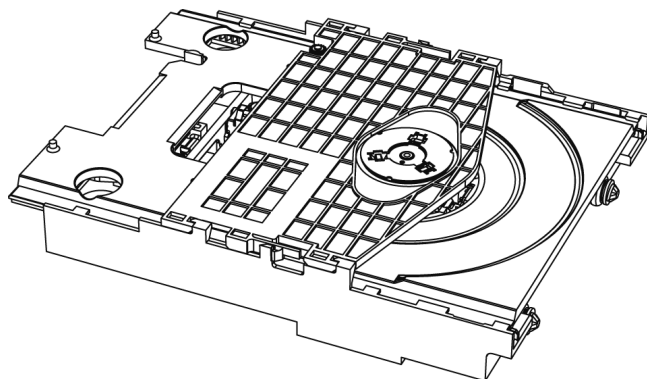


Service Manual

Mechanism Unit

DLS6



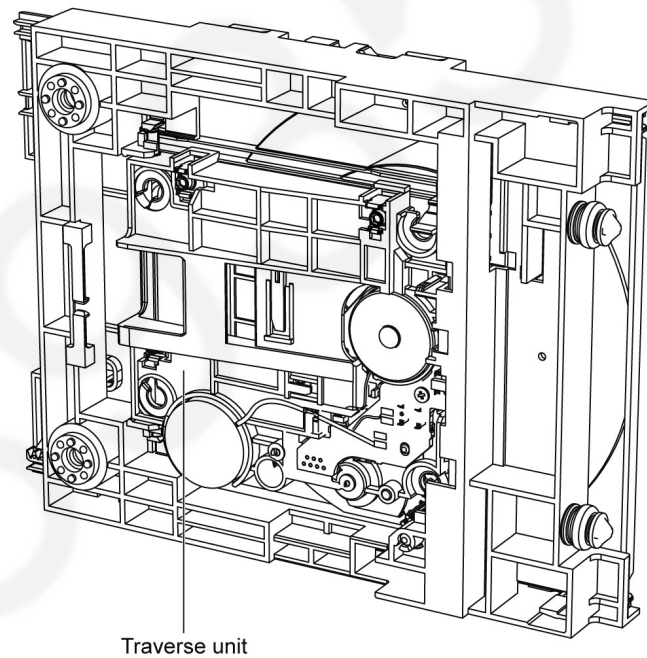
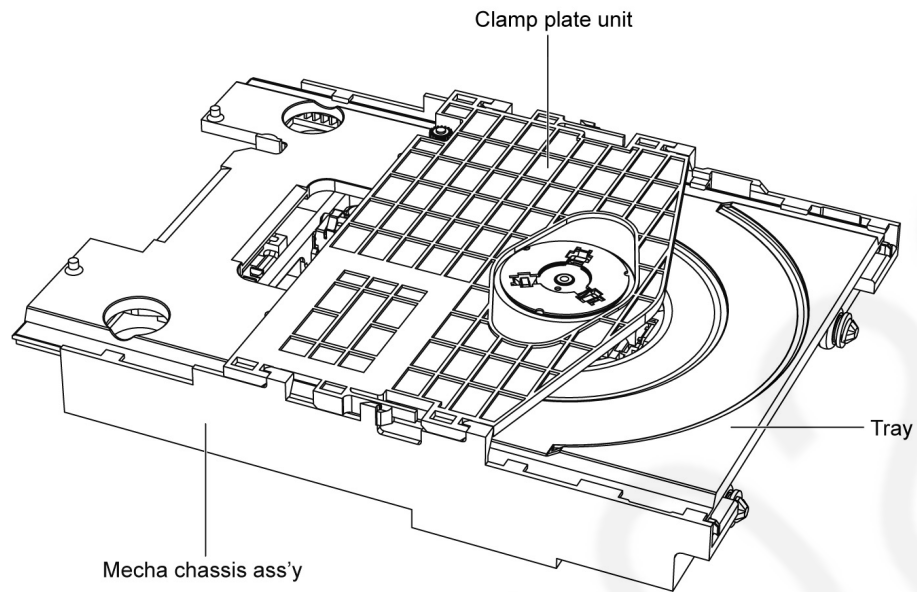
WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

	Page		Page
1 Mechanism Overview (DLS6)	2	7 Mechanism Operation Description	11
2 Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices	3	8 Assembling & Disassembling	17
3 Precaution of Laser Diode	4	9 Disassembly Flow	32
4 About Lead Free Solder (PbF)	5	10 DLS6 Mechanism Reliability	33
5 Handling Precautions for Traverse Unit	6	11 Exploded Views	39
6 Mechanism Drive Unit	8	12 Replacement Parts List	41

1 Mechanism Overview (DLS6)



DLS6 mechanism is a single tray mechanism used for CD/DVD models. DVD system control is through the DVD/HDMI module except for traverse control.

2 Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution:

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

3 Precaution of Laser Diode

CAUTION:

THIS PRODUCT UTILIZES A LASER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

CAUTION :

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wavelength: 655 nm (DVD)/785 nm (CD)

Maximum output radiation power from pickup: 100 μ W/VDE

Laser radiation from the pickup unit is safety level, but be sure the followings:

1. Do not disassemble the pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG :

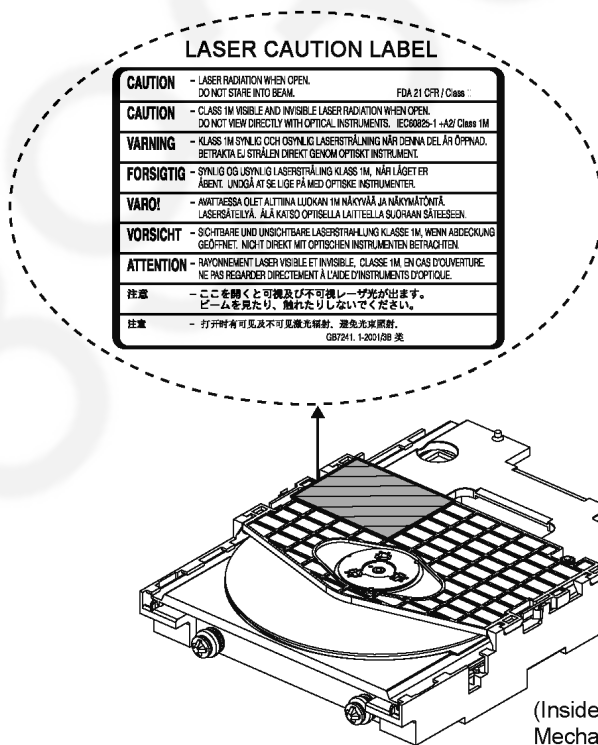
Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheitadgestrahlt.

Wellenlänge: 655 nm (DVD)/785 nm (CD)

Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

Die strahlungen der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werksseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.



4 About Lead Free Solder (PbF)

4.1. Service caution based on legal restrictions

4.1.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of "PbF" is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF
---	-----

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
(Definition: The letter of "PbF" is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
RFKZ03D01K----- (0.3mm 100g Reel)
RFKZ06D01K----- (0.6mm 100g Reel)
RFKZ10D01K----- (1.0mm 100g Reel)

Note

* Ingredient: tin (Sn), 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

5 Handling Precautions for Traverse Unit

The laser diode in the optical pickup unit may break down due to static electricity of clothes or human body. Special care must be taken avoid caution to electrostatic breakdown when servicing and handling the laser diode in the traverse unit.

5.1. Cautions to Be Taken in Handling the Optical Pickup Unit

The laser diode in the optical pickup unit may be damaged due to electrostatic discharge generating from clothes or human body. Special care must be taken avoid caution to electrostatic discharge damage when servicing the laser diode.

1. Do not give a considerable shock to the optical pickup unit as it has an extremely high-precise structure.
2. To prevent the laser diode from the electrostatic discharge damage, the flexible cable of the optical pickup unit removed should be short-circuited with a short pin or a clip (Figure 1).

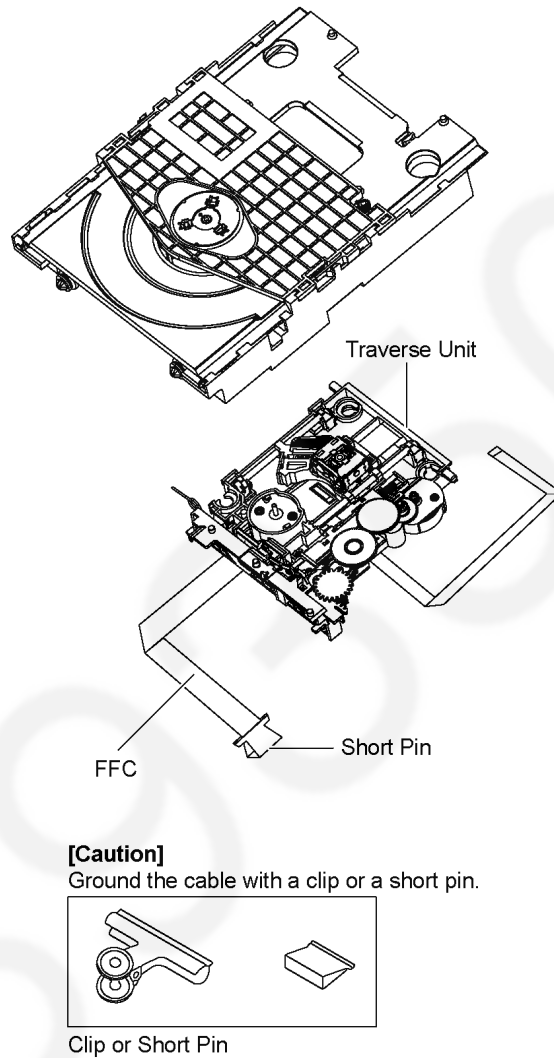


Figure 1

5.2. Grounding for electrostatic breakdown prevention

Some devices such as the CD/DVD player use the optical pickup (laser diode) and the optical pickup will be damaged by static electricity in the working environment. Proceed servicing works under the working environment where grounding works is completed.

5.2.1. Worktable grounding

1. Put a conductive material (sheet) or iron sheet on the area where the optical pickup is placed, and ground the sheet (Figure 2).

5.2.2. Human body grounding

1. Use the anti-static wrist strap to discharge the static electricity form your body (Figure 2).

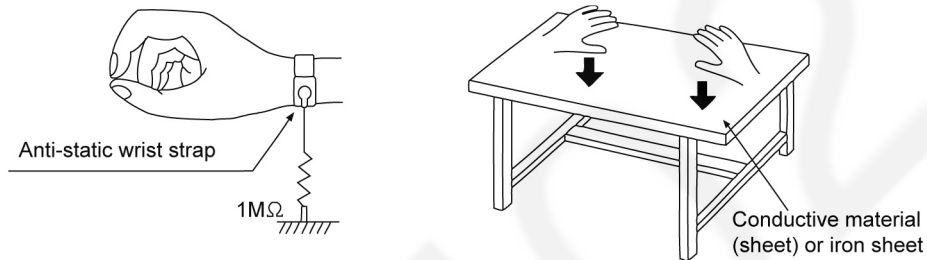


Figure 2

6 Mechanism Drive Unit

6.1. Gears' operations (Playability)

The arrows indicate the movement of the gears during play operation.

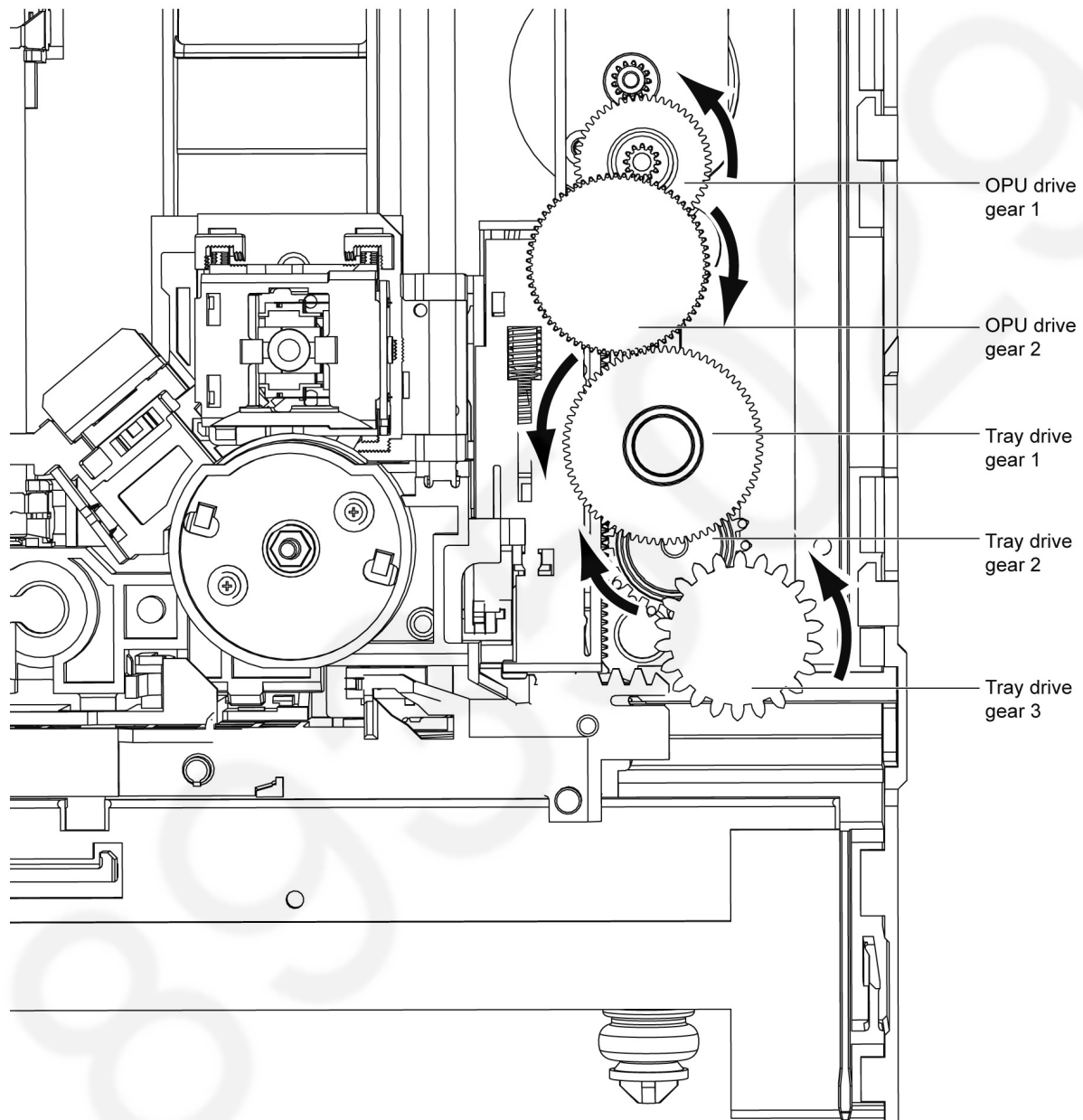


Figure 3

6.2. Traverse slide plate/Sub rack/OPU assembly

The arrows indicate the movement of the parts during play operation.

