remove fan.

**NOTE:** Refer to wiring diagram when rewiring cabinet high limit thermostat and temperature sensor.

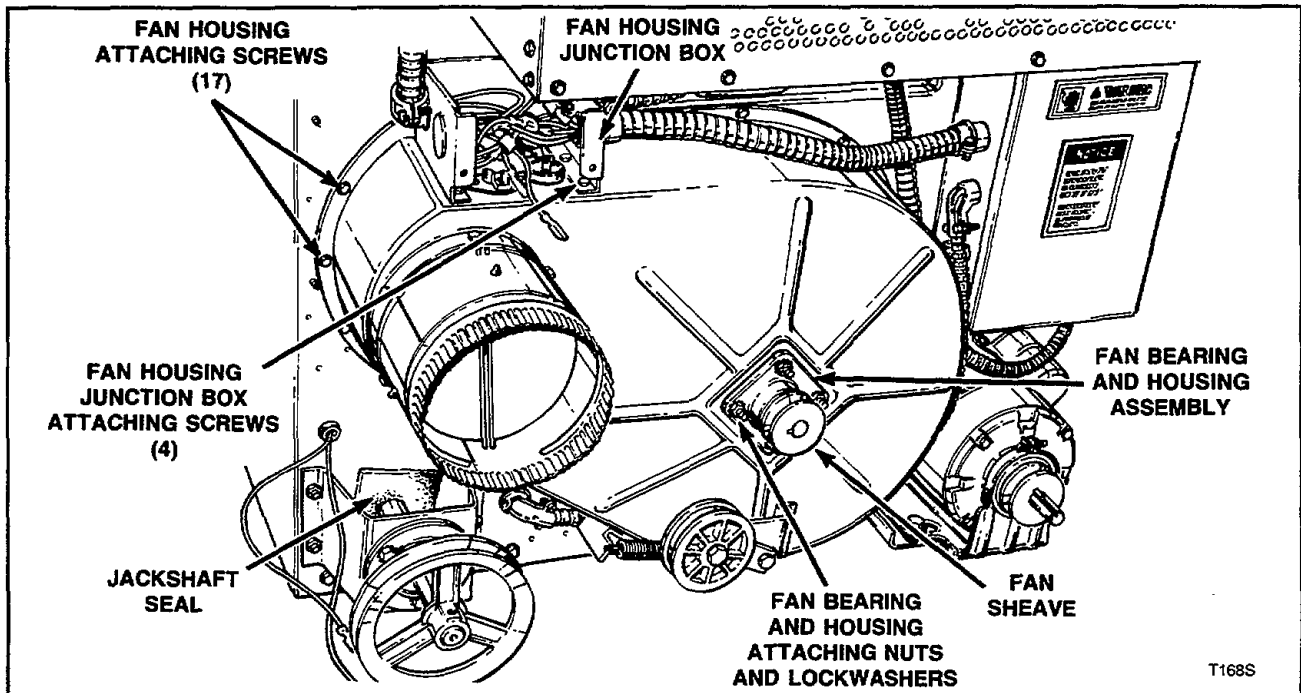


Figure 29



**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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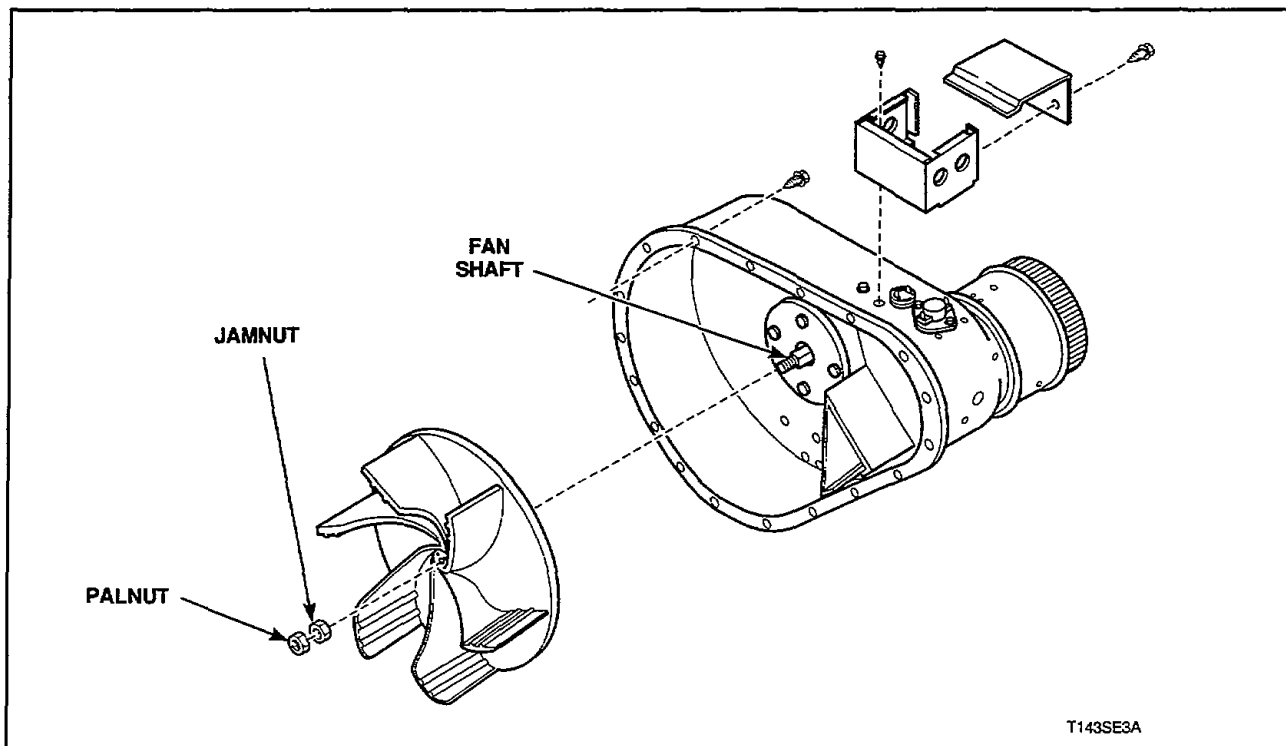


Figure 30

**34. FAN BEARING, SHAFT AND HOUSING ASSEMBLY (Figure 30)**

- Remove fan, paragraph 33.
- Loosen fan sheave setscrew. Remove fan sheave.
- Remove nuts, lockwashers and fan bearing, shaft and housing assembly from blower housing.

**IMPORTANT:** Fan bearing, shaft and housing assembly is a nonrepairable unit. If worn or damaged replace entire assembly.

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

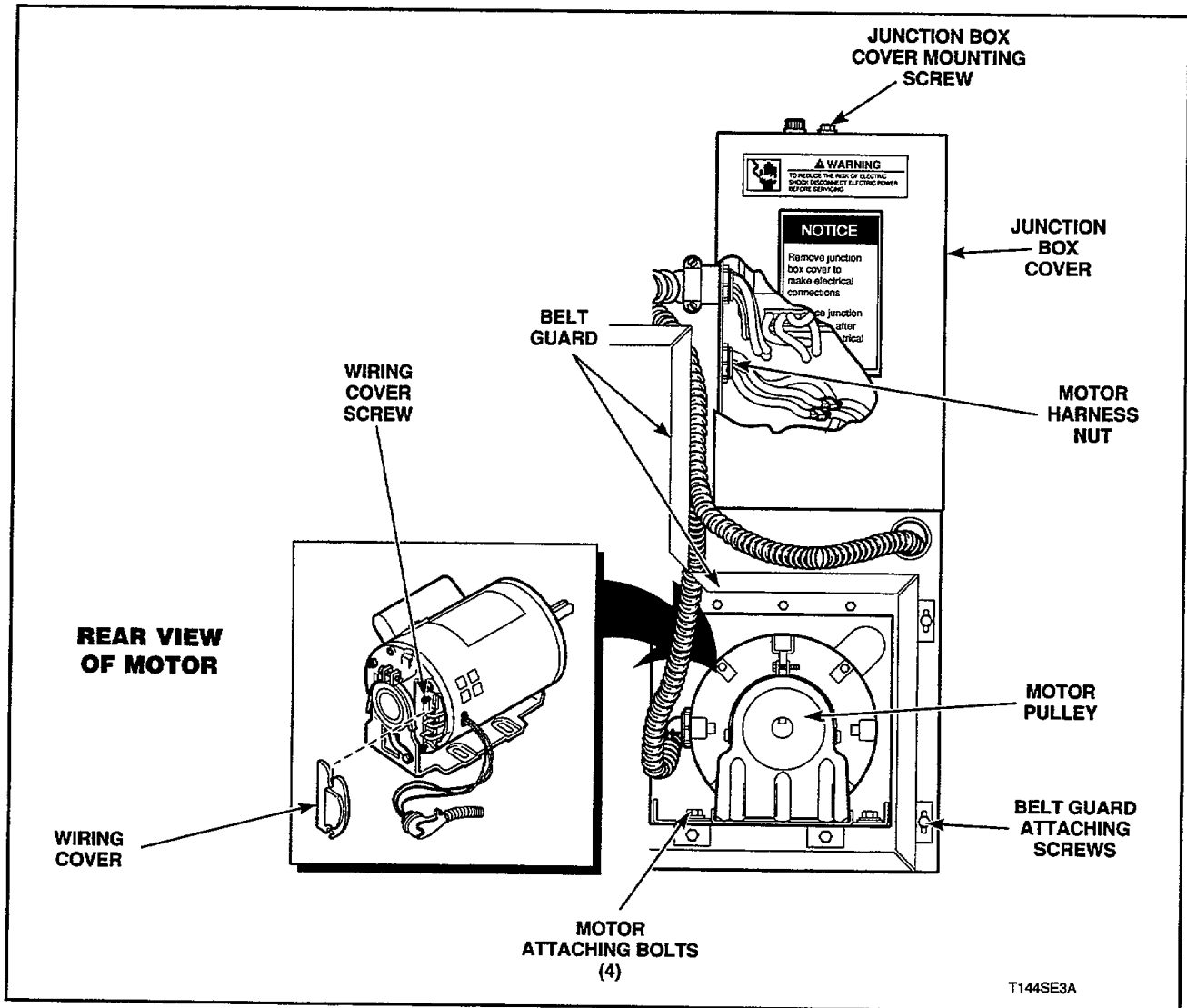


Figure 31

**35 . MOTOR (Figure 31)**

- Disconnect electrical service to tumbler.
- Remove belt guard, paragraph 30.
- Run drive belt off motor pulley.
- Remove junction box cover mounting screw. Remove junction box cover.
- Disconnect motor wires in junction box.

- Loosen and remove harness nut attaching motor harness to junction box.
- Loosen and remove bolts attaching motor to motor mounting bracket.
- Remove motor from unit with harness attached.
- Loosen screw on motor wiring cover and slide cover to the side.
- Disconnect motor harness wires from motor.

