

Section 12

Stepper Reels



The stepper reel is a DC motor-controlled device that starts, stops and monitors the position of the reel. Vision Slot upright machines accommodate three, four or five stepper reel assemblies. Periodic maintenance of each stepper reel is necessary to ensure optimum performance and aesthetic quality. Refer to the information in the Introduction of this manual for maintenance schedules and intervals.

This section contains the following information:

- **Section 12.1, Reel Assembly Inspection** – covers examination of the reel assembly to determine its condition.
- **Section 12.2, Reel Assembly Periodic Maintenance** – describes procedures necessary to maintain the reel assembly for optimum performance.
- **Section 12.3, Reel Assembly Removal and Installation** – covers removal and installation of the entire reel assembly as a unit.
- **Section 12.4, Reel Strip** – covers removal and installation of the reel strip from the reel.
- **Section 12.5, Reel** – covers removal and installation of the reel from the reel chassis.
- **Section 12.6, Reel Position Sensor** – covers removal and installation of the reel position sensor from the reel assembly.
- **Section 12.7, Stepper Motor** – covers removal and installation of the stepper motor from the reel assembly.
- **Section 12.8, Reel Assembly Functional Verification** – includes a reference to the appropriate manual to perform functional verification testing.

12.1 Reel Assembly Inspection

1. Check each reel strip for a clean surface. The reel strip should be free of dust and fingerprints.
2. Check each reel strip for proper attachment to the reel frame. The reel strip should fit under the lip on both sides of the reel frame. See that the notches on both sides of the reel strip are aligned with the index marks on both rims of the reel. Make certain the reel strip fits evenly around the rim.
3. Check the encoding flags located on the inner frame of each reel. Make sure they are not chipped or broken and that they are free of dust.
4. Check the harness on each stepper reel for proper routing and that the harness wires are secured away from any moving parts.
5. Check the reel sensor for dust accumulation on the inner surfaces and make sure it is fastened securely.



12.2 Reel Assembly Periodic Maintenance

The stepper reel assembly does not require lubrication or adjustments.

Caution: *Always wear eye protection when using pressurized air or cleaning solvents.*

Reel Assembly Cleaning

1. Open the machine door and turn the **power off**.
2. Carefully wipe each reel strip with a cloth moistened with warm water to remove any dust or dirt.
3. Use compressed air (not to exceed 60 psi) to remove any dust accumulations from the encoding flags on the inner reel, the reel sensor, the reel chassis and reel frame.
4. Clean the reel sensor with denatured alcohol or mild glass cleaner as needed.



12.3 Reel Assembly Removal and Installation

To remove or install an entire reel assembly, use the following procedure.

12.3.1 Reel Assembly Removal

To remove a stepper reel from the reel shelf, see Figure 12-1 and proceed as follows.

1. Open the machine door and turn the **power off**.
2. Place fingertips behind the front mounting flange and place thumbs against the front edge of the reel shelf.
3. Carefully pull the stepper reel straight out from the reel shelf.

Note: The reel may be tight-fitting, so increase pressure gradually until the reel is released.

