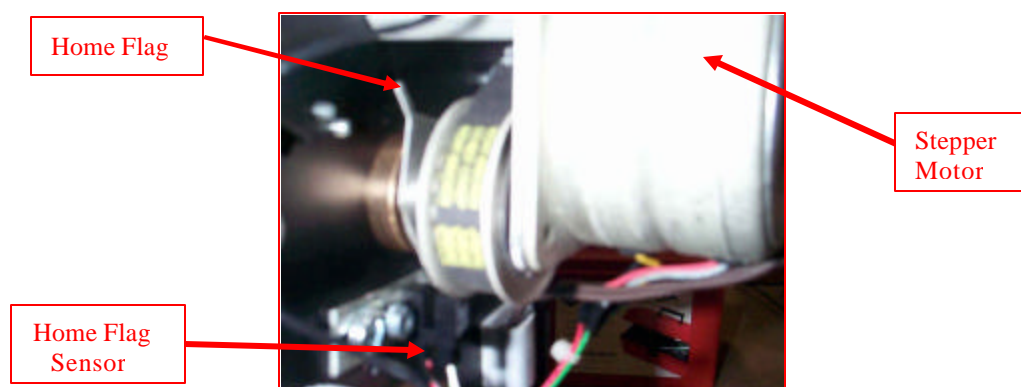


Error 10—911 and 912 Checksigners (LCD Version)

The following information is for troubleshooting the 911 and 912 checksigners. **NOTE: These instructions are intended for a qualified field service technician, and should be used only by someone knowledgeable in machine repair and electronic troubleshooting. It is strongly recommended that any internal maintenance performed be done in a static free environment, including a wrist strap, rubber mat and grounded workstation.**

Error 10 is a failure of the machine to “home” itself. The issue is electronically limited to the stepper motor, its connection (JSTEP) on the main logic board, the replaceable stepper driver chip, the 1 amp minifuse at location F1 on the main board, the homeflag sensor, and its 4-wire connection (JOPSW). A failure of any of the above items would cause some variation of an ERROR code 10. Mechanically, it could be signature shaft bind up (no lubricant), belt tension on the stepper motor, or a damaged home flag hitting the photo-optic sensor each time the signature shaft rotates. During an install situation, or with a new operator, verify proper installation of the signature plates and ink roller shaft. When initial setup of the machine is performed, the signature plate drum has to be moved. When retightening the setscrew, make sure that it is tightened into the keyway of the signature shaft. If this were not done, a typical symptom would be the machine jamming at the signature plates.

If an ERROR 10 is received, the first step is to remove the ink roller shaft and signature plates, and then recreate the problem. If the same problem occurs, verify that the stepper motor is firing. This is most easily done from diagnostic test 4 (Stepper Motor System Test).



Operator's side 911/912 (behind keyboard)

GETTING TO DIAGNOSTICS

The easiest way into diagnostics is using the machines executive key.

1. Insert key into back of machine and turn.
2. Turn unit on.
3. Wait for the prompt "or 2 to change stored forms".
4. Press pause/stop 1 time (screen won't change).
5. Press '9' key five times. The prompt "Diagnostics 0-9" should be displayed.

At right is a picture of the first version of the 911 check-signer. This unit has a LED readout (red), Where the new style of machine uses LCD (quartz black and grey).

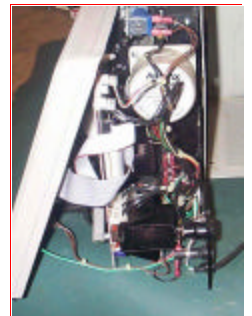


Diagnostics on this style of machine works in the same way However, the options are more primitive. Any questions in regard to technical support on this unit should be directed to Martin Yale Industries, Inc. at 200-225-5644.