**NOTE:** Refer to wiring diagram when rewiring motor wires.

**NOTE:** When installing motor, refer to wiring diagram when rewiring motor.

**▲ WARNING**

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

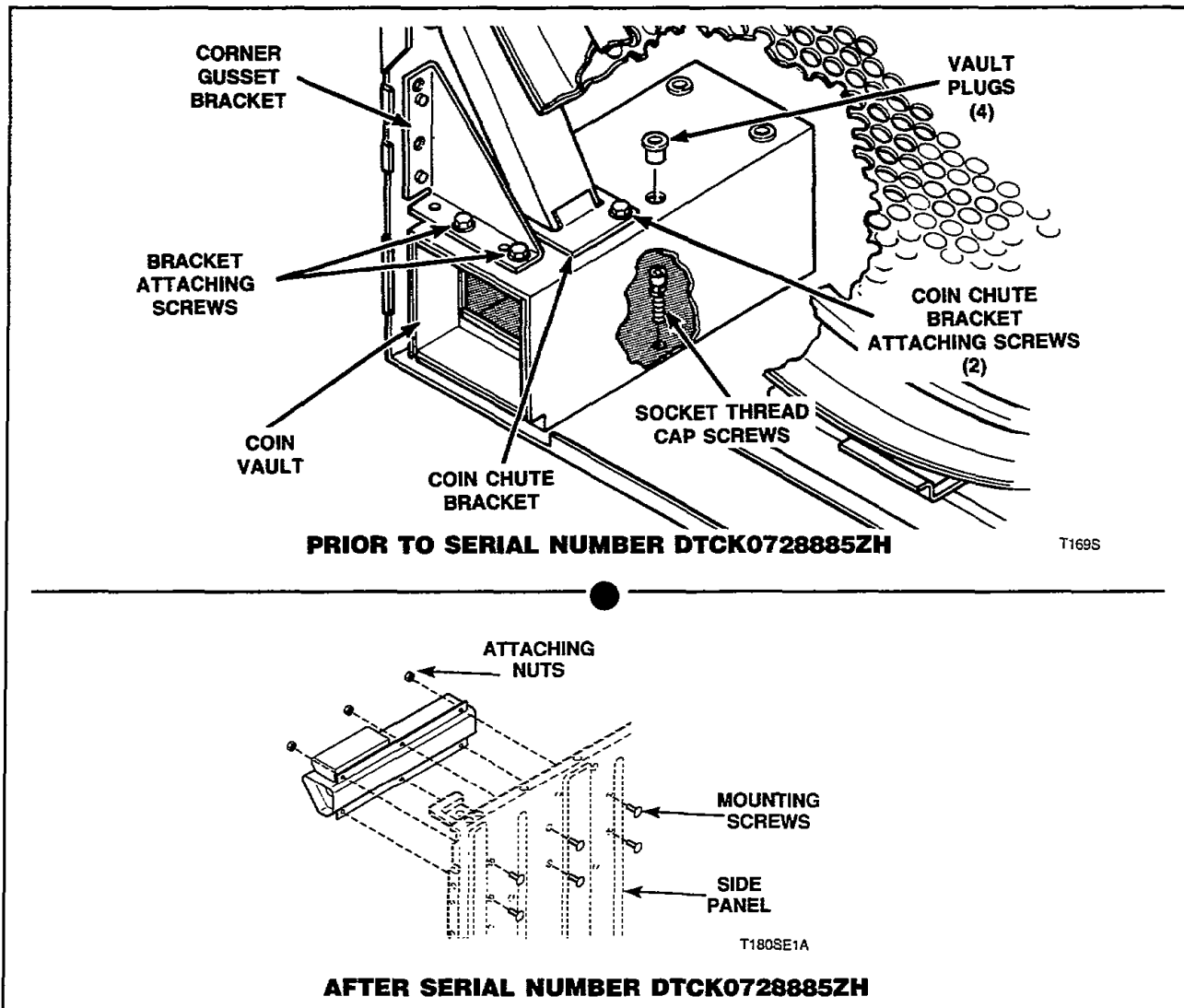


Figure 32

**36. COIN VAULT (Lower Stacked only)  
(Figure 32)**

- Disconnect electrical service to tumbler.
  - Remove loading door, paragraph 2.
  - Unlock and remove lint drawer.
  - Remove front panel, paragraph 5.
- Remove screws attaching corner gusset bracket to top of vault. Remove corner gusset.
  - Remove screws attaching coin chute bracket to top of coin vault. Remove coin chute bracket.

**Prior to Serial No. DTCK0728885ZH**

- Remove four plugs on top of coin vault.
- Remove coin drawer.
- Remove four socket head cap screws.
- Slide coin vault forward.

**From Serial No. DTCK0728885ZH**

- Remove six nuts from mounting screws.
- Pull vault toward center clearing mounting screws.
- Pull vault out of tumbler.

# SECTION II

## Adjustments

### ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam gate valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

### 37. LEVELING LEGS

**NOTE:** Keep the tumbler as close to the floor as possible. All four legs must rest firmly on the floor so weight of tumbler is evenly distributed. Tumbler must not rock.

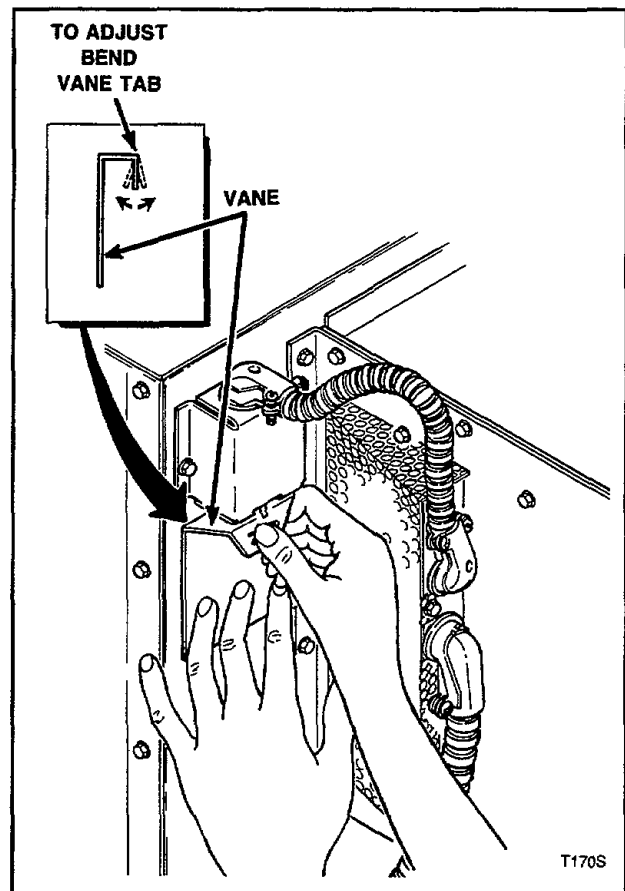
- a. Check the front to rear level by rotating the clothes cylinder until one of the cylinder ribs is at the bottom. Place a level on the rib. Adjust legs as necessary.

**NOTE:** The front of the tumbler should be slightly higher than the rear (approximately 1/8 inch, 3.18 mm). This will prevent the clothes, while tumbling, from wearing on the door glass gasket.

- b. Check the side to side level by placing a level on the front and rear of top panel. Adjust legs as necessary.

### 38. MAIN GAS BURNER AIR SHUTTER

**IMPORTANT:** The burner requires no adjustment for primary air.



T170S

Figure 33

## ▲ WARNING

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

### 39. AIRFLOW SWITCH (Figure 33)

The airflow switch is set at the factory for proper operation. However, at installation, airflow must be checked on each switch. If there is a problem, adjust as follows:

**IMPORTANT:** Lint drawers, loading doors, coin vaults and microprocessor doors must be in place before attempting to adjust airflow switch.

**IMPORTANT:** Airflow switch vane must remain closed during operation. If it opens during the drying cycle, this indicates insufficient airflow through the tumbler. If switch remains open, or pops open and closed during the cycle, the heating system will shut off. The cylinder and fan will continue to operate even though the airflow switch is malfunctioning.

**IMPORTANT:** Airflow switch operation may be affected by a clogged lint screen, lack of make-up air, or in the customer installed main or collector ducts. These conditions must be checked and necessary corrections made before adjusting airflow switch. Always check airflow at installation.

The airflow switch operation is controlled by bending the vane. Bending the vane either increases or decreases airflow switch sensitivity. The vane should be adjusted so the airflow will force the vane away from the cabinet when the machine door is opened 1-1/2 inches (3.81 cm). Loading door switch must be taped shut during this adjustment. Adjust the airflow switch as follows:

- a. Load the tumbler with a dry cotton load.

**NOTE:** Airflow adjustment is much faster to make with one person opening loading door in front and another adjusting the vane in the rear of the tumbler.

- b. Start the tumbler. Open loading door 1-1/2 inches (3.81 cm). The airflow vane should move away from the cabinet, opening the switch contacts and shutting off the heat system. This indicates proper operation and proper adjustment.
- c. If switch is not opening as described in step "b", it should be adjusted so it is MORE sensitive. Grasp the vane and spread the vane and switch connection apart. Retest by opening loading door and continue spreading the vane until switch operates as described in step "b".
- d. If switch opens BEFORE loading door is opened the proper distance, step "b", it should be adjusted so it is LESS sensitive. Squeeze the vane and switch connection together. Retest by opening the loading door and continue squeezing vane connection together until switch operates as described in step "b".
- e. Remove tape from the loading door switch.

### 40. CYLINDER DOOR SWITCH (Figure 34)

The door switch should be adjusted so the cylinder stops when door is opened two inches (5.08 cm), plus or minus 1/4 inch (6.35 mm). This switch is a normally open switch and is closed when the door is closed.

- a. Close door and start tumbler. Slowly open loading door. Cylinder and heat system should shut off when door is open two inches (5.08 cm) plus or minus 1/4 inch (6.35 mm).
- b. Slowly close loading door. When door is two inches (5.08 cm) from being fully closed, the tab on the door should contact the switch plunger and depress it enough to close the switch with an audible "click".
- c. If tab does not depress the switch plunger enough to operate the switch, bend tab on loading door OUTWARD and repeat steps "a" and "b".

