



SERVICE MANUAL

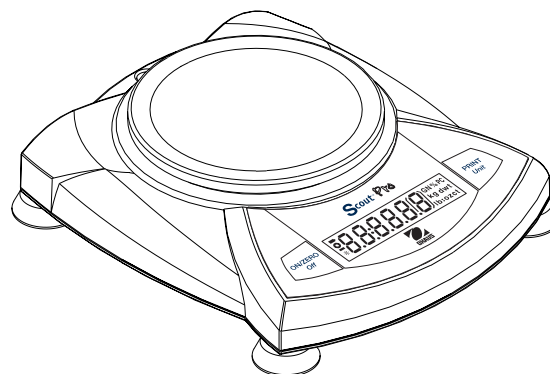
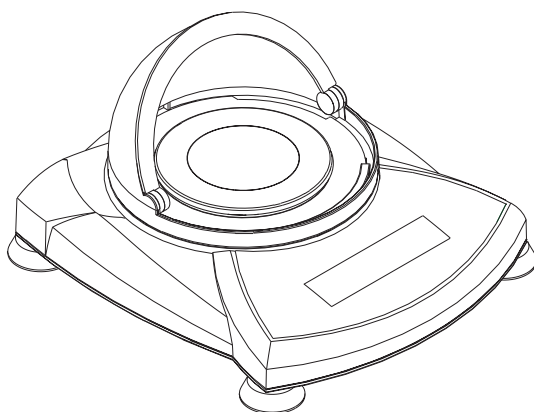
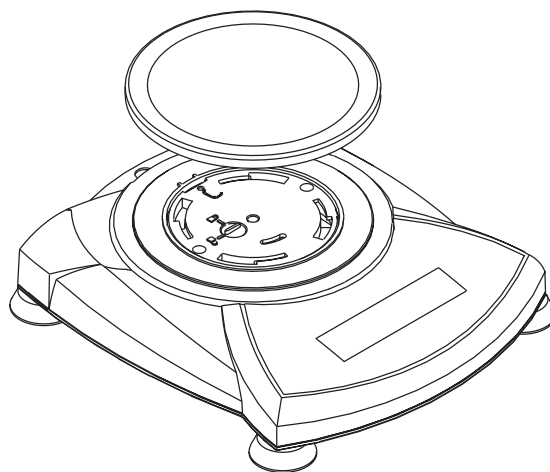
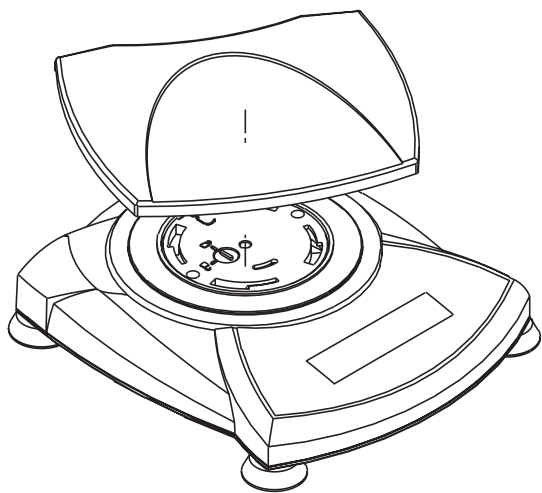
SCOUT® *PRO* BALANCES

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SERVICE MANUAL

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1.1 INTRODUCTION

This service manual contains the information needed to perform routine maintenance and service on the Ohaus Scout® *Pro* Balances. The contents of this manual is contained in five chapters and are listed as follows:

Chapter 1 Introduction - Contains information regarding service facilities, tools, test equipment, calibration masses and specifications.

Chapter 2 Diagnosis - Contains a diagnostic guide for troubleshooting problems and error code tables.

Chapter 3 Repair Procedures - Contains disassembly/assembly and replacement procedures.

Chapter 4 Testing - Contains an operational test, a segment display test and performance tests.

Chapter 5 Drawings and Parts Lists - Contains an exploded view drawing and a parts list.

Before servicing the balance, you should be familiar with the Instruction Manual which is packed with every balance. The procedures in this manual assumes the technician performing them has a working knowledge of the use of standard hand tools and the repair of precision instruments.

1.2 SERVICE FACILITIES

To service the Scout® *Pro* balances, the service area should meet the following requirements:

- Should be temperature controlled and meet the balance specifications for temperature environmental requirements. See specifications for temperature ranges of the various models.
- Must be free of vibrations such as fork lift trucks close by, large motors, etc.
- Must be free of air currents or drafts from air conditioning/heating ducts, open windows, people walking by, fans, etc.
- Area must be clean and air must not contain excessive dust particles.
- Work surface must be stable and level.
- Work surface must not be exposed to direct sunlight or radiating heat sources.

CHAPTER 1 INTRODUCTION

1.3 TOOLS AND TEST EQUIPMENT REQUIRED

In order to properly service the Scout *Pro* balances, certain Ohaus special tools and test items are required in addition to standard electronic tool kits. These items are listed as follows:

1.3.1 Special Tools and Test Equipment List

1. Alternate voltage Power Adapter if local power requirements do not match Balance Adapter voltage ratings.
2. Scout *Pro* RS232 option PN 71147376.
3. A PC running Microsoft Windows NT 4.0 or later, or Microsoft Windows 98 or later.
3. Scout *Pro* instruction manual.
4. Scout *Pro* Tools.zip.
5. Set of Feeler gauges ranging from 0.40mm/0.16in. to 0.65mm/0.026in.
6. Micro sized alligator clip.

1.3.2 Standard Tools and Test Equipment List

1. Standard Electronics Tool Kit.
2. Digital Voltmeter (DVM) Input impedance of at least 10 megohms in the 1 Volt dc position.
3. Masses totaling up to 6000 grams are required. Ohaus makes various calibration sets available. Please contact your nearest Ohaus dealer for further details.

1.4 TEST MASSES REQUIRED

The masses required to test the Scout *Pro* balances must meet or exceed the requirements of ASTM Class 4 Tolerance. The calibration points are listed in Table 1-1.

TABLE 1-1. CALIBRATION POINTS

| CAPACITY | SPAN CAL POINT | LINEARITY CAL POINTS |
|----------|----------------|----------------------|
| 200g | 200g | 100g, 200g |
| 400g | 200g | 200g, 400g |
| 600g | 300g | 300g, 600g |
| 2000g | 2000g | 1000g, 2000g |
| 4000g | 4000g | 2000g, 4000g |
| 6000g | 6000g | 3000g, 6000g |

1.5 SPECIFICATIONS

Specifications for the Scout *Pro* balances are listed in Table 1-2. When a balance has been serviced, it must meet the specifications listed in the table. Before servicing the balance, determine what specifications are not met.

TABLE 1-2. SPECIFICATIONS

| | | | | | | | |
|-------------------------------|---|--------|--------|--------|---------|---------|---------|
| Capacity (g) | 200 | 400 | 400 | 400 | 2000 | 4000 | 6000 |
| Readability (g) | 0.01 | | 0.1 | | | | |
| Repeatability (Std. Dev.) (g) | 0.01 | | 0.1 | | | | |
| Off Center Loading (g) | ±0.01 | | ±0.1 | | | | |
| Linearity (g) | ±0.01 | | ±0.1 | | | | |
| Tare range | To capacity by subtraction | | | | | | |
| Over Range Capacity | Capacity + 90d | | | | | | |
| Stabilization Time | 3 seconds | | | | | | |
| Operating Temp. Range | 50° to 104° F/10° to 40° C | | | | | | |
| Power Requirements | AC Adapter (included) 4 AA Batteries (not included) | | | | | | |
| Item Numbers | SPx202 | SPx402 | SPx401 | SPx601 | SPx2001 | SPx4001 | SPx6000 |

CHAPTER 1 INTRODUCTION

2.1 TROUBLESHOOTING

This section of the manual specifies problem areas of the balance which can occur. Information is contained to isolate specific problems using Table 2-1, Diagnostic Guide, and Table 2-2, Error Codes. Follow all directions step by step. Make certain that the work area is clean and use care when handling components of the balance.

