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## MANUAL REVISION HISTORY

### **V2014.07.03:**

- Initial Manual Release

### **V2014.12.17:**

- Updated Hardware – Handle

### **V2015.11.03:**

- B-RAD Select Upgrade

### **V2016.02.12:**

- Firmware Release 2.07.02

### **V2016.02.25:**

- Firmware Release 2.08.01
- Added 3000-2/4000-2 Tool Model

### **V2016.06.29:**

- Firmware Release 2.08.07
- Updated Torque Ranges and Tool Models Table
- Updated Cycle of Operation

### **V2017.02.02:**

- Updated Manual Layout

### **V2017.03.28:**

- Updated General Power Tool Safety Warnings
- Section 1.2.1: Added Tool System Weight and Vibration Specifications

### **V2017.06.26:**

- Added 4400/6000-M Tool Model

## 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 plug from the power source and/or remove the battery pack, if detachable, 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. **Maintain power tools and accessories.** 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. **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- g. **Use the power tool, accessories, and tool bits etc. 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.
- h. **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.

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## 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.

## 1.0 GENERAL INFORMATION

### 1.1 System Components

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

- B-RAD Select 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 Select



Figure 1.1-2: RAD Li-Ion Battery Pack



Figure 1.1-3: RAD Battery Charger



Figure 1.1-4: Standard Reaction Arm

**Note:** Some distributors may ship additional parts along with the B-RAD Select Tool System.

## 1.2 Specifications

### 1.2.1 Tool Model Specifications

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

Tool Model	Torque Range (Imperial)	Torque Range (Metric)	Weight (includes battery)
B-RAD Select 200 / 275-M	50-200 LbFt	60-275 Nm	7.2Lb / 3.3kg
B-RAD Select 350 / 475-M	70-350 LbFt	100-475 Nm	7.5Lb / 3.4kg
B-RAD Select 500 / 700-M	125-500 LbFt	170-700 Nm	7.6Lb / 3.4kg
B-RAD Select 500-2 / 700-2-M			9.2Lb / 4.2kg
B-RAD Select 1000 / 1400-M	200-1000 LbFt	300-1400 Nm	8.2Lb / 3.7kg
B-RAD Select 1000-2/1400-2-M			10.0Lb / 4.5kg
B-RAD Select 1500 / 2000-M	300-1500 LbFt	400-2000 Nm	8.9Lb / 4.0kg
B-RAD Select 1500-2/2000-2-M			10.7Lb / 4.9kg
B-RAD Select 3000 / 4000-M	600-3000 LbFt	800-4000 Nm	13.0Lb / 5.9kg
B-RAD Select 3000-2/4000-2-M			16.2Lb / 7.3kg
B-RAD Select 4400/6000-M	1000-4400 LbFt	1350-6000 Nm	19.0Lb / 8.6kg

Table 1.2.1-1: Tool Model Torque Ranges and Weights

<b>Vibration (all tool models)</b>	Does not exceed 2.5 m/s <sup>2</sup>
<b>Noise Level (all tool models)</b>	90 ± 2 dB

Table 1.2.1-2: Tool Operation Specifications

### 1.2.2 Battery Specifications

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

<b>Battery Output</b>	
Voltage	18 VDC
Current	30 A
<b>Charge Time</b>	60 minutes
<b>Charger Voltage</b>	
Input	115 or 230 VAC
Output	12 – 18 VDC
<b>Charger Output Current</b>	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.

<b>Temperature Ranges</b>	<b>°C</b>	<b>°F</b>
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.

## 2.0 TOOL SYSTEM

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

### 2.1 Tool Handle

The B-RAD Select (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 the 4-digit LED display. Two buttons are used to enter the desired torque setting. The RAD Li-Ion Battery Pack is attached to the bottom of the Tool Handle.

1. Trigger Switch – tool activation
2. Forward/Reverse Switch – controls direction of rotation
3. LED Display and Up/Down Button Module
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 Select and LED 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 LED Display Interface

The LED Display and Up/Down Button Interface is the user control module for the B-RAD Select Tool System (See Figure 2.2-1). The LED Display has 4 numeric digits, used to display torque values in Torque Select mode and the calibration menus in Calibration mode. The Up/Down navigation buttons are used to increment and decrement numeric values, as well as enter and navigate the various menu systems in the module. The LED Display will light a small indicator LED near each button to confirm that a button is being pushed or held down.



