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B-RAD S USER MANUAL

RAD TORQUE SYSTEMS

PNEUMATIC SERIES



- **PATENTED PLANETARY GEAR REDUCTION**
Delivers one of the highest power-to-weight ratios of any pneumatic controlled bolting system
- **SMOOTH CONTINUOUS FLOW OF CONTROLLED TORQUE**
Eliminates destructive hammering
- **LIGHTWEIGHT ERGONOMIC PISTOL GRIP DESIGN**
Reduces operator strain and injury; resulting in increased productivity
- **UNMATCHED RELIABILITY AND QUALITY**
Delivered by one of the most advanced engineered gear boxes on the market

ELECTRONIC SERIES E-RAD



- **PUSH-BUTTON SELECT TORQUE**
Fast and convenient error-free digital single increment torque settings
- **DIGITAL TORQUE CONSOLE DISPLAY**
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- **LIGHTWEIGHT AND ERGONOMIC PISTOL GRIP DESIGN**
Advanced low-profile handle to reduce operator fatigue and increase productivity
- **EXTREMELY LOW NOISE LEVEL ONLY 75DB**
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- **LED GREEN (PASS) OR RED (FAIL) INDICATOR LIGHTS**
Unmistakable visual signal indicates status of torque procedure for maximum accuracy and speed

BATTERY SERIES B-RAD



- **QUICK ADJUST TORQUE SETTINGS**
Fast and accurate "dial a torque" for maximum versatility and efficiency
- **SOFT-START VARY SPEED TRIGGER**
Allows operator to safely and quickly set reaction arm before full torque is applied
- **EQUAL POWER IN FORWARD AND REVERSE**
Convenience and cost effective use of same tool for break away and final torque
- **IMAGINE THE FREEDOM - NO AIR LINES, NO POWER CORDS!**
The lightweight design of the B-SERIES makes it ideal for any application, especially where compressed air and electricity are not readily available.
- **ADVANCED GEARBOX DESIGN**
PATENTED planetary gear reduction drive system delivering one of the highest power-to-weight ratios of any controlled bolting system

ELECTRIC SERIES V-RAD



- **QUICK ADJUST TORQUE SETTINGS**
Fast and accurate "dial a torque" for maximum versatility and efficiency
- **SOFT-START VARY SPEED TRIGGER**
Allows operator to safely and quickly set reaction arm before full torque is applied
- **EQUAL POWER IN FORWARD AND REVERSE**
Convenience and cost effective use of same tool for break away and final torque
- **ADVANCED ULTRA-DURABLE ELECTRIC MOTOR DESIGN**
Extreme duty designed to reduce maintenance cost and increase reliability
- **ADVANCED GEARBOX DESIGN**
Patented planetary gear reduction drive system delivering one of the highest power-to-weight ratios of any controlled bolting system

SMART SOCKET™ SERIES



- **MEASURE AND DISPLAY PEAK TORQUE**
Transducer technology combined with a custom socket measures the actual torque applied to the bolt during a torque cycle.
- **PASS OR FAIL INDICATION**
Unmistakable digital signal indicates peak torque achieved for maximum accuracy
- **BLUE TECHNOLOGY**
View and download logs onto your smartphone or tablet
- **IDEAL ON SITE CALIBRATION TOOLS**
Comparable in size to a standard socket, it's the perfect tool for inspecting bolted joints and can function as a master calibrator for your torque tools

NOTICE:

This manual applies to the following hardware and firmware release:

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MANUAL REVISION HISTORY

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- Updated: 4.2 Torque Operation

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- Fixed section numbers
- Updated references to centre button from M button

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- Update 7.0 Contact Us: New Address

GENERAL POWER TOOL SAFETY WARNINGS



WARNING!

READ ALL SAFETY WARNINGS, INSTRUCTIONS, ILLUSTRATIONS, AND SPECIFICATIONS PROVIDED WITH THIS POWER TOOL. FAILURE TO FOLLOW ALL INSTRUCTIONS LISTED BELOW MAY RESULT IN ELECTRIC SHOCK, FIRE AND/OR SERIOUS INJURY.

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE.

The term "power tool" in the warnings refers to your battery-operated (cordless) power tool.

1. Work Area Safety

- a. **Keep work area clean and well lit.** Cluttered and dark areas invite accidents.
- b. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- c. **Keep children and bystanders away while operating the power tool.** Distractions can cause you to lose control.

2. Electrical Safety

- a. **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce the risk of electric shock.
- b. **Avoid body contact with earthed (grounded) surfaces such as pipes, radiators, ranges, or refrigerators.** There is an increased risk of electric shock if your body is earthed (grounded).
- c. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- d. **Do not abuse the cord. Never use the cord to carry, pull, or unplug the power tool. Keep cord away from heat, oil, sharp edges, and moving parts.** Damaged or entangled cords increase the risk of electric shock.
- e. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
- f. **If operating a power tool in a damp location is unavoidable, use a Ground Fault Circuit Interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electric shock.

3. Personal Safety

- a. **Stay alert, watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
- b. **Use personal protective equipment and always wear eye protection.** Protective equipment such as a dust mask, non-skid safety shoes, hard hat, and hearing protection used in appropriate conditions will reduce personal injuries.
- c. **Prevent unintentional starting.** Ensure the switch is in the off position before connecting to a power source and/or battery pack, picking up, or carrying the tool. Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.
- d. **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- e. **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
- f. **Dress properly. Do not wear loose clothing or jewellery.** Keep your hair, clothing, and gloves away from moving parts.

- g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.
- h. **Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles.** A careless action can cause severe injury within a fraction of a second.

4. Power Tool Use and Care

- a. **Do not force the power tool.** Use the correct power tool for your application.
- b. **Do not use the power tool if the switch does not turn it on and off.** A power tool that cannot be controlled with the switch is dangerous and must be repaired.
- c. **Disconnect the power source and/or the battery pack from the power tool before making any adjustments, changing accessories or storing power tools.** Such preventive measures reduce the risk of starting the power tool accidentally.
- d. **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.
- e. **Power tools must be properly maintained.** Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.
- f. **Use the power tool and accessories in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.
- g. **Keep handles and grasping surfaces dry, clean and free from oil and grease.** Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

5. Battery tool use and care

- a. **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- b. **Use power tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.
- c. **When battery pack is not in use, keep it away from other metal objects,** like paper clips, coins, keys, nails, screws or other small metal objects that can make a connection from one terminal to another. Shorting the battery terminals together may cause burns or a fire.
- d. **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.
- e. **Do not use a battery pack or tool that is damaged or modified.** Damaged or modified batteries may exhibit unpredictable behaviour resulting in fire, explosion or risk of injury.
- f. **Do not expose a battery pack or tool to fire or excessive temperature.** Exposure to fire or temperature above 130 °C (265 °F) may cause explosion.
- g. **Follow all charging instructions and do not charge the battery pack or tool outside the temperature range specified in the instructions.** Charging improperly or at temperatures outside the specified range may damage the battery and increase the risk of fire.

6. Service

- a. **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.
- b. **Never service damaged battery packs.** Service of battery packs should only be performed by the manufacturer or authorized service providers.

Battery Pack Safety Warnings

Only use the RAD Li-Ion Battery Pack with the B-RAD Tool System. The use of other batteries with the B-RAD Tool System will cause damage to the tool.

The RAD Li-Ion Battery Pack should only be charged on the RAD Battery Charger. If an incompatible charger is used, damage to the RAD Battery will occur.

Keep the RAD Li-Ion Battery Pack away from any metal objects. If the battery terminals are connected by a metal object, the battery will short and will cause damage to the battery and injury to the operator.

Do not expose the RAD Li-Ion Battery Pack to wet conditions. This will cause damage to the RAD Battery and increase the risk of electric shock.

Do not use faulty or deformed RAD Batteries. Do not attempt to open the RAD Battery. Do not short circuit the RAD Battery. Failure to comply will cause damage to the RAD Battery and injury to the operator.

If liquid is ejected from the RAD Battery, avoid contact. If contact with skin occurs, immediately flush with water. If contact with eyes occurs, immediately flush with water and seek medical aid. Liquid from the RAD Battery may cause irritation and/or burns.

RAD Li-Ion Battery Packs cannot be disposed of with regular waste. Return RAD Batteries to your RAD Distributor.

1. GENERAL INFORMATION

1.1 System Components

The B-RAD S Tool System is shipped in a storage case with the following parts:

- B-RAD S Tool (Figure 1.1-1)
- Two RAD Li-Ion Battery Packs (Figure 1.1-2)
- RAD Battery Charger (Figure 1.1-3)
- Standard Reaction Arm and Snap Ring (Figure 1.1-4)
- Calibration Certificate
- User Manual



Figure 1.1-1: B-RAD S



Figure 1.1-2: RAD Li-Ion Battery Pack



Figure 1.1-3: RAD Battery Charger

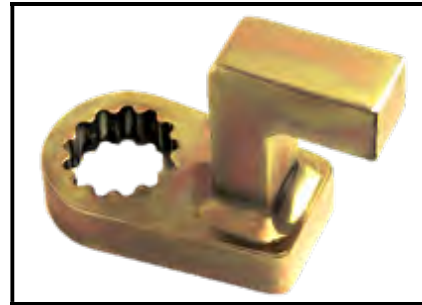


Figure 1.1-4: Standard Reaction Arm

1.2 Specifications

1.2.1 Tool Model Specifications

The following tables outline the torque ranges, weight, and vibration of the available B-RAD S models:

Tool Model	Torque Range (Imperial)	Torque Range (Metric)	Weight (includes battery)
B-RAD S 500 / 700-M	50-500 ft·lb	67-700 N·m	9.2 lb / 4.2 kg
B-RAD S 1000 / 1400-M	100-1000 ft·lb	135-1400 N·m	9.4 lb / 4.3 kg
B-RAD S 1500 / 2000-M	150-1500 ft·lb	200-2034 N·m	10.8 lb / 4.9 kg
B-RAD S 3000 / 4000-M	300-3000 ft·lb	400-4068 N·m	15.9 lb / 7.2 kg
B-RAD S 5000 / 7000-M	500-5000 ft·lb	678-7000 N·m	21.7 lb / 9.9 kg

Table 1.2.1-1: Tool Model Torque Ranges and Weights

Vibration (all tool models)	Does not exceed 2.5 m/s ²
Noise Level (all tool models)	85 ± 2 dB

Table 1.2.1-2: Tool Operation Specifications

1.2.2 Battery Specifications

Ensure that all Battery Specifications are followed when using the B-RAD Tool System.