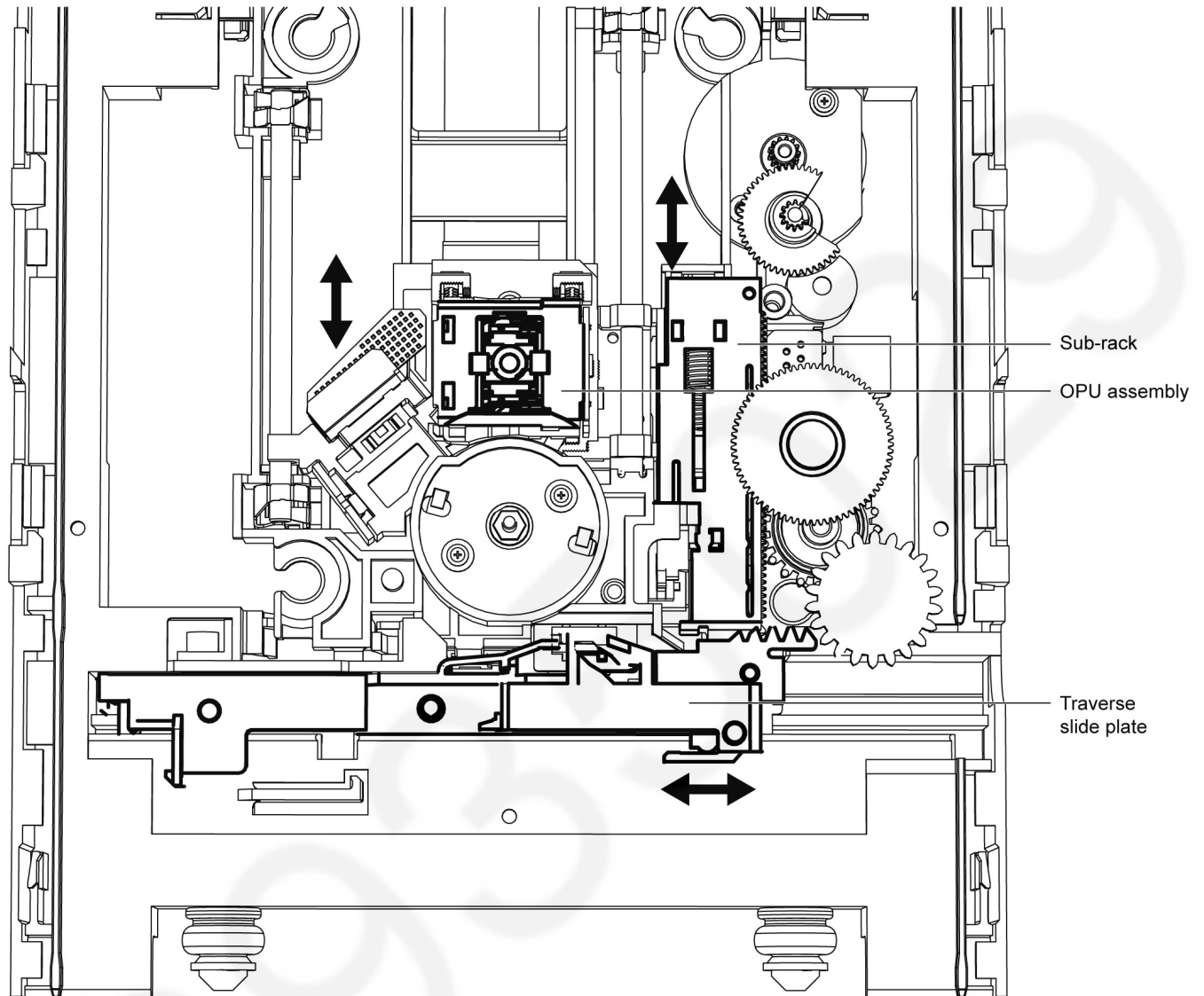


Figure 4

6.3. Switch / Motors

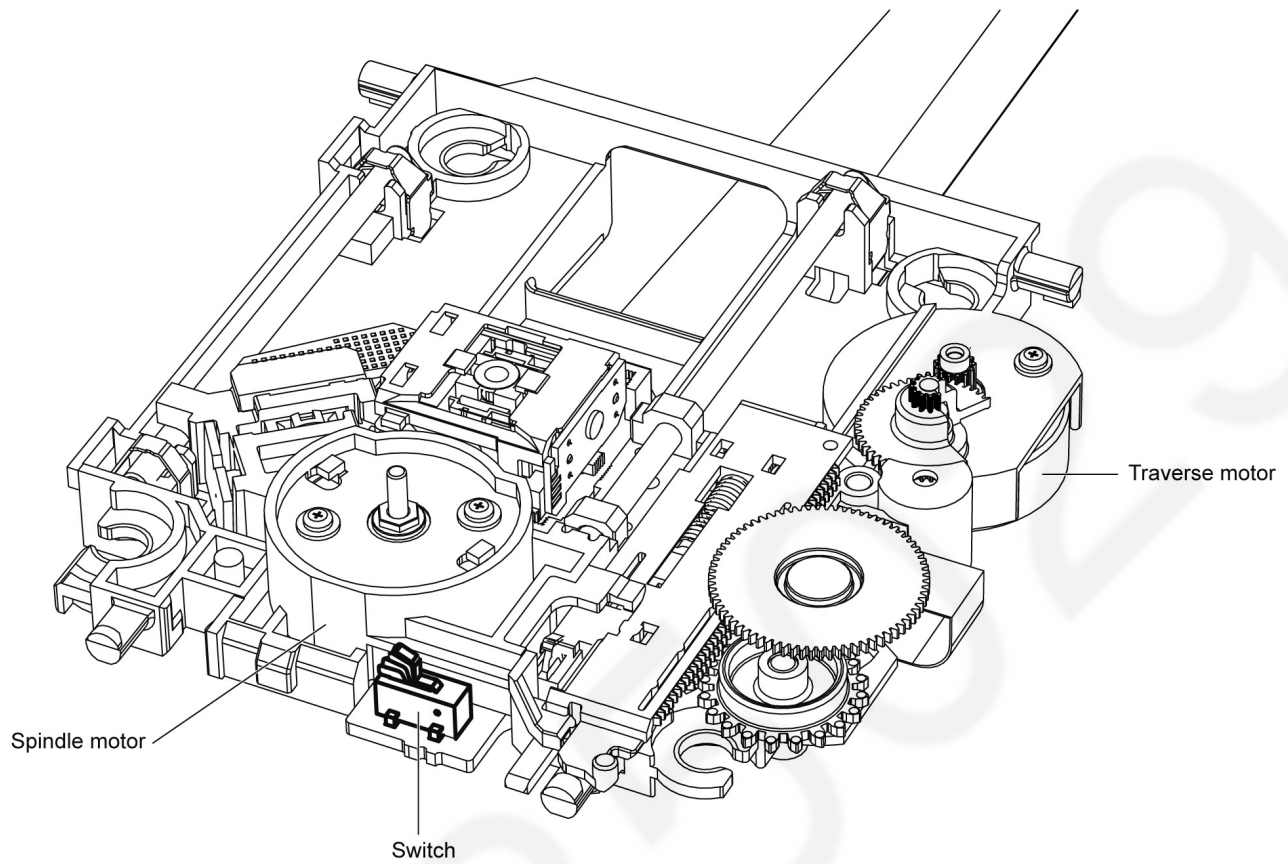
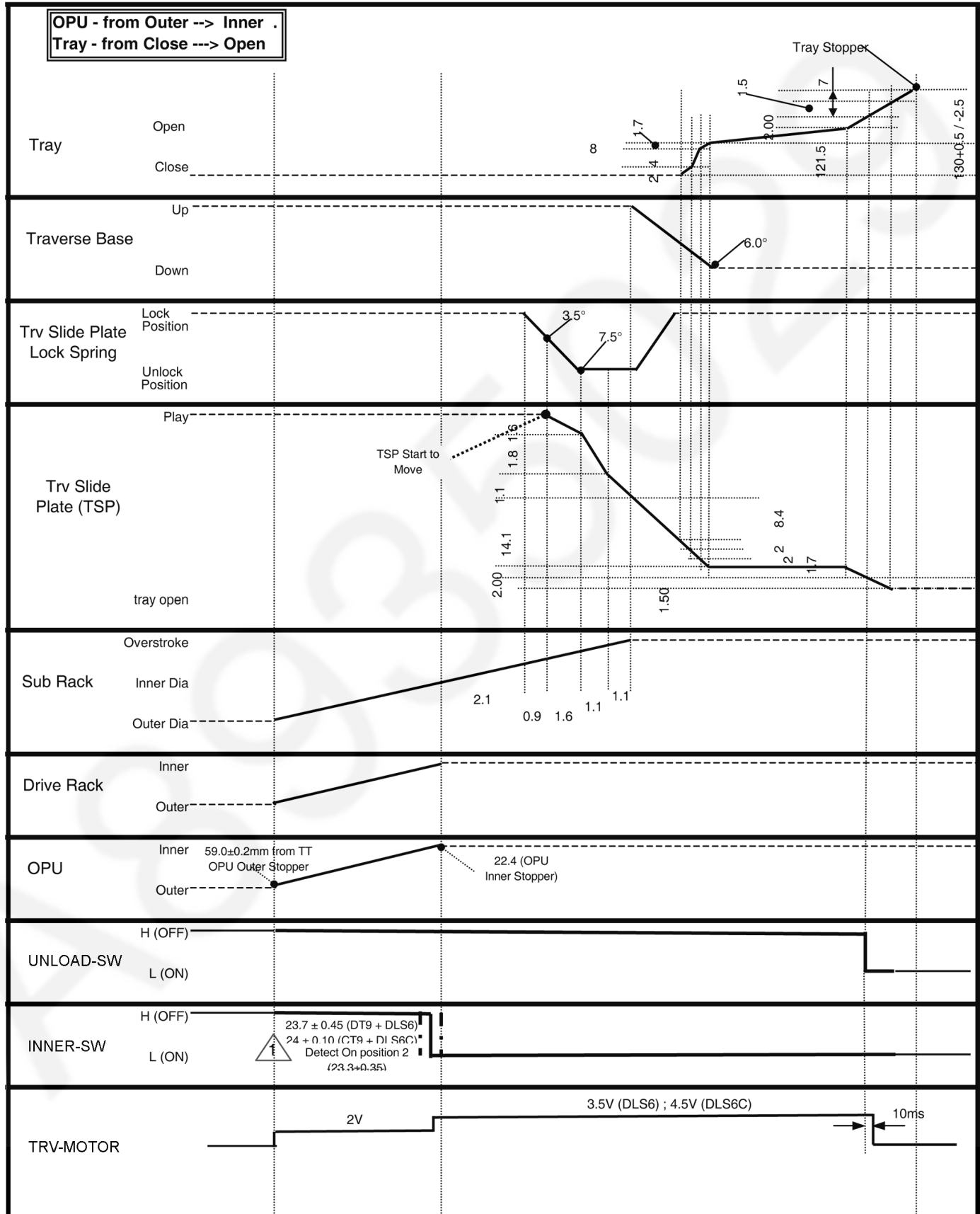


Figure 5

7 Mechanism Operation Description

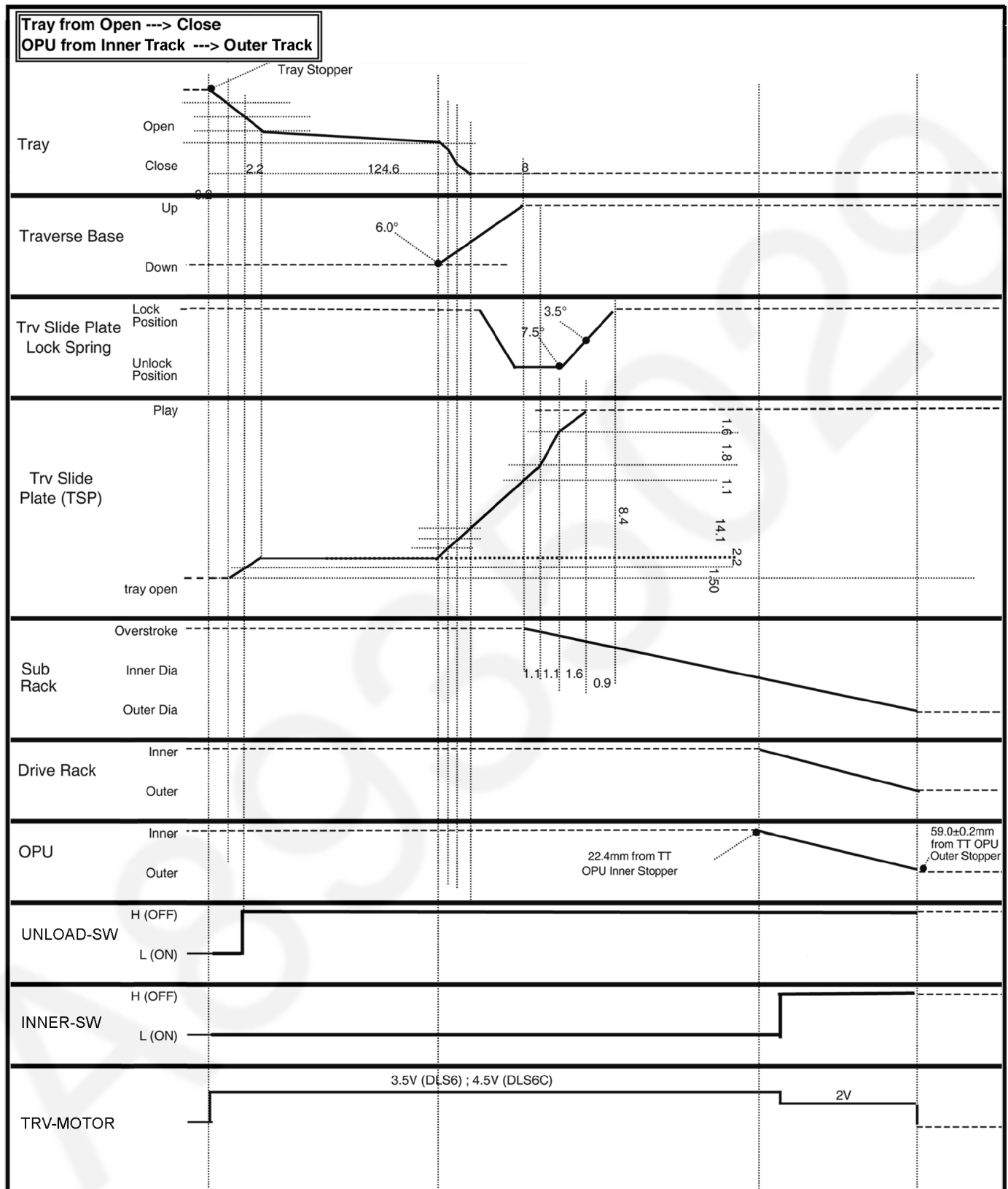
7.1. Open/Close Operation

Below shows the inter relation of parts during the open & close operations.



