Tool & Hoist Products

OPERATOR'S MANUAL

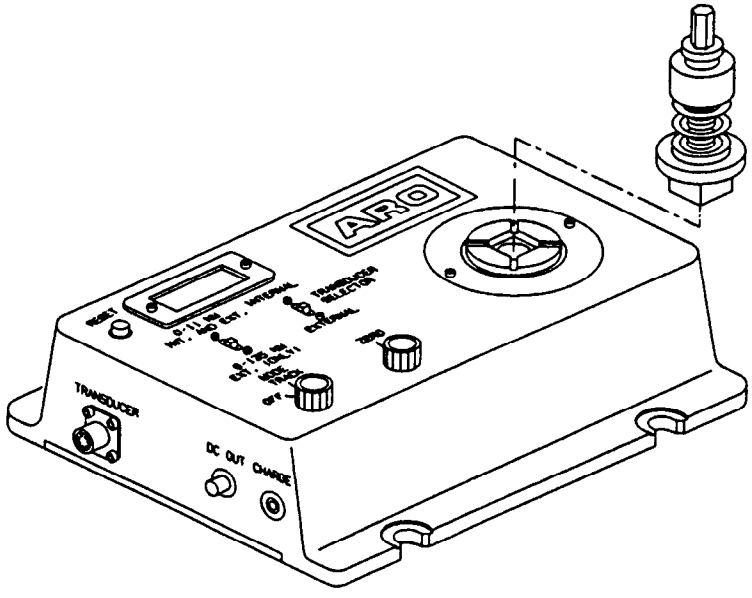
INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

TORQUE TESTER

Released: 11–29–93
Revised:

Model 8560–A

IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.



OPERATING AND SAFETY PRECAUTIONS

WARNING: The maximum torque rating of the 8560–A torque tester is 100 in. lbs (11.3 Nm). Over torquing will result in damage to internal components. Do not use the torque tester with impact or impulse tools.

When using the 8560–A torque tester, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury. Including the following:

1. Keep work area clean. Cluttered area and benches invite injuries.
2. Consider work area environment. Do not expose the torque tester or components to water. Keep work area well lit. Do not use the torque tester in the presence of flammable liquids or gases.
3. Keep bystanders away. Do not permit unauthorized personnel to operate the torque tester.
4. Store unused equipment. When not in use, the torque tester should be stored in a dry and secured area.
5. Dress properly. Do not wear loose clothing or jewelry. They can be caught in moving parts. Wear protective hair covering to contain long hair.
6. Wear suitable eye protection.
7. Secure the torque tester. Use a clamp, fixture or a vise to hold the unit.
8. Do not overreach. Keep proper footing and balance at all times.

For parts and service information, contact your local ARO distributor, or ARO Tool Products, White House, TN at PH: (615) 672–0321, FAX: (615) 672–0601.

ARO Tool Products
Ingersoll–Rand Company
1725 U.S. No. 1 North • P.O. Box 8000 • Southern Pines, NC 28388–8000

Part of worldwide Ingersoll-Rand

OPERATION

1. Where possible, clamp the tester to a solid base (such as a table top) to avoid damage to the tester and tool or injury to the operator.

2. Turn the "MODE" switch to the "track" position and move the "TRANSDUCER SELECTOR" switch to "internal". Check the display to see if the low battery indicator is displayed.

   NOTE: When the low battery indicator is first visible, approximately 8 hours of useful operation are left before recharging is necessary. Charging time is 15 hours or less, depending on remaining charge. **ONLY USE THE CHARGER SUPPLIED WITH THE TORQUE TESTER TO RECHARGE TO UNIT.**

3. Set the "SELECTOR" switch to the appropriate unit of measure (0 – 100 in. lbs or 0 – 1130 cN. M).

4. With no force on the input drive, adjust the LIQUID CRYSTAL DISPLAY to 000 or 00.0.

   NOTE: Before taking a series of readings, zero the tester as listed below to ensure accurate results.

