MITSUBISHI ELECTRIC
Changes for the Better

Overview

On most scale feedback machines, encoder on motor is phase-matched to the motor and provides velocity feedback. On the SVC machines, the X axis has a linear motor with no encoder. The magnetic poles of the motor must be referenced to the Z pulse on the scale. The relationship of the scale Z pulse to the motor poles is set by parameter SV028. This parameter needs to be adjusted when the motor is replaced or when the scale has been replaced or re-installed.

Parameter SV034 is used to set the axis in "DC Excitation Mode" where the axis moves back and forth automatically to find the magnetic poles of the linear motor. When the search is completed, the relationship between the scale Z pulse and the magnetic pole is displayed on "AFLT GAIN" on the servo monitor display.

With the long travel of SVC1200 and SVC2000 models, the pole position must be checked at each end, and at the center of travel. The final value entered for SV028 should be an average of the 3 positions on the table.

Tools Needed

- Paper and Pencil

Instructions

I. Set SV028 to 0

    A. Enter Privilege Mode

        1. Press the **EMERGENCY STOP** button on the front of the operation panel.
        2. Press the **[DIAGNOS]** soft key.
        3. Press the **[VERSION]** soft key.
        4. Press the right "**Menu Select**" button.
        5. Type **"1131"** then press **[INPUT]**.

    B. Change Parameter

        1. Press the **[SERVO MONITOR]** soft key.
        2. Press the **[PARAM]** soft key.
        3. A small window will appear.
        4. Press the **[PAGE DOWN]** key once.
        5. Write down the current value of SV028 for the X axis in *Table 1* (See Appendix).
        6. Using the arrows, highlight SV028 on the X axis.
        7. Type **"0"** then press **[INPUT]**.
        8. Press the **[POWER OFF]** button.
        9. Turn MAIN BREAKER off.

II. Z Phase Point

    A. Release EMERGENCY STOP

        1. Turn MAIN BREAKER on.
        2. Press the **[POWER ON]** button.
        3. Release **EMERGENCY STOP** button.
        4. Press **[MF1]**, **[MF2]** and **[RESET]** at the same time.
        5. The control will become READY

    B. Enter Privilege Mode

        1. Press the **[DIAGNOS]** soft key.
        2. Press the **[VERSION]** soft key.
        3. Press the right "**Menu Select**" button.
        4. Type **"1131"** then press **[INPUT]**.

C. Passing Z Phase Point
1. Press the **[SERVO MONITOR]** soft key.
2. Press the **[PAGE DOWN]** key once.
3. Ensure the **"CYC COUNT"** is at 0
4. Press **[X100]** button to set machine in manual mode.
5. Move the X axis towards home slowly.

   ***Caution: The axis may be unstable until this procedure is completed. It is critical to move the axis gently to prevent damage.**

6. When the **CYC COUNT** changes from 0 to a value, stop moving the X axis. This means the machine has found the Z phase on the scale.
   ***NOTE: The Z phase trigger is roughly 30 mm from the hard stop bumpers, near machine home.

III. First Magnetic Pole
   A. "Search" Mode
   1. In Handle mode, slowly move the X axis to the first magnetic pole check point. It will be approximately 8 inches from the right end of travel.
   2. Press the **EMERGENCY STOP**.
   3. Press the **[DIAGNOS]** soft key.
   4. Press the **[VERSION]** soft key.
   5. Press the **[SERVO MONITOR]** soft key.
   6. Press the **[PARAM]** soft key.
   7. In order to turn on the magnetic pole search function, change the following parameters:
      SV34: 2-->12
      SV61: 0-->15
      SV62: 0-->50
      SV63: 0-->2000
   8. Release **EMERGENCY STOP** button.
   9. Press **[MF1]**, **[MF2]** and **[RESET]** at the same time.
   10. When the control becomes READY, the X axis will automatically start to move back and forth several times as it searches for the magnetic poles on the motor.
   11. When the motor stops, it will display the pole location on AFLT GAIN. Write down the value in TABLE 2.
   12. Press the **EMERGENCY STOP**.
   13. Repeat steps 8 to 12 to get a total of 5 readings.
   B. Set SV028
   1. Press the **EMERGENCY STOP**.
   2. In the **[SERVO MONITOR]** page.
   3. Press the **[PARAM]** soft key.
   4. A small window will appear.
   5. Press the **[PAGE DOWN]** key once.
   6. Calculate the average of the 5 readings for the first magnetic pole.
   7. Using the arrows, highlight SV028 on the X axis.
   8. Enter the average then press **[INPUT]**.