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

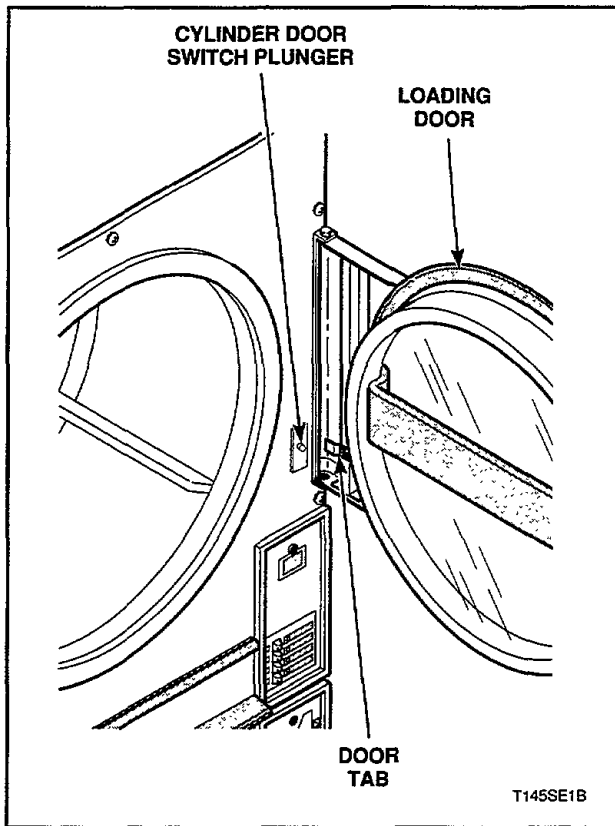


Figure 34

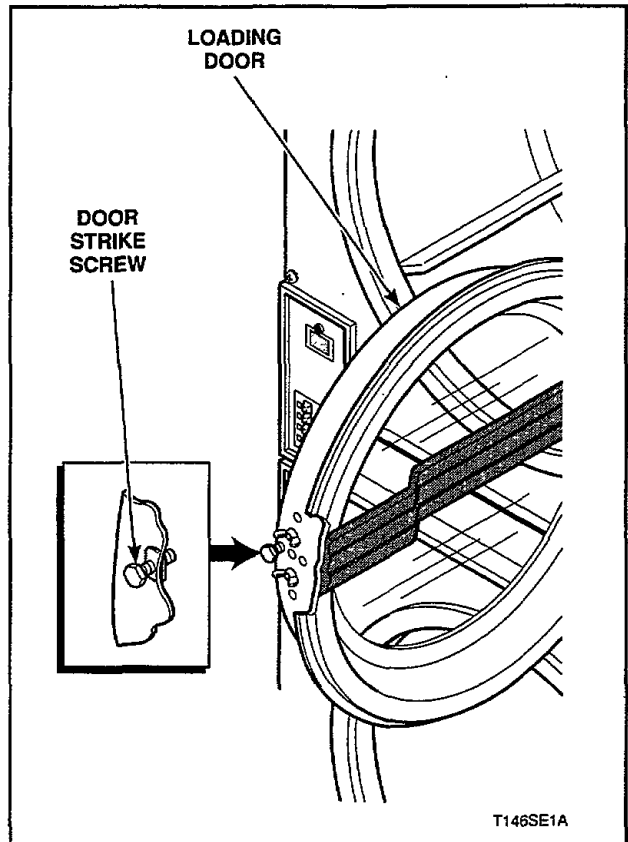


Figure 35

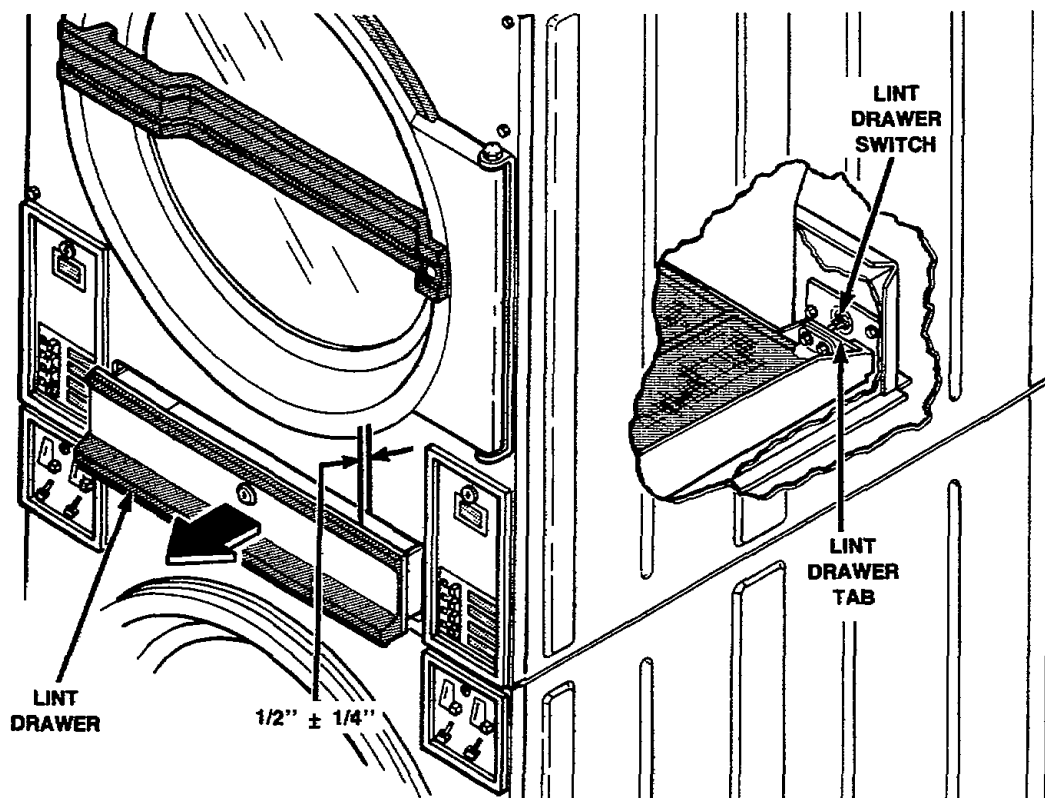
**41. CYLINDER DOOR STRIKE (Figure 35)**

The door strike must be adjusted so that sufficient tension holds loading door closed against the force of a load tumbling against it. The door is properly adjusted when 8-15 lbs. (35.6-66.7 kg) of pull is required to open door.

To adjust, open door and turn door strike screw in or out as required.

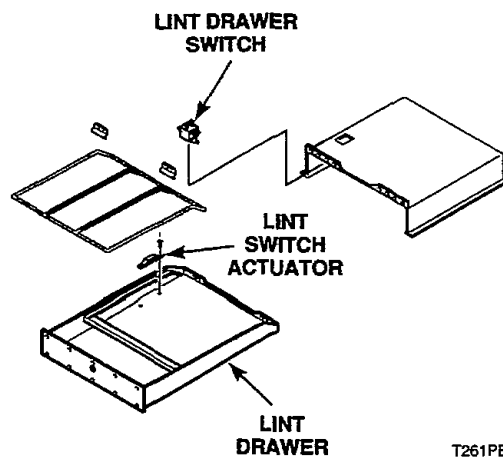
**42. BELT GUARD SWITCH**

The belt guard switch is a normally open switch and closed when the guard front is in place. No adjustment is necessary.



**Prior to Serial Number DTCK930800527**

T157S



T261PE1B

**After Serial Number DTCK930800527**

Figure 36

## **▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

### **43. LINT DRAWER SWITCH (Figure 36)**

The lint drawer switch is set so that when the lint drawer is opened  $1/2"$  (1.22 cm)  $\pm$   $1/4"$  (6.35 mm), the machine shuts off and tumbling action stops. If the lint drawer is dropped or hit, the switch actuator could be bent causing improper operation.

- a. With the loading door closed and belt guard front in place, push start button. Unlock the lint drawer and open slowly. The machine should shut off when the door is opened  $1/2"$  (1.22 cm)  $\pm$   $1/4"$  (6.35 mm).
- b. Slowly close the lint drawer. An audible "click" should be heard at approximately  $1/2"$  (1.22 cm) opening.
- c. If lint drawer tab does not contact switch plunger enough to operate the switch, bend the tab BACKWARD and repeat steps "a" and "b".

**NOTE: Lint drawer switch is not adjustable after serial number DTCK9308000527.**

### **44. DRIVE BELT TENSION**

Correct tension is maintained by a spring loaded idler. No adjustment is necessary.

### **45. CYLINDER BELT TENSION**

Correct tension is maintained by a spring loaded idler. No adjustment is necessary.



# SECTION III

## Service Helps

### ▲ WARNING

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**IMPORTANT:** Refer to appropriate wiring diagram for aid in testing tumbler components.

### 46. MOTOR DOES NOT START

POSSIBLE CAUSE	TO CORRECT
Electrical power off or circuit breaker or fuse blown.	Check power supply, or replace fuses.
Loading door switch, lint drawer switch or belt guard switch not closed or inoperative switch.	Close door, drawer or replace guard or test switch and replace if inoperative.
Door switch improperly adjusted.	Refer to ADJUSTMENTS section in this manual for door switch adjustment.
Start circuit not complete.	Press start switch button, or test switch and replace if inoperative.
Inoperative motor.	Have motor tested and replace if inoperative.
Improper coins inserted in coin drop.	Check that proper coins are inserted.
Inoperative coin drop.	Test coin drop and replace if inoperative.
Broken, loose, or incorrect wiring.	Refer to wiring diagram located on back of tumbler.
Jackshaft binding in bearings.	Replace bearings.
Fan shaft binding in bearings.	Replace fan shaft and bearing assembly.
Cylinder shaft binding in bearings.	Replace cylinder bearing and housing assembly.
Idler bearings binding.	Replace idler(s).
Stove high limit thermostat is open or inoperative.	Allow unit to cool down and clean lint screen or replace thermostat.
Microprocessor relay inoperative.	Replace microprocessor.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**47. MOTOR OVERLOAD PROTECTOR CYCLES REPEATEDLY**

POSSIBLE CAUSE	TO CORRECT
Incorrect voltage.	Refer to INSTALLATION INSTRUCTIONS supplied with tumbler) for electrical requirements.
Clothes load too large.	Remove part of load.
Clothes cylinder is binding.	Check cylinder for binding.
Inadequate wiring.	Check with local power company to ensure that wiring is adequate.
Inadequate make-up air.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for make-up requirements.
Poor housekeeping.	Clean lint accumulation on and around the motor.
Broken, loose, or incorrect wiring.	Refer to wiring diagram located on back of tumbler.

**48. MOTOR RUNS BUT CYLINDER DOES NOT TURN**

POSSIBLE CAUSE	TO CORRECT
Motor drive pulley loose and key fallen out.	Replace key and tighten setscrews.
Drive belt sheave loose and key fallen out.	Replace key and tighten setscrews.
Broken drive belt.	Replace drive belt.
Broken cylinder belt.	Replace cylinder belt.
Cylinder is binding.	Check cylinder for binding.

**49. MOTOR DOES NOT STOP**

POSSIBLE CAUSE	TO CORRECT
Inoperative door switch, belt guard switch, lint drawer switch or stove high limit thermostat.	Test switches and thermostat and replace if inoperative.
Inoperative coin drop.	Test coin drop and replace if inoperative.
Incorrect wiring.	Refer to wiring diagram located on back of tumbler.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

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**50. BURNER DOES NOT IGNITE**

POSSIBLE CAUSE	TO CORRECT
Improper or inadequate exhaust system.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for exhaust system requirements.
Blown fuses or tripped circuit breaker in external electric supply line.	Check fuses or circuit breaker.
Drying selector set in the "cool down" portion of cycle.	Reset switch on microprocessor.
Inoperative cabinet high limit thermostat.	Test thermostat and replace if inoperative.
Insufficient gas supply.	Open partially closed gas shut-off valve, or correct low gas pressure. Check manifold pressure and adjust to pressure specified on rating plate. If pressure cannot be obtained, have gas supplier check main pressure.
Incorrect orifices.	Tumbler is equipped for type of gas specified on rating plate. If orifices are different from that specified on rating plate, obtain proper orifices.
Inoperative airflow switch.	Clean lint compartment after every 8 hour shift. Check damper for foreign objects, lint accumulation, or other causes that may prevent damper from opening. Check ductwork for lint build-up. Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) to ensure that ductwork and make-up air openings are sized adequately. Check exhaust outlet. If a screen has been improperly installed on the outlet, it may be clogged with lint or frozen over in winter. Never install a screen over the exhaust outlet. Vacuum within the tumbler drops to .09 inches water column, or less, for normal operation of tumbler, vacuum reading (in water column inches) should range between .15 and .3. Vacuum reading can be made with a vacuum 4-gauge by removing a sheet metal screw in the front panel of tumbler, and inserting the rubber tube of the vacuum gauge into screw opening. Test switch and replace if inoperative.
Airflow switch out of adjustment.	Refer to ADJUSTMENTS section in this manual for airflow switch adjustment.
Lint drawer not closed properly.	Unlock and open lint drawer, close lint drawer on tumbler (ensuring a tight fit) then lock.
Broken, loose, or incorrect wiring.	Refer to wiring diagram located on back of tumbler.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**50. BURNER DOES NOT IGNITE**

POSSIBLE CAUSE	TO CORRECT
Improper igniter to burner tab clearances.	Set gap as described in SERVICE PROCEDURES section, paragraph 26.
Valve coils inoperative.	Check valve coils and replace valve if necessary.
Blow fuse on tumbler.	Check fuse and replace if necessary.
Gas shut-off valve closed.	Open shut-off valve.
Green wire from IEI board not connected to ground terminal.	Connect green wire to terminal.
Inoperative IEI control.	Replace IEI control.
Inoperative motor switch.	Replace motor.
IEI control in safety lockout.	Reset IEI control by opening and closing tumbler door.

**51. BURNER IGNITES AND GOES OUT REPEATEDLY**

POSSIBLE CAUSE	TO CORRECT
Insufficient gas pressure.	Check gas supply and pressure.
Inoperative cabinet high limit thermostat.	Test thermostat and replace if inoperative.
Improper or inadequate exhaust system.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for exhaust requirements.
Improper orifices.	Tumbler is equipped for type of gas specified on rating plate. If orifices are different from that specified on rating plate, obtain and install proper orifices.
Broken, loose, or incorrect wiring.	Refer to wiring diagram located on back of tumbler.
Excessive igniter to burner clearance.	Set gap as described in SERVICE PROCEDURES section, paragraph 26.
Inadequate make-up air.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for make-up air requirements.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**52. BURNER REPEATEDLY CYCLES INTO LOW FIRE (Prior to Serial No. DTCK9211033714 only)**

POSSIBLE CAUSE	TO CORRECT
External exhaust system is longer than recommended.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for exhaust system requirements.
Clogged lint screen.	Clean screen. Lint screen and compartment should be cleaned after every eight hour shift.
Lint in internal tumbler ductwork.	Disassemble tumbler ductwork and clean.
Lint in external exhaust system.	Disassemble exhaust system and clean.
Stepdown thermostat cycling at too low a temperature.	Replace thermostat.
Inoperative latch relays.	Replace latch relays.

**53. BURNER DOES NOT SHUT OFF**

POSSIBLE CAUSE	TO CORRECT
Motor does not stop.	Refer to paragraph 49.
Impurities on gas valve seat, preventing valve from closing.	Replace gas valve.
Incorrect wiring.	Refer to wiring diagram located on back of tumbler.
Inoperative thermistor.	Run diagnostic check, paragraph 64.

**▲ WARNING****To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**54. CLOTHES DO NOT DRY**

POSSIBLE CAUSE	TO CORRECT
Burner does not ignite.	Refer to paragraph 50.
Too much water in articles being dried.	Remove excess water.
Clothes load too large.	Remove part of load. Thirty pounds dry weight (cotton load) is maximum load.
Improper or inadequate exhaust system.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for exhaust recommendations.
Burner shuts off prematurely.	Refer to paragraph 51.
Drying selector improperly set.	Set selector for higher setting.
Incorrect voltage.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for electrical requirements.
Inadequate make-up air.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for make-up air requirements.
Clogged lint screen.	Clean lint screen.
Unit is in low fire condition.	Clean lint screen and check exhaust system. Check stepdown thermostat and replace if necessary. Check latch relays and replace if necessary. Check unit's wiring.
Exhaust thimble binding.	Adjust thimble vanes so they turn freely.

