

MKIV Universal Hopper Service Manual



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1. Diary of Changes

Issue 1.0.....8th September 2002
First issue in new format

Issue 2.0.....13th April 2003
Applied TMWP 3.2
Improved all drawings
Added [Figure 19: Loom and Connector Positioning](#).

Issue 2.1.....30th June 2004
Changed footer

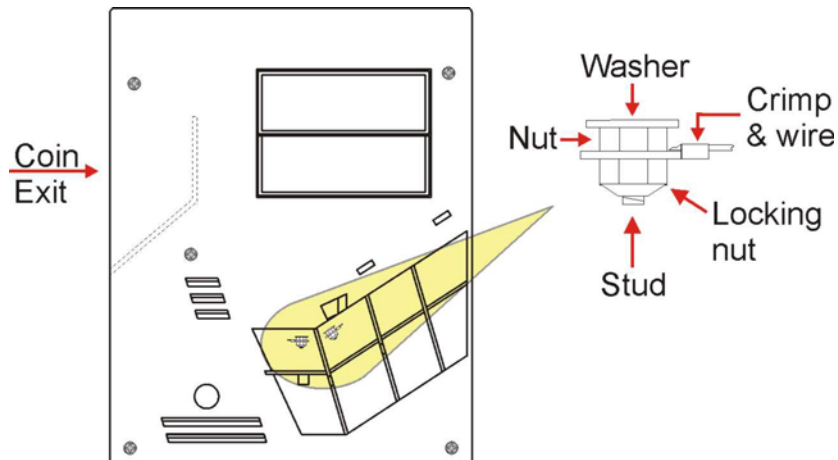
2. Coin Box Removal

1. Place the hopper in front of you as shown, (looking at the outside of the 'Coin Box').

Refer to [Figure 1](#).

2. Remove the 2 locking nuts which hold the 'Low Level Sense Plate' wires to the studs.
3. Remove the crimp & wire from the studs.

Figure 1: Low level sensor crimp positions

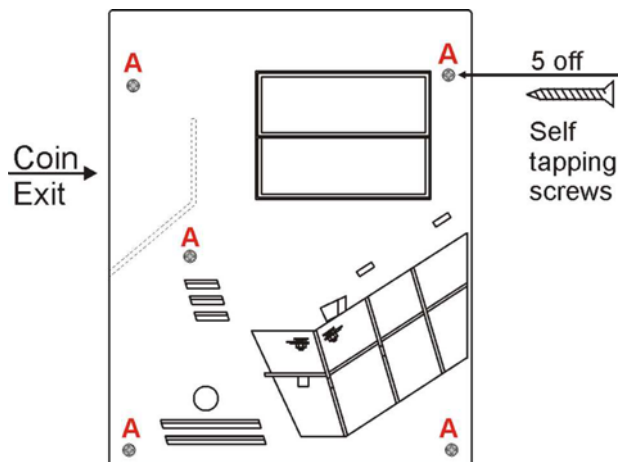


4. If other sense plates are used, i.e. High/Top, then refer to section 4 otherwise continue.

Refer to [Figure 2](#).

5. Remove the 5 screws indicated (A), which hold the 'Coin Box' to the 'Centre Plate'.

Figure 2: Coin box screw positions



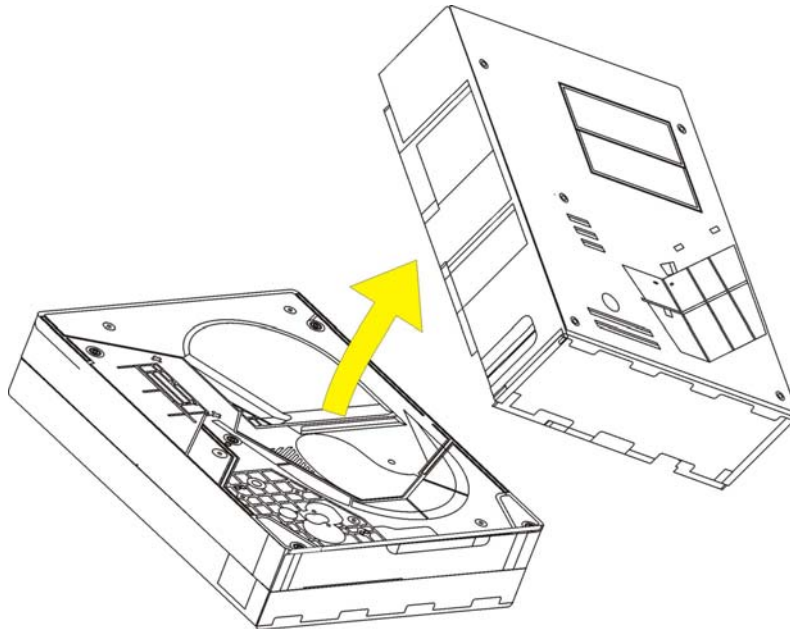
Refer to [Figure 3](#).

6. Gently lift the 'Coin Box' away from the rest of the hopper.

NOTE:- The 'Logic Board' & 'Stirrer' are located in the 'Coin Box'.

7. As the 'Coin Box' is being removed, carefully slide the 'Logic Board' out. The stirrer may stay with the 'Coin Box' or fall onto the centre plate.