Battery Output	
Voltage	18 VDC
Current	100 A
Charge Time	60 minutes
Charger Voltage	
Input	115 or 230 VAC
Output	12 – 18 VDC
Charger Output Current	2.5 A

Table 1.2.2: Battery Specifications

1.2.3 Environmental Specifications



CAUTION!

Only operate the B-RAD Tool System if the following storage and operation conditions have been met.

Temperature Ranges	°C	°F
Operating Temperature	0 – 35	32 – 95
Charging Temperature	0 – 50	32 – 122
Storage Temperature	-25 – 70	-13 – 158
Humidity	10% to 90% non-condensing	
Shock	10G according to DIN IEC 68-2-6/29	
Vibration	1G, 10-150Hz according to DIN IEC 68-2-6/29	
Required Operating Conditions	Non explosive atmosphere Dry location	

Table 1.2.3: Environmental Specifications

1.2.4 Cycle of Operation

A Cycle of Operation or a Tool Cycle as used in this manual is defined as:

- 5 seconds forward
- 10 seconds rest

Or:

- 5 seconds reverse
- 10 seconds rest

Note: An actual Torque Cycle may vary from the general definition above.

2. TOOL SYSTEM

The following sections introduce the operation of the Tool Handle, Display Interface, RAD Li-Ion Battery Pack, and RAD Battery Charger.

2.1 Tool Handle

The B-RAD S (Figure 2.1-1) is activated with a Trigger Switch. The Forward/Reverse Switch controls the direction of rotation. Torque values and tool information are displayed on Display Module. Three buttons are used to enter the desired torque setting and view the menus. The RAD Li-Ion Battery Pack is attached to the bottom of the Tool Handle. When the tool activates you will be greeted by a splash page, press Centre to initialize the tool.

1. Trigger Switch – tool activation
2. Forward/Reverse Switch – controls direction of rotation: fully to the left is Clockwise (forward); fully to the right is Counter Clockwise – CCW (reverse)
3. Display and **Plus/Minus/Centre** Keypad
4. RAD Li-Ion Battery Pack – refer to Section 2.3 – RAD Li-Ion Battery Pack
5. Battery Release Button – refer to Section 2.3.1 – Insert/Remove the RAD Li-Ion Battery Pack



Figure 2.1-1: B-RAD S and Display

2.1.1 Trigger Lock

The Trigger Lock is useful while transporting or storing the B-RAD. The Trigger Lock disables the use of the On/Off Trigger, therefore disabling the tool. It is suggested that while the B-RAD is not in use, the Trigger Lock should be enabled.

To enable the Trigger Lock:

- Slide the Forward/Reverse Switch to the Centre Position (neither fully to the right nor fully to the left).

Note: The On/Off Trigger cannot be pressed.

To disable the Trigger Lock:

- Slide the Forward/Reverse Switch to the Forward Position or the Reverse Position.

Note: The On/Off Trigger can be pressed.

2.2 Display Interface



CAUTION!

The Display Module may be damaged by mechanical shock, electrostatic discharge, excessive force, moisture, or extreme temperatures. Avoid such conditions and gently wipe clean or let dry before use.

To turn on the Display, attach the RAD Li-Ion Battery to the B-RAD S handle. You will be greeted by a splash screen that shows the current date, time and name of the active Log File. Press the Centre button momentarily to initialize the tool. The Display will change to the torque select interface.

Note: If Data Logging is disabled then the screen will go directly to the torque select interface upon start-up.

The Display goes into sleep mode and turns off after 30 seconds of inactivity while on the torque select interface. To turn it back on, lightly pull the trigger or press a button.

Note: The tool does not turn itself off while in any of the menus.

For more information, the interface is described in detail in Section 3.2 – Basic Level Functions and 3.3 – Advanced Level Functions.

2.2.1 Keypad

The keypad located below the Display consists of three buttons used to navigate the B-RAD S Interface (Figure 2.2.1-1).

- **UP** (Plus, increase) Button – used to increment numbers

and navigate through columns.

- **Down** (Minus, decrease) Button – used to decrement numbers and navigate through columns.
- **Centre** (M, Enter, Select) Button – used to select and toggle options, and enter various menus.

The **Centre** button has two different operations depending on how long it was pressed. From the Main Screen:

- A short press of the Centre button will highlight numbers on the screen in yellow, allowing you to modify the values (see section 3.2.2 – Change the Target Torque and 3.2.3 – Change the Target Angle).
- A long press will open the Main Menu.

Note: A long press is 3-5 seconds.



Figure 2.2.1-1: Display Interface

2.2.2 Main Screen

The Main Screen is the central interface for the B-RAD S Tool System. The Target Torque, Torque Units, Target Angle, B-RAD S Model, Program Mode, and Direction of Rotation are displayed on the Main Screen. Figures 2.2.2-1 and 2.2.2-2 show the layout of the Main Screen.



Figure 2.2.2-1: Main Screen – Torque



Figure 2.2.2-2: Main Screen – Program Mode

2.3 RAD Li-Ion Battery Pack



CAUTION!

Only use the RAD Li-Ion Battery Pack with the B-RAD Tool System. Using third-party batteries may damage the B-RAD Tool System.

Keep the RAD Li-Ion Battery Pack away from any metal objects. If the battery terminals are connected by a metal object, the battery will short and cause damage to the battery and injury to the operator.

The RAD Li-Ion Battery Pack supplies power to the tool; for the B-RAD to perform best, ensure the RAD Battery is fully charged and in good condition before use. In optimal conditions, the RAD Battery should be capable of approximately 100 Torque Cycles at 50% of the Maximum Torque.

Note: The application torque, joint hardness, battery condition, age, and operating temperature will affect the actual number of Torque Cycles per charge.

2.3.1 Insert/Remove the RAD Li-Ion Battery Pack

To insert the RAD Battery:

- 1.Ensure the On/Off Trigger is in the Off Position (not depressed).
- 2.Align the RAD Battery with the bottom of the Tool Handle.
- 3.Slide the RAD Battery into place until it is fully seated.

Note: A click will confirm that the RAD Battery is locked in place.

- 4.Check that the RAD Battery is locked in place by trying to slide it out of place.

To remove the RAD Battery:

- 1.Press and hold the Battery Release Button.
- 2.Slide the RAD Battery away from the Tool Handle.

2.3.2 Check RAD Battery Charge

To check the RAD Battery Charge:

- Press the "Charge" button on the RAD Battery (Figure 2.3.2-1).

Result: The green bars will light up. If all the bars are illuminated, the Battery is fully charged. If only one of the bars is illuminated, the RAD Battery is discharged and needs charging (refer to Section 2.4.1 – Charging the RAD Li-Ion Battery Pack).

- Battery voltage may also be viewed on the B-RAD S Display from the Information menu. See Section 3.2.2 – View the Battery Voltage.

Note: When the battery charge gets too low, the "batterie empty" will be displayed on the screen.

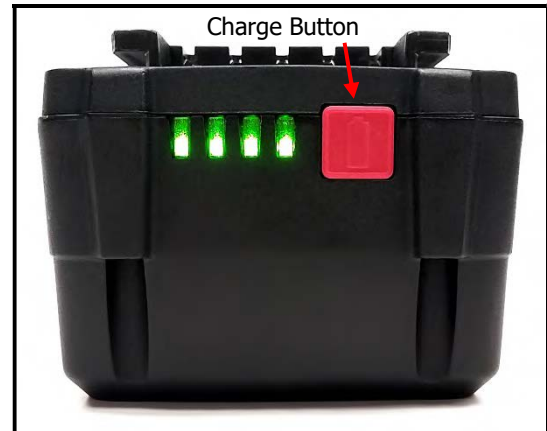


Figure 2.3.2-1: RAD Li-Ion Battery Pack

2.4 RAD Battery Charger



CAUTION!

The RAD Li-Ion Battery Pack should only be charged on the RAD Battery Charger. If an incompatible charger is used, damage to the RAD Battery will occur.

The Charging Status Display (Figure 2.4-1) indicates when the RAD Battery is charging, when the charge is complete, and if there is an error.

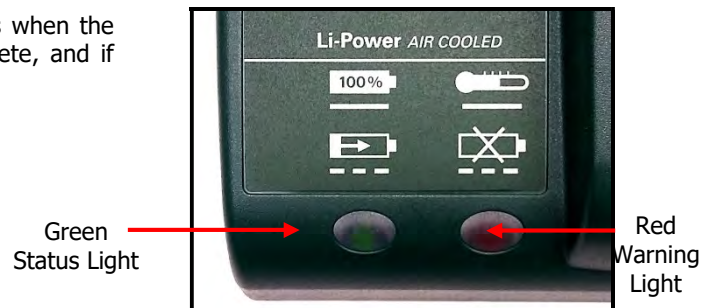


Figure 2.4-1: Charging Status Display

2.4.1 Charging the RAD Li-Ion Battery Pack

Note: The temperature range for charging is 0°C to 50°C (32°F to 122°F).