2.2 DIAGNOSTIC GUIDE

Table 2-1 is a diagnostic guide designed to help locate the problem area quickly and easily. To use the table, first locate the symptom that you are observing. Follow the symptom column and review the probable cause column and remedy column. The probable causes are listed with the most common cause first. If the first remedy does not fix the problem, proceed on to the next remedy. Before attempting to repair the Balance, read all chapters of this manual to familiarize yourself with the balance components and operation. Do not attempt repairs unless you fully understand the operation of the balance.

2.2.1 Diagnosis

1. Isolate and identify the symptom.
2. Refer to Table 2-1 Diagnostic guide and locate the symptom.
3. Follow the suggested remedies in the order that they appear.
4. Perform the indicated checks, or see the appropriate section of the manual.
5. Repair or replace the defective section of the balance.

NOTE:

If more than one symptom is observed, it is necessary to approach one area at a time, and also remember, that the symptoms may be interrelated.

In the event that erratic or fluctuating weight readings are observed, it is necessary to isolate the problem to either the mechanical area or the electronic area of the balance. The repeatability test will quickly point out whether the Transducer (8) is operating properly or whether the problem is due to an electronic malfunction.

If a problem arises that is not covered in this manual, contact Ohaus Corporation for further information.

CHAPTER 2 DIAGNOSIS

TABLE 2-1. DIAGNOSTIC GUIDE

| SYMPTOM | PROBABLE CAUSE | REMEDY |
|-------------------------|--|---|
| No display. | 1. No power. 2. Power Jack defective. 3. Weak battery. 4. Battery connector - poor contact. 5. PC Board defective. | 1. Check AC Adapter. 2. Replace Power Jack. 3. Replace. 4. Clean or replace. 5. Replace PC Board. |
| Low BAT displayed. | 1. Weak battery. 2. AC Adapter defective or wrong type being used. 3. PC Board defective. | 1. Replace battery. 2. Replace AC Adapter. 3. Replace PC Board. |
| Stays in segment check. | 1. Weak battery. 2. PC Board defective. | 1. Replace battery. 2. Replace PC Board. |
| Always displays zero. | 1. Possible power surge. 2. Down stop improperly set. 3. Transducer not connected. 4. Defective Transducer. 5. PC Board defective. | 1. Perform linearity calibration. 2. Set per specifications. 3. Plug in Transducer. 4. Replace Transducer. 5. Replace PC Board. |
| Cannot calibrate. | 1. Incorrect calibration masses. 2. Transducer not connected. 3. Defective Transducer. 4. PC Board defective. | 1. Use correct masses. 2. Plug in Transducer. 3. Replace Transducer. 4. Replace PC Board. |
| Displays (Err2) | 1. Missing Pan. 2. Down Stop improperly set. 3. Transducer zero has shifted. | 1. Put pan on balance 2. Check stops and reset if necessary. 3. Perform factory calibration B.1 or B.2 |

TABLE 2-1. DIAGNOSTIC GUIDE (Cont.)

| SYMPTOM | PROBABLE CAUSE | REMEDY |
|--------------------------------|--|---|
| Displays (Err2) (Cont.). | 4. Defective Transducer. 5. PC board defective. | 4. Replace Transducer. 5. Replace PCB. |
| Exceeds off center load limit. | 1. Defective Transducer. | 1. Replace Transducer. |
| Inaccurate readings. | 1. Improper calibration (Span or Linearity). 2. Not zeroed before weighing. 3. Defective Transducer. 4. PC Board defective. | 1. Perform linearity calibration. 2. Press Zero On with no weight on the Pan, then weigh. 3. Replace Transducer. 4. Replace PC Board. |
| Fluctuating readings. | 1. Unstable environment. 2. Debris in balance. 3. PC Board defective. 4. Defective transducer. 5. Transducer Lock engaged or misaligned. | 1. Check area for vibrations, leveling and drafts. 2. Disassemble and clean if necessary. 3. Replace PC Board. 4. Replace Transducer. 5. Unlock or realign. |
| Drifting display. | 1. Balance not warmed up. 2. Defective Transducer. 3. PC Board defective. | 1. Allow balance to stabilize. 2. Replace Transducer. 3. Replace PC Board. |
| Error code (Err#) on display. | 1. Balance has detected an error condition. 2. Defective Transducer. 3. PC Board defective. | 1. See Table 2-2, Error Codes. 2. Replace Transducer. 3. Replace PC Board. |

CHAPTER 2 DIAGNOSIS

TABLE 2-1. DIAGNOSTIC GUIDE (Cont.)

| SYMPTOM | PROBABLE CAUSE | REMEDY |
|--|--|---|
| RS232 Not functioning. (On models equipped with RS232). | 1. Improper Print Menu settings. | 1. Check all settings. (Menu item Power must be set to ON .) |
| | 2. RS232 not turned on. | 2. Turn the option on. (See instruction manual). |
| | 3. RS232 does not stay on. | 3. If batteries are being used, the RS232 turns off when the unit is turned off. Either turn the option on or use the ac adapter. |
| | 4. Loose or disconnected RS232 option. | 4. Check connection. |
| | 5. RS232 option defective. | 5. Replace RS232 option. |

2.3 ERROR CODES

Scout *Pro* balances are equipped with software which will display an error condition when it occurs. Table 2-2 Error Codes, describes the various error codes which can appear on the display and specifies the probable reason and remedy.

TABLE 2-2. ERROR CODES

| DISPLAY | REASON | ACTION |
|--------------|----------------------------|---|
| Err 1 | Invalid checksum data | 1. Perform factory calibration. 2. Restore data file. 3. Check transducer. 4. Check PCB. |
| Err 2 | Overload or Underload | 1. Make sure the right pan is on the balance. 2. Perform service LIN calibration per B.1. 3. Check transducer. 4. Check PCB. |
| Err 4 | Incorrect calibration mass | 1. Calibrate using correct mass. |
| Err 5 | Parts counting error | 1. Sample is less than 1d. Change sample quantity or increase sample. |
| Err 8 | RS232 buffer is full | 1. Check printing device. |
| Err 9 | Internal data error | 1. Restore data file. 2. Check PCB. 3. Check transducer. |

3.1 REPAIR PROCEDURES

This section of the manual contains detailed disassembly procedures of the balance. Refer to Figure 5-1. Before disassembling the balance, it should be noted that components inside of the balance are delicate and need to be handled with care. It is imperative that the Transducer (8) should never be subjected to any excessive torque, stress, or abrasion as damage may result. Once the balance has been disassembled, any small scratch or abrasion made to any of the Individual Strain Gauges will render the entire Transducer (8) unusable. The Printed Circuit Board (9) contains integrated circuits which employ CMOS technology, therefore, caution must be exercised so as not to subject any of these components to static electricity discharge. When servicing, a wrist Ground Strap with a 10 Megohm series resistor to earth ground is highly recommended. The Printed Circuit Board (9) should be handled by grasping the edges only and never placing fingers on any of the runs or traces.

3.1.1 Cover Removal

To disassemble the balance, proceed as follows:

1. Turn the balance off and if using an AC Adapter, disconnect it from the balance.
2. Remove the Pan (1, 2 or 3) from the balance. Pan sizes and shapes vary.
3. Place the Shipping Lock in the locked position. See Figure 3-1. This will help protect the Transducer.

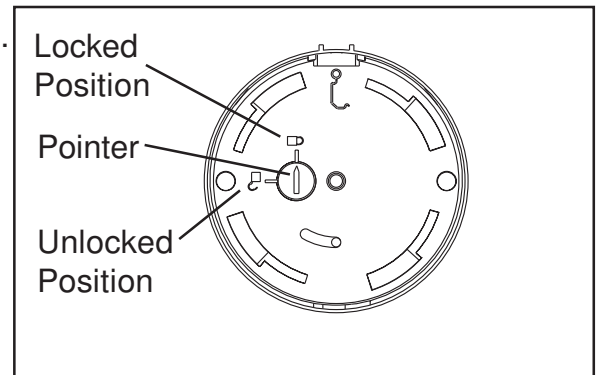


Figure 3-1. Shipping Lock.

