GAMESMAN side payout Hopper Technical Manual

Money Controls

Contents

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Tables

1. Diary of Changes

Issue 1.0 - First issue ..... 9th February 2001

Issue 2.0 - Changes requested by Coin Inc. ..... 12th February 2001
- Add spanner / wrench.
- Changed c/sk to countersunk.
- Changed dog point info.
- Updated Table 1.

Issue 3.0 ..... 24th May 2001
- Fig 2a and 2b changed to match TSP011.
- Update to Table 6.

Issue 4.0 ..... 9th August 2001
- Fig 2a updated to show bridge plate components.
- Updated Table 6.
- Last page disclaimer added.

Issue 5.0 ..... 13th March 2002
- Re-paginated / formatted manual
- Added Money Controls logo.
- Corrected references in section 10.
- Applied TMWP v3.0

Issue 6.0 ..... 21st March 2002
- Expanded “Maintainable Life” section.

Issue 6.1 ..... 6th September 2002
- Modification to disclaimer.

Issue 6.2 ..... 21st September 2003
- Applied TMWP V3.2
- Changed Figure 1.
- Ammended details in Table 1.
- Ammended Strip Down procedure – section 9.31.
- Ammended Re-build procedure – section 9.32.
- Ammended “Service and Maintenance” – section 10.
- Added Figure 4.

Issue 6.3 ..... 20th February 2004
- Added 16,17 & 18 to Figure 2.

Issue 6.4 ..... 30th June 2004
- Changed footer

Issue 6.5 ..... 19th August 2005
- Added Appendix 1 (Fitting the Bridge Plate).

2. Introduction

The Gamesman side payout hopper has been designed for use primarily in the casino slot machine industry. Its main features are:-

- A “Knifeless” coin pick-up system to reduce the likelihood of jams.
- A large capacity bowl to facilitate the payment of high value jackpots, in either coins or tokens.

Some parts of the hopper are specific to the size of coin/token being dispensed and therefore it is necessary to state the coin/token to be paid out when ordering a Gamesman.

There are several versions of the Gamesman, designed for compatibility with specific types of gaming machines. This manual describes the general features of Gamesman, which are common to all versions. Separate appendices will provide application specific details.

3. Theory of Operation

The motor/gearbox will cause the disc to rotate, when power is applied to the hopper and any control inputs are set into their active state. The coins in the bowl will flow, under gravity, past the regulator and on to the rotating disc. Pins on the disc will pick up the coins and carry them up to the bridge plate where the coins are lifted off the disc and fed into the ejector mechanism.
The spring-loaded ejector arm will push the coin out of the exit slot. An optical sensor, mounted in the exit, will detect the coin as it leaves the hopper and generate an output signal which can be used by a host machine to record the number of coins dispensed.
All control boards have the ability to detect when a jam has occurred and will reverse the direction of the motor, for a short time to clear the obstruction.

4. Variants

There are several selectable features available on the Gamesman to suit most applications.

These must be specified when ordering, i.e. -

Coin/token size	-	within specified range, see Table 1.
Bowl type	-	application specific.
Level sensing	-	high, medium, low.
Control board & connector	-	application specific.
Base	-	application specific.
Power supply	-	24V DC or 110V to 240V AC.

5. Mechanical Description

5.1 Motor / gearbox.

The drive unit is mounted on the rear of the main housing and comprises the motor, gearbox and mounting plate. It is attached to the disc by 2 x M6 screws, which are visible in the centre of the disc. If the motor has to be removed, it is important to ensure that the two fixing screws are tightened to the correct torque upon replacement. See Figure 1.

5.2 Disc.

The circumference of the disc is divided into segments by a series of pins/raised sections. The size of each segment is coin size specific, being greater than one coin diameter and smaller than two coin diameters.

5.3 Bridge plate.

The bridge plate is designed to lift a coin from the disc and guide it into the ejector. This is achieved by squeezing the coin between a disc pin and the bridge pin, as the disc rotates, forcing the coin upwards. A number of bridge plates are available to suit different coin sizes.

5.31 DOG POINT SCREW (BRIDGE PIN) ADJUSTMENT.

It is not normally necessary to alter the setting of the bridge pin. However, if it must be done, the following procedure must be followed :-

i. Screw the dog point screw into the bridge plate, with the dog point end towards the disc, until it is finger tight.
ii. Secure the dog point screw in position, using the nut and washer. The nut should be tightened to the specified torque (*see* Figure 1).
iii. Hold the nut in position with a spanner and back-off the screw by between half and three-quarters of a turn, using a 3mm Allen key.
iv. Check that the disc can turn without being obstructed by the pin.