Figure 2.2-1: LED Display



## 2.3 RAD Li-Ion Battery Pack



### CAUTION!

The RAD Li-Ion Battery Pack must only be charged with the supplied RAD Battery Charger.

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 on a joint with a hardness of approximately 10 degrees.

**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:

1. 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).

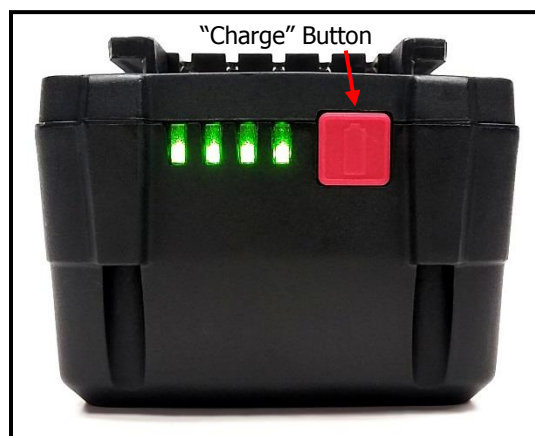


Figure 2.3.2-1: RAD Li-Ion Battery Pack

## 2.4 RAD Battery Charger



### CAUTION!

The RAD Li-Ion Battery Pack must only be charged using 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) on the RAD Battery Charger is used to notify the operator 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.  
**Result:** 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.  
**Result:** 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 moves within the required range for charging, 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.

## 3.0 LED DISPLAY OPERATION



### CAUTION!

The LED Display and Button Module is susceptible to mechanical shock and any excessive force exerted on the module may result in damage.

The LED Display can be damaged by moisture or water and high temperatures. Avoid such conditions and gently wipe clean or let dry before use.

The LED Display and Up/Down Button Module is used to enter torque values, select units of measurement, and calibrate the tool, and view basic tool information. This section describes the functions and use of each setting within the Interface.

## 3.1 Torque Select Mode



### CAUTION!

The B-RAD Select must be calibrated before use. If the LED Display shows anything other than the normal Torque Select screen, the Unit Select Menu, or the Calibration Menus, contact New World Technologies Inc. Technical Support (refer to Section 7.0 – Contact Us) or your RAD Distributor.

When the RAD Li-Ion Battery is first attached to the B-RAD Select handle, the LED Display Module will remain off until the Trigger Switch is depressed. The LED Display will start in Torque Select Mode when the Trigger Switch is depressed.

**Note:** If the tool has just been calibrated, the LED Display will show the tool's rated minimum torque.

**Note:** If the tool has not been calibrated, the LED Display will display the minimum of the Default gearbox, which is 250 LbFt. When Nm (metric) units are used, the LED Display will light a small LED dot in the bottom left corner of the display (Refer to Section 3.1.2 – Unit Select Menu).

### 3.1.1 Setting Torque

**To change the torque value displayed on the LED Display:**

1. Press either the Up or the Down button to increment or decrement the number.
2. The torque value will increment/decrement in multiples of 10 units when a button is pressed briefly or repeatedly.
3. The torque value will increment/decrement in multiples of 100 units as long as a button is pushed and held down.
4. The LED Display will automatically save the selected torque value after 5 seconds, enabling the user to remove and replace the battery without losing the selected torque value.

### 3.1.2 Unit Select Menu

The display units can be changed at any time using the Unit Select menu.

**To enter the menu:**

1. Press and hold both buttons on the Display Module until the Display flashes. The Display will read "u- F" or "u- n" as shown in Figures 3.1.2-1 and 3.1.2-2 below.



Figure 3.1.2-1: Units – LbFt



Figure 3.1.2-2: Units – Nm

2. The units can be changed by pressing the Up or Down button to toggle between "F" (LbFt) and "n" (Nm) units as desired.