   4.1 Turn the input shaft in the direction the unit is to be used (clockwise or counterclockwise) and release the shaft.

   4.2 Turn the "ZERO" knob until "000" is first visible. Note the dial position.

   4.3 Turn the "ZERO" knob in the same direction until the display changes from "000" to "001". Note the dial position.

   4.4 Return the dial halfway between the two dial positions noted.

   4.5 To make measurements in the other direction, repeat steps 4.1 thru 4.4.

5. The torque tester is ready to monitor the tool torque. The power switch allows the operator to monitor the torque in two modes (TRACK and HOLD).To read torque continuously as it increases and decreases, turn turn the power switch to "TRACK". To hold the display at the highest torque applied, turn turn the power switch to "HOLD". NOTE: When in the "HOLD" mode, reset the display to 000 with the "RESET" button.

6. **NOTICE:** Use only the recommended ARO Tool Products external rotary transducer with the 8560–A torque tester. For information regarding the use of other rotary transducers, contact ARO Tool Products.

7. When using the remote transducer, plug the tool's transducer cable into the transducer connector (six pin connector) on the torque tester. Move the transducer selector switch to "EXTERNAL".

   7.1 Turn the input shaft on the external transducer in the direction the tool is to be used (clockwise or counterclockwise) and release the shaft

   7.2 Turn the "ZERO" knob until "000" is first visible. Note the dial position.

   7.3 Turn the "ZERO" knob in the same direction until the display changes from "000" to "001". Note the dial position.

   7.4 Return the dial halfway between the two dial positions noted.

8. **CAUTION:** When connecting a scope or plotter to the torque tester, refer to the owner/instruction manual supplied by the manufacturer. The full scale output value is 0 – 1 volt DC. A high impedance oscilloscope/plotter/recorder that accepts an analog DC input voltage and has an input range selector, will function with the 8560–A torque tester.

9. The 8560–A torque tester is supplied with a run down adapter with 2 springs for simulating different joint characteristics. The yellow (soft draw) spring should be used with tools that will be operating on a soft draw joint. The blue (hard draw) spring should be used with tools that will be operating on a hard draw joint.

10. When the tester is not in use, always return the "POWER/MODE" switch to the OFF position.

CARE

1. To ensure proper readings, periodically check the zero adjustment. Drift of the zero point may occur due to changes in temperature.

2. DO NOT store the torque tester in humidity above 85%.

3. DO NOT operate a power tool on the tester without some kind of adapter between the tool and the tester.

4. Keep the exterior of the unit clean and dry.

5. DO NOT drop the unit.

6. Have the unit calibrated at least once a year.

SERVICE

Information on parts can be obtained upon request or the tester can be sent to ARO Tool Products, 510 Hester Drive, White House, Tenn. 37188, for calibration and repair.

CALIBRATION

Controlling the accuracy of the torque setting of hand–held tools is the first step in a quality torque control program. Periodic measurement and calibration will ensure high precision. Use a suitable dead weight test set to check the calibration of your ARO 8560–A torque tester.

1. Attach a tester securely to a work surface so that the axis of tool rotation is parallel to the ground.
2. Turn the "power/mode" switch to "TRACK" and make sure the battery has sufficient charge. Recharge if necessary.

   NOTE: To ensure an accurate battery reading, check the "battery status meter" 5 minutes after the unit has been turned on.
3. Select the appropriate measurement units (in. lbs or cN m).
4. Attach a 4.0" radius wheel (ARO part number 48941) to the input drive.
5. Gently hang a 25 lb. weight on the wire cable of the wheel in the appropriate direction (clockwise or counterclockwise) for a few seconds. Remove the weight.
6. Turn the "zero" knob until 000 or 00.0 just appears. Note the dial position.
7. Turn the "zero" knob in the same direction until 000 just changes to 001. Note the dial position.
8. Return the dial halfway between the two positions previously noted.
9. Once the unit is "zeroed", gently hang a 25 lb. weight on the wheel. Note the display reading.
10. If the reading is within the acceptable tolerance (table 1), continue the calibration procedure with the 5, 10, 15 and 20 lb. weights.

    If the reading is not within tolerance, readjust the span potentiometer inside the unit (it is the only potentiometer visible on the 3" x 3.5" PCB). Once the reading is in tolerance, continue the calibration with the 5, 10, 15 and 20 lb. weights.

Calibration is now complete. Do step 11 only if you will be using the tester to measure in both clockwise and counterclockwise directions.