4. Repeat steps 2 and 3 for each stepper reel.

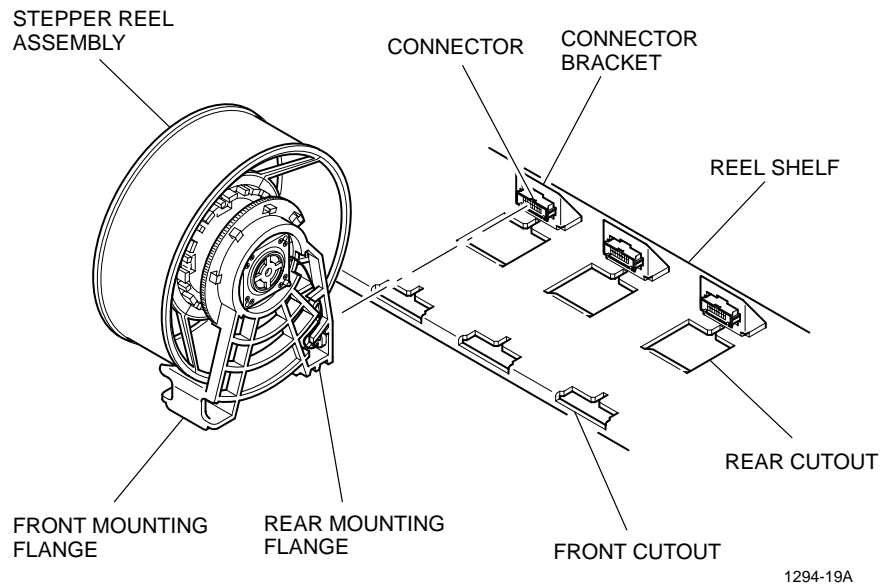


Figure 12-1. Stepper Reel Removal.



12.3.2 Reel Assembly Installation

To install a stepper reel, proceed as follows.

1. Position the stepper reel assembly between the protruding guides on the reel shelf.
2. Align the front and rear mounting flanges on the stepper reel with the front and rear cut-outs in the reel shelf.
3. Slide the stepper reel assembly toward the back wall of the machine enclosure. Be sure both mounting flanges fit securely under the reel shelf and that the connector on the rear mounting flange fully engages the receptacle located at the rear of the reel shelf.
4. Repeat steps 2 through 4 for each stepper reel assembly.
5. Turn the **power on** and verify correct reel function using the procedure in Section 12.8.
6. Close and lock the machine door.



12.4 Reel Strip

The reel strips are easily removable and are matched to the game software and the various glass displays. To remove or install a reel strip, see Figure 12-2 and follow the procedures in this section.

12.4.1 Reel Strip Removal



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1. Open the machine door and turn the **power off**.
2. Rotate the stepper reel to locate the end of the reel strip.
3. Carefully peel the adhesive end of the strip away from the reel and the underlying strip.
4. Remove the reel strip from under the retaining lip encircling both sides of the reel.
5. Repeat steps 2, 3 and 4 for each stepper reel.

12.4.2 Reel Strip Installation

Note: For easy reel strip installation, the stepper reel should remain installed in the machine.

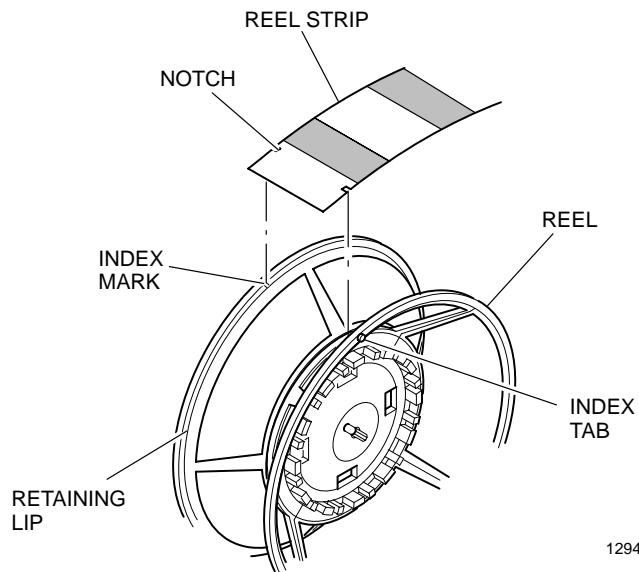


Figure 12-2. Reel Strip Removal/Installation.