4. If a battery is being used, turn the balance over and remove the Battery Compartment Cover (12) as shown in Figure 3-2.

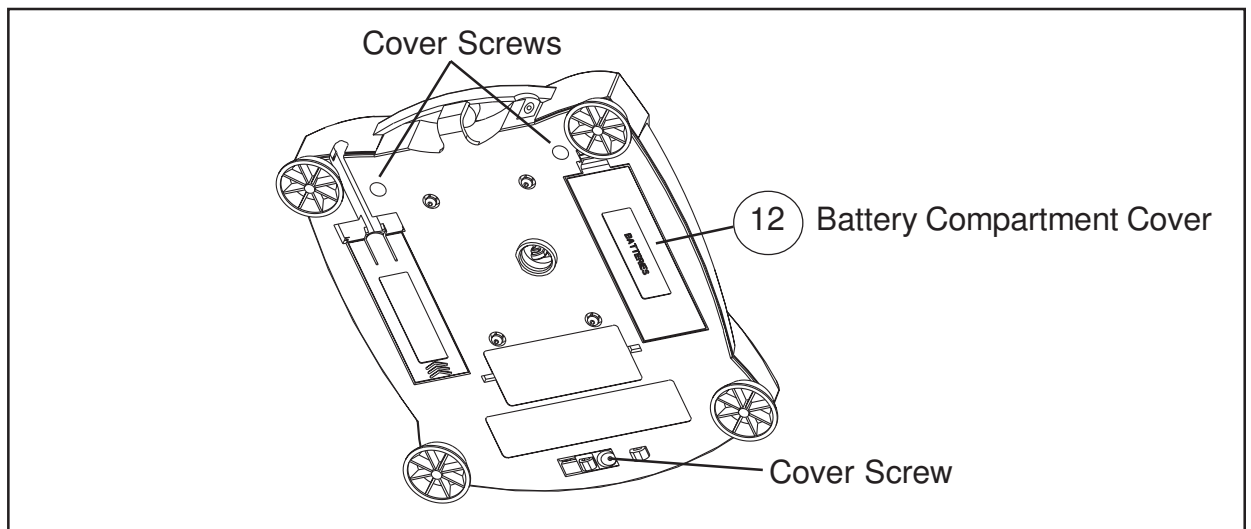


Figure 3-2. Bottom of Balance.

CHAPTER 3 REPAIR PROCEDURES

3.1.1 Cover Removal (Cont.)

5. Remove the 4 AA batteries from inside the battery compartment and replace the Battery Compartment Cover (12).
6. Slide the Lockswitch to the unlocked position to gain access to one of the cover screws. Remove the 3 Cover Screws as shown in Figure 3-2.
7. Turn the balance over in an upright position and carefully lift the Top Cover (6) from the balance Base (10).
8. After repairs and or adjustments have been made, reassemble the balance in the reverse order.

3.1.2 Printed Circuit Board (9) Replacement

In an effort to keep service costs down, it is suggested that if the Printed Circuit Board (9) is suspected of being faulty, it should be replaced rather than repaired.

To replace the Printed Circuit Board (9) , proceed as follows:

1. Remove the balance cover, refer to paragraph 3.1.1.

CAUTION

WHEN HANDLING THE PRINTED CIRCUIT BOARD, HANDLE BY EDGES ONLY! DO NOT TOUCH FOIL SIDE OF BOARD. STATIC DISCHARGE MAY DAMAGE SOME COMPONENTS.

2. The Printed Circuit Board (9) is fastened in place by 2 clips which are part of the Base (10) and 2 screws located on top of the Printed Circuit Board. In addition, a Calibration Lock (15)(small plastic piece) is positioned at the front of the Printed Circuit Board. See Figure 3-3.

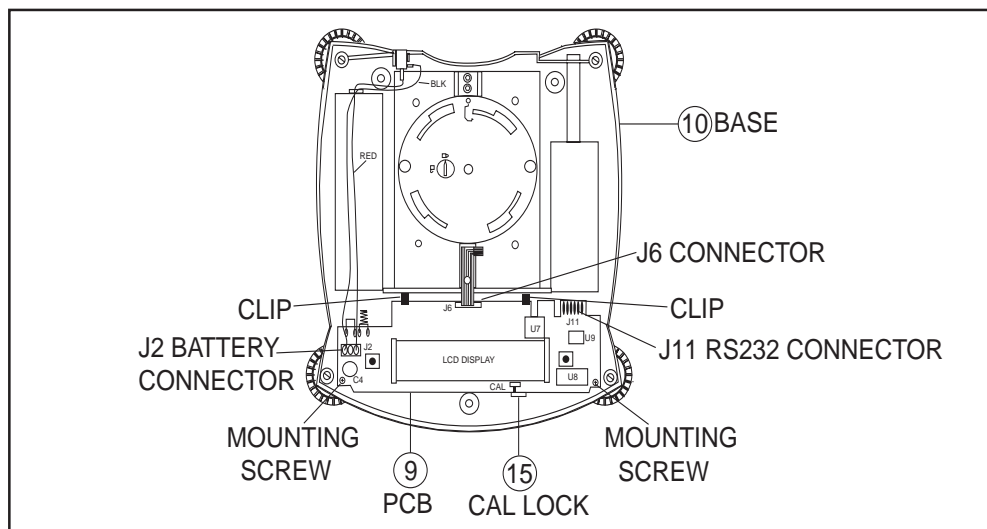


Figure 3-3. Printed Circuit Board Removal.

3.1.2 Printed Circuit Board (9) Replacement (Cont.)

3. When an RS232 option is installed, remove the RS232 Connector from J11 on the Printed Circuit Board (9).
4. Disconnect the Transducer cable from Connector J6 on the Printed Circuit Board (9).
5. Disconnect the battery cable from Connector J2 on the Printed Circuit Board (9).
6. Remove the 2 mounting screws on top of the Printed Circuit Board (9).
7. Push the Printed Circuit Board towards the back as far as it will go and apply a small forward pressure to the Cal Lock (15). Lift up on the front of the Printed Circuit Board (9) to remove it.
8. Install the new Printed Circuit Board (9). Make sure that the Printed Circuit Board is positioned under the 2 clips on the Base (10).
9. Connect the flexible cable from the Transducer to Connector J6 on the Printed Circuit Board (9).
10. Connect the RS232 to Connector J11 on the Printed Circuit Board (9) if the RS232 is installed.
11. Connect the battery cable to connector J2 on the Printed Circuit Board (9).
12. Replace the 2 mounting screws on top of the Printed Circuit Board (9), make sure the board is positioned as far forward as possible to ensure the calibration lock switch will operate properly.
13. Reassemble the Balance.
14. Replace the batteries if previously removed.
15. See Appendix A Service Tools Instructions and load temperature compensation data.
16. Check the performance of the Balance and perform Factory Calibration B.2.

CHAPTER 3 REPAIR PROCEDURES

3.1.3 Transducer (8) Replacement

There are 8 Transducer Kits that are available for replacement purposes. Each Kit is fully assembled and consists of metal base plate, a transducer mounted to the base plate and a subplatform mounted to the transducer. All adjustments such up stop and down stop (limits travel of the transducer to safe limits) have been factory set. Transducer kits are available in the following ranges: 120g, 200g, 400g, 600g, 1200g, 2000g, 4000g and 6000g. Check the bottom of the balance and verify the capacity before ordering a new transducer kit.

CAUTION

Extreme care must be exercised so as not to twist or deform the Transducer in any way. Do not drop or hit the Transducer. Any damage to the Transducer can render it inoperative.

1. Remove the cover in accordance with the procedures in paragraph 3.1.1.
2. Remove the 4 screws that secure the Transducer (8) to the Base (10). The screws are accessible at the bottom of the balance. See Figure 3-4.