11. If both clockwise and counterclockwise measurements are to be made with the same calibration settings, modify calibration as follows:

    11.1 Do steps 5 thru 9 in the clockwise direction. Note the display readings.

    11.2 Repeat steps 5 thru 9 in the counterclockwise direction. Note the readings.

    11.3 If both readings for the 25 lb weight are within the acceptable range, continue the calibration procedure in the counterclockwise direction. Repeat in the clockwise direction. **NOTE:** Remember to preload and re–zero the unit before testing in another direction.

    11.4 If one or both of the readings is out of acceptable limits and the difference between them is less than 1.2 in. lbs (13 cN.m), keep the 25 lb. weight on the wheel and adjust the span potentiometer inside the unit. Adjust until the higher reading is as far above "exact" (see table 1) as the lower reading is below "exact".

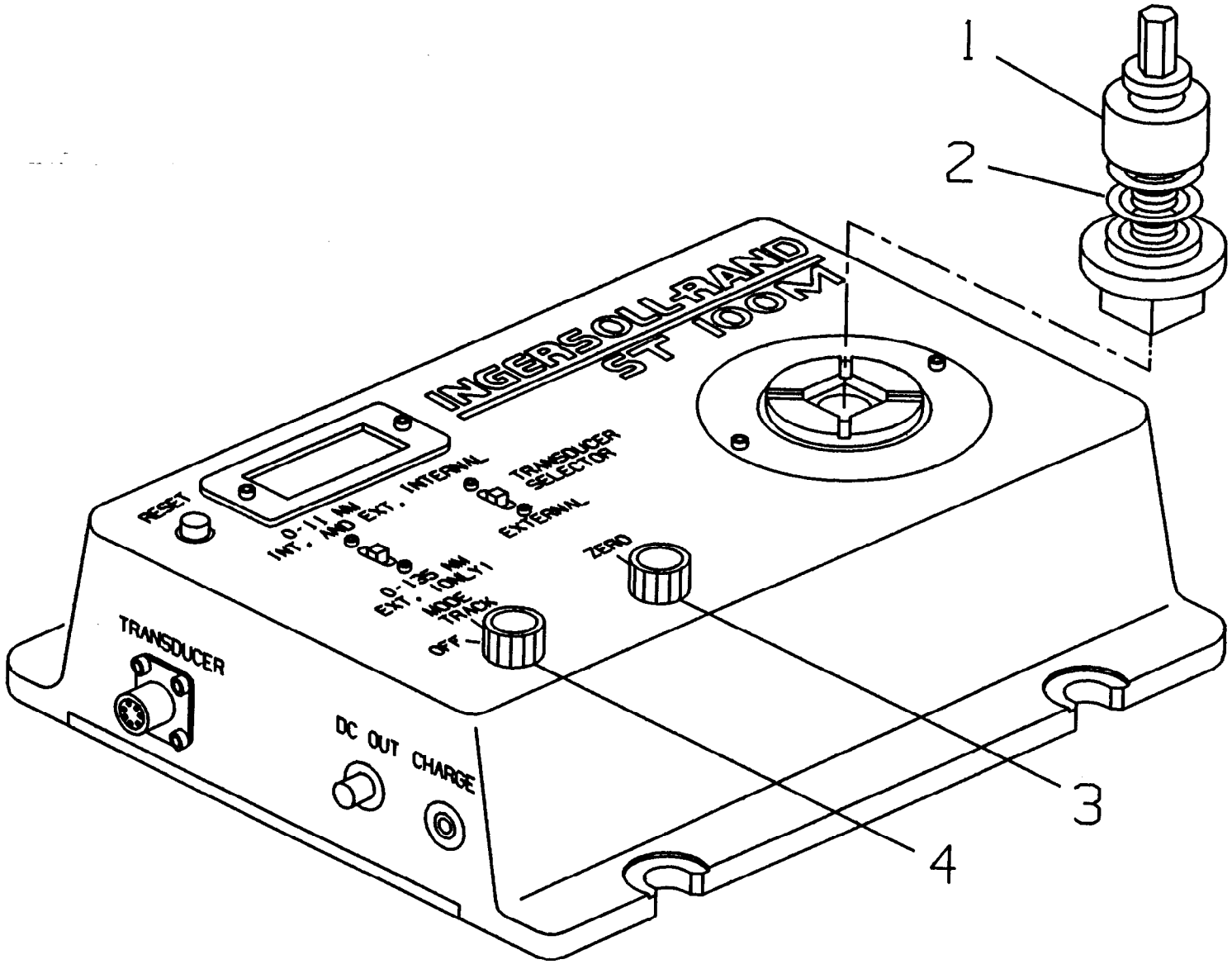
NOTE: If the difference between the clockwise and counterclockwise directions is greater than 1.2 in. lbs (13 cN.m), return the unit to ARO Tool Products for calibration.

