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1. BEFORE USING THIS PRODUCT

To ensure the safe usage of the product, be sure to read the following before using the product. The following instructions are intended for the use of QUALIFIED SERVICE PERSONNEL ONLY. After carefully reading and sufficiently understanding the instructions should any activity be carried out on the product. Only qualified service personnel should carry out maintenance on the product.

Terms such as WARNING!, CAUTION, and IMPORTANT! Are used where an explanation is given which requires special attention, depending on the potential risk. SEGA is not responsible for injury or damage caused by use in a manner contrary to the instructions stated in this document. In order to prevent accidents warning stickers and printed instructions are applied in the places where a potentially hazardous situation relating to the product could arise. Be sure to comply with these warnings.



WARNING!

Indicates that mishandling the product by disregarding this warning will cause a potentially hazardous situation which can result in death or serious injury.



CAUTION!

Indicates that mishandling the product by disregarding this caution will cause a potentially hazardous situation which can result in personal injury and or material damage.



IMPORTANT!

This is cautionary information which should be complied with when handling the product. Indicates that mishandling the product by disregarding this will cause a potentially hazardous situation which may not result in personal injury but could damage the product.

Be sure to turn off the power and disconnect from the mains supply before working on the machine.

Ensure that the correct fuse(s) is fitted to the machine.

Details of the correct fusing of the machine are enclosed in the Service Manual.

Ensure that only qualified Service Engineers perform any maintenance work on the machine.

Specification changes, removal of equipment, conversion and/or addition, not designated by SEGA are not permitted and will invalidate this product's CE conformity.

The parts of the product also include any warning labels or safety covers for personal protection etc. A potential hazard will be created if the machine is operated while any parts have been removed. Should any doors, lids or protective covers be damaged or lost, do not operate the product. SEGA is not liable in any whatsoever for any injury and/or damage caused by specification changes not designated by SEGA.

Before installing the product, check for the Electrical Specification Sticker, SEGA products have a sticker on which the electrical specifications are detailed. Ensure that the product is compatible with the power supply voltage and frequency requirements of the location in which the machine is to be installed.

Install and operate the machine only in places where appropriate lighting is available, allowing warning stickers to be clearly read.

To ensure maximum safety for both customers and operators, stickers and printed instructions describing potentially hazardous situations are applied to places where accidents could occur. Ensure that where the product is operated has sufficient lighting to allow any warnings to be read. If any sticker or printed warning is removed or defaced, do not operate the machine, until it has been replaced by an identical item.

When handling the monitor, be very careful. (Applies only to product with monitor)

Some of the monitor (TV) parts are subject to high tension voltage. Even after turning off the power some components are still occasionally subject to high tension voltage. Monitor repair and replacement should be performed by qualified service engineers only.

In cases where commercially available monitors and printers are used only the contents relating to this product are stated in this manual. Some commercially available equipment has functions and reactions not stated in this manual. Read this manual in conjunction with the specific manual of such equipment.

Descriptions contained herein may be subject to change without prior notification.

The contents described herein are fully prepared with due care. However, should any question arise or errors be found please contact SEGA.

1.1. **INSPECTIONS IMMEDIATELY AFTER TRANSPORTING THE PRODUCT TO THE LOCATION**



IMPORTANT!

- Inspection should only be carried out by QUALIFIED SERVICE PERSONNEL.

Normally, at the time of shipment, SEGA products are in a state to allowing usage immediately after transporting to the location. Nevertheless, an irregular situation may arise during transportation preventing this. Before turning on the power, check the following points to ensure that the product has been transported safely.

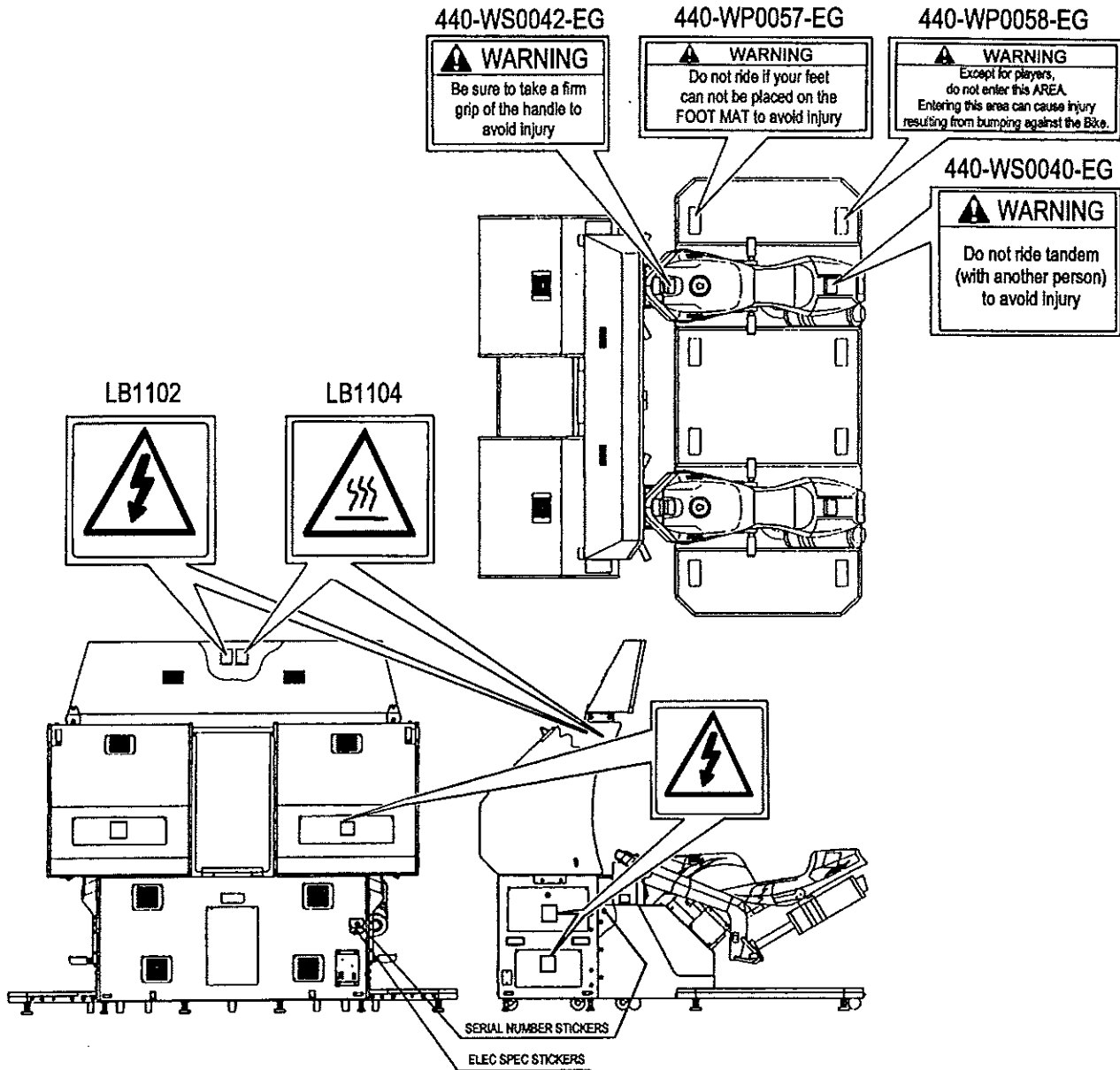
- Are there any dented parts or defects (cuts, etc.) on the external surfaces of the product?
- Are castors and leg adjusters present and undamaged?
- Do the power supply voltage and frequency requirements meet with the local supply?
- Are all wiring connectors correctly and securely connected? Unless connected in the correct direction, connector connections cannot be made successfully. Do not insert connectors forcibly.
- Are all IC's of each IC BD firmly inserted?
- Does the power cord have any cuts or dents?
- Do fuses meet the specified rating?
- Are such units such as monitors, control equipment, IC BD, etc. firmly secured?
- Are all earth wires connected?
- Are all accessories available?
- Can all doors and lids be opened with the accessory keys and/or tools?

CONCERNING THE STICKER DISPLAY

SEGA product has stickers describing the product manufacture number (Serial Number) and electrical specification. If you require service assistance you will require the Serial Number. Identical machines may have different parts fitted internally. Only by quoting the Serial Number will the correct parts be identified.

CONCERNING WARNING STICKERS

SEGA product has warning displays on stickers, labels or printed instructions adhered/attached to or incorporated in the places where hazardous situations can arise. The warning displays are intended for the accident prevention of customers and service personnel.



SPECIFICATIONS	
Installation Space (cm):	240 W x 207 D
Height (cm):	202
Weight (kg):	470
Power, Max:	Rated Voltage (V.AC): 230
	Rated Current (A): 3.5

Note: Descriptions in this manual are subject to change without prior notice.

2. INTRODUCTION TO THIS SERVICE MANUAL

SEGA ENTERPRISES LTD., supported by its experience in electronic high technology of VLSI's, microprocessors etc. and with a wealth of experience, have for more than 30 years been supplying various innovative and popular games to the world market. This Service Manual is intended to provide detailed descriptions together with all the necessary information covering the general operation of electronic assemblies, electromechanicals, servicing controls, spare parts, etc. as MOTOR RAID TWIN, a new SEGA product. This manual is intended for those who have knowledge of electricity and technical expertise especially in IC's, CRT's, microprocessors etc.. Carefully read this manual to acquire sufficient knowledge before working on the machine. Should there be any malfunction, non technical personnel should under no circumstances touch the interior systems. Should such a situation arise contact the nearest branch listed below or our head office.

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3. INSTALLATION AND SERVICE INSTRUCTIONS



IMPORTANT!

- Installation and commissioning should only be carried out by **QUALIFIED SERVICE PERSONNEL**.

3.1. HANDLING AND INSTALLATION PRECAUTIONS

When installing or inspecting the machine, be very careful of the following points and pay attention to ensure that the player can enjoy the game safely.

The game must NOT be installed under the following conditions:

- Outside, the game is designed for indoor use only.
- In areas directly exposed to sunlight, high humidity, dust, excessive heat or extreme cold.
- In locations that would present an obstacle in the case of an emergency i.e. near fire equipment or emergency exits.
- On unstable surfaces or surfaces subject to vibration.
- Where liquids, other than routine cleaning, may come into contact with the game.

Important:

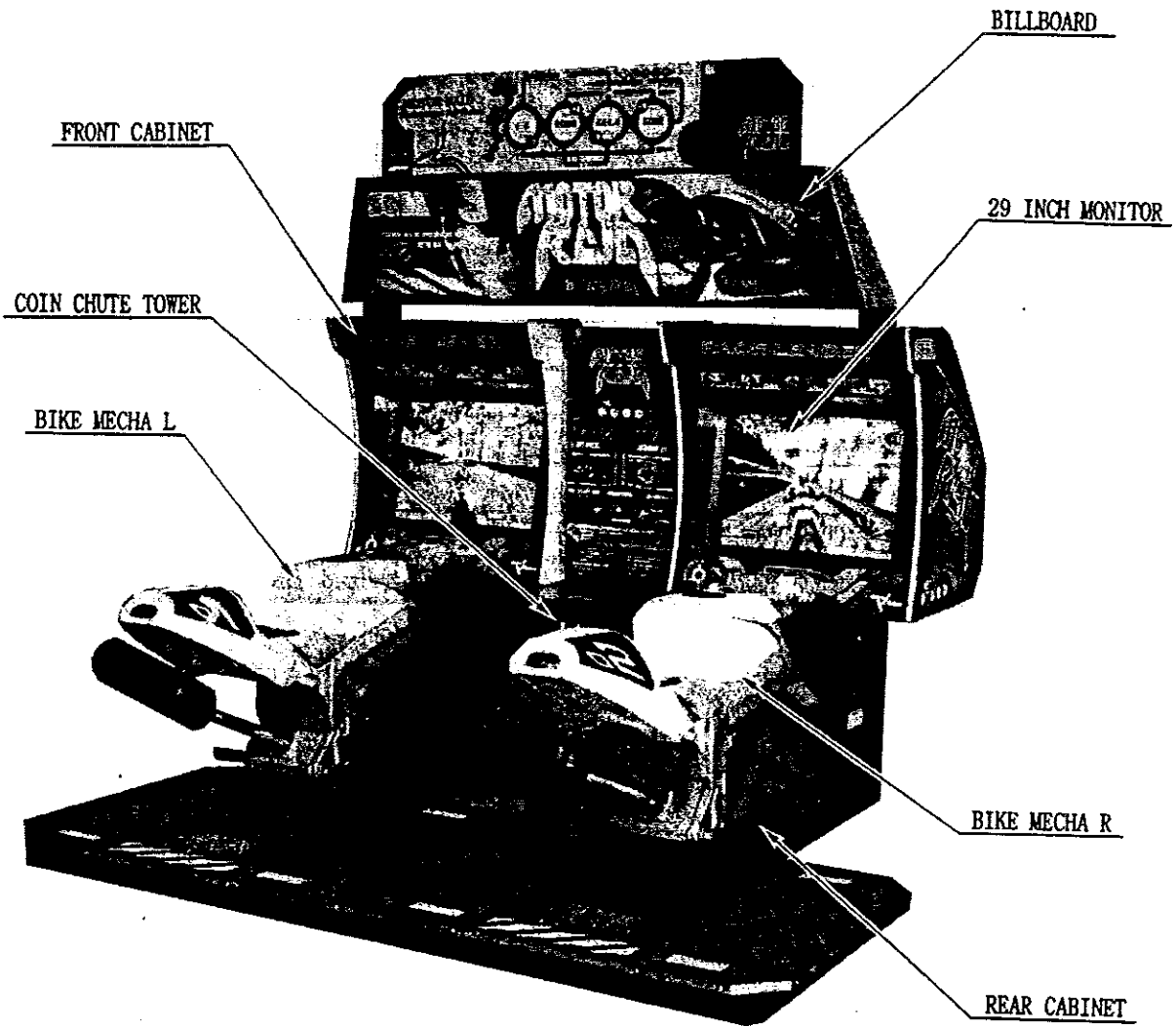
- This machine should only be installed by Qualified Service Personnel.
- Be sure to switch the supply power **OFF** and remove the mains supply plug from the machine before any work is carried out on the machine.
- Do not attempt to repair the PCB's (Printed Circuit Boards) yourself. This will void the warranty. The PCB's contain static sensitive devices that could be damaged.
- Always return a faulty part to your distributor with adequate packaging and protection.
- When removing the plug from the mains always grasp the plug not the cable.
- Do not use a fuse that does not meet the specified rating.
- Make sure all connections are secure before applying power.



IMPORTANT!

- Ensure that the mains lead is not damaged. If the mains lead is damaged in any way there could be a danger of electric shock or a fire hazard.
- Ensure that the power supply is fitted with circuit protection. Using the power supply without circuit protection is a fire hazard.

3.2. NAME OF PARTS



	Width (cm)	Length (cm)	Height (cm)	Weight (kg)
FRONT CABINET	197 (154 when closed)	90	202	Approx. 270
REAR CABINET	240	144	88	Approx. 200
When Assembled	240	207	202	Approx. 470

3.3. ACCESSORIES

The machine is supplied with an installation kit. Please ensure the following parts are supplied:

No.	PART NUMBER	QTY	DESCRIPTION
1	MRD-0200UK	1	ASSY BILLBOARD TWIN UK
2	TTR-1530UK	2	ASSY FLOOR SIDE UK
3	TTR-1520UK	1	ASSY FLOOR C UK
4	TTR-0007	2	BILLBOARD BRKT
5	TTR-0009	2	FLOOR BRKT F
6	TTR-0010	3	FLOOR BRKT R
7	TTR-0011	1	JOINT PIPE UPPER
8	TTR-0014	1	DESIGN PLATE MAP
9	TTR-0015	1	HOLE PLATE
10	TTR-0016	1	MAP HOLDER
11	TTR-0017	1	MAP SASH UPPER
12	TTR-0018	1	MAP SASH LOWER
13	440-WP0057-EG	2	PLATE W FOOTMAT ENG
14	440-WP0058-EG	2	PLATE W THIS AREA ENG
15	TTR-0021	2	STAND SUPPORT
16	422-0630-01	1	PLAY INSTR SH MRD TWIN ENG
17	429-0146UK	1	POP PANEL MRD TWIN
101	514-5078-5000	1	FUSE 5X20 CERAMIC SB 5000mA
204	030-000820-SB	27	M8X20 BLT W/S BNP
205	030-000860-SB	12	M8X60 BLT W/S BNP
206	FS1014	39	M8 WSHR FORM C FLT BNP
207	FX0411	12	M8X30 BLT BNP
208	000-P00520-OB	2	M5X20 MSCR POSI PAN BNP
209	000-T00408-OC	6	M4X8 MSCR POSI TH CRM
210	FX0400	12	M8 WSHR FORM A FLT BNP
211	FS1019	12	M8 WSHR SPR BNP
212	FS1012	2	M5 WSHR FORM C FLT BNP
213	FX0343	2	M5 WSHR SPR BNP
400	420-6335-01UK	1	SERVICE MANUAL MOTOR RAID TWIN
401	OS1019	1	SELF SEAL BAG 9X12.3/4
402	420-5418-24 OR 420-5395-24-1SA	1 1	SERVICE MANUAL NANA O USA SERVICE MANUAL SANWA SAMSUNG
407	220-5484	2	VOL CONT B-5K OHM
409	421-9636	1	STICKER No. 1~4
413	509-0161	1	SW PB TYPE 1T YEL W/LAMP
414	TTR-0015	1	HOLE PLATE
415	310-5050-160110	1	FLEX TUBE 16-0110CM
416	310-5051-16	2	CONN 16
501	PK0058	1	CARTON INST KIT TWIN

3.4. ASSEMBLY INSTRUCTIONS



IMPORTANT!

- Perform the assembly by following the procedure herein stated. Failure to comply with the instructions, for example, inserting the plug into an outlet at a stage not mentioned in this manual can cause an electric shock
- Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling can cause damage to the machine, or malfunction to occur.
- Do not attempt to complete this work alone, a minimum of 2 people are required.
- Assembly should only be carried out by **QUALIFIED SERVICE PERSONNEL.**

When carrying out the assembly work, follow the procedure in the following 6 item sequence

- STEP 1 ASSEMBLING THE FRONT CABINET**
- STEP 2 INSTALLING THE BILLBOARD**
- STEP 3 CONNECTING THE CABINETS**
- STEP 4 SECURING IN PLACE (LEG ADJUSTERS)**
- STEP 5 CONNECTION TO THE POWER SUPPLY**
- STEP 6 ASSEMBLY CHECK**

Note that the parts contained within the installation kit are required for the assembly work.



- Fit all fixings loosely first as detailed in step 1~3, then position all components before finally tightening fixings at step 4.

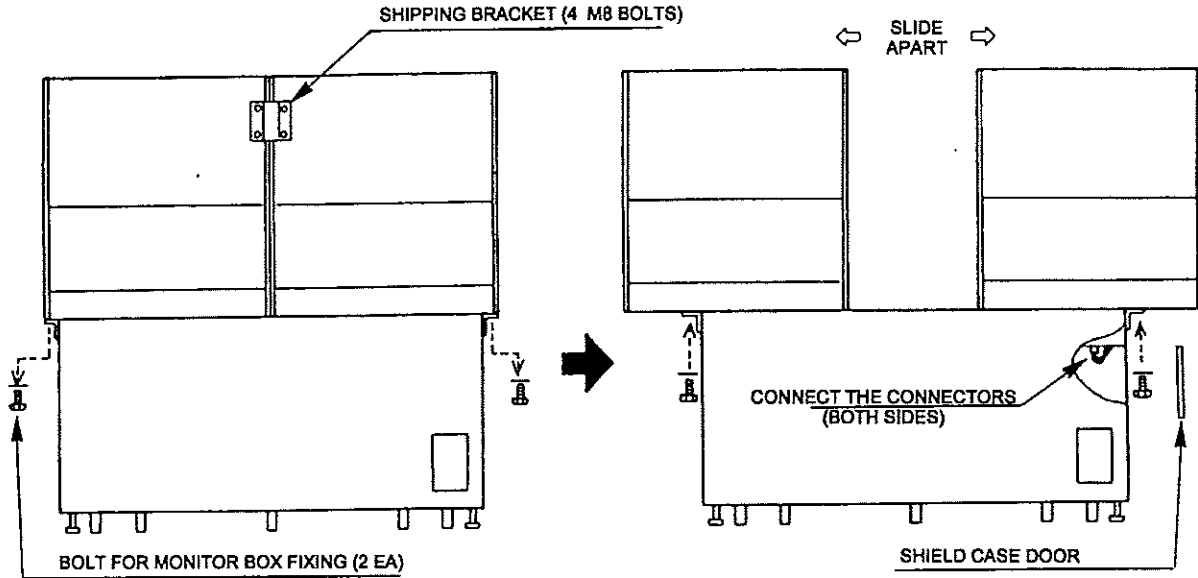
3.4.1. ASSEMBLING THE FRONT CABINET



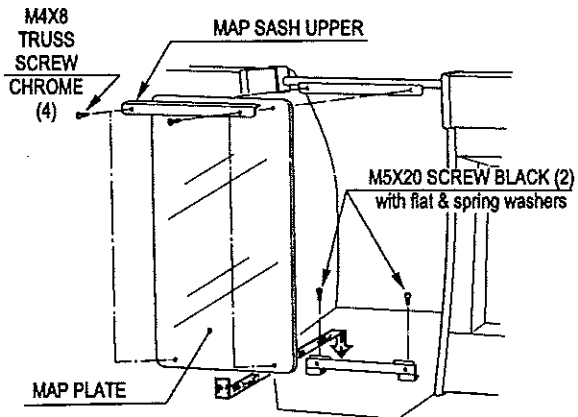
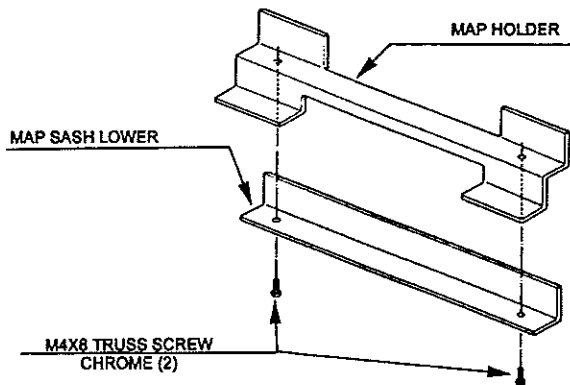
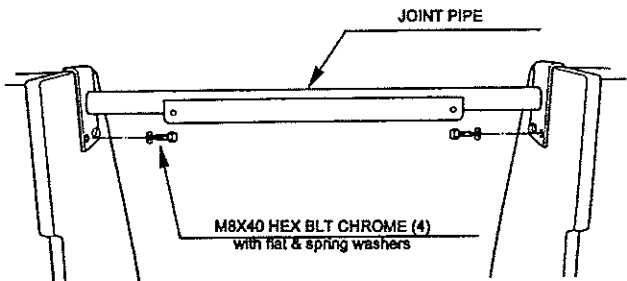
IMPORTANT!

- This operation should only be carried out by **QUALIFIED SERVICE PERSONNEL**.

1. Remove the SHIPPING BRACKET installed at the time of the shipment and the 2 M⁸ bolts used for monitor locking (each side)
2. Pull out the monitor box cabinets as shown.
3. Open both shield case doors and connect the wiring connectors underneath the monitor boxes (3 connections on the 1P side and 2 on the 2P side).



4. Install the JOINT PIPE in between the two monitor boxes.
5. Install the MAP SASH LOWER to the MAP HOLDER.
6. Install the MAP HOLDER assembled above on to the front cabinet. Securely insert the lower edge of the MAP PLATE into the MAP HOLDER and secure the upper part of the MAP PLATE with MAP SASH UPPER.



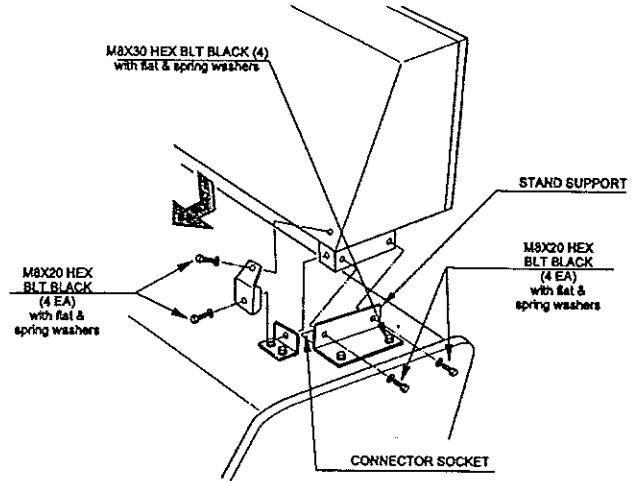
3.4.2. INSTALLING THE BILLBOARD



IMPORTANT!

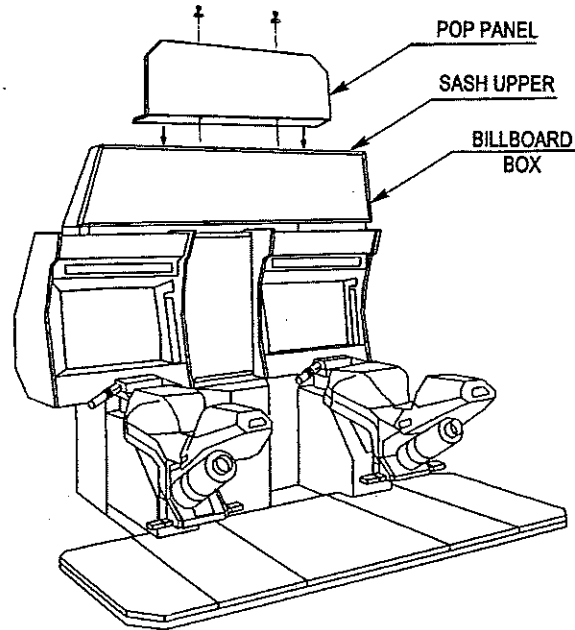
- This operation should only be carried out by **QUALIFIED SERVICE PERSONNEL**.
- This procedure should be carried out by a minimum of 2 people as lifting heavy objects may cause physical injury.

Install the BILLBOARD on top of the 2 monitor boxes as shown. Before securing with bolts, be sure to connect the wiring connector in the top of the 1P monitor box to provide power to the billboard.



Install the POP PANEL on top of the BILLBOARD BOX as shown.

1. Remove the 2 middle screws securing the SASH UPPER and retain.
2. Peel off the top strip of the double face tape on the underside of the POP PANEL and place on top of the BILLBOARD BOX, making sure that the holes are lined up with the holes in the BILLBOARD BOX & SASH UPPER.
3. Replace the screws for the SASH UPPER and tighten.



3.4.3. CONNECTING THE CABINETS



IMPORTANT!

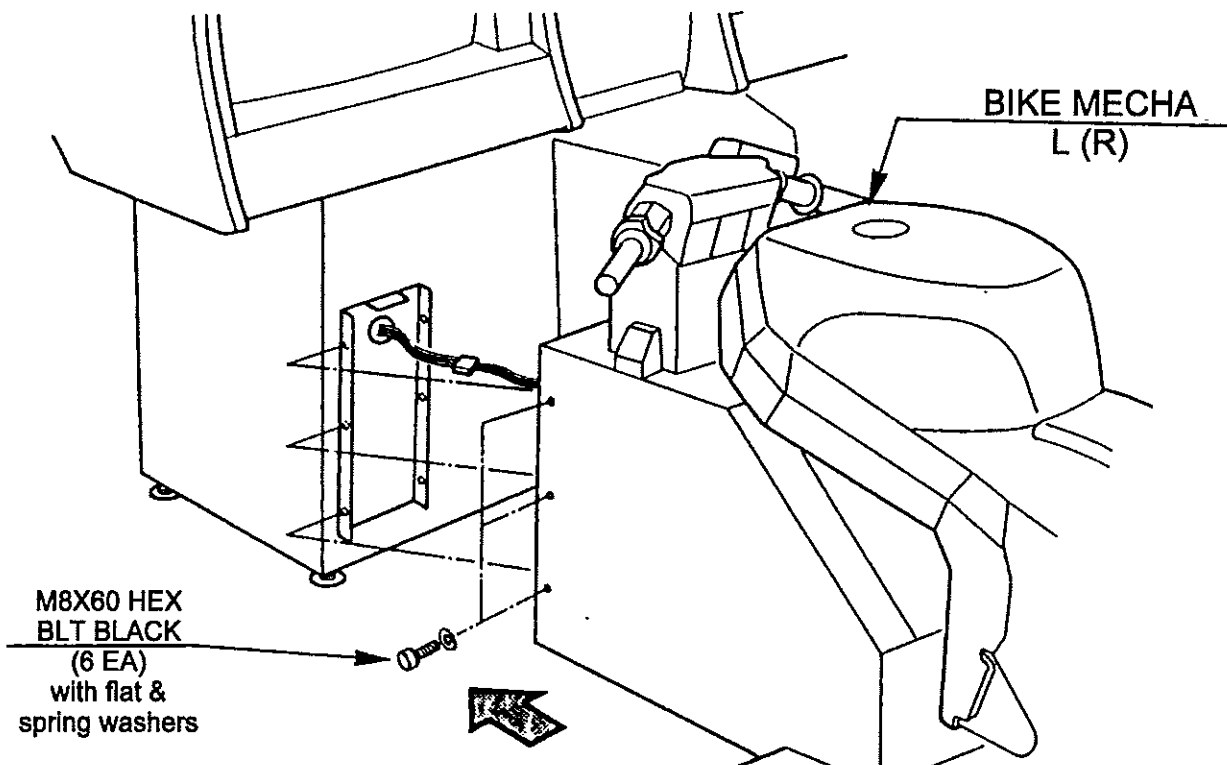
- This operation should only be carried out by **QUALIFIED SERVICE PERSONNEL**.

1. Remove the **SHIPPING BRACKET** installed at the time of shipment and replace **BANK GUARD L (R)**.
2. Connect the wiring connector.
3. Be sure to connect the **EARTH RING TERMINAL** to the earthing point just inside the **FRONT LOWER CABINET** (on the upper mount plate).
4. Adjust the height of the front cabinet (using leg adjusters) so that the bike frame's mounting holes line up with the mount bracket on the front cabinet.
5. Secure the bikes to the front cabinet using the **M8 bolts** provided (total of 12 bolts).

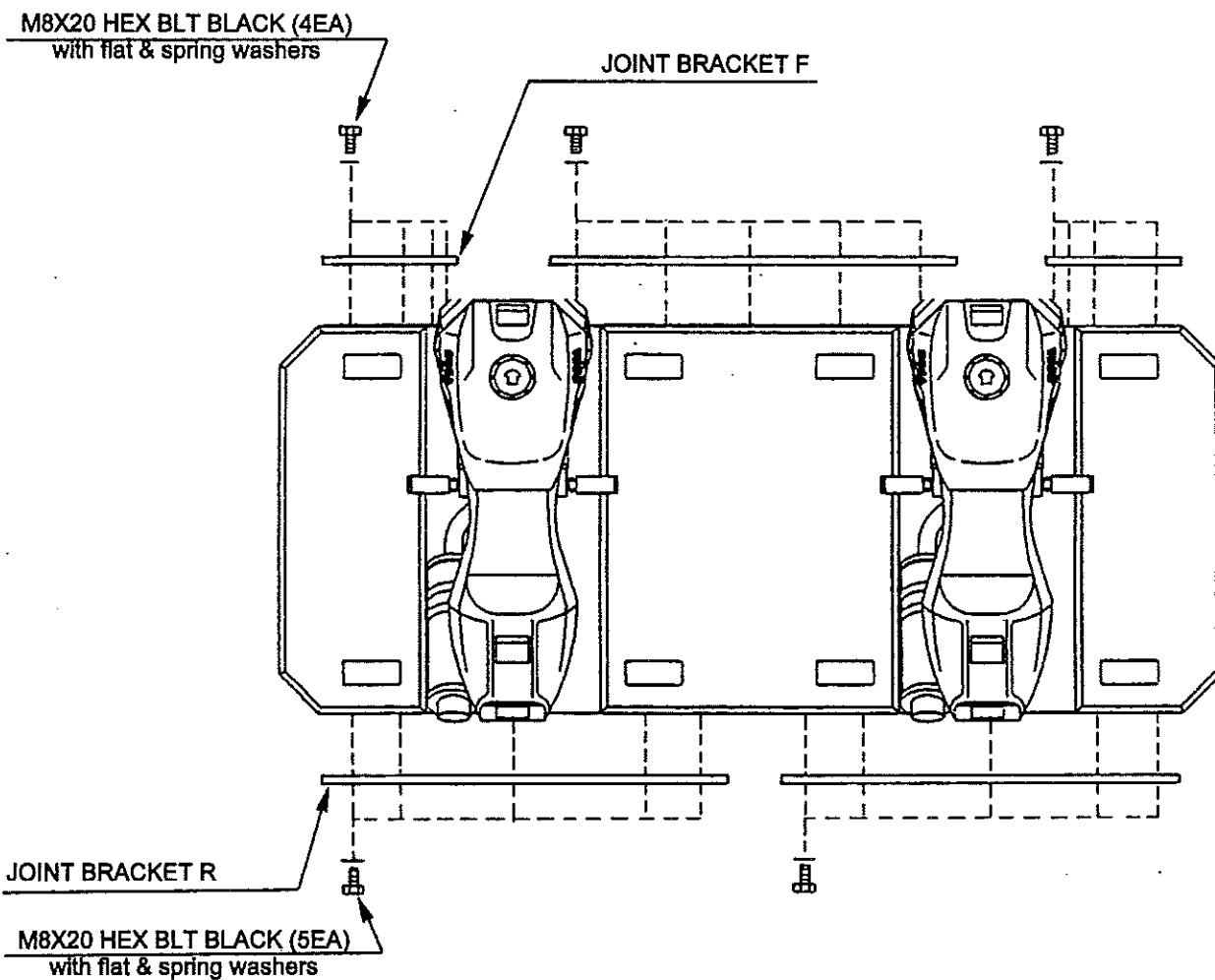
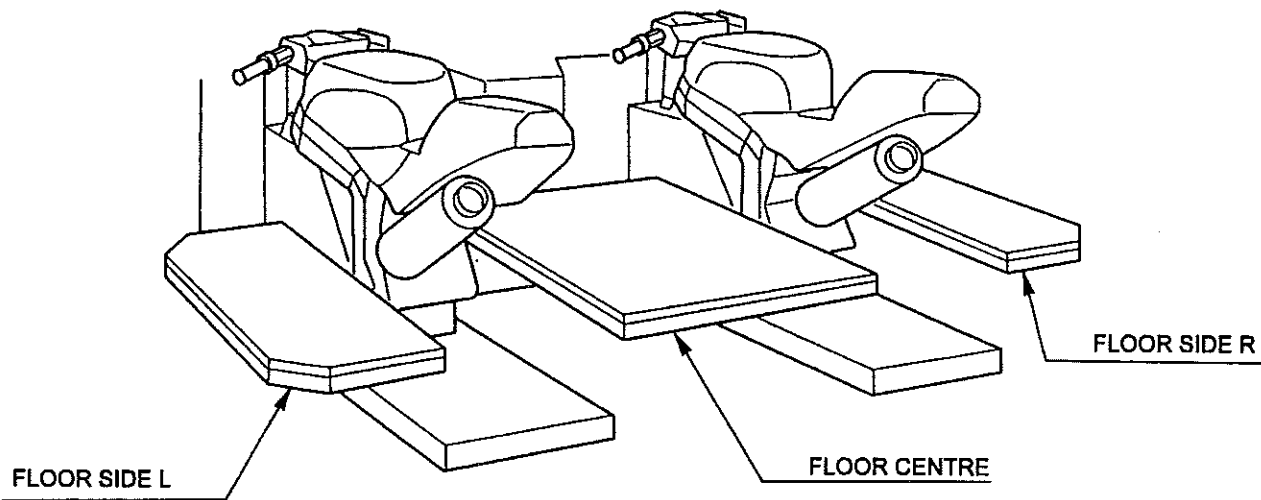
SCREW (4)



SHIPPING BRACKET



6. Install FLOOR SIDE L, FLOOR SIDE R & FLOOR CENTRE. At this time, adjust the FLOORS' leg adjusters so that they are level.
7. Using the JOINT BRACKETS, secure each floor to the bikes' floors.



3.4.4. SECURING IN PLACE (LEG ADJUSTERS)



CAUTION!