To charge the RAD Battery:

1. Plug the RAD Battery Charger into the wall outlet. The Red Warning Light will turn on for one second and then the Green Status Light will turn on for one second.
2. Align the RAD Battery with the RAD Battery Charger.
3. Slide the RAD Battery into place. The Green Status Light will flash while the RAD Battery is charging.

When the RAD Battery has been fully charged, the Green Status Light will stop flashing and stay illuminated. Until the RAD Battery is removed from the RAD Charger, the Charger will maintain the battery charge at maximum capacity.

To remove the RAD Battery:

1. Slide the RAD Battery away from the RAD Charger.
2. Check that the RAD Battery is fully charged (refer to Section 2.3.2 – Check RAD Battery Charge).

2.4.2 Charging Errors

The Red Warning Light is on:

The RAD Battery is not charging because its temperature is not within the required temperature range for charging. When the RAD Battery's temperature changes to within the required range, the Red Warning Light will turn off and charging will commence.

The Red Warning Light is flashing:

The RAD Battery may be placed incorrectly on the RAD Battery Charger. Remove the RAD Battery and replace it correctly on the RAD Battery Charger. If the Red Warning Light continues to flash, the RAD Battery is defective; remove the RAD Battery immediately.

If these problems continue, contact New World Technologies Inc. Technical Support (refer to Section 7.0 – Contact Us) or your RAD Distributor.

3. B-RAD S FUNCTIONS

The B-RAD S Controller and Display are used to set up the tool and change settings. The Display interface has many functions, including Presets, Torque Settings, and Calibration. The following sections describe these functions and how to enable and use them.

Refer to Section 2.2 – Display Interface to understand the use of the buttons in this section.

3.1 Unlock Levels

Access to the functions on the Display has been restricted to two Access Levels: the Basic Level, and the Advanced Level. Access to the Advanced Level requires a password. Each Level has access to different functions. Table 3.1-1 outlines the functions accessible in each level.

	Level		
	Basic	Intermediate	Advanced
Norm-Program/Check-Program Selection	✓	✓	✓
View Log Files	✓	✓	✓
Select Tool Presets	✓	✓	✓
View Statistics	✓	✓	✓
View Tool Information and Serial Number	✓	✓	✓
View Tool System Diagnostics	✓	✓	✓
Set Torque Values	✓	✓	✓
Set Angle Values	✓	✓	✓
Point Calibration	×	✓	✓
Change Torque Units	×	✓	✓
Change interface language	×	✓	✓
Set Back-off Values	×	✓	✓
Set Tool Presets	×	✓	✓
Calibration	×	×	✓

Table 3.1-1: User Access Levels and Functions

Function

3.1.1 Unlocking Access Levels

Access Level	Passcode
Basic	No Code Needed
Intermediate	17580
Advanced	Contact your RAD Distributor

Table 3.1.1-1: Access Levels and Passwords

To unlock an Access Level:

1. Press and hold the centre button to open the Main Menu (Figure 3.1.1-1).
2. Press the Down Arrow button to highlight the "Extended" option.
3. Press the centre button. The Password keyboard will be displayed (Figure 3.1.1-2).

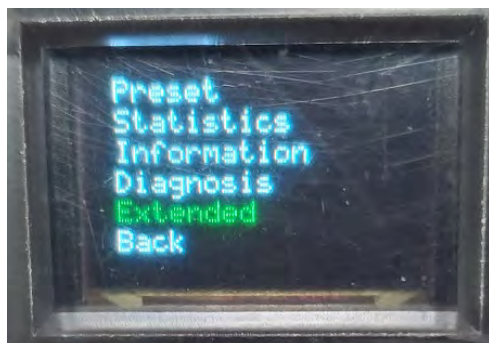


Figure 3.1.1-1: Main Menu



Figure 3.1.1-2: Password Input Screen

4. Use the navigation keypad to enter the desired password (See Table 3.1.1-1).

Note: Use the Up and Down navigation buttons to select a number. Use the centre button to accept the number and move to the next character.

5. Once the OK is highlighted on the Display, press the centre button to enter the password.
6. The Main Menu will be displayed again.
7. Select the "Extended" option again, which will now take you to the Extended Menu (Figure 3.1.1-3).

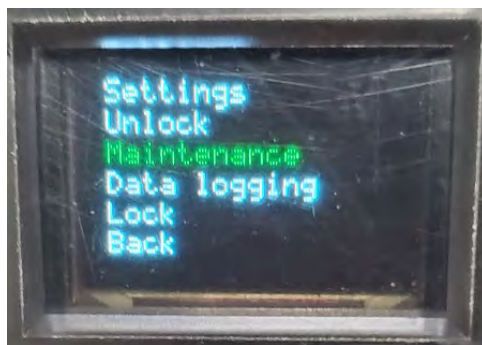


Figure 3.1.1-3: Extended Menu Screen

3.1.2 Returning to the Basic Level

The B-RAD S will revert to the Basic Level every time power is removed from the tool.

To return to the Basic Access Level – While Tool is Powered:

1. Press and hold the centre button to open the Main Menu (Figure 3.1.2-1).
2. Press the navigation keypad to highlight the "Extended" option.
3. Press the centre button to get to the Extended Menu Screen (Figure 3.1.2-2).

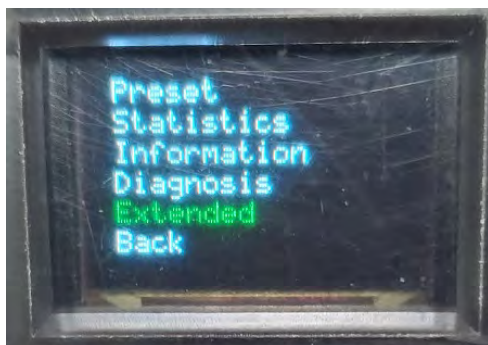


Figure 3.1.2-1: Main Menu

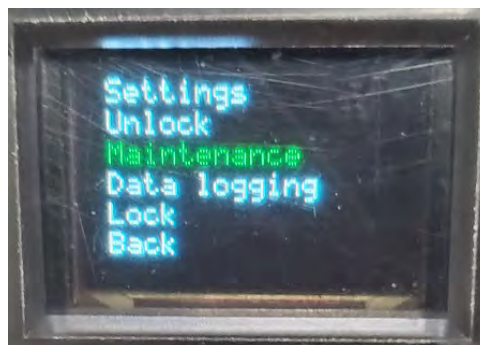


Figure 3.1.2-2: Extended Menu Screen

4. Use the navigation keypad to select the "Lock" option.

5. The Main Menu will be displayed and the B-RAD S will be in the Basic Access Level.

3.2 Basic Level Functions

The following sections describe the functions available when the B-RAD S is in the Basic Level. Refer to Section 3.1 – Unlock Levels for more information on the accessibility of these functions.

3.2.1 Change the Target Torque

The Target Torque is the torque output at which the B-RAD S will stop the Torque Cycle and the cycle will be considered a pass. For more information on the Target Torque and Torque Cycle, refer to Section 4.2 – Torque Operation.

Note: Refer to Section 1.2.1 – Tool Model Specifications for more information.

To change the Target Torque:

1. Press the centre button briefly to highlight the Target Torque value in yellow (Figure 3.2.2-1).

Note: Each button press will toggle between Torque, Angle (if enabled), and no highlight.

2. Use the Up Arrow button to increase the Target Torque or the Down Arrow button to decrease the Target Torque.

Note: While either the Up Arrow button or the Down Arrow button is continuously pressed:

- i. The Torque value will increase or decrease by one unit at a time while the button is being pressed.
- ii. Once the Torque value has changed at least 10 units, it will begin to change by 10 units at a time.
- iii. After the Torque value has changed at least 100 units, it will begin to change by 100 units at a time.



Figure 3.2.2-1: Main Menu – Torque Selected

3. Once the desired Target Torque is displayed, press the centre button to deselect the torque value and again to deselect the angle (if enabled). The B-RAD S is ready for a Torque Cycle.

3.2.2 Change the Target Angle

This function allows you to change the Target Angle. The Target Angle is the rotation angle, in degrees, that the B-RAD S will move after the Target Torque (Pretorque) is reached. For more information on Target Angle and Torque and Angle Operation, refer to Section 4.3 – Torque and Angle Operation.

Note: The Final Torque of a Torque and Angle Cycle will not exceed the set Angle Torque Limit of the tool.

To change the Target Angle:

1. Press the centre button briefly to highlight the Target Angle value on the Main Screen (Figure 3.2.3-1).

Note: The centre button will toggle the highlight through Torque, Angle, and no highlight.

2. Use the Up Arrow button to increase the Angle value or use the Down Arrow button to decrease the Angle value (Figure 3.2.3-2).

Note: The maximum Angle value is 360°.

3. Once the desired Angle is set, press the centre button to deselect the Angle value. The B-RAD S is ready for a Torque and Angle Cycle.



Figure 3.2.2-1: Main Menu – Angle Selected

3.2.3 Select Preset – Customerpreset

The B-RAD S can save up to twenty user defined Presets.