7.2. Play Operation

Below shows the inter relation of parts during the play operation.



7.3. Initialization

During the power-up of main unit (using DLS6 mechanism), the state of switches is sensed by the micro-p IC and the traverse motor is adjusted accordingly. (This is the initialization process).

Note: Refer to Table 1 for the initialization process. Figures 6 & 7 show the flow of the initialization.

Condition for Initialization Processing:

	UNLOAD-SW	INNER-SW	TRV-MOTOR
Condition 1	H	H	CCW
	L	H	CCW
Condition 2	H	L	CW
	L	L	CW

Table 1

Decision for Initialization Processing:

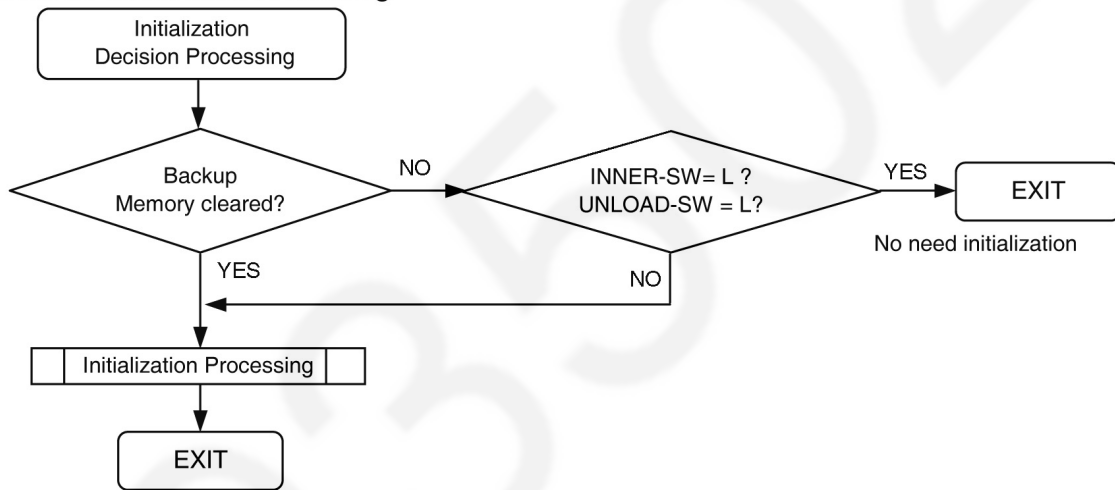


Figure 6

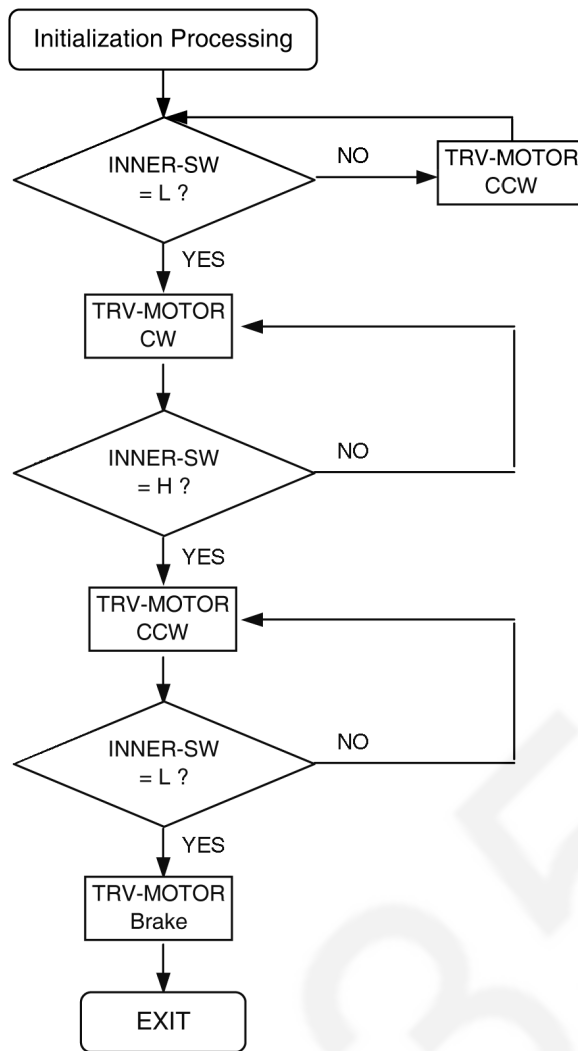


Figure 7

7.4. Fail safe

* Fail safe is a function for recovery of tray movement if mechanism can not carry out tray open or close within a specified time.

Fail Safe 1: Tray opening; Tray can't open and UNLOAD-SW not detected. -- TRV-MOTOR turns CW to close tray and return to INNER-SW = L.

Fail Safe 2: Tray closing; Tray can't close and INNER-SW not detected. -- Return tray to 'OPEN position' where UNLOAD-SW = L.

Definition of positions :

'OPEN position'	INNER-SW = L & UNLOAD-SW = L
-----------------	------------------------------

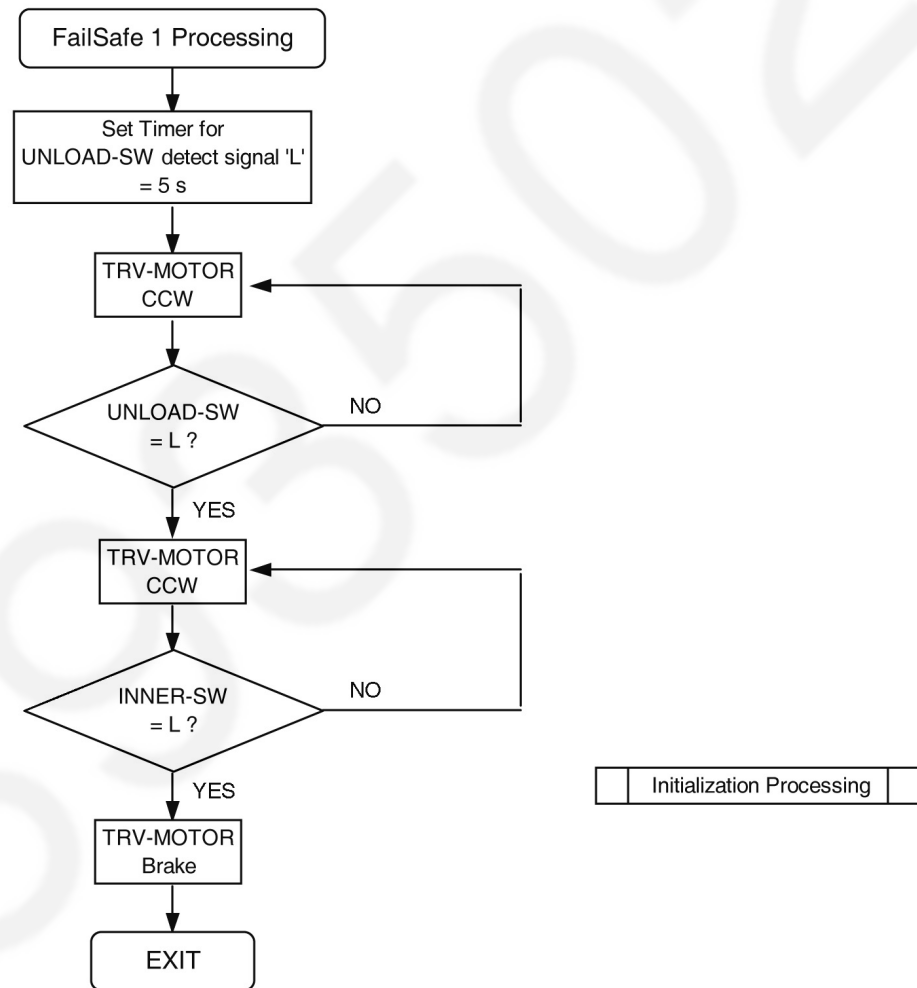


Figure 8

7.5. Switches and motors

Switches	Function
OPU Inner Switch [INNER-SW]	For OPU to reset to Home position for subsequent process.
Tray Unload Switch [UNLOAD-SW]	To detect Tray Open end position.

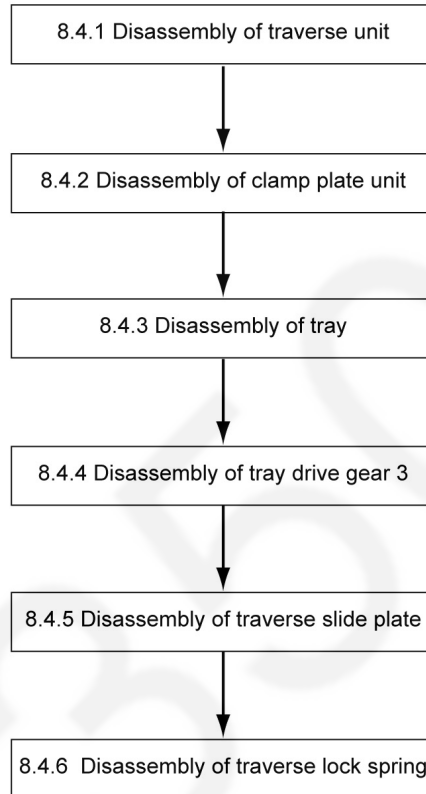
Motors	Function
Traverse Motor [TRV-MOTOR]	To drive OPU for traverse movement To drive Tray from Play-Open position
Spindle Motor [SP-MOTOR]	For Disc spinning

8 Assembling & Disassembling

8.1. Flow Chart

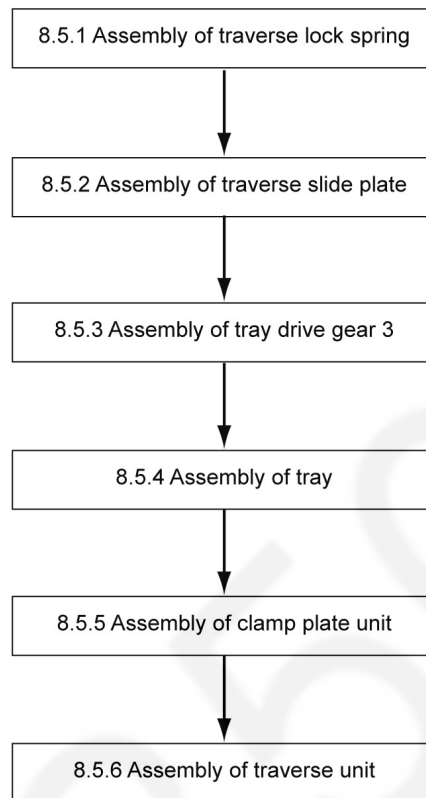
8.1.1. Disassembly flow chart

Below describes the disassembly flow for the mechanism.

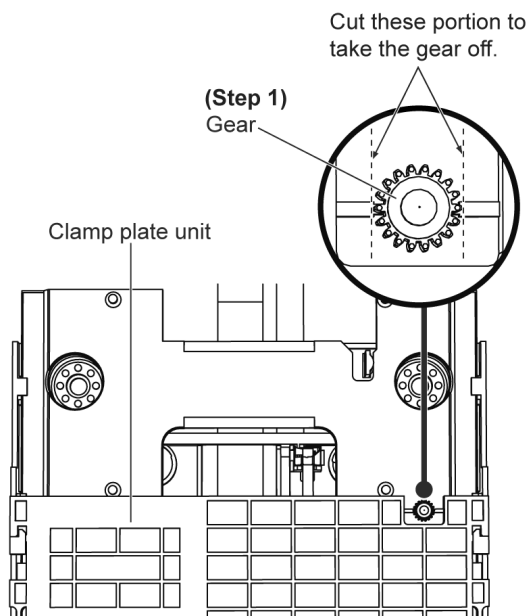


8.1.2. Assembly flow chart

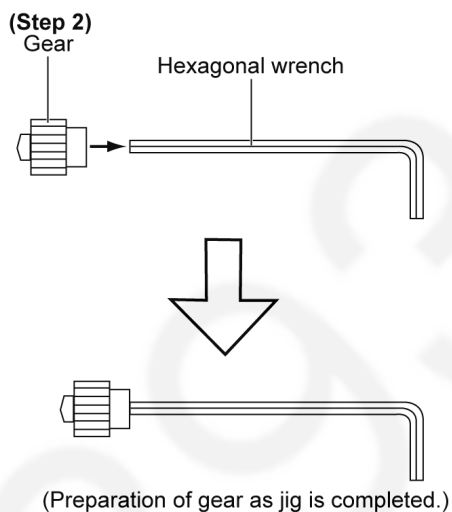
Below describes the assembly flow for the mechanism.



8.2. Preparation of Service jig



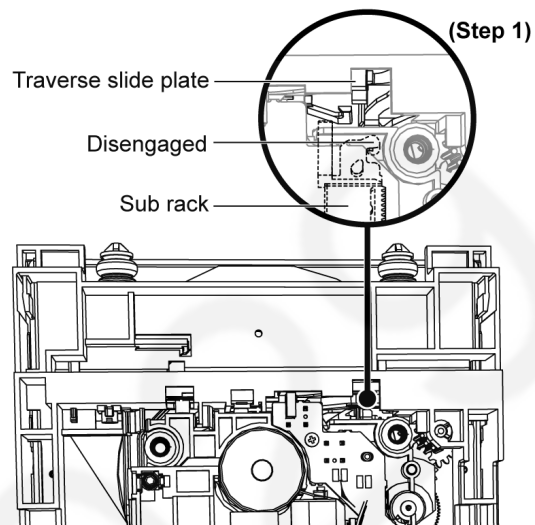
Step 1: Cut the gear out from the clamp plate unit.



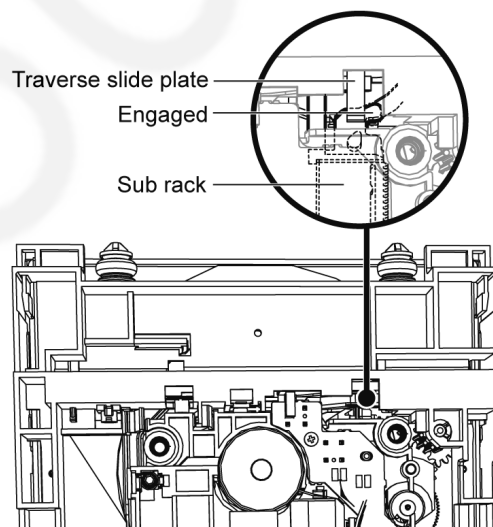
Step 2: Insert the gear into the hexagonal wrench.