**To exit the Unit Select menu:**

1. Press and hold both buttons on the Module until the Display flashes, then release the buttons.
2. The LED Display will light a small LED dot in the bottom left corner of the display when Nm units are used (Figure 3.1.2-3), and will not light the dot when LbFt units are used (Figure 3.1.2-4).



Figure 3.1.2-3: Nm Display



Figure 3.1.2-4: LbFt Display

**Note:** When the units are changed, the LED Display will convert the previous displayed torque setting into the nearest torque setting in the desired units.

### 3.1.3 Viewing Program and Gearbox Information

The Program and Gearbox menus are useful to view tool information. The program version number and the currently selected tool model can be reviewed using these functions.

**To view the tool information:**

1. Navigate into the Unit Select menu (refer to Section 3.1.2 – Unit Select Menu).
2. Press and hold the Up (left) button until the indicator LED starts blinking.
3. Press the Down (right) button, then release both buttons.
4. The Program menu is displayed, scrolling the firmware version number across the display.
5. Repeat steps 2 and 3 to view the Gearbox menu.
6. The gearbox number, model, and units will scroll across the display.
7. To exit the menu at any time, press and hold both buttons until the display starts blinking.

## 3.2 Lock Mode

The B-RAD Select has a built-in Lock function to prevent the user from changing preset torque values or changing torque units. The set torque value will remain saved on the LED Display even if the RAD Battery is removed.

The B-RAD requires a combination code to enter or exit Lock Mode. Contact your RAD Distributor or New World Technologies Inc. See Section 7.0 for contact information.

When the B-RAD Select Tool System is in Lock Mode, the torque value cannot be changed using the Up or Down buttons. The B-RAD must be first unlocked, the torque setting changed to the desired value, then locked again to prevent the torque setting from being changed.

When the B-RAD is put into Lock Mode, the LED Display will scroll the word "Lock" until the buttons are released. In Lock Mode, the LED Display will light 2 small dots in the bottom left-hand side of the display. When the B-RAD is unlocked with the code, the LED Display will scroll the word "unlock" until the buttons are released.

## 4.0 CALIBRATION



### CAUTION!

Only qualified personnel with training in the safe operation of torque tooling and the B-RAD Select Tool System should operate this tool.

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

Calibration should only be done by a Qualified Calibration Technician. Improper use of the calibration function will result in tool damage.

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.

The B-RAD requires a combination code to enter Calibration Mode. Contact your RAD Distributor or New World Technologies Inc. See Section 7.0 – Contact Us.

### 4.1 Calibration Menu Navigation

The 2-button navigation functions differently in Calibration Mode than in Torque Select Mode.

#### To change values within each menu:

- Press the Up or Down button briefly.
- When changing torque values, the displayed value will change initially by 1 unit per button press.
- After a torque value of a multiple of 10 has been reached, the displayed value will change by 10 units per button press as long as a button is being pressed repeatedly.
- After about  $\frac{3}{4}$  of a second with no button presses, the torque value will again be changed by 1 unit per button press.

**Note:** Pressing and holding buttons to change values in Calibration Mode is not supported.

#### To change which menu appears on the Display:

1. Press and hold the Up button until the corresponding indicator LED begins flashing.
2. While the LED is flashing, press the Down button briefly, then release both buttons.
3. The title of any Calibration menu can be displayed by pressing and holding the Up button without pressing the Down button to navigate to the next menu.
4. To quickly navigate through menus, keep the Up button depressed until the LED flashes, and press the Down button as many times as needed.

## 4.2 Tool Calibration

### 4.2.1 Table of Calibration Menus

The order and function of the menus in Calibration Mode are outlined in Table 4.2.1 below.

Menu Title	Description of Function
G# (G00, G01, ... G18)	Gearbox Select – Sets tool model, maximum, and minimum torque. Each model is shown in Table 4.2.2 below.
CPLO	Calibration Point Low – Sets the minimum energy limit for Calibration, shown in Percentage of Output Energy (default is 14.6%).
CPHI	Calibration Point High – Sets the maximum energy limit for Calibration, shown in Percentage of Output Energy (default is 80.1%).
CAL1, CAL2, CAL3, CAL4, CAL5, CAL6	Tool Calibration Points – Six points to calibrate the tool's range, shown in torque at 3, 20, 40, 60, 80, and 99% of energy output.
SAVE	Save Calibration – Calibration Mode must be exited from this menu to save the calibration settings.