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

**55. TUMBLER OVERHEATING**

POSSIBLE CAUSE	TO CORRECT
Incorrect main burner orifices.	Replace orifices.
Gas pressure too high.	Adjust gas pressure as specified on rating plate.
Inadequate make-up air.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for make-up air requirements.
Lint accumulation.	Remove lint.
Restricted or inadequate exhaust system.	Remove obstruction or lint build up from exhaust ductwork. Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for exhaust system requirements.
Inoperative temperature sensor.	Check wiring to ensure temperature sensor is connected. Replace temperature sensor if necessary.
Exhaust thimble binding.	Adjust vanes so they turn freely.

**56. BURNERS NOT BURNING PROPERLY**

POSSIBLE CAUSE	TO CORRECT
Dirt in burners.	Disassemble burners and blow out the dirt.
Gas pressure too high.	Check rating plate on back of tumbler for correct gas pressure.
Incorrect orifices.	Tumbler is equipped for type of gas specified on rating plate. If orifices are different from that specified on rating plate, obtain and install proper orifices.
Restricted or blocked exhaust duct.	Disassemble and clean exhaust system.
Airflow switch not functioning properly.	Replace airflow switch.
Inadequate make-up air.	Refer to INSTALLATION INSTRUCTIONS (supplied with tumbler) for make-up air requirements.

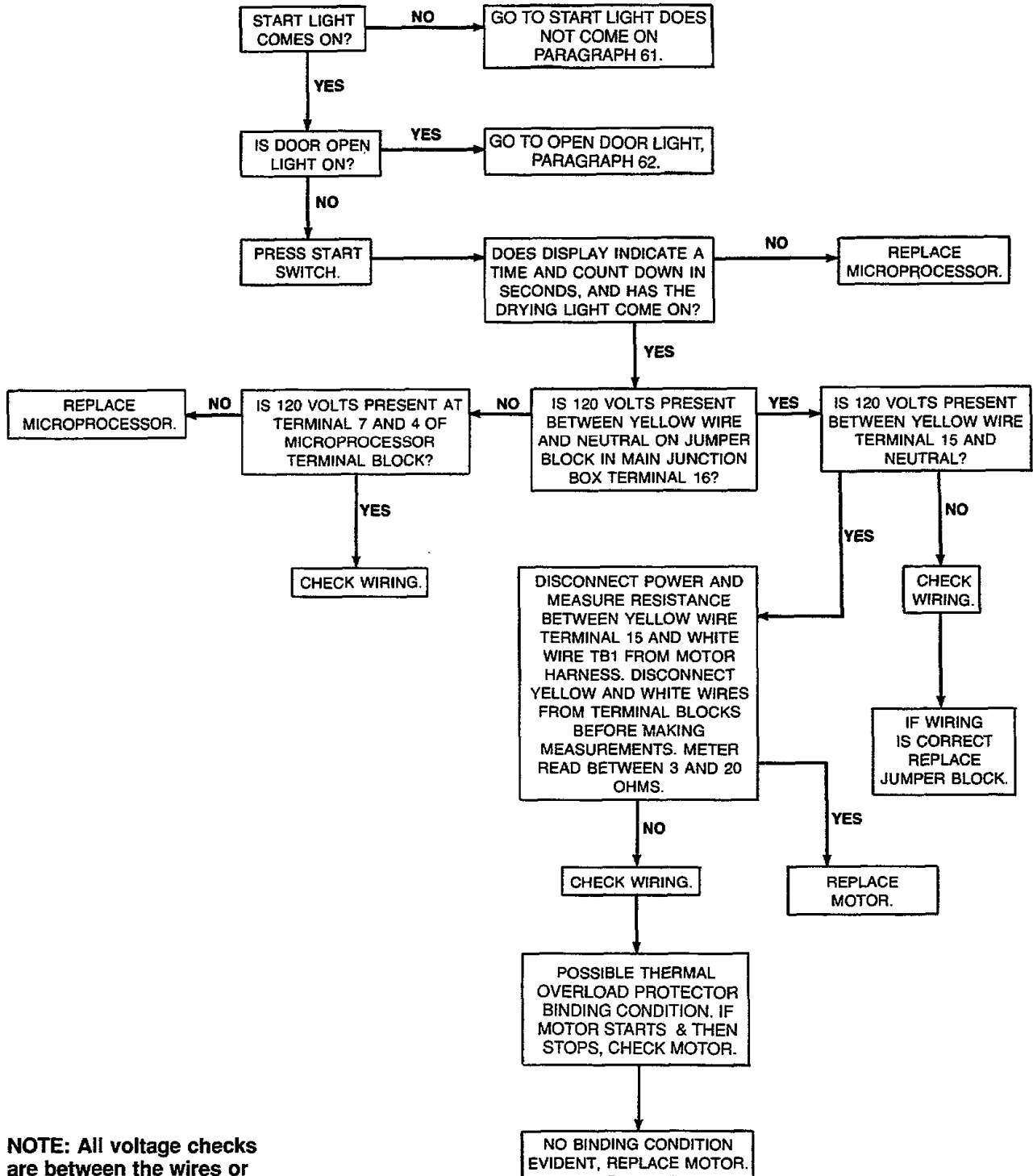
**57. CYLINDER DOOR OPENS DURING OPERATION**

POSSIBLE CAUSE	TO CORRECT
Door strike improperly adjusted.	Refer to ADJUSTMENTS section in this manual for door strike adjustment.
Tumbler improperly leveled.	Refer to ADJUSTMENTS section in this manual for level leg adjustment.

# SECTION IV

## Troubleshooting

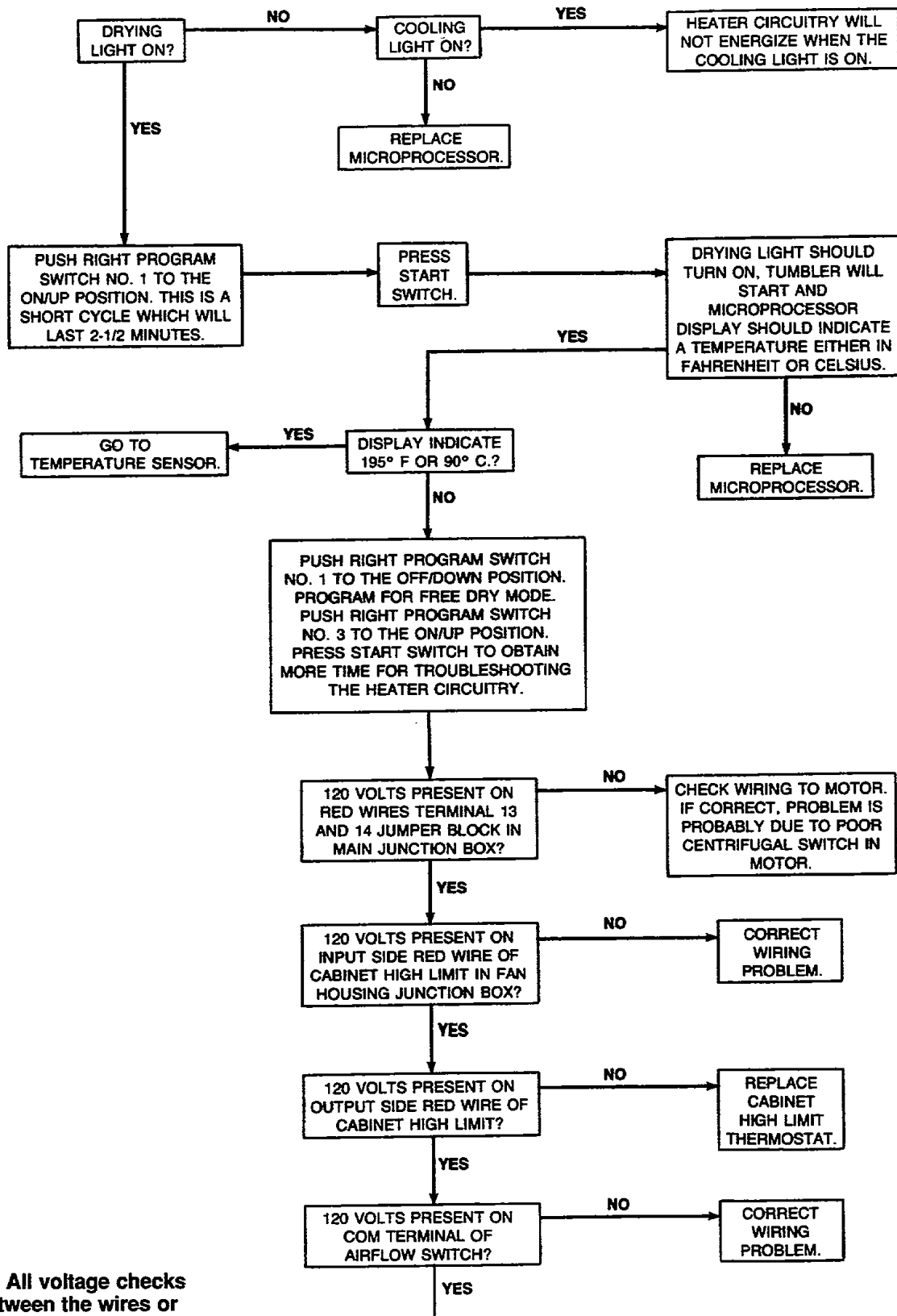
### 58. TUMBLER DOES NOT START



**NOTE:** All voltage checks are between the wires or terminal points to neutral (white wire).

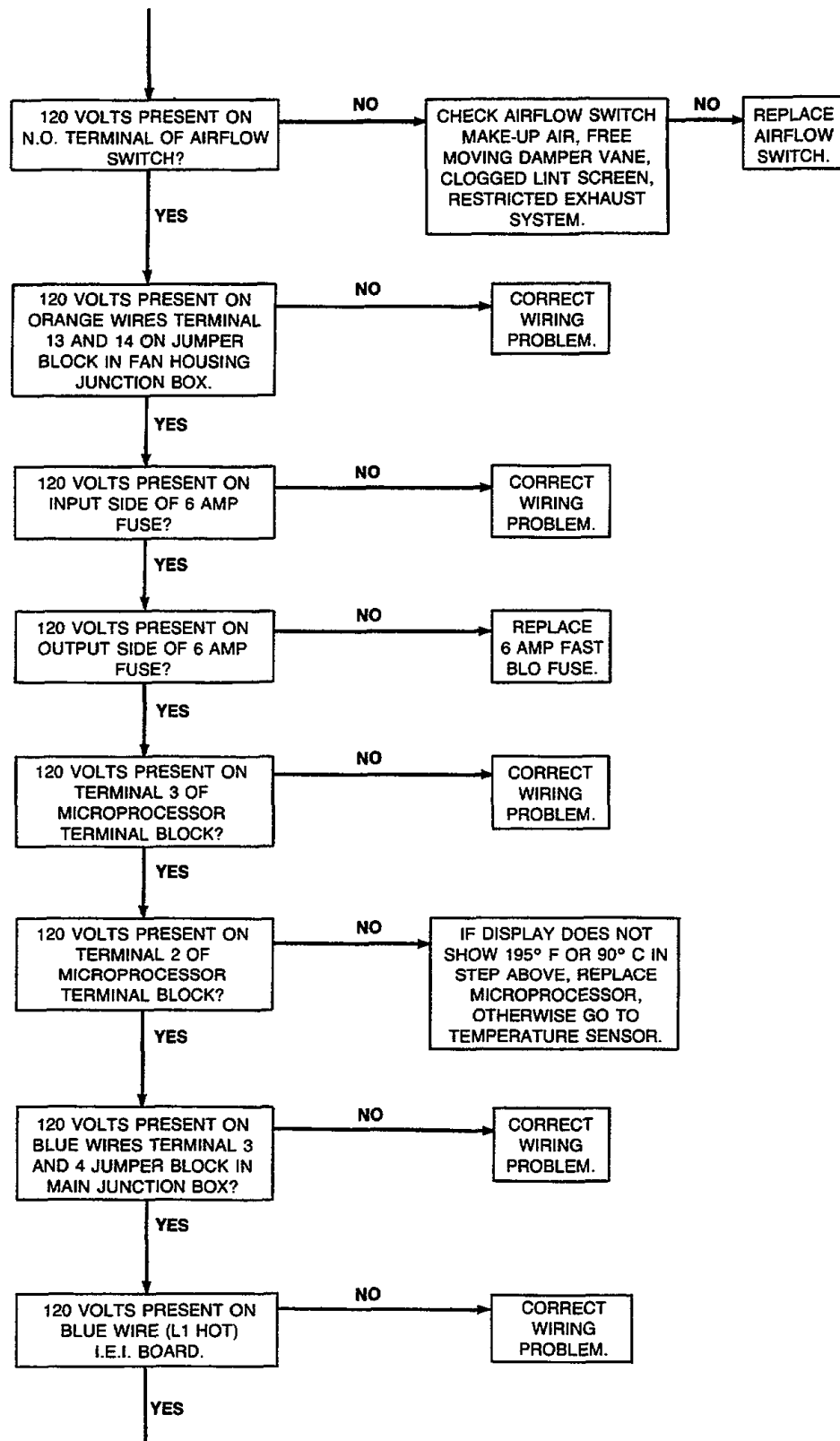


59. CYLINDER TURNS BUT NO HEAT



NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).