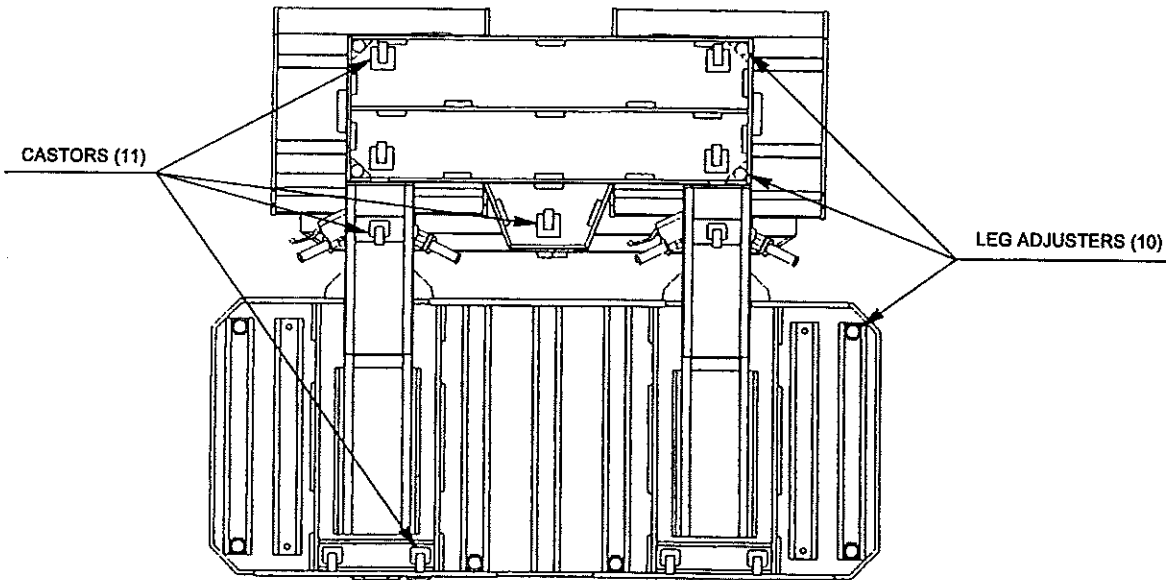


IMPORTANT!

- Make sure all of the leg adjusters are in contact with the floor. If they are not the machine may move and cause injury. This operation requires 2 people.
- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

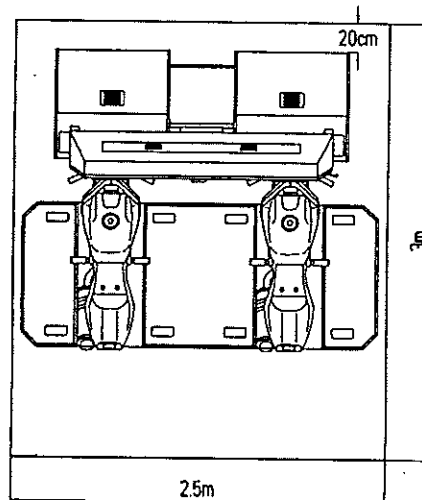
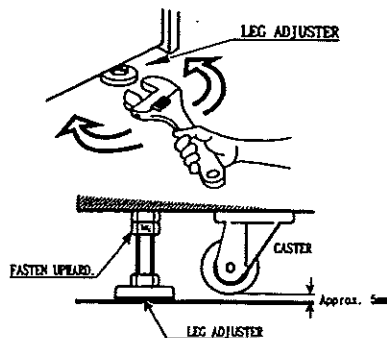
This machine has a total of 11 castors (5 for the front cabinet and 6 for the rear cabinet) and 10 leg adjusters (6 for the front cabinet and 4 for the rear cabinet). When the installation position is decided. Unscrew the leg adjusters so that they raise each castor a minimum of 5mm from the floor. Make sure the machine is level.

1. When choosing the installation position, be sure to allow enough room for the players to access the machine safely from all sides. Be aware that the bikes themselves move approximately 20cm from side to side.
2. Lower all of the leg adjusters so that they touch the floor. Using a spanner, make the machine level on the floor.
3. Raise the whole machine so that the castors are approximately 5mm above the floor. After making adjustments, lock the position of the leg adjusters by moving the locking nut upwards.



After securing the leg adjuster bolts, fully tighten all bolts temporarily attached in 1~3 above.

Ensure adequate ventilation is maintained as detailed right.



3.4.5. CONNECTION TO THE POWER SUPPLY



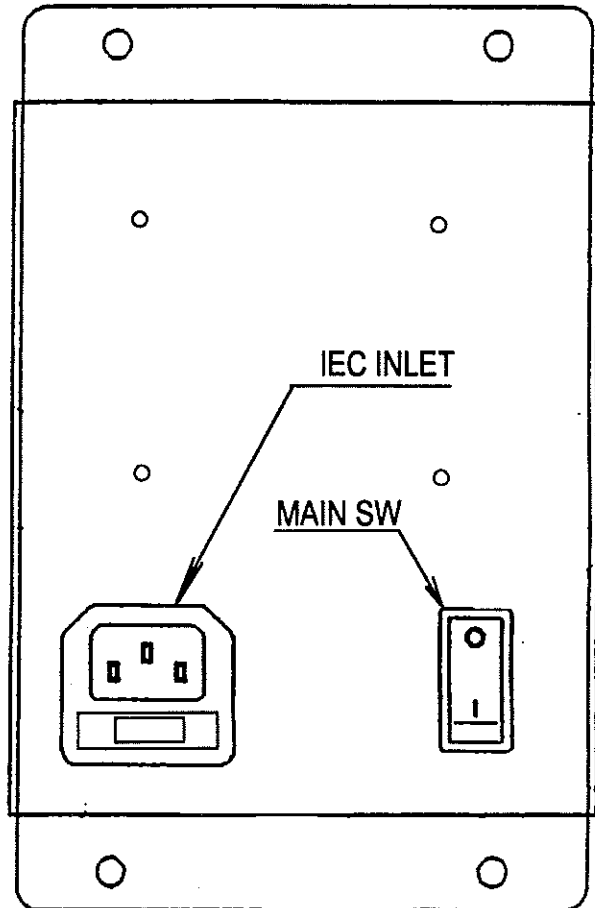
WARNING!



IMPORTANT!

- This operation may only be carried out once the machine has been completely assembled.
- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

The AC Unit is located on the rear of the lower front cabinet. Using the power lead supplied connect the IEC inlet to the mains socket at the wall.



3.4.6. ASSEMBLY CHECK



IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

In the TEST MODE, perform the following checks to ensure that the assembly of the machine has been performed correctly and that the IC Board is functioning satisfactorily.

Perform the following:

MEMORY TEST

MEMORY TEST

```
<ROM>
IC12 GOOD IC13 GOOD
IC10 GOOD IC11 GOOD IC8 GOOD IC9 GOOD
IC6 GOOD IC7 GOOD IC4 GOOD IC5 GOOD
<RAM> CPU BOARD
IC12 GOOD IC13 GOOD IC14 GOOD IC15 GOOD
IC16 GOOD IC17 GOOD
IC41 GOOD IC42 GOOD IC43 GOOD IC44 GOOD
IC65 GOOD IC66 GOOD
<RAM> VIDEO BOARD
IC30 GOOD IC31 GOOD IC32 GOOD IC33 GOOD
IC35 GOOD IC36 GOOD IC37 GOOD IC38 GOOD
IC39 GOOD IC40 GOOD IC41 GOOD IC42 GOOD
IC43 GOOD IC45 GOOD IC46 GOOD
IC47 GOOD IC48 GOOD IC49 GOOD IC50 GOOD
IC54 GOOD IC55 GOOD
IC57 GOOD IC58 GOOD IC59 GOOD
IC75 GOOD IC76 GOOD IC77 GOOD IC78 GOOD
IC79 GOOD IC60 GOOD IC81 GOOD IC82 GOOD
```

PRESS TEST BUTTON TO EXIT

The MEMORY TEST is for checking the on-board memory ICs.

GOOD is displayed for normal ICs.

BAD is displayed for abnormal ICs.

When the test is completed, if the results are as shown to the left, all is satisfactory. If the test did not complete, there may be some IC malfunction.

After finishing the test, press the TEST button to exit.

T.G.P. TEST

T.G.P. TEST

```
IC47 GOOD
IC56 GOOD
IC60 GOOD
IC64 GOOD
```

PRESS TEST BUTTON TO EXIT

The T.G.P. TEST is for checking the on-board T.G.P. memory ICs (screen display-related ICs).

GOOD is displayed for normal ICs.

BAD is displayed for abnormal ICs.

When the test is completed, if the results are as shown to the left, all is satisfactory. If the test did not complete, there may be some IC malfunction.

After finishing the test, press the TEST button to exit.

INPUT TEST

INPUT TEST	
BANK	80H
ACCEL	80H
BRAKE	80H
START/VIEW	OFF
PUNCH	OFF
KICK	OFF
COIN CHUTE#1	OFF
COIN CHUTE#2	OFF
SERVICE	OFF
TEST	OFF

PRESS TEST BUTTON TO EXIT

The INPUT TEST is for checking each switch and VR. VR value setting may also be performed using this screen.

As each switch is pressed, the display changes from OFF to ON. If all works satisfactorily, the wiring and switch are functional.

After finishing the test, press the TEST button to exit.

OUTPUT TEST

OUTPUT TEST	
START/VIEW LAMP	OFF
BRAKE LAMP	OFF
RACE LEADER LAMP	OFF
> EXIT	

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

The OUTPUT TEST is for checking each lamp.

Select the lamp to be tested using the SERVICE BUTTON.

Press the TEST button to change the status of the lamp from OFF to ON and OFF again.

If the lamp lights up, the wiring and lamp are functional.

To finish the test, select EXIT with the SERVICE button and press the TEST button to exit.

SOUND TEST

SOUND TEST	
NO.	0

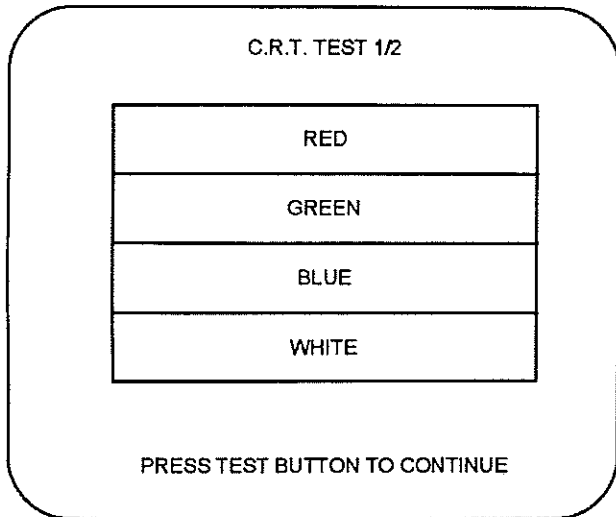
SELECT WITH SERVICE BUTTON
PRESS TEST BUTTON TO EXIT

The SOUND TEST is for checking sound related ICs and each speaker.

Each time the SERVICE button is pressed, the number displayed increments by 1 and the next sound is played.

After finishing the test, press the TEST button to exit.

C.R.T. TEST

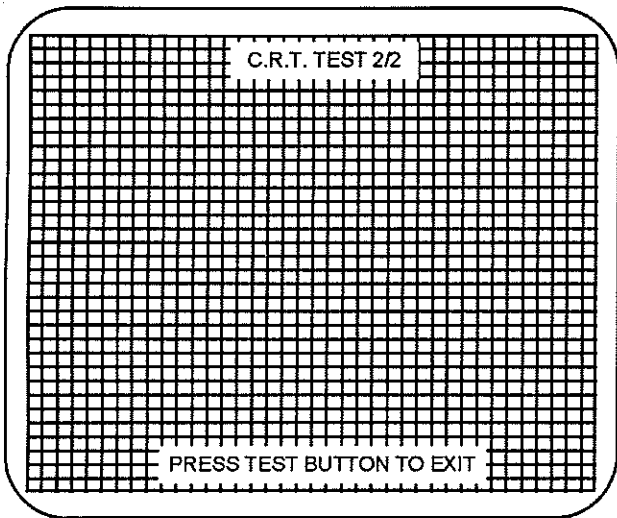


The C.R.T. TEST is for checking monitor colour, brightness, contrast and scaling.

Screen 1/2 enables colour, brightness & contrast adjustments to be made.

Make sure that each of the colour bars are darkest at the left-hand side and brightest at the right-hand side (the right-hand edge of each colour bar should be sharp).

Press the TEST button to continue to the next screen.



Screen 2/2 enables scaling adjustments to be made.

Make sure that the cross-hatch lines are fully within the visible area of the screen and are spaced in equally from all 4 edges.

Press the TEST button to exit.

PERFORM ALL OF THE ABOVE AT THE TIME OF THE MONTHLY INSPECTION.

3.5. MOVING THE MACHINE



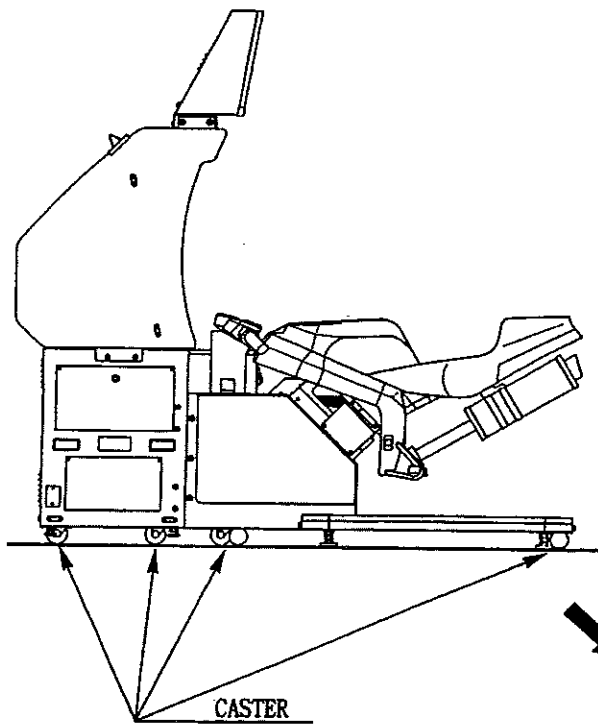
CAUTION!

- When moving the machine, be sure to remove the plug from the power supply. Moving the machine with the plug inserted can cause the power cord to be damaged, resulting in a fire or electric shock.
- Since this machine is of heavy construction (approximately 470kg), its leg adjusters must be retracted when moving the machine. Where there are step-like differences in level, it may be necessary to disassemble the cabinets and move them separately.
- During movement pay careful attention so that the casters or leg adjusters do not damage any other cabling laid on the floor. Such damage could result in a fire or electric shock.

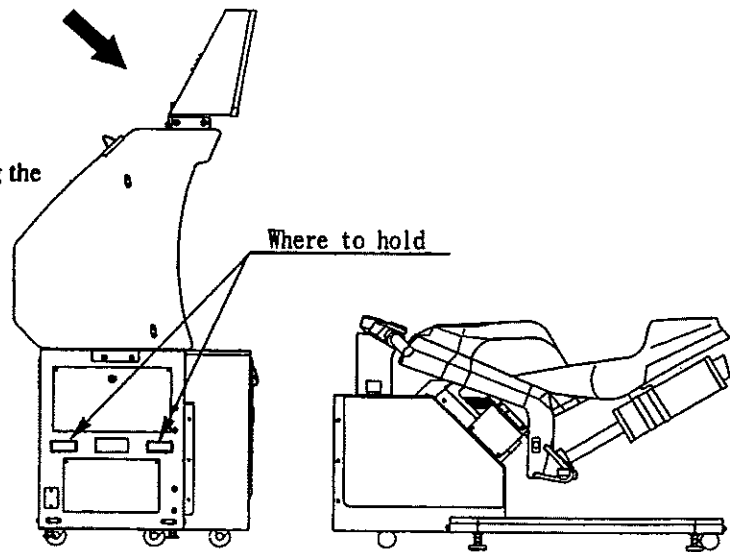


IMPORTANT!

- This operation should only be carried out by **QUALIFIED SERVICE PERSONNEL**.
- This procedure should be carried out by a minimum of 2 people as lifting heavy objects may cause physical injury.



On level surfaces, move the machine by causing the Casters to make contact with the surfaces.



3.6. FUSES



WARNING!



IMPORTANT!

- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any fuse.

- FUSES should only be replaced by QUALIFIED SERVICE PERSONNEL.

There are a number of fuses used on this machine to protect the user and the machine from damage. Only replace the fuse once you have removed the cause of its failure. Detailed below is a list of the fuses used, their location and if relevant P.C.B. reference:

PART NUMBER	LOCATION	TYPE & DETAILS	QTY
514-5078-5000	IEC INLET (EP1302)	5A 250V 20mm T CERAMIC	1 per IEC inlet
514-5080-10000UK	TRANSFORMER 12.5V OUTPUT	10A 250V 32mm T CERAMIC	1 per 12.5V output
514-5080-1600UK	TRANSFORMER 19V OUTPUT	1.6A 250V 32mm T CERAMIC	1 per 19V output
838-11650--	F1, EQ. AMP BD	6.3A 250V 20mm T GLASS	1 per BD
400-5264-91	F1, SW REGU	4A 250V 30mm T GLASS	1 per SW REGU
838-11856	F1, CONN BD	7A 250V 32mm T GLASS	1 per BD

There are also fuses located on the Monitor PCB. Refer to the relevant Monitor manual supplied to reference these fuses.

3.7. REPLACEMENT OF FLUORESCENT LAMP AND OTHER LAMPS



WARNING!



IMPORTANT!

- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any lamp.

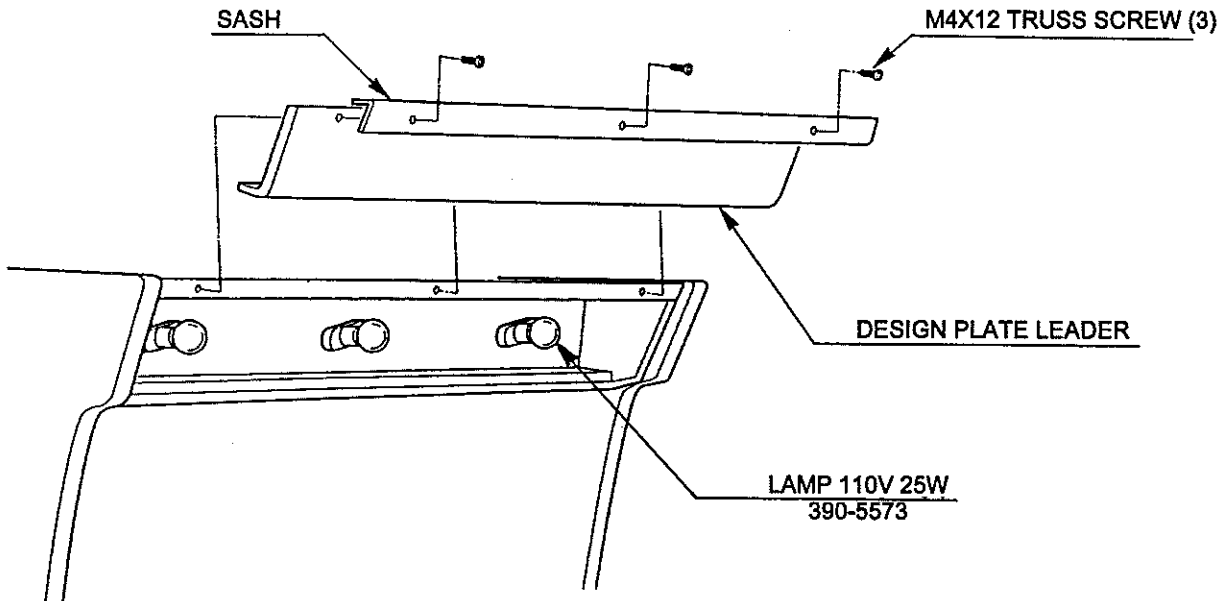
- Lamps should only be replaced by QUALIFIED SERVICE PERSONNEL.

3.7.1. FLUORESCENT LAMP REPLACEMENT

1. Switch the power off to the machine and remove the plug from the wall socket.
2. Remove the billboard by removing the lower sash and loosening the left and right sashes.
3. Withdraw the plate downwards to access the fluorescent tube.
4. Disconnect the end caps from the tube and pull the tube out of the steel clips using a twisting motion.
5. Replacement is the reverse of removal.

3.7.2. LEADER LAMP REPLACEMENT

1. Switch the power off to the machine and remove the plug from the wall socket.
2. Remove the SASH and the DESIGN PLATE LEADER to access the lamps.



3.8. HANDLE MECHANISM MAINTENANCE



WARNING!



IMPORTANT!

- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any VR.

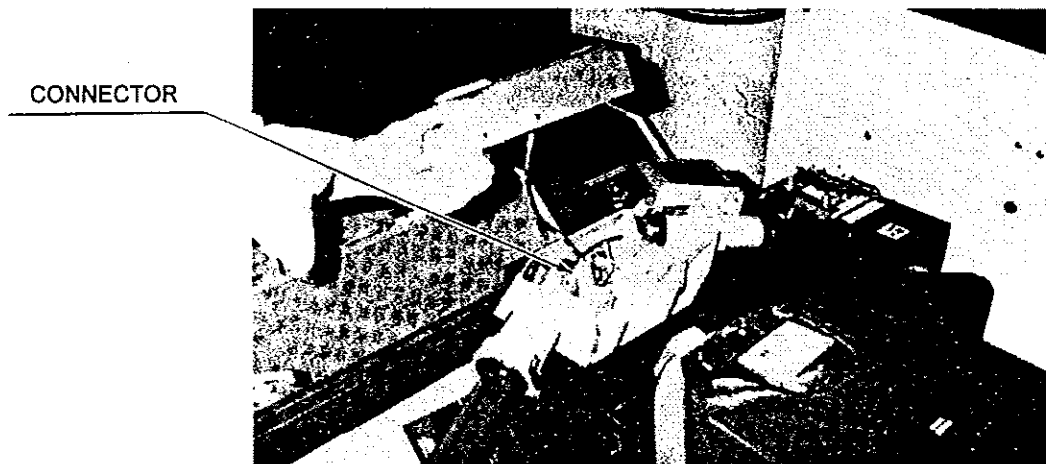
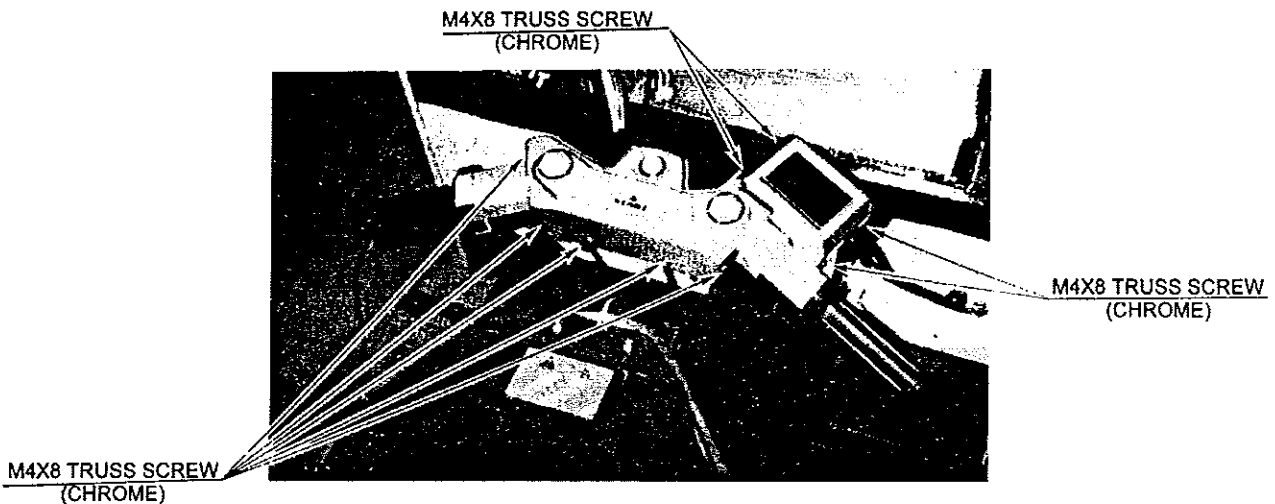
- VRs should only be replaced by QUALIFIED SERVICE PERSONNEL.

In the TEST MODE, if the accel & brake VR values do not lie within the specified range, some adjustment of the VR gear may be necessary.

When replacing the START SWITCH, remove only the HANDLE COVER. Disconnect the wiring connectors to the switch and then remove the switch from the HANDLE COVER.

To remove the HANDLE COVER & BRAKE COVER:

1. Turn the power off to the machine and remove the plug from the wall socket.
2. Remove the 5 screws that hold the HANDLE COVER.
3. Disconnect the wiring connector attached to the HANDLE COVER.
4. Remove the 4 screws that hold the BRAKE COVER.



3.8.1. ACCELERATOR / BRAKE VR ADJUSTMENT

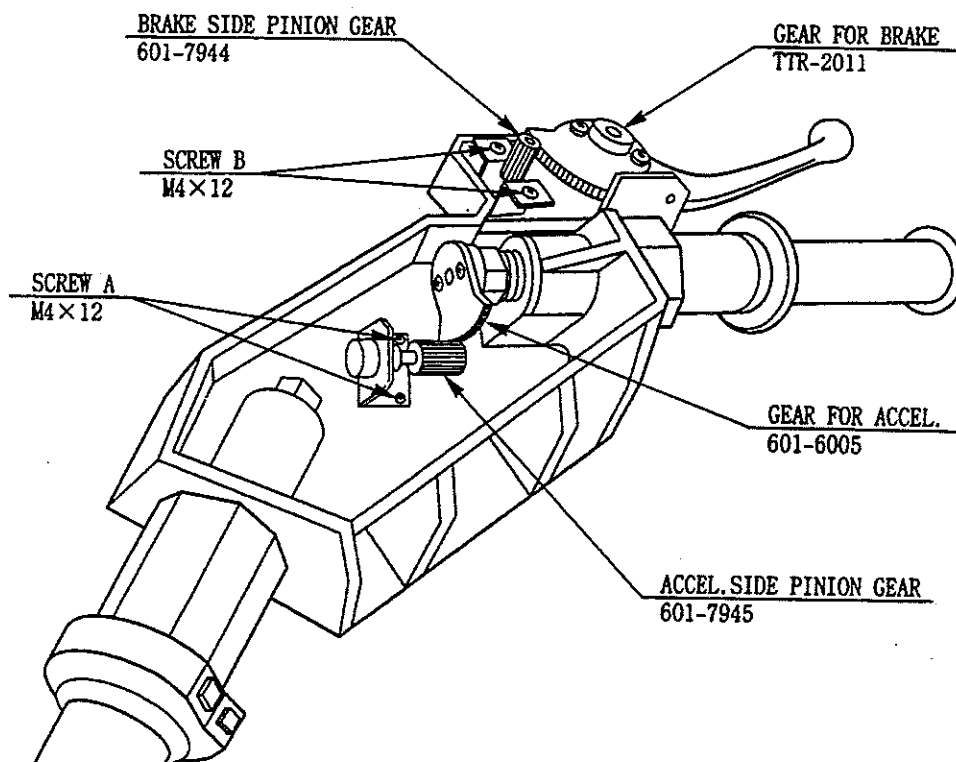
This machine has VR setting functions. The VR should function in the game satisfactorily if the VR shaft can rotate freely throughout the full movement of the accelerator grip or brake lever. Display the INPUT TEST in the TEST MODE, and make the following adjustments:

ACCELERATOR ADJUSTMENTS:

1. Remove the HANDLE COVER.
2. Loosen Screw A and move the GEAR to ensure that the variation in the VR value is within $20H \pm 10H$.
3. If the value is within the specified range, retighten Screw A.
4. Perform the VR setting procedure in Section 5.2.9.

BRAKE ADJUSTMENTS:

1. Remove the HANDLE COVER and then the BRAKE COVER.
2. Loosen Screw B and move the GEAR to ensure that the variation in the VR value is within $20H \pm 10H$.
3. If the value is within the specified range, retighten Screw A.
4. Perform the VR setting procedure in Section 5.2.9.

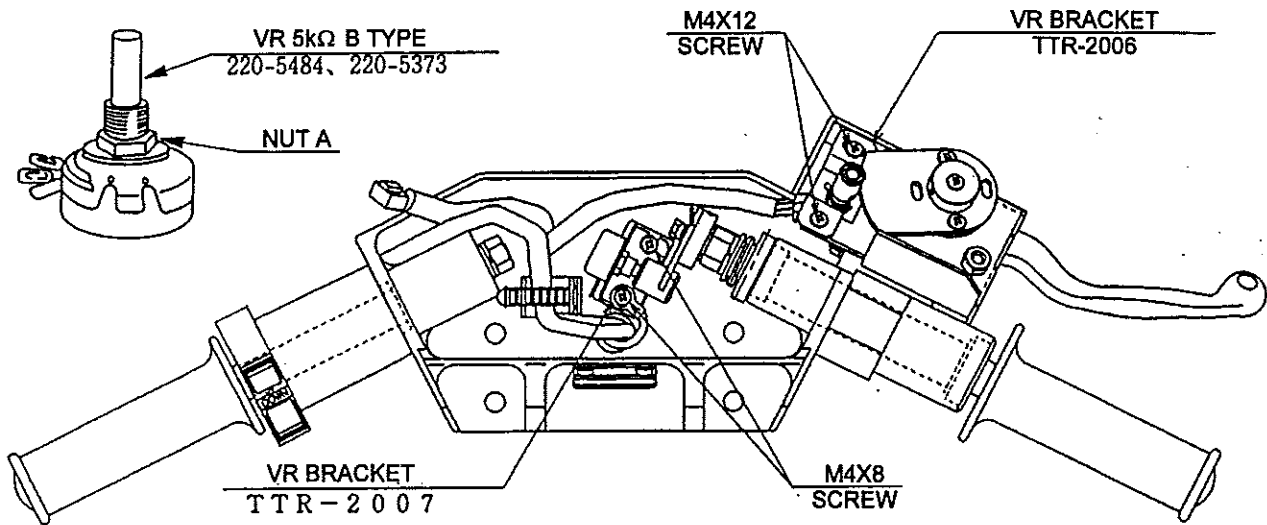


3.8.2. ACCELERATOR / BRAKE VR REPLACEMENT

To set up the VR, turn the VR shaft to the end of travel of the shaft where the VR value is lowest, engage the gears and secure the VR bracket. Make sure that the accelerator grip and the brake lever are both set to minimum. The VR should function in the game satisfactorily if the VR shaft can rotate freely throughout the full movement of the accelerator grip or brake lever.

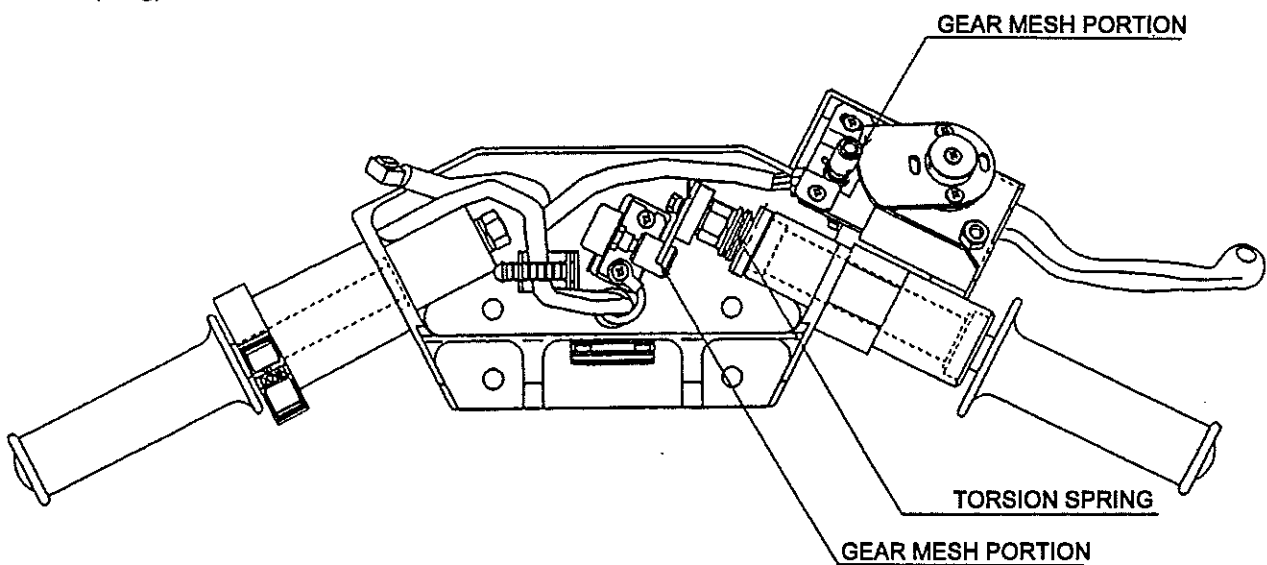
REPLACEMENT PROCEDURE:

1. Take out the 2 screws that secure the VR bracket and remove the bracket from the handle mecha assembly.
2. To remove the PINION GEAR, loosen the 2 set screws securing the gear to the shaft of the VR to be replaced.
3. Take out Nut A from the VR shaft to remove the VR from the bracket.
4. Replacement is the reverse of removal, using a new VR.
5. Perform the VR setting procedure in Section 5.2.9.



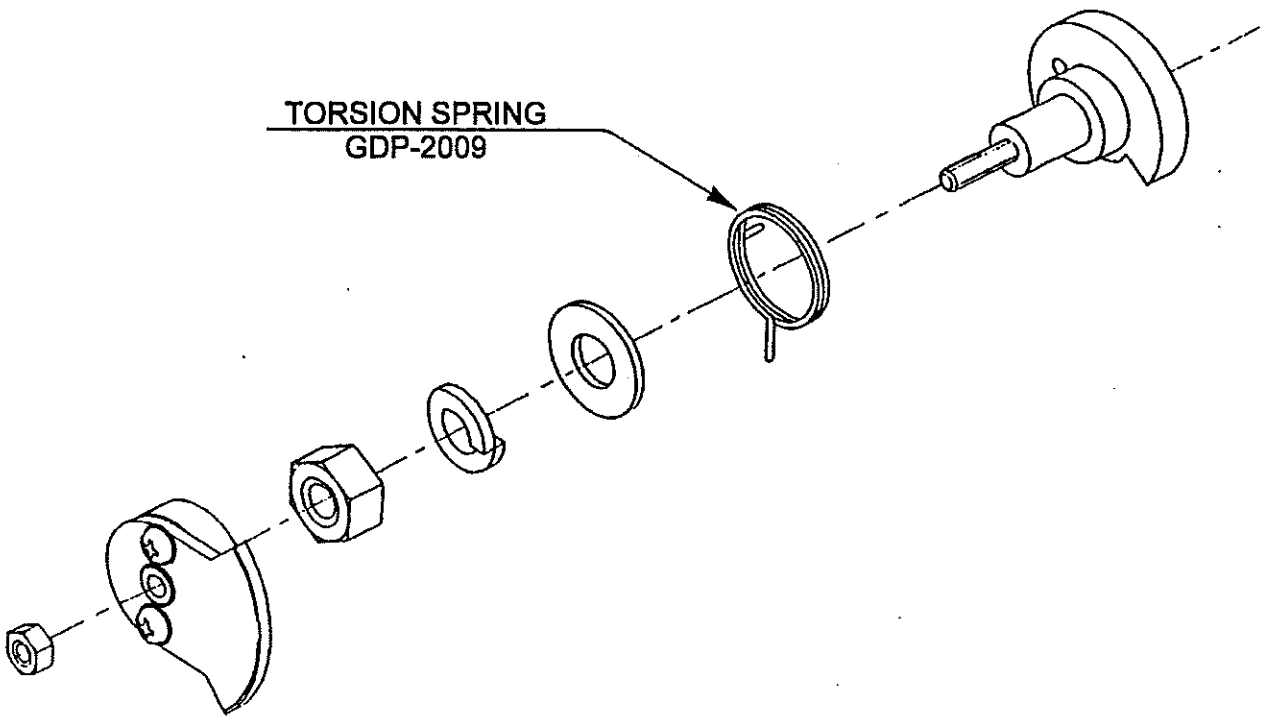
3.8.3. GREASING

Apply spray grease once every 6 months at the 2 places detailed below (engagement portion of gears and on the spring):



3.8.4. SPRING REPLACEMENT

As shown below, remove parts to replace the torsion spring:



3.9. BIKE MECHANISM MAINTENANCE



WARNING!



