
Model DR 4300 Circular Chart Recorder Replacement Instruction

Pen Arm Kit (30756409-002)

Document Number Form: 43-DR-33-68
Effective: 5/98
Supersedes: None

Kit Contents This kit includes the following parts:

- Screw, 10-32 x 3/4 (5)
- Retaining Ring (2)
- #1 Pen Arm Assembly (1)
- #2 Pen Arm Assembly (1)

Summary The pen arm kit contains all the components you need to replace pen arm 1 (and 2, if applicable).

WARNING Never access components inside the case with power applied.

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Component Location

Refer to Figure 1 for the component locations and Table 1 for the installation procedure.

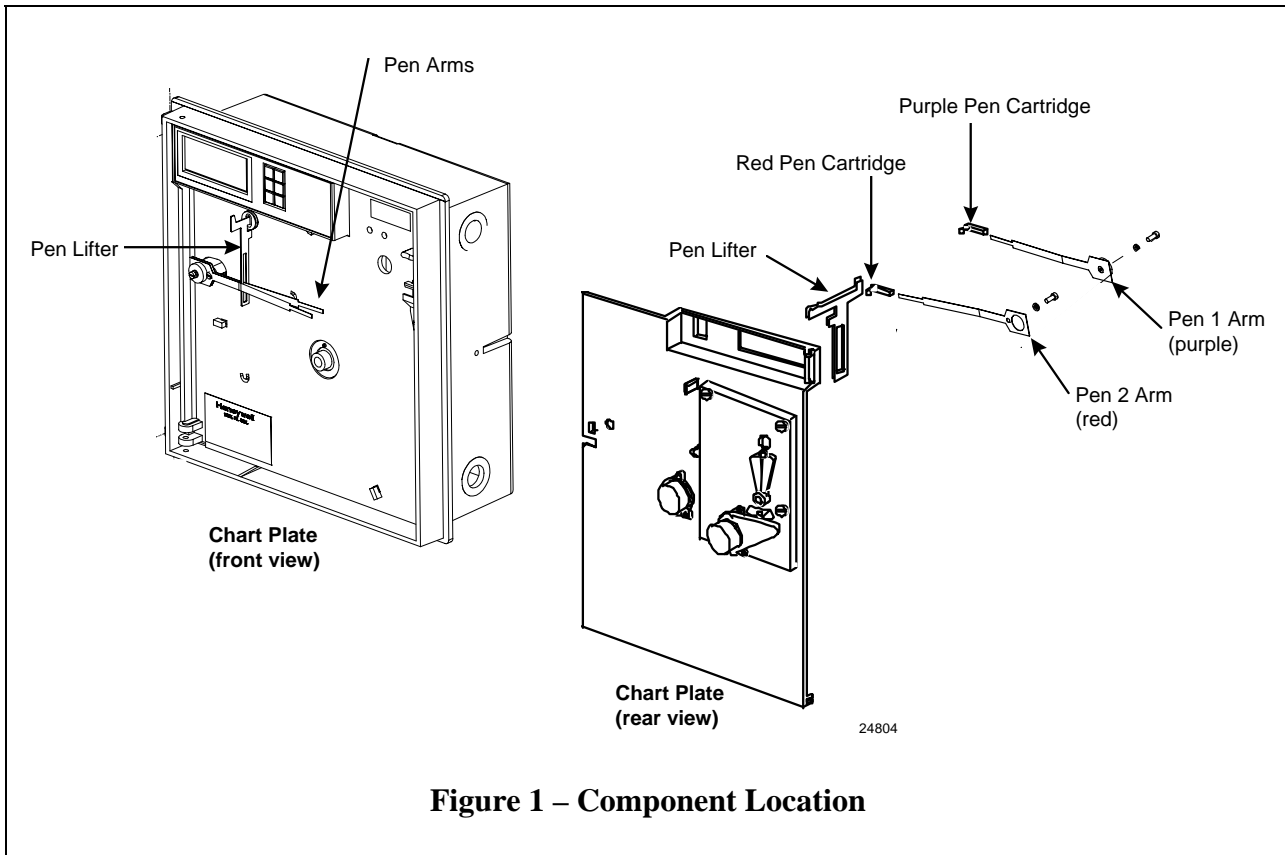


Figure 1 – Component Location

Installation Procedure Follow the procedure in Table 1 to replace or install pen arm 1 (and 2 if applicable).

Table 1 – Pen Arm Assembly Installation

Step	Action
1	Power down the recorder and open the chart door.
2	Note the location of the pen(s)—pen 1 (purple), pen 2 (red)—on the chart. Pull the lifter up to raise the pen(s) from the chart and remove the ink cartridge(s).
3	Remove the screw, lockwasher, and flat washer that hold the pen 1 arm to the servo shaft. Remove the pen arm. If applicable, remove the screw, lockwasher, and flat washer that hold the pen 2 arm to the servo shaft. Remove the pen arm.