5.4 Ejector.

The spring-loaded ejector arm is mounted on the outside of the bridge plate. A pin, fixed to the arm, protrudes through a slot in the bridge plate and into the coin path. As a coin is pushed off the disc it forces the arm upwards and puts the spring under tension. When the coin has travelled to a point where more than half of its diameter has passed the pin, the spring will cause the arm to return to its rest position and eject the coin through the exit slot.

5.5 Bowl assembly.

The plastic bowl is fastened to the yolk which, in turn, is attached to the main housing. A regulator is also fixed to the yolk. The shape of the bowls has been designed so that coins will migrate, under gravity, towards the disc. The regulator ensures that the number of coins reaching the disc is enough to prevent coin starvation, but not enough to flood the disc, which could cause jams or poor pick-up. There will be different regulators to suit different coin sizes.

5.6 Yolk spacers

The bowl assembly is free to move backwards and forwards to assist in the clearing of any jams. The amount of movement, as well as the clearance between bowl and disc, is coin specific and is determined by the yolk spacers. These plastic components are colour-coded for ease of identification.

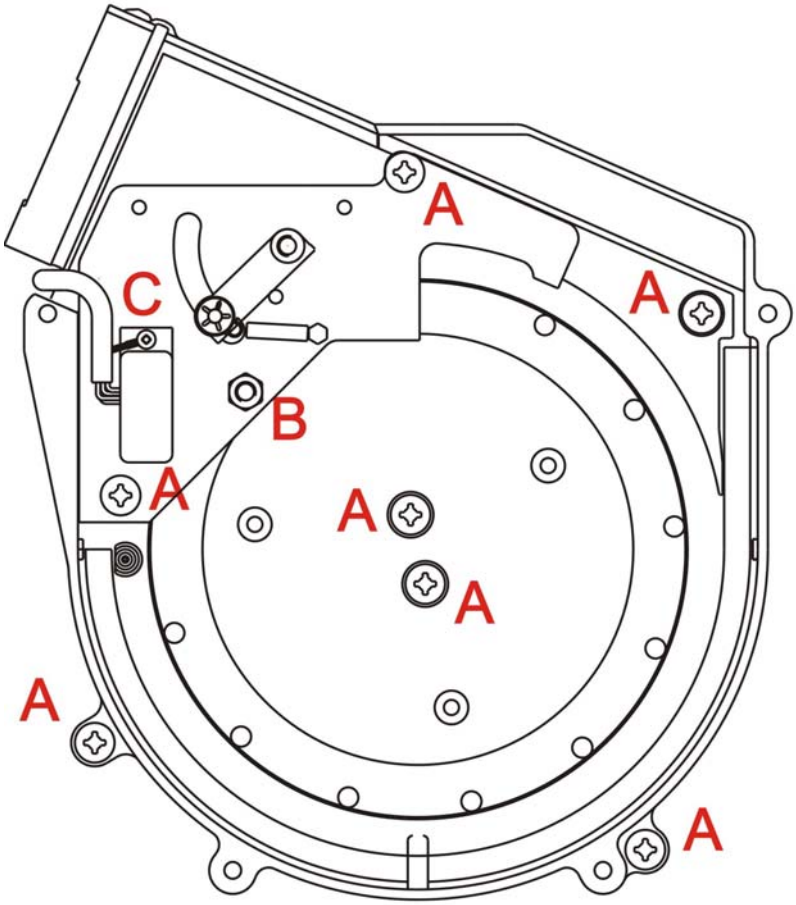
IMPORTANT:

If the bowl has to be removed, for any reason, it is important that the spacers are re-fitted correctly, otherwise the hopper will not run reliably.

Money Controls Technical Services department will be able to assist in identifying the correct spacers for a particular coin type.

Figure 1: Torque Settings

REF No	TORQUE IN N-M	TORQUE IN FT-LBS
A	4 N-M	2.95 FT-LBS
B	4 N-M	2.95 FT-LBS
C	1 N-M	0.74 FT-LBS



NOTE:

1] YOKE AND BOWL RIVETED TOGETHER
2] FRAMES TO BASEPLATE RIVETED
3] HANDLE TO FRAME RIVETED
4] ON HOPPERS THAT HAVE THE FRAMES BOLTED TOGETHER THEN TORQUE AS REF A

6. Level Sensors

Where fitted, level sensing will be achieved by the use of two round brass plates fitted inside the bowl. The lower plate will be connected to the 0-Volt line and the other plate will be connected to the host machine, either directly to the main connector or via the control board. An electrical connection between the plates, via the coins, will provide an indication of the level of coins in the hopper. Some bowls have a series of pre-drilled holes, which allow a user to move the position of the level sensor. This is achieved by unplugging the sensor wire, removing the nut and washer from the fixing stud, moving the sensor plate and stud to the new position, and re-attaching the nut and wire.