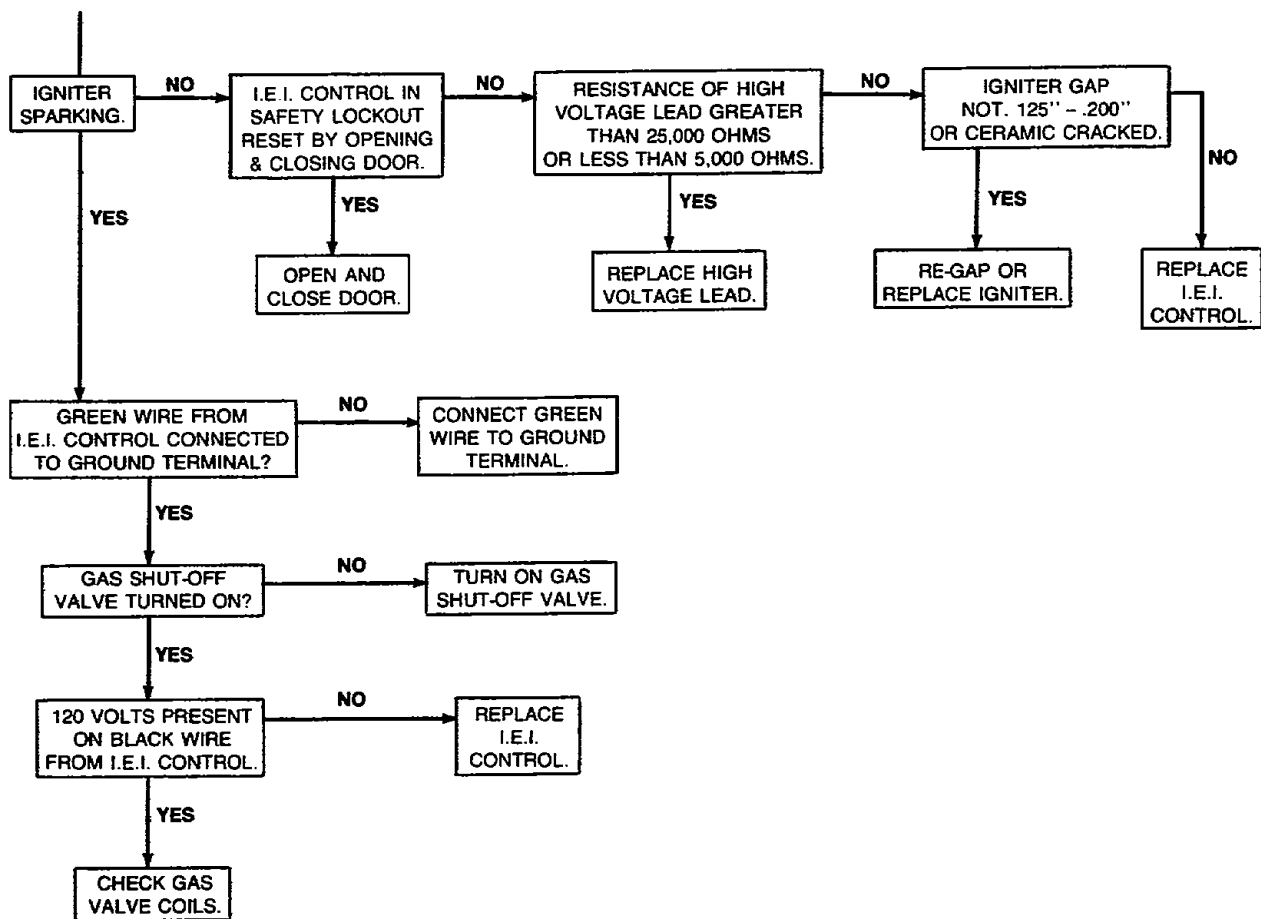
59. CYLINDER TURNS BUT NO HEAT (cont.)



NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).

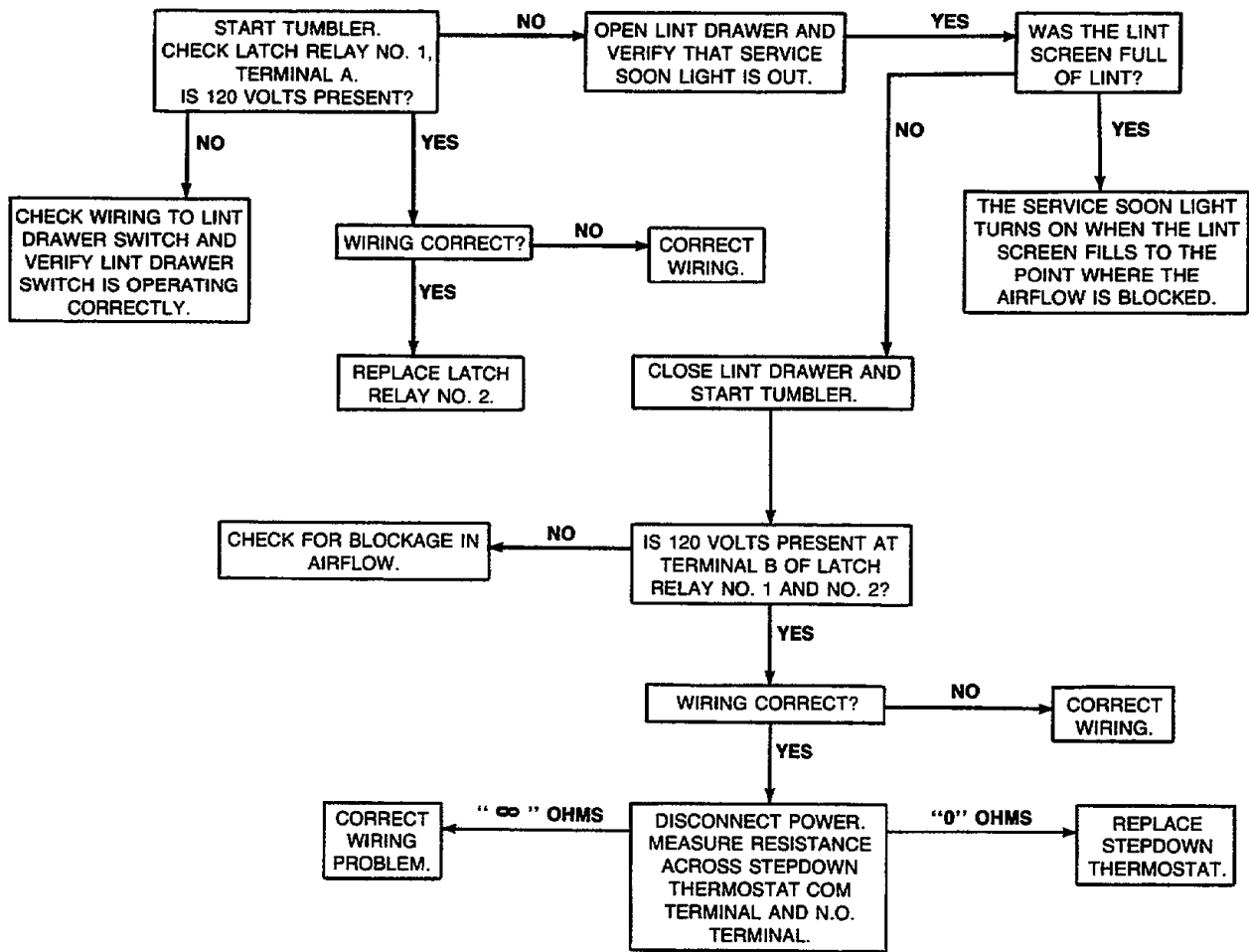
59. CYLINDER TURNS BUT NO HEAT (cont.)

(CONT'D)



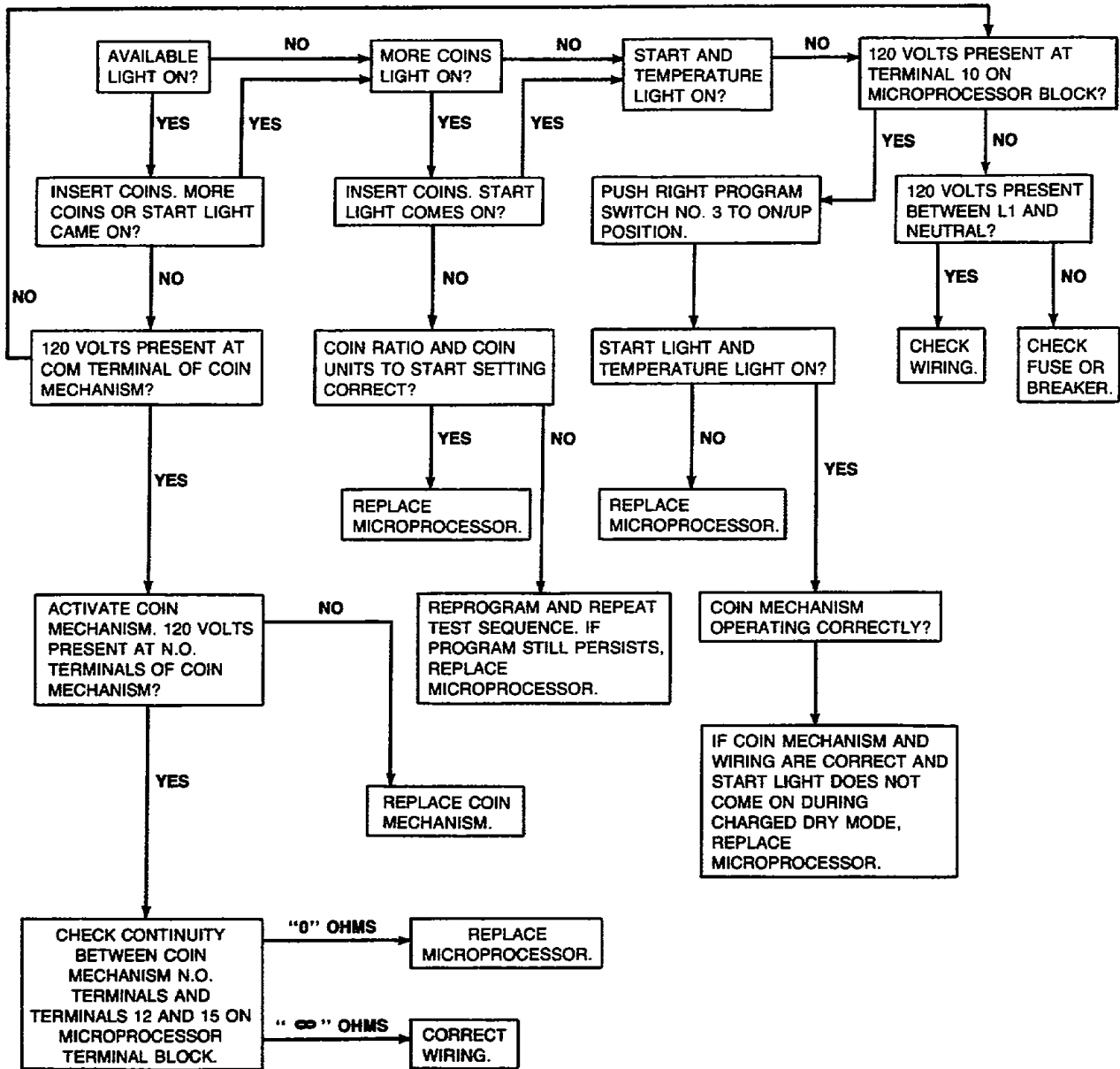
**NOTE:** All voltage checks are between the wires or terminal points to neutral (white wire).