Figure 3: Coin box removal



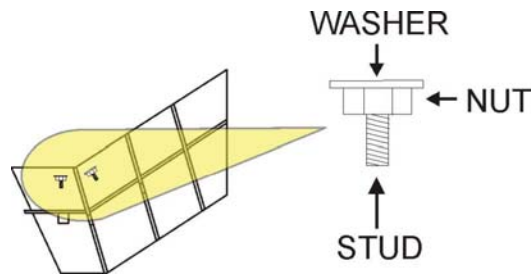
ACCESS IS NOW AVAILABLE TO THE 'LOW LEVEL' SENSE PLATES, THE MAIN PCB, THE EXIT WINDOW, THE MOTOR TERMINALS & PART OF THE WIRING LOOM.

3. Low Level Sense Plate Removal

1. First, remove the 'Coin Box', see section [2](#).

Refer to [Figure 4](#).

Figure 4: Low level stud assembly

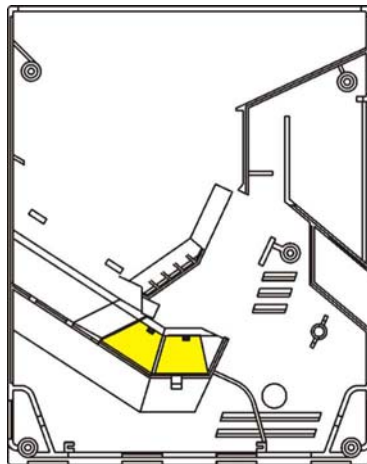


2. Remove the 2 remaining nuts & washers from the sense plate studs.
3. Remove the studs.

Refer to [Figure 5](#).

4. Slide the sense plates away from the 'Coin Box' & remove.

Figure 5: Low level sense plates position



THIS SHOWS THE POSITION OF THE TWO LOW LEVEL SENSE PLATES, LOOKING AT THE INSIDE OF THE 'COIN BOX'.

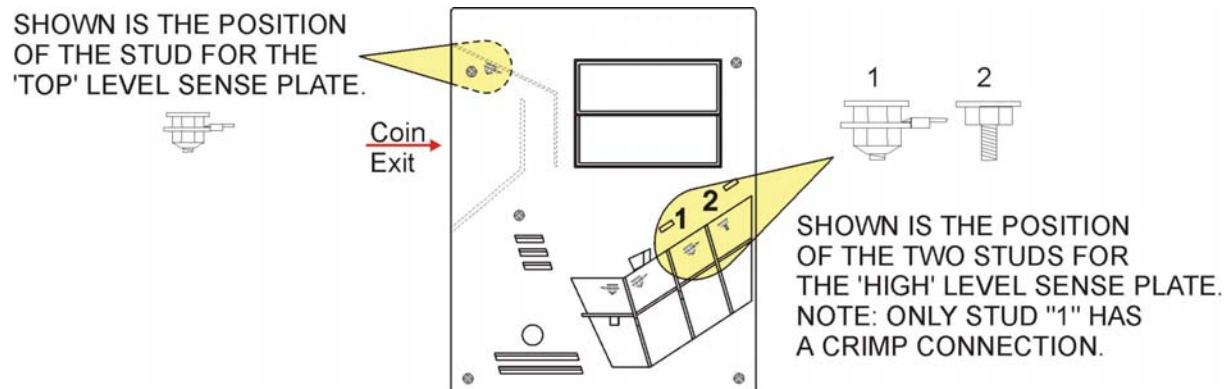
5. To re-assemble, follow the above steps in reverse.

4. High/Top Level Sense Plate Replacement

The 'High' & 'Top' level sense plates can be accessed without removing the 'Coin Box'.

Refer to [Figure 6](#).

Figure 6: High & Top level studs



Irrespective of which plate is fitted :-

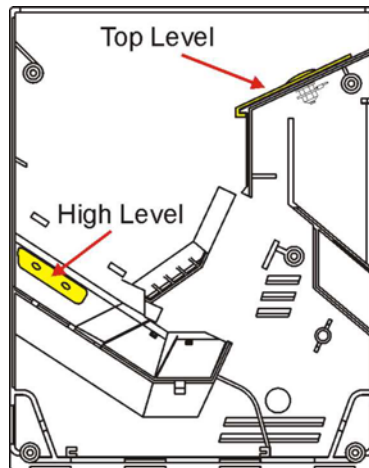
1. Remove the locking nut, (where fitted).
2. Remove the sense plate crimp & wire.
3. Remove the remaining nuts & washers.
4. Remove the stud/s.

The sense plate can now be removed.

Refer to [Figure 7](#).

5. Place the relevant sense plate in position.

Figure 7: High & Top level sense positions



SHOWN IS THE SHAPE & POSITION OF THE 'TOP' & 'HIGH' LEVEL SENSE PLATES, LOOKING AT THE INSIDE OF THE 'COIN BOX' ON IT'S OWN.