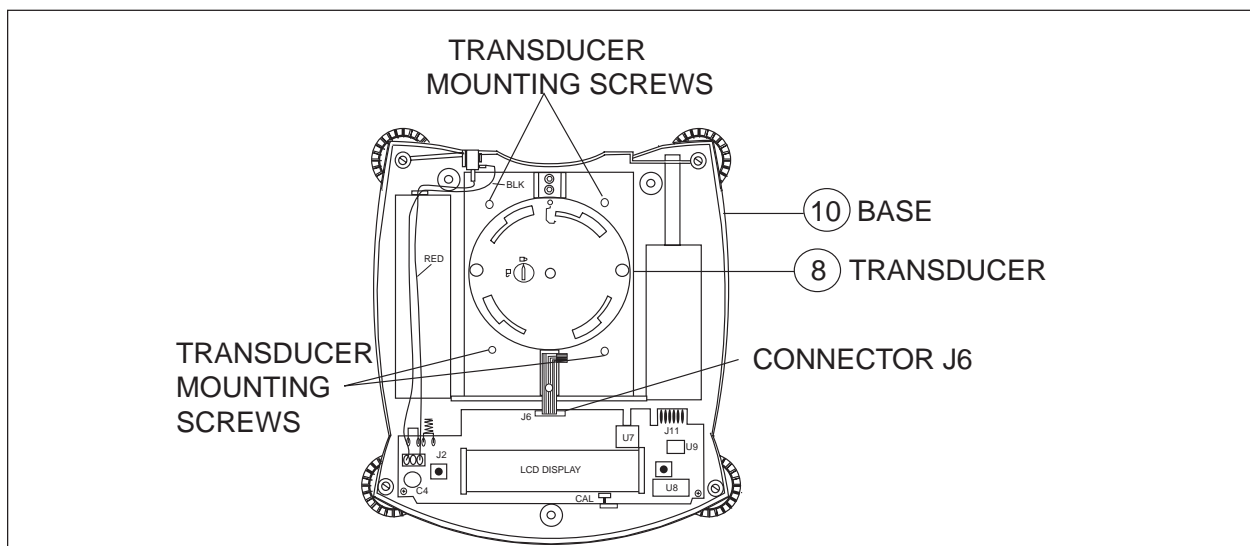


Figure 3-4. Transducer Removal.

3. Disconnect Connector J6 coming from Transducer (8).
4. Install the replacement Transducer using the 4 screws previously removed and connect the Transducer flexible cable to connector J6 on the Printed Circuit Board.
5. Reassemble the balance.
6. See Appendix A Service Tools Instructions and load temperature compensation data.
7. Recalibrate the balance in accordance with instructions in Appendix B, Factory Calibration B.2
8. Check the performance of the balance.

4.1 TESTING

Before servicing the balance, an operational test and various performance tests should be made to ascertain whether or not the balance meets specifications. Turn the balance on and allow it warm up for at least five minutes before performing these tests. Make sure the test area is free from drafts and that the balance rests on a level and vibration free surface. The masses used for final calibration must be adjusted to ASTM Class 4 tolerance or better.

4.1.1 Operational Test

1. Connect a functioning AC Adapter to the balance Power Jack located at the rear of the balance.
2. Plug the AC Adapter into a suitable power source. If the AC Adapter supplied with the balance is rated for a different voltage, use an appropriate adapter to match the supply voltage.

4.1.2 Segment Display Test

1. Turn the balance on by pressing **ON/ZERO Off**, all segments are enabled and displayed briefly, then followed by a software revision number. See Figure 4-1 for full display.
2. Tare the balance. The display should indicate a zero weight.



Figure 4-1. LCD Full Display.

4.2 PERFORMANCE TESTS

Accurate performance of a Scout *Pro* balance is determined by a series of three performance tests. The displayed readings are compared with the tolerances listed in Table 4-1. Tolerance values are expressed in counts. A one count change is equal to the last digit shown on the balance display.

TABLE 4-1. TYPES OF PERFORMANCE TESTS

| PERFORMANCE TEST | TOLERANCE |
|------------------|---------------|
| Repeatability | ± 1 Count |
| Off Center Load | ± 2 Count |
| Linearity | ± 1 Count |

CHAPTER 4 TESTING

4.2 PERFORMANCE TESTS (CONT.)

The following performance tests are used to evaluate the balance operation before and after repairs. Each balance tested must meet the requirements specified in each test as well as the specifications listed in Table 1-2. Tolerance values are expressed in counts. A balance which passes each of these three tests meets the manufacturing specifications.

4.2.1 Repeatability Test

Repeatability is a word used in balance specifications meaning the Standard Deviation of a set of similar weight readings. To determine whether a balance meets the calculated Standard Deviation value in the Specification Table 1-2, perform the following test:

Test

1. Tare the balance. The reading on the display should be 0g.
2. Select a mass weighing near the maximum capacity of the balance and place the mass on the **center** of the Pan (1). Observe and record the reading.
3. Remove the mass. Reading should return to 0g ± 1 count.
4. Repeat this test for ten readings. If the standard deviation of the readings is less than ± 1 count, the balance passes the Repeatability Test.

Adjustment

If the deviation for any set of readings (using the same mass placed on the center of the Pan) is greater than ± 1 count, the balance does not meet the Repeatability Test specification. Inspect and correct the following areas:

1. Check for mechanical obstructions. Any foreign object touching any part of the moving Pan can cause a balance to fail the Repeatability Test. Inspect and correct as necessary.
2. An error in the Off-Center Load Test can affect the results of the Repeatability Test. Inspect and correct if necessary. See Off-Center Load Test.
3. Foreign material or debris located in the balance between the Pan (1) and the Top Cover (6) can cause the balance to fail the test.
4. Environmental influences such as vibrations, drafts or a non-level surface can also cause failures.
5. If the balance fails the test, refer to table 2-1 Diagnostic Guide for assistance.

4.2.2 Off-Center Load Test

The Off-Center Load Test is used to determine whether displayed weight values are affected by moving the sample to different areas of the Pan (6).

Test

1. Place 1/2 of the balance capacity in the **center** of the Pan (1).
2. Note the reading.
3. Move the mass halfway (between the center and the edge) to the front of the Pan (1). Note any differences in the displayed weight reading.
4. Repeat this test for the back, left, and right positions of the Pan.
5. Maximum allowable change in displayed weight readings is ± 2 count for each of the four positions. If this reading is exceeded, it usually indicates a defective Transducer (8).

4.2.3 Linearity Test

This test is used to determine the linearity of the unit throughout its operating range. The masses used to perform this test must be adjusted to ASTM Class 4 Tolerance, or better.

NOTE:

The balance must pass the Off-Center Load Test and Repeatability Test before the Linearity Test may be performed.

Test

Loads do not have to be test weights. They can be anything that totals the load value. The test mass can be anything that weighs near the test mass value

TABLE 4-2. TEST MASSES

| Capacity | Test mass | Load 1 | Load 2 | Load 3 | Load 4 |
|----------|-----------|--------|--------|--------|--------|
| 200g | 1g | 50g | 100g | 150g | 190g |
| 400g | 1g | 100g | 200g | 300g | 390g |
| 600g | 1g | 150g | 300g | 450g | 590g |
| 2000g | 1g | 500g | 1000g | 1500g | 1990g |
| 4000g | 1g | 1000g | 2000g | 3000g | 3990g |
| 6000g | 1g | 1500g | 3000g | 4500g | 5990g |

1. Place the test mass on the balance, record the weight and then remove.
2. Place Load 1 on the balance and press the **ON/ZERO/Off** button.
3. Place the test mass on the balance, record the weight and then remove.
4. Place Load 2 on the balance and press the **ON/ZERO/Off** button.

CHAPTER 4 TESTING

4.2.3 Linearity Test (Cont.)

Test (Cont.)

5. Place the test mass on the balance, record the weight and then remove.
6. Place Load 3 on the balance and press the **ON/ZERO/Off** button.
7. Place the test mass on the balance, record the weight and then remove.
8. Place Load 4 on the balance and press the **ON/ZERO/Off** button.
9. Place the test mass on the balance, record the weight and then remove.
10. The difference in the weights of the test mass should be within the tolerance in table 4.1. If not, perform a linearity calibration, see Appendix B and do the test again.