60. SERVICE SOON LIGHT



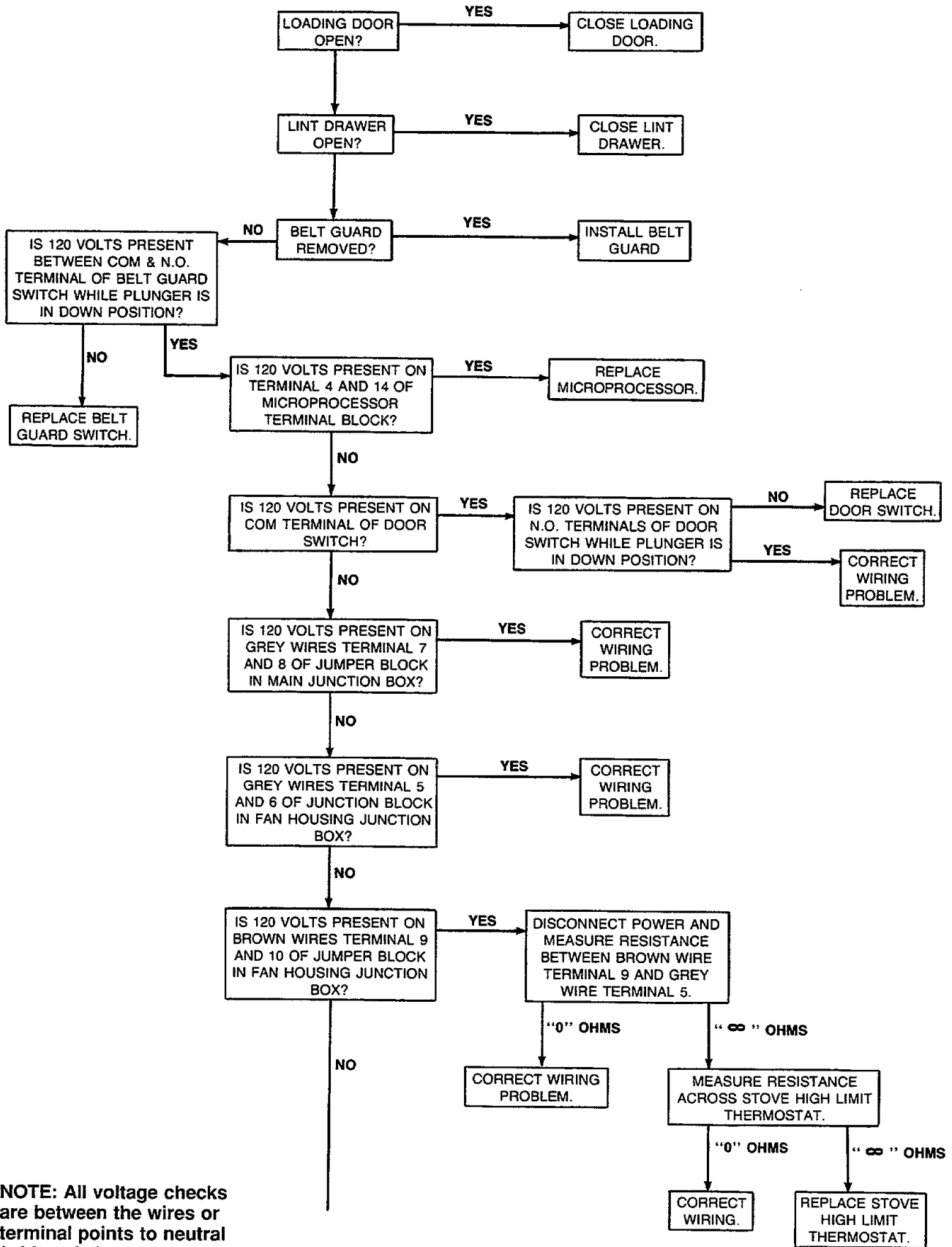
NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).

# 61. START LIGHT DOES NOT COME ON



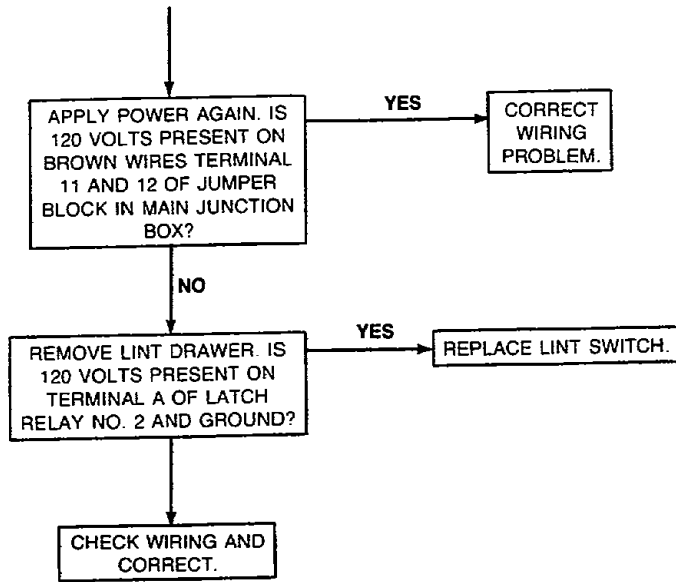
**NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).**

62. DOOR OPEN LIGHT ON?



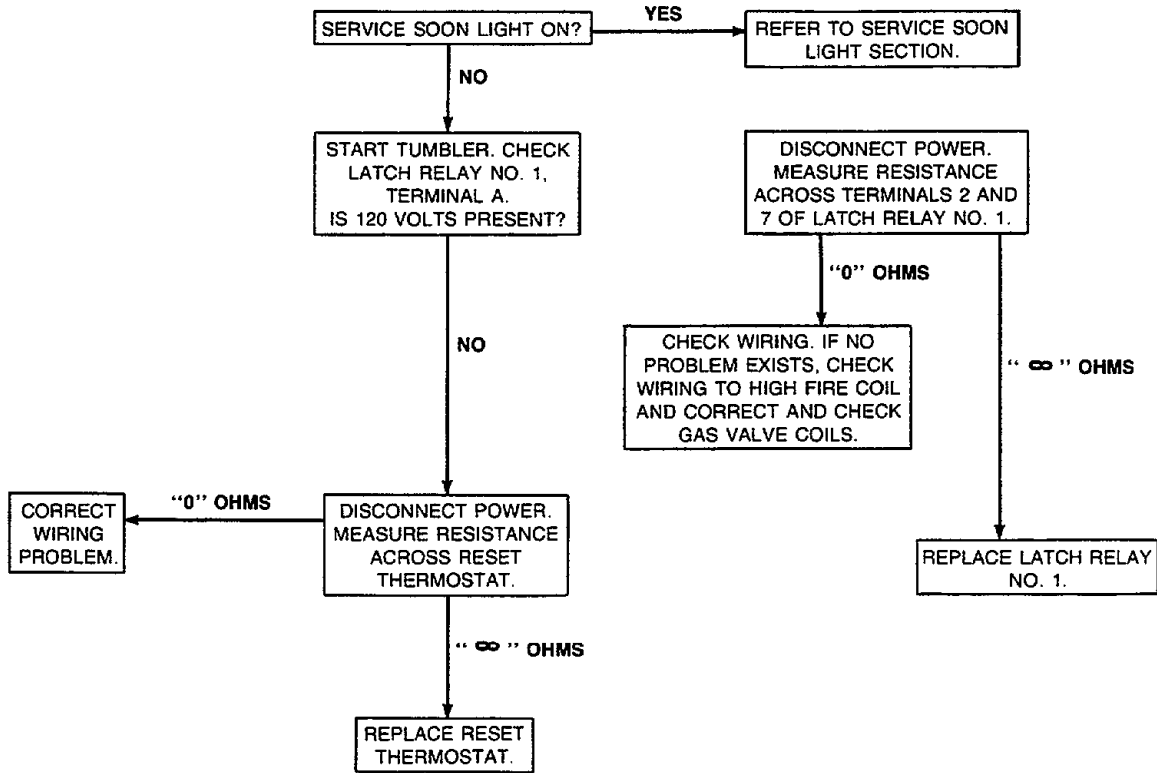
NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).

62. DOOR OPEN LIGHT ON? (cont.)

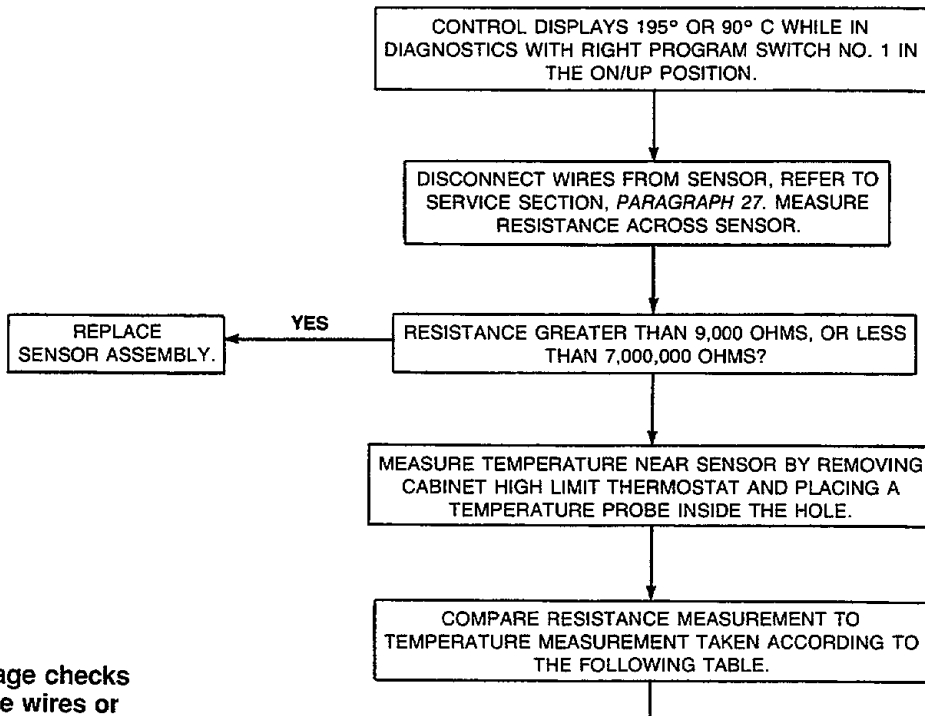


**NOTE:** All voltage checks are between the wires or terminal points to neutral (white wire).

63. UNIT IN LOW FIRE  
(Prior to Serial No. DTCK9211033714 only)



64. TEMPERATURE SENSOR TESTING

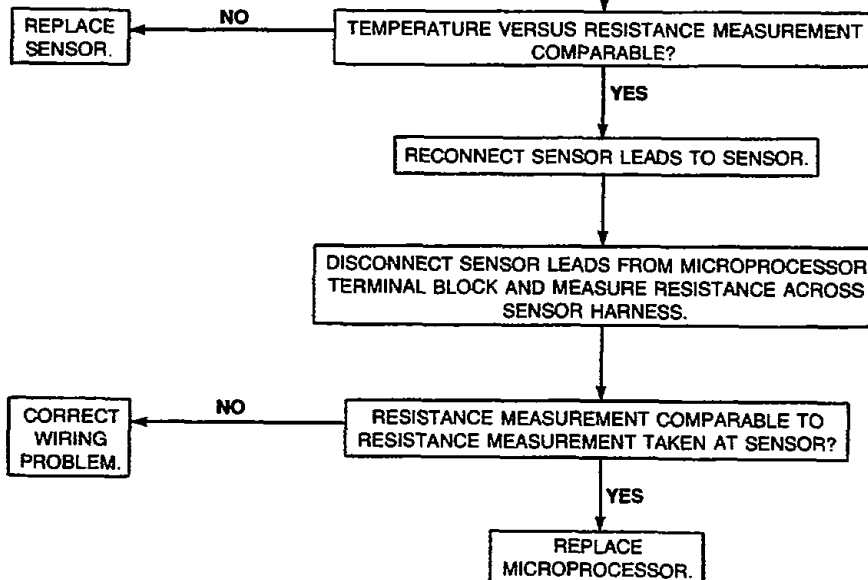


NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).