To select a Preset:

1. Press and hold the centre button to open the Main Menu (Figure 3.2.3-1).
2. The "Preset" option will be highlighted. Press the centre button.
3. The Preset Menu will be displayed with the "Customerpreset" highlighted (Figure 3.2.3-2). Press the centre button.
4. The Preset Details Screen will be displayed (Figure 3.2.3-3):
 - Preset Number and User Defined Name
 - Torque / Torque Units / Angle
 - Lower-Upper Limits
 - Bolt cycles allowable

Note: 0 signifies there is no limit set.

 - Norm- or Check- Programme Mode.

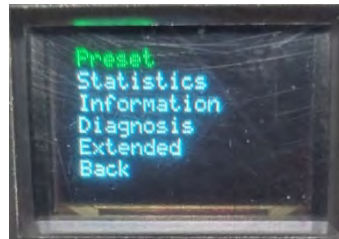


Figure 3.2.3-1: Main Menu



Figure 3.2.3-2: Preset Menu

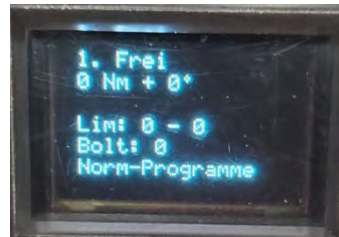


Figure 3.2.3-3: Preset Details Screen



Figure 3.2.3-4: Preset Options

5. Use the navigation buttons to go through the saved Presets.
6. When on the Preset with the desired values press the centre button to open the Preset Options (Figure 3.2.3-4).
7. Highlight Accept and press the centre button to accept Preset and exit to the Main Screen.

Caution: The Torque Units the B-RAD S uses will change to those saved in the Preset if they are different.

3.2.4 Select Preset – HV-Preset

HV-Presets can only be selected and not overwritten.

To select a Preset:

1. Press and hold the centre button to open the Main Menu (Figure 3.2.4-1).
2. The "Preset" option will be highlighted. Press the centre button.
3. The Preset Menu will be displayed with the "HV-Preset" highlighted (Figure 3.2.4-2). Press the centre button.
4. The Preset Details Screen will be displayed (Figure 3.2.4-3):
 - Preset Name
 - Torque / Torque Units / Angle
 - Lower-Upper Limits
 - Bolt cycles allowable

Note: 0 signifies there is no limit set.

 - Norm- or Check- Programme Mode.
5. Use the navigation buttons to go through the HV-Presets.
6. When on the HV-Preset with the desired values press the centre button to open the Preset Options.
7. Highlight Accept and press the centre button to accept Preset and exit to the Main Screen.

Caution: The Torque Units the B-RAD S uses will change to those saved in the Preset if they are different.

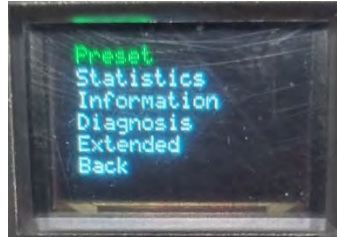


Figure 3.2.4-1: Main Menu

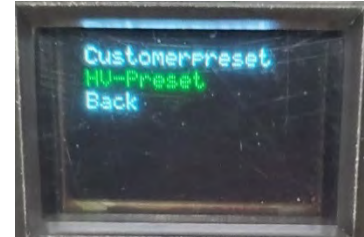


Figure 3.2.4-2: Preset Menu

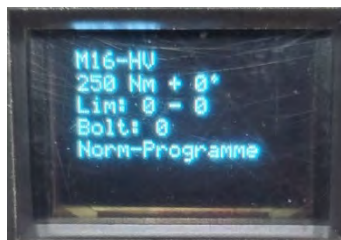


Figure 3.2.4-3: HV-Preset Details Screen



Figure 3.2.4-4: HV-Preset Options

3.2.5 Norm-Program Mode

The Norm-Program Mode is used when performing a standard Torque or Torque and Angle Cycle.

To Switch to Norm-Program Mode:

1. Press and hold the both the Up and Down navigation buttons until the Data Logging Menu opens (Figure 3.2.5-1).
- Note:** Menu will appear after 3 seconds.
2. With "Prog.Selection" highlighted, press the centre button.
3. With "Norm-Programme" highlighted,



Figure 3.2.5-1: Data Logging Menu



Figure 3.2.5-2: Program Selection

press the centre button.

Menu – Norm-Program

Note: A Check-Mark beside the name indicates which Program is active.

4. Navigate to "Back" and press the centre button to exit.

3.2.6 Check-Program Mode

The Check-Program Mode is used when wanting to check the Torque on an already tightened bolt. A Torque and Angle Cycle is not available in this Mode. The speed of the Tool is decreased while operating in this Mode.

To Switch to Check-Program Mode:

1. Press and hold the both the Up and Down navigation buttons until the Data Logging Menu opens (Figure 3.2.6-1).

Note: Menu will appear after 3 seconds.

2. With "Prog.Selection" highlighted, press the centre button.
3. With "Check-Programm" highlighted, press the centre button.

Note: A Check-Mark beside the name indicates which Program is active.

4. Navigate to "Back" and press the centre button to exit.



Figure 3.2.6-1: Data Logging Menu

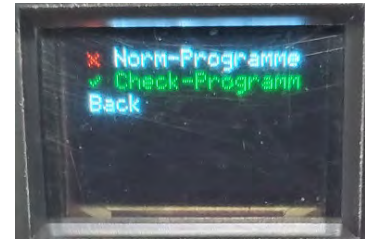


Figure 3.2.6-2: Program Selection Menu – Check-Program

3.2.7 View Log File

Every time the B-RAD S completes a cycle it creates a Log File that holds information related to the cycle.

To select and view a Log File:

1. Press and hold the both the Up and Down navigation buttons until the Data Logging Menu opens (Figure 3.2.7-1).

Note: Menu will appear after 3 seconds.

2. With "View Log File" highlighted, press the centre button.
3. View individual cycle records using the navigation buttons (Figure 3.2.7-2).

- ID:
- Date:
- Time:
- T: - Set Torque / Set Angle
- Unit: - Torque Units
- A:

4. To view the more information on a



Figure 3.2.7-1: Data Logging Menu



Log File, hold the down button for 2 seconds to get to the second information page (Figure 3.2.7-3).

Figure 3.2.7-2: View Log File – Page 1

Figure 3.2.7-3: Preset Options

- TotM:
 - Lim:
 - Mov: - Angle Moved / Cycle Time
 - Sup:
 - Prog.: - Mode Program was in during cycle
 - WK:
5. Press centre button to exit back to Data Logging Menu.

3.2.8 Statistics – Cycle Counts

The Statistics menu contains the cycle counts for the tool.

- "Miant.-Counter": this is the Maintenance Life Cycle Counts for the tool which is used to track how many cycles the tool was used for since its last service. This cycle counter can be cleared under Advanced Unlock (see Section 3.3.10).
- "Total-Counter": this is the Total Life Cycle Counts for the tool which is used to track how many cycles the tool was used for since it was first made. This cycle counter can not be cleared.

To View the Cycle Counts:

1. Press and hold the centre button until the Main Menu opens (Figure 3.2.8-1).
2. With "Statistics" highlighted, press the centre button.
3. Use the navigation buttons to switch between viewing Maint.-Counter (Figure 3.2.8-2) and Total-Counter (Figure 3.2.8-3).
 - 0-20%:
 - 21-80%:
 - 81-100%:
 - Total:
4. Press centre button to exit back to Main Menu.

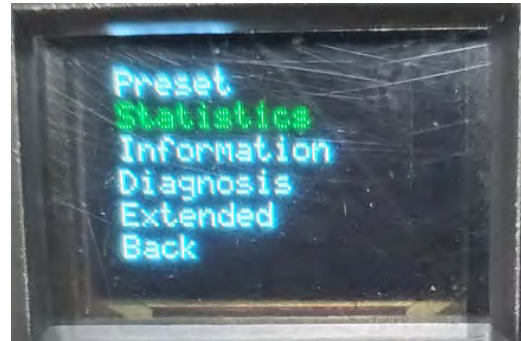


Figure 3.2.8-1: Main Menu

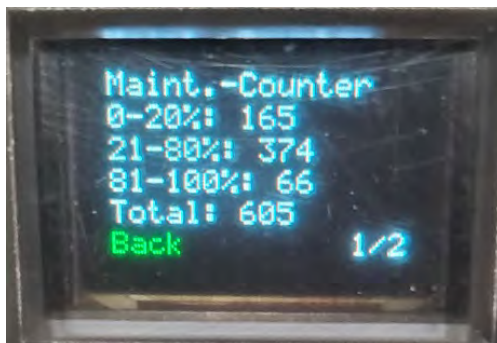


Figure 3.2.8-2: Maintenance Life Cycle Counts

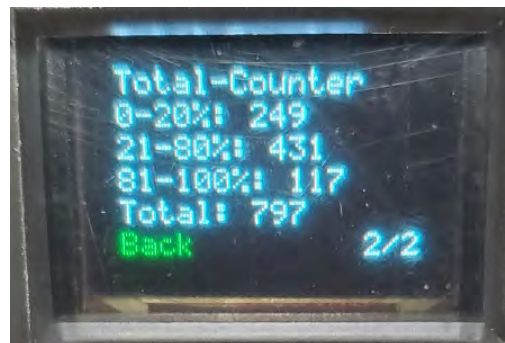


Figure 3.2.8-3: Total Life Cycle Counts

3.2.9 Information

The Information Menu contains the program version, tool serial number, and customer service contact information.

To View the Tool Information:

1. Press and hold the centre button until the Main Menu opens (Figure 3.2.9-1).
2. With "Information" highlighted, press the centre button.
3. Information:
 - Ver: - Program Version
 - S.No.: - Tool Serial Number
 - Customer Service contact information
4. Press centre button to exit back to Main Menu.