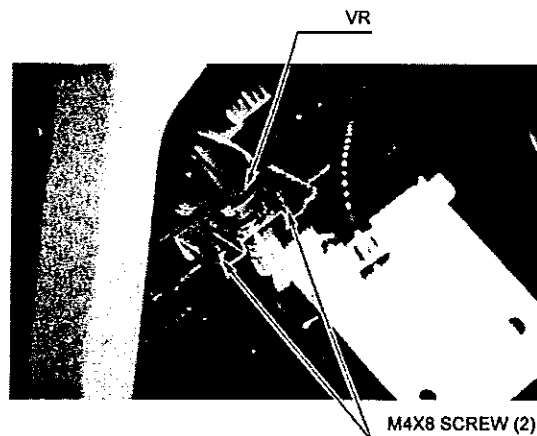
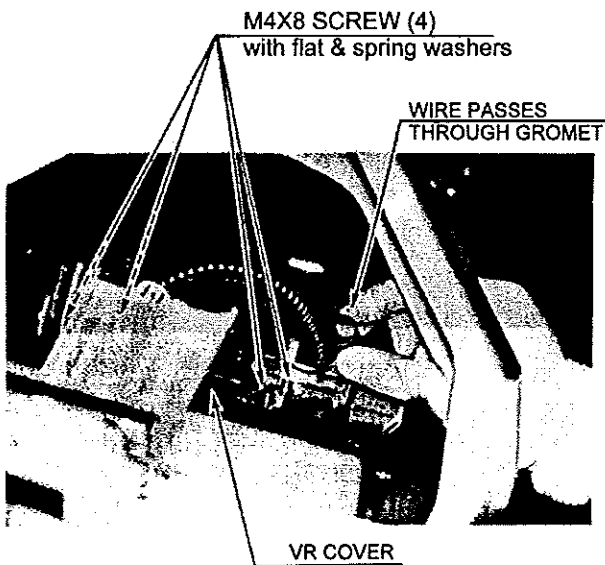
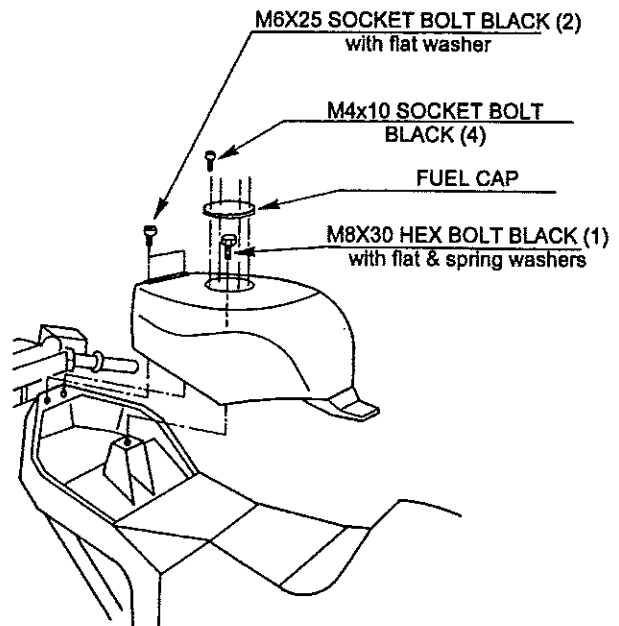
IMPORTANT!

- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any VR.

- VRs should only be replaced by QUALIFIED SERVICE PERSONNEL.

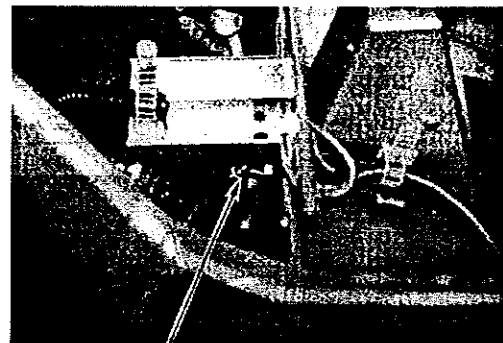
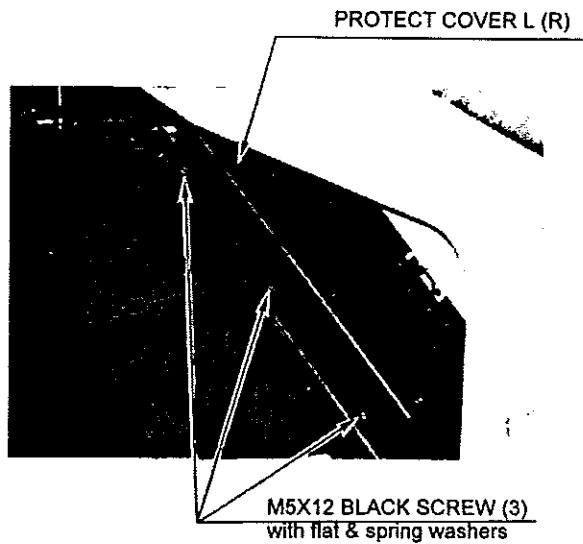
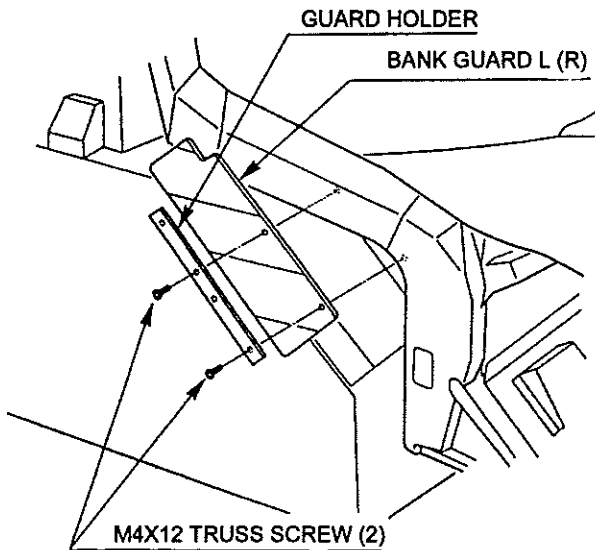
3.9.1. VR REPLACEMENT

1. Remove the 4 M4 socket bolts securing the FUEL CAP and remove the FUEL CAP.
2. Remove the 2 M6 socket bolts and the M8 hexagon bolt securing the TANK and remove the TANK.
3. Remove the 4 M4 screws securing the VR COVER and pull aside the VR COVER.
4. Remove the 2 M4 screws securing the VR BRACKET & VR, unplug the wiring connector and remove the VR with its bracket.
5. When replacing the VR, be sure to set the VR to the centre of its travel and check that it rotates freely throughout the travel of the bike as it banks from left to right.
6. Replace the TANK and FUEL CAP.
7. Perform the VR setting procedure in Section 5.2.9.



3.9.2. GREASING

1. Remove the 2 M4 screws securing BANK GUARD L & BANK GUARD R (total of 4 screws).
2. Remove the 4 M4 screws securing the VR COVER.
3. Remove the 3 M5 screws securing PROTECT COVER L & PROTECT COVER R (total of 6 screws).
4. Apply grease to the portions shown (remove the dust cap to access the grease nipple).
5. Replace the covers.



3.10. MONITOR ADJUSTMENT



WARNING!

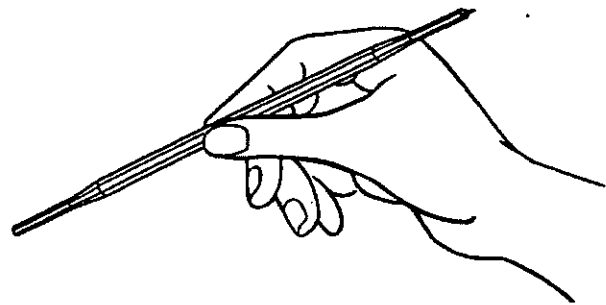
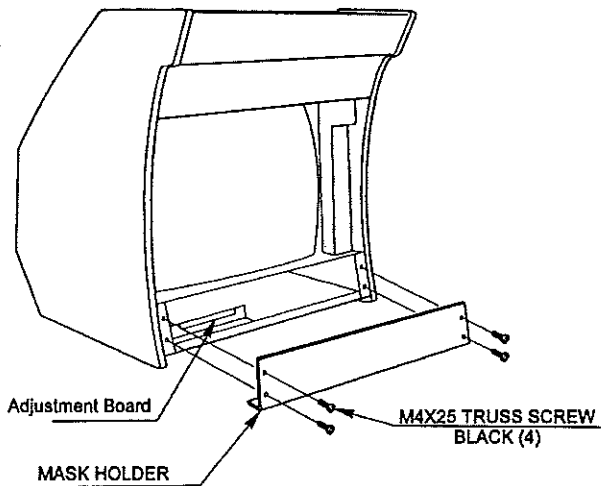


IMPORTANT!

- Monitor adjustments have been made at the time of shipment. There may however, be certain circumstances on installation (proximity to large steel structures, etc) that affect the adjustment.
- When making adjustments, be sure to always use a plastic adjustment tool to avoid electric shock.
- Erroneous adjustment may irretrievable damage. Be sure that adjustment is actually required and not just a degauss (see section 5.1).
- Refer to the Monitor Service Manual supplied with this machine.

To gain access to the monitor ADJUSTMENT BOARD, follow the procedure below:

1. Remove the 4 M4 screws securing the MASK HOLDER and remove the MASK HOLDER. Note that there is an earth wire attached to the back of the MASK HOLDER - it is not essential that this is removed to access the ADJUSTMENT BOARD.
2. The ADJUSTMENT BOARD is in the bottom left-hand corner of the monitor box.
3. Follow the adjustment method as detailed in the Monitor Service Manual supplied with this machine.



FOR ADJUSTMENT, USE A PLASTIC TOOL

3.11. TROUBLESHOOTING



IMPORTANT!

- These procedures should only be carried out by QUALIFIED SERVICE PERSONNEL.

If a problem occurs, first check the wiring connections.

PROBLEMS	CAUSE	COUNTERMEASURES
When the main switch is turned ON, the machine is not activated	The power is not ON.	Firmly insert the plug into the outlet.
	Incorrect power source/voltage.	Make sure that the power supply/voltage are correct.
	AC Unit CIRCUIT PROTECTION DEVICE (ie; fuse) was activated due to an instantaneous overcurrent.	First, remove the cause of overcurrent and reinstate the circuit protection device to its original status. Then identify the cause of the fault on the item which caused the overcurrent & fix.
The colour image on the screen is incorrect	Incorrect monitor adjustment.	Make appropriate adjustments. Refer to the Monitor Service Manual
The on-screen image of the monitor sways and/or shrinks	The power source and voltage are not correct.	Make sure that the power supply and voltage are correct.
Sound is not emitted	Sound volume adjustment is not correct.	Adjust the volume setting on the VTS bracket. Section 5.1
	Malfunctioning BD and Amp.	Perform Sound Test to check it. Section 5.2
	Connector connection is incorrect	Check connector connection from Base to Speaker
Operation of Accelerator, Brake and bank controls are not satisfactory	V.R. position deviated	Adjust V.R. value in the test mode. Section 5.2
	VR malfunctioning	Replace the V.R. Section 3
	ADJUST GEAR's engagement is not correct	Adjust the engagement of ADJUST GEAR. Section 3
SHIFT BUTTONS doesn't operate satisfactorily	Switch malfunctioning	Replace the switch. Section 3
The fluorescent lamp does not light up	Fluorescent lamp needs replacement	Replace the fluorescent lamp. Section 3
	The connector is disconnected	Check connector connections in the billboard case. Section 3
The LEADER lamp does not light up	The lamp needs replacement.	Replace the lamp. Section 3
Interactive play is not possible	Communication cable is disconnected	Connect the cable.
	Cable connections are not correct	Connect the cable correctly. Section 3
	Settings for communication play are not correct	Ensure that GAME ASSIGNMENTS settings are correct. Section 3

3.12. GAMEBOARD



WARNING!



IMPORTANT!

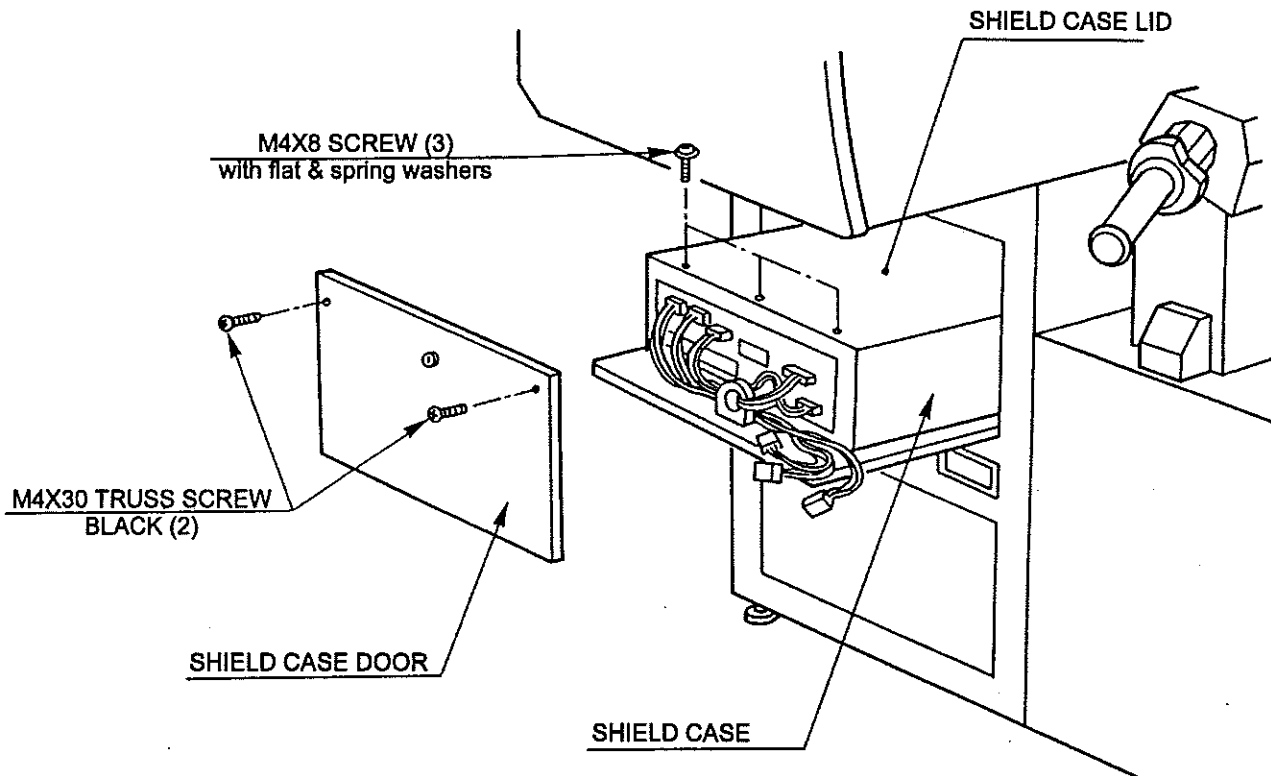
- Turn off the mains power and remove the power cord before opening the machine.

- The GAME BOARD should not require any work to be carried out upon it. All settings and tests can be achieved without access to the GAME BOARD.

- All work to be carried out by QUALIFIED SERVICE PERSONNEL

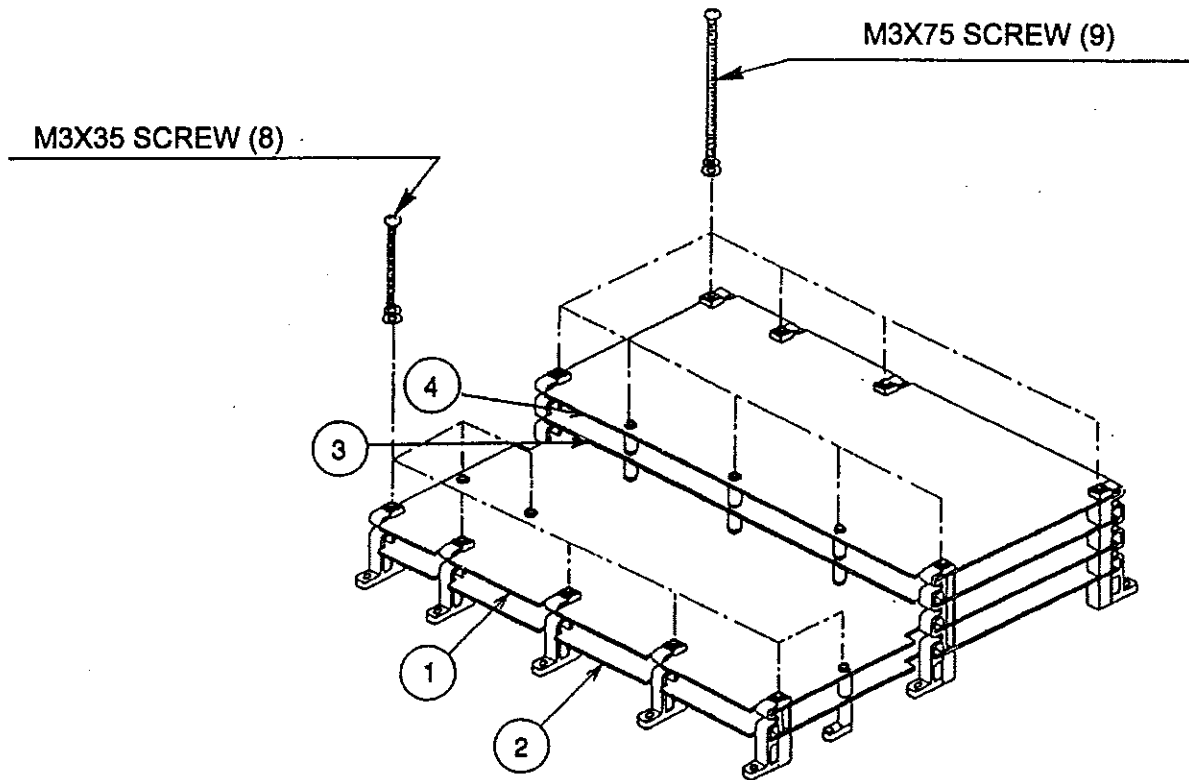
3.12.1. REMOVING THE BOARD

1. Turn off power to the machine and remove the plug from the wall outlet.
2. Remove the 2 M4 screws from the SHIELD CASE DOOR and unlock the door using the key provided. Remove the door.
3. Disconnect all wiring and optical connectors and remove the SHIELD CASE ASSEMBLY.
4. Remove the 3 M4 screws securing the SHIELD CASE LID and remove the lid. The GAMEBOARD is now exposed.



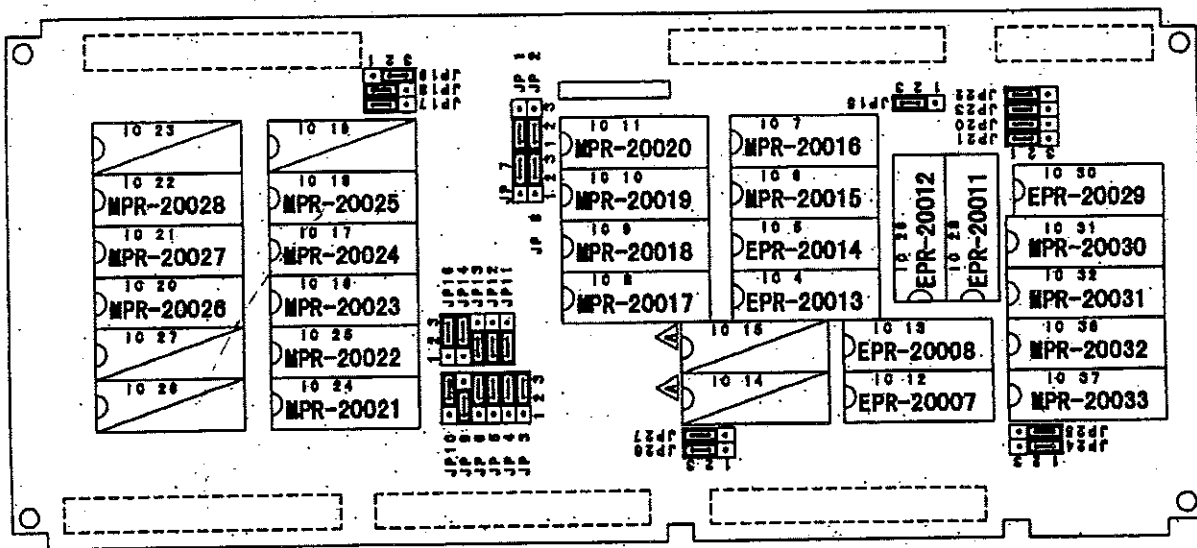
3.12.2.COMPOSITION OF THE GAME BOARD

GAME BOARD MOTOR RAID TWIN (833-13232)



ITEM NUMBER	PART NUMBER	DESCRIPTION
1	837-10848-01-*	MODEL2 A-CRX CPU BD COM
2	837-10849-02-*	MODEL2 A-CRX VIDEO BD COM
3	837-12396	COMM BD MANX TT
4	834-13233	ROM BD MOTOR RAID TWIN

ROM LAYOUT:



3.13. COMMUNICATION PLAY



IMPORTANT!

- Linking machines should only be carried out by **QUALIFIED SERVICE PERSONNEL**.
- During communication play, if communication is interrupted in any way, the game will be halted and the Network Check screen will be displayed.

For this game, 2 machines can be connected to allow up to 4 players to play simultaneously.

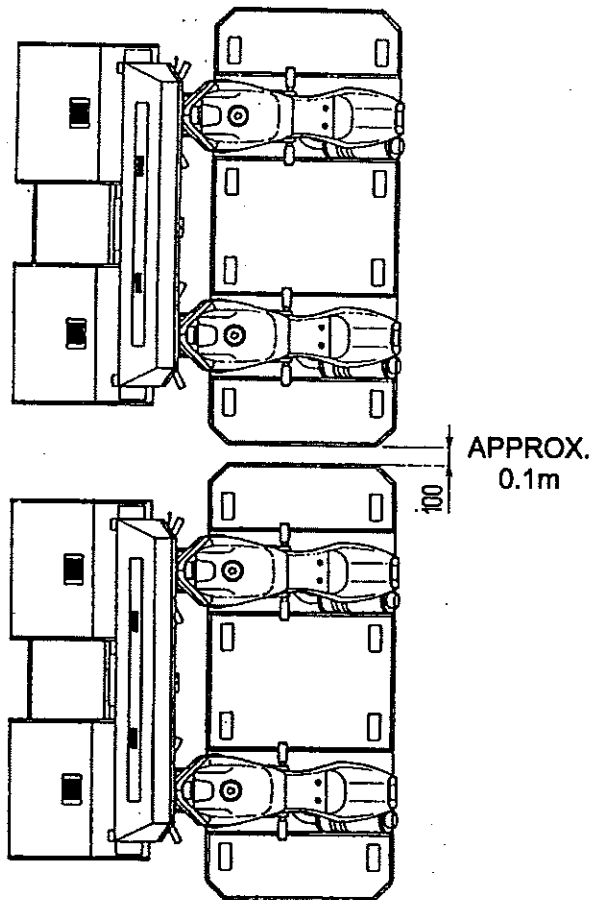


IMPORTANT!

- Mixed communication between TWIN type and DELUXE type machines is not allowed.
- Be careful not to bend the fibre optic cables too much as over-bending may affect the communication performance.

3.13.1. INSTALLATION PRECAUTIONS

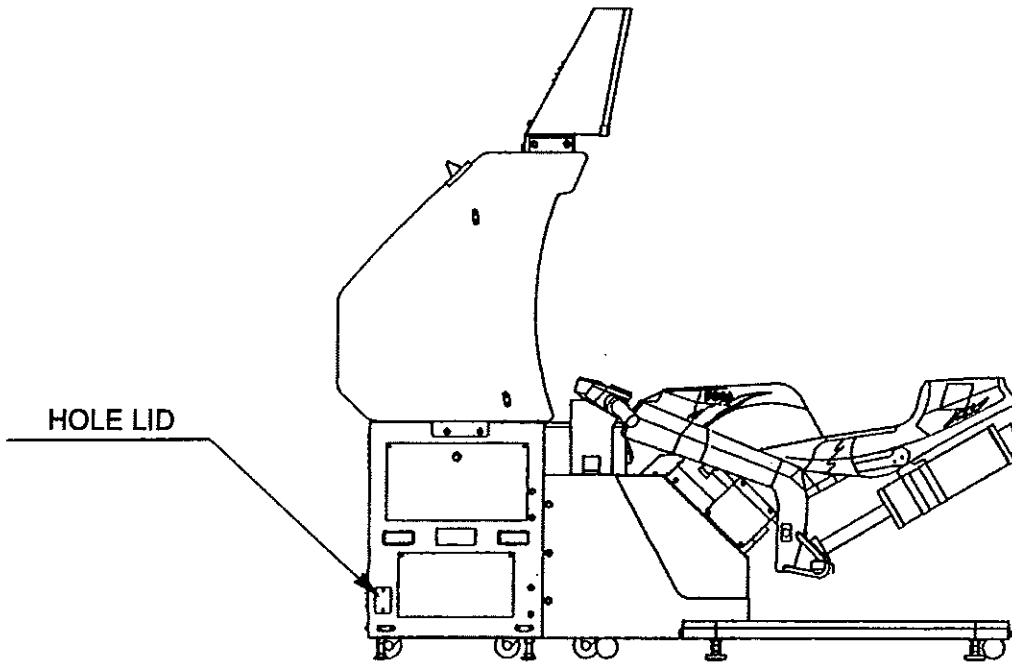
1. When linking a number of machines, be sure that sufficient power is available (3.5A at 230V).
2. Due to the length of the communications cable, the distance between the machines should be approximately 100mm or less.



3.13.2.CONNECTING THE COMMUNICATION CABLES

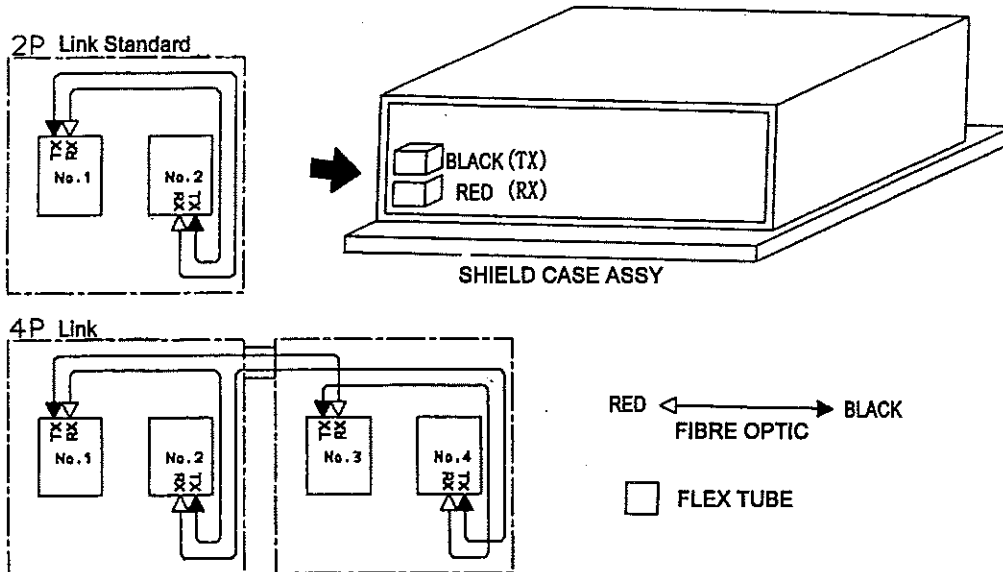
The protect tube supplied with this machine is to protect the fibre optic cables as they pass from one machine to the other. Link the machines together as shown below.

1. Remove the 2 M4 screws securing the HOLE LID on the side of the machine closest to the machine to be linked.
2. Free up the coils of fibre optic cable inside the SHIELD CASE DOOR so that there is enough to link to the other machine.
3. Pass the fibre optics through the protect tube and connectors supplied with the machine and connect the protect tube connectors to the HOLE PLATE also supplied with the machine. This provides good protection for the fibre optics between the machines.



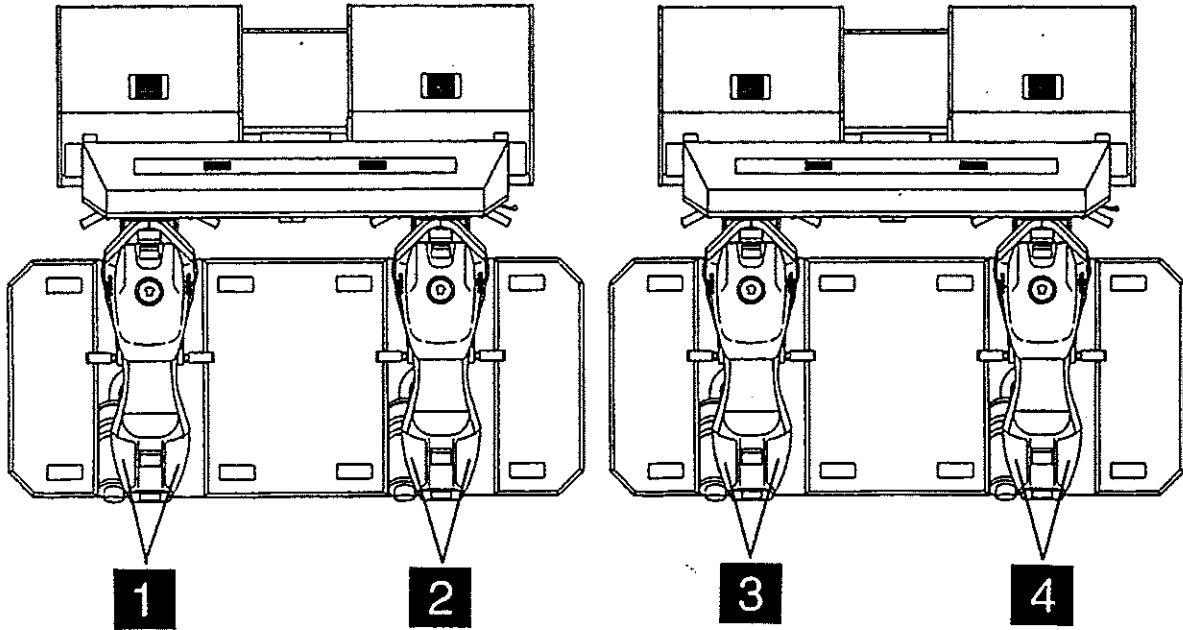
4. Connect the fibre optics in the manner shown below to link the 2 machines.

FIBRE-OPTIC CONNECTIONS



5. Using the screws previously removed, attach the HOLE PLATES to the cabinets

6. Apply the numbering stickers supplied with the machine as shown below



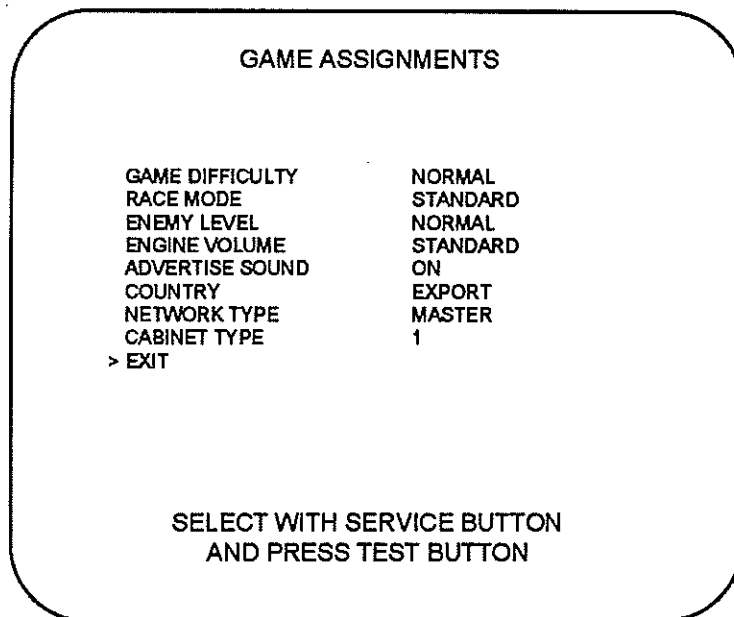
3.13.3.SETTINGS FOR COMMUNICATION PLAY

For interactive play, the GAME ASSIGNMENTS settings need to be changed. One of the seats (normally the left-most seat) should be configured as MASTER under NETWORK TYPE. All other seats are set to SLAVE.

Those seats designated as SLAVE units will take on the settings for GAME DIFFICULTY, RACE MODE, ENEMY LEVEL, ENGINE VOLUME, ADVERTISE SOUND & COUNTRY as designated by the MASTER unit. If the SLAVE units have been set otherwise, those setting will remain ineffective during linked play.

Set the CABINET ID number of each seat. Normally, this starts with number 1 being the left-most seat and the highest number the right-most seat.

Finish making changes to the GAME ASSIGNMENTS on all machines and the exit the TEST MODE simultaneously from all seats. The NETWORK CHECKING screen will be displayed. When the network has been checked and verified, the ADVERTISE screens will be displayed.



3.14. PERIODIC CHECK AND INSPECTION

The items listed below require periodic check and maintenance to retain the performance of the machine and ensure safe operation:



WARNING!



IMPORTANT!

- Be sure to check annually to see if the power cords are damaged. The plug is securely inserted and that there is no dust in the interior of the machine or between the socket and the power cord. Using the product in an unclean condition may cause a fire or electric shock.
- Periodic checks should only be carried out by **QUALIFIED SERVICE PERSONNEL**.

DESCRIPTION	WHAT TO CHECK	INTERVAL
HANDLE MECHA	Check the V.R. value	Monthly
	Check adjust gear engagement	Every 3 months
	Greasing of gears	Every 3 months
ACCELERATOR & BRAKE	Check the V.R. value	Monthly
	Check adjust gear engagement	Every 3 months
	Greasing of gears	Every 3 months
SHIFT LEVER	Check SW	Monthly
	Greasing	Every 3 months
MONITOR / PROJECTOR	Clean screen	Weekly
	Check adjustment	Monthly
SEAT	Rail greasing	Monthly
GAME BD	Memory Test	Monthly
	Game Assignments	Monthly
INTERIOR	Clean	Annually
POWER SUPPLY CORD	Check condition	Annually
CABINET SURFACE	Clean	As required
CONTROL PANEL	Lamp operation	Monthly
	Check switch operation	Monthly
CONTROLLER (GUN)	Clean	As required
	Check sighting	Weekly
	Check switch operation	Monthly
COIN MECHANISM	Check SW (If Fitted)	Monthly

4. HOW TO PLAY

4.1. PRECAUTIONS FOR USE

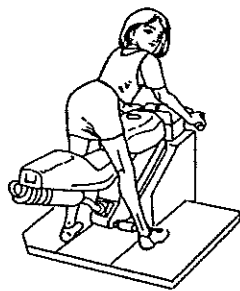


IMPORTANT!

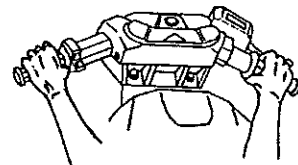
- To prevent accidents, provide sufficient space for crowded use. The bikes move approximately 20cm from side to side, so there should be enough space for people to watch and not be in danger of being hit by the bikes.
- Check that the bikes' bank guards are intact and in good condition. The bank guard is intended to prevent finger entrapment injury.
- Check that all leg adjusters are adjusted properly and that the machine is level and cannot move.

To avoid injury to players, be sure to pay careful attention to those who are playing the game:
It should be stressed that the following people are discouraged from playing the game as they may experience some harm:

- People who have suffered from epilepsy or loss of consciousness due to playing video games.
- Pregnant women.
- Drunk people.
- People susceptible to motion sickness.
- People abusing the game.
- Those whose feet cannot be placed on the floors when seated on the bike.



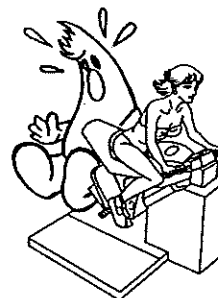
- Be sure to take a firm grip on the handlebar.



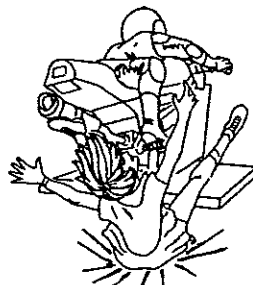
- The game should not be played when wearing high-heeled shoes.



- Do not enter the area around the game that is marked out by the floor area so as to avoid collisions with the bike.



- Do not ride tandem.



- Do not place items on the floors when playing the game.



4.2. GAME PLAY

The following explanations apply to the case that the product is functioning satisfactorily. Should there be any moves different from the following, there may be a fault. Immediately identify the cause of the fault and eliminate its source.

The following instructions apply to a linked twin machine operating in isolation to others.

1. Sit on the bike.
2. As viewed when facing the monitor the 1P side is on the left-hand side. Between the bike seats there is a coin chute tower. Inserting one play's worth of coins allows the ENTRY screen to appear. Up to 9 credits can be counted at one time. Coins inserted after the count has reached 9 credits will neither be counted or returned.
3. When the on-screen time counts down to 0 (or when the other bike has finished the entry procedure, the screen displayed is that of PLAYER SELECT.
4. In the PLAYER SELECT mode, choose the desired bike & rider out of the 4 characters. Their characteristics are displayed in the upper left portion of the screen. To select the character, incline the bike from left to right and either press the START/VIEW button or twist the throttle to decide.