TABLE 1 – ACCEPTABLE TORQUE READINGS USING A 4" RADIUS WHEEL

WEIGHT	IN. LBS			cN m		
	LOW LIMIT	EXACT	HIGH LIMIT	LOW LIMIT	EXACT	HIGH LIMIT
5 LB.	19.8	20.0	20.2	224	226	228
10 LB.	39.7	40.0	40.3	449	452	455
15 LB.	59.6	60.0	60.4	673	678	682
20 LB.	79.5	80.0	80.5	898	904	909
25 LB.	99.4	100.0	100.6	1123	1130	1136

Limits are determined using basic accuracy of – 0.5% of reading – 1 digit for 10 – 25 lb. weights and – 1% of reading – 1 digit for 5 lb. weight.

MODEL ST100 AND ST100M TORQUE TESTER



TPD1181-1

ARO®

Part of worldwide Ingersoll-Rand

PN 49999–449

Certificate of Calibration

This is to certify that this ARO Torque Tester conforms to NBS/NIST standards as follows:

ARO Model _____ Torque Tester Serial No. _____

The full range of the ARO Torque Tester's operation was certified by using a Dead Weight Test. Standards of Mass NBS/NIST test number _____. Class _____ tolerance.

Accuracy _____

Remarks _____

_____

The Standards of Mass used for this calibration was last calibrated on _____.
All calibration procedures conform to MIL-STD 45662A.

Date Certified _____
Certified By _____
Witnessed By _____

ARO
TOOL & HOIST PRODUCTS
THE ARO CORPORATION
ONE ARO CENTER, BRYAN, OHIO 43506-0151
PH 419 636 4242 • TWX 810 443 2994 • TELEX 286456 • FAX 419 636-2115

RE-CALIBRATION DATA

Date	Certified By	Witnessed By	Test No.

NOTE: When returning this torque tester to The Aro Corporation for re-calibration, this certificate should accompany the unit.

NEW

ARO® Electronic Torque Analyzer

for accurate, on-site torque verification

The ARO Model 8560 Electronic Torque Analyzer is the ideal quality control companion for assembly operations with stringent torque control standards. Featuring exceptional accuracy and portable size, it provides a convenient method of measuring and calibrating the torque output of hand and power tools at the job site. Other user benefits include —

- **Ensure quality standards are met.** Measures torque output with an accuracy of ±0.5% of reading ± one count from 20% to 100% of full scale (±1% of reading ± one count below 20% of full scale).
- **Use it for a wide range of assembly operations.** Dual scale readout in either lb.in. or Nm, with a range of 0-100 lbf.in. or 0-1130 cN.m.