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Table 1 – Servo Plate Assembly Installation, continued

Step	Action
4	<p>Replace the pen arm(s). Pen 2 arm (red) goes through the pen lifter; pen 1 (purple) goes on top of the pen lifter.</p> <p><i>For 1-pen Recorder only:</i></p> <ul style="list-style-type: none"> • Replace the pen arm, flat washer, lockwasher, and screw, but leave the screw slightly loose. • Raise the pen lifter and replace the ink cartridge on the pen arm. • Push down the pen lifter and carefully position the pen to the location noted in Step 2. Tighten the pen arm screw. <p><i>For 2-pen Recorder only:</i></p> <ul style="list-style-type: none"> • Replace the pen 2 arm, flat washer, lockwasher, and screw, but leave the screw slightly loose. • Replace the red ink cartridge on the pen 2 arm. • Push down the pen lifter and carefully position pen 2 to the location noted in Step 2. Tighten the pen 2 arm screw. • Replace the pen 1 arm, flat washer, lockwasher, and screw, but leave the screw slightly loose. • Raise the pen lifter and replace the purple ink cartridge on the pen 1 arm. • Push down the pen lifter and carefully position the pen 1 to the location noted in Step 2. Tighten the pen 1 arm screw.
5	<p>Align the pen. Refer to the procedure in</p> <ul style="list-style-type: none"> • Table 2 for a recorder <i>without</i> a display, or • Table 3 for a recorder <i>with</i> a display.

Location of Switches Figure 2 shows the location of the switches used for aligning a pen in a recorder without a display.

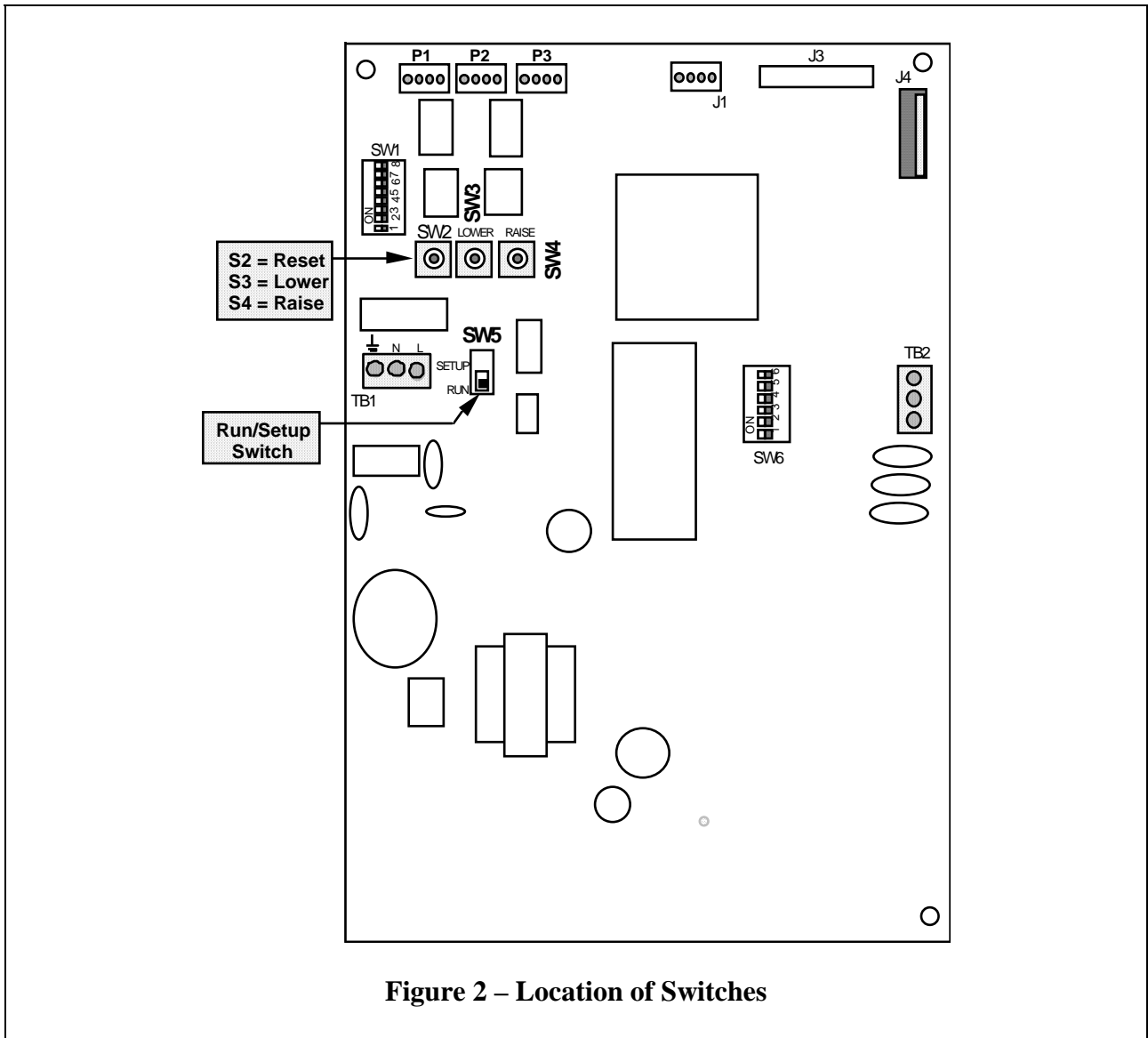


Figure 2 – Location of Switches

**Pen Alignment—
Recorder without
Display**

Table 2 gives the procedure for aligning pens at the zero and 100% chart positions in a recorder without a display. Refer to Figure 2 for location of switches.

