MELDAS Series

M500 PLG Adjustment using O-scope

USA-E99671-035 *

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USA

List of Revisions

Rev	Date of Revision	Detail	Author
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Purpose:

The purpose of this procedure is to allow Service Engineers and end user to perform PLG feedback device adjustment using Oscilloscope on a M500 control.

Overview:

PLG device is used in spindle drive system as feed back device that monitors the speed of the motor shaft and the direction of shaft rotation. When doing the PLG adjustments, the spindle drive is put into an open loop mode. The Open Loop mode disables the spindle drive from using the PLG feedback. At this time the drive has control of the spindle with no feedback Often times it becomes necessary to perform adjustment especially in case when there is:

Often, times it becomes necessary to perform adjustment especially in case when there is:

- An excessive speed deflection error (AL-23)
- Spindle speed fluctuation
- When replacing PLG device
- Commanded speed is different than actual spindle speed

Parts Needed:

1. Oscilloscope with Probes
2. Small flat head Screw driver for adjusting

Instructions:

I. Open Loop

A. Set the drive in Open Loop *(Add 8000 to Parameter SP038)*
Note: It is very important that the spindle is in the Open Loop mode before making adjustments. Performing PLG adjustments with spindle not in Open Loop can cause damage to the spindle drive

1. Press the **[ALARM/DIAG]** button.
2. Press the **[PLCI/F]** soft key button.
3. Type **(1001) ( ) (M)**
4. Press the **[INPUT]** button.
5. Press the **[PARAM]** button.
6. Press the **[MENU]** soft key.
7. Press the **[SPINDLE]** soft key.
8. Press the far right [>] soft key several times to page forward till you see SP038 on the screen. **Note: Write down the value of SP038 ex:SP038= 0040**
9. Type number of the parameter row in first set of parenthesis #( ),
10. Next the spindle you want to put into open loop *(may have several spindles in same machine)*
11. Finally add 8000 to the third set of parenthesis ( ),
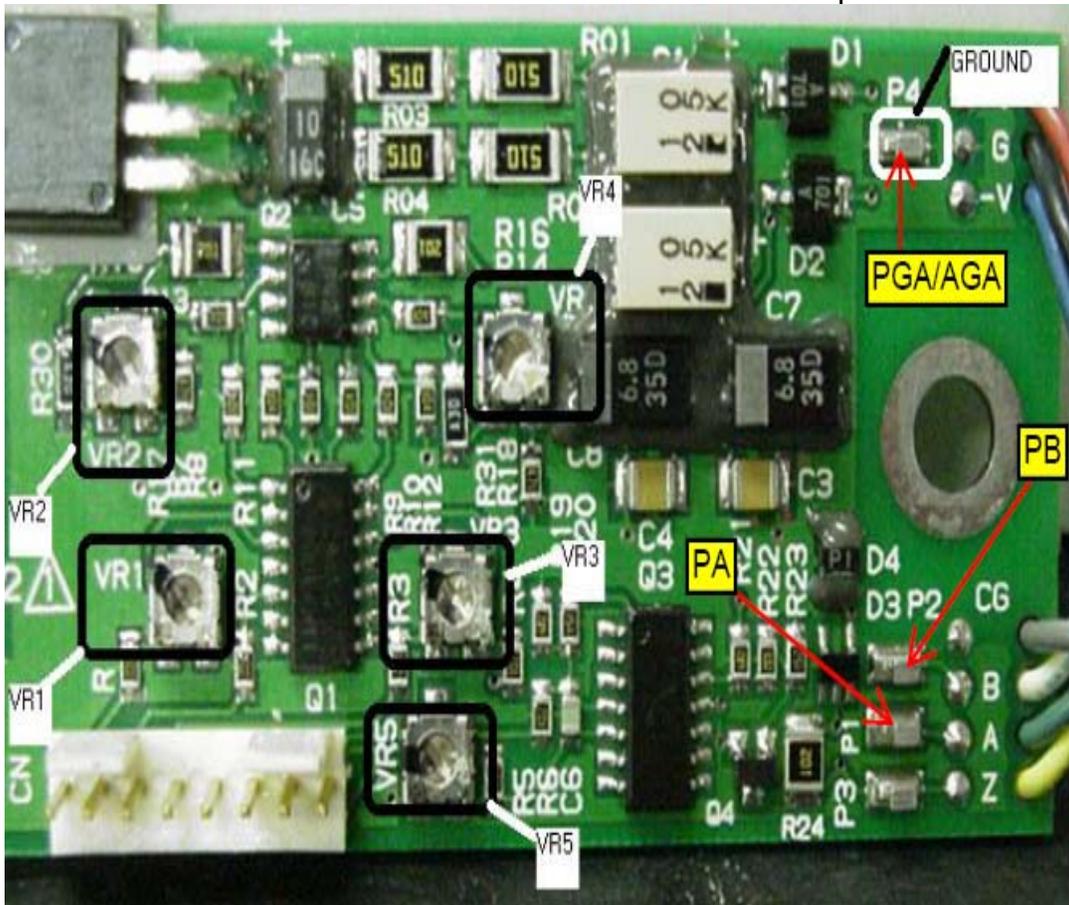12. Press [INPUT] button.
   - **Example line should look like this if SP038= 0040: #(38) <1> (8040)**

B. Cycle power on the machine. *(The parameter will now have taken affect.)*

II. Adjusting PLG using Oscilloscope

    A. Setting up O-Scope *(our o-scope model is a FLUKE 196B scope meter yours may vary)*

        1. Open the spindle motor junction box and locate PLG Pre-Amp board *(if not there should be relatively close to the spindle motor)*