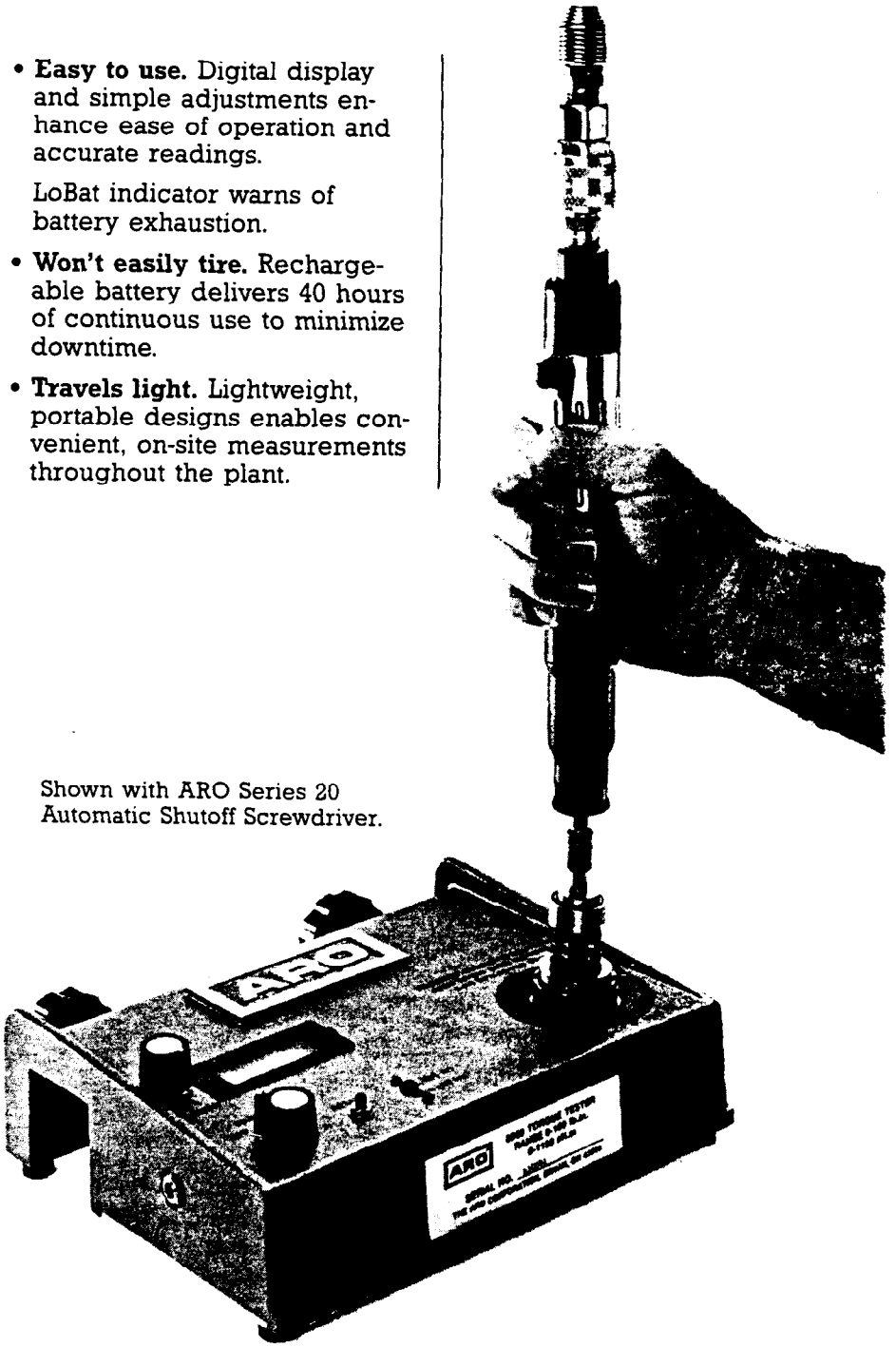
  Designed for torque controlled automatic shutoff and adjustable, ratcheting clutch power tools.

  Mounts horizontally or vertically to easily test inline and pistol grip tools.

  Measures both clockwise and counterclockwise torque.

- **Easy to use.** Digital display and simple adjustments enhance ease of operation and accurate readings.

  LoBat indicator warns of battery exhaustion.
- **Won't easily tire.** Rechargeable battery delivers 40 hours of continuous use to minimize downtime.
- **Travels light.** Lightweight, portable designs enables convenient, on-site measurements throughout the plant.



Shown with ARO Series 20 Automatic Shutoff Screwdriver.

SPECIFICATIONS

MODEL	TORQUE RANGE lbf.in	TORQUE RANGE cN.m	GRADUATIONS lbf.in	GRADUATIONS cN.m	POWER SOURCE	SIZE	WEIGHT
8560	0-100	0-1130	0.1	1	1.2 V NiCd x 6 rechargeable battery	7.25 x 9.25 x 3.0 in. 184 x 235 x 76 mm	6.0 lb. 2.7 kg