LO

ATTACK	☆☆☆☆☆
ACCELE	☆☆☆
GRIP	☆☆☆
SPEED	☆☆☆☆



ROBIN

ATTACK	☆☆
ACCELE	☆☆☆☆
GRIP	☆☆☆☆☆
SPEED	☆☆



GEILA

ATTACK	☆☆☆
ACCELE	☆☆☆☆☆
GRIP	☆☆
SPEED	☆☆☆



GUNZ

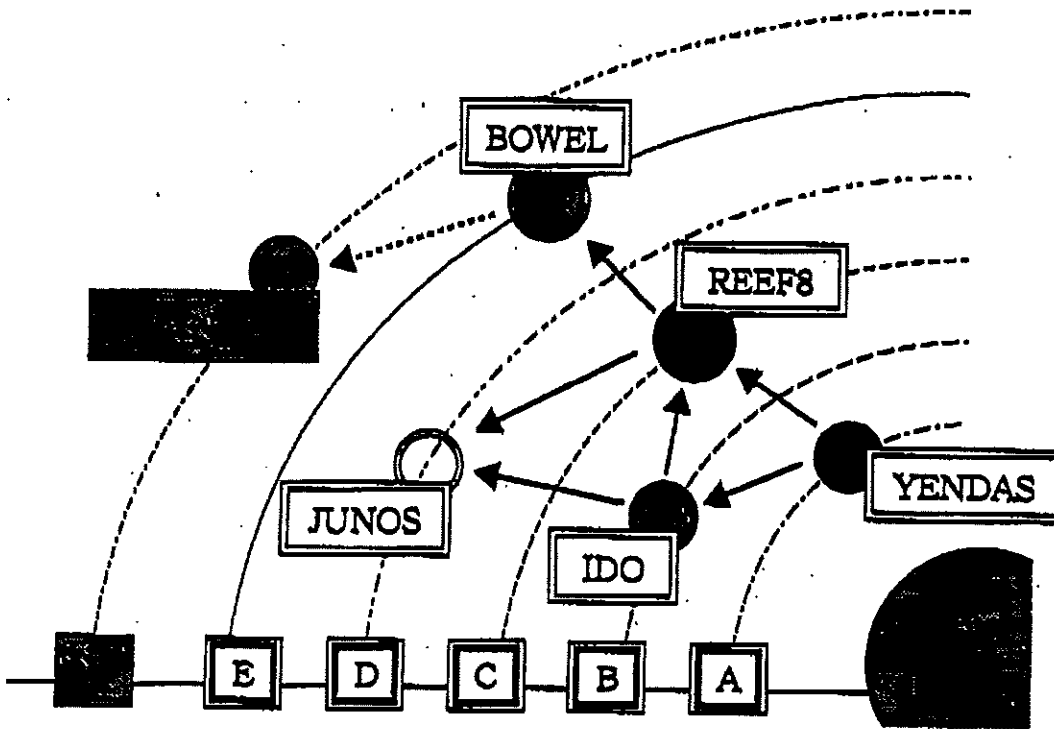
ATTACK	☆☆☆☆
ACCELE	☆☆
GRIP	☆☆☆
SPEED	☆☆☆☆☆

ATTACK..... Potential attacking power such as barehanded attack power or bodily crash strength.
 ACCELE..... Start-up acceleration.
 GRIP Cornering performance.
 SPEED..... Maximum potential speed.

5. For 1P mode, the GAME MODE SELECT screen will appear. Choose between CHAMPIONSHIP and PRACTICE. To select the GAME MODE, incline the bike from left to right and either press the START/VIEW button or twist the throttle to decide. For interactive play, CHAMPIONSHIP mode cannot be selected and PRACTICE is selected by default. Next select the course to be played.

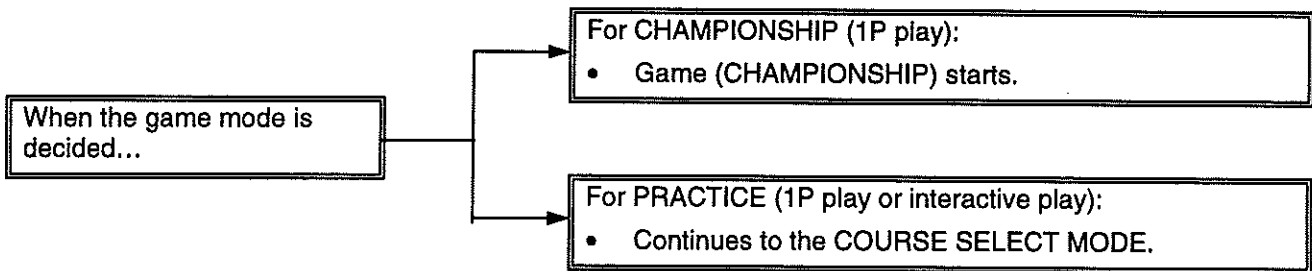
CHAMPIONSHIP:

This game mode is a stage-clearing type in which the player aims to finish various courses on different planets to become the Grand Champion. The player can proceed to the next course after the course has been completed ("GOAL" is achieved). Depending on the player's finishing position for that course, time bonuses are awarded which are added to the remaining time for the next courses. Finishing a total of 3 or 4 courses results in ALL CLEAR.



PRACTICE:

In this mode, only one course can be selected. This mode has more laps than in the CHAMPIONSHIP mode so that one course may be practised intensively. The game is over when the course is finished or time runs out.

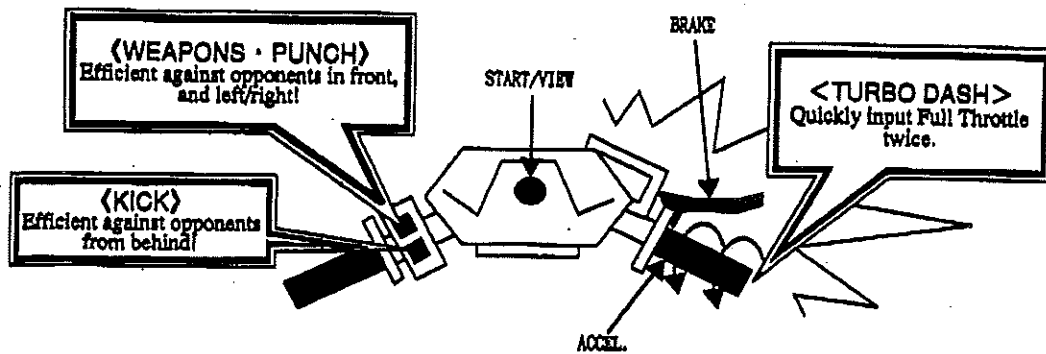


6. In the COURSE SELECT MODE, choose one of the 5 courses. The selected course's shape is displayed on the right-hand side of the screen. To select the course, incline the bike from left to right and either press the START/VIEW button or twist the throttle to decide.

- YENDAS An oval course for beginners. In the CHAMPIONSHIP mode, this is always the first course.
- IDO..... A cliff course with steep ups & downs, in which the player runs at full speed between sheer cliff rocky mountains.
- REEFS A long course symbolised by the blue sky and ocean, where strange plants are growing.
- JUNOS..... A snowstorm curse to drive through under the never-ending snowdrift.
- BOWEL..... A cavern course in which the player goes underground while catching a glimpse of the lava flowing under the road.

Note: When the course is determined, the game (verses or PRACTICE) starts.

7. As regards basic operation, ACCEL accelerates, BRAKE decelerates and inclining the bike from side to side corners the bike on screen. The following are the game's special operation features:



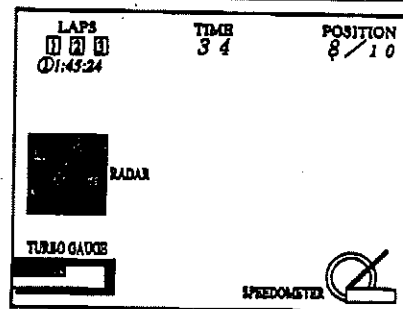
VARIOUS ATTACKS:

- Use buttons on the left-hand side of the handlebar to attack. The upper button is for WEAPONS & PUNCH, the lower button is for KICK.
- The attack turns into various tricks (such as weapon throw or special weapon attack).
- When the player crashes, he drops the weapon. By attacking an opponent who has a weapon, the player can recapture it.

TURBO DASH:

- Twist the accelerator twice quickly to use TURBO DASH.
- TURBO can be used if the TURBO gauge displays the remaining TURBO on the lower left portion of the screen.
- Once TURBO is used, the TURBO gauge shows 0. However, it will be restored automatically after a certain time.

8. In the game mode screen, COURSE LAPS and RACE TIME are displayed on the upper left-hand side of the screen. TIME and REMAINING TIME is shown in the centre and the players position is displayed on the upper right-hand side of the screen. On the left-hand side in the centre, there is a RADAR screen indicating the players' positions, on the lower left-hand corner there is the TURBO gauge and on the lower right-hand corner the SPEEDO.



9. When the game starts, time countdown starts. Passing the on-course checkpoints allows time to be added. Failing to pass the checkpoint within the time limit finishes the game. When the game is over, a message of advice is displayed for the player to learn some techniques for next time.
10. By fully utilising attack tricks and TURBO DASH, finishing the specified number of laps will bring the player to the GOAL. When the player achieves the GOAL, comprehensive results are displayed for that player's game (Position, Time, Total points, Player rank, etc). For CHAMPIONSHIP games, achieving the GOAL allows the player to proceed to the next course.
11. In 1P mode only, the most excellent payer with a high score can enter his name. Incline the bike to choose the letters and decide with the START/VIEW button. The name will be registered and displayed during advertise mode.
12. After the game has been finished, if the number of credits needed for game play are available, the ENTRY screen will be displayed.

ADVICE FOR GAME PLAY

☆ **Efficiently use the TURBO DASH:**

TURBO DASH will be most effective when used on straight portions of the course. Use of the TURBO DASH can be very beneficial to the course time.

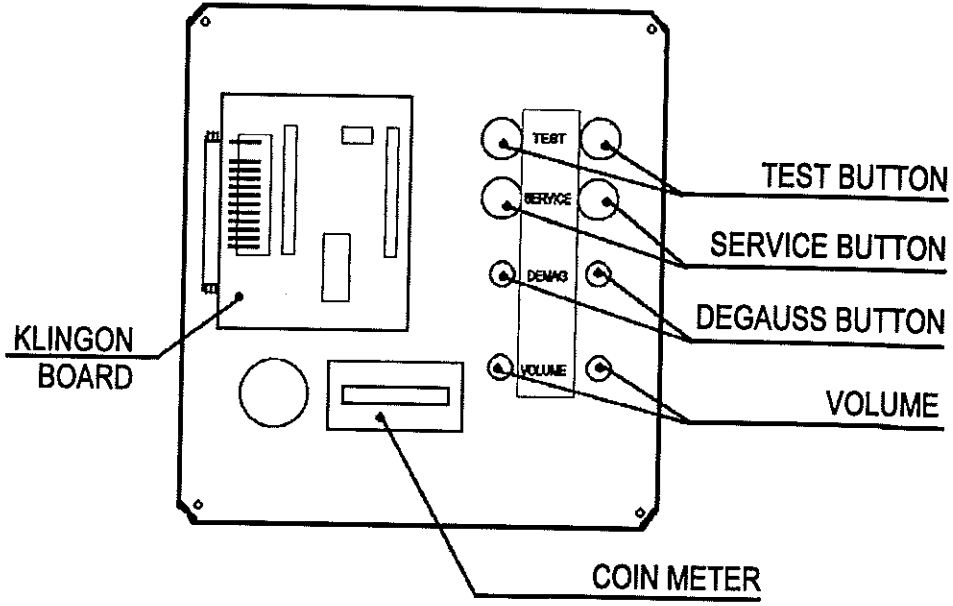
☆ **Apply each of various attacks appropriately:**

Depending on the situation, apply the most suitable attack to your advantage. By watching the Radar screen, ascertain the position of your opponents and use the Punch & Kick attacks accordingly. Always be aware of the position of opponents' bikes when driving to prevent their successful attack.

5.1.1. VTS ASSEMBLY



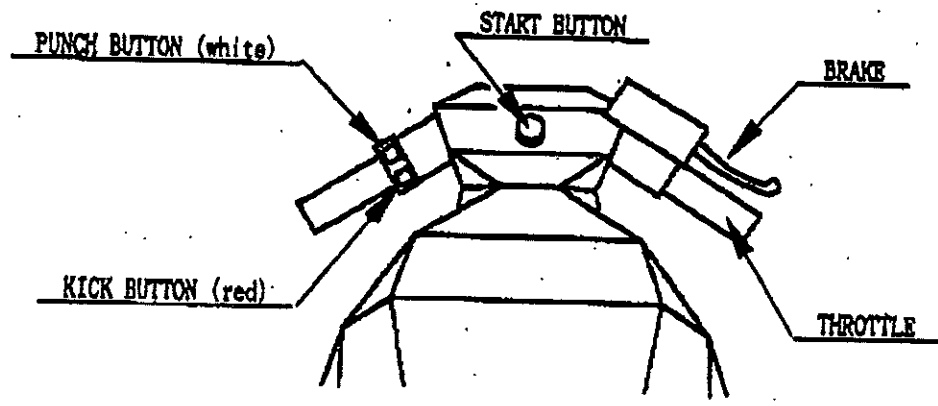
- Do not touch places other than those specified. Touching places not specified could cause an electric shock or short circuit.



Opening the Coin Chute door will reveal the VTS Assembly shown above. The function of each switch is as follows. The controls on the left affect the 1P cockpit, those on the right the 2P.

- TEST BUTTON**
(The START button on the handlebar can also be used for this purpose)
Used to enter TEST mode. Also has function during TEST mode. Refer to the later section detailing TEST mode.
- SERVICE BUTTON**
(The PUNCH & KICK buttons on the handlebar can also be used to navigate up & down the Test Mode menus)
Gives credits without registering on the coin counter. Also used during TEST mode.
- DEGAUSS BUTTON**
Eliminates colour unevenness from the monitor screen.
- VOLUME CONTROL**
Adjusts the volume of the speakers.

The control panel switches can also be used in the place of the VTS switches:



5.2. TEST MODE

The TEST MODE allows the functioning of each part of the machine to be checked. In addition game configuration and coin configuration changes can be made within TEST MODE.



- When setting changes are made within TEST MODE, be sure to exit from TEST MODE using the exit options. If you turn the power off and then on without having exited correctly the changes you made will not take effect.

TEST MENU

MEMORY TEST
T.G.P. TEST
INPUT TEST
OUTPUT TEST
SOUND TEST
C.R.T. TEST
GAME ASSIGNMENTS
COIN ASSIGNMENTS
VOLUME SETTING
BOOKKEEPING
BACKUP DATA CLEAR
> EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

Press the TEST BUTTON to bring up the screen shown to the left.

Press the SERVICE BUTTON to move downwards through the list. The current selection is shown by the arrow.

Press the TEST BUTTON to activate the selected test.

To finish TEST MODE, move the arrow to EXIT and press the TEST.

5.2.1. MEMORY TEST

MEMORY TEST

```
<ROM>
IC12 GOOD  IC13 GOOD
IC10 GOOD  IC11 GOOD  IC8 GOOD  IC9 GOOD
IC6 GOOD   IC7 GOOD   IC4 GOOD  IC5 GOOD
<RAM> CPU BOARD
IC12 GOOD  IC13 GOOD  IC14 GOOD  IC15 GOOD
IC16 GOOD  IC17 GOOD
IC41 GOOD  IC42 GOOD  IC43 GOOD  IC44 GOOD
IC65 GOOD  IC66 GOOD
<RAM> VIDEO BOARD
IC30 GOOD  IC31 GOOD  IC32 GOOD  IC33 GOOD
IC35 GOOD  IC36 GOOD  IC37 GOOD  IC38 GOOD
IC39 GOOD  IC40 GOOD  IC41 GOOD  IC42 GOOD
IC43 GOOD  IC45 GOOD  IC46 GOOD
IC47 GOOD  IC48 GOOD  IC49 GOOD  IC50 GOOD
IC54 GOOD  IC55 GOOD
IC57 GOOD  IC58 GOOD  IC59 GOOD
IC75 GOOD  IC76 GOOD  IC77 GOOD  IC78 GOOD
IC79 GOOD  IC80 GOOD  IC81 GOOD  IC82 GOOD
```

PRESS TEST BUTTON TO EXIT

The MEMORY TEST is for checking the on-board memory ICs.

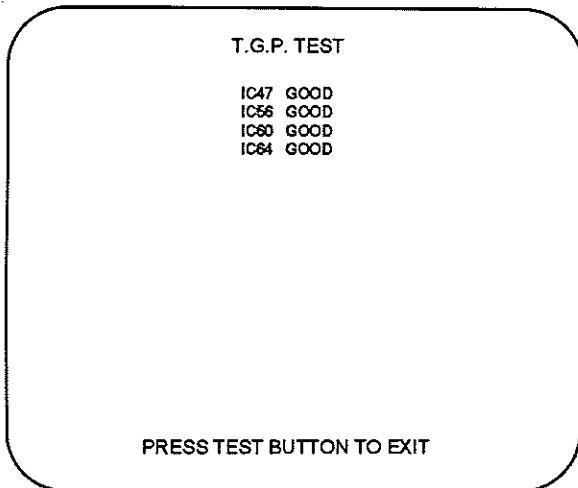
GOOD is displayed for normal ICs.

BAD is displayed for abnormal ICs.

When the test is completed, if the results are as shown to the left, all is satisfactory. If the test did not complete, there may be some IC malfunction.

After finishing the test, press the TEST button to exit.

5.2.2. T.G.P. TEST



The T.G.P. TEST is for checking the on-board T.G.P. memory ICs (screen display-related ICs).

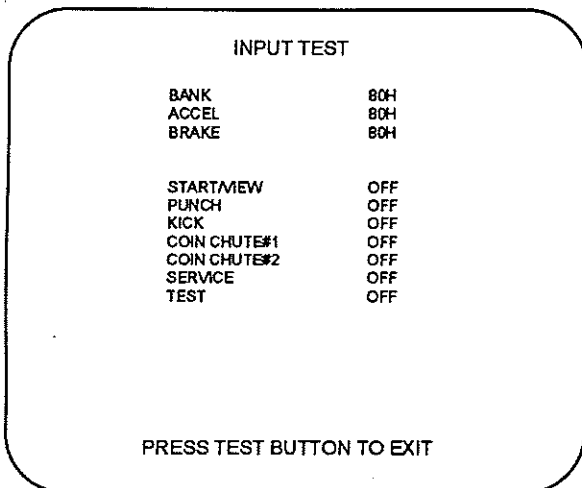
GOOD is displayed for normal ICs.

BAD is displayed for abnormal ICs.

When the test is completed, if the results are as shown to the left, all is satisfactory. If the test did not complete, there may be some IC malfunction.

After finishing the test, press the TEST button to exit.

5.2.3. INPUT TEST



The INPUT TEST is for checking each switch and VR. VR value setting may also be performed using this screen.

As each switch is pressed, the display changes from OFF to ON. If all works satisfactorily, the wiring and switch are functional.

After finishing the test, press the TEST button to exit.

VR setting values:

When checking the VR value, ensure that the value is within the following limits:

ACCELE	min:	20H	(without turning the Accelerator grip)		
BRAKE		20H	(without pulling the Brake level)		
BANK	min:	20H		80H	max: F0H
		(when inclined to the RIGHT)		(centre position)	(when inclined to the LEFT)

5.2.4. OUTPUT TEST

OUTPUT TEST

START/VIEW LAMP	OFF
BRAKE LAMP	OFF
RACE LEADER LAMP	OFF
> EXIT	

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

The OUTPUT TEST is for checking each lamp. Select the lamp to be tested using the SERVICE BUTTON.

Press the TEST button to change the status of the lamp from OFF to ON and OFF again.

If the lamp lights up, the wiring and lamp are functional.

To finish the test, select EXIT with the SERVICE button and press the TEST button to exit.

5.2.5. SOUND TEST

SOUND TEST

NO. 0

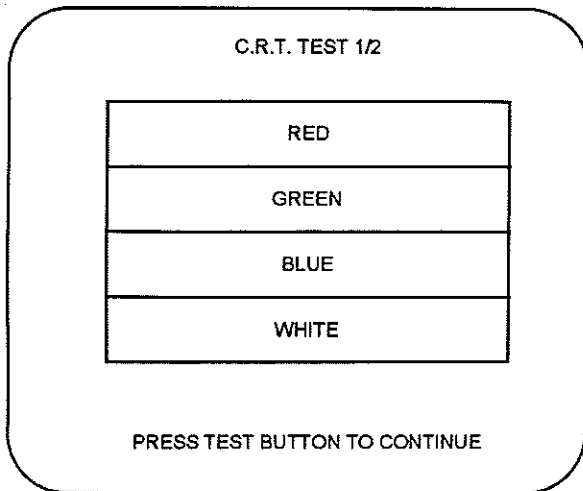
SELECT WITH SERVICE BUTTON
PRESS TEST BUTTON TO EXIT

The SOUND TEST is for checking sound related ICs and each speaker.

Each time the SERVICE button is pressed, the number displayed increments by 1 and the next sound is played.

After finishing the test, press the TEST button to exit.

5.2.6. C.R.T. TEST

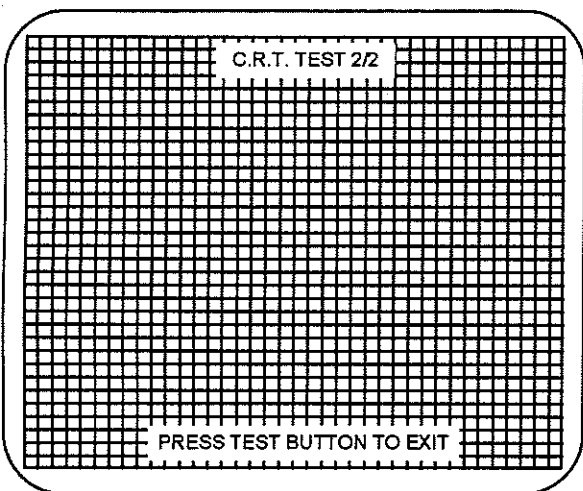


The C.R.T. TEST is for checking monitor colour, brightness, contrast and scaling.

Screen 1/2 enables colour, brightness & contrast adjustments to be made.

Make sure that each of the colour bars are darkest at the left-hand side and brightest at the right-hand side (the right-hand edge of each colour bar should be sharp).

Press the TEST button to continue to the next screen.

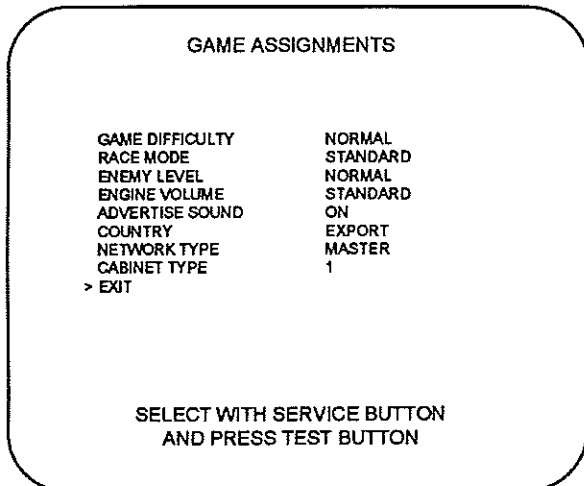


Screen 2/2 enables scaling adjustments to be made.

Make sure that the cross-hatch lines are fully within the visible area of the screen and are spaced in equally from all 4 edges.

Press the TEST button to exit.

5.2.7. GAME ASSIGNMENTS



GAME ASSIGNMENTS is for setting up play options and link network identification. Options in **BOLD CAPITALS** are factory defaults.

Select the setting to be changed using the **SERVICE BUTTON**.

Press the **TEST** button to scroll through the options for that setting.

To finish the test, select **EXIT** with the **SERVICE** button and press the **TEST** button to exit.



IMPORTANT!

- When setting changes are made within **TEST MODE**, be sure to exit from **TEST MODE** using the exit options. If you turn the power off and then on without having exited correctly the changes you made will not take effect.

Game Difficulty	very easy easy NORMAL hard very hard		Sets the game difficulty.
Race Mode	STANDARD long	(2~5mins) (4~7mins)	Sets the number of laps of each course during game play.
Enemy Level	NORMAL strong		Sets the opponents' attack rate and correction status.
Engine Volume	STANDARD half		Sets the relative level of engine sounds.
Advertise Sound	ON off		Sets the machine to play attraction sounds & music when not in game play.
Country	Japan USA EXPORT		Sets the language variant for on-screen display and sounds.
Network Type	stand alone MASTER SLAVE live	(1P) (2P,3P,4P)	Sets the communication between seats. Up to 4 seats (2 twin machines) may be linked using fibre optics. Refer to Section 3.9 for settings. "Live" is used to render the seat as an unplayable monitor unit, displaying live action from another seat as it is being played.
Cabinet Type	1 2 3 4	(1P) (2P) (3P) (4P)	Sets the intrinsic cabinet identification number used to distinguish seats during linked communication play. Ensure that the numbers used to identify each seat is unique.

5.2.8. COIN ASSIGNMENTS

COIN ASSIGNMENTS

COIN/CREDIT SETTING #1
CHUTE #1
1COIN 1CREDIT

CHUTE #2
1COIN 1CREDIT

MANUAL SETTING
> EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

COIN ASSIGNMENTS is for setting the values of credits to start & continue. This mode expresses "how many coins correspond to how many credits".

For COIN/CREDIT SETTING, refer to the table in section 5.2.8.1. This option sets "how many coins correspond to how many credits".

For MANUAL SETTING, refer to the table in section 5.2.8.2. This option allows finer settings of coin/credit ratios.

To finish the test, select EXIT with the SERVICE button and press the TEST button to exit.

5.2.8.1.COIN/CREDIT SETTING

SETTING	FUNCTIONING OF COIN CHUTE #1		FUNCTIONING OF COIN CHUTE #2	
SETTING #1	1 COIN	1 CREDIT	1 COIN	1 CREDIT
SETTING #2	1 COIN	2 CREDITS	1 COIN	1 CREDIT
SETTING #3	1 COIN	3 CREDIT	1 COIN	1 CREDIT
SETTING #4	1 COIN	4 CREDITS	1 COIN	1 CREDIT
SETTING #5	1 COIN	5 CREDITS	1 COIN	1 CREDIT
SETTING #6	1 COIN	2 CREDITS	1 COIN	2 CREDITS
SETTING #7	1 COIN	5 CREDITS	1 COIN	2 CREDITS
SETTING #8	1 COIN	3 CREDITS	1 COIN	3 CREDITS
SETTING #9	1 COIN	4 CREDITS	1 COIN	4 CREDITS
SETTING #10	1 COIN	5 CREDITS	1 COIN	5 CREDITS
SETTING #11	1 COIN	6 CREDITS	1 COIN	6 CREDITS
SETTING #12	2 COINS	1 CREDIT	2 COINS	1 CREDIT
SETTING #13	1 COIN	1 CREDIT	2 COINS	1 CREDIT
SETTING #14	1 COIN	2 CREDITS	2 COINS	1 CREDIT
SETTING #15	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	3 CREDITS	2 COINS	3 CREDITS
SETTING #16	1 COIN	3 CREDITS	1 COIN	1 CREDIT
			2 COINS	3 CREDITS
SETTING #17	3 COINS	1 CREDIT	3 COINS	1 CREDIT
SETTING #18	4 COINS	1 CREDIT	4 COINS	1 CREDIT
SETTING #19	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	2 CREDITS	2 COINS	2 CREDITS
	3 COINS	3 CREDITS	3 COINS	3 CREDITS
	4 COINS	5 CREDITS	4 COINS	5 CREDITS
SETTING #20	1 COIN	5 CREDITS	1 COIN	1 CREDIT
			2 COINS	2 CREDITS
			3 COINS	3 CREDITS
			4 COINS	5 CREDITS
SETTING #21	5 COINS	1 CREDIT	5 COINS	1 CREDIT
SETTING #22	1 COIN	2 CREDITS	3 COINS	1 CREDIT
			5 COINS	2 CREDITS
SETTING #23	2 COINS	1 CREDIT	2 COINS	1 CREDIT
	4 COINS	2 CREDITS	4 COINS	2 CREDITS
	5 COINS	3 CREDITS	5 COINS	3 CREDITS
SETTING #24	1 COIN	3 CREDITS	2 COINS	1 CREDIT
			4 COINS	2 CREDITS
			5 COINS	3 CREDITS
SETTING #25	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	2 CREDITS	2 COINS	2 CREDITS
	3 COINS	3 CREDITS	3 COINS	3 CREDITS
	4 COINS	4 CREDITS	4 COINS	4 CREDITS
	5 COINS	6 CREDITS	5 COINS	6 CREDITS
SETTING #26	1 COIN	6 CREDITS	1 COIN	1 CREDIT
			2 COINS	2 CREDITS
			3 COINS	3 CREDITS
			4 COINS	4 CREDITS
			5 COINS	6 CREDITS
SETTING #27	FREE PLAY		FREE PLAY	

5.2.8.2. MANUAL SETTING

**COIN ASSIGNMENTS
MANUAL SETTING**

COIN TO CREDIT **1COIN 1CREDIT**
BONUS ADDER **NO BONUS ADDER**

COIN CHUTE #1 MULTIPLIER
 1 COIN COUNTS AS 1 COIN

COIN CHUTE #2 MULTIPLIER
 1 COIN COUNTS AS 1 COIN

> EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

MANUAL SETTING is for setting the values of credits to start & continue more finely than by using one of the standard ratios in section 5.2.8.1.

For COIN TO CREDIT setting, refer to the table below.

For BONUS ADDER setting, refer to the table below. This sets how many coins should be inserted to obtain one service coin (bonus).

For COIN CHUTE MULTIPLIER setting, refer to the table below. This sets how many tokens one coin represents.

To finish the test, select EXIT with the SERVICE button and press the TEST button to exit.

MANUAL SETTING

COIN TO CREDIT	1 COIN	1 CREDIT
	2 COINS	1 CREDIT
	3 COINS	1 CREDIT
	4 COINS	1 CREDIT
	5 COINS	1 CREDIT
	6 COINS	1 CREDIT
	7 COINS	1 CREDIT
	8 COINS	1 CREDIT
	9 COINS	1 CREDIT

BONUS ADDER	NO BONUS ADDER
	2 COINS GIVE 1 EXTRA COIN
	3 COINS GIVE 1 EXTRA COIN
	4 COINS GIVE 1 EXTRA COIN
	5 COINS GIVE 1 EXTRA COIN
	6 COINS GIVE 1 EXTRA COIN
	7 COINS GIVE 1 EXTRA COIN
	8 COINS GIVE 1 EXTRA COIN
	9 COINS GIVE 1 EXTRA COIN

COIN CHUTE MULTIPLIER	1 COIN COUNTS AS 1 COIN
	1 COIN COUNTS AS 2 COINS
	1 COIN COUNTS AS 3 COINS
	1 COIN COUNTS AS 4 COINS
	1 COIN COUNTS AS 5 COINS
	1 COIN COUNTS AS 6 COINS
	1 COIN COUNTS AS 7 COINS
	1 COIN COUNTS AS 8 COINS
	1 COIN COUNTS AS 9 COINS

5.2.9. VOLUME SETTING

VOLUME SETTING

BANK	MAX 80 (C0)	MIN 80 (20)	NEU 80 (80)
ACCELE	MAX 00 (C0)	MIN 00 (20)	
BRAKE	MAX 00 (C0)	MIN 00 (20)	

> EXIT WITHOUT SAVE
 EXIT WITH SAVE

SELECT WITH SERVICE BUTTON
 AND PRESS TEST BUTTON

VOLUME SETTING is for setting the maximum and minimum values for VR inputs.

For each of BANK, ACCELE and BRAKE, move the control input levers from minimum to maximum of its moveable range. This is detected and set into the values on screen automatically.

When adjustment is complete select:

EXIT WITHOUT SAVE to return to the main menu without saving the new settings.

EXIT WITH SAVE to save the new settings and return to the main menu.

5.2.10. BOOKKEEPING

BOOKKEEPING PAGE 1/2

COIN CHUTE #1	0	
COIN CHUTE #2	0	
TOTAL COINS	0	
COIN CREDITS	0	
SERVICE CREDITS	0	
TOTAL CREDITS	0	
NUMBER OF GAMES	0	

TOTAL TIME	0D	00H	00M	00S
GAME PLAY TIME	0D	00H	00M	00S
AVERAGE GAME TIME		00H	00M	00S
LONGEST GAME TIME		00H	00M	00S
SHORTEST GAME TIME		00H	00M	00S

PRESS TEST BUTTON TO CONTINUE

BOOKKEEPING displays the game frequency and time data.

COIN CHUTE #*: Number of coins put in each chute.

COIN CREDITS: Number of credits registered by inserting coins.

SERVICE CREDITS: Number of credits registered by pressing the SERVICE button.

TOTAL CREDITS: COIN + SERVICE CREDITS.

NUMBER OF GAMES: Total number of plays.

TOTAL TIME: Total energised time.

GAME PLAY TIME:

AVERAGE GAME TIME:

LONGEST GAME TIME:

SHORTEST GAME TIME:

Press the TEST button to continue to page 2/2.

Screen 2/2 shows the game play histogram.

This details the frequency of games that lasted for times inside the limits shown on the screen.

Press the TEST button to exit.

BOOKKEEPING PAGE 2/2

0M 00S ~ 0M 29S	0	
0M 30S ~ 0M 59S	0	
1M 00S ~ 1M 29S	0	
1M 30S ~ 1M 59S	0	
2M 00S ~ 2M 29S	0	
2M 30S ~ 2M 59S	0	
3M 00S ~ 3M 29S	0	
3M 30S ~ 3M 59S	0	
4M 00S ~ 4M 29S	0	
4M 30S ~ 4M 59S	0	
5M 00S ~ 5M 29S	0	
5M 30S ~ 5M 59S	0	
6M 00S ~ 6M 29S	0	
6M 30S ~ 6M 59S	0	
OVER 7M 00S	0	

PRESS TEST BUTTON TO EXIT

5.2.11.BACKUP DATA CLEAR

BACKUP DATA CLEAR

YES(CLEAR)

> NO(CANCEL)

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

BACKUP DATA CLEAR clears the contents of BOOKKEEPING (does not affect GAME ASSIGNMENTS).

To clear all data, select YES with the SERVICE button and press the TEST button. COMPLETED will appear on the screen. Press the TEST button to exit.

To keep all data, select NO with the SERVICE button and press the TEST button to exit.

5.3. COIN MECH INSTALLATION AND CREDIT BOARD SET-UP

5.3.1. INTRODUCTION

Game credits between the Coin Mech and the game board for this machine are controlled by a *Klingon* board. This electronic circuit allows the price of play to be set for a range of different countries. These functions are set on Dual In Line (DIL) PCB mounted switches.

DIL-2 is used to set the currency (or coin ratio) and DIL-1 the price of play. Refer to the Tables on the following pages for the correct settings for your environment.

The *Klingon* board pictured below is mounted on the VTS Bracket within the Coin Chute Tower.

The *Klingon* board is connected to the coin validator and lamps via a dedicated wiring harness depending upon the coin validator used:

Wiring Harness	Validator	
LM1006	Coin Controls	(15 way connector)
LM1007	Mars	(13 way connector)
LM1008	Mechanical	See note 2
N/A	NRI	See note 1

Notes

1. If NRI mechs are to be used, these should be ordered with the highest denomination coin on coin path #1 and the lowest denomination on coin path #4. The *Klingon* board should be then be set up for either the UK or Switzerland settings. A minimum connecting lead length of 600mm is required.
2. Mechanical coin mechs may be connected in parallel allowing two identical mechs to be fitted.