7. Electronic Control

A range of control boards is available to suit different applications. Each board will start and stop the motor when instructed by input signals from a host machine, detect and clear coin jams, and provide an output signal whenever a coin is dispensed.

7.1 Input signals.

The type and polarity of the input signals are unique to each type of control board.
Refer to separate data sheets for further information.

7.2 Jam detection and clearing.

The current being drawn by the motor is monitored continuously by the control board. If the current rises above a pre-set threshold, it will indicate that a jam has occurred. The motor will then be run in the reverse direction, for a fixed time, before resuming its forward motion. If the obstruction is not cleared at the first attempt, the sequence will be repeated until either the jam is cleared or a thermal switch activates and removes the power from the motor.

The thermal switch is designed to protect the motor from overheating in the unlikely event of a hard jam. It can be reset by removing power from the hopper for approximately 60 seconds.

7.3 Coin sensors.

Each hopper is fitted with an optical sensor, which generates a beam of light across the coin exit path. When a coin blocks the light beam, the opto-detector changes state, causing the control board to generate an output signal to the host machine.

7.4 Coin output signals.

The type and polarity of the output signals are unique to each type of control board.
Refer to separate data sheets for further information.

8. Power Supply

The motor and the control board are designed to operate from a 24 Volt DC supply. Some applications have only 110 Volt AC supplies available. For this reason, versions of Gamesman are available which incorporate a certified power supply to convert the AC supply into 24 Volts DC. The power supply is held in a bracket, which is usually attached to the hopper.

9. Technical Specification

Table 1: Coin Dimensions

Diameter:	16mm – 45 mm	0.63” – 1.77”
Thickness:	1.0 mm – 4.0 mm	0.0394” – 0.1575”

Table 2: Power Supply

Voltage:	24V DC +/- 10% 110V AC with PSU fitted.

Table 3: Current Consumption

Running:	0.7 A Typical @ 24V DC
Reversing:	3.9 A Maximum @ 24V DC

Table 4: Environmental Ranges

Operating temperature range:	0°C to +50°C
Storage temperature range:	-20°C to +70°C
Operating Humidity:	10% to 75% RH non-condensing
Storage Humidity:	10% to 95% RH non-condensing

Table 5: Maximum Capacities

Coin & bowl dependant. e.g.	
Bowl No.1 (LH)	Typically 2000 coins 25.4mm (1”) x 2.8mm (0.11”)
Bowl No.4 (RH)	Typically 2000 coins 25.4mm (1”) x 2.8mm (0.11”)

9.1 Electrical Specification

Application specific – refer to individual appendices for details.

9.2 Overall dimensions

Application specific – refer to individual appendices for details.

9.3 Maintainable Life

5,000,000 coins/tokens.

After 5,000,000 the disk unit [Item 13 - Figure 2] and the bridge plate [Item 6 - Figure 2] should be replaced.

9.31 STRIP DOWN

Refer to Figure 2 and Figure 3 Exploded Diagram Pages 14 and 15.

1) Disconnect the opto loom [Item 32 - Figure 2] from the control board.

2) Disconnect the motor loom [Item 33 - Figure 3].

3) Disconnect the level sense wires from the bowl [Item 35 - Figure 3].

4) Remove the top left hand M6 x 16 poz pan head screw and 5mm long metal spacers, [Items 12 & 4 - Figure 2]. Remove the top right hand M6 x 30 poz pan head screw, 26mm long metal spacer and coloured spacer, [Items 30, 5 & 3 - Figure 2]. The bowl can then be lifted off the bottom two M6 x 25 shoulder screws [Item 2].

5) Remove the M6 x 20 poz pan head screw and shake-proof washer [Item 7 & 8 - Figure 2]. Remove the M6 x 30 poz pan head screw, nut and shake-proof washer, [Items 9 - Figure 2 and 28 & 29 - Figure 3]. The bridge plate unit, [Item 6 - Figure 2], can now be removed.

6) Take hold of the motor to keep it in position. Then remove the two M6 x 16 poz countersunk Anu-lok screws, [Item 14 - Figure 2], from the centre of the disc unit, [Item 13 - Figure 2]. With the two screws removed the drive assembly, spring, rotary bearing and disc unit can be removed, [Items 13 - Figure 2 and 26, 25 & 24 - Figure 3].

