Chapter 2

ERROR RECOVERY

Contents

2.1 GENERAL ERROR RECOVERY PROCEDURES

2.1.1 Overview

This section contains procedures for recovery from certain errors. These errors are:

- Overtravel release
- Hand breakage recovery
- Pulse coder alarm
- Chain failure detection recovery

2.1.2 Overtravel Release

An overtravel error occurs when one or more of the robot axes moves beyond the software motion limits. When this happens one of the overtravel limit switches is tripped and the system does the following:

- Shuts off drive power to the servo system and applies robot brakes
- Displays an overtravel alarm error message
- Lights the operator panel FAULT light
- Turns on the teach pendant FAULT status indicator
- Limits motion for the axes involved in the overtravel

If you are jogging in JOINT, the axis number indicating the axis (or axes) in an overtravel will be displayed in the error log. You can manually release overtravel on your system from the MANUAL OT Release screen. The axis that is in overtravel will display TRUE in either OT_MINUS or OT_PLUS.

Refer to Table 2–1 for information on the MANUAL OT Release items.

Use Procedure 2-1 to recover from an overtravel error.

Table 2–1. MANUAL OT Release Items

ITEM	DESCRIPTION
AXIS	This item displays the number for each axis.
OT MINUS	This item displays whether a particular axis is in an overtravel condition.
OT PLUS	This item displays whether a particular axis is in an overtravel condition.

Procedure 2-1   Recovering from an Overtravel Error

Conditions

- An axis (or axes) are in overtravel and the overtravel alarm has occurred. If you are jogging in JOINT the axis number indicating the axis (or axes) in an overtravel will be displayed in the error log.

Steps

1. Press MENU.

2. Select SYSTEM.

3. Press F1, [TYPE].

4. Select OT Release. You will see a screen similar to the following. The axis that is overtraveled will display TRUE in either OT_MINUS or OT_PLUS.

```
MANUAL OT Release
    AXIS      OT MINUS        OT PLUS
     1          FALSE           TRUE
     2          FALSE          FALSE
     3          FALSE          FALSE
     4          FALSE          FALSE
     5          FALSE          FALSE
     6          FALSE          FALSE
     7          FALSE          FALSE
     8          FALSE          FALSE
     9          FALSE          FALSE
```

5. Move the cursor to the OT PLUS or OT MINUS value of the axis in overtravel.

6. Press F2, RELEASE. The value of the overtraveled axis should change back to FALSE.

7. **If the robot is calibrated**, you will see the message **Can't Release OT. Press HELP for detail.**

   a. If you press F5, DETAIL, you will see a screen similar to the following.

```
MANUAL OT Release
When robot is calibrated, overtravel
cannot be released.  Press SHIFT &
RESET to clear the error, and jog out
of the overtravel condition.
```

Note For the following steps, press and **hold down the SHIFT key** until you have completed Step 7b through Step 7d .

b.   Press and continue pressing SHIFT and press F2, RESET. Wait for servo power.

c.   Continuously press and hold the DEADMAN switch and turn the teach pendant ON/OFF switch to ON.

d.   Jog the overtraveled axis off the overtravel switch. When you have finished jogging, **you can release the SHIFT key** .

Note If you accidentally release the shift key during Step 7b through Step 7d , you will have to repeat them.

8.   **If the robot is not calibrated,** perform the following steps:

Note For the following steps, press and **hold down the SHIFT key** until you have completed Step 8a through Step 8d .

a.   Press and continue pressing SHIFT and press F2, RESET. Wait for servo power.

b.   Press COORD until you select the JOINT coordinate system.

c.   Continuously press and hold the DEADMAN switch and turn the teach pendant ON/OFF switch to ON.

d.   Jog the overtraveled axis off the overtravel switch. When you have finished jogging, **you can release the SHIFT key** .

Note If you accidentally release the shift key during this step, you will need to repeat it.

9.   Turn the teach pendant ON/OFF switch to OFF and release the DEADMAN switch.

10.   Check CRM68 & CRF7 connection on the amplifier PCB if the robot is not in an actual overtravel condition.

2.1.3 Hand Breakage Recovery

A hand breakage error occurs when the hand breakage detection switch is tripped on robots equipped with hand breakage hardware. The switch is tripped when the robot tool strikes an obstacle, which could possibly cause the tool to break. The system

• Shuts off drive power to the servo system and applies robot brakes

• Displays an error message indicating that the hand is broken

• Lights the operator panel FAULT light

• Lights the teach pendant FAULT LED

The status of the hand breakage detection switch is displayed on the STATUS Safety Signals screen.