IF YOU DON'T HAVE THE KEY

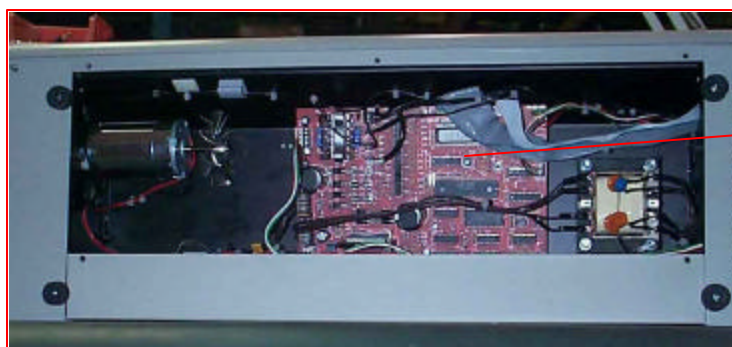
(Machines below s/n 12000)

1. Remove right side cover (requires a security socket MY# MRS012014).
2. Locate the small black button at location SW1 on logic board.
3. Hold down SW1 button while turning the machine on.



(Machines above s/n 12000)

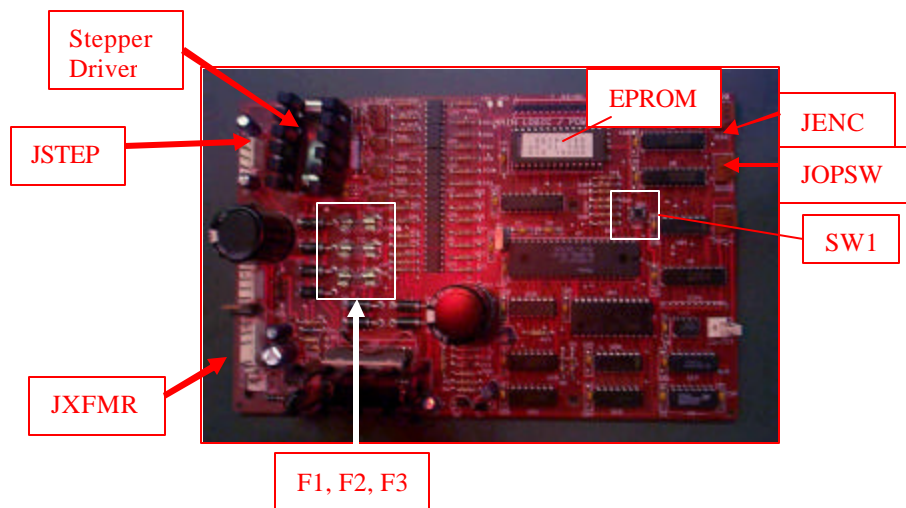
1. Remove exit tray, feed tray and any other accessories.
2. Set machine on its back.
3. Remove the 4 security screws (requires part MRS012014 security socket).
4. Turn machine on, press SW1 switch on main logic board.



SW1

At this time you should see “Diagnostics 0-9” on the screen. Once in diagnostics, you can test all the systems on the signer. Consider the “Diagnostics 0-9” prompt to be the home screen. In order to choose a diagnostic test, you must press the test number at that prompt, and you do not need to press ‘ENTER’ after you choose the test, it is automatically initiated. Below, see an outline of what needs to be verified in a common servicing situation.

- 4- Stepper motor (signature shaft motor).
- 5- System output test (sensors, solenoids, ability to home, microswitches, encoder base function).
- 9- Encoder sensor readings, DC motor (should all be .50 plus or minus .06).
- **DO NOT TEST STEPPER MOTOR WHILE PLATES ARE INSTALLED.**



TESTING STEPPER MOTOR

1. Go to diagnostics (diagnostics 0-9).
2. Press 4 key (stepper motor system test).
3. Press 3 (disregard readings on screen).
4. Press 7, the signature shaft should begin a steady rotation. The stepper motor will sound kind of rough.
5. Press 8, shaft should rotate more quickly, more steadily and more quietly.
6. Press PAUSE/STOP.

***NOTE: IF NO POWER, CHECK F1 FUSE FOR CONTINUITY, REMOVE AND RESEAT CONNECTOR AT JSTEP.**

If machine successfully does this, and a physical inspection of the signature shaft, stepper motor, home flag sensor and connection (JSTEP) does not show any flaws, you can assume the stepper system is working. At this point press undo 1 time, you should be at the “diagnostics 0-9” prompt. The next step is to

verify the home flag sensor is functioning. **NOTE: If stepper still does not energize effectively, go to page 5.**

HOME FLAG TESTING

1. Go to diagnostics (diagnostics 0-9).
2. Press 5 (system output test).
3. Each time the 'RUN' key is pressed, the stepper should fire and rotate the signature shaft until one of the two home flags enters the sensor. (HOME=1 when flag is in sensor, HOME=0 otherwise).
4. Experiment by rotating shaft out of 'home' by hand in various degrees and pressing RUN. Make sure both flags are utilized.