4.3 Down Stop Adjustment

When the balance fails the Off-Center Load test and or the Linearity test, the Transducer may require checking and adjusting of the down stop. To make adjustments, the Transducer must be removed from the balance. Perform procedures 3.1.1 and 3.1.3 and remove the Transducer from the balance.

NOTE: This procedure will require feeler gauges ranging from 0.40mm/0.16in. to 0.65mm/0.026in.

Checking and adjusting the down stop.

1. Place masses equaling mass 1 as indicated in Table 4-3 on the platform. You should still be able to feel some movement with a slight downward push.
2. Place masses equaling mass 2 as indicated in Table 4-3 on the platform. You should feel no movement with a slight downward push.
3. If the above conditions **are not met**, adjust the screws on the base plate using the data in Table 4-4. See Figure 4-2 for location of adjustment screws.

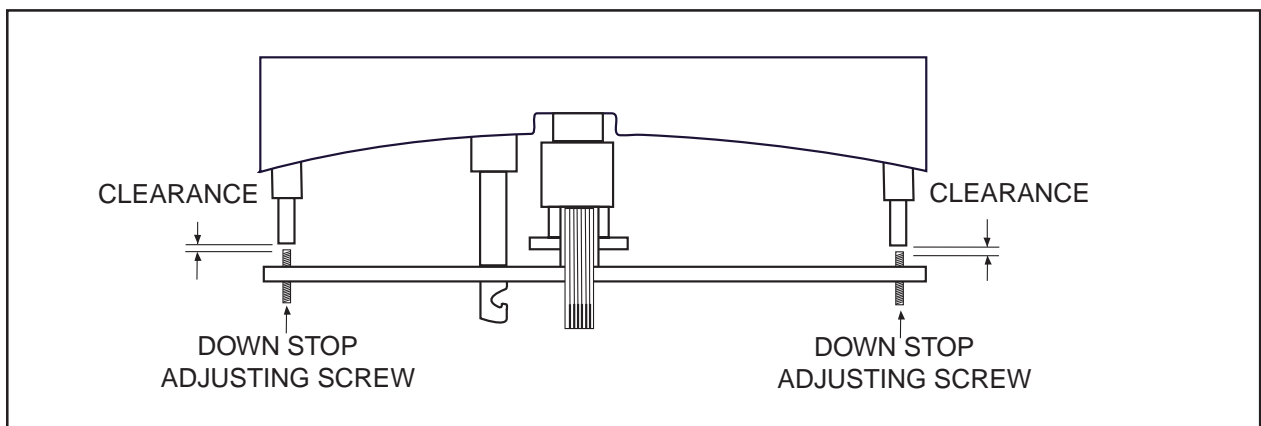


Figure 4-2. Transducer Front View - Down Stop Adjustment Screws

4.3 Down Stop Adjustment (Cont.)

TABLE 4-3. TEST MASS VALUES

| Balance Capacity | Mass 1 | Mass 2 |
|------------------|--------|--------|
| SP202 | 250 | 350 |
| SP402 | 500 | 700 |
| SP401 | 500 | 900 |
| SP601 | 700 | 900 |
| SP2001 | 3000 | 7000 |
| SP4001 | 5000 | 7000 |
| SP6000 | 7000 | 9000 |

TABLE 4-4. TRANSDUCER ADJUSTMENT TOLERANCES

| Capacity of Load Cell | Min(mm/in) | Max(mm/in) |
|-----------------------|------------|------------|
| 120g | 0.40/0.016 | 0.45/0.018 |
| 200g | 0.60/0.024 | 0.70/0.028 |
| 400g | 0.50/0.020 | 0.60/0.024 |
| 600g | 0.65/0.026 | 0.75/0.030 |
| 600g | 0.75/0.030 | 0.90/0.035 |
| 2Kg | 0.65/0.026 | 0.90/0.035 |
| 4Kg | 0.60/0.024 | 0.70/0.028 |
| 4Kg | 0.65/0.026 | 0.90/0.035 |
| 6Kg | 0.50/0.020 | 0.60/0.024 |

After the transducer has been adjusted, assemble the balance retest and recalibrate.

CHAPTER 4 TESTING

5.1 DRAWINGS

This section of the manual contains an exploded view and parts lists. The exploded view drawing is designed to identify the parts which can be serviced on the balance in the field.

NOTE:

In all cases where a part is replaced, the balance must be thoroughly checked after the replacement is made. The balance **MUST** meet the parameters of all applicable specifications in this manual.

If further technical information is needed, in the United States call Ohaus Aftermarket toll-free 1-800-526-0659 between 8.00 a.m. and 4.00 p.m. EST. An Ohaus factory service technician will be available to provide assistance. Outside the U.S.A., please contact:

Ohaus Corporation
19 Chapin Road
Pine Brook, NJ 07058, USA
www.ohaus.com
Tel: (973) 377-9000,
Fax: (973) 593-0359

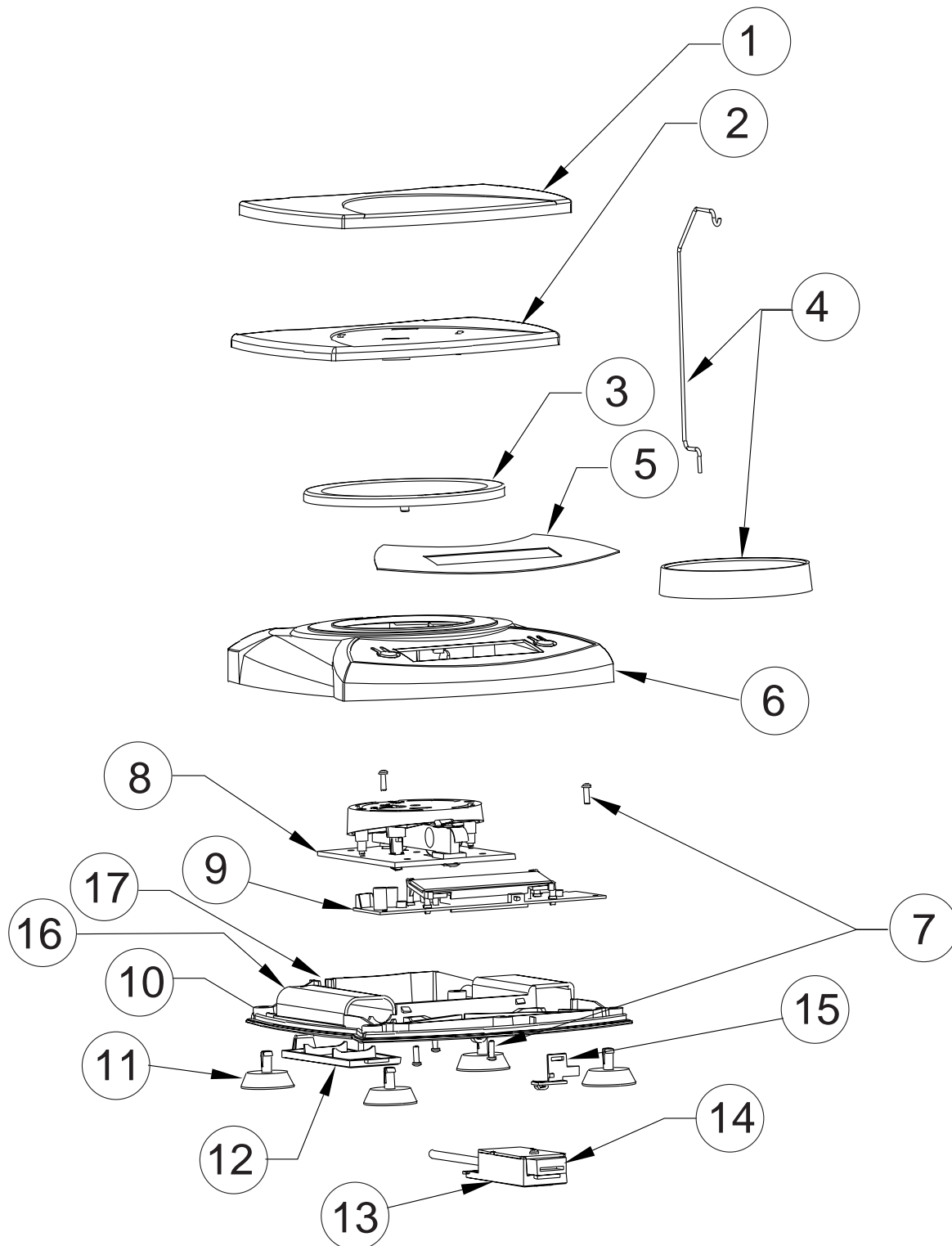


Figure 5-1. Scout Pro Exploded View.