6. To re-assemble, follow steps 1 to 4, above, in reverse.

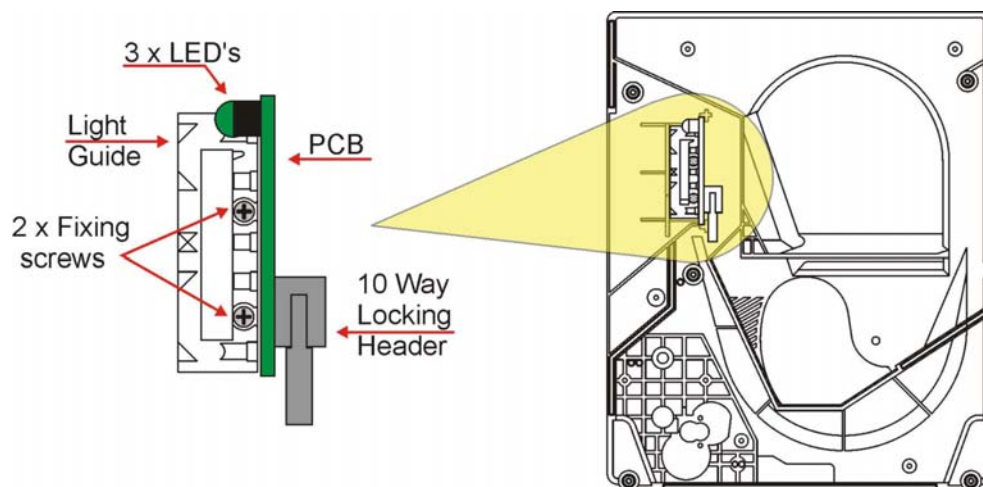
5. Exit Window Replacement

1. First, remove the 'Coin Box', see section [2](#).

This will then enable access to the 'Exit Window'

2. Unscrew & remove the 2 fixing screws. [Figure 8](#).
3. Remove the 'Exit Window' from the 'Centre Plate'.
4. Unclip & remove the 10 way ribbon cable header.

Figure 8: Exit window position



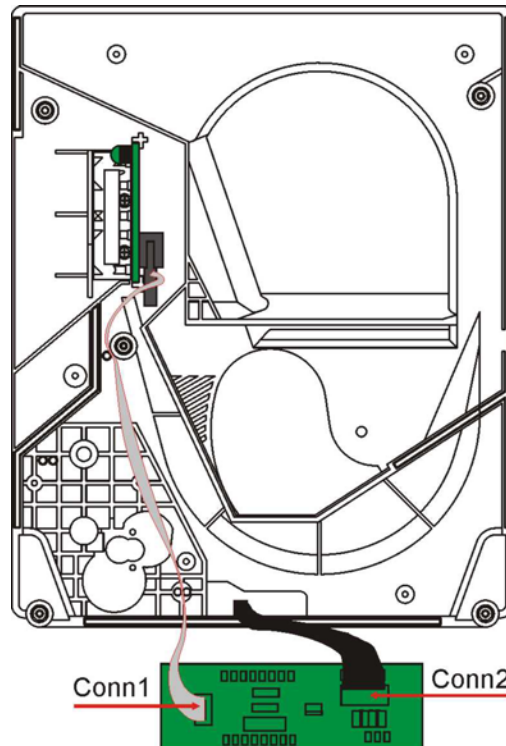
5. To re-assemble, follow the above steps in reverse.

6. Logic Board Replacement

1. First, remove the 'Coin Box', section [2](#).

This will then enable access to the 'Logic Board'.

Figure 9: Logic Board position



10 way ribbon IDC socket (CONN 1).

2. Move the two ejector arms at right angles to & away from the connector, if fitted.
This should release the socket from the header.
Clasping the connector between thumb & forefinger, pull away from pin header.

14 way crimp socket (CONN 2).

3. Gently, un-clip the "friction lock" from the connector housing.
Clasping the connector between thumb & forefinger, pull away from pin header.

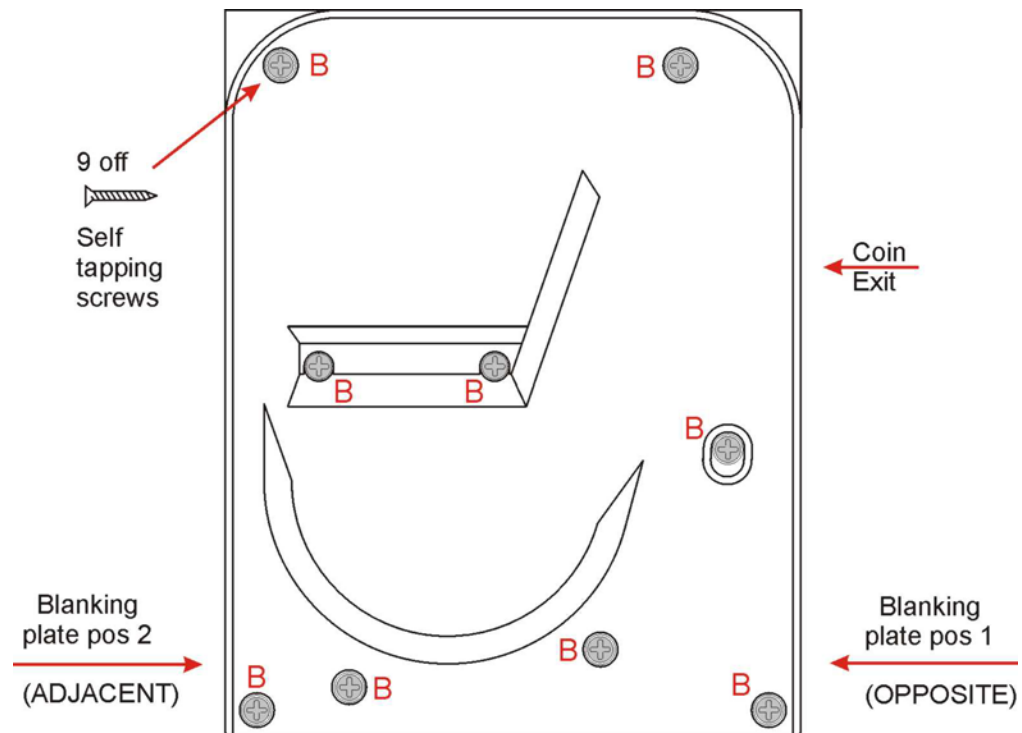
The Logic Board is now released.