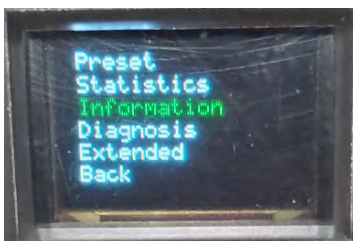


Figure 3.2.9-1: Main Screen



Figure 3.2.9-2: Information Menu

3.2.10 Diagnosis

The Diagnosis Menu contains information on the general status of the B-RAD S Tool.

To View the Diagnosis Information:

1. Press and hold the centre button until the Main Menu opens (Figure 3.2.10-1).
2. With "Diagnosis" highlighted, press the centre button.
3. Use the navigation buttons to switch between page 1 (Figure 3.2.10-2) and page 2 (Figure 3.2.10-3).
 - Sup: -
 - InP: -
 - S: -
 - Status: -
 - Temp-A: -
 - Temp-M: -
 - Temp-I: -
4. Press centre button to exit back to Main Menu.

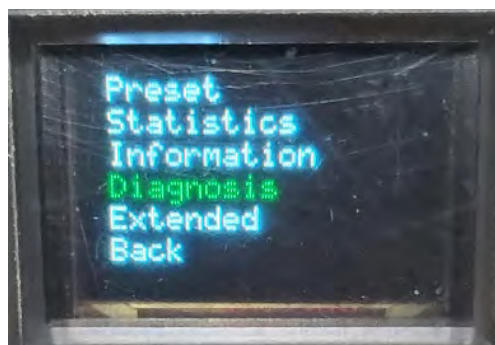


Figure 3.2.10-1: Main Menu

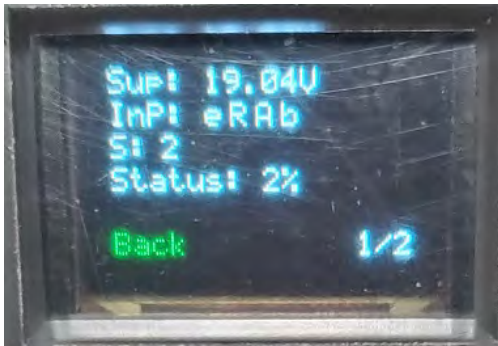


Figure 3.2.10-2: Diagnosis Page 1

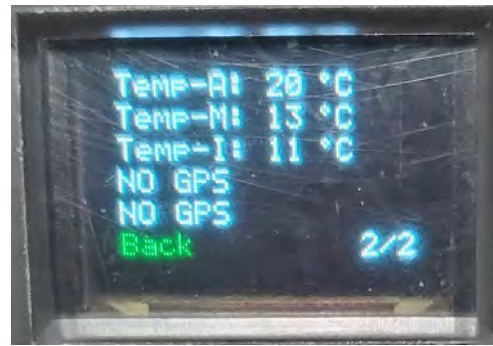


Figure 3.2.10-3: Diagnosis Page 2

3.3 Advanced Level Functions

The following sections describe the functions available when the B-RAD S is in the Advanced Level. Refer to Section 3.1 – Unlock Levels for more information on the accessibility of these functions.

Note: Make sure the B-RAD S is unlocked in the Advanced Level before proceeding.

3.3.1 Save Preset – Customerpreset

The B-RAD S can save up to twenty user defined Presets.

To Save a Customerpreset:

1. Press and hold the centre button to open the Main Menu (Figure 3.3.1-1).
2. The "Preset" option will be highlighted. Press the centre button.
3. The Preset Menu will be displayed with the "Customerpreset" highlighted (Figure 3.3.1-2). Press the centre button.
4. The Preset Details Screen will be displayed (Figure 3.3.1-3):
5. Use the navigation buttons to go through the saved Presets.
6. When on the Preset with the desired values press the centre button to open the Preset Options (Figure 3.3.1-4).
7. Highlight Overwrite and press the centre button to overwrite that Preset.
8. On the Preset Name Save Screen (Figure 3.3.1-5) that comes up, a desired name for the Preset can be entered.
9. Use the Up and Down Navigation buttons to change the highlighted digit.
10. Use the centre button to accept the digit and advance to the next.

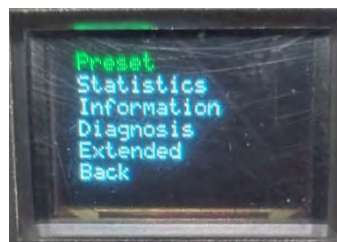


Figure 3.3.1-1: Main Menu



Figure 3.3.1-2: Preset Menu

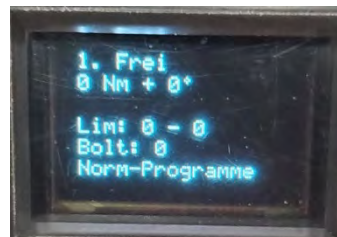


Figure 3.3.1-3: Preset Details Screen



Figure 3.3.1-4: Preset Options



Figure 3.3.1-5: Preset Name Save Screen

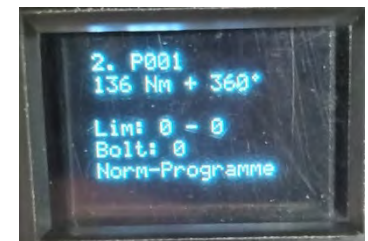


Figure 3.3.1-6: Preset Details Screen

11. Once Save is highlighted, press the centre button to save and exit back to Preset Details (Figure 3.3.1-6).

3.3.2 Settings – Angle Enable/Disable

This option is available if it is desired to Enable/Disable the angle option from being available on the Torque Select Screen.

Note: This option comes *Enabled* from factory.

3.3.3 Settings – Limits Enable/Disable

Enabling this option allows the for limits to be placed on a torque setting.

Note: This option comes *Disabled* from factory.

Note: For more information contact your RAD Distributor for assistance.

3.3.4 Settings – Bolt Counter Enable/Disable

Enabling this option allows a bolt counter to be input that will disable the tool once that amount is reached.

Note: This option comes *Disabled* from factory.

Note: For more information contact your RAD Distributor for assistance.

3.3.5 Settings – Torque Sensor Enable/Disable



CAUTION!

Disabling this feature has effects on the function and accuracy of the electric torque wrench.

In the case where the sensor is causing issues and the tool still needs to be used the sensor can be disabled.

Note: This option comes *Enabled* from factory.

Note: For more information contact your RAD Distributor for assistance.

3.3.6 Settings – Point Calibration Setup

Point Calibration allows a single torque point to be fine-tuned to suit the needs of an application. A Point Calibration can be saved as a Preset (see Section 3.3.1 Save Preset – Customerpreset).

Point Calibration cannot be used with a Torque and Angle cycle.

Note: Point Calibration does not replace the Tool Calibration. For information on Tool Calibration, refer to Section 5 – Calibration. A full calibration must be done before Point Calibration may be used.

To enable or disable Point Calibration:

1. Change the torque to the desired value.
Note: Refer to the following sections to set the torque: Section 3.2.1 Change the Target Torque.
2. Go to: Main Menu > Extended > Settings > Pointcali (Figure 3.3.6-1).
3. Perform a torque cycle on a test bench for Bolt 1 (Figure 3.3.6-2).
4. Press the centre button to highlight the number in yellow and adjust them to match the torque displayed



Figure 3.3.6-1: Settings Menu

at the test bench.

5. Press centre button to accept changes.
6. Use the navigation buttons to go to Bolt 2 (Figure 3.3.6-3) and perform another torque cycle on the test bench.
7. Press the centre button to highlight the number in yellow and adjust them to match the torque displayed at the test bench.
8. Press centre button to accept changes.
9. Use the navigation buttons to go to the "Save" page (Figure 3.3.6-4) and press the centre button to save the Point Calibration and exit to the Settings Menu.



Figure 3.3.6-2: Bolt 1 Torquing Screen



Figure 3.3.6-3: Bolt 2 Torquing Screen

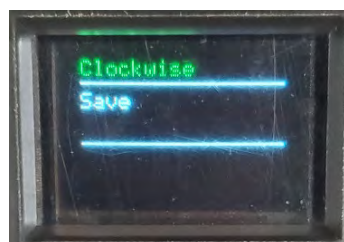


Figure 3.3.6-4: Preset Name Save Screen

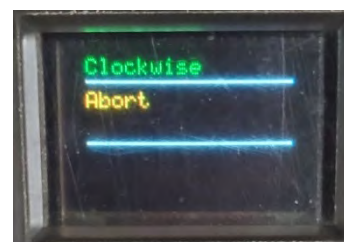


Figure 3.3.6-5: Preset Details Screen

Note: Go to the "Abort" page and press the centre button to discard the changes and exit (Figure 3.3.6-5).

10. Exit back to the torque select screen to use the Point Calibrated torque setting which is indicated by the bullseye symbol in the top right corner of the display. desired name for the Preset can be entered.

3.3.7 Settings – Unit Selection

The options for units are Imperial (FtLbs), Metric (NM), and "Level".

Note: For more information on the "Level" option please contact your RAD Distributor for assistance.

To Change the Torque Units:

1. Go to: Main Menu > Extended > Settings > Settings "Page 2" > Unit.
2. Navigate to the desired units and press centre button to accept.

3.3.8 Settings – Language Selection

The following Language options are available:

- English
- German

To Change the Language:

1. Go to: Main Menu > Extended > Settings > Settings "Page 2" > Language.
2. Navigate to the desired Language and press centre button to accept.