5.2 PARTS LISTS

This section of the manual contains the replaceable parts for the Scout Pro Balances.

TABLE 5-1. REPLACEMENT PARTS LIST

| KEY NO. | PART NO. | DESCRIPTION |
|---------|----------|---|
| 1 | 71160314 | Square Pan, 6.5" x 5.5" SS, Scout Pro, SPx01, SPxx01, SPxx00, SPXx01, SPXxx01, SPXxx00 |
| 2 | 71160308 | Pan Support, 6.5" x 5.5" Square, Scout Pro, SPx01, SPxx01, SPxx00, SPXx01, SPXxx01, SPXxx00 |
| 3 | 71154611 | Round pan Assy, 4.7" (120mm) dia. SS, Scout Pro, SPx02, SPXx02 |
| 4 | 71147378 | Specific Gravity Kit, Scout Pro, SPExxx |
| 5 | 71160395 | Function Label, Scout Pro, SPExxx |
| 5 | 71160346 | Function Label, Scout Pro, All but SPExxx |
| 6 | 71160302 | Top Cover, Scout Pro, All |
| 7 | 71160347 | Wire Assembly, Power, Scout Pro, All |
| 8 | 71160477 | Kit, Transducer replacement, 2000g, Scout Pro, SP2001, SPX2001 |
| 8 | 71160408 | Kit, Transducer replacement, 6000g, Scout Pro, SP6001, SPX6001 |
| 8 | 71160407 | Kit, Transducer replacement, 4000g, Scout Pro, SP4001, SPX4001 |
| 8 | 71160406 | Kit, Transducer replacement, 1200g, Scout Pro |
| 8 | 71160405 | Kit, Transducer replacement, 600g, Scout Pro, SPx01, SPXx01 |
| 8 | 71160404 | Kit, Transducer replacement, 400g, Scout Pro, SP402, SPX402 |
| 8 | 71160403 | Kit, Transducer replacement, 200g, Scout Pro, SP202, SPX202 |
| 8 | 71160402 | Kit, Transducer replacement, 120g, Scout Pro, SP123, SPX123 |
| 9 | 71160411 | Kit, PCB w/LCD replacement, Full Bridge Hi, Scout Pro, For 120g, 400g, 4000g, SP123, SPX123, SP402, SPX402, SP401, SPX401 |
| 9 | 71160410 | Kit, PCB w/LCD replacement, Half Bridge, Scout Pro, For 600g, 6000g, SPx01, SPXx01, SP6000, SPX6000 |
| 9 | 71160409 | Kit, PCB w/LCD replacement, Full Bridge Lo, Scout Pro, For 200g, 1200g, 2000g, SP202, SPX202, JS1200, SP2001, SPX2001 |

CHAPTER 5 DRAWINGS AND PARTS LISTS

TABLE 5-1. REPLACEMENT PARTS LIST (Cont.)

| | | |
|----|----------|---|
| 10 | 71164070 | Base w/threaded inserts, Scout Pro, SPGxxx, SPSxxx, SPxxxN |
| 10 | 71160301 | Base, Scout Pro, All with fixed feet |
| 11 | 71160412 | Adjustable feet, with rubber pad, Scout Pro, SPGxxx, SPSxxx, SPxxxN |
| 11 | 71160305 | Foot, Non adjustable, Scout Pro, All |
| 12 | 71160303 | Battery cover, Scout Pro, All |
| 13 | 71160304 | Interface cover, Scout Pro, All |
| 14 | 71147994 | LCD, Scout Pro, All |
| 15 | 71160313 | Cal Lock, Scout Pro, All |
| 16 | 71160323 | Connector, Battery, Scout Pro, All |
| 17 | 12102033 | Weigh Below cover, Scout Pro, All |
| 18 | 71160309 | Lock, sub platform, Scout Pro, All |
| 19 | 71160413 | Level, Scout Pro, SPGxxx, SPSxxx, SPxxxN |
| 20 | 71160311 | LCD support (Left), Scout Pro, All |
| 21 | 71160312 | LCD support (Right), Scout Pro, All |
| | 12102323 | Adapter, 230V/AU, Scout Pro, All |
| | 12102322 | Adapter, 240V/UK, Scout Pro, All |
| | 12102321 | Adapter, 230V/EU, Scout Pro, All |
| | 12102320 | Adapter, 100-120V/US, Scout Pro All |

A. SERVICE TOOLS INSTRUCTIONS

This tool is required when either a main PC board or a transducer is replaced in a Scout Pro balance. It is used to re-configure the balance to its old parameters in the case of a board replacement or new parameters in the case of a transducer replacement.

A.1 REQUIREMENTS FOR SCOUT PRO TOOLS

- VGA 640x480 or higher resolution screen
- Microsoft Windows NT 4.0 or later, or Microsoft Windows 98 or later
- Scout Pro RS232 Interface Kit or USB interface Kit
- Scout Pro instruction manual
- Scout Pro Tools.zip

A.2 SOFTWARE INSTALLATION

1. If you need the software it can be downloaded at the following URL. [HTTP://files.share.ohaus.com/docushare/](http://files.share.ohaus.com/docushare/).
 - a. Click on Login.
 - b. Login = ServiceA
Password = aservice
Both are case sensitive
 - c. Click on the Xerox logo at the upper left.
 - d. Click on Technical Support.
 - e. Click on Service Notes.
 - f. Click on Authorized Service Centers.
 - g. Click on Scout Pro Tools.
 - h. Download all 3 files.
2. Create a folder in the C:\ drive and name it **ScoutPro**. If you choose another directory you will have to open the file **toledo.ini** and modify the path to the **service.txt** file to agree with the folder name and path you have chosen.
3. Copy the file **ScoutPro Tools.zip** into C:\ScoutPro.
4. Extract the files in **ScoutPro Tools.zip** into C:\ScoutPro.
5. Copy the file **service.txt** into the C:\ScoutPro, if required.
6. You may want to put a shortcut on your desktop for easier access.

APPENDIX A SERVICE TOOL INSTRUCTIONS

A.3 HARDWARE INSTALLATION

NOTE: The optional interface must be modified so that the EEPROM may be written to.

1. Remove the screw and the housing as shown in Figure A-1.

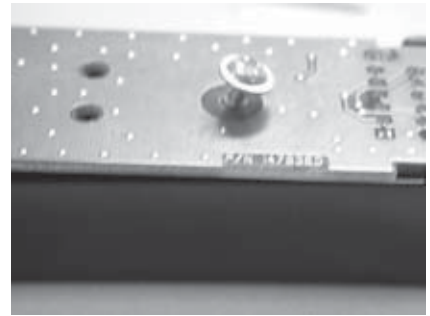


Figure A-1. Screw and Housing Removal.

2. Locate J3 on the interface board. See Figure A-2.

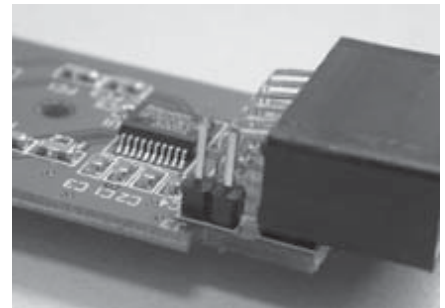


Figure A-2. Connector J3 Location.