4. To re-assemble, follow the above steps in reverse.

7. End Plate Removal

1. Place the hopper in front of you as shown, (looking at the outside of the 'End Plate').
Refer to [Figure 10](#).
2. Remove the 9 screws indicated (B), which hold the 'End Plate' to the 'Centre Plate'.
3. Locate the position of the 'Connector Blanking Plate'.
4. Holding the 'Connector Blanking Plate' gently lift the 'End Plate' away from the rest of the hopper.

Figure 10: End Plate screw positions



5. To re-assemble, follow the above steps in reverse.

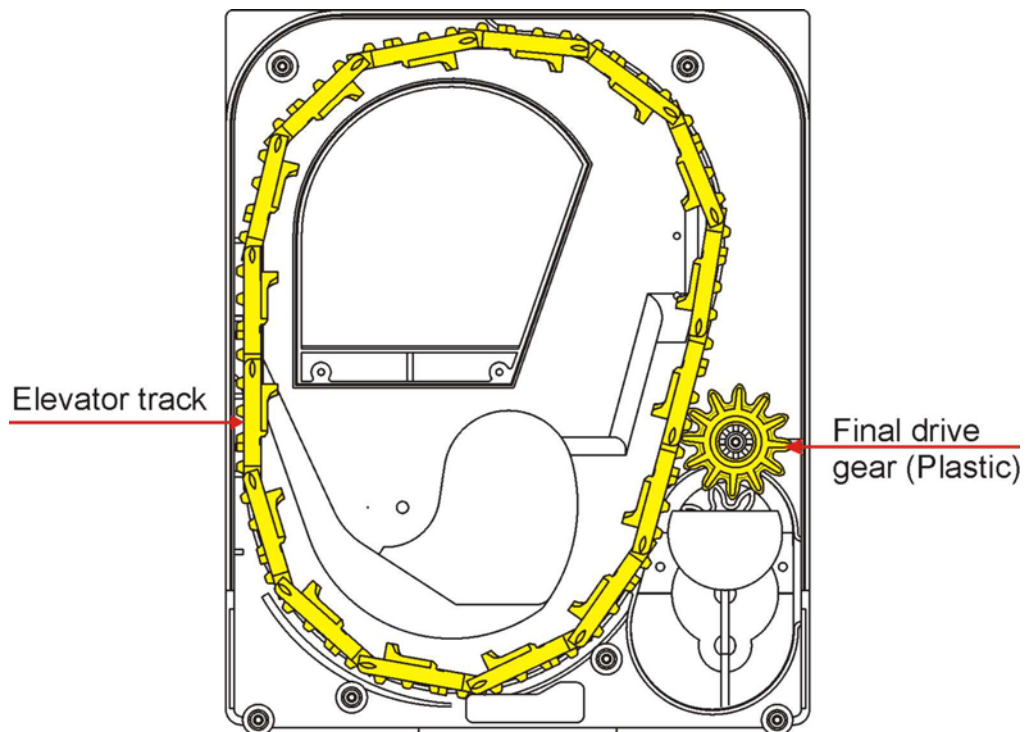
8. Track Plate Removal

1. First, remove the 'End Plate', section [7](#).

Refer to [Figure 11](#).