3.3.9 Settings – Back-off Setup

The amount the B-RAD S backs off after it finishes a cycle is adjustable.

Note: The default from factory is 10 degrees.

Note: Trigger must remain depressed after the completion of a cycle until it comes to a complete stop for back-off to complete.

To Change the Language:

1. Go to: Main Menu > Extended > Settings > Settings "Page 2" > Backoff.
2. Use the navigation keys and centre button to input the desired back-off.

Note: For more information contact your RAD Distributor for assistance.

3.3.10 Maintenance – Delete Maintenance Cycles

The Maintenance Life Cycle Counts for the tool are used to track the usage cycles of the tool since its last service. These can be cleared after the tool is serviced to better track its usage after any service work is done to the tool.

To Delete the Maintenance Cycles:

1. Go to: Main Menu > Extended > Maintenance > Delete Maint. (Figure 3.3.10-1).
2. Press the centre button to delete the maintenance life cycles.

Note: For more information contact your RAD Distributor for assistance.

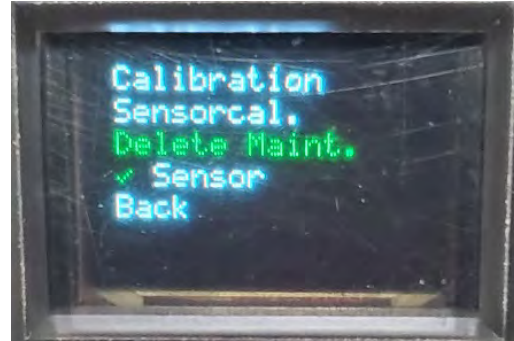


Figure 3.3.10-1: Maintenance Menu

3.3.11 Data Logging – Choose Log File

Allows the user to set up a name for the Log Files.

To Choose a Log File:

1. Go to: Main Menu > Extended > Data logging> Choose Log File.
2. On the Screen that comes up, a desired name for the Log File can be entered.
3. Use the Up and Down Navigation buttons to change the highlighted digit.
4. Use the centre button to accept the digit and advance to the next.
5. Once Save is highlighted, press the centre button to save and exit.

Note: For more information contact your RAD Distributor for assistance.

3.3.12 Data Logging – Date/Time Setup

Allows the user to set or change the Date/Time.

To Change/Set the Date/Time:

1. Go to: Main Menu > Extended > Data logging> Date/Time (Figure 3.3.12-1).
2. On the Date/Time Screen (Figure 3.3.12-2) that comes up, the Date and Time can be adjusted if needed.
3. Press the Up or Down Navigation button once to highlight the Date digit.

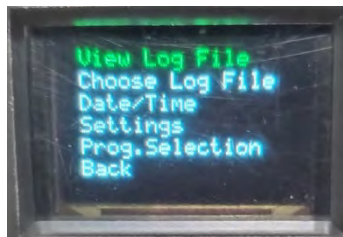


Figure 3.3.12-1: Data Logging Menu



Figure 3.3.12-2: Date/Time Screen

4. Then use the Up and Down Navigation buttons change the highlighted digit to the desired value.
5. Use the centre button to accept the digit and advance to the next digit and change as needed.
6. Once Save is highlighted, press the centre button to save and exit.

Note: For more information contact your RAD Distributor for assistance.

3.3.13 Data Logging – Settings – Worker-ID

Enabling this option makes it so that users have a Worker-ID that is saved in the logs for tracking who was using the tool for the cycle.

Note: For more information contact your RAD Distributor for assistance.

3.3.14 Data Logging – Settings – Data Transfer

When the logs need to be downloaded the tool must be put into Data Transfer mode to allow for the transfer.

To Put the Tool into Data Transfer Mode:

1. Go to: Main Menu > Extended > Data logging > Settings > Datatransfer (Figure 3.3.14-1 and 3.3.14-2).
2. Highlight Datatransfer and press centre button enter Data Transfer Mode.

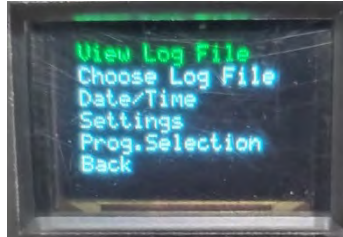


Figure 3.3.14-1: Data Logging Menu

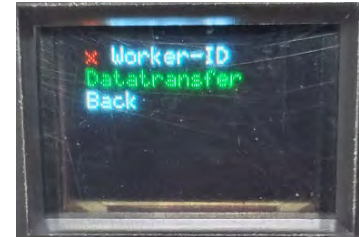


Figure 3.3.14-2: Data Logging Settings Menu

Note: For more information contact your RAD Distributor for assistance.

4. General Operating Instructions



CAUTION!

Only qualified personnel with training in the safe operation of torque tooling and the B-RAD Tool System should operate this tool. Refer to the Important Safety Notice for more information.

The B-RAD S has two operating modes: Torque Only or Torque and Angle. The Torque Only Cycle passes when the Actual Torque reaches the Target Torque, and the Cycle fails if it is interrupted before the Actual Torque reaches the Target Torque. The Torque and Angle Cycle passes when the Angle after the pre-torque reaches the Set Angle and fails if it is interrupted before the Set Angle is reached, torque exceeds the maximum torque for the tool, or the Limits are exceeded if set (see Section 3.3.3 Settings – Limits Enable/Disable).

This section instructs the operator in the use of the Reaction Arm and how to conduct a Torque Only or a Torque and Angle Cycle.

4.1 Reaction Arm



Warning!

Always keep body parts clear of the Reaction Arm when the B-RAD Tool System is in use. Serious injury could occur.

CAUTION!

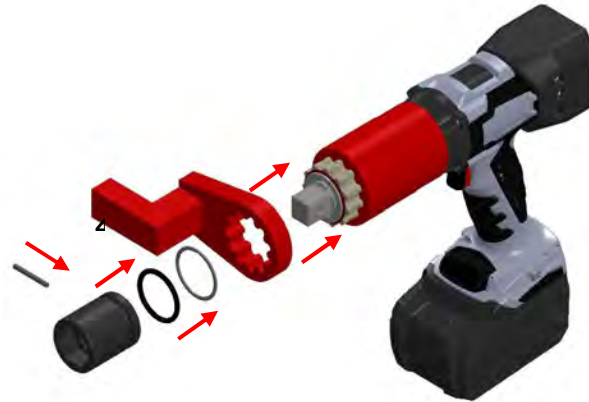
Ensure that the Reaction Arm has a solid contact point before operating the B-RAD Tool System.

Improper reaction will void warranty and can cause premature tool failure.

Please contact New World Technologies Inc. or your local RAD Authorized Distributor for information on custom Reaction Arms.

Installing the Reaction Arm

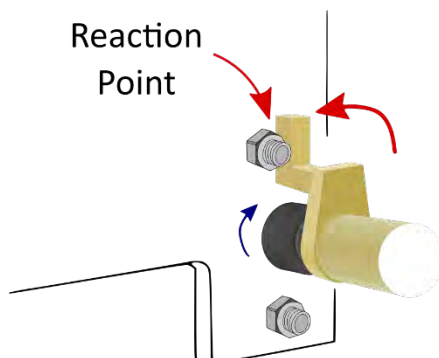
Slide the Reaction Arm onto the spline or serpentine fitting and secure the Snap Ring to hold the Reaction Arm in place. Couple the socket and square drive together with a dowel pin and secure with a locking ring.



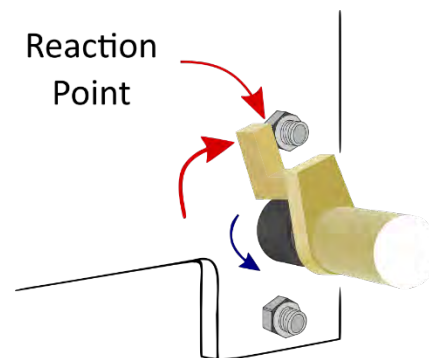
Reaction Points

Make sure that the Reaction Arm is in contact with a solid Reaction Point before you operate the tool.

When the tool is in operation, the Reaction Arm rotates in the opposite direction to the Output Square Drive and must be allowed to rest squarely against a solid object or surface adjacent to the bolt to be tightened.




Clockwise Operation



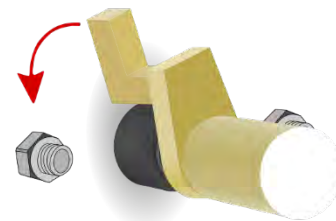
Counter-Clockwise Operation

Personal Safety

 **CAUTION!** Keep your hands clear of the Reaction Arm and joint when the tool is in operation.



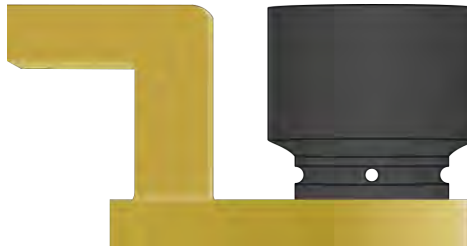
Pinch
Point



Reaction Arm Height

Ensure that the height of the socket is even with the height of the Reaction Arm.

CORRECT: The Reaction Arm and socket are even.



The height of the socket cannot be shorter or longer than the height of the Reaction Arm.