8.3. Checking of Mechanism unit

8.3.1. Before disassembling

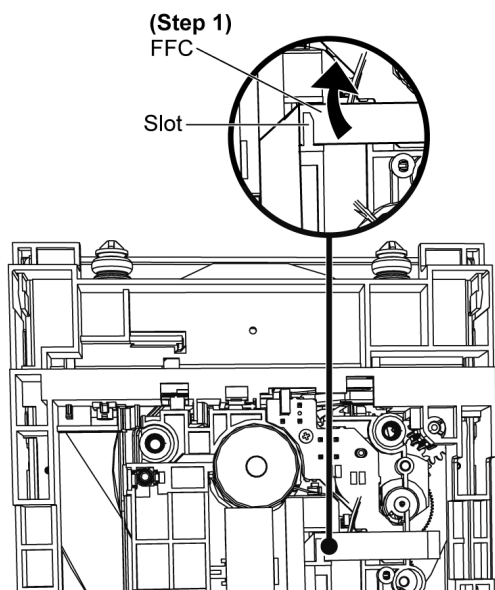


Step 1: Check if the sub rack is disengaged from the traverse slide plate before disassembly.

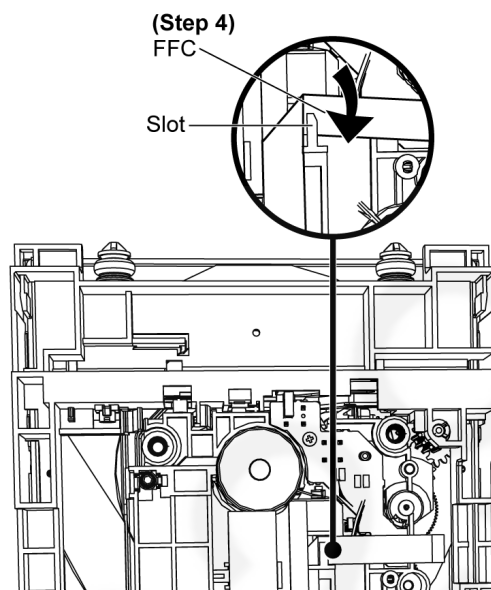


Caution:

If it is engaged, the following steps are necessary.

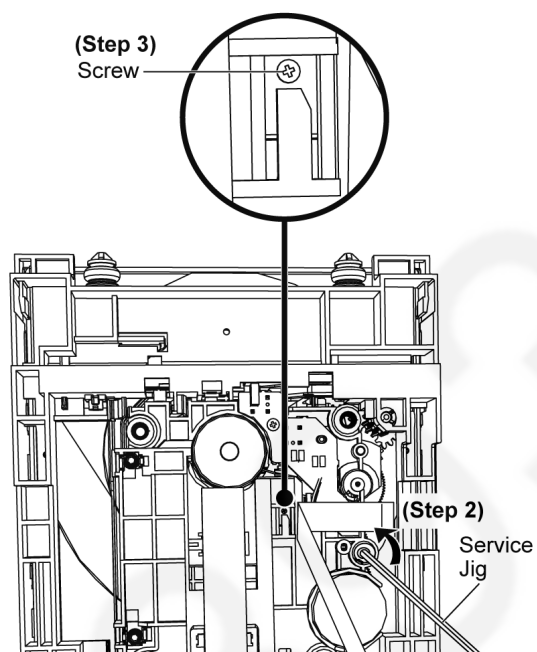


Step 1: Release the FFC from the slot.



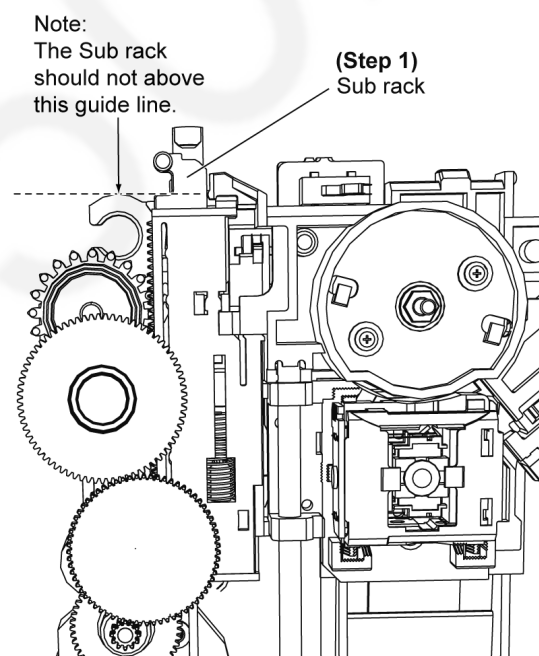
Step 4: Insert the FFC behind the slot.

8.3.2. Before assembling

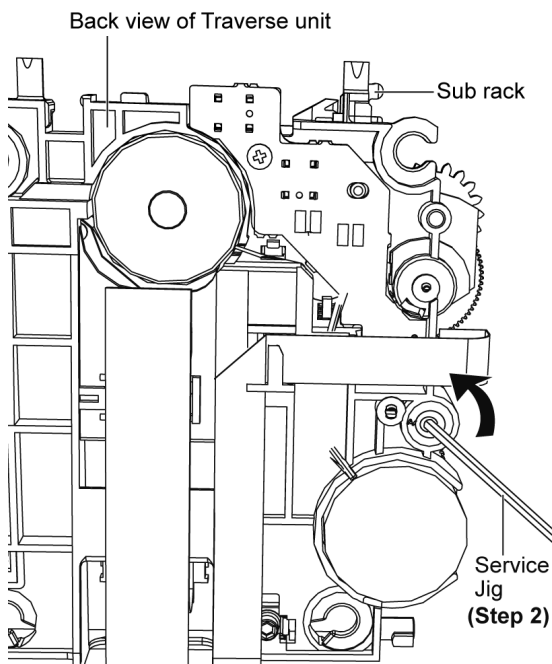


Step 2: Use service jig to turn the gear counter clockwise.

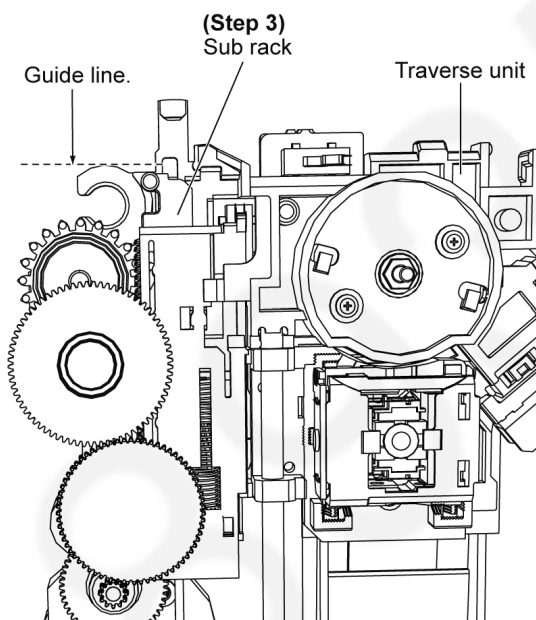
Step 3: Check that the screw is in this position then stop turning the service jig.



Step 1: Check if the sub rack is below the guide line before assembly, otherwise the following steps are necessary.



Step 2: Turn over the traverse unit, use service jig to turn the gear counter clockwise.



Step 3: Once the sub rack is below the guide line, it is ready for the assembly.

8.4. Disassembling Procedures

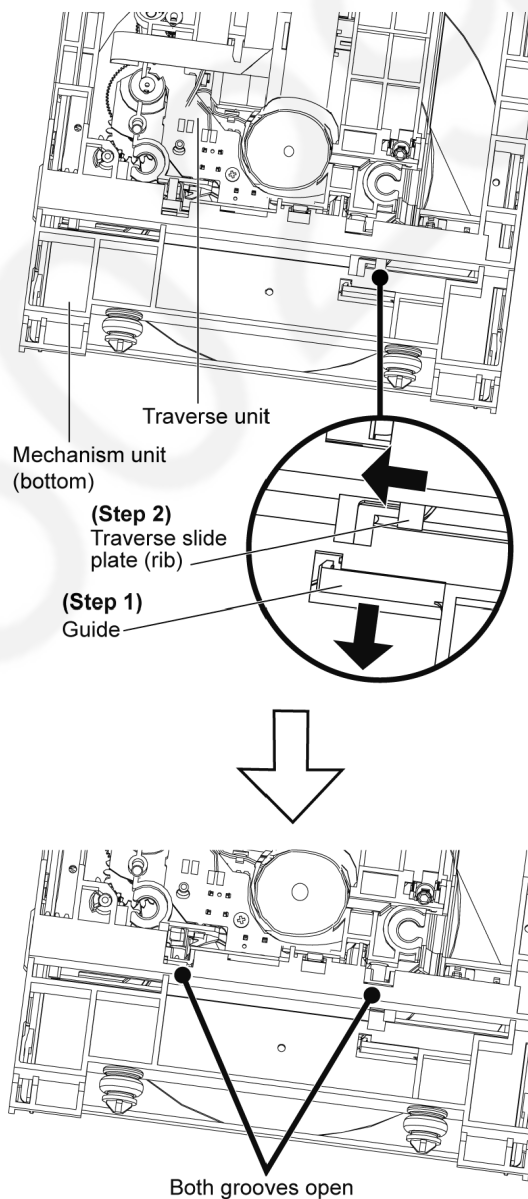
8.4.1. Disassembly of traverse unit

Caution:

Do ensure that the traverse unit is in the condition to be disassembled, please refer to section 8.3.1.

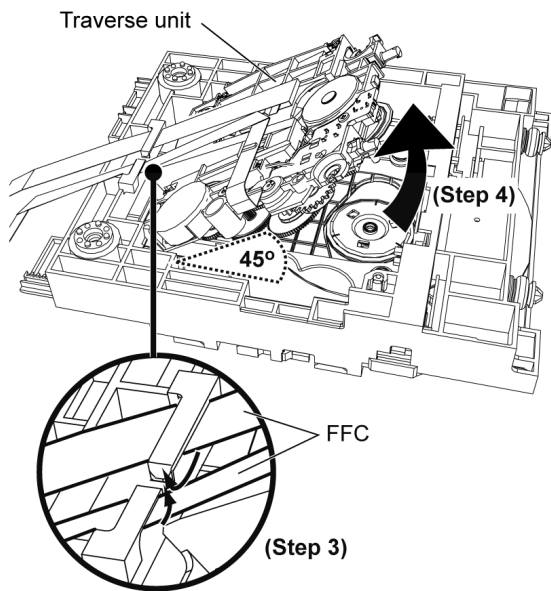
Note:

Mechanism unit (DLS6) reliability test must carry out in complete unit or using the Reliability P.C.B. (Refer to section 10).



Step 1: Release the guide.

Step 2: Push the traverse slide plate (rib), ensure both grooves are opened.

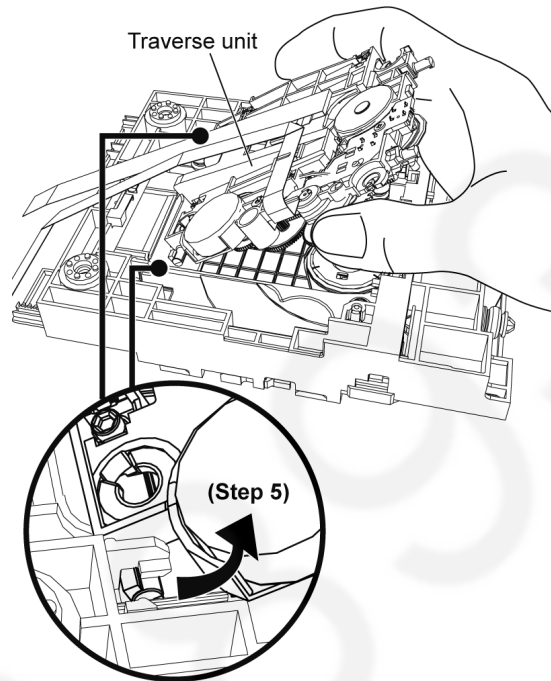
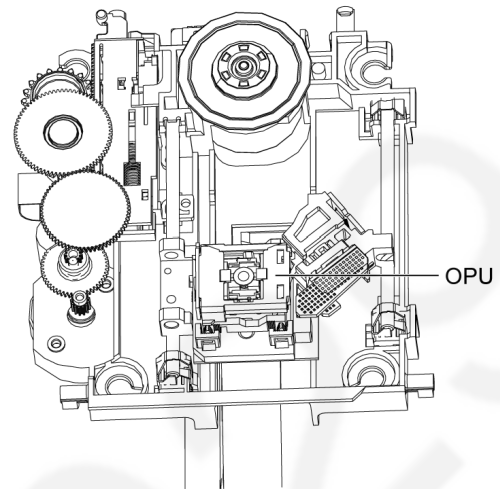


Step 3: Release the FFC as arrows shown.

Step 4: Lift the traverse unit up by approximately 45° as shown.

Caution:

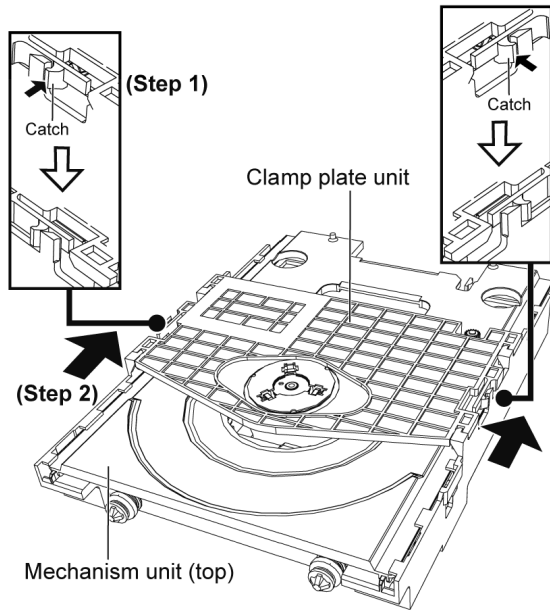
Ensure the OPU is face upwards, avoid touching the surface of the traverse unit.



Step 5: Slide out the traverse unit as arrow shown.

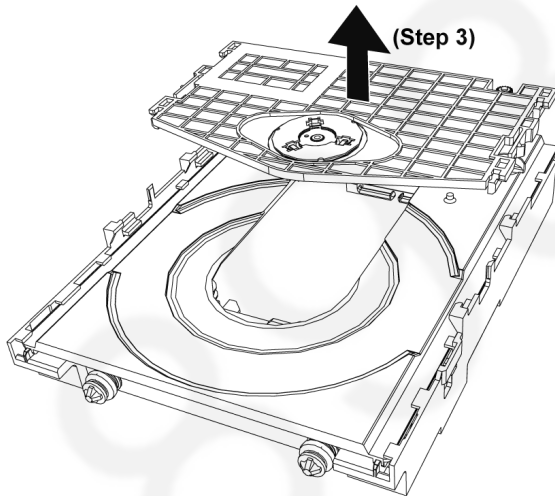
8.4.2. Disassembly of clamp plate unit

- Follow the (Step 1) to (Step 5) of item 8.4.1.