2. The 'Elevator Track' & 'Final Drive Gear' can now be removed by lifting up & away from the 'Centre Plate'.

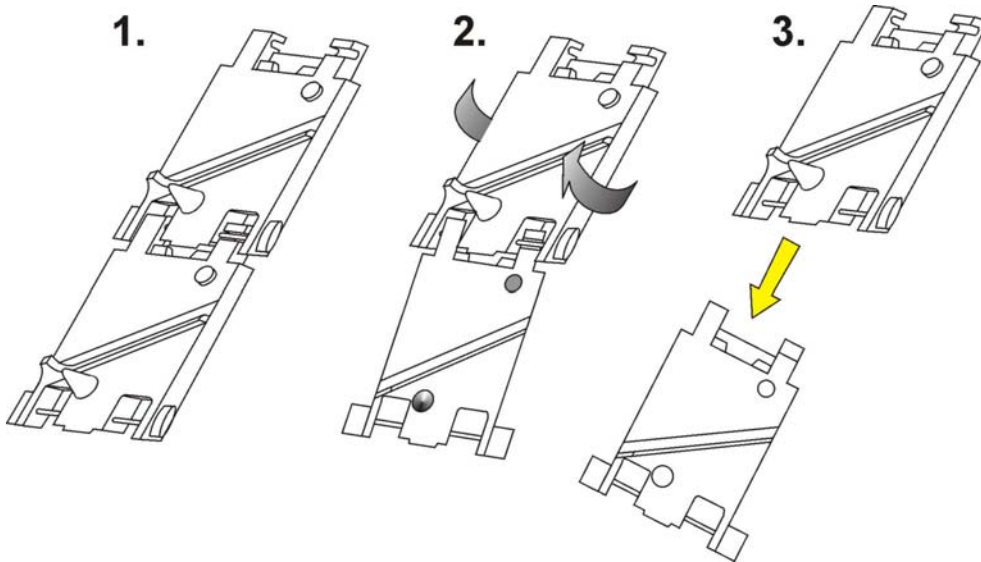
Figure 11: Elevator track position



9. Track Plate Assembly

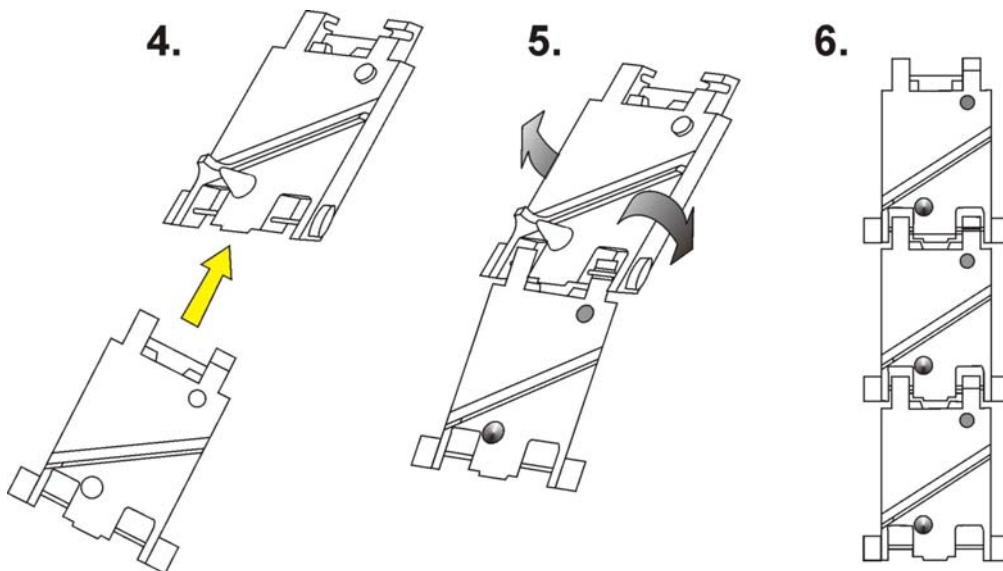
The following 3 sketches show how to take the 'Track Plate' apart.

Figure 12: Track Plate dismantling



The following 3 sketches show how to assemble the 'Track Plate'.

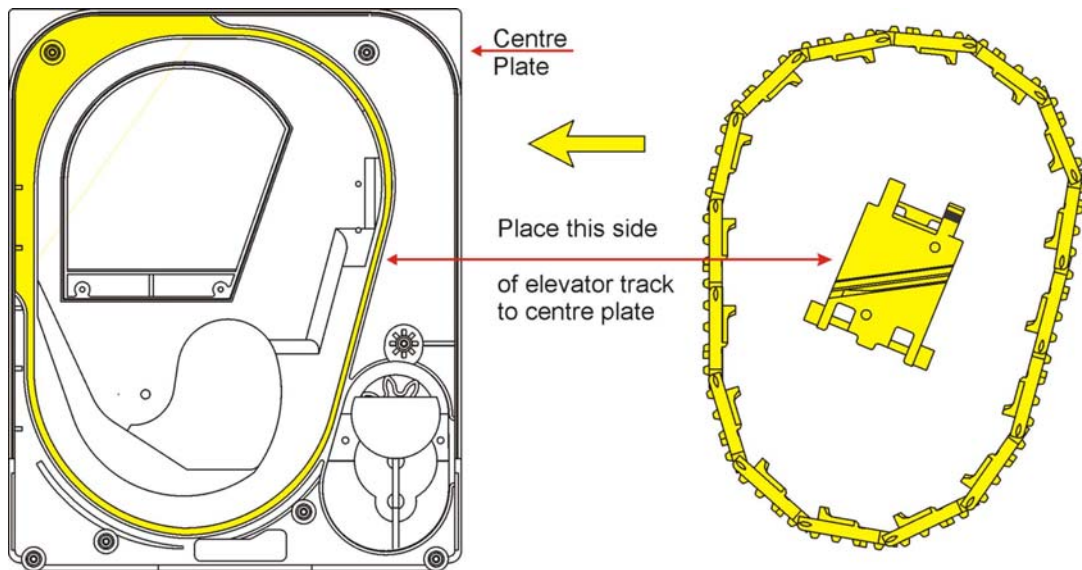
Figure 13: Track Plate assembly



10. Track Plate Replacement

1. The yellow shaded area, in [Figure 14](#), is the 'track plate' guide path.

Figure 14: Track Plate positioning

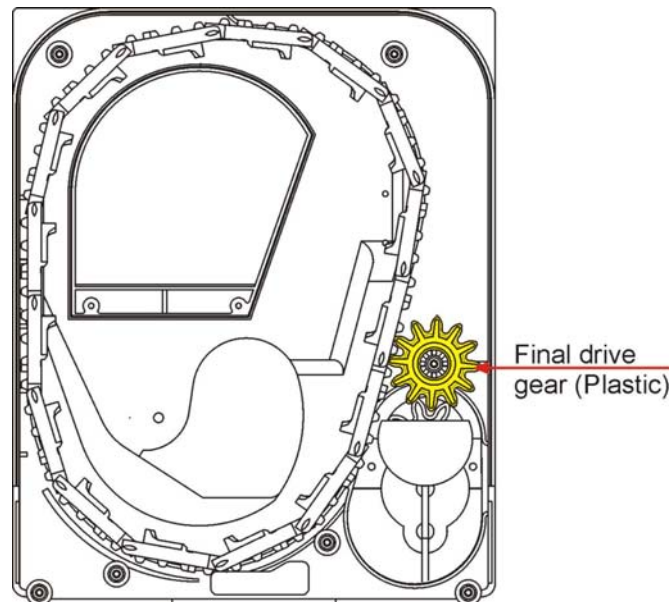


2. Once the 'track plate' is in position, turn the track through 720° to ensure it is seated in the guide path correctly.