        2. Put o-scope in **manual** mode .

        3. Will need to have input signal A and B on.

        4. Set the O-scope to **DC** coupling.

        5. Readings will be set for **Peak to Peak.**

        6. Probe A and B will be set to: **Probe type= Voltage and Attenuation= 10:1.**

        7. Input options: Polarity= Normal and Bandwidth= **10 kHz (hf reject).**

        8. Connect the both Probe Ground leads to **PGA/AGA** on PLG Pre-Amp board.

        9. For **Phase A**: Connect Probe A lead to **PA** on PLG Pre-Amp board

        10. For **Phase B**: Connect Probe B lead to **PB** on PLG Pre-Amp board


        11. Give the spindle a forward command

        12. Slowly bring the spindle up to **500rpm.**

Note: Important to only run the spindles at a max speed of 500RPM or lower do not go higher

B. Adjustment of the PLG *Recommend to display one Phase at a time on Scope during adjustments. Then display Phase A and B to confirm waveforms have same values. See Fig3)*

1. **Phase A** Adjustment

   a. Adjust **VR2= Phase A Gain adjustment** so that the scope reads the sone wave **3v peak to peak For an example of the Phase A signal look at EX# 1.**

   b. Adjust **VR1= Phase A Offset adjustment** so that the scope reads the sine wave **Positive 1.5vp and Negative 1.5vp**
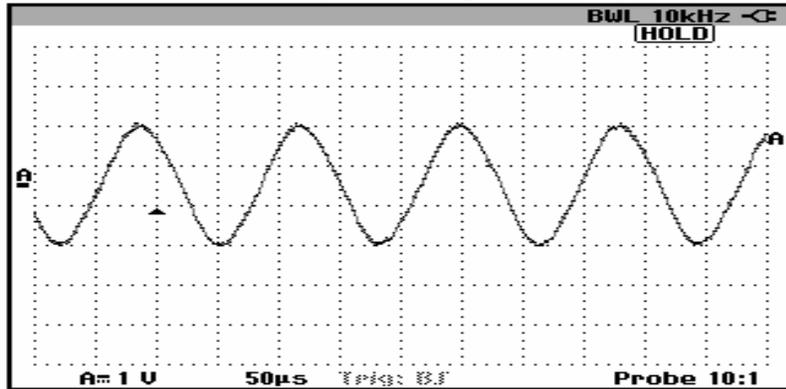
2. **Phase B** Adjustment

   a. Adjust **VR4= Phase B Gain adjustment** so that the scope reads the sine wave **3v peak to peak. For an example of the Phase B signal look at EX# 2.**

   b. Adjust **VR3= Phase B Offset adjustment** so that the scope reads the sine wave **Positive 1.5vp and Negative 1.5vp**
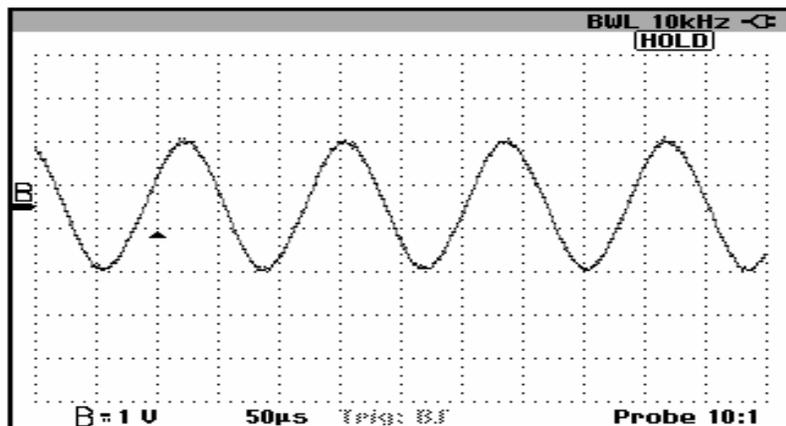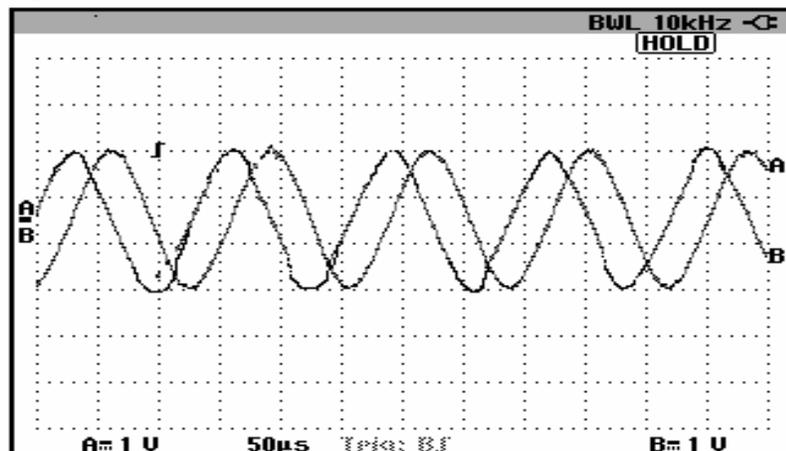

Figure 3

Note: if you cannot adjust the potentiometers to reach these values, then the sensor gap must be adjusted. Move the sensor farther from the gear to reduce the Voltage and closer to gear to increase the voltage. If either PA or PB reads 0VAC then PLG is defective and must be replaced. The standard gap setting for sensor to detection gear is 0.152mm (.006in).

*************When done with this test, return SP038 back to original setting. ***************
Note. If machine is having some issues with orientation, then look at the Z-Phase Pulse. There are no adjustments to do to the PLG for Zphase.

Z Phase Check: If spindle has Z phase

        a. Take Probe B off of PB and connect it to the Z test post it will be located just below PA on the board.
        b. Set the scope to trigger off Input B on scope.(**For an example of the Z Phase and Phase A signal look at**)