1. Rotate the stepper reel until the two index marks on the outer rims of the reel point straight out from the enclosure.
2. Drape the reel strip down the back side of the reel with the notched end of the reel strip facing toward you.
3. Align the notches on both sides of the reel strip with the index marks on both rims of the reel.
4. Insert one edge of the reel strip under the retaining lip of the rim until the notch engages the index tab inside the lip. Repeat for the other edge of the reel strip.
5. Insert both reel strip edges under the retaining lip on both rims until approximately 3 inches (7.6 cm) of the reel strip remain unattached. Make certain the reel strip fits evenly around the rim.
6. Remove the paper backing from the adhesive tape on the underside of the reel strip.
7. Insert one edge at the end of the reel strip under the retaining lip, without attaching the adhesive tape, then carefully insert the other edge. Make certain the reel strip fits evenly around the rim.
8. Carefully apply pressure to the outer and under sides of the reel strip at the same time to bond the ends of the reel strip together.
9. Make certain the reel strip fits evenly around the rim. The reel strip should have no depressions or bulges and the rim should not be warped. Repeat steps 7 and 8 if necessary.
10. Repeat steps 1 through 9 for each stepper reel.
11. Turn the **power on**.
12. Refer to the appropriate game software manual for procedures to verify the reel strip characters and position.
13. Close and lock the machine door.



12.5 Reel

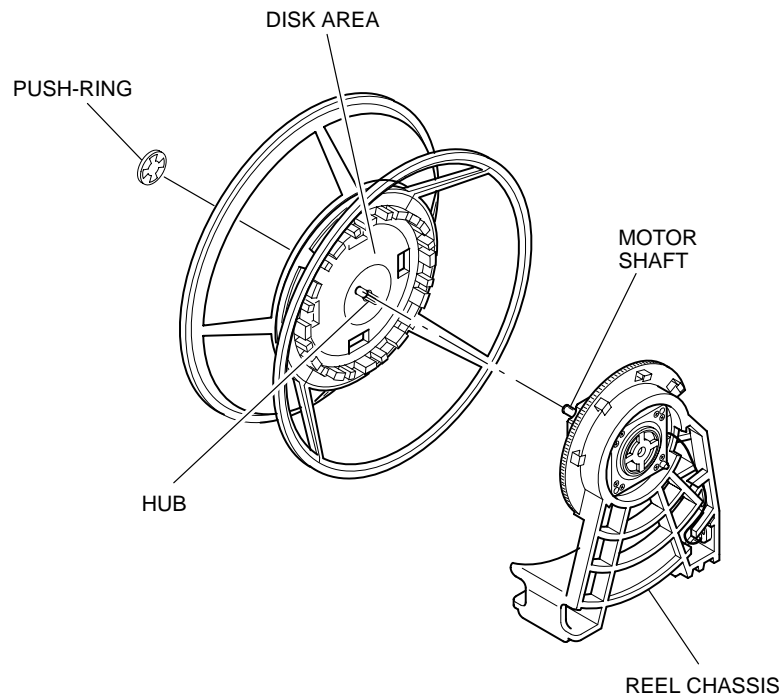
Use the procedures in this section to remove and replace the reel.

12.5.1 Reel Removal

See Figure 12-3 to remove the reel from the stepper motor.

Note: The push ring may be damaged during removal. Be prepared to replace this part prior to removing the reel assembly.

1. Open the machine door and turn the **power off**.
2. Remove the reel strip from the reel (refer to Section 12.4).
3. Remove the stepper reel from the machine enclosure and place it on a flat surface (refer to Section 12.3 for stepper reel assembly removal procedure).
4. Position the stepper reel so that the stepper motor faces away from you.



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Figure 12-3. Stepper Reel Removal.



5. Grasp the push ring at the end of the motor shaft with a small pair of pliers and carefully twist until it comes off the shaft.
6. Hold the rim of the reel assembly with both hands and pull the stepper reel toward you until the end of the motor shaft is flush with the reel hub. **Do not** grip the encoder flags (see Figure 12-4).
7. Hold the stepper reel chassis in one hand and pull the reel off the motor shaft.

12.5.2 Reel Installation

1. Insert the motor shaft into the slotted hole in the encoder side of the reel.
2. Align the motor shaft roll pin with the slot in the reel and push the reel completely onto the motor shaft.
3. Secure the reel to the motor shaft with a .25-inch push ring. Make sure the push ring fits tightly around the motor shaft and flat against the reel hub.
4. Install the reel strip onto the stepper reel. Refer to Section 12.4 for the reel strip installation procedure.
5. Install the stepper reel into the machine enclosure. Refer to Section 12.3 for the stepper reel installation procedure.
6. Turn the **power on**; close and lock the machine door.