64. TEMPERATURE SENSOR TESTING (cont.)

DEGREES		RESISTANCE OHMS	DEGREES		RESISTANCE OHMS	DEGREES		RESISTANCE OHMS
C	F		C	F		C	F	
-20	-4.0	551701	24	75.2	52400	68	154.4	8345
-19	-2.2	519300	25	77.0	50000	69	156.2	8042
-18	-0.4	488960	26	78.8	47724	70	158.0	7751
-17	1.4	460550	27	80.6	45563	71	159.8	7473
-16	3.2	433960	28	82.4	43511	72	161.6	7205
-15	5.0	409040	29	84.2	41562	73	163.4	6949
-14	6.8	385690	30	86.0	39711	74	165.2	6703
-13	8.6	363800	31	87.8	37952	75	167.0	6466
-12	10.4	343270	32	89.6	36280	76	168.8	6240
-11	12.2	324010	33	91.4	34690	77	170.6	6022
-10	14.0	305940	34	93.2	33178	78	172.4	5813
-9	15.8	288970	35	95.0	31740	79	174.2	5612
-8	17.6	273040	36	96.8	30372	80	176.0	5419
-7	19.4	258070	37	98.6	29069	81	177.8	5234
-6	21.2	244000	38	100.4	27829	82	179.6	5055
-5	23.0	230780	39	102.2	26649	83	181.4	4884
-4	24.8	218340	40	104.0	25524	84	183.2	4719
-3	26.6	206640	41	105.8	24453	85	185.0	4560
-2	28.4	195640	42	107.6	23432	86	186.8	4408
-1	30.2	185270	43	109.4	22459	87	188.6	4261
0	32.0	175510	44	111.2	21531	88	190.4	4120
1	33.8	166320	45	113.0	20646	89	192.2	3985
2	35.6	157660	46	114.8	19803	90	194.0	3854
3	37.4	149500	47	116.6	18998	91	195.8	3728
4	39.2	141800	48	118.4	18229	92	197.6	3607
5	41.0	134540	49	120.2	17496	93	199.4	3490
6	42.8	127690	50	122.0	16796	94	201.2	3378
7	44.6	121230	51	123.8	16127	95	203.0	3270
8	46.4	115130	52	125.6	15488	96	204.8	3165
9	48.2	109370	53	127.4	14878	97	206.6	3065
10	50.0	103930	54	129.2	14295	98	208.4	2968
11	51.8	98780	55	131.0	13738	99	210.2	2875
12	53.6	93920	56	132.8	13205	100	212.0	2785
13	55.4	89325	57	134.6	12695	101	213.8	2698
14	57.2	84975	58	136.4	12208	102	215.6	2614
15	59.0	80865	59	138.2	11742	103	217.4	2533
16	60.8	76975	60	140.0	11295	104	219.2	2456
17	62.6	73290	61	141.8	10868	105	221.0	2380
18	64.4	69805	62	143.6	10460			
19	66.2	66500	63	145.4	10068			
20	68.0	63370	64	147.2	9693			
21	69.8	60405	65	149.0	9334			
22	71.6	57595	66	150.8	8990			
23	73.4	54925	67	152.6	8660			



**NOTE: All voltage checks are between the wires or terminal points to neutral (white wire).**

## 65. NORMAL OPERATION OF LATCH RELAYS Prior to Serial Number DTCK9211033714

When the dryer is running and the heater circuit is energized, the reset thermostat supplies power to the unlatch coil terminal A of relay No. 1. This in turn closes the N.C. (normally closed) contacts of relay No. 1. The N.C. contact closed on relay No. 1 connects supply power to the high fire coil, thus the unit will be in a high BTU state.

The dryer will continue to turn the heat on and off based on the temperature selection and information given to the microprocessor by the temperature sensor. This operation continues for several drying cycles until the lint screen fills to a point where airflow becomes restricted.

When the airflow is sufficiently blocked, heat builds up in the stove and the reset thermostat contacts open. This disconnects power to the unlatch coil of relay No. 1. This does not effect the BTU output until the heat closes the stepdown thermostat's N.O. (normally open) contacts. A closed stepdown thermostat supplies power to both B latch coil terminals on relays No. 1 and No. 2. Power applied to latch relay coil No. 1 opens the N.C. contacts, disconnecting power to the high fire coil and reducing the BTU output.

Power applied to the latch relay coil No. 2 closes the N.O. contacts of relay No. 2, supplying power to the Service Soon light. The dryer continues its drying cycle in low fire and will complete its cycle.

The Service Soon light remains on until the lint drawer is opened, which then supplies power to the lint switch terminal and the N.C. terminals to unlatch coil terminal A of relay No. 2. Power supplied to the Com (common) unlatch coil of relay No. 2 opens the N.O. contacts of relay No. 2, disconnecting power to the Service Soon light.

On the next drying cycle, if the lint screen has not been removed and cleaned as described, the Service Soon light remains energized and the drying cycle restarts.

When the stepdown thermostat cools down, its contacts open again and the reset thermostat contacts close. In this state the high fire coil energizes until the heat builds to a point where the stepdown thermostat closes, thus starting the low fire mode. This has no effect on the Service Soon light, which is still latched into the "ON" position. This cycle continues until enough accumulated lint in the lint screen blocks the airflow, bringing the stove temperature to a point where the stove high limit thermostat opens its contacts and disconnects power to the motor and door input circuitry. This shuts down the motor and heater circuitry. At that point, the Door Open and Service Soon lights are on, and the dryer is not able to start until the stove high limit thermostat cools down and turns off the door open input. The dryer is able to be started, but will again shut down.

Thus, if the Door Open light and Service Soon light are on at the same time without the door open, this is a good indication that the stove high limit thermostat has opened due to a full lint screen.

# SECTION V

## Microprocessor Diagnostic Instructions

**NOTE:** Electrical power to the tumbler must be on. For any diagnosis to occur, all of the left program switches **MUST BE** in the **DOWN** position. The tumbler must not be running and the display must be clear.

If you wish to check the program of the microprocessor, use the Diagnostic Cycle and/or the Diagnostic Mode. The Diagnostic Cycle is an accelerated test cycle. The Diagnostic Mode checks the push buttons, beeper, and the program code on the display.

### 66. DIAGNOSTIC CYCLE

**NOTE:** Use the plastic programming stylus (supplied with tumbler) or equivalent when sliding the program switch lever up or down.

**IMPORTANT:** DO NOT touch circuit boards on the front or back side of microprocessor.

- a. Unlock and remove microprocessor door, *Figure 9*.
- b. Slide right program switch lever number 1 up, *Figure 37*, leave all the other right program switches down. The START and PERM PRESS lights will be lit and PC03 will appear on the display.

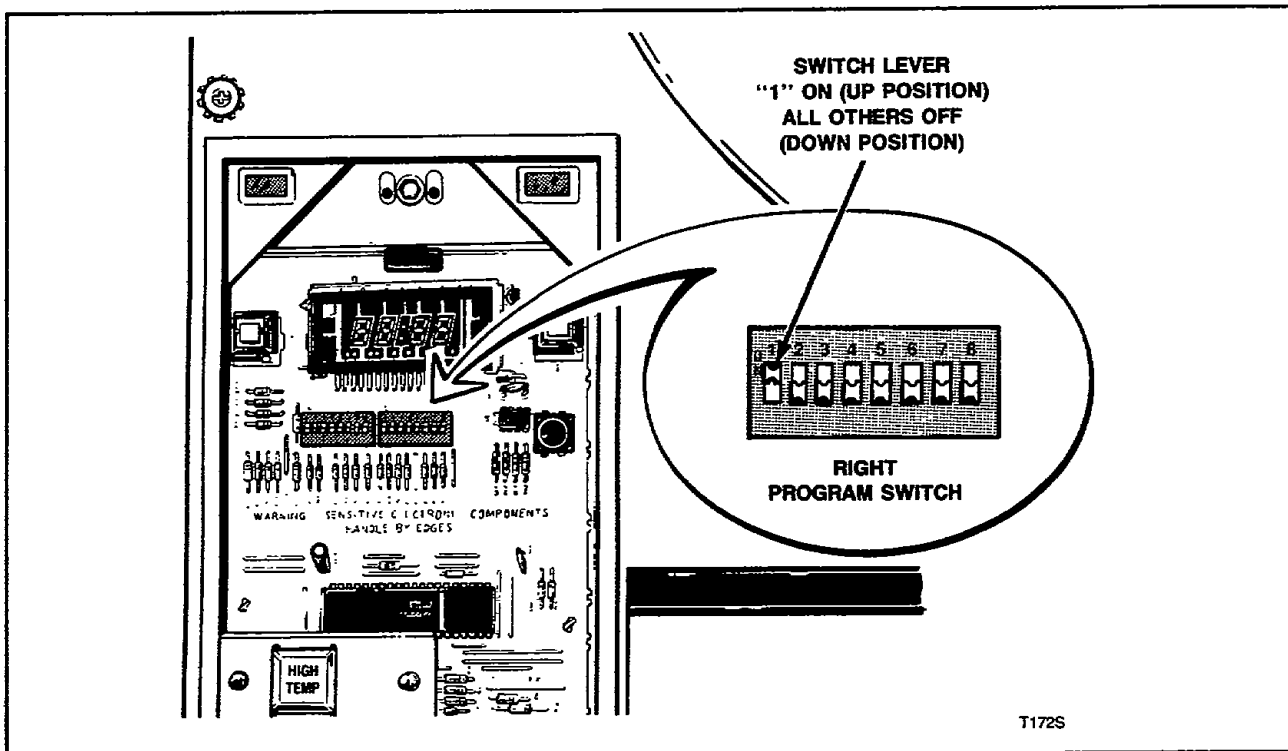


Figure 37

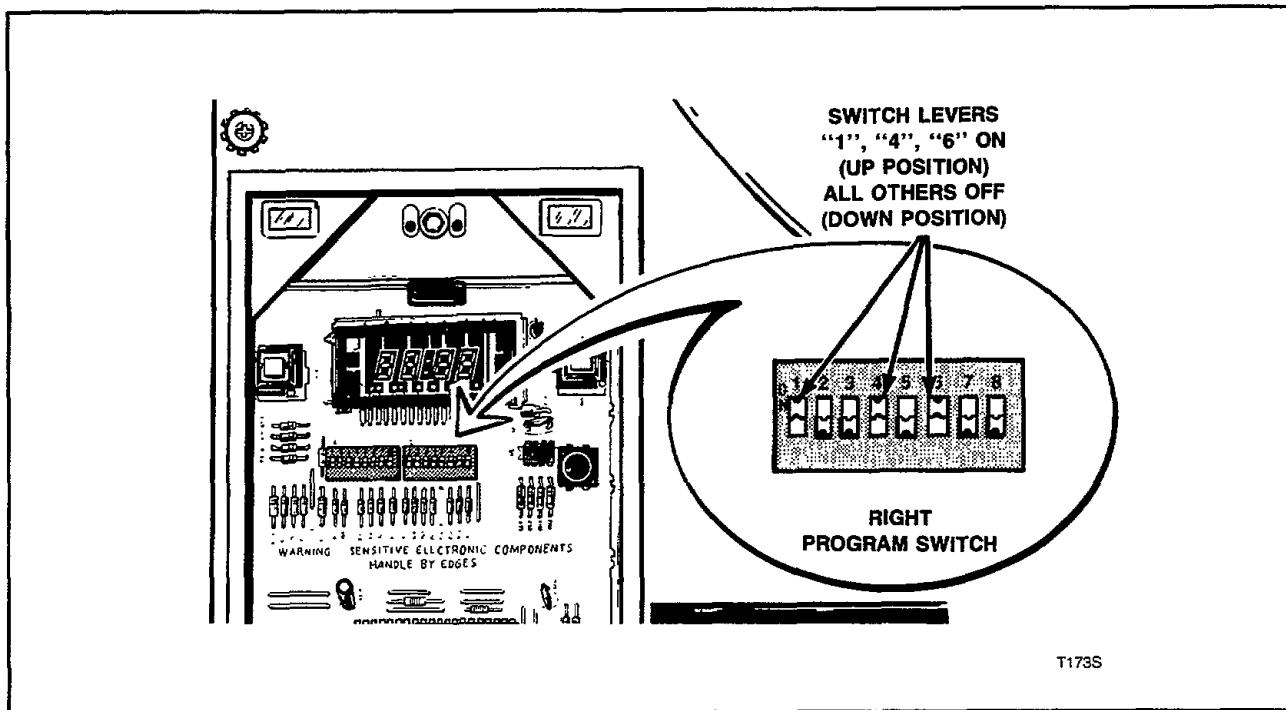


Figure 38

- c. Press the START button (this will put the tumbler into an accelerated test cycle). START light will go out, motor relay closes. DRYING and PERM PRESS lights will be lit and the display will show the room or tumbler cabinet temperature.
- d. Heater relay closes causing the burner to come on, display will show rising temperature. Burner will operate for two minutes, or until the programmed PERM PRESS temperature is reached, plus five (5) degrees.