Table 2 – Procedure for Pen Alignment (Recorder without Display)

Step	Action
1	Place the run/setup switch SW5 to the setup position (toward the top of the board) on the pen's printed circuit assembly (PCA).
2	Press SW3 and SW4 simultaneously and release them. The pen will move downscale toward the hub and be positioned at the previously set 0% point on the chart within approximately 10 seconds. <i>If the pen tip is greatly out of position, follow Steps 3 through 7.</i> <i>If pen position requires only minor adjustment, go to Step 8.</i>
3	Turn off the power to the recorder before the pen begins to move upscale (approximately 10 seconds).
4	To place the pen tip(s) in approximately the correct position, loosen the screw holding the pen 1 arm to the servo shaft and move the pen arm to access and loosen the locking screw for the pen 2 arm (if applicable).
5	If applicable, align the tip of pen 2 with the zero line on the chart and tighten the locking screw.
6	Align the tip of pen 1 with the zero line on the chart and tighten the locking screw.
7	Turn on the power and repeat Step 2.
8	To fine-tune the alignment of a pen, press the raise switch SW4 or lower switch SW3 on its PCA until the pen tip is aligned with the zero line on the chart. Approximately 10 seconds after the last press of the raise or lower switch the pen will move to the previously set 100% point.
9	To fine-tune the 100% point alignment of the pen, press the raise switch SW4 or lower switch SW3 until the pen tip is aligned with the 100% line on the chart. Approximately 10 seconds after the last press of the raise or lower switch the pen will move downscale as described in Step 2.
10	To exit the pen alignment cycle place SW5 to the run position (toward the bottom of the board). Pen will return to normal operation.

Pen Alignment—

Table 3 gives the procedure for aligning pens at zero and span (full

Kit Instruction, continued

Recorder with Display scale) in a recorder with a display.

If the recorder has 2 pens, be sure Input 1 (INP 1) is on the display. If it is not on the display, press [FUNC] key to toggle input for display.

Table 3 – Procedure for Pen Alignment (Recorder with Display)





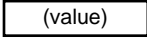
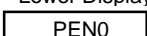


Step	Press	Action/Result
1		until you can see: Upper Display  Lower Display 
2		until you can see: Upper Display  (approximately 60 on the upper display) Lower Display  Wait until pen stops moving downscale. <i>If the pen tip is greatly out of position, follow Steps 3 through 7.</i> <i>If the pen position requires only minor adjustment, go to Step 8.</i>
3		Turn off the power to the recorder.
4		To place the pen tips in approximately the correct position, loosen the screw holding the pen 1 (purple) arm to the servo shaft and move the pen arm to access and loosen the locking screw for the pen 2 (red) arm (if applicable).
5		If applicable, align the tip of pen 2 with the zero line on the chart and tighten the locking screw.
6		Align the tip of pen 1 with the zero line on the chart and tighten the locking screw.
7		Turn on the power and repeat Step 2.
8	 or 	to set tip of pen 1 (purple) on zero scale line of chart $\pm 0.25\%$ (or quarter graduation).

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Table 3 – Procedure for Pen Alignment (Recorder with Display), continued

Step	Press	Action/Result
9	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUNC</div>	<p>and you will see:</p> <p>Upper Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">(value)</div> (approximately 1200 more than the zero value in Step 2)</p> <p>Lower Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">PEN 100</div></p> <p>Wait until pen stops moving upscale.</p>
10	<div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; width: 30px; margin: 0 auto;">▲</div> <p>or</p> <div style="border: 1px solid black; padding: 5px; width: 30px; margin: 0 auto;">▼</div> </div>	<p>to set tip of pen 1 (purple) on full scale line of chart $\pm 0.25\%$ (or quarter graduation).</p>
11	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DISP</div>	<p>to return to normal operation for pen 1. You will see:</p> <p>Upper Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">(value)</div></p> <p>Lower Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">INP 1</div></p> <p><i>If the recorder has two pens, go to Step 12.</i></p>
12	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUNC</div>	<p>You will see:</p> <p>Upper Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">(value)</div></p> <p>Lower Display <div style="border: 1px solid black; padding: 2px 10px; display: inline-block;">INP 2</div></p> <p>Repeat Steps 1, 2, and 8 through 11 for pen 2 (red).</p>