Step 1: Release the catches at both sides of the clamp plate unit.

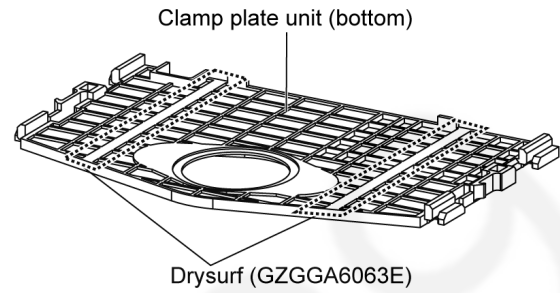
Step 2: Slide the clamp plate unit as arrows shown.



Step 3: Lift up and remove the clamp plate unit as arrow shown.

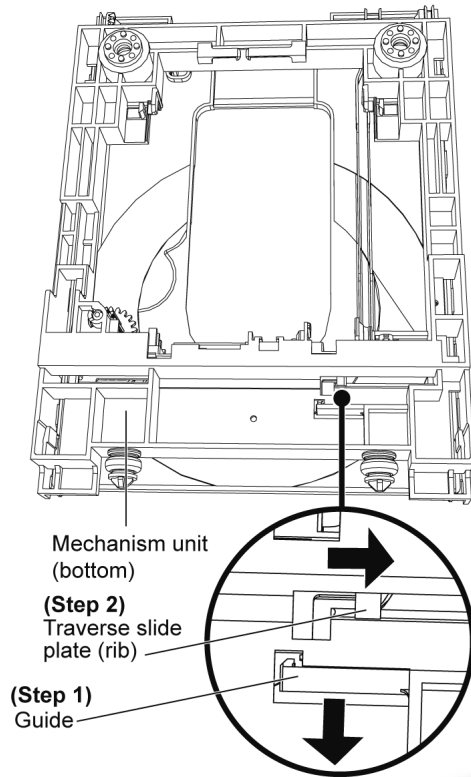
Caution:

Avoid touching the drysurf areas. Below diagram shows the areas for the drysurf to be applied.



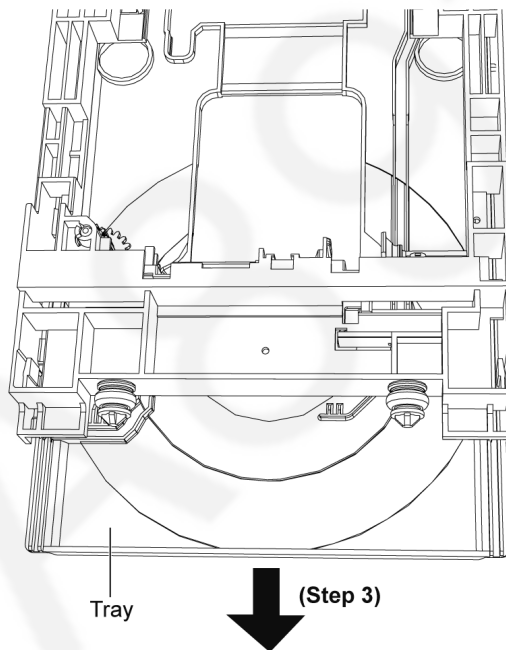
8.4.3. Disassembly of tray

- Follow the (Step 1) to (Step 5) of item 8.4.1.
- Follow the (Step 1) to (Step 3) of item 8.4.2.

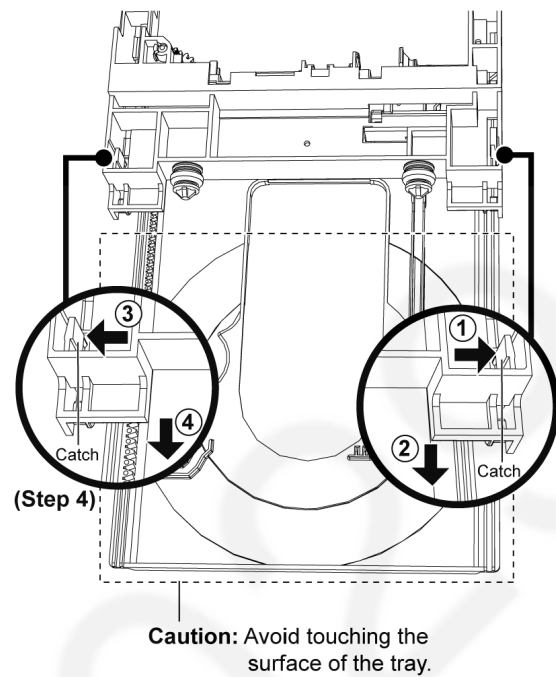


Step 1: Release the guide.

Step 2: Push the traverse slide plate (rib) until it stop.



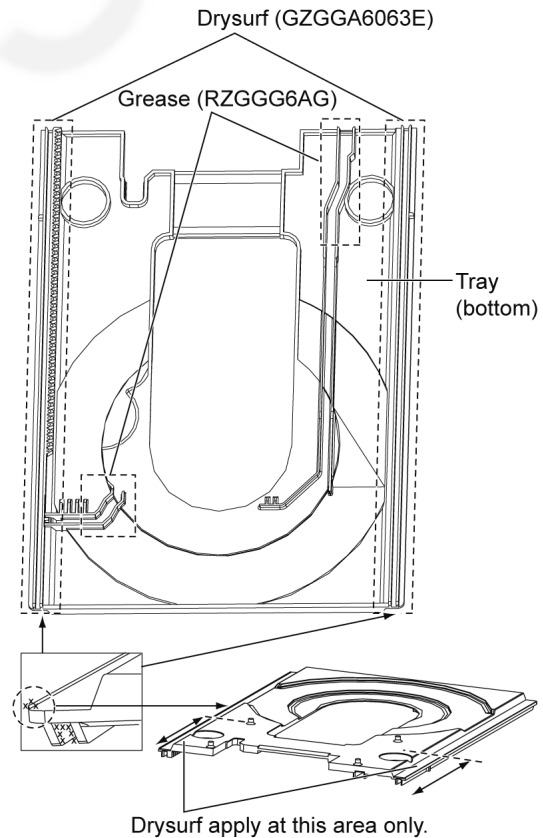
Step 3: Slide the tray out fully.



Step 4: Release the catches respectively as arrows shown to remove the tray.

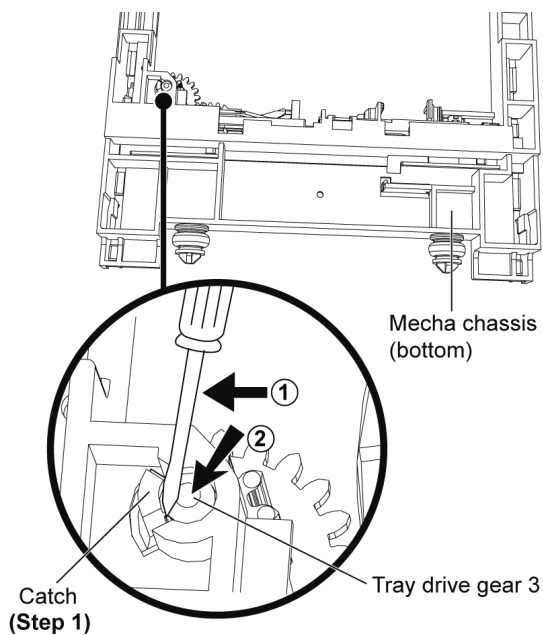
Caution:

Avoid touching the drysurf and grease areas. Below diagram shows the areas of greasing points.



8.4.4. Disassembly of tray drive gear 3

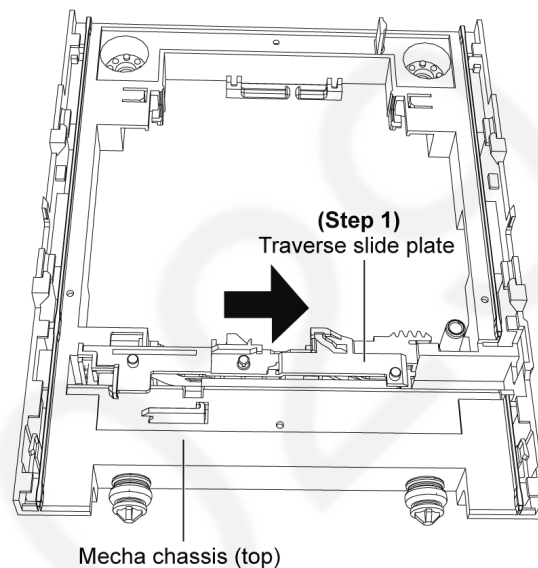
- Follow the (Step 1) to (Step 5) of item 8.4.1.
- Follow the (Step 1) to (Step 3) of item 8.4.2.
- Follow the (Step 1) to (Step 4) of item 8.4.3.



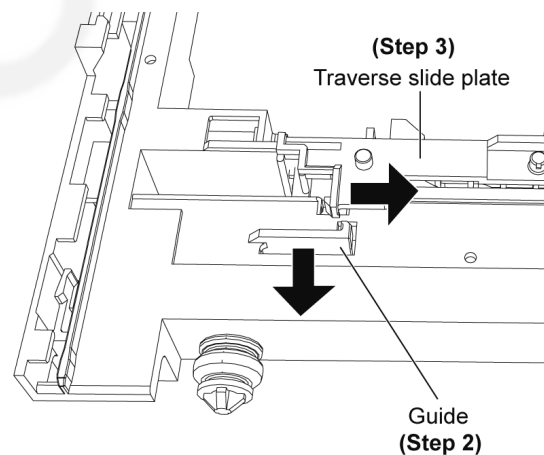
Step 1: Use a screw driver to release the catch and push down the tray drive gear 3 in order of sequences (1) to (2).

8.4.5. Disassembly of traverse slide plate

- Follow the (Step 1) to (Step 5) of item 8.4.1.
- Follow the (Step 1) to (Step 3) of item 8.4.2.
- Follow the (Step 1) to (Step 4) of item 8.4.3.
- Follow the (Step 1) of item 8.4.4.

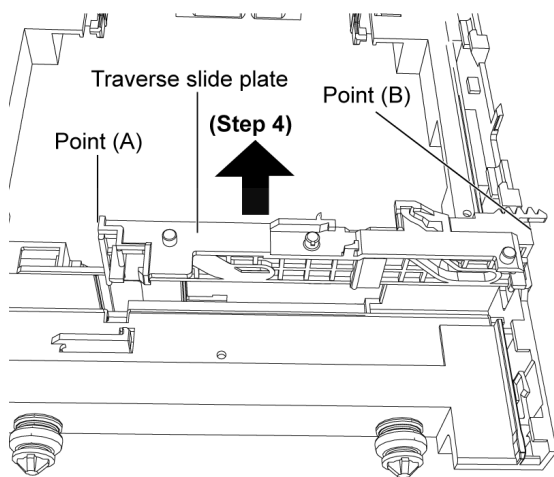


Step 1: Slide the traverse slide plate till it come to a stop as arrow shown.



Step 2: Release the guide.

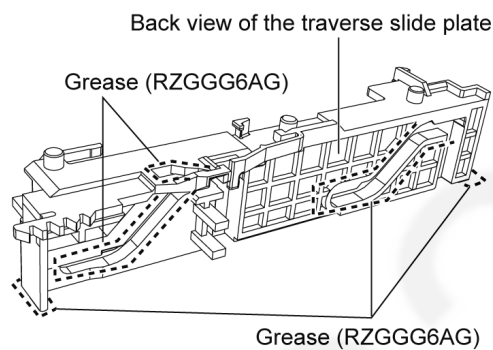
Step 3: Slide the traverse slide plate until it stop.



Step 4: Hold both points (A) and (B) of the traverse slide plate to remove it.

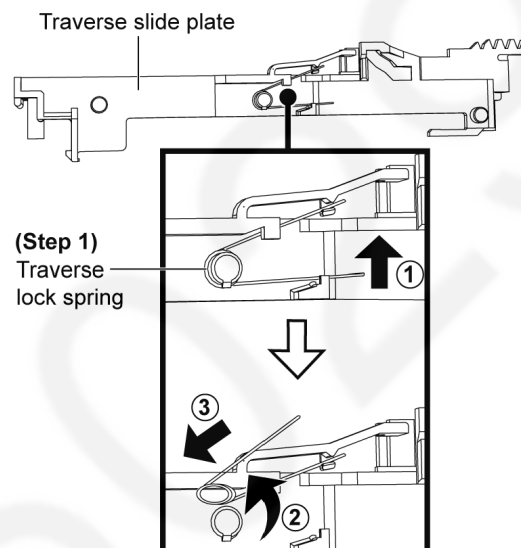
Caution:

Avoid touching the grease areas. Below diagram shows the areas of greasing points.



8.4.6. Disassembly of traverse lock spring

- Follow the (Step 1) to (Step 5) of item 8.4.1.
- Follow the (Step 1) to (Step 3) of item 8.4.2.
- Follow the (Step 1) to (Step 4) of item 8.4.3.
- Follow the (Step 1) of item 8.4.4.
- Follow the (Step 1) to (Step 4) of item 8.4.5.

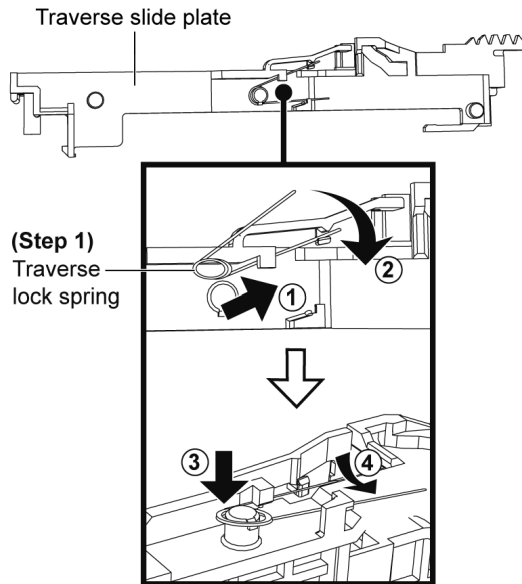


Step 1: Release the traverse lock spring as arrows shown to remove it.

Note: Keep the traverse lock spring in a safe place.