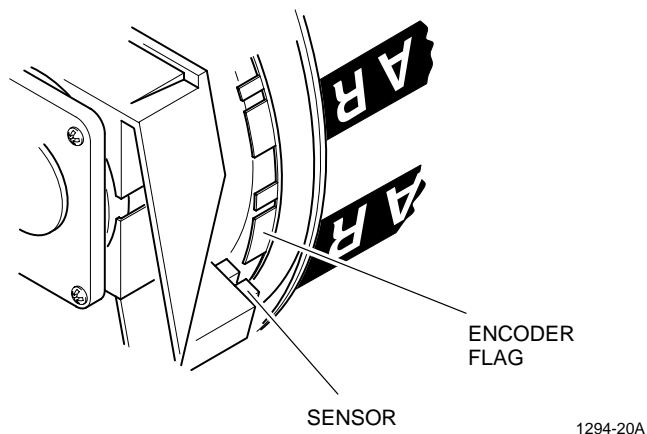


Figure 12-4. Reel Encoder Flags.



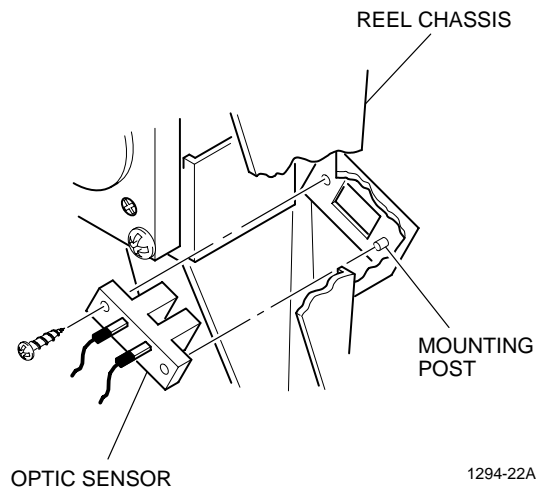
12.6 Reel Position Sensor

To remove and install the reel position sensor, see Figure 12-5 and proceed as follows.

12.6.1 Reel Position Sensor Removal



1. Open the machine door and turn the **power off**.
2. Remove the stepper reel from the machine enclosure and place it on a flat surface. Refer to Section 12.3 for the reel assembly removal procedure.
3. Carefully cut any ty-raps that secure the stepper motor harness and the optic sensor wires using small wire cutters.
4. Remove the four optic sensor wires (lighter gauge) from the connector located at the chassis base using a small pin remover. Wire location numbers are pins 7, 8 and 9 (2 in 1 pin).
5. Remove the screw that fastens the sensor to the reel chassis.
6. Unhook the sensor harness from the harness retaining clip on the back side of the reel chassis and remove the sensor from the reel chassis.



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Figure 12-5. Reel Position Sensor Removal.

12.6.2 Reel Position Sensor Installation

To install the reel position sensor, see Figure 12-5 and proceed as follows.

1. Insert the sensor fork into the rectangle cut-out from the back of the reel chassis.
2. Place the bottom mounting hole on the sensor over the mounting post on the chassis and hold in place.
3. Fasten the sensor to the chassis with the screw previously removed. Tighten securely, but **do not** overtighten.
4. Hook the sensor wires under the harness retaining clips located on the back of the reel chassis.
5. Insert the sensor wire terminals into the correct pin locations in the connector located at the chassis base.
6. Install the stepper reel into the machine enclosure. Refer to Section 12.3 for the stepper reel installation procedure.
7. Turn the **power on**, and close and lock the machine door.