Use Procedure 2-2 to recover from a hand breakage.

Procedure 2-2 Recovering from a Hand Breakage

Conditions

• The hand breakage error message is displayed.

Steps

1. If you have not already done so, continuously press and hold the DEADMAN switch and turn the teach pendant ON/OFF switch to ON.

2. Hold down the SHIFT key and press RESET. The robot can now be moved.

3. Jog the robot to a safe position.

4. Press the EMERGENCY STOP button.

5. Request a trained service person to inspect and, if necessary, repair the tool.

6. Determine what caused the tool to strike an object, causing the hand to break.

7. If the hand breakage occurred while a program was being executed, you might need to reteach positions, modify the program, or move the object that was struck.

8. Test run the program if it has been modified, if new positions have been recorded, or if objects in the work envelope have been moved.

2.1.4 Pulse Coder Alarm Recovery

If the pulse counts at power up do not match the pulse counts at power down, a pulse mismatch error occurs for each motion group and each axis. Use Procedure 2-3 to reset a pulse coder alarm.

Procedure 2-3 Resetting a Pulse Coder SRVO-062 Alarm

Steps

1. Press MENU.

2. Select SYSTEM.

3. Press F1, [TYPE].

4. Select Master/Cal.

If Master/Cal is not listed on the [TYPE] menu, do the following; otherwise, continue
to Step 5 .

    a.   Select VARIABLE from the [TYPE] menu.

    b.   Move the cursor to $MASTER_ENB.

    c.   Press the numeric key 1 and then press ENTER on the teach pendant.

    d.   Press F1, [TYPE].

    e.   Select Master/Cal. You will see a screen similar to the following.

```
SYSTEM Master/Cal
1 FIXTURE POSITION MASTER
2 ZERO POSITION MASTER
3 QUICK MASTER
4 SINGLE AXIS MASTER
5 SET QUICK MASTER REF
6 CALIBRATE
 Press 'ENTER' or number key to select.
```

5.   Press F3, RES_PCA. You will see a screen similar to the following.

```
SYSTEM Master/Cal
1 FIXTURE POSITION MASTER
2 ZERO POSITION MASTER
3 QUICK MASTER
4 SINGLE AXIS MASTER
5 SET QUICK MASTER REF
6 CALIBRATE
 Press 'ENTER' or number key to select.
Reset pulse coder alarm? [NO]
```

6.   Press F4, YES. You will see a screen similar to the following.

```
SYSTEM Master/Cal
1 FIXTURE POSITION MASTER
2 ZERO POSITION MASTER
3 QUICK MASTER
4 SINGLE AXIS MASTER
5 SET QUICK MASTER REF
6 CALIBRATE
 Pulse coder alarm reset!
```

2.1.5 Chain Failure Detection Error Recovery

A Single Chain Failure Detection fault will be set if one safety chain is in an Emergency Stop condition, and the other is not in an Emergency Stop condition.

When a Single Chain Failure Detection fault occurs, the system does the following:

- Shuts off drive power to the servo system and applies robot brakes

- Displays an error message indicating that a single chain failure has occurred.

- Lights the operator panel FAULT light

- Lights the teach pendant FAULT LED

Chain Failure Detection Errors

Refer to the *Maintenance Manual* for more information on chain failure detection errors, SRVO-230 and 231, SRVO-266 through 275 (external checking -customer), and SRVO-370 through 385 (internal checking)

Procedure 2-4 Chain Failure Detection Error Recovery

Conditions

- The system detected either a SRVO-230 Chain 1 (+24V abnormal) or a SRVO-231 Chain 2 (0V abnormal) error.

- You cannot reset the chain failure errors, even after turning the controller OFF and then ON again.

Steps

1. Correct the cause of the alarm.

2. Press MENU.

3. Select ALARMS. You will see a screen similar to the following.

```
ALARM: Active
SRVO-230 Chain 1(+24V) abnormal


```

4. Press F4, RES_CH1. You will see a screen similar to the following

```
ALARM: Active
SRVO-230 Chain 1(+24V) abnormal
Reset Single Channel Fault [NO]
```

5. Press F4, YES to reset the fault.

6. Press the RESET button on the teach pendant or operator panel.

⚠	**Warning** **If you reset the chain failure fault without fixing the cause of it, the same alarm will occur, but the robot can move until the alarm occurs again. Be sure to fix the cause of the chain failure before you continue. Otherwise, you could injure personnel or damage equipment.**