11. Final Drive Gear Replacement

1. Once the 'Elevator Track' is in place, the 'Final Drive Gear' can be fitted by placing the gear over its mounting spindle, while lining the teeth up with the secondary drive gear, adjust the 'Elevator Track' so that the gear falls into place. [Figure 15](#).

Figure 15: Final Drive Gear position

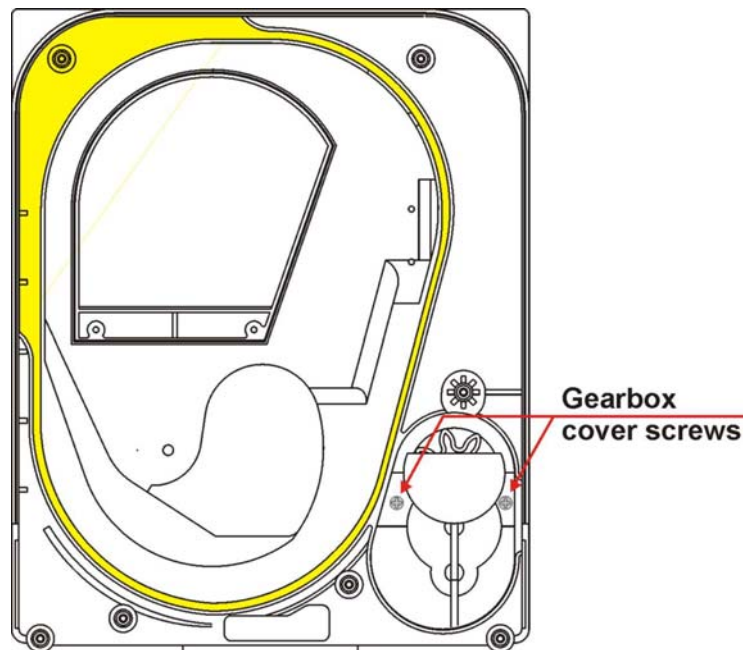


2. The end plate can now be re-fitted. See section [7](#).

12. Gear Box Cover Replacement

1. Remove the 'End Plate'. Section [7](#).
2. Remove the 'Elevator Track' & 'Final Drive Gear'. Section [8](#).
3. Unscrew the 2 gearbox cover screws & remove the cover. [Figure 16](#).

Figure 16: Gear Box Cover position

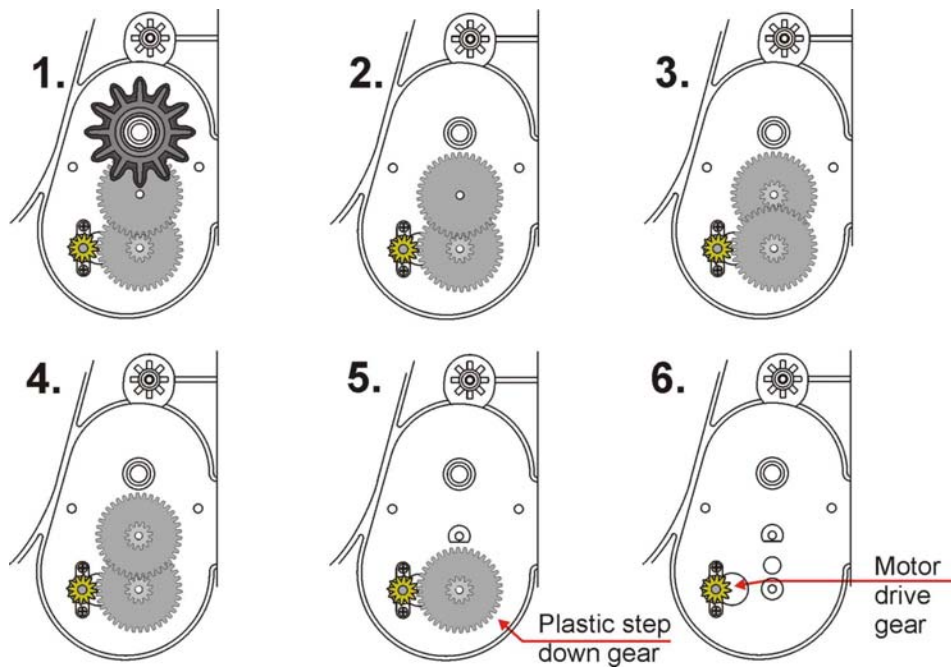


Access to the gears is now possible. See Section [13](#).

13. Gear Box Assembly

1. Remove the 'End Plate'. Section [7](#).
2. Remove the 'Elevator Track' & 'Final Drive Gear'. Section [8](#).
3. Remove the gearbox cover. Section [12](#).
4. Remove the gears in the order as shown in [Figure 17](#).

Figure 17: Gear Box Assembly



Access to the motor fixing screws is now possible.