C. Disable magnetic pole search function

    1. In order to turn on the magnetic pole search function, change the following parameters:

        SV34: 12-->2
        SV61: 15-->0
        SV62: 50-->0
        SV63: 2000-->0

IV. Second Magnetic Pole

  A. Setup "Search" mode

    1. In Handle mode, slowly move the X axis roughly to the center of travel.
    2. Press the **EMERGENCY STOP**.
    3. Press the **[DIAGNOS]** soft key.
    4. Press the **[VERSION]** soft key.
    5. Press the **[SERVO MONITOR]** soft key.
    6. Press the **[PARAM]** soft key.
    7. In order to turn on the magnetic pole search function, change the following parameters:

        SV28: ***-->0
        SV34: 2-->12
        SV61: 0-->15
        SV62: 0-->50
        SV63: 0-->2000

    8. Release **EMERGENCY STOP** button.
    9. Press **[MF1]**, **[MF2]** and **[RESET]** at the same time.
    10. When the control becomes READY, the X axis will automatically start to move back and forth several times as it searches for the magnetic poles on the motor.
    11. When the motor stops, it will display the pole location on AFLT GAIN. Write down the value in TABLE 2.
    12. Press the **EMERGENCY STOP**.
    13. Repeat steps 8 to 12 to get a total of 5 readings.

  B. Set SV028

    1. Press the **EMERGENCY STOP**.
    2. In the **[SERVO MONITOR]** page.
    3. Press the **[PARAM]** soft key.
    4. A small window will appear.
    5. Press the **[PAGE DOWN]** key once.
    6. Calculate the average of the 5 readings for the second magnetic pole.
    7. Using the arrows, highlight SV028 on the X axis.
    8. Enter the average then press **[INPUT]**.

  C. Disable magnetic pole search function

    1. In order to turn on the magnetic pole search function, change the following parameters:

    SV34: 12-->2
    SV61: 15-->0
    SV62: 50-->0
    SV63: 2000-->0

V. Third Magnetic Pole

A. "Search" Mode

1. In Handle mode, slowly move the X axis roughly 8 inches from the end of its stroke (furthest from home position).
2. Press the **EMERGENCY STOP**.
3. Press the **[DIAGNOS]** soft key.
4. Press the **[VERSION]** soft key.
5. Press the **[SERVO MONITOR]** soft key.
6. Press the **[PARAM]** soft key.
7. In order to turn on the magnetic pole search function, change the following parameters:
   SV28: ***-->0
   SV34: 2-->12
   SV61: 0-->15
   SV62: 0-->50
   SV63: 0-->2000
8. Release **EMERGENCY STOP** button.
9. Press **[MF1]**, **[MF2]** and **[RESET]** at the same time.
10. When the control becomes READY, the X axis will automatically start to move back and forth several times as it searches for the magnetic poles on the motor.
11. When the motor stops, it will display the pole location on AFLT GAIN. Write down the value in TABLE 2.
12. Press the **EMERGENCY STOP**.
13. Repeat steps 8 to 12 to get a total of 5 readings.

B. Set SV028

1. Press the **EMERGENCY STOP**.
2. In the **[SERVO MONITOR]** page.
3. Press the **[PARAM]** soft key.
4. A small window will appear.
5. Press the **[PAGE DOWN]** key once.
6. Calculate the average of the 5 readings for the third magnetic pole.
7. Calculate the average for all 3 magnetic poles.
8. Using the arrows, highlight SV028 on the X axis.
9. Enter the average then press **[INPUT]**.

C. Disable magnetic pole search function and validation

1. In order to turn off the magnetic pole search function, change the following parameters:
   SV34: 12-->2
   SV61: 15-->0
   SV62: 50-->0
   SV63: 2000-->0
2. Press the **[POWER OFF]** button.
3. Turn MAIN BREAKER off.
4. Wait 10 seconds.
5. Turn MAIN BREAKER on.
6. Press the **[POWER ON]** button.
7. Test run the X axis in handle, Zero return and rapid modes thru the full range of movement, looking for vibration or noise.
8. If some vibrations or noise is detected, SV038 can be adjusted accordingly.

Appendix

Initial SV028 Value

Table 1

	1st Magnetic Point	2nd Magnetic Point	3rd Magnetic Point
1st reading			
2nd reading			
3rd reading			
4th reading			
5th reading			
Average			

Table 2