8.5. Assembling Procedure

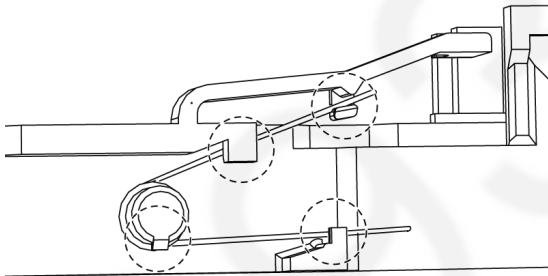
8.5.1. Assembly of traverse lock spring



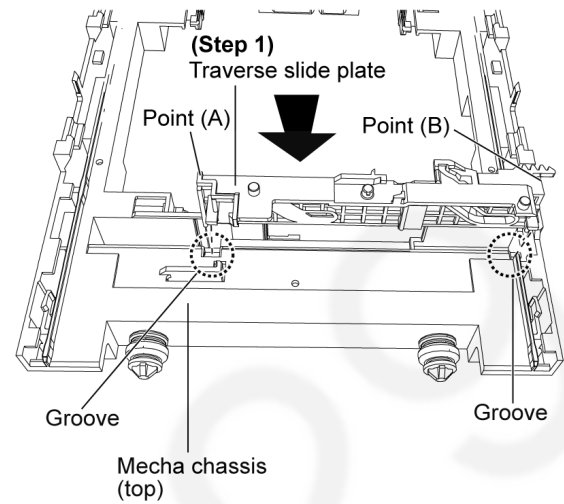
Step 1: Fix the traverse lock spring as arrows shown respectively.

Caution:

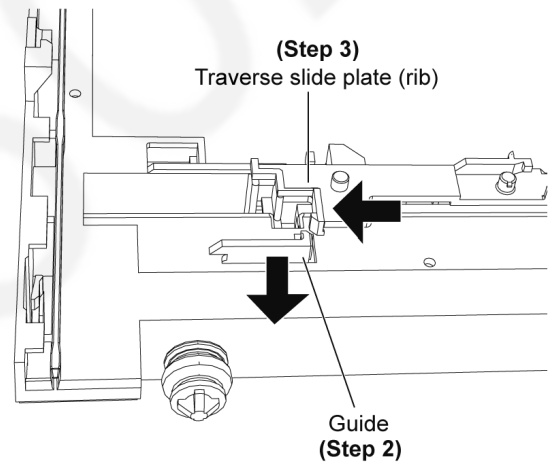
Make sure the traverse lock spring is fully caught onto the traverse slide plate as shown.



8.5.2. Assembly of traverse slide plate



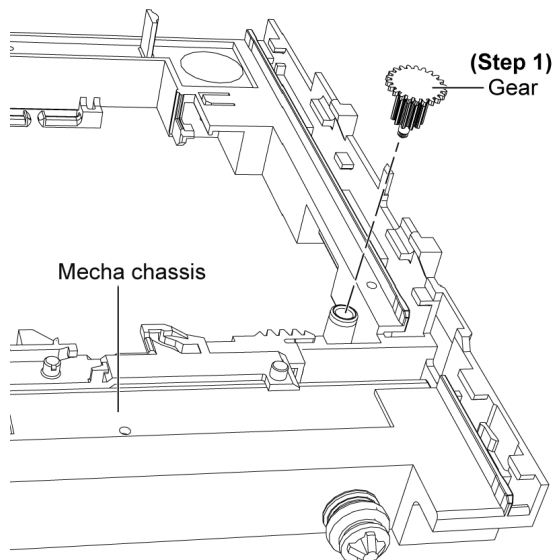
Step 1: Hold both points (A) and (B) of the traverse slide plate, slot it into the grooves.



Step 2: Release the guide.

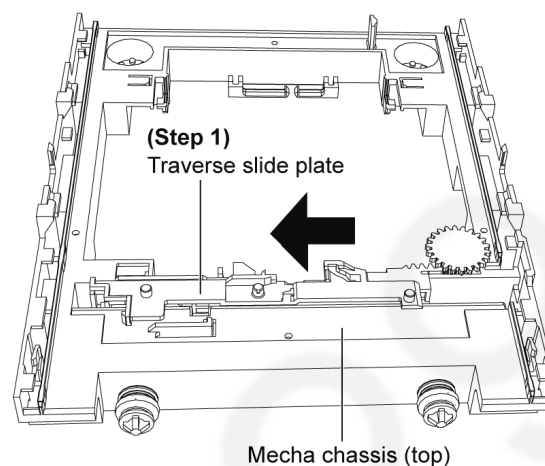
Step 3: Push the traverse slide plate (rib) in to secure the traverse slide plate.

8.5.3. Assembly of tray drive gear 3

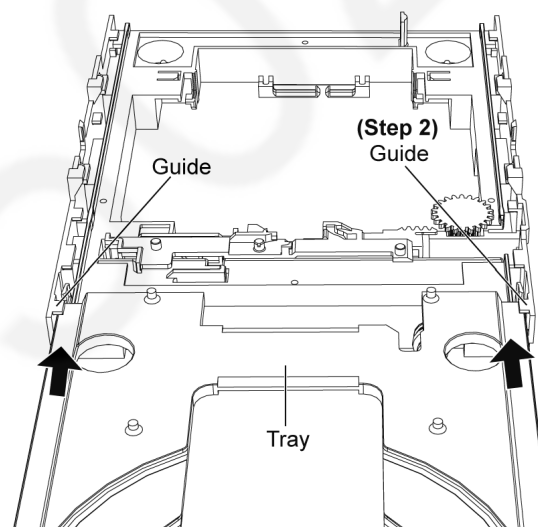


Step 1: Insert the tray drive gear 3 into the slot as shown, press down until hear a “click” sound is heard.

8.5.4. Assembly of tray

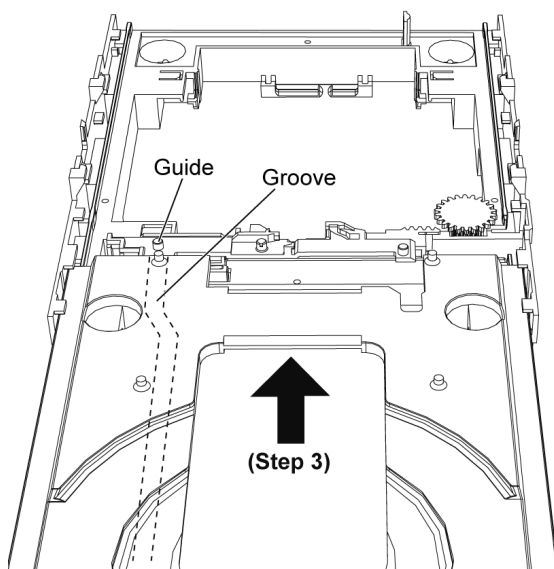


Step 1: Slide the traverse slide plate right to the end.



Step 2: Slide the tray in as arrows shown.

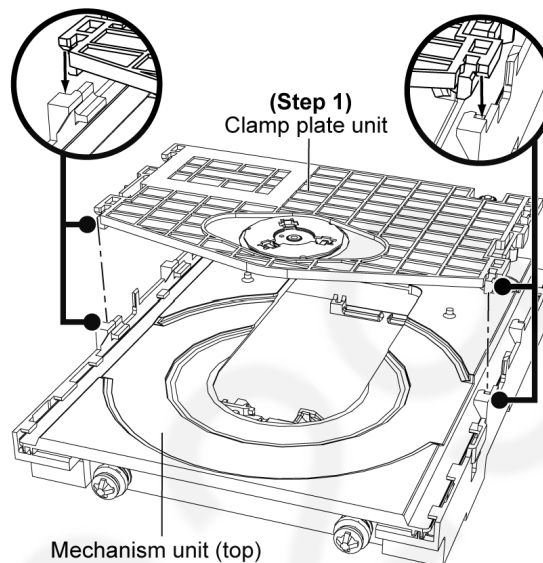
Note: Ensure the tray is underneath both guides.



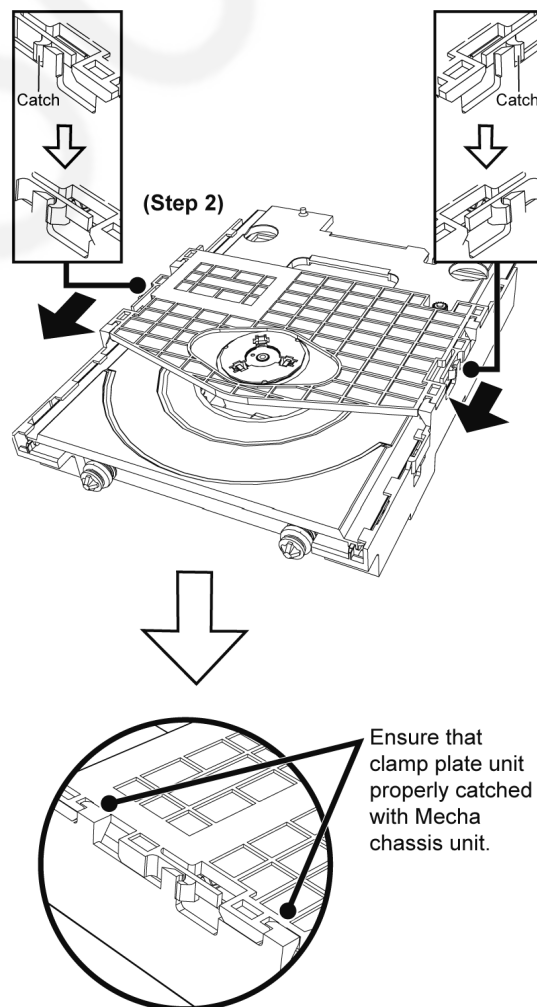
Step 3: Slide the tray in fully.

Note: Ensure the groove below the tray is aligned with the traverse slide plate's guide when sliding the tray in.

8.5.5. Assembly of clamp plate unit



Step 1: Align the clamp plate unit as shown.

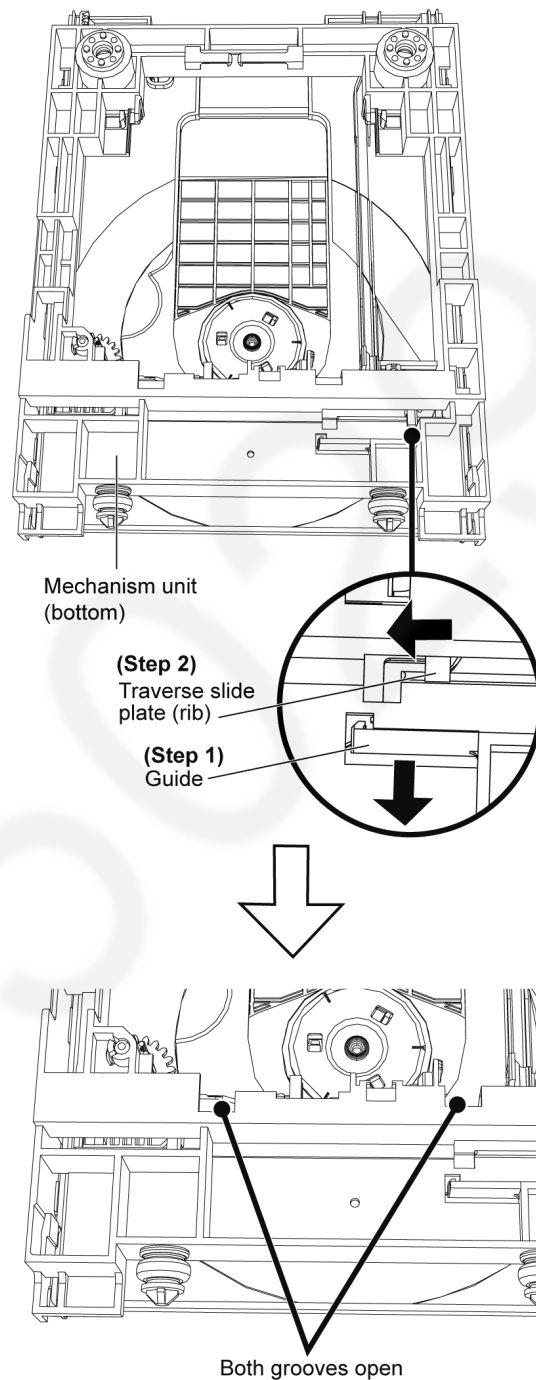
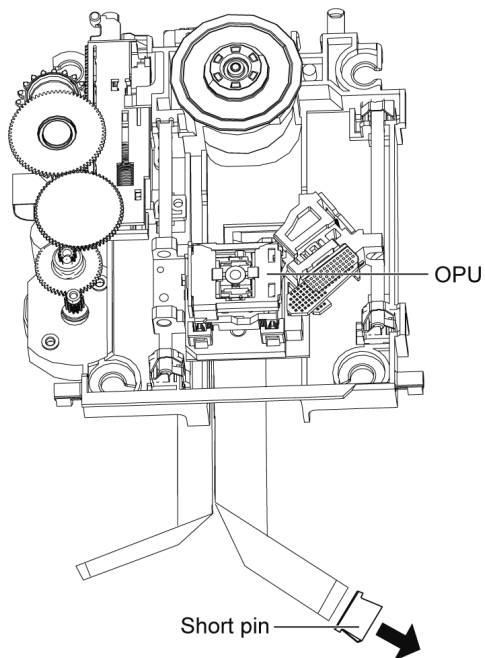


Step 2: Push the clamp plate unit as arrow shown until the catches are properly caught.

8.5.6. Assembly of traverse unit

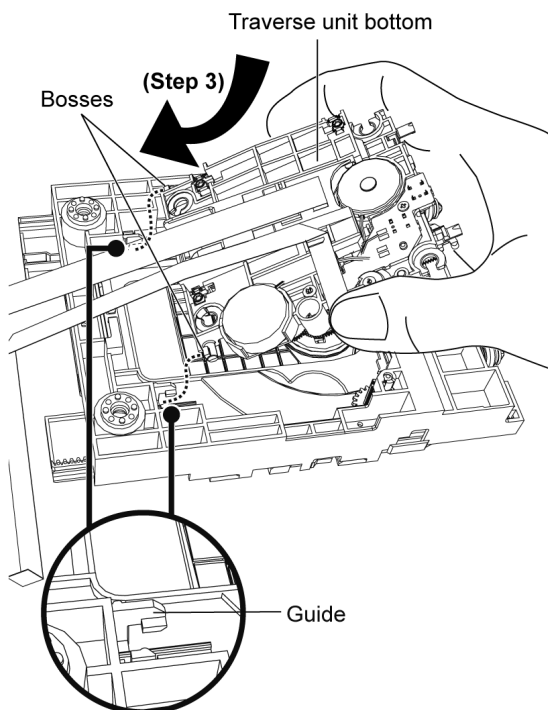
Caution:

- Do ensure that the traverse unit is in the condition to be assembled, please refer to section 8.3.1.
- Removal of the short pin is necessary for replacement of new traverse unit.