5. To re-assemble, follow the above steps in reverse.

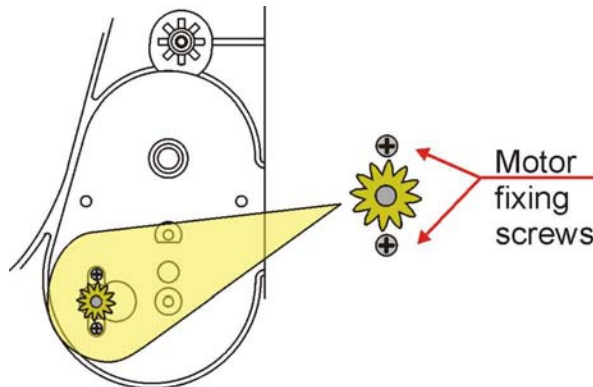
14. Motor Replacement

1. Remove the 'Coin Box'. Section [2](#).
2. Unsolder the red & black wires from the motor.

NOTE: The black wire connects to the terminal marked with a RED dot.

3. Remove the 'End Plate'. Section [7](#).
4. Remove the 'Track Plate' & 'Final Drive Gear. Section [8](#).
5. Remove the gearbox cover. Section [12](#).
6. Dismantle the gearbox. Section [13](#).
7. Unscrew the 2 motor fixing screws. [Figure 18](#).

Figure 18: Motor screw positions



8. To re-assemble, follow the above steps in reverse.

15. Loom Replacement

1. Remove the 'Coin Box'. Section [2](#).
2. Unsolder the red & black wires from the motor.

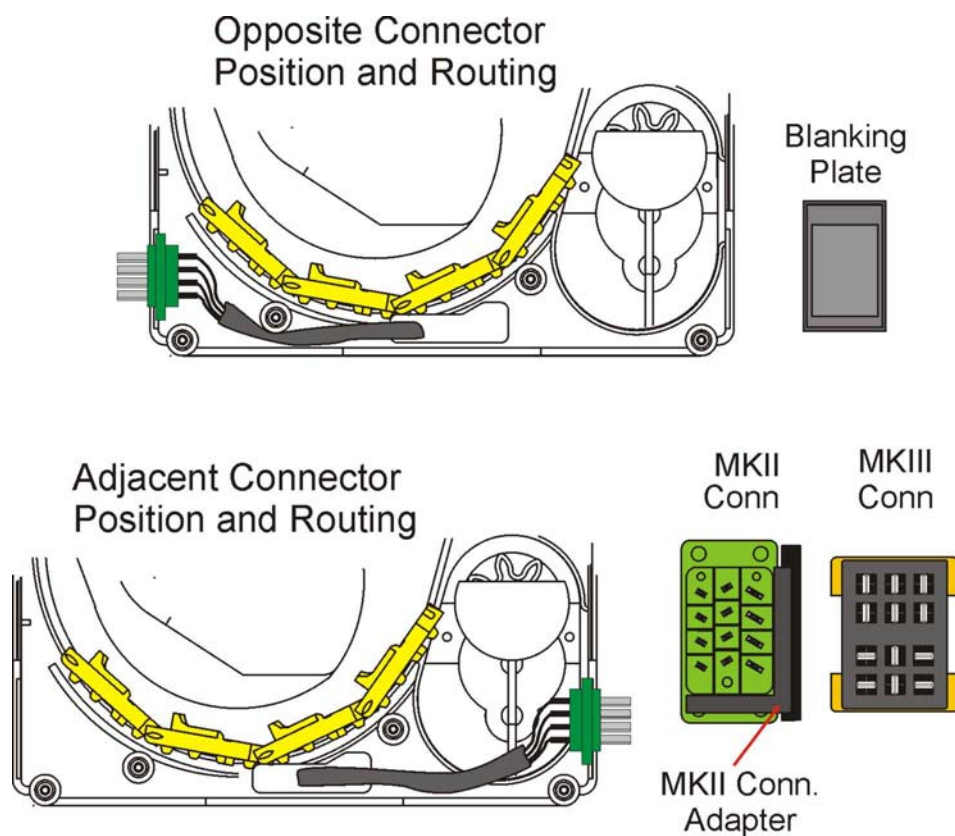
NOTE: The black wire connects to the terminal marked with a RED dot.

3. Remove the 'End Plate'. Section [7](#).
4. Remove the 'Track Plate' & 'Final Drive Gear'. Section [8](#).
5. Remove CONN 2 from the 'Logic Board'. Section [6](#).

The loom can now be removed by pulling it through the 'Centre Plate' from the track side.

6. To replace the loom, follow the above steps in reverse.

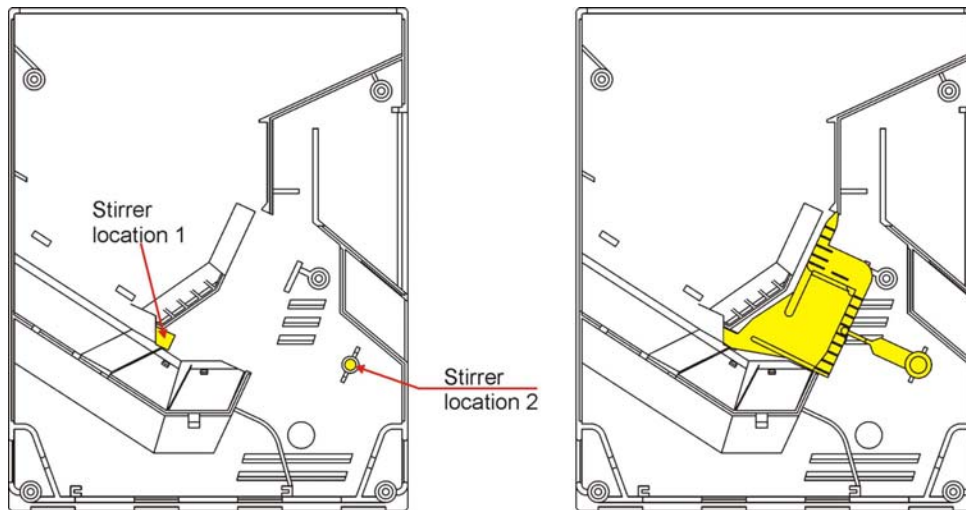
Figure 19: Loom and Connector Positioning