NOTE: All readings for sensors are on the same format. 0 means the sensor is open and 1 means it is blocked. If a sensor always reads 1 and never 0 the sensor either has failed, has something blocking it, or an issue with the connector or cable to the board.

If the sensor is functioning, but the machine does not find home, it may need to be adjusted. **NOTE: sensor is set at the factory and should not be moved unless the servicing technician can logically determine it's out of position. For instance, a bent home flag or a loose screw on the sensor mounting.**

In order to position the home flag sensor, follow the steps below.

1. Go to diagnostics (diagnostics 0-9).
2. Press 4.
3. Press 3 (shaft will be hard to move by hand).
4. Adjust sensor so flag is centered and the reading for home is '1'.
5. Tighten sensor screws.
6. Press UNDO 1 time.
7. Press 5 (system output test).
8. Press RUN, see if machine homes. Move shaft manually too different positions and experiment. Make sure both flags are utilized. Machine should consistently find the sensor. If not, you may need to make a minor readjustment by repeating the above steps. Any failure to home, even sporadically, could eventually lead to operational problems.

With these items noted, the service technician will typically be in one of three situations.

1. Motor works.
2. Motor energizes, but does not rotate signature shaft, or rotates signature shaft sporadically.
3. Motor does not fire. F1 fuse and JSTEP connection have both been checked.

A bad connection can cost you voltage squareness. This would leave the motor matching symptom #2. There are 4 wires that go from the motor to the main board at JSTEP. A stepper motor has two windings. Therefore there are two individual circuits that supply voltage to the motor. This allows the motor to move both forward and backward instantaneously. A microchip on the main board located at (U29) controls the voltage output at JSTEP. A heat sink and sil pad (heat sink compound on older units) are installed on top of the chip to help dissipate the heat it generates. The chip cannot perform without these items. Knowing when a driver chip is bad can be a tricky process, but can be determined if the entirety of these steps are performed. It may be a good situation based on general principles to simply replace the chip. Below is what would be considered to be advanced electrical readings for the stepper system. **NOTE: if you make or break connection at JSTEP while connection pins are energized, you will damage the driver chip.**

STEPPER DRIVER ISOLATION

1. Turn machine off. Unplug stepper motor from main logic board.
2. Take readings for resistance on motor leads: 2 left wires 1.7-2.0 OHMS. 2 right wires 1.7-2.0 OHMS (machine should be off).
3. Set scale for 20 VAC, place clips on left 2 pins at JSTEP (motor unplugged), make sure they are secure and not touching each other.
4. Rotate signature shaft out of home by hand and turn machine on.
5. Verify and record voltage reading, approximately 8-13 VAC.
6. Turn machine off.
7. Hook leads to opposite two pins and then repeat steps 3-5.
8. Turn machine off.

Voltage level on both circuits should be the same +/- 1.0-1.5 VAC. If not, stepper driver is suspect. If getting no voltage, the driver has completely failed. It can be replaced by ordering a new one, part # MRS045212. **REMEMBER: fuse F1 must be checked for continuity.** Fuse part # M-S045187. 1.0A mini fuse.

REPLACING DRIVER

1. Remove heat sink above JSTEP connection (remove clip).
2. Take a small tool and carefully extract chip, be careful not to damage the chip housing.
3. Press new chip into housing, one corner is shaved off in determining how it goes in slot.
4. Cut sil pad to size, remove backing, and put on top of chip.
5. Reinstall heat sink.
6. Turn machine on – does it find HOME or give an ERROR 10?

By this point you should have a functional homing system. If signature shaft continues to have trouble, please contact Martin Yale Industries, Inc., Technical Support at (800) 225 -5644.

Technical Support
Martin Yale Industries, Inc.
3-24-02