7) Clean the coin dust from ALL removed parts.

8) Ensure the optics are clean.

9) Re-build the hopper – See section 9.32

9.32 RE-BUILD

Under NO circumstances, should any lubrication be used.

1) Take the rotary bearing, spring and drive assembly previously removed, [Items 24, 25 & 26 - Figure 3] and locate the pin on the rotary bearing into the small hole in the housing. With the spring mounted on to the drive bush, locate the drive assembly into the rotary bearing.

2) Holding the drive assembly in place, place the **NEW** disc unit, [Item 13 - Figure 2], onto the locating pip on the end of the drive bush. Using the two M6 x 16 poz countersunk Anu-lok screws, [Item 14 - Figure 2], fix the disc to the drive bush.

3) Take the NEW bridge plate unit, [Item 6 - Figure 2] and position the bridge plate unit on the housing so that the two 6.2mm mounting holes line up with the two mounting holes in the housing. Fix the bridge plate unit to the housing using the M6 x 20 poz pan head screw, [Item 7 - Figure 2] and 6mm shake-proof washer, [Item 8 - Figure 2], in the top right hand hole. **SEE** Appendix 1 (Fitting the Bridge Plate).

In the bottom left hand fixing hole, (See Note 2) fit the M6 x 30 poz pan head screw, nut and washer [Items 9 - Figure 2 and 28 & 29 - Figure 3],

Note 2:- If the build is a No 6, 7 or 8 then the M6 x 35 poz countersunk screw [Item 36 - *Figure 2*] ***and filler piece extension [Item 37 -*** *Figure 2*] ***are fitted at this point.***

4) All the M6 poz head screws should now be tightened to 4Nm [2.95 ft-lbs].

5) Set the “Dog Point” – See Setting the “Dog Point” section 9.33.

6) Fit the Bowl Unit [Item 1 - Figure 2] and secure the top right hand side in place with the M6 x 30 poz pan screw , metal spacer and colour spacers. [Item 30, 5 and 3 - Figure 2] Secure the top left hand side in place with the M6 x 16 poz pan screw and small metal spacer. [Item 12 and 4 - Figure 2]. Ensure the spacers are correct according to the bowl label. [Item 38 - Figure 2].

7) Reconnect level sense wires to bowl.

8) Reconnect the plug on the motor loom to the socket on the loom fitted to the control board.

9) Reconnect the opto loom to the control board.

10) Test the hopper.

9.33 SETTING THE "DOG POINT"

Please refer to Figure 2.

1) Screw the dog point screw, [Item 10] into the M6 tapped hole in the bridge plate, with the dog point end towards the disc, until it is finger tight.

2) Fit the 6mm shake-proof washer, [Item 8], onto the dog point. Screw an M6 nut, [Item 11], onto the dog point screw. Secure the dog point screw to the bridge plate by placing the 10mm socket onto the M6 nut and tighten to 4Nm [2.95 ft-lbs].

3) Taking the 10mm spanner / wrench and the 3mm allen key, hold the nut with the spanner / wrench and with the allen Key in the dog point, turn the dog point anti-clockwise between half and three quarters of a turn.

4) Check that the disc can turn without being obstructed by the pin.

10. Service / Maintenance

Clean the optical sensor every 100,000 coins/tokens.

Under NO circumstances, should any solvent or foam type cleaner be used.

Under NO circumstances, should any lubrication be used.

Procedure:-

i. Disconnect the level sense wires from the bowl, if fitted;

Note: Make a note of the size and positions of the coloured spacers.

ii. Remove the top left hand M6 x 16 poz pan head screw and 5mm long metal spacers. Remove the top right hand M6 x 30 poz pan head screw, 26 long metal spacer and coloured spacer.
The bowl can then be lifted off the bottom two M6 x 25 shoulder screws.

iii. Disconnect the opto loom from the control PCB.

iv. Remove the 2 x M6[1] screws, which hold the bridge plate[2] in place.

v. Lift the bridge clear of the disk.

vi. Using a soft brush, remove any dirt from the opto reflector in the waffle plate and from the opto shields in the bridge plate.

vii. Re-assemble the bridge plate, **SEE** Appendix 1 (Fitting the Bridge Plate).

viii. Re-assemble the opto loom, bowl and level sensors, making sure that the bowl spacers are replaced in the original positions as shown on the bowl label. Ensure that the screws are tightened to the correct torque's (where specified) see Figure 1.

[1]. See Figure 2 - screws 7 and 9.