5.3.2. KLINGON CREDIT BOARD OPTION SETTINGS

DIL Switch 2 (under IC socket)

Coin Controls:

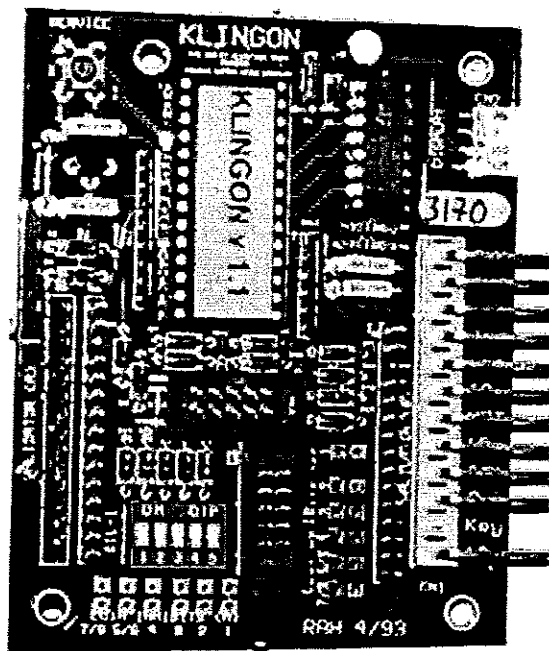
Mars:

SW 1	SW 2	SW 3	SW 4	OPTIONS	COIN 1 F	COIN 2 E	COIN 3 D	COIN 4 C
OFF	OFF	OFF	-	UK coin setting	£1	50p	20p	10p
ON	OFF	OFF	-	Belgium coin setting	n/u	50BFr	20BFr	5BFr
OFF	ON	OFF	-	Spain coin setting	100Pta	50Pta	n/u	25Pta
ON	ON	OFF	-	German coin setting using NRI	-	-	-	-
OFF	OFF	ON	-	Netherlands coin setting	n/u	5NLG	2.5NLG	1NLG
ON	OFF	ON	-	Portugal coin setting	100Es	50Es	n/u	n/u
OFF	ON	ON	-	Austria coin setting	20Sch	10Sch	5Sch	1Sch
ON	ON	ON	-	Switzerland coin setting	5SFr	2SFr	1SFr	n/u
-	-	-	OFF	Direct mode	-	-	-	-
-	-	-	ON	2 channel mode	-	-	-	-

Note: These switch settings are under constant review and may change due to world currency updates.

Set DIL switches (DIL-1) SW-1 to SW-5 according to the option settings found in the relevant Price Of Play Settings Table on the following pages.

Set DIL switches (DIL-2) on the *Klingon* board located under the IC socket as shown in the table above. SW-4 must always be set 'ON'. Care must be exercised when removing IC-1 so as not to damage its lead-outs pins. After setting the switches return the IC to its socket with the package indent mark adjacent to the board edge.



The "Klingon" board.

5.3.2.1.PRICE OF PLAY SETTINGS FOR THE UK (£ = Pound Sterling)

				DIP SWITCH SETTING				
				1	2	3	4	5
10p Play	50p = 5	-	£1 = 10	OFF	OFF	OFF	OFF	OFF
10p Play	50p = 5	-	£1 = 11	ON	OFF	OFF	OFF	OFF
10p Play	50p = 6	-	£1 = 12	OFF	ON	OFF	OFF	OFF
20p Play	50p = 2 ½	-	£1 = 5	ON	ON	OFF	OFF	OFF
20p Play	50p = 3	-	£1 = 6	OFF	OFF	ON	OFF	OFF
20p Play	50p = 3	-	£1 = 7	ON	OFF	ON	OFF	OFF
30p Play	50p = 1 2/3	-	£1 = 3 1/3	OFF	ON	ON	OFF	OFF
30p Play	50p = 2	-	£1 = 4	ON	ON	ON	OFF	OFF
30p Play	50p = 2	-	£1 = 5	OFF	OFF	OFF	ON	OFF
40p Play	50p = 1 ¼	-	£1 = 2 ½	ON	OFF	OFF	ON	OFF
40p Play	50p = 1 ¼	-	£1 = 3	OFF	ON	OFF	ON	OFF
50p Play	50p = 1	-	£1 = 2	ON	ON	OFF	ON	OFF
50p Play	50p = 1	-	£1 = 3	OFF	OFF	ON	ON	OFF
60p Play	50p = 5/6	-	£1 = 1 2/5	ON	OFF	ON	ON	OFF
60p Play	50p = 5/6	-	£1 = 2	OFF	ON	ON	ON	OFF
80p Play	50p = 5/8	-	£1 = 1 ¼	ON	ON	ON	ON	OFF
£1 Play	50p = ½	-	£1 = 1	OFF	OFF	OFF	OFF	ON
£1 Play	50p = ½	£1 = 1	£2 = 3	ON	OFF	OFF	OFF	ON
£2 Play	50p = ¼	-	£1 = ½	OFF	ON	OFF	OFF	ON
£2 Play	50p = ¼	£1 = ½	£5 = 3	ON	ON	OFF	OFF	ON
£3 Play	NO BONUSES			OFF	OFF	ON	OFF	ON
-	-	-	-	ON	OFF	ON	OFF	ON
-	-	-	-	OFF	ON	ON	OFF	ON
-	-	-	-	ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 10p:

Coin 1 = £1, Coin 2 = 50p, Coin 3 = 20p, Coin 4 = 10p

5.3.2.2.PRICE OF PLAY SETTINGS FOR BELGUIM (BFr = Belgian Franc)

				DIP SWITCH SETTING				
				1	2	3	4	5
5BFr Play	20BFr = 4	-	50BFr = 10	OFF	OFF	OFF	OFF	OFF
5BFr Play	20BFr = 4	-	50BFr = 11	ON	OFF	OFF	OFF	OFF
5BFr Play	20BFr = 5	-	50BFr = 12	OFF	ON	OFF	OFF	OFF
10BFr Play	20BFr = 2	-	50BFr = 5	ON	ON	OFF	OFF	OFF
10BFr Play	20BFr = 2	-	50BFr = 5	OFF	OFF	ON	OFF	OFF
10BFr Play	20BFr = 3	-	50BFr = 7	ON	OFF	ON	OFF	OFF
15BFr Play	20BFr = 1 1/3	-	50BFr = 3 1/3	OFF	ON	ON	OFF	OFF
15BFr Play	20BFr = 1 1/3	-	50BFr = 4	ON	ON	ON	OFF	OFF
15BFr Play	20BFr = 2	-	50BFr = 5	OFF	OFF	OFF	ON	OFF
20BFr Play	-	-	50BFr = 2 1/2	ON	OFF	OFF	ON	OFF
20BFr Play	-	-	50BFr = 3	OFF	ON	OFF	ON	OFF
20BFr Play	50BFr = 3	-	100BFr = 7	ON	ON	OFF	ON	OFF
25BFr Play	20BFr = 4/5	-	50BFr = 2	OFF	OFF	ON	ON	OFF
25BFr Play	20BFr = 4/5	50BFr = 2	100BFr = 5	ON	OFF	ON	ON	OFF
25BFr Play	20BFr = 4/5	50BFr = 3	100BFr = 6	OFF	ON	ON	ON	OFF
30BFr Play	20BFr = 2/3	-	50BFr = 1 1/2	ON	ON	ON	ON	OFF
30BFr Play	20BFr = 2/3	50BFr = 1 2/3	100BFr = 4	OFF	OFF	OFF	OFF	ON
30BFr Play	20BFr = 2/3	50BFr = 2	100BFr = 4	ON	OFF	OFF	OFF	ON
40BFr Play	20BFr = 1/2	-	50BFr = 1 1/4	OFF	ON	OFF	OFF	ON
40BFr Play	20BFr = 1/2	50BFr = 2 1/4	100BFr = 3	ON	ON	OFF	OFF	ON
				OFF	OFF	ON	OFF	ON
				ON	OFF	ON	OFF	ON
				OFF	ON	ON	OFF	ON
				ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 5BFr:

Coin 1 = n/u, Coin 2 = 50BFr, Coin 3 = 20BFr, Coin 4 = 5BFr

5.3.2.3.PRICE OF PLAY SETTINGS FOR SPAIN (Pta = Peseta)

				DIP SWITCH SETTING				
				1	2	3	4	5
25Pta Play	50Pta = 2	-	100Pta = 4	OFF	OFF	OFF	OFF	OFF
25Pta Play	50Pta = 2	-	100Pta = 5	ON	OFF	OFF	OFF	OFF
-	-	-	-	OFF	ON	OFF	OFF	OFF
50Pta Play	100Pta = 2	-	-	ON	ON	OFF	OFF	OFF
50Pta Play	100Pta = 3	-	-	OFF	OFF	ON	OFF	OFF
50Pta Play	100Pta = 3	-	200Pta = 7	ON	OFF	ON	OFF	OFF
75Pta Play	100Pta = 2/3	-	-	OFF	ON	ON	OFF	OFF
75Pta Play	100Pta = 2/3	-	200Pta = 3	ON	ON	ON	OFF	OFF
75Pta Play	200Pta = 3	-	400Pta = 7	OFF	OFF	OFF	ON	OFF
100Pta Play	-	-	-	ON	OFF	OFF	ON	OFF
100Pta Play	200Pta = 3	-	-	OFF	ON	OFF	ON	OFF
200Pta Play	-	-	-	ON	ON	OFF	ON	OFF
200Pta Play	500Pta = 3	-	-	OFF	OFF	ON	ON	OFF
300Pta Play	-	-	-	ON	OFF	ON	ON	OFF
300Pta Play	500Pta = 2	-	-	OFF	ON	ON	ON	OFF
400Pta Play	-			ON	ON	ON	ON	OFF
400Pta Play	1000Pta = 3			OFF	OFF	OFF	OFF	ON
				ON	OFF	OFF	OFF	ON
				OFF	ON	OFF	OFF	ON
				ON	ON	OFF	OFF	ON
				OFF	OFF	ON	OFF	ON
				ON	OFF	ON	OFF	ON
				OFF	ON	ON	OFF	ON
				ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 25Pta:

Coin 1 = 100Pta, Coin 2 = 50Pta, Coin 3 = n/u, Coin 4 = 25Pta

**5.3.2.4.PRICE OF PLAY SETTINGS FOR THE NETHERLANDS
(NLG = Netherlands Guilder)**

				DIP SWITCH SETTING				
				1	2	3	4	5
1NLG Play	NO BONUS			OFF	OFF	OFF	OFF	OFF
1NLG Play	2.5NLG = 3	-	5NLG = 6	ON	OFF	OFF	OFF	OFF
1NLG Play	2.5NLG = 3	-	5NLG = 7	OFF	ON	OFF	OFF	OFF
2NLG Play	NO BONUS			ON	ON	OFF	OFF	OFF
2NLG Play	5NLG = 3	-	-	OFF	OFF	ON	OFF	OFF
2NLG Play	5NLG = 3	-	10NLG = 7	ON	OFF	ON	OFF	OFF
3NLG Play	NO BONUS			OFF	ON	ON	OFF	OFF
3NLG Play	5NLG = 2	-	-	ON	ON	ON	OFF	OFF
3NLG Play	5NLG = 2	-	10NLG = 5	OFF	OFF	OFF	ON	OFF
4NLG Play	NO BONUS			ON	OFF	OFF	ON	OFF
4NLG Play	10NLG = 3			OFF	ON	OFF	ON	OFF
5NLG Play	NO BONUS			ON	ON	OFF	ON	OFF
5NLG Play	10NLG = 3			OFF	OFF	ON	ON	OFF
6NLG Play	NO BONUS			ON	OFF	ON	ON	OFF
6NLG Play	15NLG = 3			OFF	ON	ON	ON	OFF
8NLG Play	NO BONUS			ON	ON	ON	ON	OFF
8NLG Play	20NLG = 3			OFF	OFF	OFF	OFF	ON
10NLG Play	NO BONUS			ON	OFF	OFF	OFF	ON
10NLG Play	20NLG = 3			OFF	ON	OFF	OFF	ON
				ON	ON	OFF	OFF	ON
				OFF	OFF	ON	OFF	ON
				ON	OFF	ON	OFF	ON
				OFF	ON	ON	OFF	ON
				ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 1NLG:

Coin 1 = N/U, Coin 2 = 5NLG, Coin 3 = 2.5NLG, Coin 4 = 1NLG

5.3.2.5.PRICE OF PLAY SETTINGS FOR PORTUGAL (Es = Escudo)

				DIP SWITCH SETTING				
				1	2	3	4	5
10Es Play	50Es = 5	-	10Es = 10	OFF	OFF	OFF	OFF	OFF
10Es Play	50Es = 5	-	10Es = 11	ON	OFF	OFF	OFF	OFF
10Es Play	50Es = 6	-	10Es = 12	OFF	ON	OFF	OFF	OFF
20Es Play	50Es = 2 ½	-	100Es = 5	ON	ON	OFF	OFF	OFF
20Es Play	50Es = 3	-	100Es = 6	OFF	OFF	ON	OFF	OFF
20Es Play	50Es = 3	-	100Es = 7	ON	OFF	ON	OFF	OFF
30Es Play	50Es = 1 2/3	-	100Es = 1 1/3	OFF	ON	ON	OFF	OFF
30Es Play	50Es = 2	-	100Es = 4	ON	ON	ON	OFF	OFF
30Es Play	50Es = 2	-	100Es = 5	OFF	OFF	OFF	ON	OFF
40Es Play	50Es = 1 ¼	-	100Es = 2 ½	ON	OFF	OFF	ON	OFF
40Es Play	50Es = 1 ¼	-	100Es = 3	OFF	ON	OFF	ON	OFF
50Es Play	50Es = 1	-	100Es = 2	ON	ON	OFF	ON	OFF
50Es Play	50Es = 1	-	100Es = 3	OFF	OFF	ON	ON	OFF
60Es Play	50Es = 5/6	-	100Es = 1 2/5	ON	OFF	ON	ON	OFF
60Es Play	50Es = 5/6	-	100Es = 2	OFF	ON	ON	ON	OFF
80Es Play	50Es = 5/8	-	100Es = 1 ¼	ON	ON	ON	ON	OFF
100Es Play	50Es = ½	-	100Es = 1	OFF	OFF	OFF	OFF	ON
100Es Play	50Es = ½	100Es = 1	200Es = 3	ON	OFF	OFF	OFF	ON
200Es Play	50Es = ¼	-	100Es = ½	OFF	ON	OFF	OFF	ON
200Es Play	50Es = ¼	100Es = ½	500Es = 3	ON	ON	OFF	OFF	ON
				OFF	OFF	ON	OFF	ON
				ON	OFF	ON	OFF	ON
				OFF	ON	ON	OFF	ON
				ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 10Es:

Coin 1 = 100Es, Coin 2 = 50Es, Coin 3 = n/u, Coin 4 = n/u

5.3.2.6.PRICE OF PLAY SETTINGS FOR AUSTRIA (Sch = Schilling)

				DIP SWITCH SETTING				
				1	2	3	4	5
1Sch Play	5Sch = 5	-	10Sch = 10	OFF	OFF	OFF	OFF	OFF
1Sch Play	5Sch = 5	-	10Sch = 11	ON	OFF	OFF	OFF	OFF
1Sch Play	5Sch = 6	-	10Sch = 12	OFF	ON	OFF	OFF	OFF
2Sch Play	5Sch = 2 ½	-	10Sch = 5	ON	ON	OFF	OFF	OFF
2Sch Play	5Sch = 3	-	10Sch = 6	OFF	OFF	ON	OFF	OFF
2Sch Play	5Sch = 3	-	10Sch = 7	ON	OFF	ON	OFF	OFF
3Sch Play	5Sch = 1 2/3	-	10Sch = 3 1/3	OFF	ON	ON	OFF	OFF
3Sch Play	5Sch = 2	-	10Sch = 4	ON	ON	ON	OFF	OFF
3Sch Play	5Sch = 2	-	10Sch = 5	OFF	OFF	OFF	ON	OFF
4Sch Play	5Sch = 1 ¼	-	10Sch = 2 ½	ON	OFF	OFF	ON	OFF
4Sch Play	5Sch = 1 ¼	-	10Sch = 3	OFF	ON	OFF	ON	OFF
5Sch Play	5Sch = 1	-	10Sch = 2	ON	ON	OFF	ON	OFF
5Sch Play	5Sch = 1	-	10Sch = 3	OFF	OFF	ON	ON	OFF
6Sch Play	5Sch = 5/6	-	10Sch = 1 2/5	ON	OFF	ON	ON	OFF
6Sch Play	5Sch = 5/6	-	10Sch = 2	OFF	ON	ON	ON	OFF
8Sch Play	5Sch = 5/8	-	10Sch = 1 ¼	ON	ON	ON	ON	OFF
10Sch Play	5Sch = ½	-	10Sch = 1	OFF	OFF	OFF	OFF	ON
10Sch Play	5Sch = ½	10Sch = 1	20Sch = 3	ON	OFF	OFF	OFF	ON
20Sch Play	5Sch = ¼	-	10Sch = ½	OFF	ON	OFF	OFF	ON
20Sch Play	5Sch = ¼	10Sch = ½	50Sch = 3	ON	ON	OFF	OFF	ON
30Sch Play	NO BONUSES			OFF	OFF	ON	OFF	ON
30Sch Play	50Sch = 3	-	-	ON	OFF	ON	OFF	ON
50Sch Play	-	-	-	OFF	ON	ON	OFF	ON
50Sch Play	100Sch = 3	-	-	ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 1Sch:

Coin 1 = 20Sch, Coin 2 = 10Sch, Coin 3 = 5Sch, Coin 4 = 1Sch

5.3.2.7.PRICE OF PLAY SETTINGS FOR SWITZERLAND (SFr = Swiss Franc)

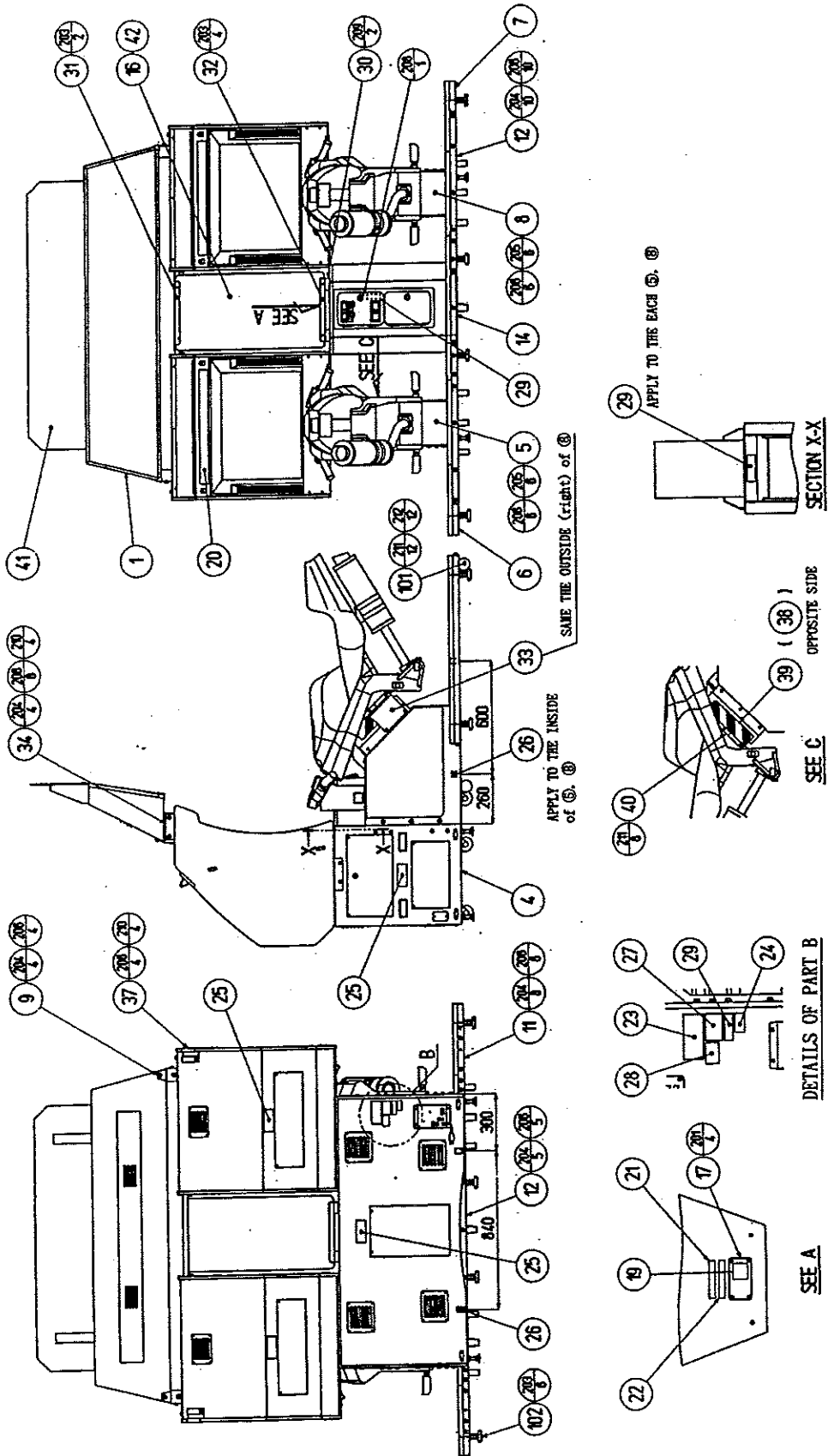
				DIP SWITCH SETTING				
				1	2	3	4	5
1SFr Play	5SFr = 5	-	10SFr = 10	OFF	OFF	OFF	OFF	OFF
1SFr Play	5SFr = 5	-	10SFr = 11	ON	OFF	OFF	OFF	OFF
1SFr Play	5SFr = 6	-	10SFr = 12	OFF	ON	OFF	OFF	OFF
2SFr Play	5SFr = 2 ½	-	10SFr = 5	ON	ON	OFF	OFF	OFF
2SFr Play	5SFr = 3	-	10SFr = 6	OFF	OFF	ON	OFF	OFF
2SFr Play	5SFr = 3	-	10SFr = 7	ON	OFF	ON	OFF	OFF
3SFr Play	5SFr = 1 2/3	-	10SFr = 3 1/3	OFF	ON	ON	OFF	OFF
3SFr Play	5SFr = 2	-	10SFr = 4	ON	ON	ON	OFF	OFF
3SFr Play	5SFr = 2	-	10SFr = 5	OFF	OFF	OFF	ON	OFF
4SFr Play	5SFr = 1 ¼	-	10SFr = 2 ½	ON	OFF	OFF	ON	OFF
4SFr Play	5SFr = 1 ¼	-	10SFr = 3	OFF	ON	OFF	ON	OFF
5SFr Play	5SFr = 1	-	10SFr = 2	ON	ON	OFF	ON	OFF
5SFr Play	5SFr = 1	-	10SFr = 3	OFF	OFF	ON	ON	OFF
6SFr Play	5SFr = 5/6	-	10SFr = 1 2/5	ON	OFF	ON	ON	OFF
6SFr Play	5SFr = 5/6	-	10SFr = 2	OFF	ON	ON	ON	OFF
8SFr Play	5SFr = 5/8	-	10SFr = 1 ¼	ON	ON	ON	ON	OFF
10SFr Play	5SFr = ½	-	10SFr = 1	OFF	OFF	OFF	OFF	ON
10SFr Play	5SFr = ½	10SFr = 1	20SFr = 3	ON	OFF	OFF	OFF	ON
20SFr Play	5SFr = ¼	-	10SFr = ½	OFF	ON	OFF	OFF	ON
20SFr Play	5SFr = ¼	10SFr = ½	50SFr = 3	ON	ON	OFF	OFF	ON
-	-	-	-	OFF	OFF	ON	OFF	ON
-	-	-	-	ON	OFF	ON	OFF	ON
-	-	-	-	OFF	ON	ON	OFF	ON
-	-	-	-	ON	ON	ON	OFF	ON
FREE PLAY OPTION				ON	ON	ON	ON	ON

1 Meter Pulse = 1SFr:

Coin 1 = n/u, Coin 2 = 5SFr, Coin 3 = 2SFr, Coin 4 = 1SFr

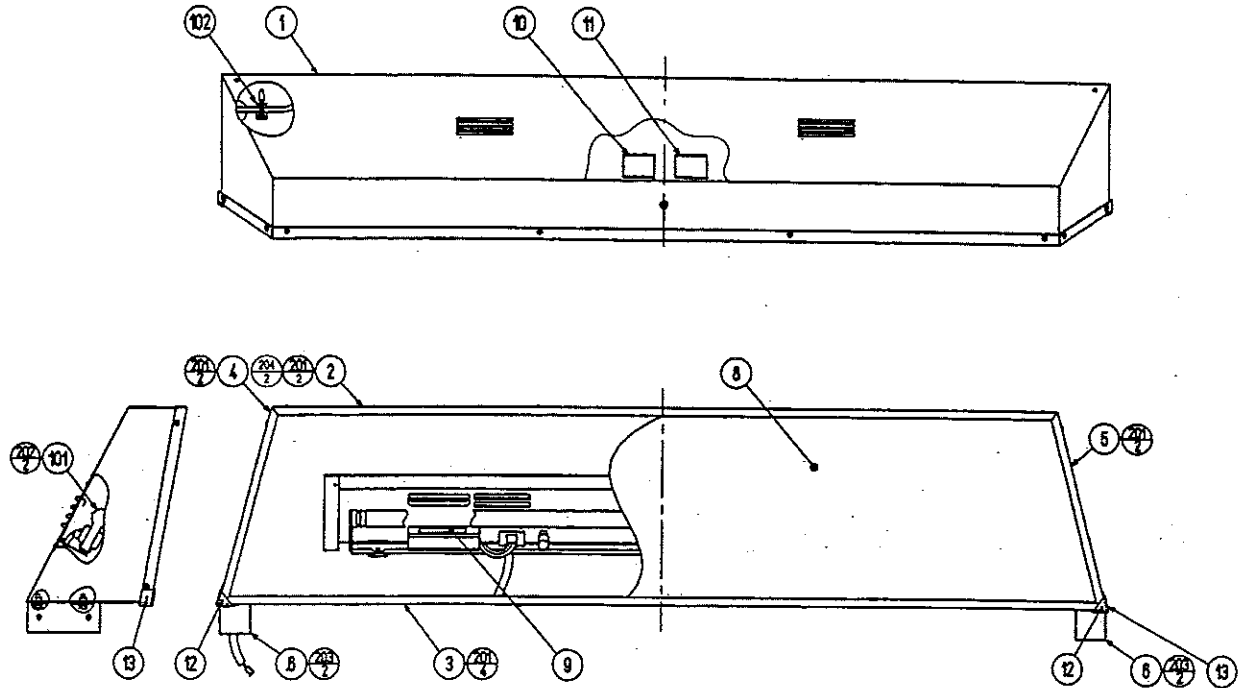
7. PARTS LIST

7.1. TOP ASSY MRD TWIN (MRD-00001UK)



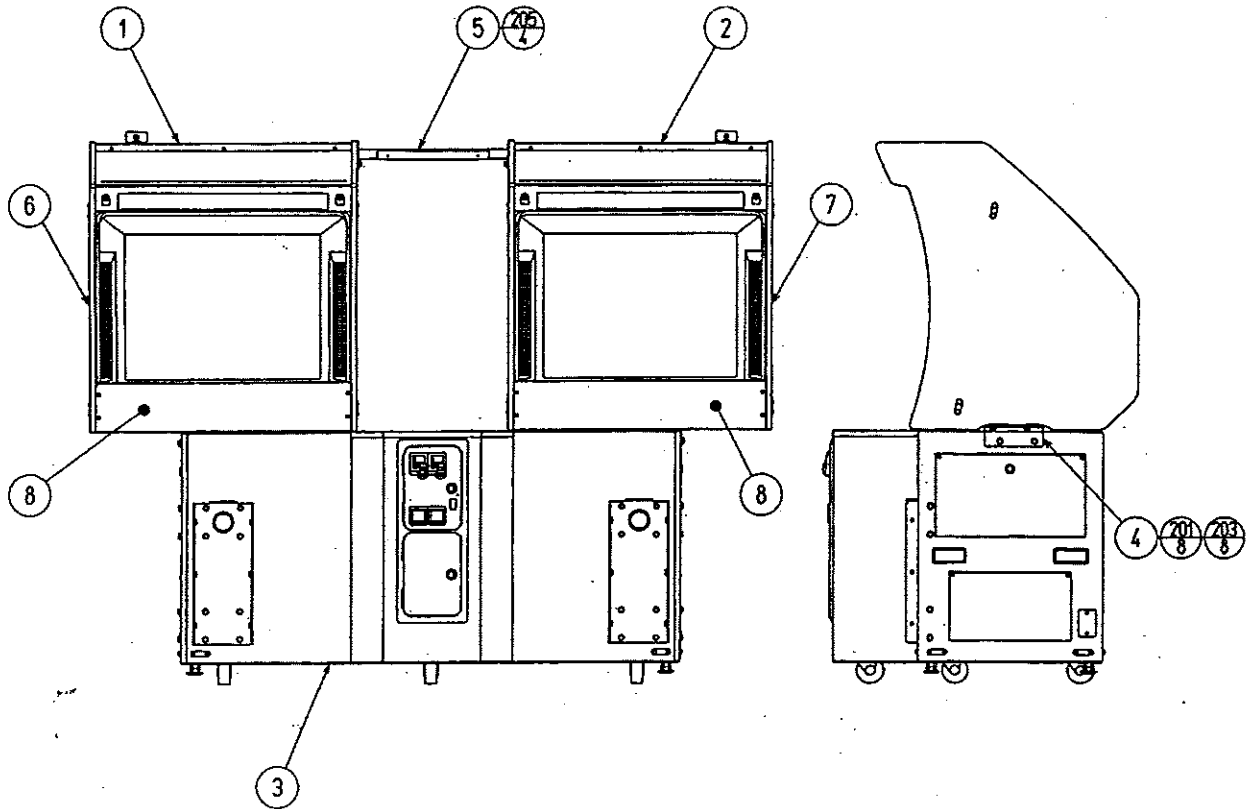
No.	PART NUMBER	DESCRIPTION
1	MRD-0200UK	ASSY BILLBOARD
4	MRD-10001UK	ASSY FRONT CABINET
5	MRD-1500UK	ASSY BIKE MECHA L
6	TTR-1530	ASSY FLOOR L
7	TTR-1540	ASSY FLOOR R
8	MRD-1550UK	ASSY BIKE MECHA R
9	TTR-0007	BILLBOARD BRKT
11	TTR-0009	FLOOR BRKT F
12	TTR-0010	FLOOR BRKT R
14	TTR-1520	ASSY FLOOR C
16	TTR-0014	DESIGN PLATE MAP
17	DYN-0010UK	DENOMI PLATE
20	422-0631	SUB INSTR SH MRD TWIN
25	LB1102	STICKER W BD POWER OFF ENG
26	421-7020UK	STICKER CAUTION FORK
27	421-7987UK-MRD-T	STICKER ELEC SPEC
29	421-7988-91UK	STICKER SERIAL NUMBER
30	TTR-0016	MAP HOLDER
31	TTR-0017	MAP SASH UPPER
32	TTR-0018	MAP SASH LOWER
33	TTR-0020	SHIPPING BRKT
34	TTR-0021	STAND SUPPORT
35	SGM-.4403	POLY COVER 1100 X2200><1700
36	SGM-4404	POLY COVER 1500 X500x 1000
37	BVG-0033	SHIPPING BRKT S
38	TTR-0025	BANK GUARD L
39	TTR-0026	BANK GUARD R
40	TTR-0027	GUARD HOLDER
41	429-0146UK	POP PNL MRD TWIN
42	422-0630-01	PLAY INSTR SH MRD TWIN ENG
101	601-5471	CASTER
102	MA1015	LEG ADJUSTER BOLT 0 60
201	000-TO0408-OB	M SCR TH BLK M4X 8
203	030-TO0408-OC	M SCR TH CRM M4x 8
204	030-000820-SB	HEX BLT W/S BLK M8X 20
205	030-000860-SB	HEX BLT W/S BLK MSX 60
206	068-852216-OB	FLT WSHR BLK 8.5-22x 1.6
208	000-TO0430-OB	M SCR TH BLK M4 X30
209	000-PO0520-WB	M SCR PH W/FS BLK M5 X20
210	030-000830-SB	HEX BLT W/S BLK MSX 30
211	000-TO0412-OC	M SCR TH CRM M4 X12
401	601-6604-70	CARTON BOX 70
402	420-6335-01UK	OWNERS MNL MRD TWIN ENG KEY
403	SGM-2675	POLYETHYLENE BAG 240x 370
407	220-5373	VOL CONT B-5K OHM
410	421-9636	STICKER NUMBER 1-4
412	514-5078-5000	FUSE 5X20 CERAMIC SB 5000mA
414	TTR-0015	HOLE PLATE
415	310-5050-220110	FLEX TUBE 22-0110CM
416	310-5051-22	CONN 22
418	TTR-0023	SHIPPING BRKT CABI
419	030-000830~OB	HEX BLT W/S BLK M8X 30
420	068-852216-OB	FLT WSHR BLK 8.5-22 xl.6

7.2. ASSY BILLBOARD (MRD-0200UK)



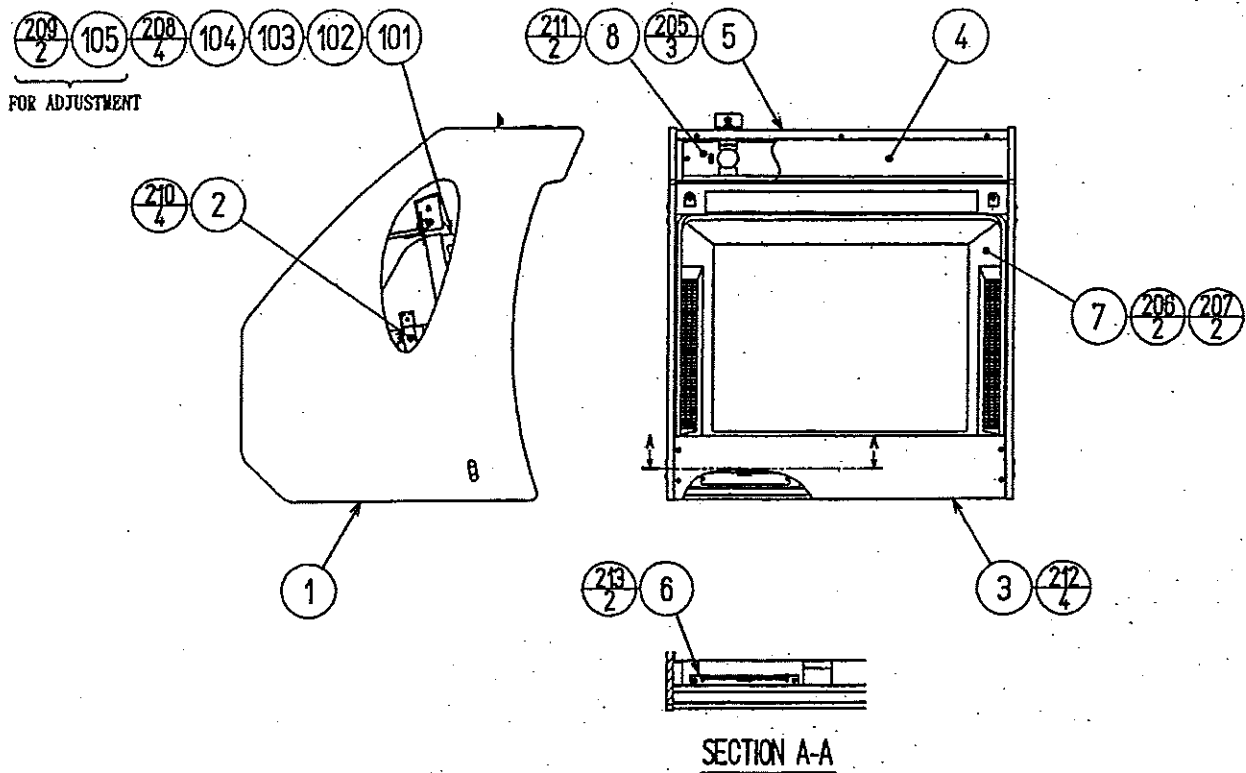
No.	PART NUMBER	DESCRIPTION
1	TTR-0201UK	BILLBOARD BOX
2	TTR-0202	CORNER SASH UPPER
3	TTR-0203	CORNER SASH LOWER
4	TTR-0204	CORNER SASH LEFT
5	TTR-0205	CORNER SASH RIGHT
6	TTR-0206	BILLBOARD STAND
8	423-0305UK	BILLBOARD PLATE MRD
9	421-7501-10	STICKER FL40W
10	LB1102	STICKER DANGEROUS VOLTAGE
11	LB1104	STICKER CAUTION HOT SURFACE
12	TTR-0208	EDGE CUSHION F
13	TTR-0209	EDGE CUSHION S
101	390-5538-40EX	ASSY FL40W EX W/CONN HIGH
102	280-5009	CORD CLAMP 021
201	000-T00408-OC	M SCR TH CRM M4X8
202	000-PO0416-W	M SCR PH W/FS M4X16
203	030-000820-S	HEX BLT W/S M8X20
204	000-T00416-OC	M SCR TH CRM M4X16
301	600-6697-19UK	WIRE HARN BILLBOARD