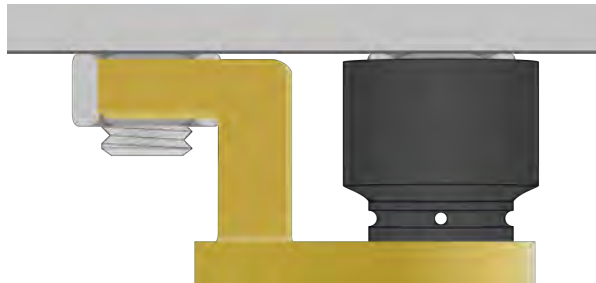
INCORRECT: The leg of the Reaction Arm is too short in the left image and too long in the right image.



Reaction Arm Foot

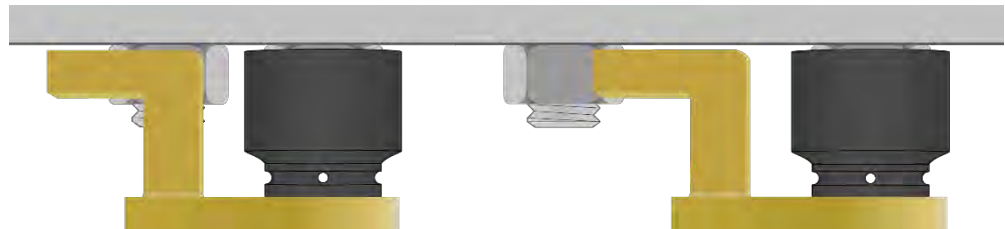
Ensure that the foot of the Reaction Arm aligns with the reaction point.

CORRECT: The foot of the Reaction Arm aligns with the reaction point.



The length of the foot cannot be shorter or longer than the reaction point.

INCORRECT: The reaction point is too close in the left image and too far in the right image. Do not react against the heel of the reaction arm.



4.2 Torque Operation

To operate the tool in a Torque Cycle:

1. Ensure the tool is in Torque Select mode (Figure 4.2-1).
2. Ensure the Display is showing the correct units (see Section 3.3.7 Settings – Unit Selection).
3. Change the torque value as desired.

Note: Refer to the following sections to set the torque: Section 3.2.1 Change the Target Torque, Section 3.2.3 Select Preset – Customerpreset, or Section 3.2.4 Select Preset – HV-Preset).

4. The tool is ready to torque at the displayed setting.



Figure 4.2-1: Torque Select Mode

5. Ensure the Forward/Reverse Switch is in the Forward position. The top left side will have "Clockwise" displayed (Figure 4.2-1).

6. Press and release On/Off Trigger to ensure tool is awake.

7. Press and hold the On/Off Trigger.

Note: To stop the Torque Cycle at any time, release the On/Off Trigger.

8. When the B-RAD S reaches the selected Torque, the tool will stop turning. Release the On/Off Trigger.

Note: Cycle result will be shown on screen in blue.

4.3 Torque and Angle Operation

To operate the tool in a Torque and Angle Cycle:

1. Ensure the tool is in Torque and Angle Select mode (Figure 4.2-1).
2. Ensure the Display is showing the correct units (see Section 3.3.7 Settings – Unit Selection).
3. Change the torque value as desired.

Note: Refer to the following sections to set the torque: Section 3.2.1 Change the Target Torque, Section 3.2.2 Change the Target Angle, Section 3.2.3 Select Preset – Customerpreset, or Section 3.2.4 Select Preset – HV-Preset).

4. The tool is ready to torque at the displayed setting.

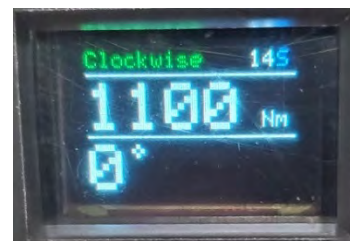


Figure 4.3-1: Torque and Angle Select Mode

5. Ensure the Forward/Reverse Switch is in the Forward position. The top left side will have "Clockwise" displayed (Figure 4.2-1).

6. Press and release On/Off Trigger to ensure tool is awake.

7. Press and hold the On/Off Trigger.

Note: To stop the Torque Cycle at any time, release the On/Off Trigger.

8. When the B-RAD S reaches the selected Torque, the tool will stop turning. Release the On/Off Trigger.

5. CALIBRATION



CAUTION!

Only qualified personnel with training in the safe operation of torque tooling and the B-RAD S Tool System should operate this tool. Improper use of the calibration function will result in tool damage.

Do not calibrate at Target Torques that result in exceeding the B-RAD S Tool System's Torque Range. Severe tool damage will occur.

This function allows the operator to access the calibration values for the B-RAD. These values should only be modified by a Qualified Calibration Technician and using a Calibration Stand.

5.1 Entering Calibration Mode

The Calibration functions are only available when the B-RAD S Tool System is Unlocked with the "Advanced" passcode. Contact New World Technologies Inc. Technical Support for more information.

To Unlock the Calibration menu:

1. While in the Main Menu, navigate to the Extended option (Figure 5.1-1).
2. Enter the "Advanced" passcode.
3. Press either the UP or DOWN button until the desired digit appears (Figure 5.1-2).
4. Press the centre button to accept and advance to next digit.
5. Once the passcode is entered, the Main Menu (Figure 5.1-1) will reappear.
6. Re-select Extended option.
7. From the Extended Menu select the Maintenance option (Figure 5.1-3).
8. From the Maintenance Menu select the Calibration option (Figure 5.1-4) for the main calibration mode or the Sensorcal option (Figure 5.1-5) for the sensor calibration mode.
9. You are now in calibration mode.

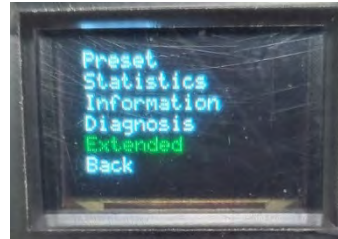


Figure 5.1-1: Main Menu - Extended



Figure 5.1-2: Password Entry

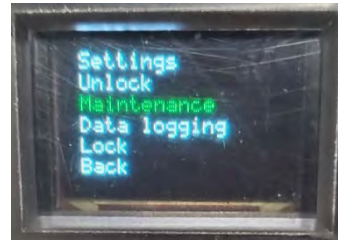


Figure 5.1-3: Extended Menu

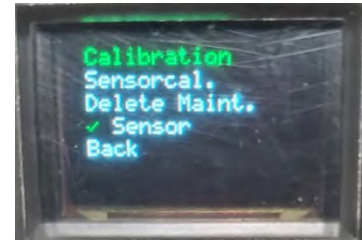


Figure 5.1-4: Maintenance Menu – Calibration

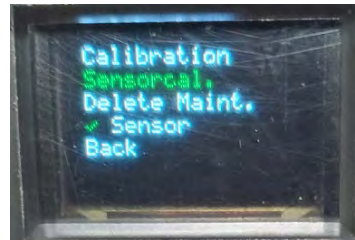


Figure 5.1-5: Maintenance Menu – Sensor Calibration

5.2 Table of Calibration Menus

The order and function of the menus in Calibration Mode are outlined in Table 5.2 below.

Menu Title	Description of Function
Minimal Torque (Norm)	Minimum Torque Limit – Set to 10% of the maximum for the attached gearbox. This is preset at the factory and should only be altered after consulting the manufacturer.
Maximal Torque (Norm)	Maximum Torque Limit – Set to the maximum for the attached gearbox. This is preset at the factory and should only be altered after consulting the manufacturer.
Minimal Impulse (Norm)	Speed Setting at Minimum Torque For "Normal Mode" – Starts at "1" being slowest and increases. This is preset at the factory and should only be altered after consulting the manufacturer.
Maximal Impulse (Norm)	Speed Setting at Maximum Torque For "Normal Mode" – Starts at "1" being slowest and increases. This is preset at the factory and should only be altered after consulting the manufacturer.
Set xxx, ..., Set xxxx (7 settings) (Norm)	Tool Normal Calibration Points – Calibrates "Normal Mode" output torque at 7 points over the output range.
Minimal Impulse (Prove)	Speed Setting at Minimum Torque For "Prove Mode" – Starts at "1" being slowest and increases. This is preset at the factory and should only be altered after consulting the manufacturer.
Maximal Impulse (Prove)	Speed Setting at Maximum Torque For "Prove Mode" – Starts at "1" being slowest and increases. This is preset at the factory and should only be altered after consulting the manufacturer.
Set xxx, ..., Set xxxx (6 settings) (Prove)	Tool Prove Calibration Points – Calibrates "Prove Mode" output torque at 6 points over the output range.
Set Angle	Set how many pulses the motor produces to turn the square drive by 360°. This number is generally 12 × the gearbox ratio. This is preset at the factory and should only be altered after consulting the manufacturer. To verify the setting, mark the 0 spot on the square drive and the stationary annulus, then pull the trigger and note where the mark returns when the motor power is shut off.

Serial Number	Tool Serial Number. One letter at start and six trailing numbers are possible. The serial number is displayed on the information screen and appears as the device name on PC for activated documentation.
Save	Save all changes and exit.

Table 5.2: Calibration Menu Titles and Functions

5.3 Calibration Procedure



CAUTION!

All changes in calibration have effects on the function of the electric torque wrench. Every fault could result in malfunction or in destruction of the tool.

In calibration mode there is no gearbox protection. Always keep an eye on the display of the calibration unit. When the gearbox maximum is exceeded turn-off the tool immediately.