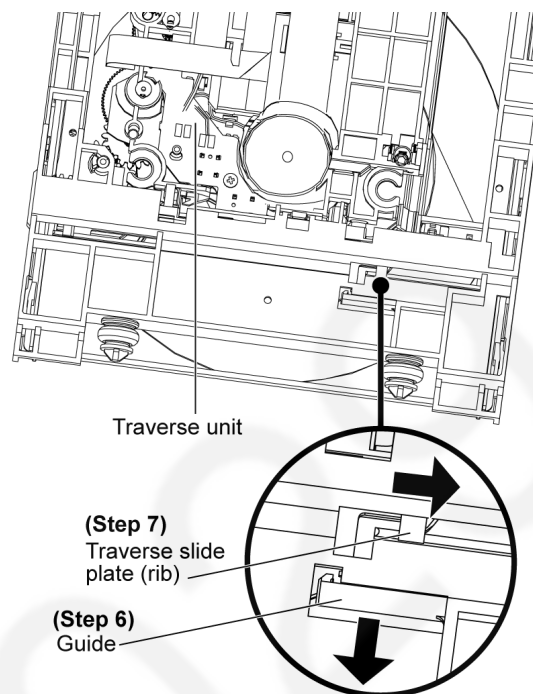
Step 1: Release the guide.

Step 2: Push the traverse slide plate (rib), ensure both grooves are opened.



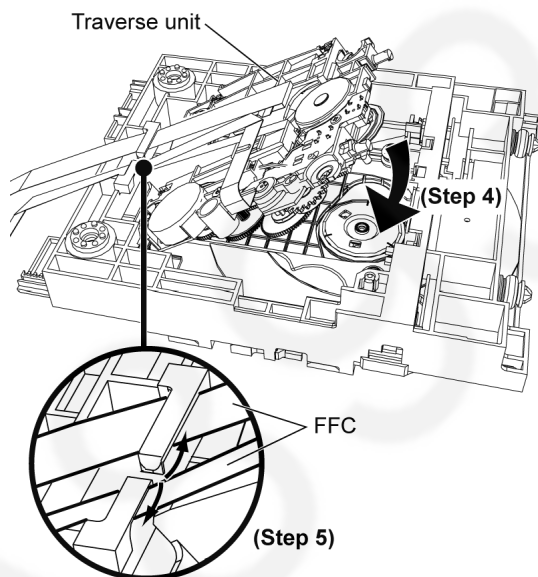
Step 3: Slot the traverse unit at approximately 45° into the mecha chassis as arrow shown.

Note: Ensure the bosses fix exactly onto the guides.



Step 6: Release the guide.

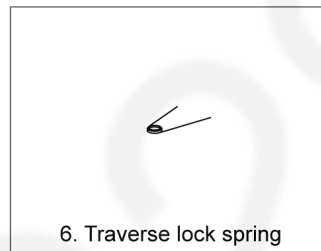
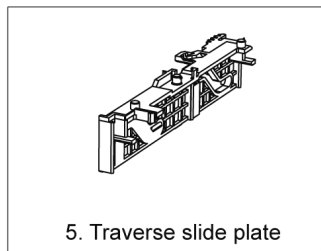
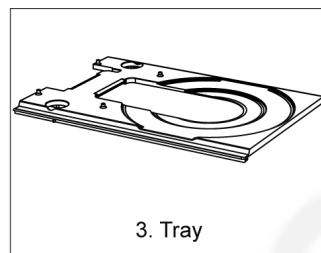
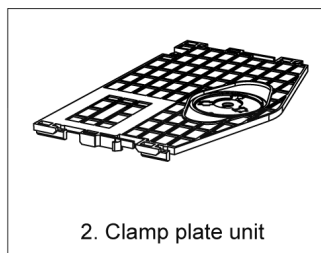
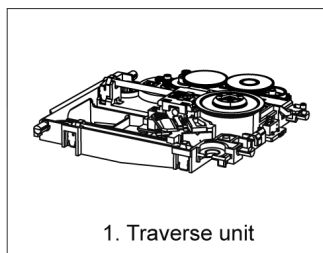
Step 7: Push the traverse slide plate (rib) to lock the traverse unit in.



Step 4: Place down the traverse unit.

Step 5: Place the FFC as arrows shown.

9 Disassembly Flow



10 DLS6 Mechanism Reliability

Purpose: To test the DLS6 mechanism unit operation by using the Reliability P.C.B. before installation into the main unit.

10.1. Setup Connection

Below diagram shows the set-up necessary to carry out the reliability of mechanism.

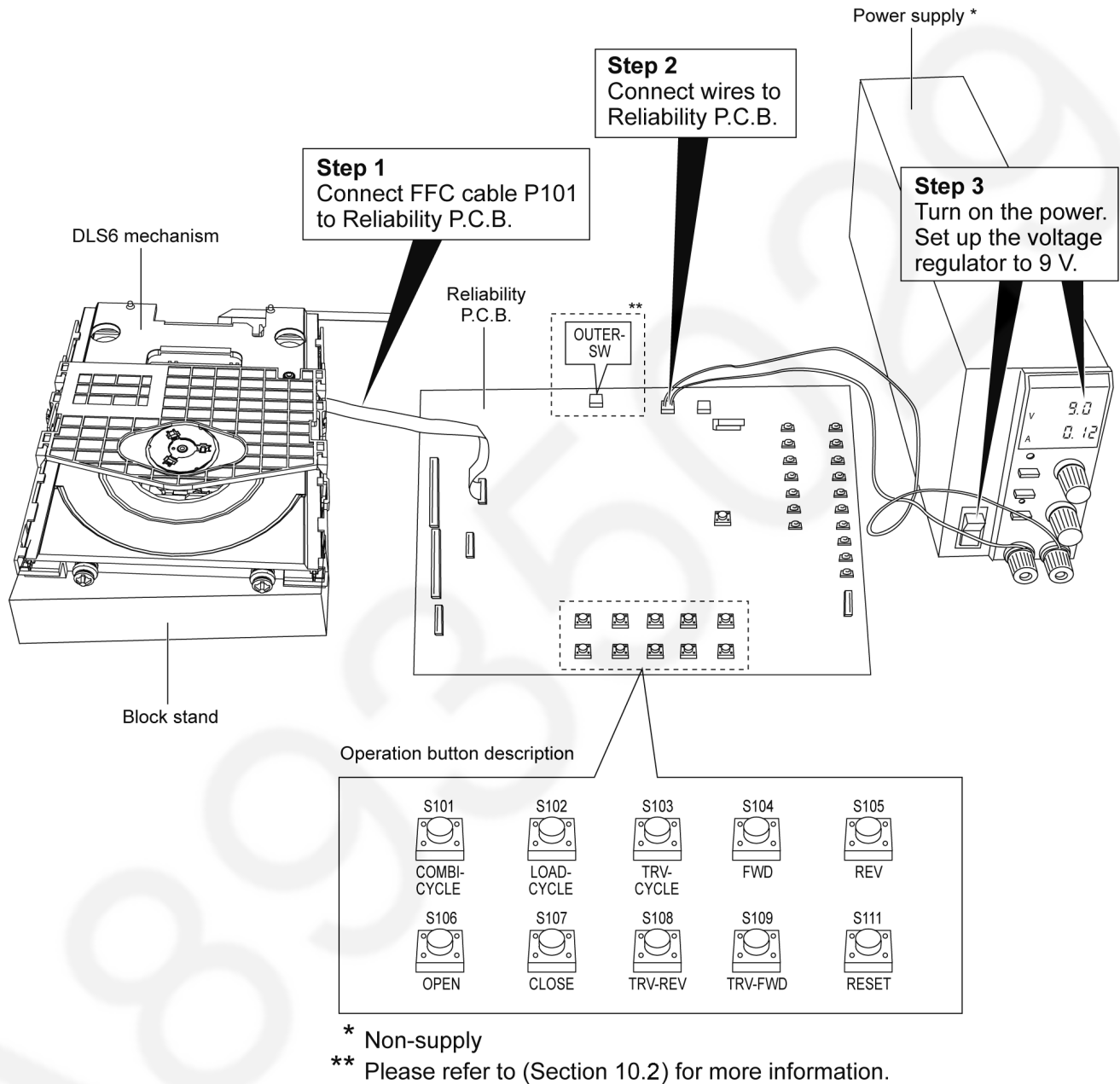


Figure 9

Equipments required for the set up preparation:

- Power supply
- Reliability P.C.B. (RFKZCR14)

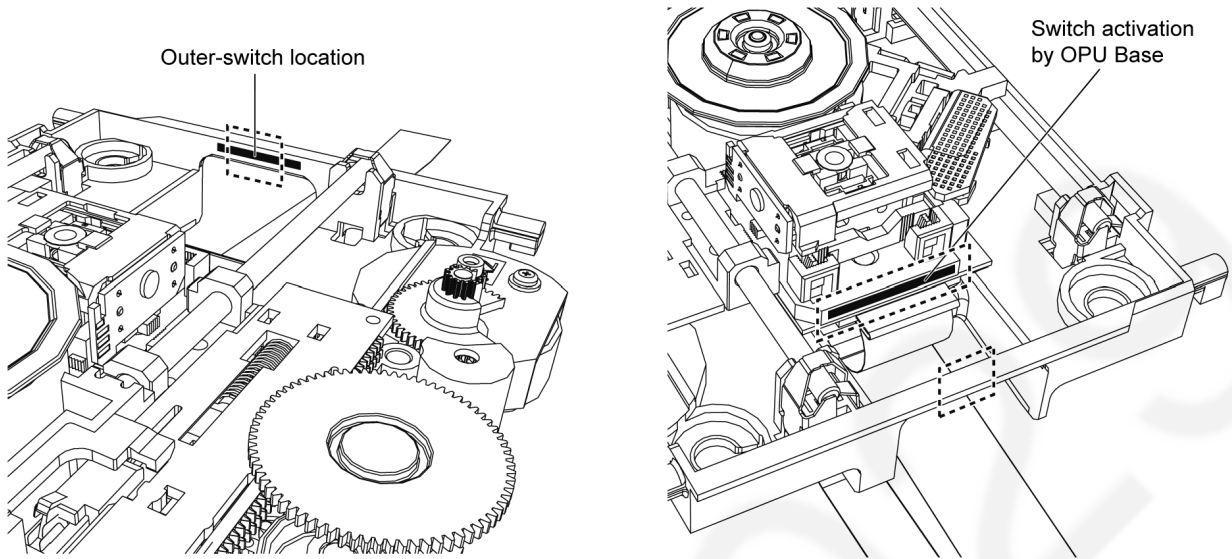
10.2. Jig's Flow Diagram

Button	Operation description	Mecha mode	Switch state		
				INNER	OUTER
Open (S106)	[Normal Operation] TRV motor turns CCW and stop when UNLOAD-SW = Signal change from H-->L (Refer Figure 10 for flow)	Open position	L	L	H
Close (S107)	[Normal Operation] TRV motor turns CW and stop when INNER-SW = Signal change from L-->H (Refer Figure 11 for flow)	Close Position	H	H	H
* Trv FW (S109)	[Normal Operation] TRV motor turns CCW and stops when INNER-SW = Signal change from H-->L (Refer Figure 12 for flow)	OPU Inner position	H	L	H
* Trv REV (S108)	[Normal Operation] TRV motor turns CW and stops when OUTER-SW = Signal change from H-->L (Refer Figure 13 for flow)	OPU Outer position	H	H	L
FWD (S104)	[Manual mode] TRV motor turns CCW and stops when user release button (Refer Figure 14 for flow)	Manual mode Trv motor FW	~	~	~
REV (S105)	[Manual mode] TRV motor turns CW and stops when user release button (Refer Figure 15 for flow)	Manual mode Trv motor Rev	~	~	~
* Combi cycle (S101)	[Aging Mode-1] Mechanism in continuous cycle mode of combination between Loading and Traverse function. (Refer Figure 16 for flow)	Mode-1	~	~	~
Load cycle (S102)	[Aging Mode-2] Mechanism in continuous cycle mode of Loading function. (Refer Figure 17 for flow)	Mode-2	~	~	~
* Trv cycle (S103)	[Aging Mode-3] Mechanism in continuous cycle mode of Traverse function. (Refer Figure 18 for flow)	Mode-3	~	~	~

* An Outer-switch is required for these operations.