16. Coin Box Assembly

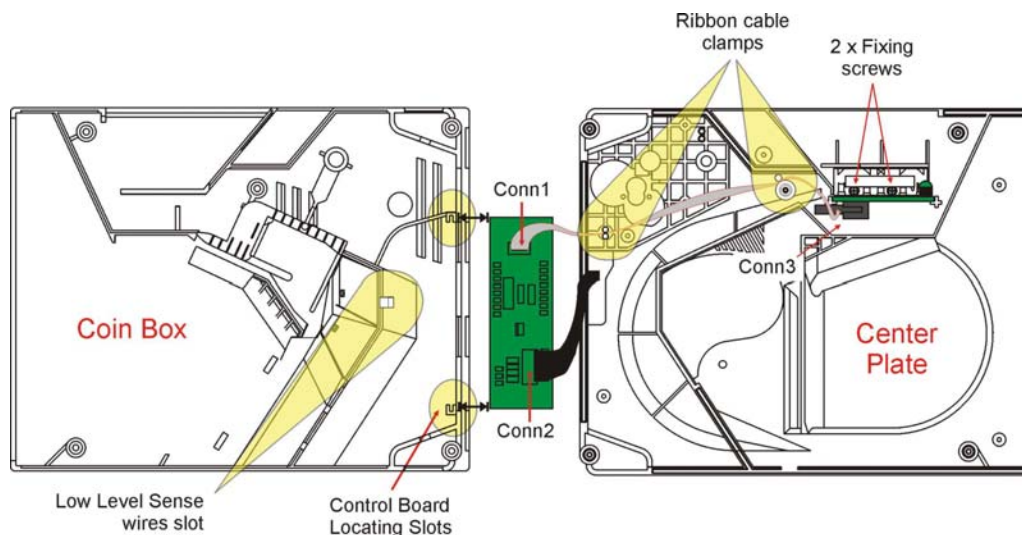
1. Firstly, locate the 'Stirrer' in the 'Coin Box' as shown in [Figure 20](#).

Figure 20: Stirrer position



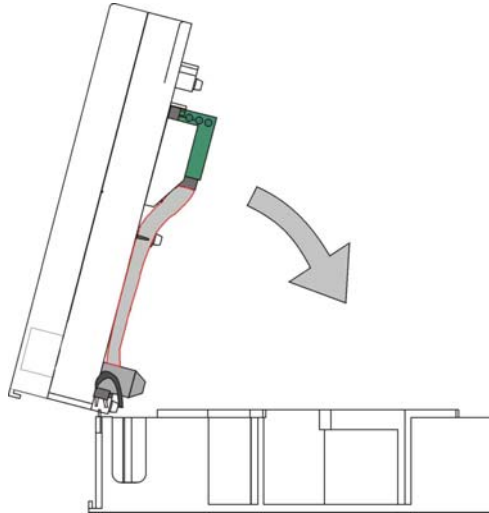
2. Line up the 'Centre Plate' & 'Coin Box' as shown below. [Figure 21](#).
3. Route the ribbon cable as shown in [Figure 21](#).
4. Fit the 'Logic Board' into slots shown in [Figure 21](#).
5. Feed the level sense wires through the slot shown in [Figure 21](#).

Figure 21: Coin Box Assembly (1)



6. Lift the 'Centre Plate' to meet the 'Coin Box'. [Figure 22](#).

Figure 22: Coin Box Assembly (2)



7. Align the 'centre plate' & 'coin box' & push together.
8. Turn the hopper over & refit the screws.
8. Refit the level sense wires.

17. Cleaning

All accessible parts of the coin route should be cleaned between 50,000 & 100,000 coins (dependant on coin type) using a mild detergent on a damp cloth. No spray solvents should be used.

Particular attention should be paid to the sensors at the coin exit, as excessive dirt build up on the optical surfaces may cause unreliable coin counting.

17.1 Health and Safety

Due to the potential respiratory hazards, it is highly recommended that a facemask be worn to prevent the inhalation of dust particles dislodged during the maintenance process.

17.2 Cleaners

The following cleaning products can be used for the maintenance of the hopper:

17.21 AIR DUSTERS

High pressure compressed inert gas to remove dust and loose particles.

17.22 SWABS

Lint free polyester swabs to clean otherwise difficult to access areas.

17.23 CLEANING CLOTHS

Soft lint free cloths to wipe down accessible surfaces of the compact hopper.

17.24 MILD DETERGENTS

This can be washing up solution mixed with warm water or a non-abrasive cleaner.

All these items can be purchased from suppliers such as RS and Farnell.

NB: ONLY USE MILD DETERGENTS SO AS NOT TO DAMAGE THE HOPPER.

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