7.3. ASSY FRONT CABINET (MRD-10001UK)



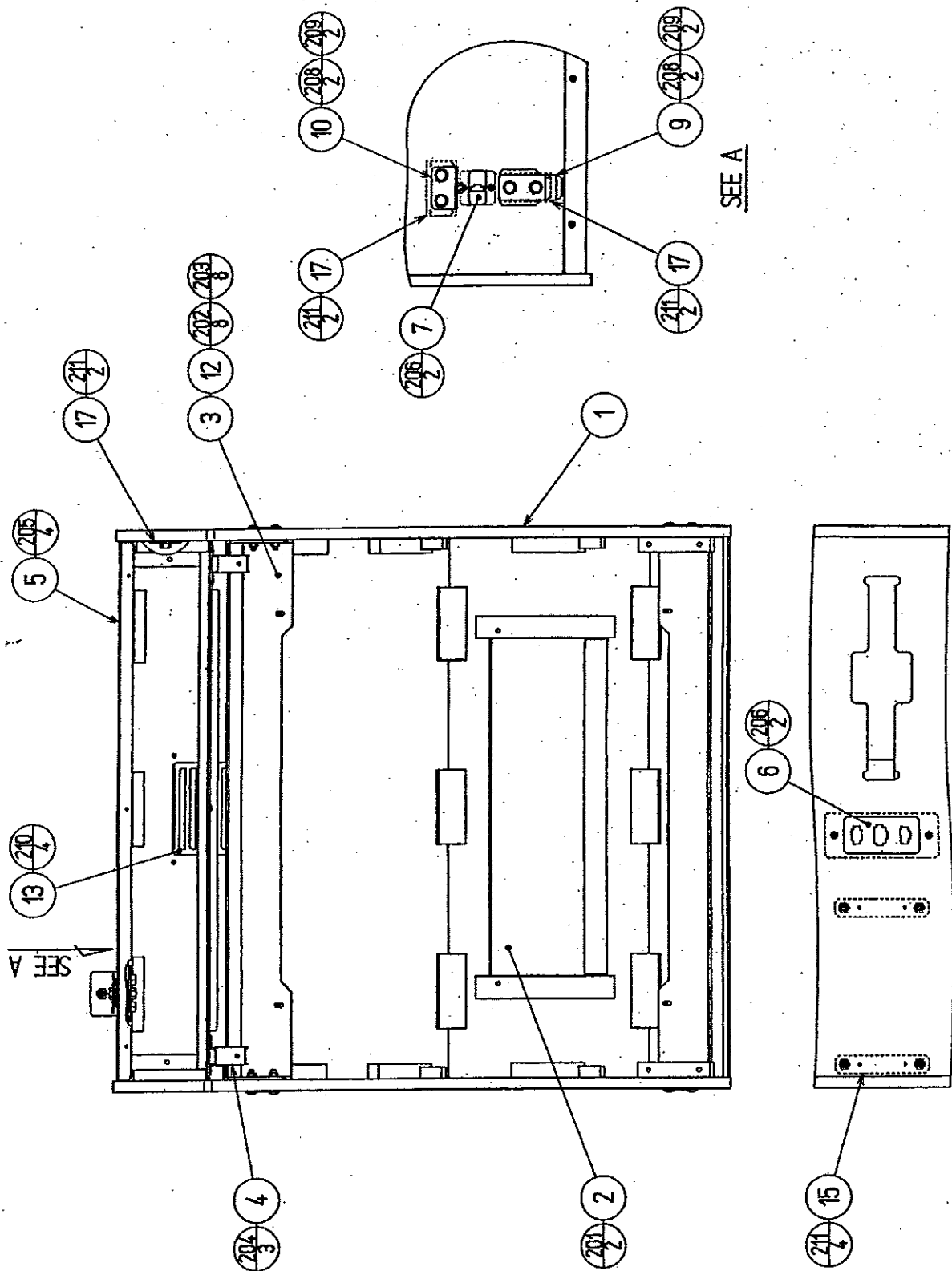
No.	PART NUMBER	DESCRIPTION
1	TTR-1050UK	ASSY MONITOR L
2	TTR-1070UK	ASSY MONITOR R
3	MRD-1200UK	ASSY FRONT CABINET LOWER
4	TTR-1018	MONITOR LOCK BRKT
5	TTR-0011	JOINT PIPE UPPER
6	421-9622	STICKER SIDE L
7	421-9623	STICKER SIDE R
8	421-9625	STICKER MASK HOLDER
201	030-000840-SB	HEX BLT W/S M8X 40
203	060-F00800-0B	FLT WSHR BLK M8
205	FAS-300007	HEX BLT CRM W/FS MSX 40

7.4. ASSY MONITOR L (MRD-1050UK)



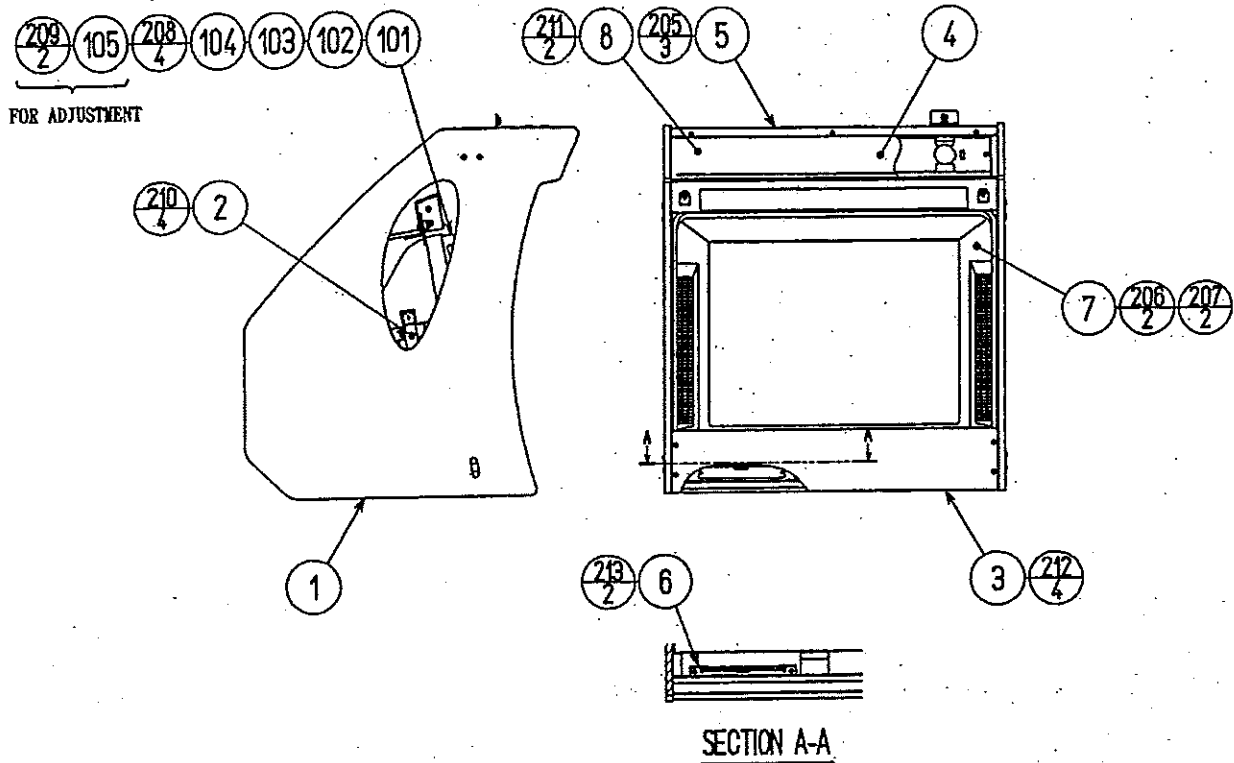
No.	PART NUMBER	DESCRIPTION
1	TTR-1051UK	ASSY SUB CABI MONITOR L
2	TTR-1090	ASSY SPEAKER
3	TTR-1063	MASK HOLDER
4	TTR-1064UK	DESIGN PLATE LEADER
5	TTR-1065	SASH
6	TTR-1066	ADJUST PANEL
7	TTR-1067UK	MONITOR MASK
8	TTR-1080	LAMP UNIT
101	200-5481-24	ASSY CLR DSPL 29 TYPE 100V
	OR	
	200-5395-24-1SA	29 CRT ASSY FOR TERMINAL
102	280-5112	BUSH FOR TV
103	280-5113	COLLAR FOR TV
104	280-5114	SPACER 6.4-25x 2
105	280-5185-6	SPACER TUBE L=6
205	000-TO0412-OB	M SCR TH BLK M4X12
206	000-T00530-OB	M SCR TH BLK M5X30
207	068-552016-OB	FLT WSHR BLK 5.5-20X1.6
208	050-FOO600	FLG NUT M6
209	000-POO312-WB	M SCR PH W/FS BLK M3X12
210	000-POO416-W	M SCR PH W/FS M4X16
211	000-POO440-W	M SCR PH W/FS M4X40
212	000-TO0425-OB	M SCR TH BLK M4X25
213	011-PO3512	TAP SCR PH 3.5X12

7.5. ASSY SUB CABI MONITOR L (MRD-1051UK)



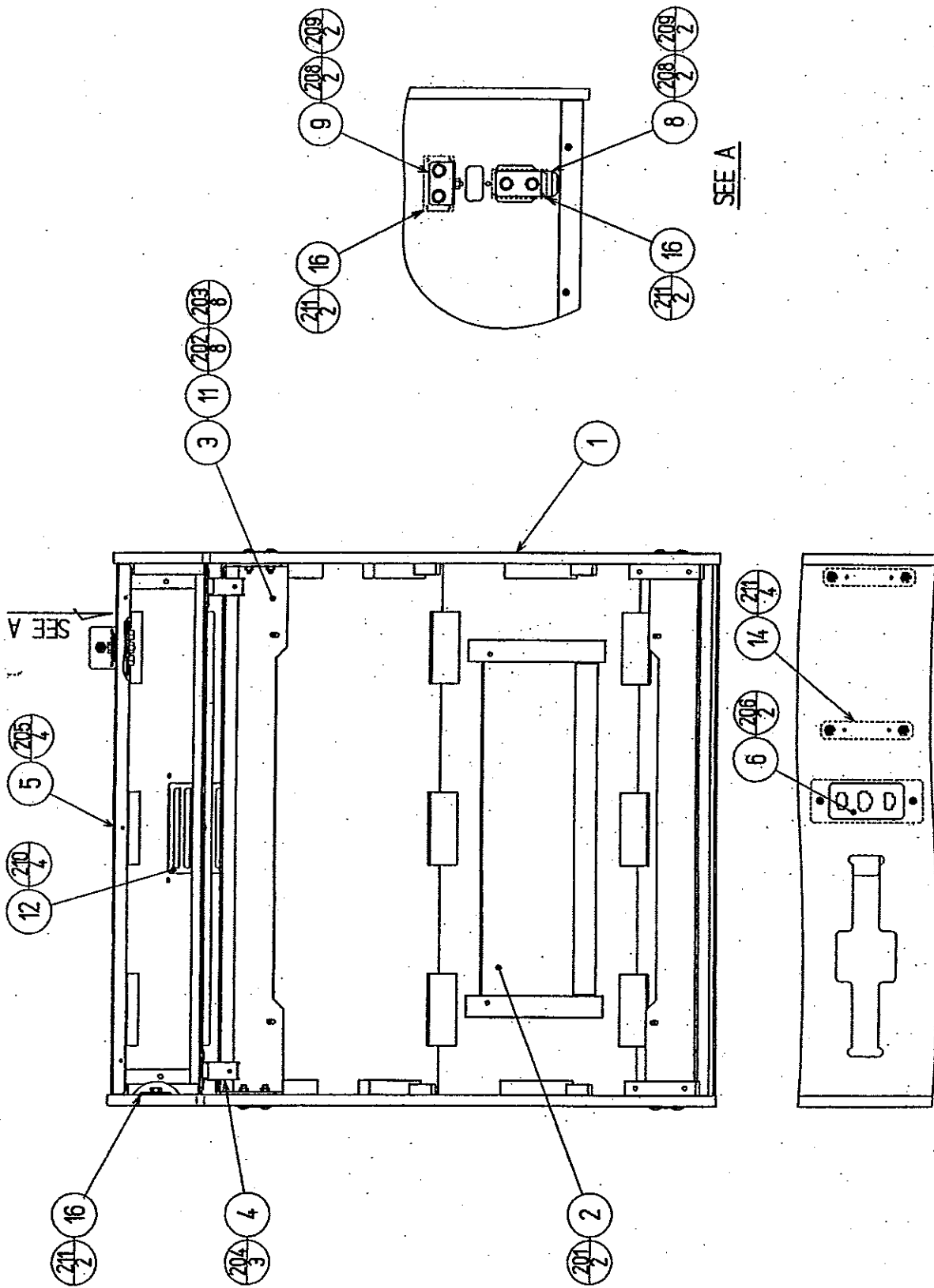
No.	PART NUMBER	DESCRIPTION
1	TTR-1052UK	MONITOR BOX L
2	TTR-1053	MONITOR BACK LID
3	TTR-1054	MONITOR SUPPORT
4	TTR-1055	MASK SUPPORT
5	TTR-1056	SASH HOLDER
6	TTR-1057UK	CONN PLATE CABI
7	TTR-1058UK	CONN PLATE FL
9	TTR-1060	BILLBOARD HOOK
10	TTR-1061	BILLBOARD HOLDER
12	117-5235	PLATE 6-30
13	104-5239-04	AIR VENT BLACK
15	TTR-1008	NUT PLATE 2-M3
17	DYN-2121	NUT PLATE 2-M8
201	000-T00430-OB	M SCR TH BLK M4X30
202	031-000630-OC	CRG BLT CRM M6X30
203	050-F00600	FLG NUT M6
204	000-T00416-OB	M SCR TH BLK M4X16
205	000-F00416	M SCR FH M4X16
206	000-P00425-WB	M SCR PH W/FS BLK M4X25
208	030-000830-SB	HEX BLT W/S BLK M8X30
209	060-F00800-OB	FLT WSHR BLK M8
210	000-T00420-OB	M SCR TH BLK M4X20
211	011-T003512	TAP SCR TH 3. 5X12
301	600-6697-13UK	WIRE HARN MONITOR L1
302	600-6697-18UK	WIRE HARN MONITOR R2
303	600-6927-104	WIRE HARN FL SUPPLY
304	LM9433	LOOM EARTH 600mm
305	LM9313	LOOM EARTH 500mm

7.6. ASSY MONITOR R (MRD-1070UK)



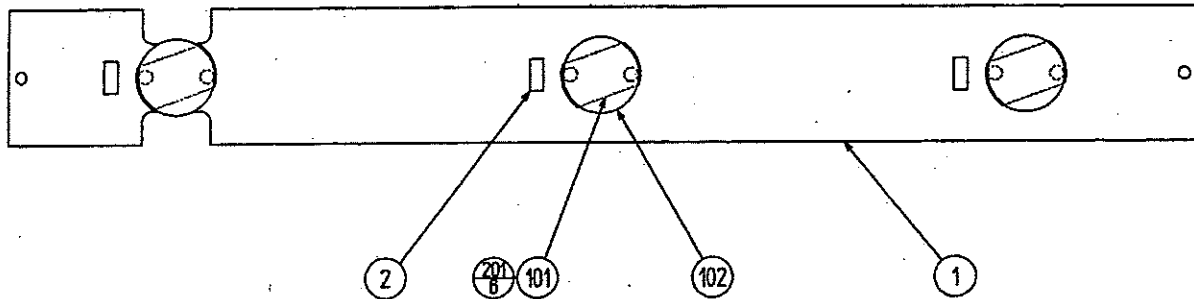
No.	PART NUMBER	DESCRIPTION
1	TTR-1071UK	ASSY SUB CABI MONITOR R
2	TTR-1090	ASSY SPEAKER
3	TTR-1063	MASK HOLDER
4	TTR-1064UK	DESIGN PLATE LEADER
5	TTR-1065	SASH
6	TTR-1066	ADJUST PANEL
7	TTR-1067UK	MONITOR MASK
8	TTR-1080	LAMP UNIT
101	200-5481-24	ASSY CLR DSPL 29 TYPE 100V
	OR	
	200-5395-24-1SA	29 CRT ASSY FOR TERMINAL
102	280-5112	BUSH FOR TV
103	280-5113	COLLAR FOR TV
104	280-5114	SPACER 6.4-25x 2
105	280-5185-6	SPACER TUBE L=6
205	000-TO0412-OB	M SCR TH BLK M4X12
206	000-T00530-OB	M SCR TH BLK M5X30
207	068-552016-OB	FLT WSHR BLK 5.5-20X1.6
208	050-FOO600	FLG NUT M6
209	000-POO312-WB	M SCR PH W/FS BLK M3X12
210	000-POO416-W	M SCR PH W/FS M4X16
211	000-POO440-W	M SCR PH W/FS M4X40
212	000-TO0425-OB	M SCR TH BLK M4X25
213	011-PO3512	TAP SCR PH 3.5X12

7.7. ASSY SUB CABI MONITOR R (MRD-1071UK)



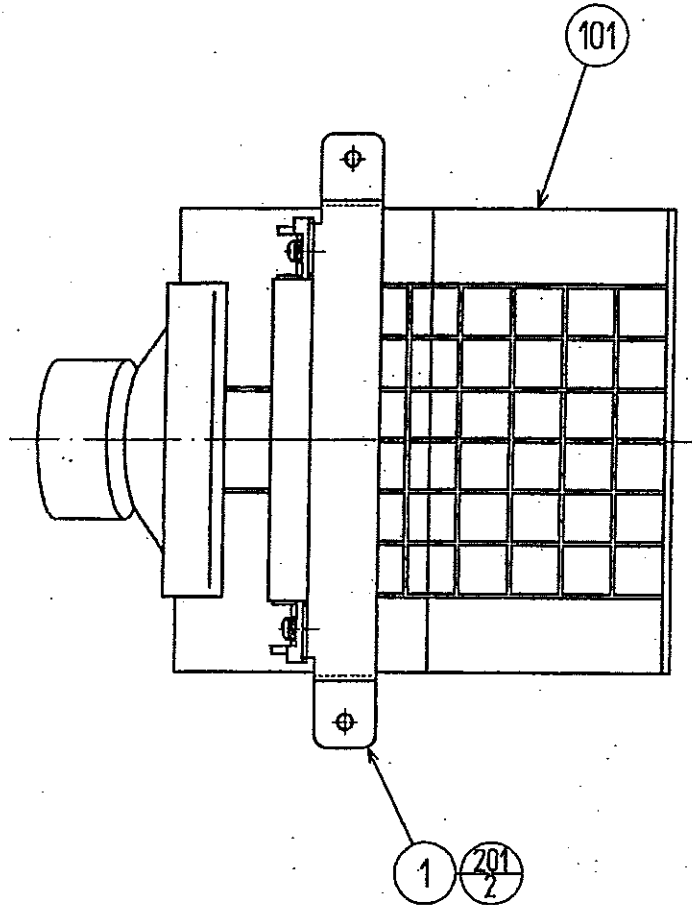
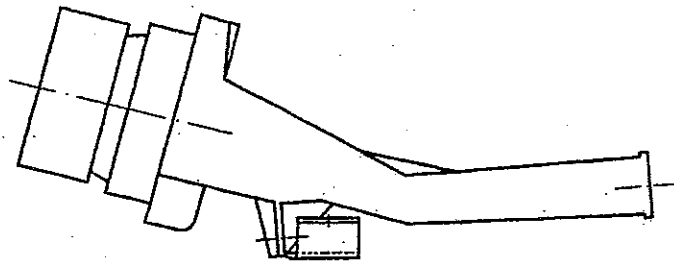
No.	PART NUMBER	DESCRIPTION
1	TTR-1072UK	MONITOR BOX R
2	TTR-1053	MONITOR BACK LID
3	TTR-1054	MONITOR SUPPORT
4	TTR-1055	MASK SUPPORT
5	TTR-1056	SASH HOLDER
6	TTR-1057UK	CONN PLATE CABI
8	TTR-1060	BILLBOARD HOOK
9	TTR-1061	BILLBOARD HOLDER
11	117-5235	PLATE 6-30
12	104-5239-04	AIR VENT BLACK
14	TTR-1008	NUT PLATE 2-M8
16	DYN-2121	NUT PLATE 2-M8
201	000-T00430-OB	M SCR TH BLK M4X30
202	031-000630-OC	CRG BLT CRM M6X30
203	050-F00600	FLG NUT M6
204	000-T00416-OB	M SCR TH BLK M4X16
205	000-F00416	M SCR FH M4X16
206	000-P00425-WB	M SCR PH W/FS BLK M4X25
208	030-000830-SB	HEX BLT W/S BLK M8X30
209	060-F00800-OB	FLT WSHR BLK M8
210	000-T00420-OB	M SCR TH BLK M4X20
211	011-T03512	TAP SCR TH 3. 5X12
301	600-6697-17UK	WIRE HARN MONITOR R1
302	600-6697-18UK	WIRE HARN MONITOR R2
303	LM9433	LOOM EARTH 600mm
304	LM9313	LOOM EARTH 500mm

7.8. ASSY LAMP UNIT (TTR-1080)



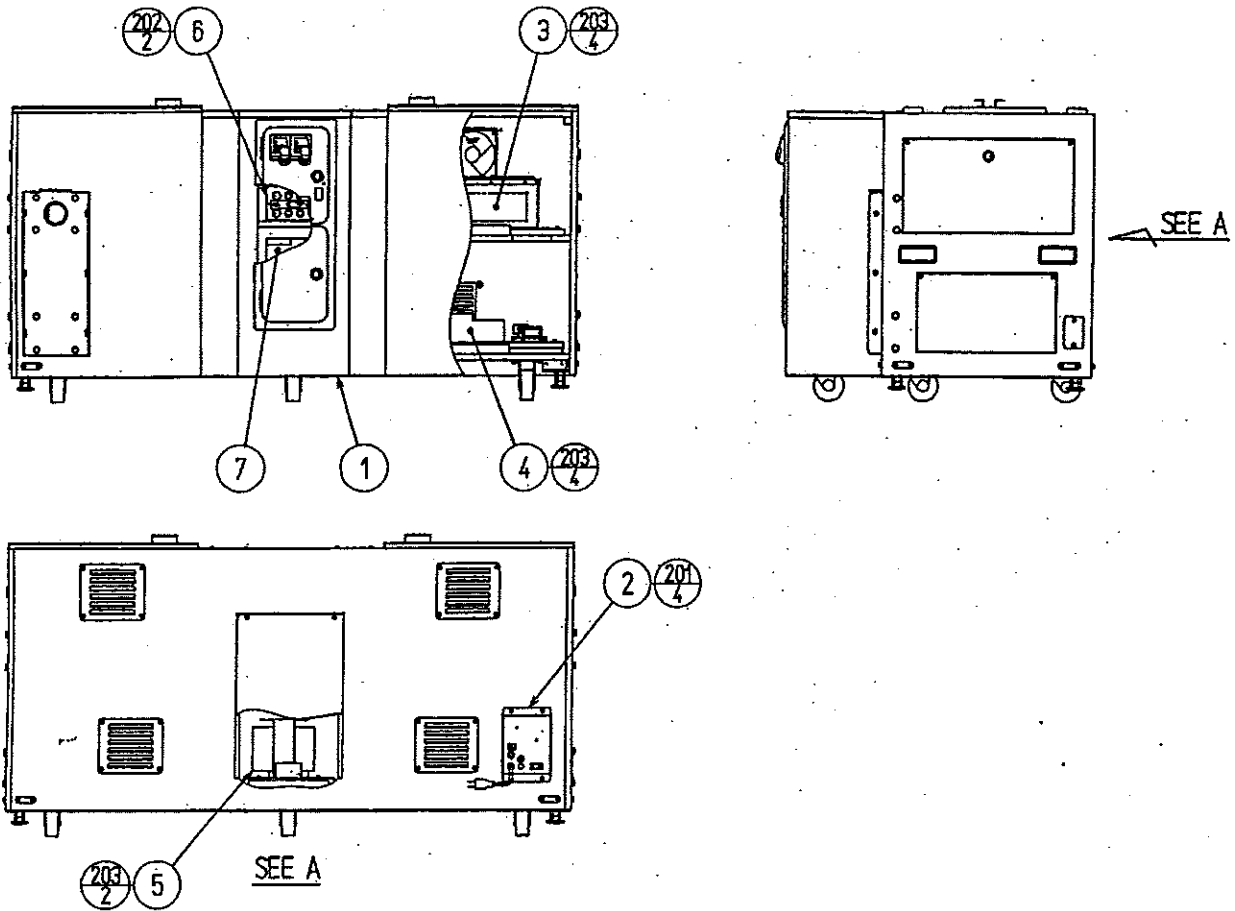
No.	PART NUMBER	DESCRIPTION
1	TTR-1081	LAMP BASE
2	421-7501-01	STICKER 110V 25W
101	214-0184	LAMP SOCKET E17
102	390-5573	LAMP 110V 25W
103	280-0419	HARNES LUG
104	LB1102	STICKER WARNING HAZARDOUS VOLTAGE
105	LB1104	STICKER CAUTION HOT SURFACE
201	011-P00320	TAP SCR PH 3X20
202	011-T00310	TAP SCR TH 3X10
301	600-6697-16UK	WIRE HARN LEADER LAMP

7.9. ASSY SPEAKER (TTR-1090)



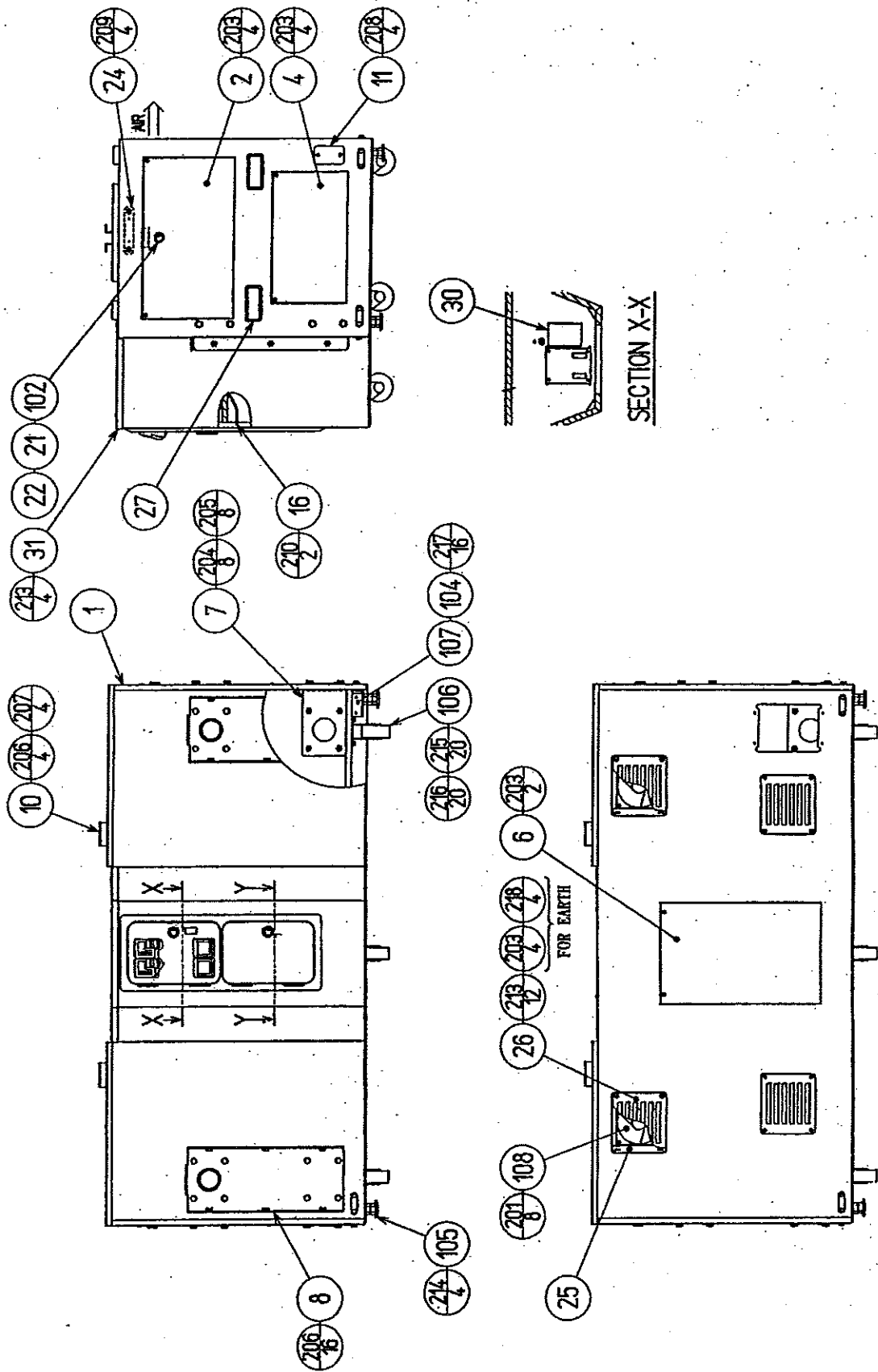
No.	PART NUMBER	DESCRIPTION
1	TTR-1091	SPEAKER BRKT
101	130-5140	SPEAKER BOX MINI DOME
201	000-P00412-W	M SCR PH W/FS M4X12
301	600-6697-15	WIRE HARN SPEAKER

7.10. ASSY FRONT CABINET LOWER (MRD-1200UK)



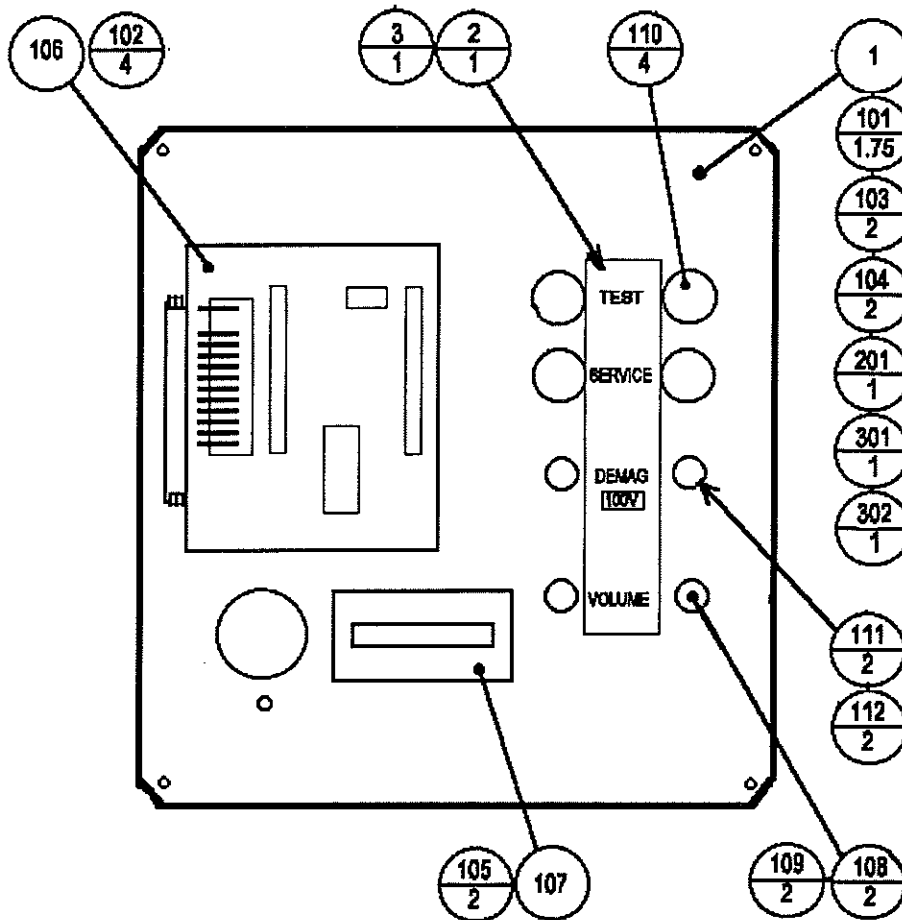
No.	PART NUMBER	DESCRIPTION
1	TTR-1201UK	ASSY SUB CABINET LOWER
2	TTR-1250UK	ASSY AC UNIT
3	MRD-1300	ASSY SHIELD CASE
4	TTR-4300UK	ASSY PWR SPLY
5	TTR-4400UK	ASSY ELEC
6	MRD-0350UK	ASSY VTS
7	253-5366UK	CASH BOX
101	600-6275-0700	ASSY FIBER CABLE 0 5 0700CM
201	000-T00420-OB	M SCR TH BLK M4X20
202	000-P00416-W	M SCR PH W/FS M4X16
203	000-P00530-W	M SCR PH W/FS M5X30
301	LM9012	LOOM EARTH 200mm
302	LM9112	LOOM EARTH 300mm

7.11. ASSY SUB CABINET LOWER (TTR-1201UK)



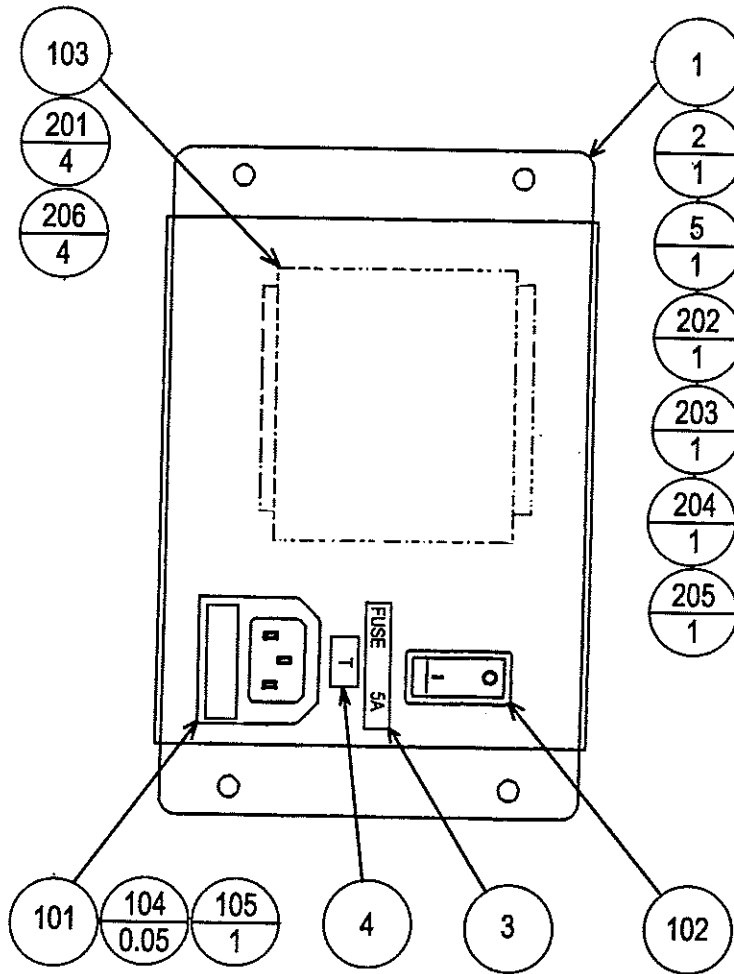
No.	PART NUMBER	DESCRIPTION
1	TTR-1202UK	WOODEN CABINET LOWER
2	TTR-1203UK	SHIELD CASE DOOR
4	TTR-1205	PWR SPLY DOOR
6	TTR-1207UK	ELEC DOOR
7	TTR-1208UK	NUT PLATE 6-M8
8	TTR-1209	JOINT BRKT
10	TTR-1211	GUIDE BRKT
11	TTR-1212	HOLE LID
24	TTR-1008	NUT PLATE 2-M8
25	HN-1042X	FAN BRKT
26	104-5239-04UK	AIR VENT BLACK
27	253-5396	CABINET HANDLE
30	LB1103	STICKER CAUTION
31	TTR-0013	CENTER PLATE
104	117-5233	PLATE LEG BRACKET BLACK
105	MA1015	LEG ADJUSTER BOLT M16x 75
106	601-6224	CASTER ø75
107	ARC-1006	LEG BRACKET
108	260-0011-02	AXIAL FLOW FAN AC100V 50-60Hz
201	000-P00312-W	M SCR PH W/FS M3X12
203	000-T00430-OB	M SCR TH BLK M4X30
204	030-000830-SB	HEX BLT W/S BLK M8X30
205	060-F00800-0B	FLT WSHR BLK M8
206	030-000830-S	HEX BLT W/S M8X30
207	060-F00S00	FLT WSHR MS
208	000-T00416-OB	M SCR TH BLK M4X16
209	011-T03512	TAP SCR TH 3.5X12
210	000-P00420-W	M SCR PH W/FS M4X20
211	011-T00312	TAP SCR TH 3X12
213	000-T00420-OB	M SCR TH BLK M4X20
214	050-H01600	HEX NUT M16
215	030-000630-S	HEX BLT W/S M6X30
216	060-F00600	FLT WSHR M6
217	030-000630-SB	HEX BLT W/S BLK M6X30
218	050-F00400	FLG NUT M4
301	600-6927-07	WIRE HARN 230V FAN
302	600-6697-08UK	WIRE HARN FRONT CABI EXT2
303	600-6697-09UK	WIRE HARN FRONT CABI EXT3
304	600-6697-10	WIRE HARN FRONT CABI EXT4
305	600-6697-11UK	WIRE HARN FRONT CABI EXT5
306	600-6697-12UK	WIRE HARN FRONT CABI EXT6
307	600-6697-20	WIRE HARN FRONT CABI EXT7
308	600-6927-35UK	WIRE HARN 230V PRIMARY EXT
309	600-6927-103UK	WIRE HARN BILLBOARD SUPPLY
310	LM9211	LOOM EARTH 400mm
311	LM9612	LOOM EARTH 1000mm

