ENGINEERING
TOMORROW

Service Manual

JS1-H Serviceability
IP54 Joysticks



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Revision history

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July 2019	Literature type corrected back to Service Manual and correct literature id number	0103
July 2019	Title corrected and Literature id number changed	0102
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In order to remove the desired item/ items, the following first steps need to be followed no matter what grip is being used.

Cup and cable disassembly

1. Remove the retainer by carefully opening the snap with a screwdriver.

The snap can be easily broken. If it is broken, a new cable will need to be purchased.



2. Carefully pull back the grommet while holding the cable.



HR1, ST7, PR2, ST2, PR7

3. Remove the 4 screws to open the cup.



4. Unplug the cable connector.



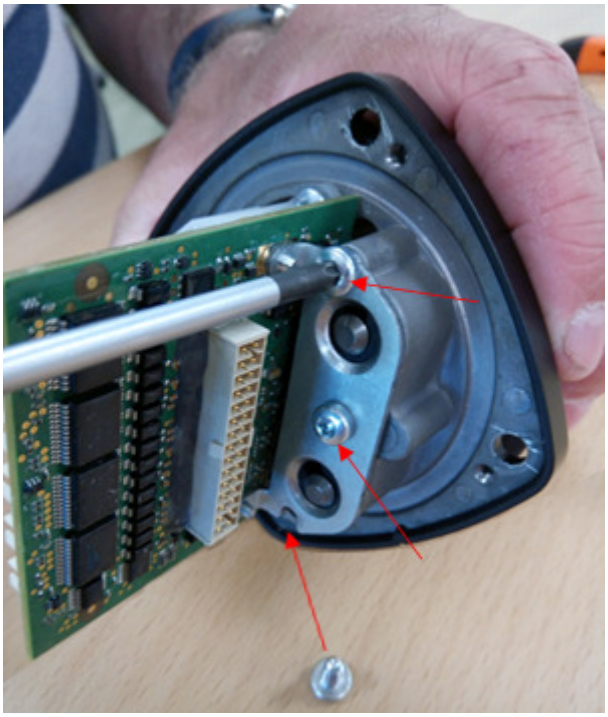
HR1, ST7, PR2, ST2, PR7

PCBA removal

1. Take a picture to ease the re-installing of the connectors. Unplug all PCBA connectors.



2. Remove the 3 screws from the bottom plate and remove the PCBA.



HR1, ST7, PR2, ST2, PR7

Grip removal from base

Loosen the 2 set screws and carefully remove the grip (not HR1 and PR7).



HR1, ST7, PR2, ST2, PR7

Boot replacement

Grip must be removed, as describe in *Grip removal from base* on page 7.

The boot can be replaced if desired with the following steps.

1. Hold the boot tightly and pull it off (it is not easy to remove).



2. To re-install the boot, place it all around the base, slightly open it and push down to get in the correct place.



HR1, ST7, PR2, ST2, PR7

Cable and cup replacement

The case (cup) will need to be removed to install the cable.

The label from the old case will need to be put back on the new case otherwise all information about the joystick is lost.

The cable will need to be removed to install the new case.

Refer to *Cup and cable disassembly* on page 4, at step 4 it is possible to replace either the cable or cup.

1. Carefully take the cable connector out through the grommet hole, replace either the cup or cable and insert the cable again through the grommet hole.



2. Align the two grooves before tightening the cup back on.



ST7, PR2, ST2

Cable and case will need to be removed, and wires unplugged and pulled through. New wires need to be routed into the base and installed correctly, then case and cable re-installed. Purchase of a new faceplate is required. Rollers can only be replaced on analog joysticks.

In order to remove a push button, roller or rocker, the whole faceplate needs to be removed and replaced.

Remove a push button or a rocker with a flat screwdriver.