3. Short the two pins of J3, see Figure A-3.
4. Replace the interface housing.
5. Install the modified RS232 / USB module in the balance being repaired.

NOTE: If using the customers interface, do not forget to remove the modification after the repair is complete.

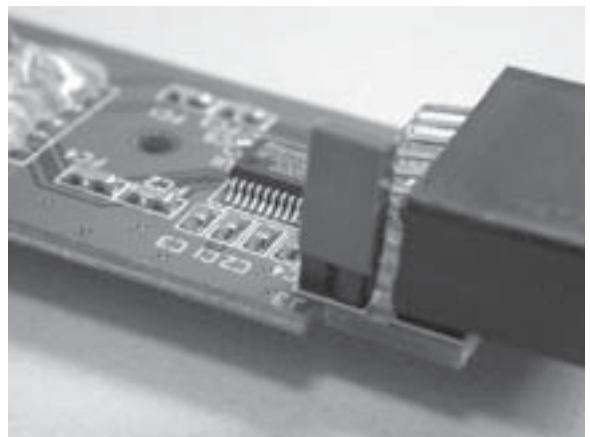


Figure A-3. Connector J3 Shorted.

6. Plug the interface cable into the PC.
7. Make sure the communications parameters match. The parameters in the tools are:
 - Baud = 2400
 - Parity = 7-None
 - Handshake = None
8. Make sure the balance **A-off** feature, under the **.S.E.T.U.P.** menu, is set to **OFF**, if this setting is left **ON**, the balance will shut off during the re-configuration.

A.4 SPECIAL INSTRUCTIONS FOR USB INTERFACE

After installing the interface using the instructions that come with the kit, the COM port will have to be changed. The interface uses COM 5 as a default. Config Tool only recognizes COM 1 to COM 4.

1. Enter the Windows Control Panel and click on the **System** icon.
2. Click on the **Hardware** tab.
3. Click on the **Device Manager** button.
4. Expand **Ports (COM & LPT)**.
5. Right Click on **USB Serial Port (COM5)** and choose **Properties**.
6. Click on the **Port Settings** tab.
7. Click on the **Advanced** button.
8. Change the COM port number to an unused port.
9. Click on **OK** twice.
9. Close the **System Properties** box.
10. Close the **Control Panel** Window.
11. The virtual port will now be the com port you selected.

A.5 USING CONFIGTOOL.EXE.

1. Open ConfigTool.exe, you will see the screen shown in Figure A-4 after the communications parameters have been checked. If the communications parameters are not matched, or, there is no balance connected, error messages will appear. If a balance is connected, it will be read automatically and the data will appear.

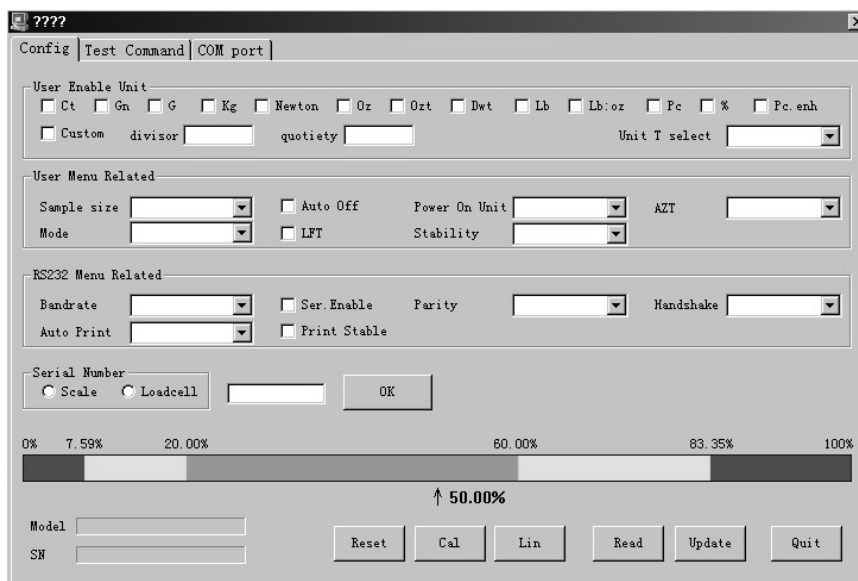


Figure A-4.
A-3

APPENDIX A SERVICE TOOL INSTRUCTIONS

A.5 USING CONFIGTOOL.EXE. (CONT.)

2. If the communications parameters have to be set, click on the **Com Port** tab and the screen shown in Figure A-5 will appear. Adjust the parameters as required to match the balance.

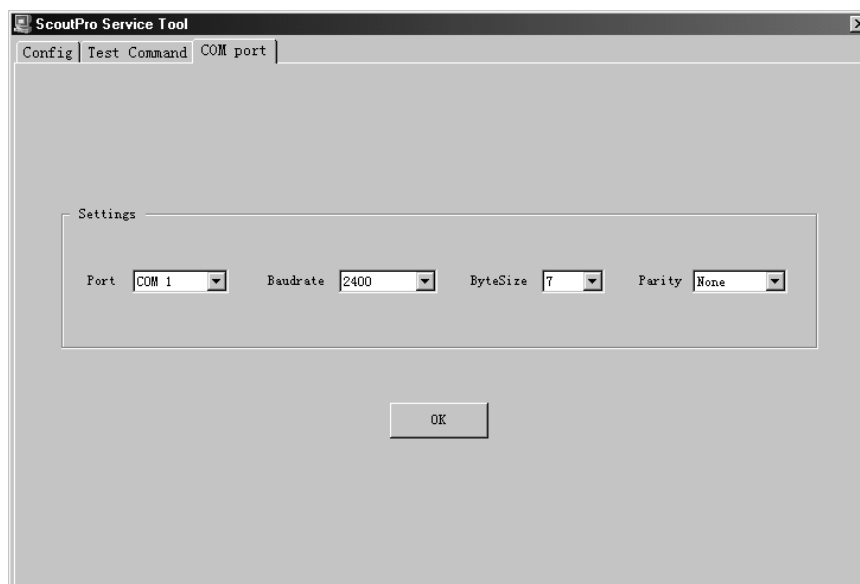


Figure A-5.

3. When the communications parameters are matched click on the **Test Command** tab and test the communications.
4. In this example, see figure A-6, the “P” command resulted in the **0.02g** being written in the lower screen. The “V” command resulted in **Sr: 1.10** being written. The **T** command had the effect of zeroing the balance, and the last **P** command resulted in the **0.00g** being written. If the balance does not reliably communicate the problem must be fixed before continuing.



Figure A-6.

A.5 USING CONFIGTOOL.EXE. (CONT.)

- When communications are reliable return to the **Config** tab. Press the read button (A) and the data will be read from the balance. See Figure A-7.

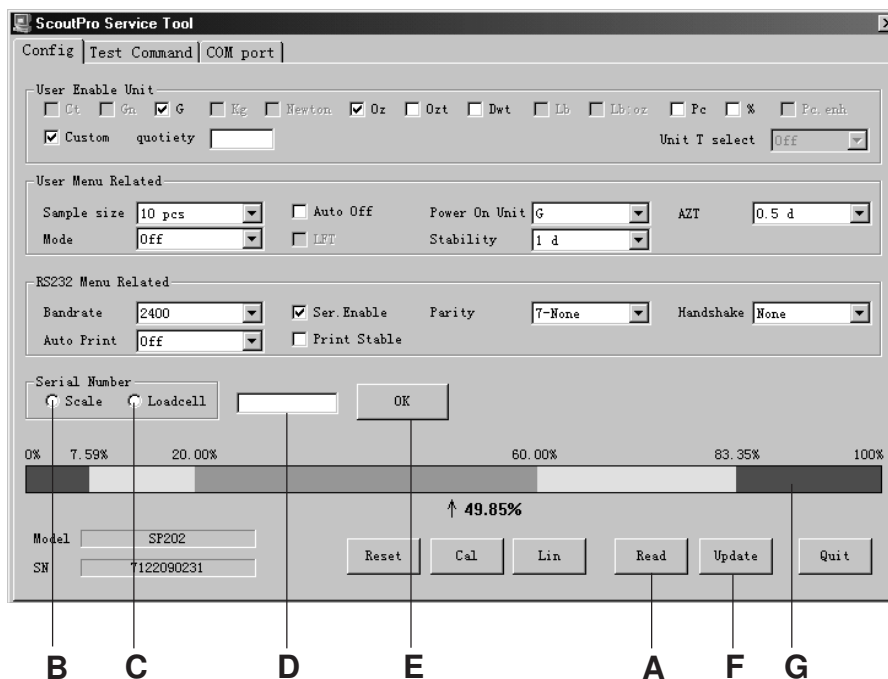


Figure A-7.