[2]. See Figure 2 - Bridge Plate assembly - Item 6

11. Exploded Drawings

Figure 2: Exploded Drawing – Bowl and disk assembly

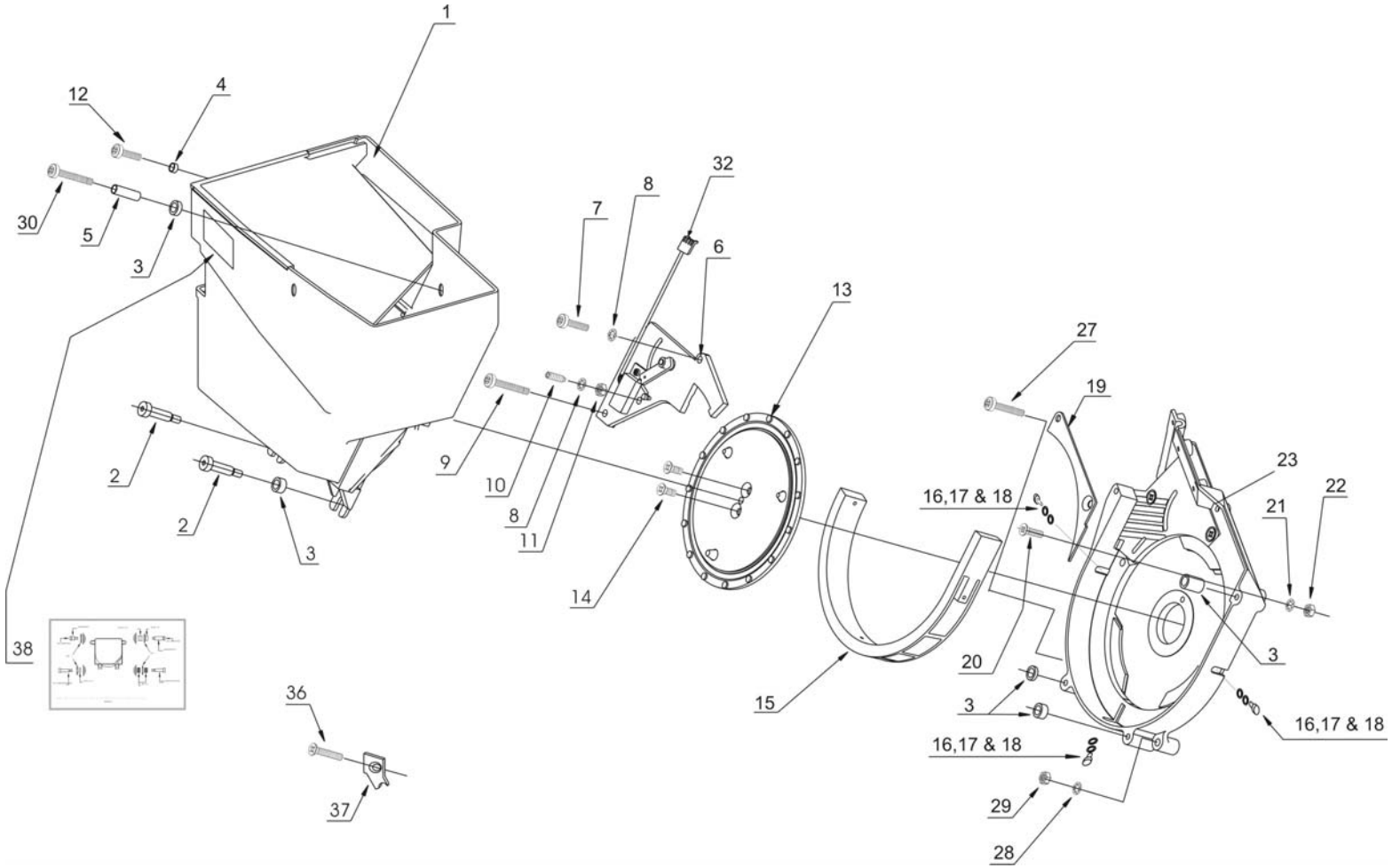


Figure 3: Exploded Drawing – Motor, frame