7.12. ASSY VTS (MRD-0350UK)



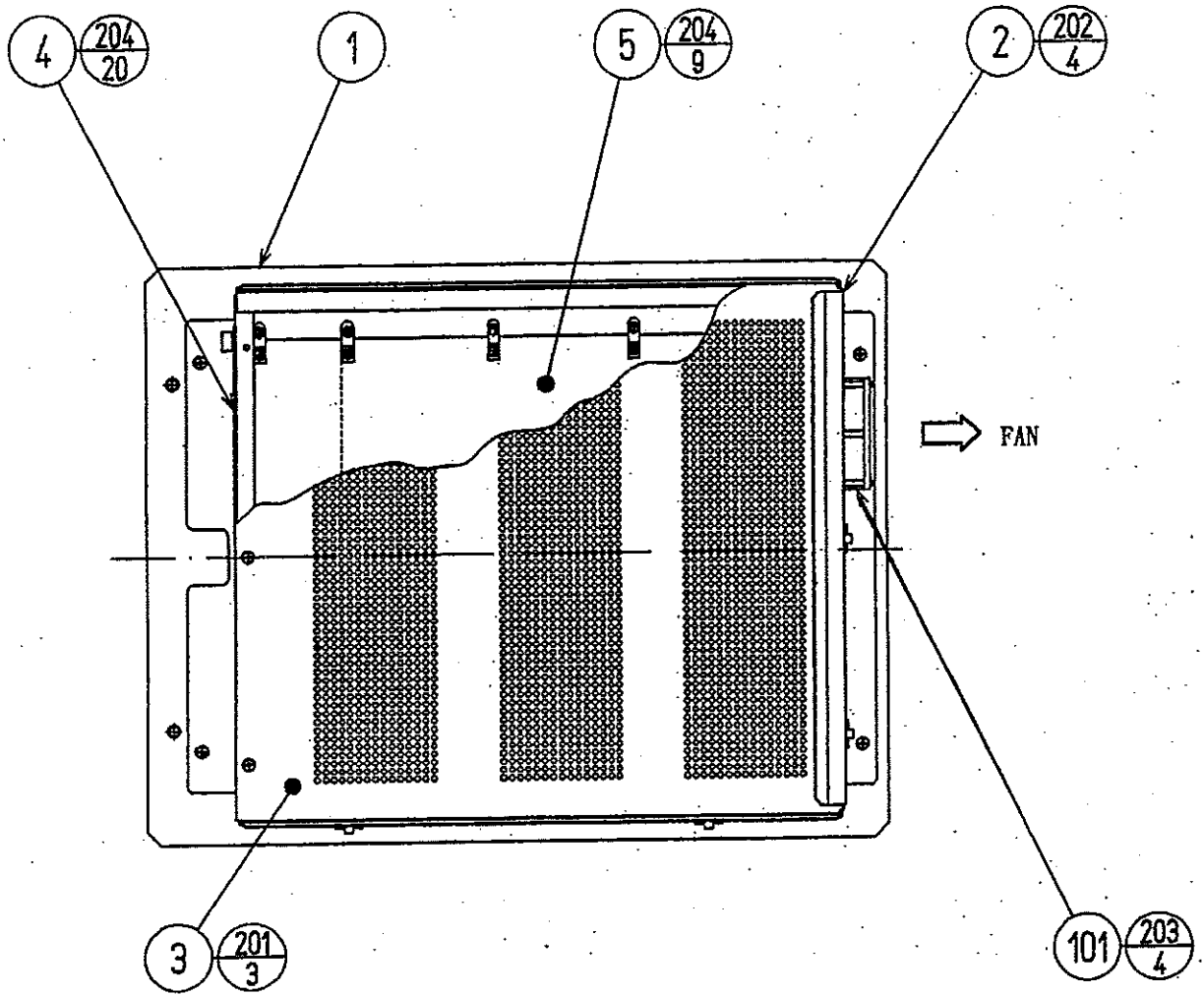
No.	PART NUMBER	DESCRIPTION
1	MRD-5002UK	VTS BRKT
2	LB1006	LABEL VTS
3	LB1028	LABEL 100V YELL/BLK
101	601-6231-C100	EDGING NEW TYPE
102	280-L01640-PS	STANDOFF 16mm 4mm PANEL SMALL
103	OS1174	CABLE TIE 100mm
104	OS1181	CABLE TIE BASE
105	OS1098	CRIMP BELL END SMALL
106	EP1004	CREDIT BD KLINGON
107	EP1003	COUNTER IMPULSE, PANEL W/CLIP
108	EP1331	POT 4.7K LIN 0.11" TAB
109	EP1018	KNOB 15MM DIA FOR 6.3MM
110	SW1100	SWITCH MOMENTARY 0.11" TAB
111	SW1099	SWITCH PB MOMENTARY 30/40A
112	OS1055	TERM 1/4" RECEPT. RED F/INSUL
201	000-P00412-W	M SCR PH W/FS M4X12
301	600-6559-101	WIRE HARN VTS DYN KWIK F
302	LM9111	LOOM EARTH 300mm

7.13. ASSY AC UNIT (MRD-1250UK)



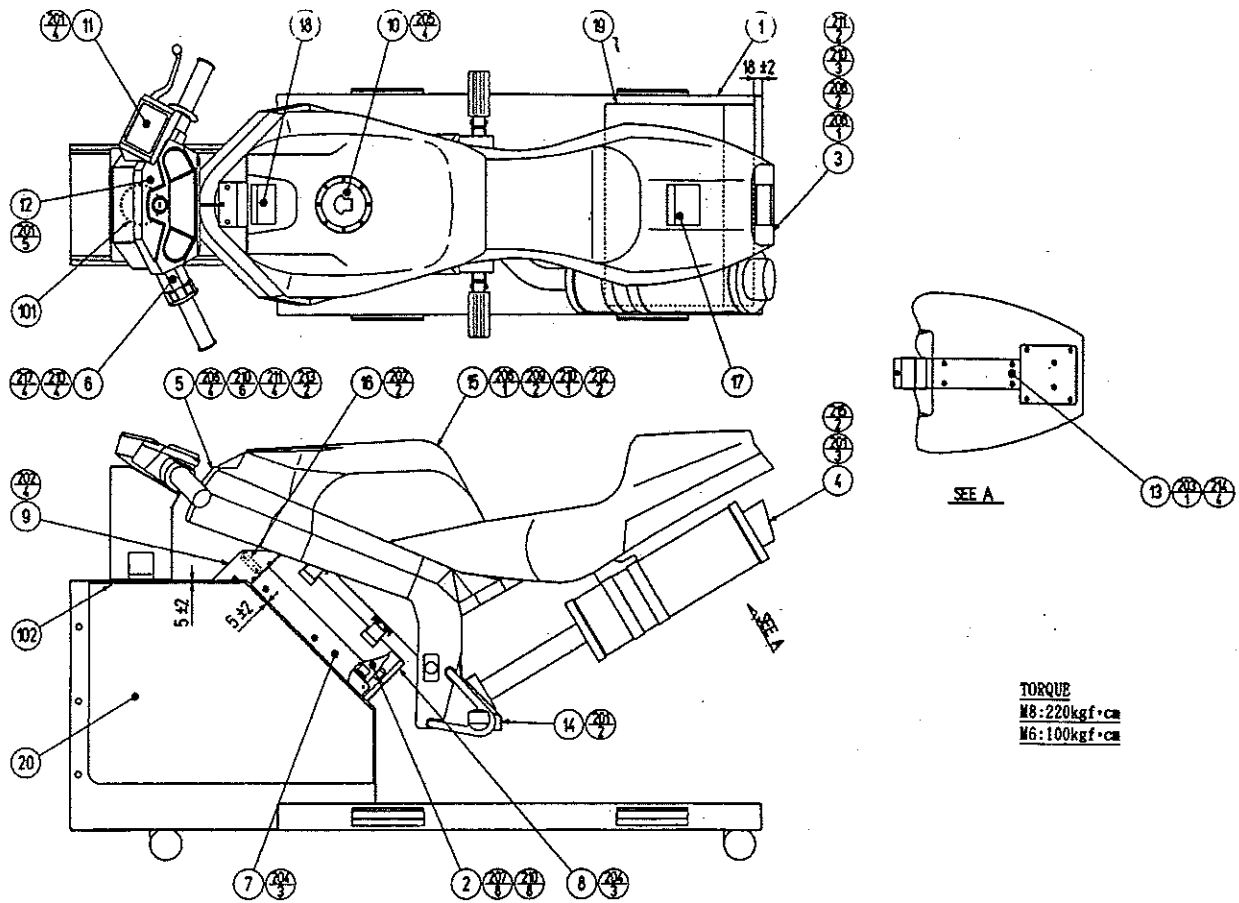
No.	PART NUMBER	DESCRIPTION
1	MRD-1251UK	AC BRKT
2	MRD-1252UK	AC BRKT COVER
3	LB1000	LABEL 5A
4	LB1100	STICKER FUSE TYPE T
5	LB1096	STICKER PROTECTIVE EARTH
101	EP1302	EUROSOCKET FUSED 10A 250VAC
102	EP1349	CIRCUIT BREAKER THERM O/L 8A
103	EP1344	FILTER EMI 10A BLP
104	310-5029-D508	HEAT SHRINK SLEEVING 50.8DIA
105	514-5078-5000	FUSE 5X20 CERAMIC SB 5000Ma
201	FX0399	M3X8 MSCR POSI PAN BZP
202	FX0011	M4 NUT FLG SER BZP
203	FX0210	M4 NUT BZP
204	FX0019	M4 WSHR S/PRF BZP
205	FX0009	M4 WSHR FORM A FLT BZP
206	FX0263	M3 WSHR FORM A FLT BZP
301	600-6925-001UK	WIRE HARN AC BRKT
302	600-6927-106UK	WIRE HARN FILTER AC OUT

7.14. ASSY SHIELD CASE TWIN (MRD-1300)



No.	PART NUMBER	DESCRIPTION
1	TTR-1301	SHIELD CASE BASE
2	105-5218	SHIELD CASE
3	105-5219-91	SHIELD CASE LID
4	839-0744	FILTER BD A-CRX RALLY
5	833-13232	GAME BD MOTOR RAID TWIN
101	260-0055	FAN MOTOR DC5V
102	209-0023	CONN CLOSED END
103	280-5009	CORD CLAMP 0 21
104	280-5275-SR10	CORD CLAMP SR10
106	601-0460	PLASTIC TIE BELT 100MM
107	FN1017	FAN GRILLE 80mm
201	000-POO408-W	M SCR PH W/FS M4X8
202	000-POO416-W	M SCR PH W/FS M4X16
203	000-POO335-W	M SCR PH W/FS M3X35
204	010-POO308-W	S-TITE SCR PH W/F M3X8
205	011-FOO310	TAP SCR FH 3X10
207	011-TO3512	TAP SCR TH 3.5X12
301	600-6697-24	WIRE HARN SHIELD CASE1
302	600-6697-25UK	WIRE HARN SHIELD CASE2
303	600-6502-13	WIRE HARN DC FAN

7.15. ASSY BIKE MECHA L (MRD-1500)

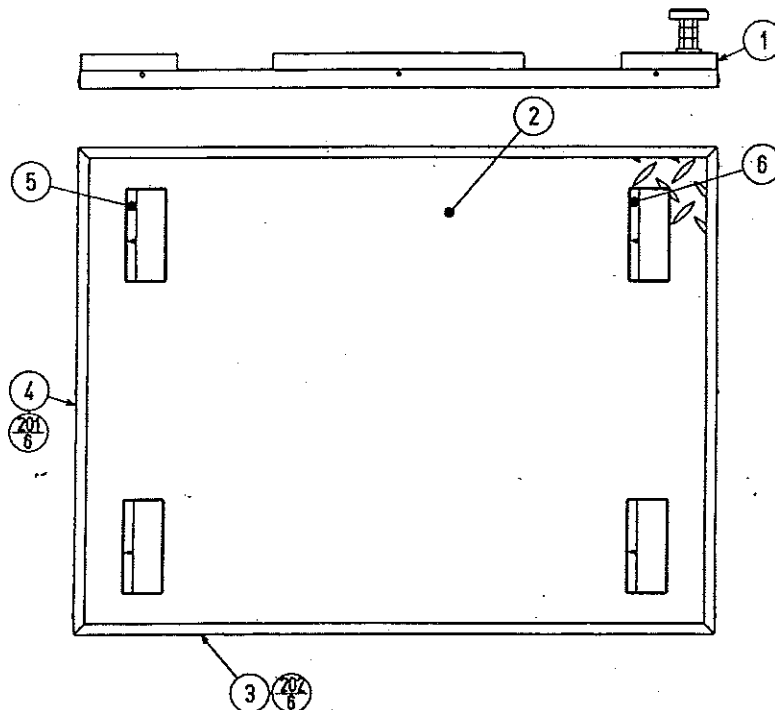


No.	PART NUMBER	DESCRIPTION
1	TTR-1502	REAR FRAME L
2	TTR-3040	ASSY CENTERING MECHA
3	TTR-3054	ASSY SEAT COWL L
4	TTR-3090	ASSY MUFFLER
5	TTR-3095	ASSY BIKE FRAME TWIN
6	610-0469	ASSY HANDLE MECHA
7	TTR-1503	PROTECT COVER L
8	TTR-1504	PROTECT COVER R
9	TTR-1505	VR COVER
10	TTR-3002	FUEL CAP
11	TTR-3003	BRAKE COVER
12	TTR-3004	HANDLE COVER
13	TTR-3007	WIRE COVER
14	TTR-3008	FRAME LID
15	TTR-3016	TANK L
16	TTR-1506	WIRE CLAMP
17	440-WS0040-EG	STICKER W TTR A ENG
18	440-WS0042-EG	STICKER W TTR C ENG
19	421-9628	STICKER STEP CENTER
20	421-9626	STICKER REAR FRAME L
21	MRD-5003UK	WIRE BRKT
101	601-5526-251	BUSH 1.6t
102	601-6231-DO80	EDGING NEW TYPE
103	280-5009	CORD CLAMP 021

(Continued...)

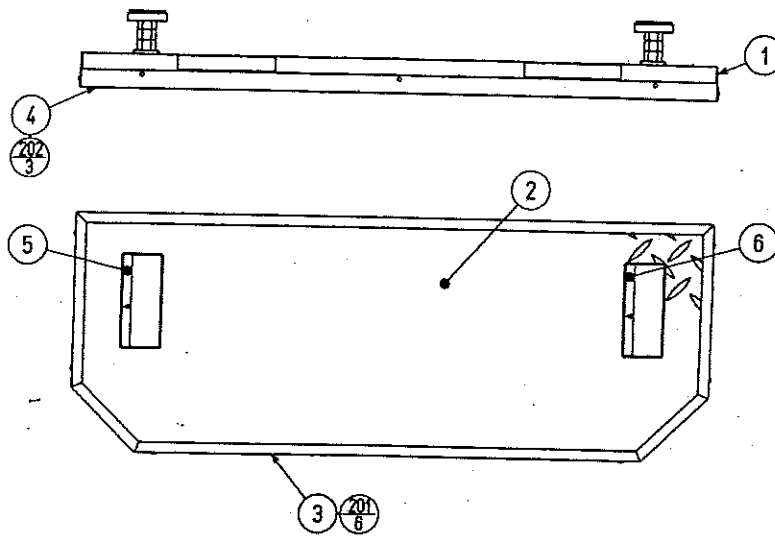
201	000-T0408-OC	M SCR TH CRM M4X8
202	000-P00408-WB	M SCR PH W/FS BLK M4X8
203	000-P00412-WB	M SCR PH W/FS BLK M4X12
204	000-P00512-WB	M SCR PH W/FS BLK M5X12
205	020-000410-HZ	HEX SKT CAP SCR BLK OZ M4X10
206	030-000830-SB	HEX BLT W/S BLK MSX30
207	030-000860-SB	HEX BLT W/S BLK M8X60
208	050-U00800	U NUT MS
209	060-F00600-0B	FLT WSHR BLK M6
210	060-F00800-0B	FLT WSHR BLK M8
211	060-S00800-0B	SPR WSHR BLK M8
212	020-000625-HZ	HEX SKT CAP SCR BLK OZ M6X25
213	020-000830-HZ	HEX SKT CAP SCR BLK OZ MSX30
214	FAS-110005	TAP SCR TH CRM M4 12
215	000-T00512-OC	M SCR TH CRM M5X12
217	030-000820-SB	HEX BLT W/S BLK M8X20
301	600-6697-36UK	WIRE HARN BIKE FRAME EXT
302	LM9411	LOOM EARTH 600mm
303	LM9311	LOOM EARTH 500mm
304	600-6697-26	WIRE HARN REAR BASE EXT 1

7.16. ASSY FLOOR C (TTR-1520)



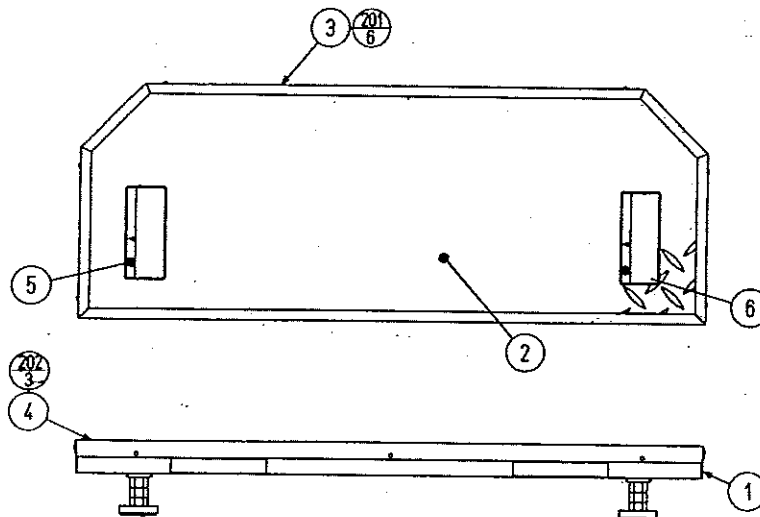
No.	PART NUMBER	DESCRIPTION
1	TTR-1521	FLOOR CENTER
2	TTR-1522	FLOOR MAT CENTER
3	TTR-1523	CORNER EDGE INNER
4	TTR-1524	CORNER EDGE FR
5	440-WP0057-EG	PLATE W FOOT MAT ENG
6	440-WP0058-EG	PLATE W THIS AREA ENG
201	000-T00408-OC	M SCR TH CRM M4X8
202	050-F00400	FLG NUT M4

7.17. ASSY FLOOR L (TTR-1530)



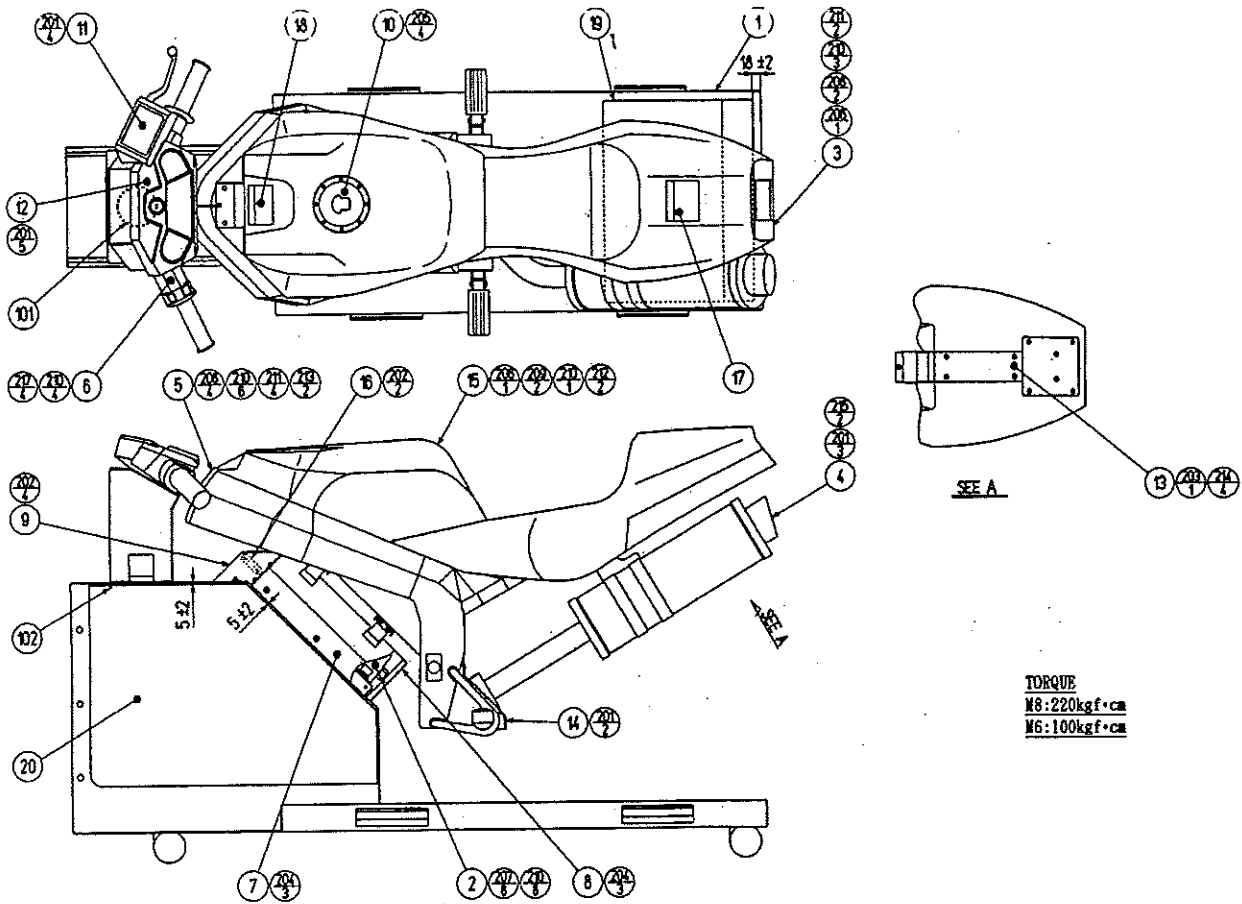
No.	PART NUMBER	DESCRIPTION
1	TTR-1531	FLOOR SIDE
2	TTR-1532	FLOOR MAT SIDE
3	TTR-1533	CORNER EDGE OUTER
4	TTR-1523	CORNER EDGE INNER
5	440-WP0057-EG	PLATE W FOOT MAT ENG
6	440-WP0058-EG	PLATE W THIS AREA ENG
201	000-T00408-OC	M SCR TH CRM M4X8
202	050-F00400	FLG NUT M4

7.18. ASSY FLOOR R (TTR-1540)



No.	PART NUMBER	DESCRIPTION
1	TTR-1531	FLOOR SIDE
2	TTR-1532	FLOOR MAT SIDE
3	TTR-1533	CORNER EDGE OUTER
4	TTR-1523	CORNER EDGE INNER
5	440-WP0057-EG	PLATE W FOOT MAT ENG
6	440-WP0058-EG	PLATE W THIS AREA ENG
201	000-T00408-OC	M SCR TH CRM M4X8
202	050-F00400	FLG NUT M4

7.19. ASSY BIKE MECHA R (MRD-1550UK)

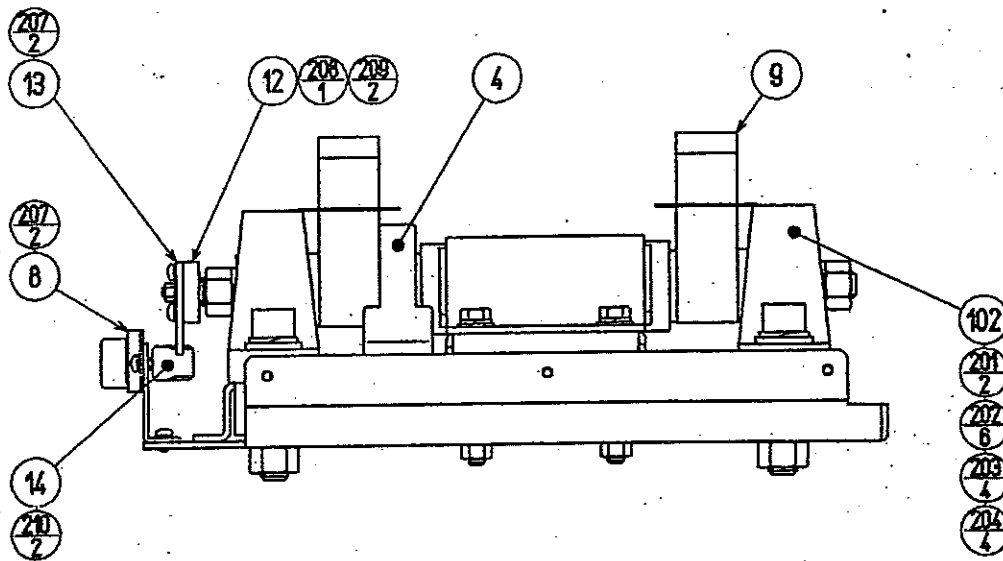
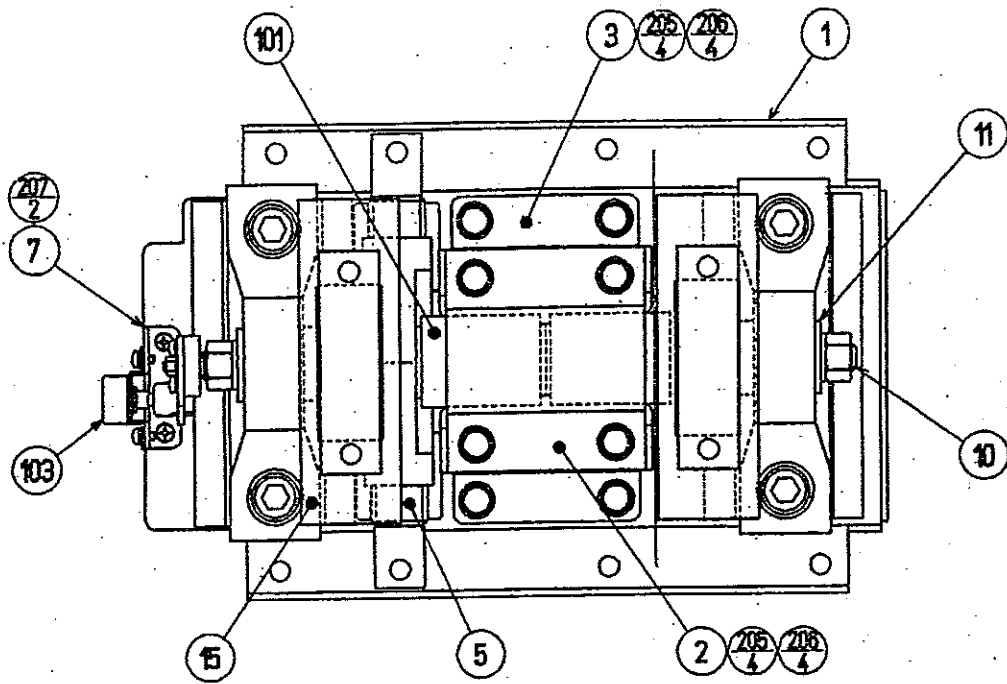


No.	PART NUMBER	DESCRIPTION
1	TTR-1552	REAR FRAME R
2	TTR-3040	ASSY CENTERING MECHA
3	TTR-3057	ASSY SEAT COWL R
4	TTR-3090	ASSY MUFFLER
5	TTR-3095	ASSY BIKE FRAME TWIN
6	610-0469	ASSY HANDLE MECHA
7	TTR-1503	PROTECT COVER L
8	TTR-1504	PROTECT COVER R
9	TTR-1505	VR COVER
10	TTR-3002	FUEL CAP
11	TTR-3003	BRAKE COVER
12	TTR-3004	HANDLE COVER
13	TTR-3007	WIRE COVER
14	TTR-3008	FRAME LID
15	TTR-3017	TANK R
16	TTR-1506	WIRE CLAMP
17	440-WS0040-EG	STICKER W TTR A ENG
15	440-WS0042-EG	STICKER W TTR C ENG
19	421-9628	STICKER STEP CENTER
20	421-9627	STICKER REAR FRAME R
21	MRD-5003UK	WIRE BRKT
101	601-5526-251	BUSH 1.6t
102	601-6231-DO80	EDGING NEW TYPE
103	280-5009	CORD CLAMP 0 21

(Continued...)

201	000-T00408-OC	M SCR TH CRM M4X8
202	000-P00408-WB	M SCR PH W/FS BLK M4X8
203	000-P00412-WB	M SCR PH W/FS BLK M4X12
204	000-P00512-WB	M SCR PH W/FS BLK M5X12
205	020-000410-HZ	HEX SKT CAP SCR BLK OZ M4X10
206	030-000830-SB	HEX BLT W/S BLK MSX30
207	030-000860-SB	HEX BLT W/S BLK M8X60
208	050-U00800	U NUT MS
209	060-F00600-0B	FLT WSHR BLK M6
210	060-F00800-0B	FLT WSHR BLK M8
211	060-S00800-0B	SPR WSHR BLK M8
212	020-000625-HZ	HEX SKT CAP SCR BLK OZ M6X25
213	020-000830-HZ	HEX SKT CAP SCR BLK OZ MSX30
214	FAS-110005	TAP SCR TH CRM M4 12
215	000-T00512-OC	M SCR TH CRM M5X12
217	030-000820-SB	HEX BLT W/S BLK M8X20
301	600-6697-36UK	WIRE HARN BIKE FRAME EXT
302	LM9411	LOOM EARTH 600mm
303	LM9311	LOOM EARTH 500mm
304	600-6697-26	WIRE HARN REAR BASE EXT 1

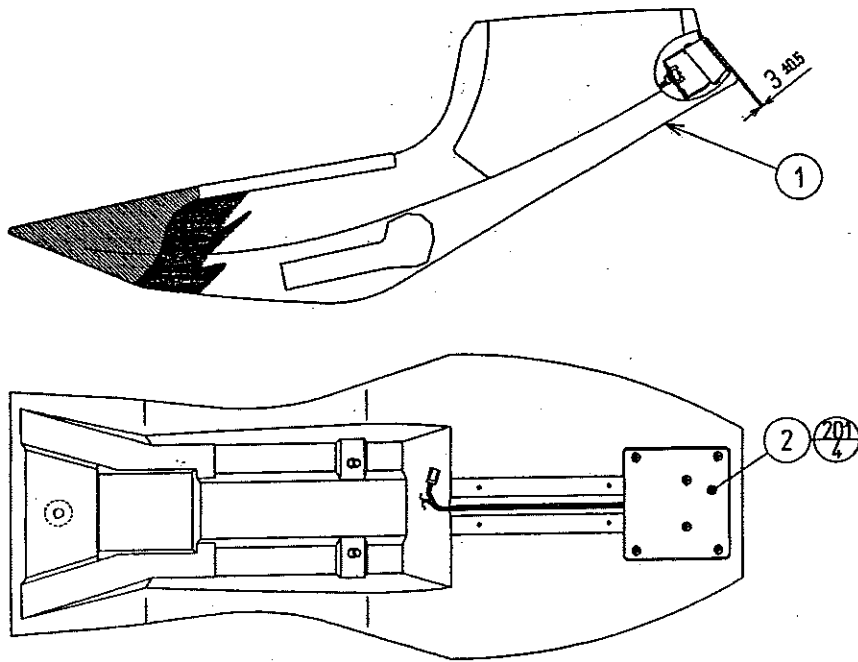
7.20. ASSY CENTERING MECHA (TTR-3040)



TORQUE
M8: 220kgf·cm
M14: 800kgf·cm
ONLY 203: 450kgf·cm

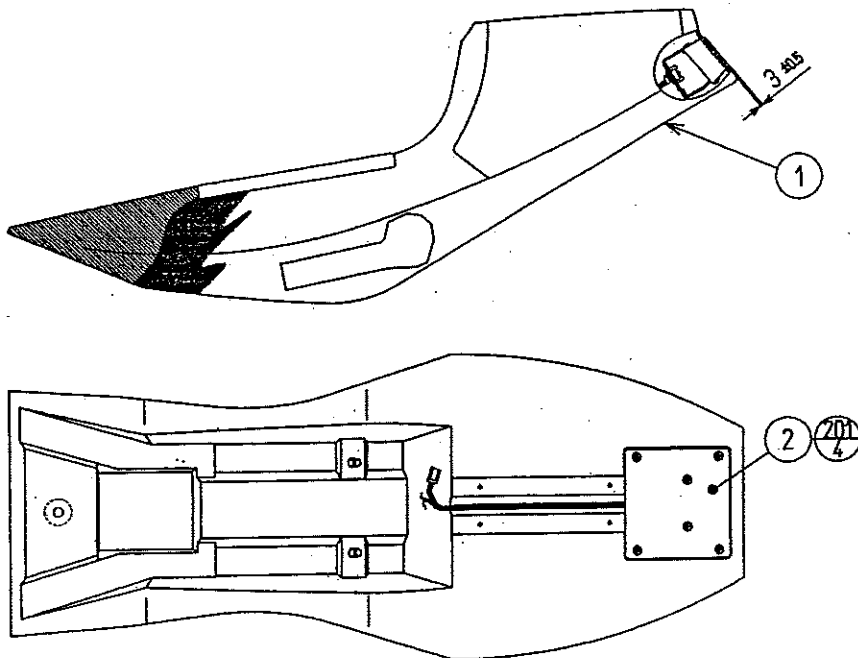
No.	PART NUMBER	DESCRIPTION
1	TTR-3041	CENTERING BASE
2	TTR-3042	ROSTA BRKT TWIN
3	TTR-3043	ROSTA MOUNT BRKT
4	TTR-3044	STOPPER BLOCK
5	TTR-3045	STOPPER RUBBER
7	TTR-3047	YR MOUNT BRKT
8	TTR-3048	VR BRKT
9	TTR-3202	MOUNT BLOCK
10	TTR-3203X	CENTERING SHAFT
11	TTR-3205	FLT 14. 5-36 x 3. 2
12	TTR-2009	GEAR HOLDER 80
13	601-6005	ADJUST GEAR
14	601-7945	GEAR 20
15	TTR-3049	SLIDE PLATE
101	601-8596	ROSTA n22
102	100-5224	BEARING 025
103	220-5484	VOL CONT B-5K OHM
106	310-5029-F20	SUMITUBE F F20MM
107	601-0460	PLASTIC TIE BELT 100MM
201	050-H01400	HEX NUT M14
202	060-S01400	SPR WSHR M14
203	FAS-200007	HEX SKT H CAP SCR BLK OZ M14X70
204	060-F01400	FLT WSHR M14
205	030-000820-S	HEX BLT W/S M8X20
206	060-F00800	FLT WSHR M8
207	000-P00408-W	M SCR PH W/FS M4X8
208	050-U00500	U NUT M5
209	028-C00416-P	SET SCR CH P M4X16
210	028-C00308-P	SET SCR CH P M3X8
301	600-6659-43	WIRE HARN ANGLE VOL