- If the PC Board has been replaced, refer to A.6.
- If the load cell was replaced, follow the same procedure as above except enter the load cell serial number and click on Load cell (C) in the serial number box.
- The bar (G) is a graphical indication of the portion of the transducer output that is being used.

A.6 USING CONFIG TOOL AFTER REPLACING THE MAIN PC BOARD

- Using ConfigTool after a new Main PC board has been installed, make sure the balance lockout switch is in the unlocked position.
- Install an RS232 option with the factory jumper (J2 on the RS232 option) in the balance.
- The AC adapter must be used
- Turn the balance on.

APPENDIX A SERVICE TOOL INSTRUCTIONS

A.6 USING CONFIG TOOL AFTER REPLACING THE MAIN PC BOARD (CONT.)

5. The balance displays **Err 9**.
6. Start the ConfigTool software, see A.5
7. An error message will be displayed “**User Enable Units & User Variable Check Sum Verify Error**”, click on **OK**.
8. Set RS232 to the correct com port, Baudrate = 2400, ByteSize = 7, Parity = None.
9. The balance will respond to the “V” command but not the others.
10. The bar graph will respond to pressure on the platform.
11. Enter the balance serial number.
12. Click on **OK**.
13. Click on **READ**.
14. The balance should read the correct model and serial number.
15. Perform the factory calibration. See B.2
16. The unit is finished. Remove the RS232 option or the jumper on the customers RS232 option.

B. FACTORY LINEARITY CALIBRATIONS

The Scout Pro service and factory linearity calibrations use three calibration points; zero, mid-scale and full scale.

B.1 SERVICE CALIBRATION

This calibration is used when an error 2 has been displayed by the balance. The calibration is performed with no error checking and is saved as a user calibration. It is not a factory calibration because no data is written to the EEPROM.

1. Start with the unit off.
2. Press and hold both the **ON/ZERO Off** and the **PRINT Unit** buttons until the display reads **rAMP**.
3. Press and release the **PRINT Unit** button. The display will show **Lin**.
4. Press and release the **On/Zero Off** button. The display will show **-C-** blinking and then the first mass value.
5. Place masses totaling this value on the balance and press the **On/Zero Off** button.
6. Press and release the **On/Zero Off** button. The display will show **-C-** blinking and then the second mass value.
7. Place masses totaling this value on the balance and press the **On/Zero Off** button.
8. Press and release the **On/Zero Off** button. The display will show **-C-** blinking and then **donE** followed by **Lin**.
9. Repeatedly press and release the **PRINT Unit** button until the display shows **END**.
10. Press and release the **On/Zero Off** button. The balance will return to the weighing mode.

B.2 FACTORY CALIBRATION

This calibration must be used when either a PC board or a transducer is replaced.

1. Remove power from the balance.
2. Install an RS232 option with the pins shorted. See Appendix A.3. If the RS232 option is not available, pins 2 and 7 of IC9 may be shorted using a micro alligator clip. See Figure B-1.

CAUTIONS

1. Be very careful that no other pins are shorted, this could destroy the IC.
2. Do not attempt to solder the jumper.

APPENDIX B FACTORY CALIBRATIONS

B.2 FACTORY CALIBRATION (CONT.)

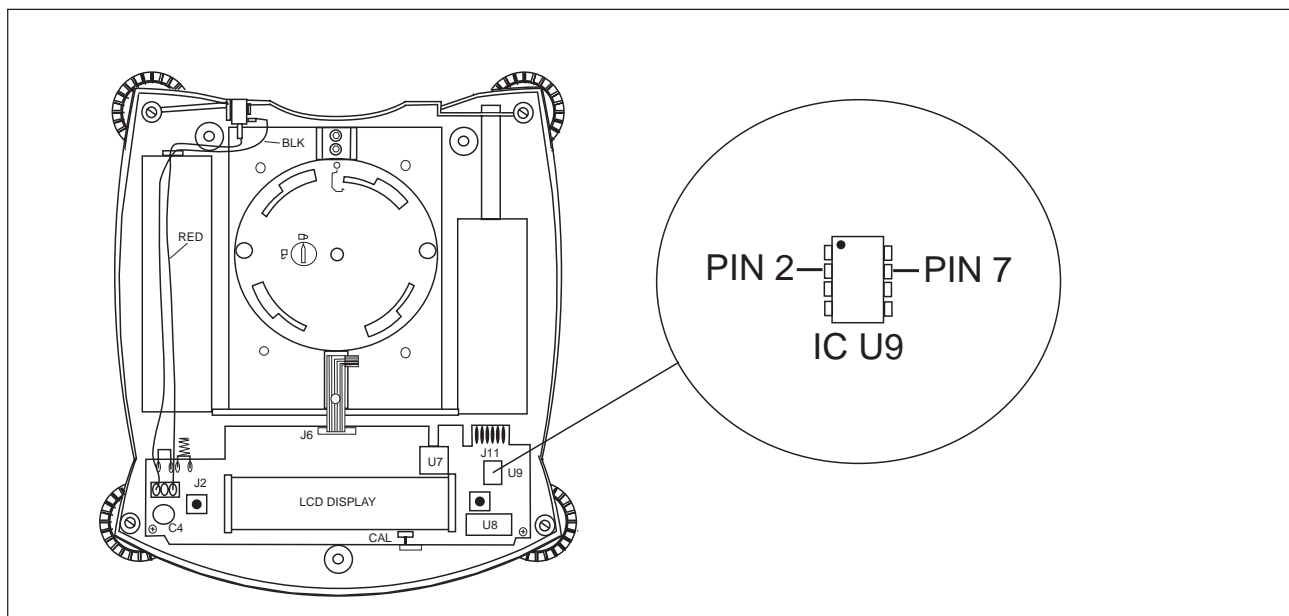


Figure B-1. IC U9 Connections.

3. You may need to use some kind of draft shield since the top cover has to be left off.
4. Apply power to the balance.
5. Start with the unit off.
6. Press and hold both the **ON/ZERO Off** and the **PRINT Unit** buttons until the display reads **rAMP**.
7. Press and release the **PRINT Unit** button. The display will show **Lin**.
8. Press and release the **ON/ZERO Off** button. The display will show **-C-** blinking and then the first mass value.
9. Place masses totaling this value on the balance and press the **ON/ZERO Off** button.
10. Press and release the **ON/ZERO Off** button. The display will show **-C-** blinking and then the second mass value.
11. Place masses totaling this value on the balance and press the **ON/ZERO Off** button.
12. Press and release the **ON/ZERO Off** button. The display will show **-C-** blinking and then **donE** followed by **Lin**.

B.2 FACTORY CALIBRATION (CONT.)

13. Repeatedly press and release the **PRINT *Unit*** button until the display shows **END**.
14. Press and release the **ON/ZERO *Off*** button. The balance will return to the weighing mode.
15. Press and hold the **ON/ZERO *Off*** button until the display shows **OFF**.
16. Remove power from the balance
17. Remove either the short on U9 or the short on the RS232 option.
18. Replace the cover.

APPENDIX B FACTORY CALIBRATIONS



P/N 80250973 SERVICE MANUAL SCOUT *PRO* ELECTRONIC BALANCES