**NOTE:** If the temperature displayed during this test reads 195, the temperature sensor circuit is not functioning correctly. Check to be sure that all the connections to the temperature sensor and the microprocessor control unit are correct. If these seem correct, check temperature sensor and control unit, and replace if necessary.

- e. Heater relay will open, DRYING light will go out. COOLING and PERM PRESS lights will be lit.
- f. After an additional thirty (30) seconds the COOLING light will go out, motor relay will open, START light will be lit and PC03 will again appear on the display.
- g. Slide right program switch number 1 down for normal operation.

#### 67. DIAGNOSTIC MODE

**NOTE:** Use the plastic programming stylus (supplied with tumbler) or equivalent when sliding the program switch lever up or down.

- a. Unlock and remove microprocessor door, Figure 9.
- b. Slide the right program switch levers 1, 4, and 6 up, Figure 38. All the other switches must be down. This mode allows you to check out the push buttons, beeper, and program code on the display.

**NOTE:** When the tumbler control is programmed into this mode, the display will show the programming code PC03.

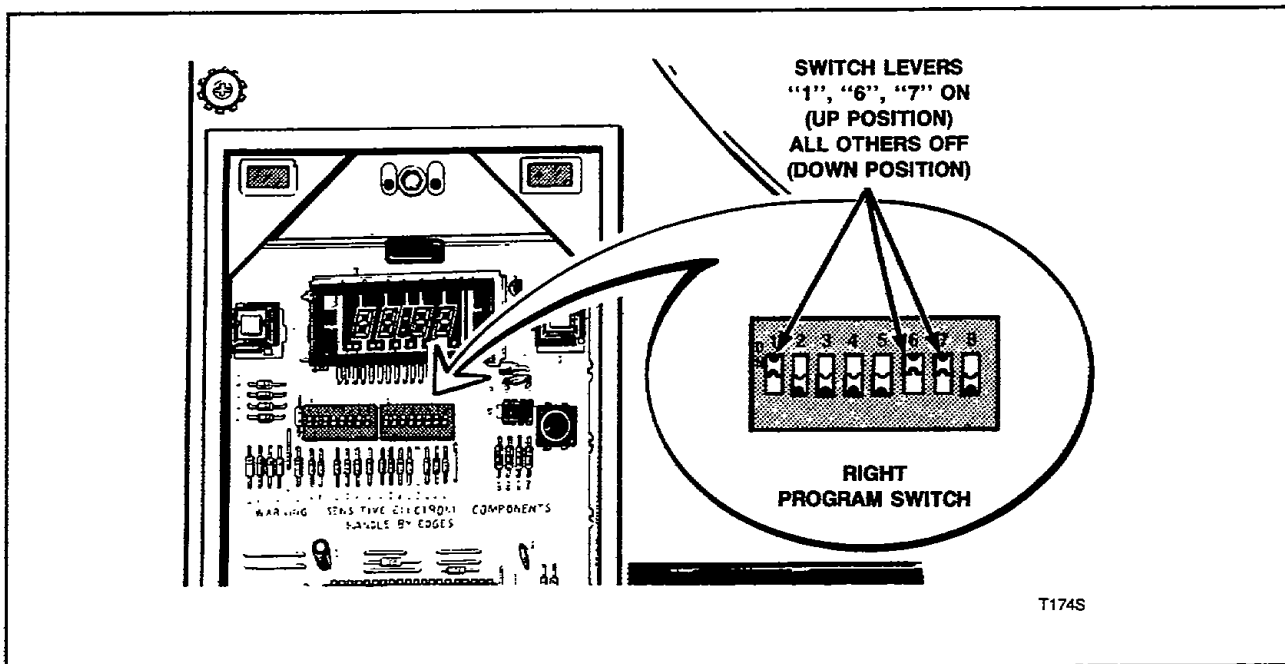


Figure 39

- c. One by one, press the HIGH TEMP, PERM PRESS, LOW TEMP, and START buttons in. You will hear a short "beep" after each button is pressed and the corresponding light will be lit.
- d. Slide the right program switch number 4 down and slide right program switch number 7 up, *Figure 39*. Switches 1, 6 and 7 must be up and all other switches must be down.

**NOTE:** When the tumbler control is programmed into this mode and with the door open, all segments and decimals points in the display will be lit, showing 88:88, and all the lights on the control panel will be lit.

- e. Slide the right program switches 1, 6, and 7 down to clear display. AVAILABLE and DOOR OPEN lights will be lit. Close door and DOOR OPEN light will go out.

# SECTION VI

## Gas Flow and Gas Valve Operation

### ▲ WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002

### 68. IGNITION SYSTEM FEATURES

#### Momentary Power Interruption

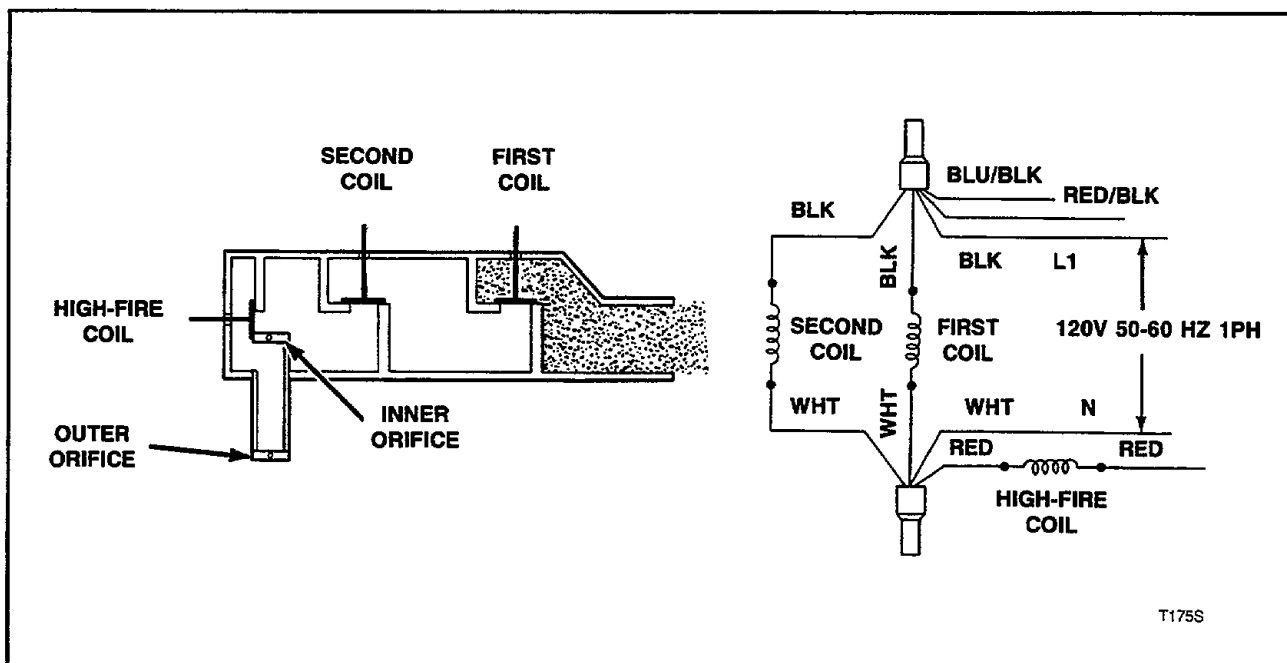
Upon power resumption, press START.

#### Flame Failure

In case of flame failure, the IEI will lock out. To resume operation, open the door, close the door and press START.

#### Ignition Failure

If flame is not established within 15 seconds, the IEI will lock out. To resume operation, open the door, close the door and press START.



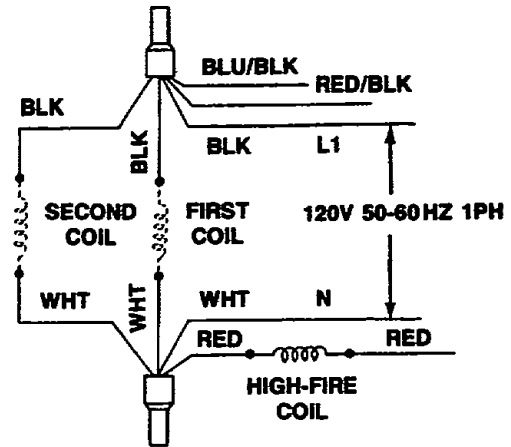
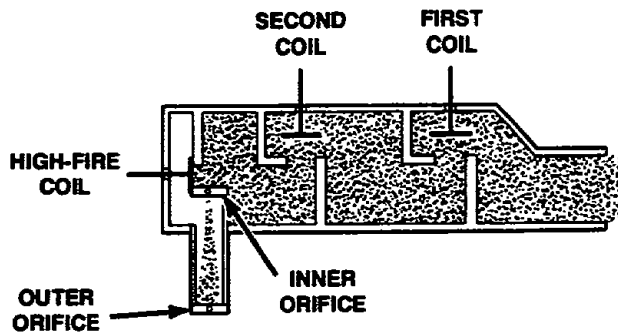
**PRE-IGNITION**  
(Prior to Serial No. DTCK9211033715)

**▲ WARNING**

**To reduce the risk of electric shock, fire, explosion, serious injury or death:**

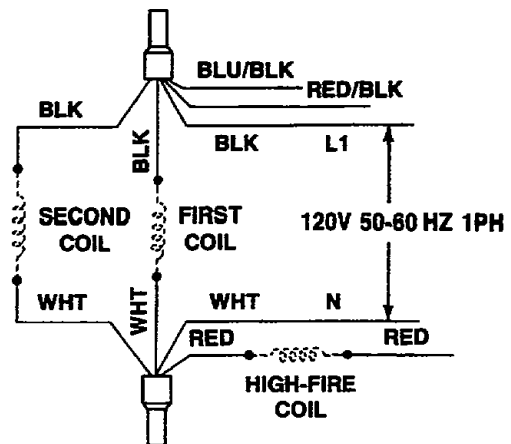
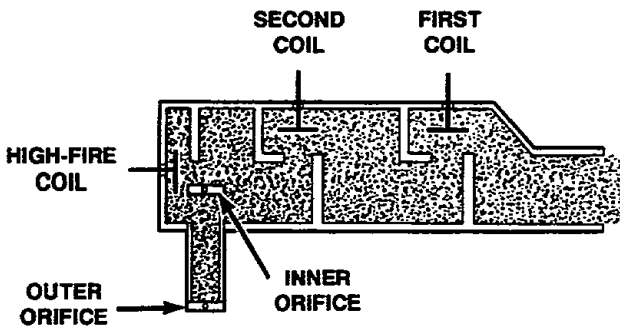
- **Disconnect electric power to the tumbler before servicing.**
- **Close gas shut-off valve to gas tumbler before servicing.**
- **Close steam gate valve to steam tumbler before servicing.**
- **Never start the tumbler with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.**

W002



T176S

**LOW-FIRE**  
**(Prior to Serial No. DTCK9211033715)**

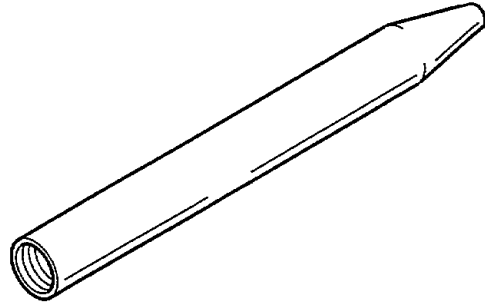


T177S

**HIGH-FIRE**  
**(Prior to Serial No. DTCK9211033715)**

# **SECTION VII**

## **Special Tools**



T147SE3A

**263P4**  
**CYLINDER GUIDE TOOL**