Table 4.2.1: Calibration Menu Titles and Functions

## 4.2.2 Table of Tool Models

The first Menu in Calibration Mode is the Gearbox Select Menu. Table 4.2.2 shows which Gearbox setting in the Menu corresponds to the desired tool model.

Gearbox Designator	Tool Model
G00	<i>Default: 250-500 LbFt</i>
G01	125 – 500 LbFt
G02	170 – 700 Nm
G03	200 – 1000 LbFt
G04	300 – 1400 Nm
G05	300 – 1500 LbFt
G06	400 – 2000 Nm
G07	<i>Custom</i>
G08	<i>Custom</i>
G09	600 – 3000 LbFt
G10	800 – 4000 Nm
G11	<i>Custom</i>
G12	<i>Custom</i>
G13	70 – 350 LbFt
G14	100 – 475 Nm
G15	50 – 200 LbFt
G16	60 – 275 Nm
G17	1000 – 4400 LbFt
G18	1350 – 6000 Nm

Table 4.2.2: Calibration Mode Gearbox Values

**Note:** Odd-numbered gearbox models use LbFt units; even-numbered gearbox models use Nm units.

## 4.2.3 Calibration Procedure

The recommended steps for calibrating the B-RAD Select Tool System are as follows:

1. Install a fresh battery into the B-RAD handle (See Section 2.3.1 – Insert/Remove the RAD Li-Ion Battery Pack).
2. Enter Calibration Mode using the button combination code (contact your RAD Distributor or New World Technologies Inc. See Section 7.0 – Contact Us).
3. Select the correct Tool Model using Table 4.2.2-1 above.
4. Navigate to the next Calibration menu (See Section 4.1 – Calibration Menu Navigation). “CPLO” will be displayed while the Up button is depressed.
5. Before any calibration points are set, it is recommended that the tool is warmed up near the tool’s maximum setting. Navigate forward again to the next Calibration Menu. “CPHI” will be displayed while the buttons are being pressed.



### CAUTION!

**DO NOT** operate the tool above 80.1% before testing lower values.

**DO NOT** operate the tool above 95.7%, as tool and/or joint damage may occur.

6. Set the level displayed on the screen to a value lower than 80%, then take a pull on the calibration stand.
7. If the output torque is much lower than the rated maximum of the tool, gradually increase the tool percentage until the torque readings nearly match the maximum torque of the tool. Do not go beyond the maximum of the tool at this point.
8. Do approximately 10 pulls in “CPHI” mode to warm up the tool.
9. Cycle through the Calibration Mode menus to find the “CPLO” menu.
10. Take a pull at the default setting.
11. Gradually increase or decrease the percentage setting until the tool pulls approximately 50 units *below* the tool’s rated minimum. For example, a 1000 LbFt tool has a minimum of 200 LbFts, so the torque to be reached would be 150 LbFts. See Table 4.2.2 for a full list of B-RAD Tool ranges.
12. Navigate to the next menu (“CPHI”). The previous value will be saved in the Module’s memory.

**CAUTION!**

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

13. Gradually increase the previous value and take pulls until the output torque reaches approximately 50 units *above* the tool's rated maximum torque.
14. Navigate to the next menu in Calibration Mode. The display will show "CAL 1."
15. The display will show a torque value approximately 3% above the minimum set by the level selected in step 11 above.
16. Take one pull at "CAL 1" and record the measured torque value.
17. Enter the torque value by incrementing/decrementing the default torque value (See Section 4.1 – Calibration Menu Navigation).
18. Navigate to the next Calibration menu "CAL 2." Take a pull and record the measured value, as before.
19. Enter the value into the module.
20. Navigate through the Menus and repeat Steps 18-19 for CAL 3, 4, 5, and 6.
21. Finally, navigate to the last menu, "SAVE," then press and hold both buttons until the Display scrolls the message "Saved." This exits Calibration Mode and saves the Calibration Data.