To Calibrate the B-RAD S:

1. Install a fresh battery into the B-RAD S.
2. Turn on the tool. Wait for the last torque value to be displayed.
3. Once you are in main calibration mode (see section 5.1). Use the arrow keys to navigate through the calibration menu (see Table 5.2). Select the calibration step by pressing the centre button. Select the value with the arrow keys and save by pressing the centre button again.
4. Go to the first "Set xxx" for Normal Mode.
5. Follow these steps to calibrate the "Set xxx":
 - i. The "xxx" value for "Set xxx" is the target torque.
 - ii. Press and hold the trigger of the tool.
 - iii. The tool shuts-off at the preset current value automatically.
 - iv. After shut-off, compare the torque displayed at the test bench with the target torque displayed on the tool.
 - v. Adjust the shut-off value if necessary. For this press the centre button, which will change the color of the number, then set the shut-off value by using the arrow keys. Save by pressing the centre button again.
 - vi. Keep executing this step until the displayed torque on the test bench complies with the required shut-off value.



Important!

All bolting results must be reached in the range of $\pm 3.5\%$ around the target value.

6. Use the arrow keys to navigate to the next "Set xxx" calibration point for "Normal Mode" and repeat Step 8 for each of the seven.
7. Repeat Step 8 for each of the six "Set xxx" calibration points under the "Prove Mode" as well.



CAUTION!

DO NOT operate the B-RAD S Tool System beyond 50 units above the rated maximum torque. Overtorquing the tool will cause severe tool damage.

5.4 Sensor Calibration Procedure



CAUTION!

All changes in calibration have effects on the function of the electric torque wrench. Every fault could result in malfunction or in destruction of the tool.

In calibration mode there is no gearbox protection. Always keep an eye on the display of the calibration unit. When the gearbox maximum is exceeded turn-off the tool immediately.

To Calibrate the Sensor of the B-RAD S:



CAUTION!

DO NOT perform a Sensor Calibration on the B-RAD S Tool System before the Main Calibration is complete

as damage may occur to the system.

1. Install a fresh battery into the B-RAD S.
2. Turn on the tool. Wait for the last torque value to be displayed.
3. Once you are in the sensor calibration mode (see section 5.1) you will be on the Zero Point Setting (Figure 5.4-1).
4. With the tool resting on a flat surface and no pressure placed on the end of the gearbox, pull the trigger briefly. The "0" will go from white to green to indicate it is set.

Note: Any pressure on the annulus may off-set the calibration.

5. Press Down navigation button to go to the Max Torque Setting (Figure 5.4-2).
6. Perform a torque cycle on a test bench.
7. Press the centre button to highlight the numbers in yellow and adjust them to match the torque displayed at the test bench.
8. Press centre button to accept changes.
9. Use the navigation buttons to go to the "Save" screen to save changes or to the "Abort" to ignore changes.
10. When on desired selection press the centre button to exit to Maintenance Menu.



Figure 5.4-1: Sensorcal – Zero Point Setting

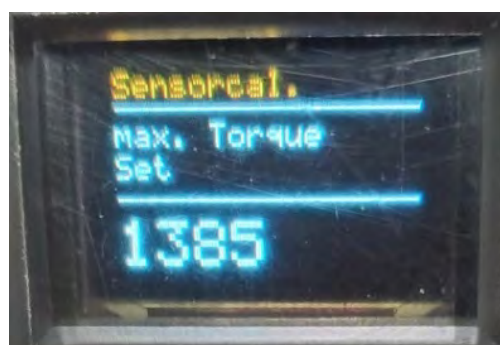


Figure 5.4-2: Sensorcal – Max Torque Setting

6. TROUBLESHOOTING



Important!

Disassembling or attempting repair will void warranty.

If breakdown, malfunction, or error occurs, contact New World Technologies Inc. Technical Support (refer to Section 7 – Contact Us).

The Display Module may exhibit abnormal behaviour depending on operating conditions, frequency of use, or excessive wear on the Display Module.

The Display Module is designed to withstand normal use over the lifetime of the B-RAD S Tool System; however, as a sensitive electronic device it is susceptible to damage caused by shock, moisture, or excessive force.

6.1 Errors and Solutions

In case of an error or problem, the B-RAD S Display will display an error message and disable tool operation. Table 6.1-1 lists error messages, problems that may occur, and possible solutions to the problem.

Note: If the problem or error persists after following solution instructions, contact New World Technologies Inc. Technical Support (refer to Section 7.0 – Contact Us).

Error	Symptoms/Reasons	Possible Solution(s)
Error Overheating	The motor, battery, or control electronics are too hot.	Let the device cool down.

Insert SD Card	SD card was not recognized.	<u>Solution:</u> Contact your RAD Distributor for assistance.
Zero Point	There is load on the gearbox when the B-RAD S was turned on.	Unload the tool.
Error Sensor	The Sensor electronics are not sending any measured values.	<u>Solution:</u> Contact your RAD Distributor for assistance. Note: To complete work, the sensor function can be deactivated in the extended menu (cycle power after).
Only dashes appear on the display instead of letters	SD card was not recognized.	<u>Solution:</u> Contact your RAD Distributor for assistance.
Date and time incorrect	1. Different Time Zone 2. Internal Battery Empty	1. Go to Extended>Date/Time to set. 2. <u>Solution:</u> Contact your RAD Distributor for assistance.
Minimum or Maximum Torque Cannot be set	1. Calibration Incorrect 2. Internal Memory Defective	1. Check the calibration and if needed re-calibrate. 2. <u>Solution:</u> Contact your RAD Distributor for assistance.
Device No Longer Responds to Buttons	1. Internal Software Error 2. Membrane Keyboard Defective	1. The device must be restarted. 2. <u>Solution:</u> Contact your RAD Distributor for assistance.
Trigger is Pressed and Device Does Not Start	1. Torque Setting set to 0. 2. Bolt counter activated and set to 0. 3. Bolt counter activated and all bolt operations completed. 4. Trigger defective.	1. Set torque to something other than 0. 2. Adjust the bolt counter to something other than 0. 3. Start a new operation. 4. <u>Solution:</u> Contact your RAD Distributor for assistance.
Device Does Not Loosen the Screws in Counter-Clockwise Rotation	1. Required torque is higher than the maximum torque of the B-RAD S. 2. Forward/Reverse switch defective.	1. Choose a larger tool to complete cycle. 2. <u>Solution:</u> Contact your RAD Distributor for assistance.
Device Shows an Error Message After Cycle	1. Limits are active and set incorrectly. 2. Limits are active and tolerance is set incorrectly. 3. Tried to re-tighten a tightened bolt. 4. The B-RAD S reached its maximum torque when tightening during angle rotation. 5. The trigger was released before the device completed its cycle.	1. Adjust the Limits. 2. Adjust the tolerance. 3. If trying to check the tightness of a tightened bolt then switch over to Check-Program Mode (see Section 3.2.5). 4. To protect the B-RAD S Tool System the tool switches off automatically and returns an error message. 5. The trigger must be fully depressed until the tool completely stops on its own.

B-RAD S LIMITED WARRANTY

NEW TOOL WARRANTY

Any new tool branded with the RAD name and purchased from New World Technologies Inc., or through one of its authorized distributors or agents, is warranted to the original purchaser against defects in materials and workmanship for a period of one (1) year from the date of original calibration. Electric drive components such as electric motors, switches, and batteries etc., are covered for a period of three (3) months from the date of original calibration. Under the terms of this warranty, New World Technologies Inc., at its option and F.O.B. either its factory or an authorized service center, will replace or repair for the original purchaser, free of charge, any part or parts, found upon examination by New World Technologies Inc., to be defective in material or workmanship or both. If any product or part is replaced or repaired under the terms of this warranty, that product or part will carry the remainder of the warranty from the date of original calibration.

REPAIRED TOOL WARRANTY

Once a tool is beyond its new tool warranty, New World Technologies Inc., for a period of three (3) months from the date of repair, will replace or repair for the original purchaser, free of charge, any part or parts, found upon examination by New World Technologies Inc., to be defective in material or workmanship or both. If any product or part is replaced or repaired under the terms and conditions of this warranty, that product or part will carry the remainder of the warranty from the date of original repair.

To qualify for the above mentioned warranties, written notice to New World Technologies Inc. must be given immediately upon discovery of such defect, at which time New World Technologies Inc. will issue an authorization to return the tool. The defective item must promptly be returned to New World Technologies Inc. all freight charges prepaid. When returning a tool, the reaction arm/s being used with the tool must also be returned.

NEW WORLD TECHNOLOGIES INC. | T: 1.800.983.0044 | E: INFO@RADTORQUE.COM

EXCLUSIONS FROM WARRANTY

At New World Technologies Inc.'s sole judgment tools or accessories that have been altered, damaged, misused, abused, badly worn due to excessive utilization, lost, or improperly maintained will NOT be covered under the terms of this warranty.

Tools returned without the reaction arm/s will not be covered under the terms of this warranty.

Consumable parts and accessories (such as extensions, reaction blanks/arms) are not covered under this warranty.

Tools that have been relabeled without prior written consent of New World Technologies Inc. will not be covered under this warranty.

Equipment and accessories not manufactured by New World Technologies Inc. (measuring equipment, etc.) are warranted only to the extent of the original manufacturer's warranty.

**There is no other express warranty. Implied warranties, including those of merchantability and fitness for a particular purpose are limited to one year from date of calibration and to the extent permitted by law. Liability for consequential damages under any and all warranties are excluded to the extent exclusion is permitted by law.*

LIGHTER FASTER STRONGER SAFER



ABOUT NEW WORLD TECHNOLOGIES INC.

New World Technologies is a leading Canadian manufacturer of pneumatic, battery powered, and electronic pistol grip torque wrenches. Our advanced products have proven to be successful all over the world in such industries as oil and gas, petrochemical, mining, aerospace, and manufacturing. We continue to invest in and employ the latest technology to achieve the highest level of Innovation, quality, and performance - which has resulted in multiple patents for our products.



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