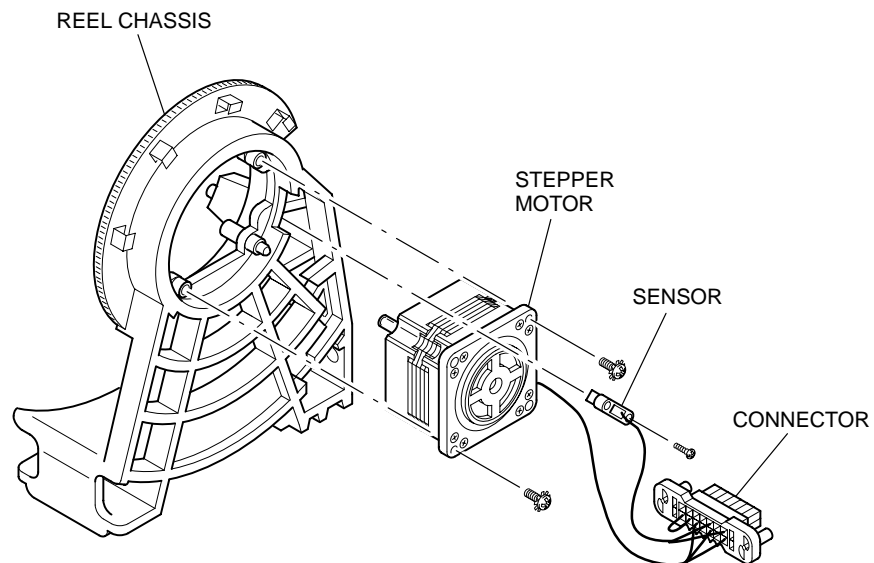
12.7 Stepper Motor

The stepper motor is assembled with the connector to the machine harness and the position sensor (see Figure 12-6).

12.7.1 Stepper Motor Removal

To remove the stepper motor from the reel chassis, see Figure 12-6 and proceed as follows.

1. Open the machine and turn the **power off**.
2. Remove the stepper reel from the machine enclosure and place it on a flat surface. Refer to Section 12.3 for the stepper reel removal procedure.
3. Remove the reel strip from the reel. Refer to Section 12.4 for the reel strip removal procedure.
4. Position the stepper reel so that the stepper motor faces away from you.
5. Remove the reel from the motor shaft; refer to Section 12.5.
6. Carefully cut any ty-raps that secure the stepper motor harness and the optic sensor wires using small wire cutters.



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Figure 12-6. Stepper Motor Removal.



7. Remove the six stepper motor wires (heavier gauge) from the connector located at the chassis base using a small pin remover. Wire location numbers are pins 1 through 6.
8. Unhook the stepper motor harness from the harness retaining clips on the back of the reel chassis.
9. Hold the reel chassis securely and remove the screws that fasten the stepper motor to the reel chassis.

Note: *It is not necessary to remove the screws from the back of the motor housing. These screws hold the motor itself together.*



10. Pull the stepper motor out of the reel chassis.

12.7.2 Stepper Motor Installation

1. Insert the stepper motor into the chassis motor mount with the motor harness routed through the opening in the motor mount.
2. Align the four mounting holes in the stepper motor with those in the reel chassis.
3. Fasten the stepper motor to the reel chassis with the screws removed previously. Tighten securely, but **do not** overtighten.
4. Insert the stepper motor wire terminals into the correct pin locations in the connector located at the chassis base.
5. Hook the stepper motor harness under the harness retaining clip located at the back of the reel chassis.
6. Secure the stepper motor harness and the optic sensor wires to the chassis ty-rap mount with a small ty-rap. Carefully remove the excess ty-rap with wire cutters.
7. Install the reel onto the motor shaft (refer to Section 12.5).
8. Install the reel strip onto the stepper reel. Refer to Section 12.4 for the reel strip installation procedure.
9. Install the stepper reel into the machine enclosure. Refer to Section 12.3 for the stepper reel installation procedure.
10. Turn the **power on**, and close and lock the machine door.

12.8 Reel Assembly Functional Verification

Refer to the game software manual to test the outputs, perform a payable test and to perform a reel strip test for functional verification of each reel.