If the B-RAD tool is calibrated in the LbFt version of a gearbox (for example, 1000 LbFt), the calibration values for the equivalent Nm gearbox (for this example, the 1400 Nm gearbox) will be saved in the calibration value table. The same applies if the Nm gearbox is calibrated; the LbFt gearbox will also be saved. The calibration values for other gearboxes will not be saved unless the B-RAD tool is calibrated again for a different tool model.

## 5.0 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 General Power Tool Safety Warnings for more information.

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 operates in Torque Cycles. The Torque 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.

This section instructs the operator in the use of the Reaction Arm needed for B-RAD operation and how to conduct a Torque Cycle.

### 5.1 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.

#### 5.1.1 Installing the Reaction Arm

Ensure that the Reaction Arm and Snap Ring are installed securely to hold the Reaction Arm in place. Make sure that the Reaction Arm is in contact with a solid Reaction Point before you operate the tool. Keep your body parts clear of the Reaction Arm when the tool is in operation.

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 (Figure 5.1.1-1).



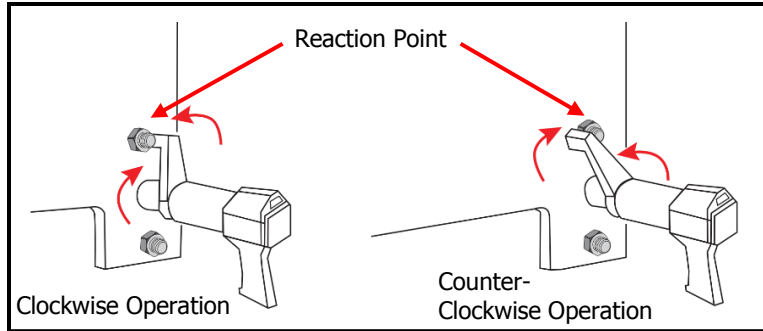


Figure 5.1.1-1 – Reaction Arm Rotation



**CAUTION!**

Keep your hands clear of the Reaction Arm and joint when the tool is in operation (Figure 5.1.1-2).

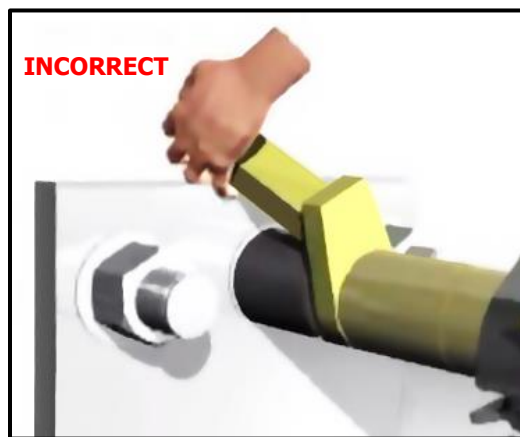


Figure 5.1.1-2: Incorrect Placement of Hand

### 5.1.2 Reaction Arm Height

Ensure that the height of the socket is even with the height of the Reaction Arm (Figure 5.1.2-1). The height of the socket cannot be shorter or longer than the height of the Reaction Arm (Figure 5.1.2-2).

**CORRECT:** The Reaction Arm and socket are even.

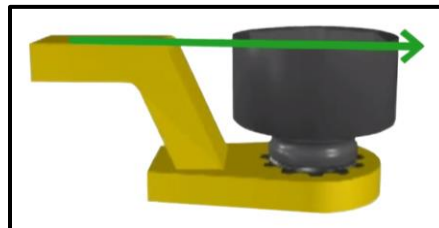


Figure 5.1.2-1: Correct Height

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

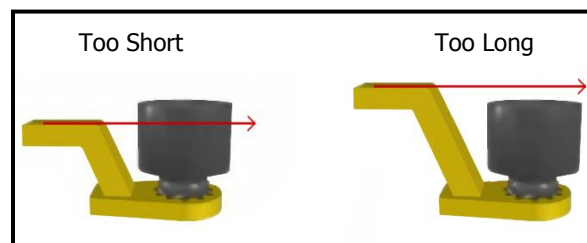


Figure 5.1.2-2: Incorrect Height



### 5.1.3 Reaction Arm Foot

Ensure that the foot of the Reaction Arm aligns with the reaction point (Figure 5.1.3-1). The length of the foot cannot be shorter or longer than the reaction point (Figure 5.1.3-2).