7.21. ASSY SEAT COWL L (TTR-3054)



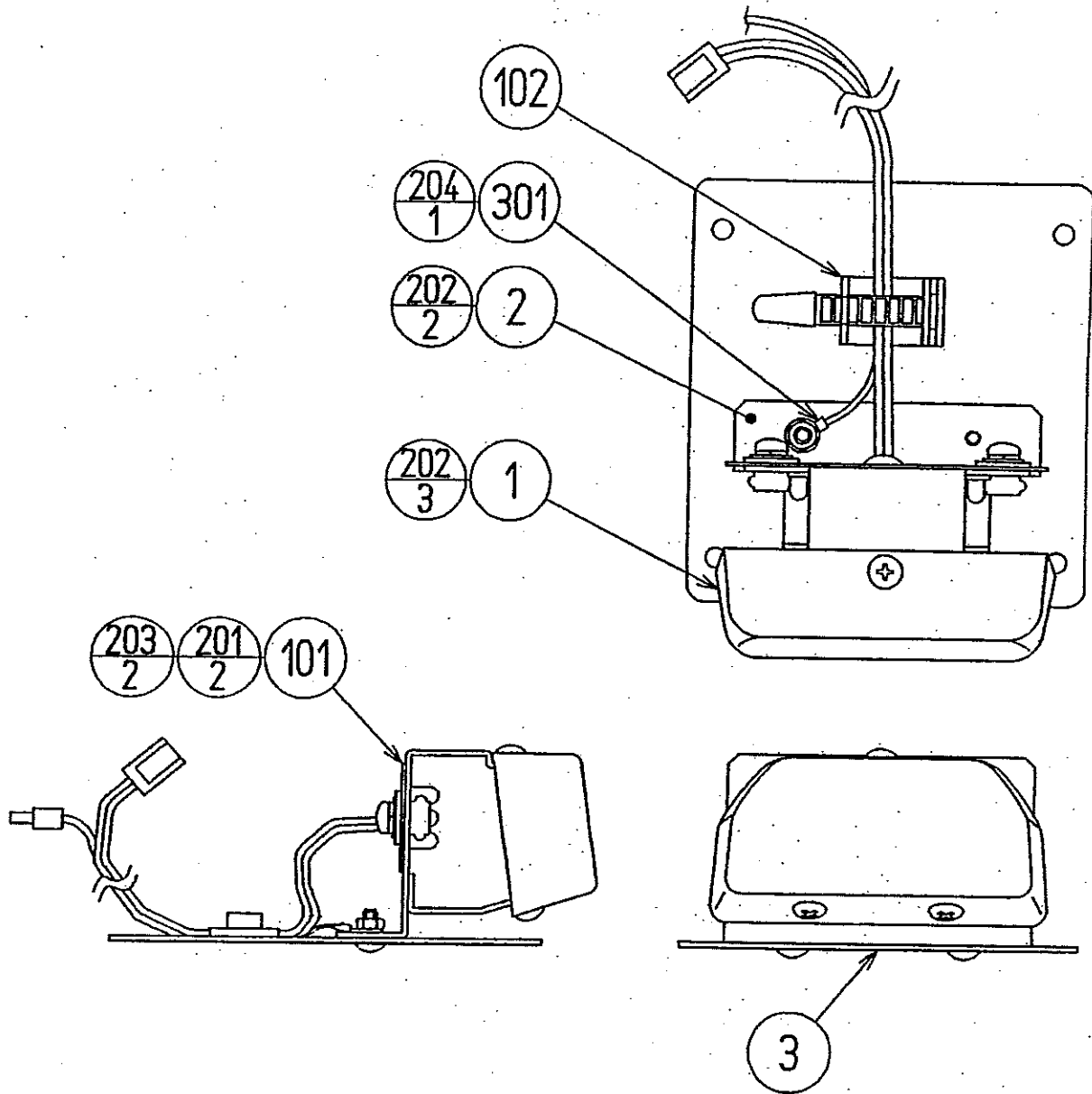
No.	PART NUMBER	DESCRIPTION
1	TTR-3055	SEAT COWL L
2	TTR-3060	ASSY TAIL LIGHT
201	FAS-110005	TAP SCR TH CRM M4X12

7.22. ASSY SEAT COWL R (TTR-3057)



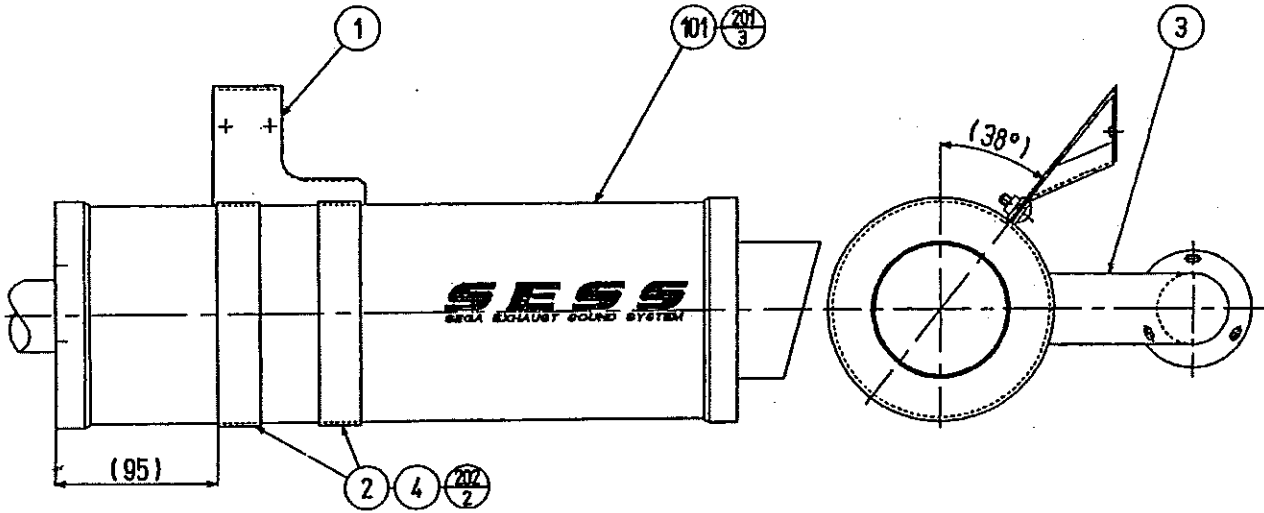
No.	PART NUMBER	DESCRIPTION
1	TTR-3058	SEAT COWL R
2	TTR-3060	ASSY TAIL LIGHT
201	FAS-110005	TAP SCR TH CRM M4X12

7.23. ASSY TAIL LIGHT (TTR-3060)



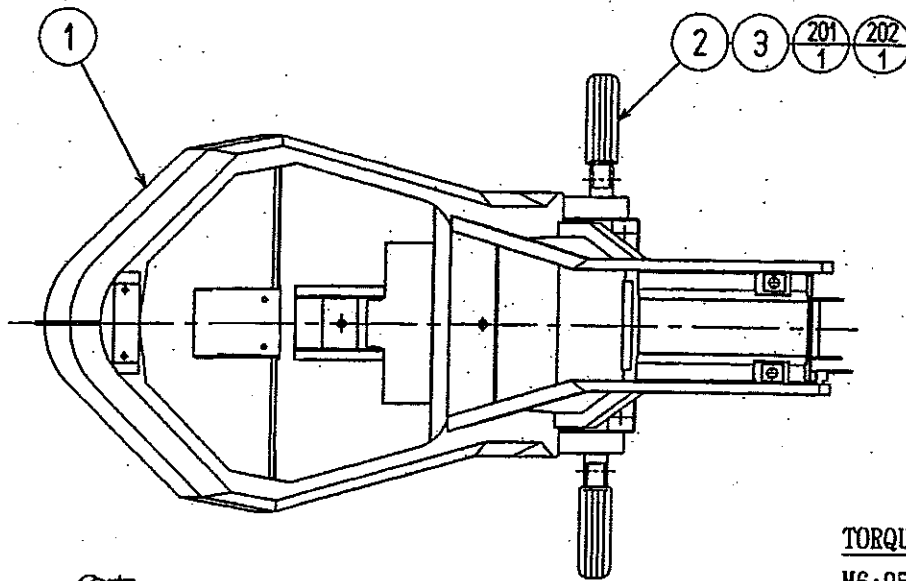
No.	PART NUMBER	DESCRIPTION
1	TTR-3061	LENS
2	TTR-3062	LED BRKT
3	TTR-3063	TAIL LID
101	390-5621	LED BD
102	280-5008	CORD CLAMP 015
201	000-P00520-W	M SCR PH W/FS M5X20
202	000-T00408-OC	M SCR TH CRM M4X8
203	FAS-500010	KURATITE NUT M5
204	050-F00400	FLG NUT M4
301	LM9611	LOOM EARTH 1000mm

7.24. ASSY MUFFLER (TTR-3090)

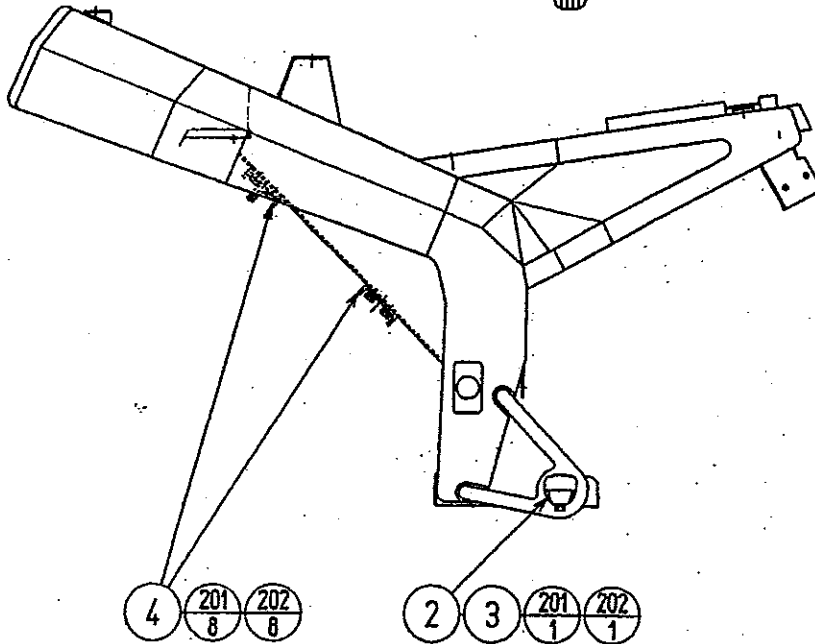


No.	PART NUMBER	DESCRIPTION
1	TTR-3091	MOUNT BRKT
2	TTR-3092	SILENSOR BAND
3	TTR-3093	CENTER PIPE
4	TTR-3094	CUSHION RUBBER
5	TTR-3096	GUARD RUBBER
101	130-5147	SPEAKER DUCT WOOFER
201	FAS-110005	TAP SCR TH CRM M4X12
202	000-T00616-OC	M SCR TH CRM M6X16

7.25. ASSY BIKE FRAME TWIN (TTR-3095)

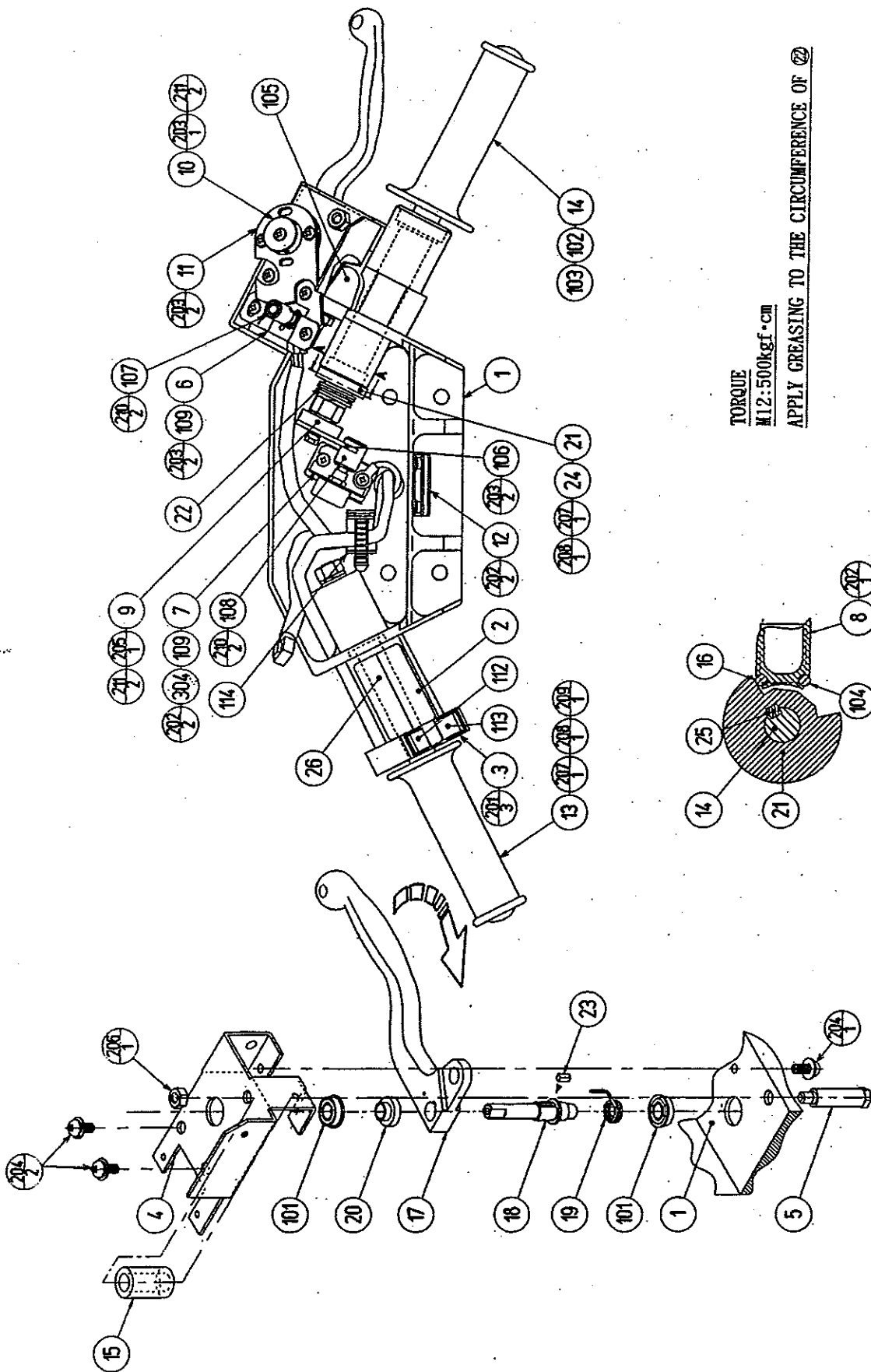


TORQUE
M6:95kgf•cm



No.	PART NUMBER	DESCRIPTION
1	TTR-3071	BIKE FRAME
2	TTR-3072	STEP RUBBER
3	TTR-3073	STEP COLLAR
4	TTR-3074	SUB MOUNT PLATE
101	280-5009	CORD CLAMP 021
102	280-5275-SR10	CORD CLAMP SR10
201	030-000620-SB	HEX BLT BLK W/S M6X20
202	060-F00600	FLT WSHR M6
203	010-P00408-F	S-TITE SCR PH W/F M4X8
301	600-6659-41	WIRE HARN BIKE FRAME 1

7.26. ASSY HANDLE MECHA (610-0469)



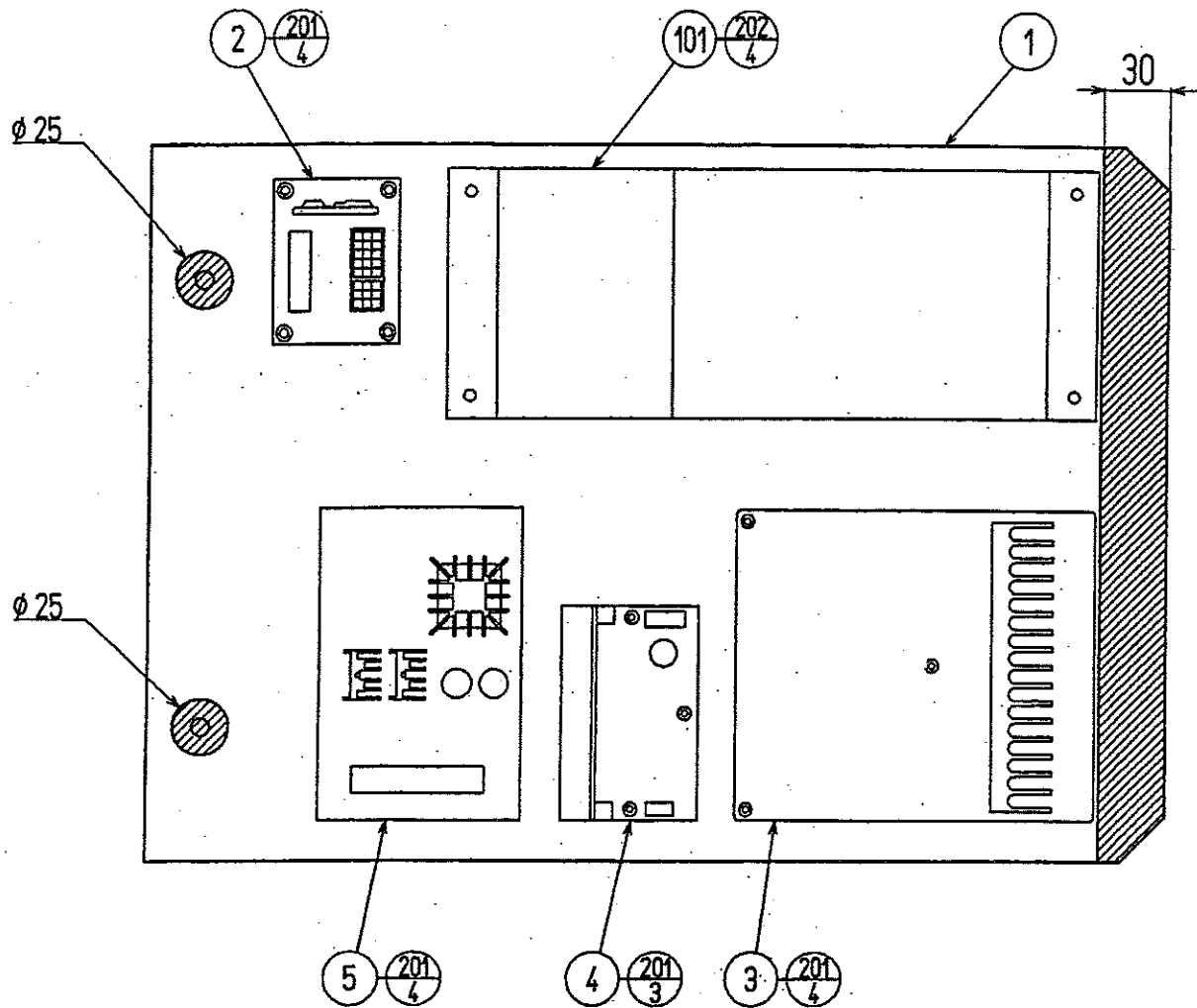
TORQUE
 M12: 500kgf·cm
 APPLY GREASING TO THE CIRCUMFERENCE OF ②

SECTION A-A

DETAILS: BRAKE PORTION'S ASSY

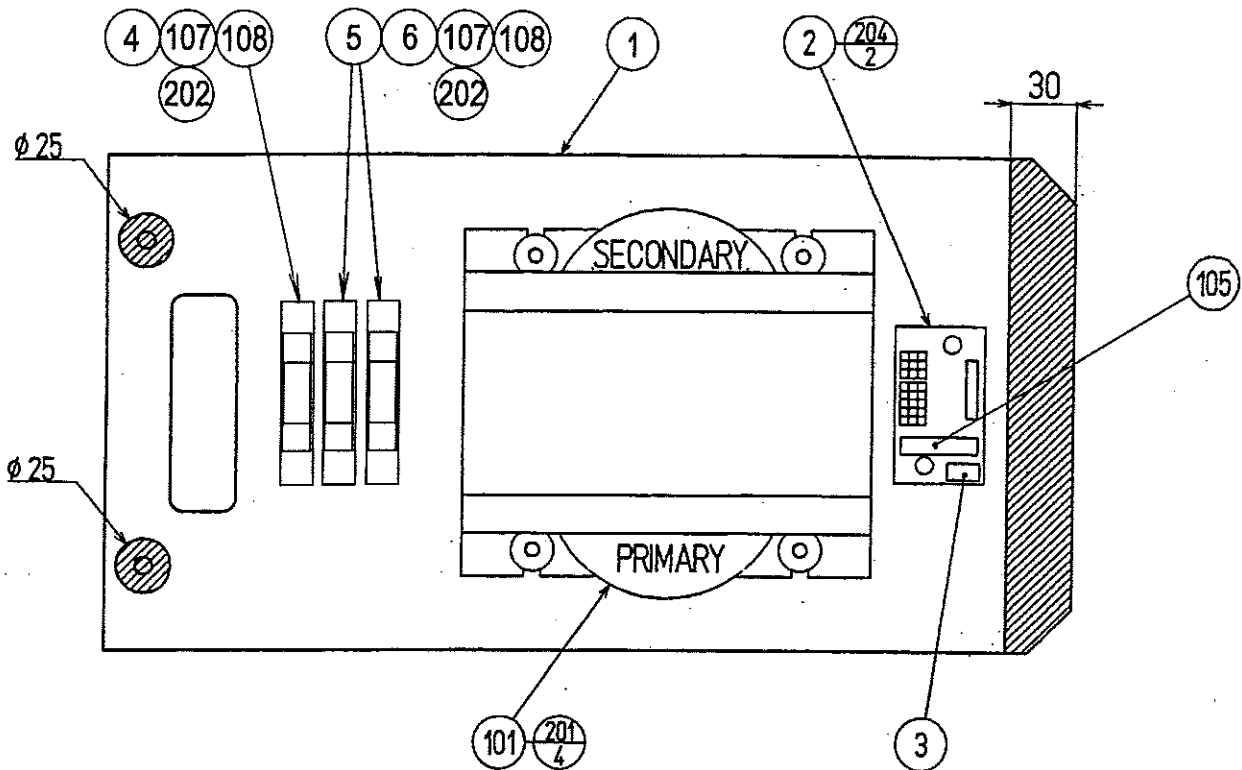
No.	PART NUMBER	DESCRIPTION
1	TTR-2001	HANDLE BASE
2	TTR-2002	HANDLE LEFT
3	TTR-2003	SW COVER
4	TTR-2004	LEVER HOLDER UPPER
5	TTR-2005	STOPPER SHAFT
6	TTR-2006	BRAKE VOL BRKT
7	TTR-2007	ACCEL VOL BRKT
8	TTR-2008	STOPPER LID
9	TTR-2009	GEAR HOLDER 80
10	TTR-2010	GEAR HOLDER 110
11	TTR-2011	GEAR 110
12	TTR-2012	COVER HOLDER BRKT
13	TTR-2013	GRIP L
14	TTR-2014	GRIP R
15	TTR-2015	STOPPER RUBBER
16	TTR-2016	ACCEL STOPPER
17	COL-2202	BRAKE LEVER
15	COL-2203	LEVER SHAFT
19	COL-2204	TORSION SPRING 1.2
20	COL-2205	LEVER COLLAR
21	COL-2215	STOPPER DISK
22	GPD-2009	TORSION SPRING
23	GLC-2218	KEY 3X3X7
24	HSD-2017	SPRING HOLDER
25	HSD-2019	KEY 4X4X12
26	421-9624	STICKER KICK PUNCH
101	100-5041	BEARING (NSK F688ZZ)
102	100-5111	BEARING 012 (NSK 6001ZZ)
103	100-5112	BEARING 017 (NSK 6003ZZ)
104	100-5228	BEARING PIN 4 X19.8
105	601-5564	STOPPER
106	601-6005	ADJUST GEAR
107	601-7944	GEAR 15
108	601-7945	GEAR 20
109	220-5484	VOL CONT B-5KOHM
110	310-5029-D20	SUMITUBE F D20MM
111	601-0460	PLASTIC TIE BELT 100MM
112	509-5724	PUSH BUTTON SW GREEN
113	509-5725	PUSH BUTTON SW RED
114	280-5008	CORD CLAMP 015
201	000-FOO308	m SCR FH M3 X8
202	000-POO408-W	M SCR PH W/FS M4X 8
203	000-POO412-W	M SCR PH W/FS M4X 12
204	000-POO512-W	M SCR PH W/FS M5X 12
205	050-U00500	U NUT M5
206	050-U00600	U NUT M6
207	050-HO1200	HEX NUT M12
208	060-SO1200	SPR WSHR M12
209	060-FO1200	FLT WSHR M12
210	028-A00306-P	SET SCR HEX SKT CUP P M3X 6
211	028-A00408-P	SET SCR HEX SKT CUP P M4X 8
301	600-6659-45	WIRE HARN HANDLE UNIT 1
302	600-6659-52	WIRE HARN HANDLE UNIT 3
303	600-6659-60	WIRE HARN EARTH HANDLE UNIT

7.27. ASSY PWR SPLY (TTR-4300UK)



No.	PART NUMBER	DESCRIPTION
1	TTR-4301UK	PWR SPLY BASE
2	838-10801-04	CONN BD B W/O FUSE
3	838-11650-14	EQ.PWR AMP MANX T.T TWIN
4	838-12280	MONORAL AMP
5	839-0451-01	LIGHT CONTROL BD TTR
101	400-5264-91	SW REGU +5V12A.12Y1.5A,-5V.1A
104	601-0460	PLASTIC TIE BELT 100MM
201	011-T00325	TAP SCR TH 3X25
202	011-T00312	TAP SCR TH 3X12
301	600-6697-21	WIRE HARN ELEC1
302	600-6697-22UK	WIRE HARN ELEC2
303	600-6697-23	WIRE HARN ELEC3
304	600-6697-33	WIRE HARN ELEC4
305	600-6697-34	WIRE HARN ELEC5
306	600-9045-4KK	WIRE HARN EARTH 450mm M4/UPS K

7.28. ASSY ELEC (TTR-4400UK)



No.	PART NUMBER	DESCRIPTION
1	TTR-4401UK	ELEC BASE
2	838-11856-01	CONN BD W/FUSE & COVER
3	421-6595-11	STICKER 7A
4	421-6595-1600-T	STICKER 1.6A T
5	421-6595-08	STICKER 10A
6	LB1100	STICKER FUSE TYPE T
101	560-5366UK	TRANSFORMER MRD CVT
103	280-5009	CORD CLAMP 0 21
105	514-5036-7000	FUSE 6.4X32 7000mA 125V
106	601-0460	PLASTIC TIE BELT 100MM
107	EP1360	FUSE HOLDER 1 1/4" 0.250" TAGS
108	EP1361	FUSE HOLDER COVER 1 1/4"
201	011-P00412-F	TAP SCR W/F TH 4X12
202	011-F00316	TAP SCR FH 3X16
204	011-T00325	TAP SCR TH 3X25
205	011-F00310	TAP SCR FH 3X10
301	600-6927-02UK	WIRE HARN XFMR AC IN
302	600-6927-107UK	WIRE HARN XFMR FUSED AC OUT
303	600-6927-04UK	WIRE HARN MAIN PWR SUPPLY
304	600-6697-05UK	WIRE HARN PWR SPLY4
305	LM9512	LOOM EARTH 750mm

8. APPENDIX A - ELECTRICAL SCHEMATIC

8.1. WIRE COLOURS

THE WIRE COLOUR CODE IS AS FOLLOWS:

A	PINK
B	SKY BLUE
C	BROWN
D	PURPLE
E	LIGHT GREEN

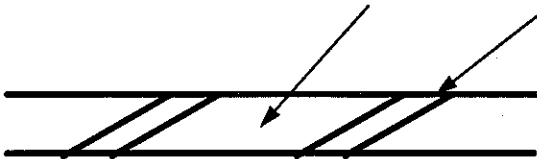
Wires other than those of any of the colours listed above will be displayed by 2 alphanumeric characters:

1	RED
2	BLUE
3	YELLOW
4	GREEN
5	WHITE
7	ORANGE
8	BLACK
9	GREY

If the right hand side numeral of the code is 0, then the wire will be of a single colour shown by the left hand side numeral (see the list above).

Note 1: If the right hand side alphanumeric is not 0, that particular wire has a spiral colour code. The left hand side character shows the base colour and the right hand side one, the spiral colour.

[Example] 51----- WHITE/RED = WHITE wire with RED stripes

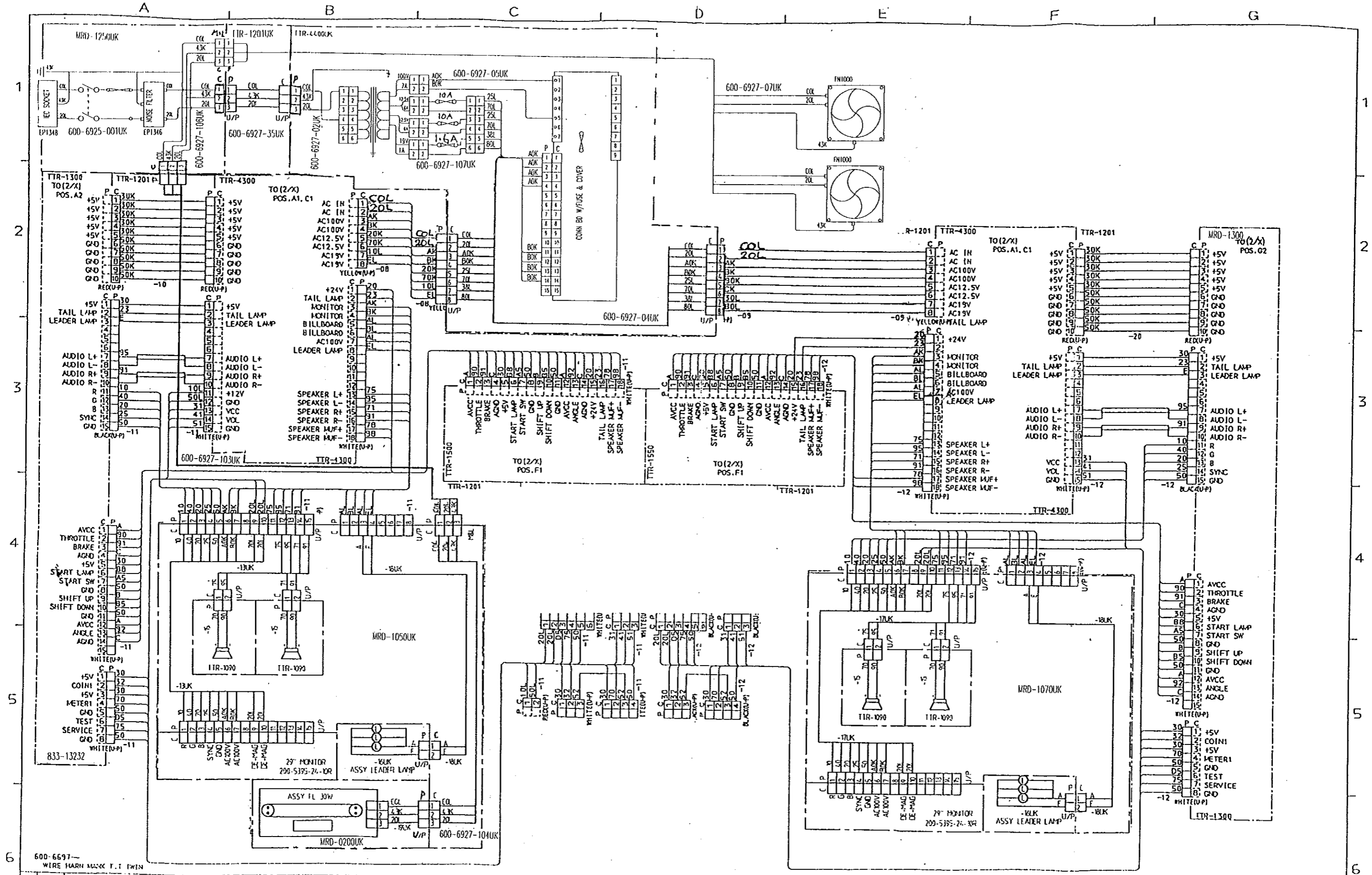


Note 2: The character following the wire colour code indicates the size of the wire.

K:	AWG18, UL1015
L:	AWG20, UL1007
None	AWG22, UL1007

8.2. ELECTRICAL SCHEMATIC

The following pages contains the electrical schematic for this machine.



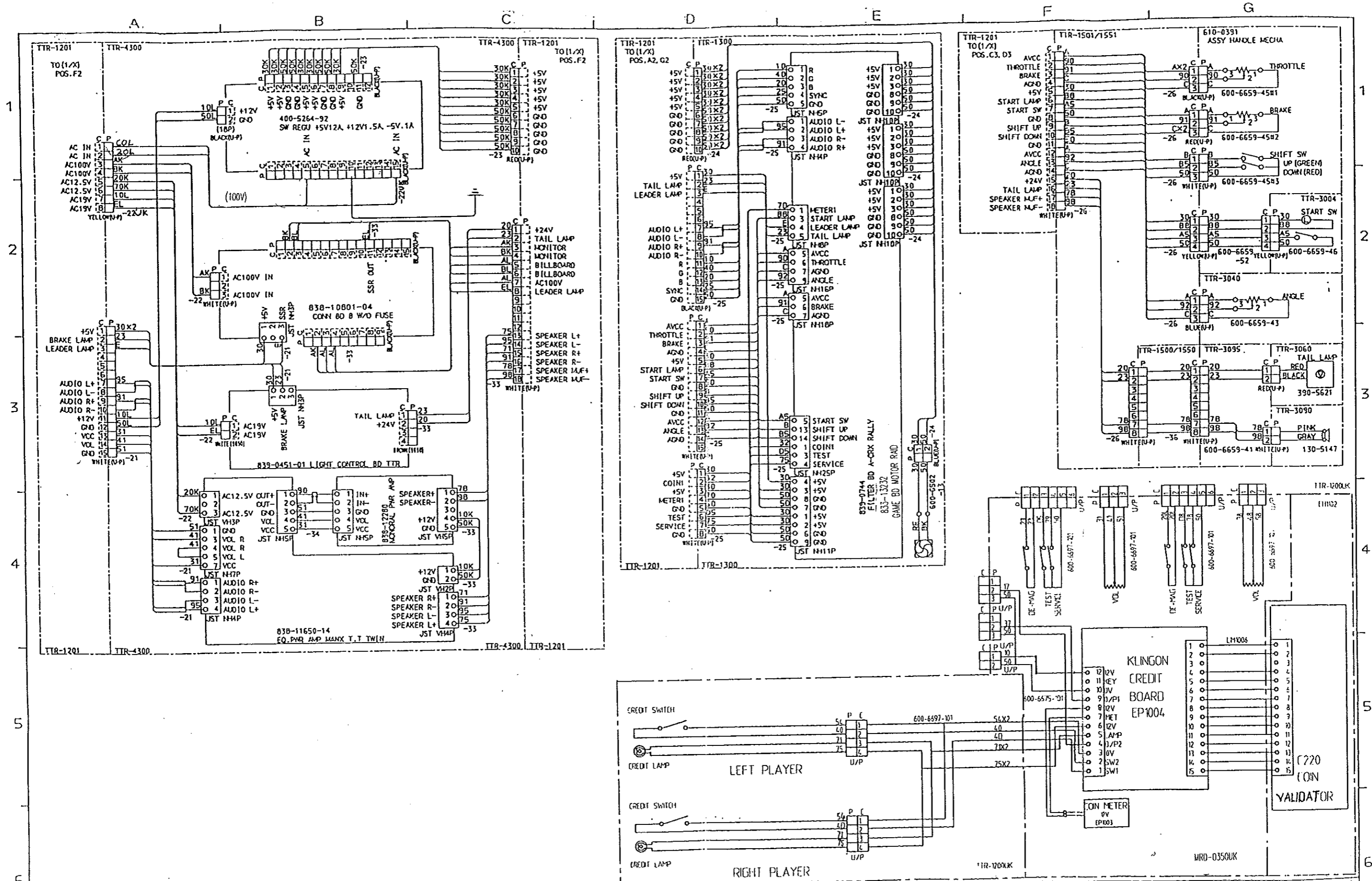
600-6697-
WIRE HARN M2XK T.T. TWIN

7	ORANGE	E	LIGHT GREEN	51	WHITE	AWG20
6	MAROON	D	PURPLE	51	WHITE	RED
5	WHITE	C	BROWN	50	WHITE	
4	GREEN	B	SKY BLUE		EXAMPLE	
3	YELLOW	A	PINK	V	AWG16	UL1007
2	BLUE	S	GRAY	L	AWG20	UL1007
1	RED	B	BLACK	L	AWG22	UL1007

120V	200V	320V	240V	100V 50Hz/60Hz
574W	617W	623W	613W	523W(MAX)594W 7.4A

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7	ORANGE	E	LIGHT GREEN	50L	WHITE	AWG20
8	MARGON	D	PURPLE	51	WHITE	9.0
9	WHITE	C	BROWN	50	EXAMPLE	
10	GREEN	B	SKY BLUE	U	EXAMPLE	
11	YELLOW	A	PINK	V	AWG18 UL1015	
12	BLUE	9	GRAY	L	AWG20 UL1007	
13	RED	8	BLACK	AVR22	UL1007	

120V	200V	220V	240V	100V 50Hz/60Hz
574W	617W	623W	613W	523W (MAX) 594W (7.4A)

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 DESCRIPTION