Items and faceplate removal

1. Insert a flat screwdriver between the faceplate and the roller and lift it.



2. Push the buttons out using the fingers.



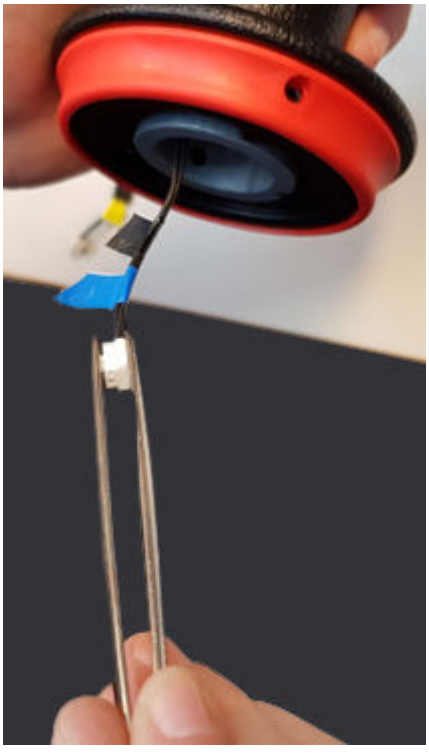
ST7, PR2, ST2

3. With all items in the faceplate removed, it is now possible to remove the faceplate. Pull it out using fingers.



4. To re-route all the cables back down to the PCBA, tweezers can be used.

Extreme care is needed since the plug could be pulled out by accident.



ST7, PR2, ST2

Items and faceplate assembly

1. A new faceplate is pushed into the grip and then the same happens with the new items.



2. The cables are then put through the boot and the setscrews tightened (align the back setscrew with the groove mentioned in *Cable and cup replacement* on page 9).

Use: Allen Key 2.5 mm, Torque: 2.1 Nm



ST7, PR2, ST2

Grip assembly

Process as described for the push button in *Items and faceplate assembly* on page 12, with the addition of the removal of the grip.

PCBA, cup and cable assembly

1. The PCBA is tightened again.

   Use: T20, Torque: 2.5 Nm

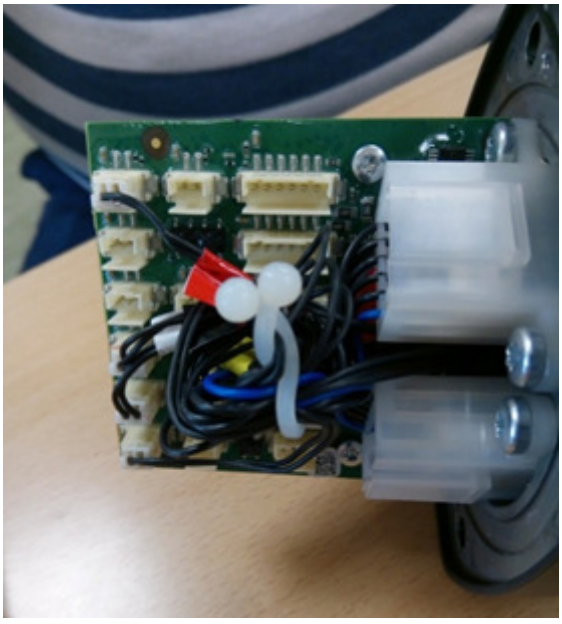
   PCBA



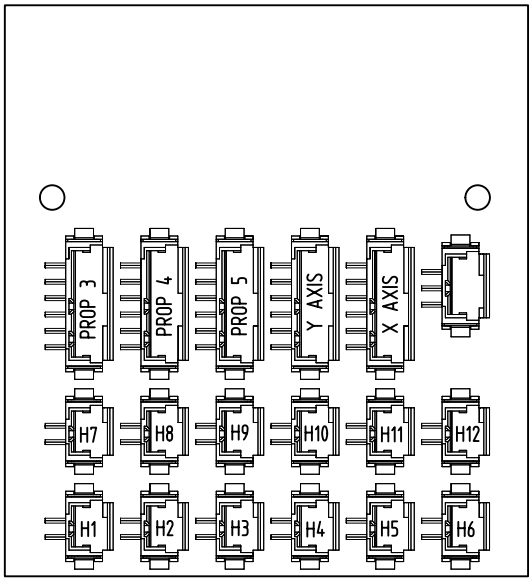
ST7, PR2, ST2

2. The PCBA connectors are plugged in accordingly and the wires are organized and fastened.

Wires are organized and fastened



Printed circuit board



Plug in connectors accordingly

Position	Tape color
H1	Red
H2	Yellow
H3	Blue
H4	Black
H5	White
H6	None
H7	Green

ST7, PR2, ST2

Plug in connectors accordingly (continued)

Position	Tape color
H8	Blue/Black
H9	Yellow/Black
H10	Yellow/Red
H11	White/Red
H12	White/Green
Prop 3	N/A
Prop 4	Yellow
Prop 5	Red

3. The cable is connected again.



4. Screw the cup back on (check *Cable and cup replacement* on page 9, for correct placement).

Use: PZ 2, Torque: 1.55 Nm

Make sure cables will not get caught when screwing back on the cup.