and base assembly

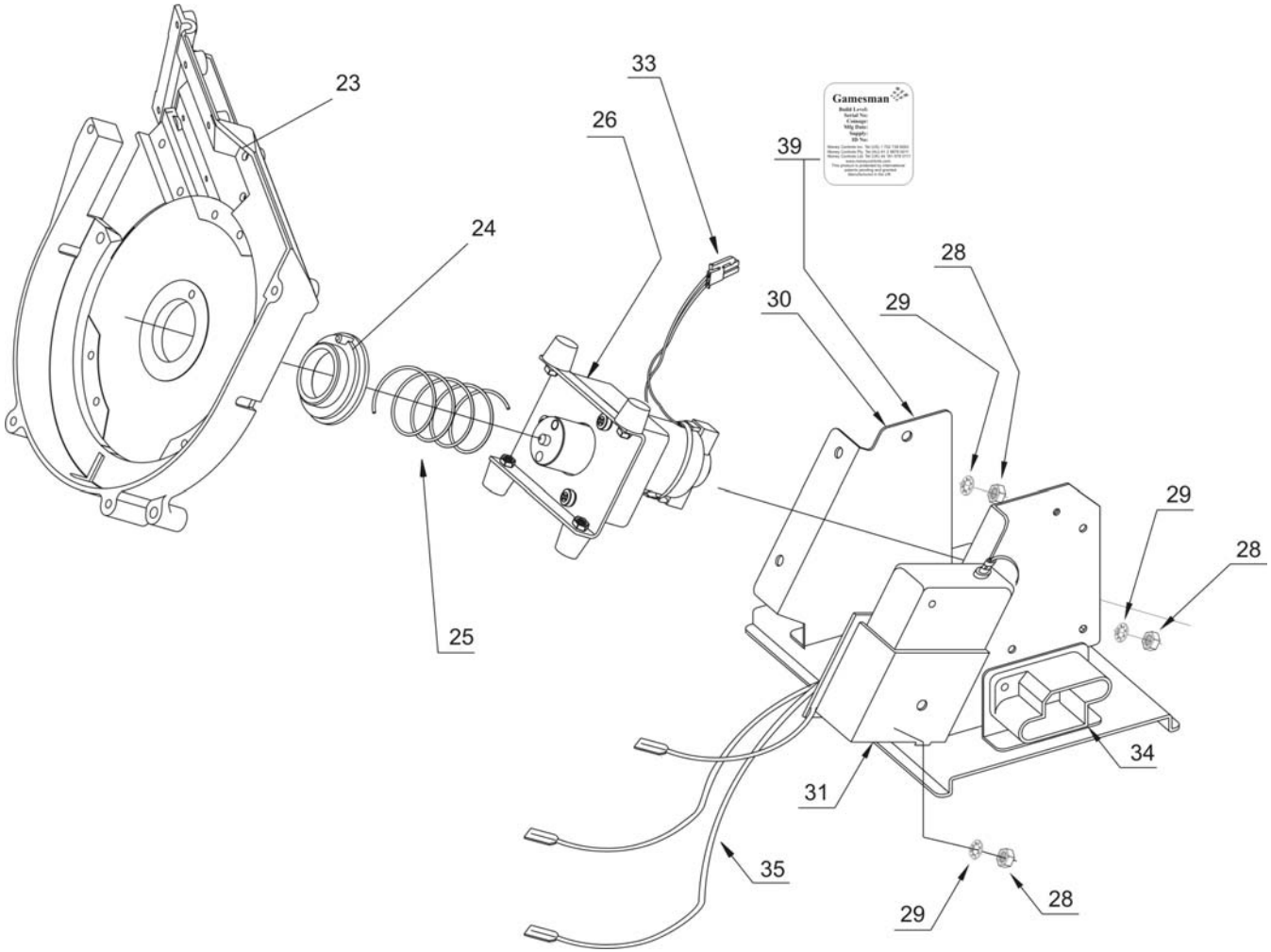
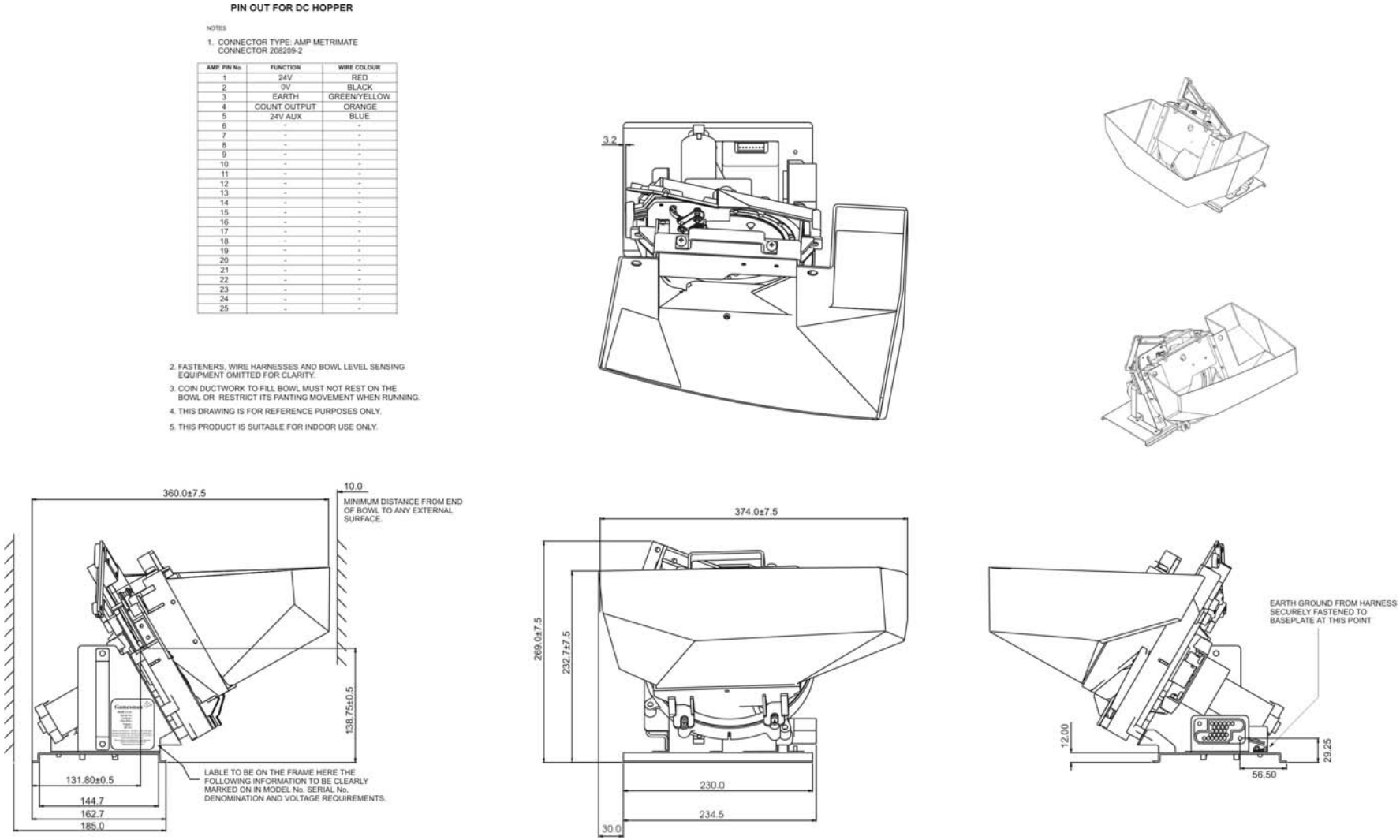