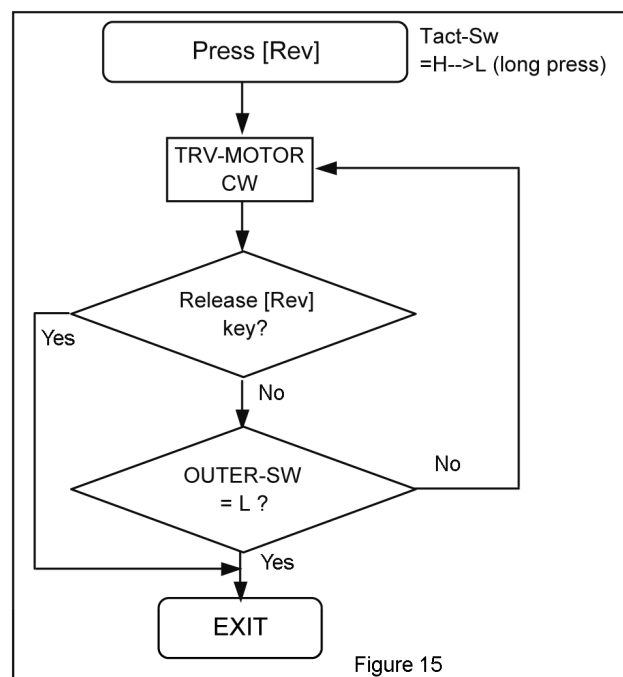
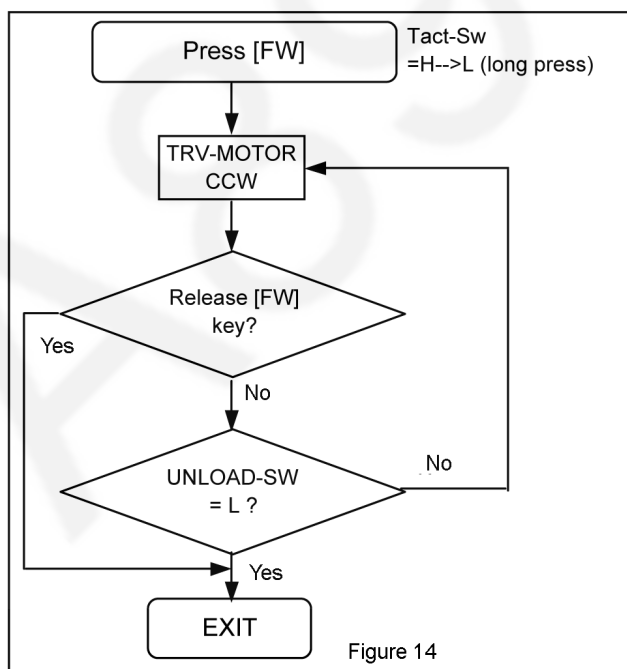
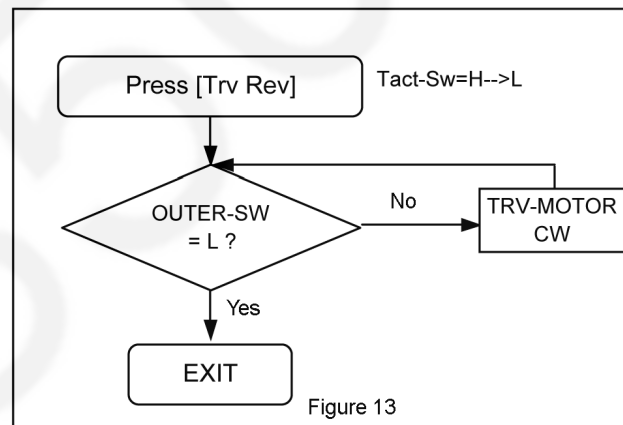
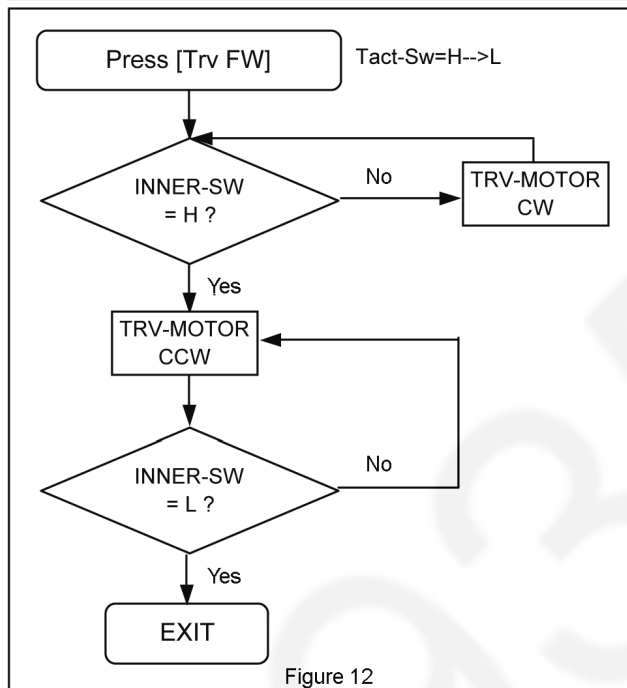
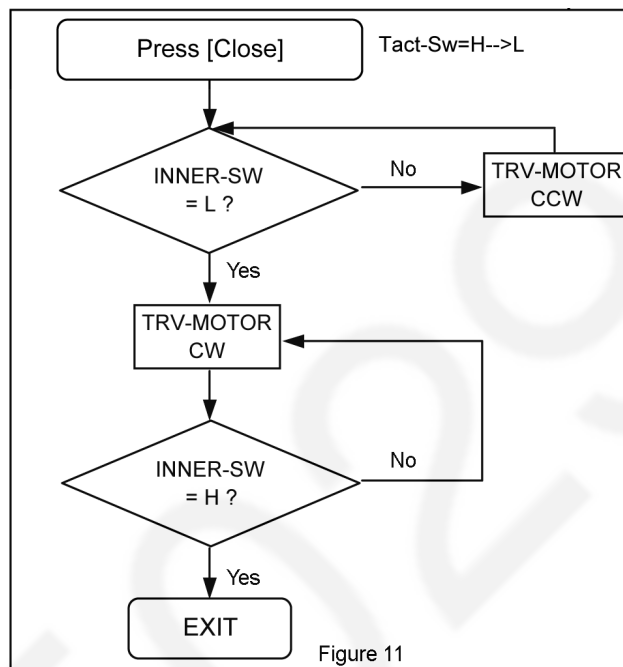
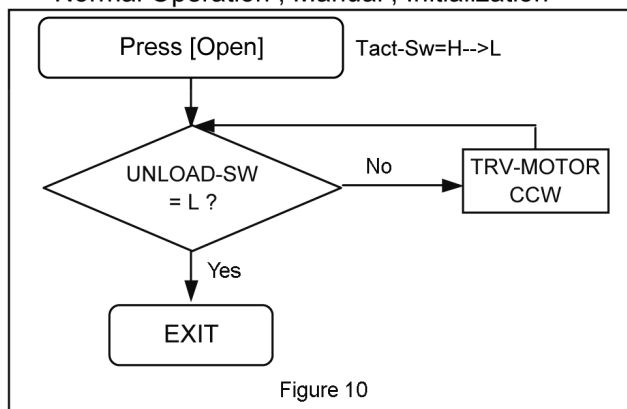
- Refer following for the suggested location for the mounting of the outer-switch (Part No. K0L1BA000134).

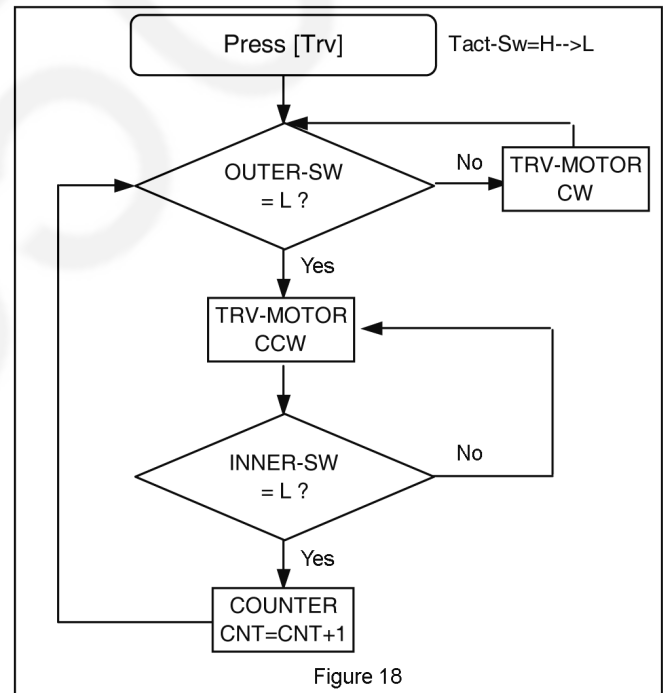
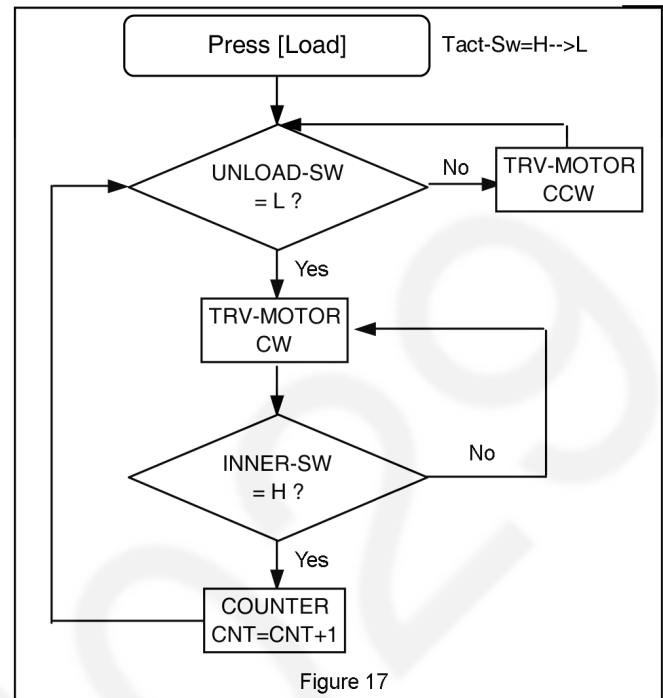
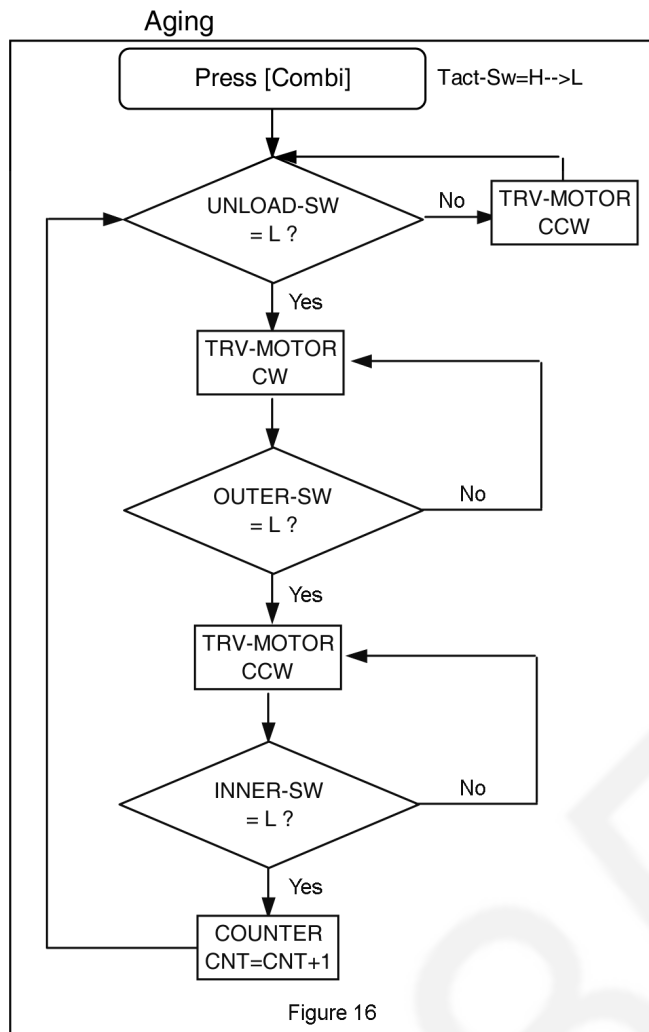
Location of outer-switch



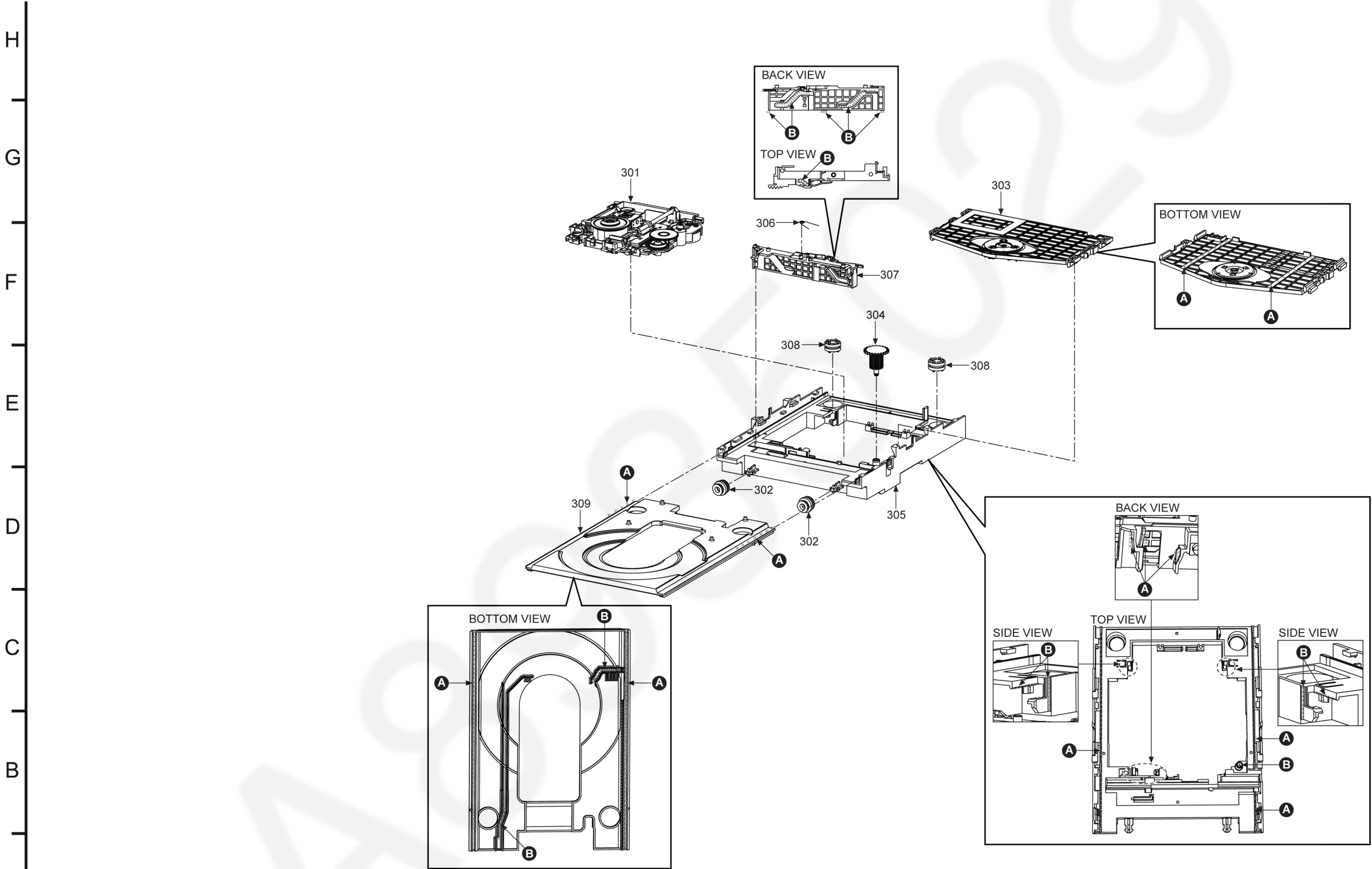
10.2.1. Flow operation

Normal Operation , Manual , Initialization





11 Exploded Views



		PART NUMBER
A	DRYSURF	GZGGA6063E
B	GREASE	RZGGG6AG

A889335029

12 Replacement Parts List

Notes:

- Important safety notice:

Components identified by △ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of these components, be sure to use only manufacturers's specified parts shown in the parts list.

- [M] Indicates in the Remarks columns indicates parts that are supplied by **PAVCSG**.

Ref. No.	Part No.	Part Name & Description	Remarks
		TRAVERSE DECK	
301	RD-DDTX001-V	TRAVERSE UNIT	[M] △ *1
301	RD-DDTX003-V	TRAVERSE UNIT	[M] △ *2
302	RMGX0049	FRONT DAMPER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
303	RXQX0046	CLAMP PLATE UNIT	[M]
304	RDGX0041A	TRAY DRIVE GEAR 3	[M]
305	RXQX0086	MECHA CHASSIS ASS'Y	[M]
306	RMEX0046	TRAVERSE LOCK SPRING	[M]
307	RMMX0013-1	TRAVERSE SLIDE PLATE	[M]
308	VMG1719	DAMPER	[M]
309	RMRX0064-K1	TRAY	[M]

Note:

- *1 denotes models applied as below:-

SA-PT460EB/EG/EF/GCP/GN-K

SA-PT465E-S

SA-PT465GC/GCS/GCT/GS/EE/GT/E-K

SA-PT467EG/EB-K

SA-PT560E/EB/EG/EE/GN/GCP-K

SA-PT560E/EG/EE-S

SA-PT565GC/GS/GCS/GCT-K

SA-PT860E/EB/EG/EE-K

SA-PT865GC/GS/GCS/GCT/GN-K.

- *2 denotes models applied as below:-

SA-PM86DEE/GCS/GN/E/EB/EG/EF-K