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

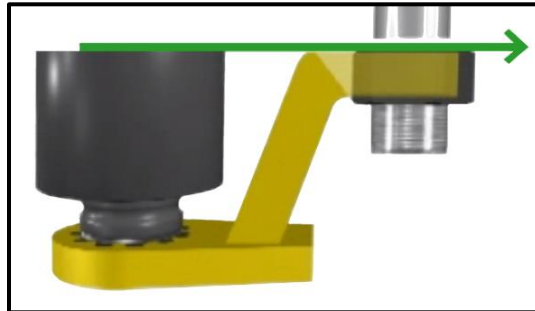


Figure 5.1.3-1: Correct Length

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

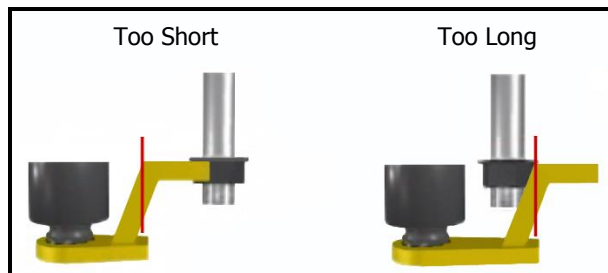


Figure 5.1.3-2: Incorrect Length

### 5.1.4 Reaction Points

Ensure that the Reaction Arm reacts off the middle of the foot (Figure 5.1.4-1). Do not react off the heel of the reaction foot (Figure 5.1.4-2).

**CORRECT:** Reaction Arm is reacting off the middle of the Reaction Arm's foot.



Figure 5.1.4-1: Correct Reaction Point

**INCORRECT:** Reaction arm is reacting off the heel of the reaction arm. This can cause premature tool failure.

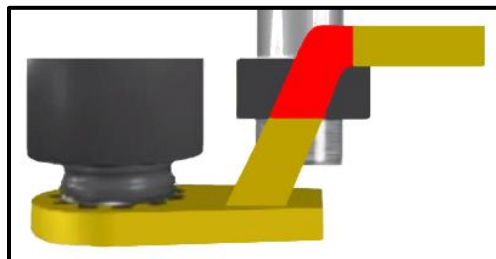


Figure 5.1.4-2: Incorrect Reaction Point

## 5.2 Torque Operation



### CAUTION!

Keep all body parts clear of moving parts and the reaction contact point.

#### To operate the tool in a Torque Cycle:

1. Ensure the tool is in Torque Select mode (example in Figure 5.2-1. Also see Section 3.1 – Torque Select Mode).



Figure 5.2-1: Torque Select Mode

2. Ensure the LED Display is showing the correct units (see Section 3.1.2 – Unit Select Menu).
3. Increment or decrement the displayed torque until the desired torque is displayed.  
**Note:** The Display will increment or decrement by 10 units with a single button push, or by 100 units if a button is held down. See Section 3.1.1 – Setting Torque for more information.
4. The B-RAD Select Tool System will immediately be ready to torque at the displayed setting. Place the B-RAD on the joint system.
5. Ensure the Forward/Reverse Switch is in the Forward position.
6. Press and hold the On/Off Trigger.  
**Note:** To stop the Torque Cycle at any time, release the On/Off Trigger.
7. When the B-RAD reaches the selected Torque, the tool will stop turning. Release the On/Off Trigger.

## 6.0 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 7.0 – Contact Us).

The LED Display 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 Select Tool System; however, as a sensitive electronic device it is susceptible to damage caused by shock, moisture, or excessive force.

## 7.0 CONTACT US

### **New World Technologies Inc.**

30580 Progressive Way  
Abbotsford, BC  
V2T 6Z2  
Canada



**Toll Free:** 1-800-983-0044

**Fax:** 604-852-0269

**Web:** [www.radtorque.com](http://www.radtorque.com)

**Email:** [info@radtorque.com](mailto:info@radtorque.com)

### **Technical Support:**

**Phone:** 1-800-983-0044 (Ext. 227)

**Email:** [eradsupport@radtorque.com](mailto:eradsupport@radtorque.com)