Figure 4: "Sample" Gamesman Dimensions



PIN OUT FOR DC HOPPER

NOTES

1. CONNECTOR TYPE: AMP METRIMATE CONNECTOR 208209-2

AMP. PIN No.	FUNCTION	WIRE COLOUR
1	24V	RED
2	0V	BLACK
3	EARTH	GREEN/YELLOW
4	COUNT OUTPUT	ORANGE
5	24V AUX	BLUE
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-

2. FASTENERS, WIRE HARNESSES AND BOWL LEVEL SENSING EQUIPMENT OMITTED FOR CLARITY.
3. COIN DUCTWORK TO FILL BOWL MUST NOT REST ON THE BOWL OR RESTRICT ITS PANTING MOVEMENT WHEN RUNNING.
4. THIS DRAWING IS FOR REFERENCE PURPOSES ONLY.
5. THIS PRODUCT IS SUITABLE FOR INDOOR USE ONLY.

12. Gamesman Hopper Parts List Description

Table 6: Parts List

Item No	Description	Part No	Comments
1	Bowl Unit		Coin/Token Dependent
2	M6 x 25 Shoulder Screw	HSC/356	
3	Yoke Colour Spacers		Coin/Token Dependent
4	Spacer 1	MER/280	
5	Spacer 2	MER/281	
6	Bridge Plate		Coin/Token Dependent
7	M6 x 20 Pozi Pan Screw	HSC/363	
8	6mm Shakeproof Washer	HWA/037	
9	M6 x 30 Pozi Pan Screw	HSC/369	Coin/Token Dependent
10	M6 x 16 dog point screw	HSC/750	
11	M6 Hex Nut	HNT/026	
12	M6 x 16 Pozi Pan Screw	HSC/360	
13	Disc Unit		Coin/Token Dependent
14	M6 x 16 Pozi c/sk Anu-Lok Screw	HSC/389	
15	Horseshoe		Coin/Token Dependent
16	M4 Pozi pan screw	HSC/140	Coin/Token Dependent
17	4mm Washer	HWA/012	Coin/Token Dependent
18	4mm Shakeproof Washer	HWA/026	Coin/Token Dependent
19	Wiper Spacer		Coin/Token Dependent
20	M6 x 20 Pozi c/sk screw	HSC/390	
21	6mm Shakeproof Washer	HWA/037	
22	M6 Hex Nut	HNT/026	
23	Housing Unit	SUB/3492	
24	Rotary Bearing	PBL/620	
25	Spring	SPR/030	
26	Drive Assembly	SUB/2342	
27	M6 x 30 Pozi pan screw	HSC/361	
28	M6 Hex Nut	HNT/026	
29	6mm Shakeproof Washer	HWA/037	
30	Frame Assembly	SUB/3479	
31	PSU Unit	PSU/002	
32	Opto Assembly	SUB/2660	
33	Motor Loom		This item is Part of Main Harness
34	Main Harness		This item is Part of Main Harness
35	Level Sensor Loom		This item is Part of Main Harness
36	M6 x 35 Pozi c/sk screw	HSC/718	Coin/Token Dependent
37	Filler Pieces Extension	MER/169	Coin/Token Dependent
38	Yoke Colour Spacers Label		Coin/Token Dependent
39	Hopper Label	TPL/010	Coin/Token Dependent

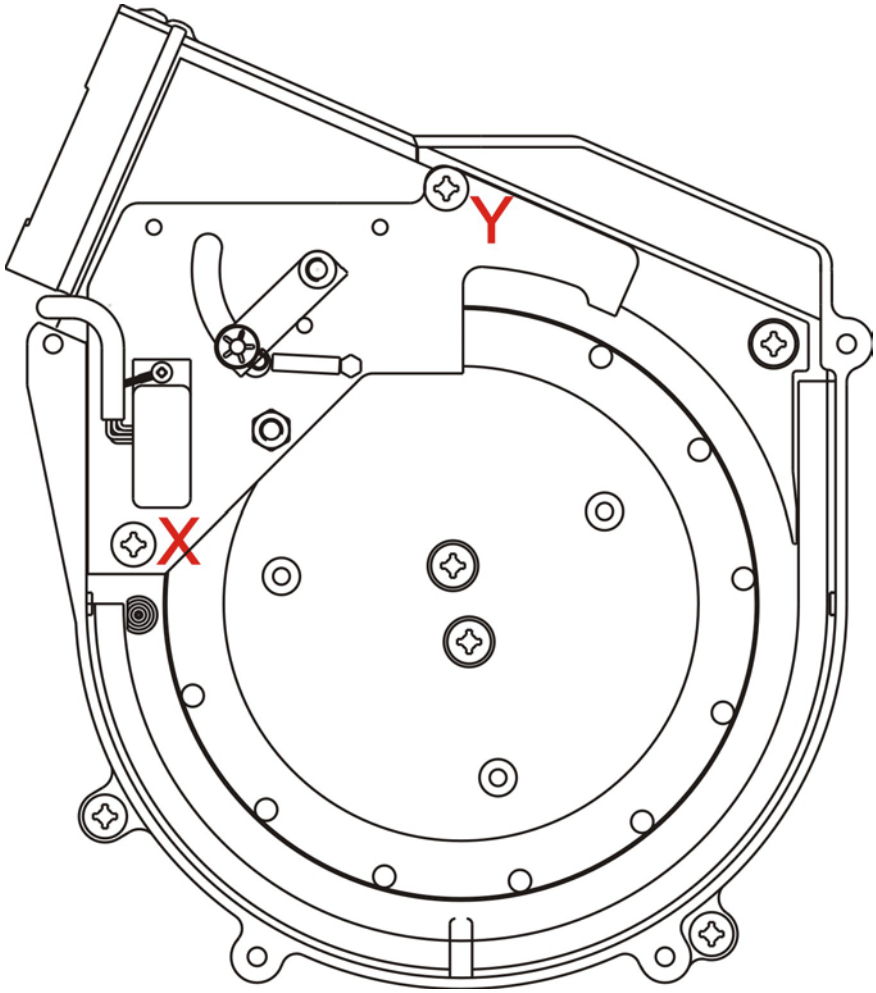
13. Appendix 1 (Fitting the Bridge Plate).

1. When fitting the Bridge plate to the housing, insert screws X & Y and HAND TIGHTEN.

2. Tighten the BOTTOM screw X to the torque settings shown in Figure 1: Torque Settings.

3. Tighten the TOP screw Y to the torque settings shown in Figure 1: Torque Settings.

Failure to follow the above steps may result in incorrect operation.



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