ST7, PR2, ST2



5. Put the grommet back in place and push in the snap.



Grip replacement

If the grip needs to be replaced, this should be done after step 2 under *Items and faceplate removal* on page 10, when all items have been removed from the faceplate. Then the items are put on the new grip and assembled following steps under *Items and faceplate assembly* on page 12 and *PCBA, cup and cable assembly* on page 13.

HR1

Grip removal from base

It is possible to remove the HR1 grip from the base, after step 2 under *PCBA removal* on page 6.

1. Remove the two plastic covers to access the setscrews.



2. Loosen the two setscrews to remove the grip from the base.

Use: Allen Key 2.5 mm, Torque: 2.8 Nm



To tighten the grip back on, use the tool and torque noted.

Boot, cup and cable replacement

The grip will need to be removed as described in *Grip removal from base* on page 17. After removing the grip, refer to *Boot replacement* on page 8 to replace the boot if desired.

The case will need to be removed to install the cable.

The label from the old case will need to be put back on the new case otherwise all information about the joystick is lost.

The cable will need to be removed to install the new case.

Refer to *Cup and cable disassembly* on page 4, step 4, in order to replace either the cup or cable.

HR1

Items and grip disassembly

In order to remove a push button, roller, or rocker, the cable and case will need to be removed, wires unplugged and pulled through.

New wires need to be routed into the base and installed correctly.

Rollers can only be replaced on analog joysticks.

1. Remove all the screws from the grip.



2. The grip will now be divided into 3 parts.



HR1

3. Push out the item/ items that are not desired and replace with new ones.



4. Close the grip again and tighten the screws back on.

Use: T10, Torque: 1.3 Nm



Items and grip reassembly

Process as described for the push button in *Items and grip disassembly* on page 18, with the addition of the removal of the grip. If the grip needs replacing, remove all the items following *Items and grip disassembly* on page 18, step 3 and then replace the grip. Refer to *Grip assembly* on page 13 to reassemble the full joystick.

PR7

Cup and cable replacement

The case (cup) will need to be removed to install the cable.

The label from the old case will need to be put back on the new case otherwise all information about the joystick is lost.

The cable will need to be removed to install the new case.

Refer to *Cup and cable disassembly* on page 4, step 4, in order to replace either the cup or cable.

Items and grip disassembly

In order to remove a push button, roller, or rocker, the cable and case will need to be removed, wires unplugged and pulled through.

Rollers can only be replaced on analog joysticks.

Refer to *PCBA removal* on page 6, it is necessary to open the PR7 grip in order to replace the desired items.

Items replacement

After step 2, under *PCBA removal* on page 6 it is necessary to open the PR7 grip in order to replace the desired items.

1. Remove all the screws to open the grip.



PR7

2. The grip will be divided in 3 parts. It is possible to remove the desired item to replace by using the fingers to push it out.



3. Close the grip and tighten the screws again.

Use: T10, Torque: 1.3 Nm

PR7



4. Follow steps under *PCBA, cup and cable assembly* on page 13 to reassemble the whole joystick.

Grip replacement

Process as described for the push button with the addition of the removal of the grip. In order to change the grip, remove all the items, refer to *Items and grip disassembly* on page 20 step 2, then separate the grip from the base.

1. Loosen the setscrew to remove the grip from the base and replace it.



PR7

2. Tighten the setscrew again, refer to *Grip replacement* on page 22, step 3 to reassemble.

   Use: T10, Torque: 2.8 Nm



Boot replacement

The grip will need to be removed as described under *Grip removal from base* on page 7. After removing the grip, it is possible to follow the steps under *Boot replacement* on page 8 to replace the boot if desired.

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