



Operation and Maintenance Manual

Sweeney Digital Turning Tool (DTT) Model SWE189DTTC

Document Number: L4518

Document Revision: E

Issue Date: 25-APR-2024

Language: English EN



To reduce the risk of injury, user must read and understand this document before use.

ABOUT US

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WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE

Refer to the controller nameplate for the product model number, serial number and other applicable information.



Note: A typical nameplate is shown above. Appearance and details of actual product nameplate may vary.

AVAILABLE LANGUAGES

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1.0 SAFETY

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event that any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

Save these instructions for future use.

If you have never been trained on turbine engine turning equipment and related safety precautions, consult your distributor or service center for information about Enerpac training courses.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING and NOTICE.

WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

NOTICE Indicates information considered important, but not hazard related (e.g. messages related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

1.1 General Safety Precautions



Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the tool or preparing it for use.
- Wear appropriate personal protective equipment (such as safety glasses and face shield). The operator must take precautions against injury due to flying debris caused by possible failure of the tool or workpiece.
- During operation, keep hands and fingers away from the work area to avoid personal injury.

- Keep this manual for future reference in a place that is accessible to all persons operating or servicing the tool.
- Always perform a visual inspection of the tool before placing it into operation. If any problems are found, do not use the tool.

1.2 Electrical Shock Hazards



Risk of electric shock! Failure to observe the following instructions and precautions may result in serious personal injury or death.

- Connect the controller power cord only to a grounded electrical outlet. Use only a power cord with a ground pin.
- Unplug controller power cord from outlet before performing cleaning, maintenance or repairs.
- The tool is intended for *indoor use only*.
- In the event that the tool is used outdoors, do not expose it to rain, standing water or damp conditions. In such cases, the tool should be brought indoors.

1.3 Electrical Safety



Failure to observe and comply with the following precautions may result in death or serious personal injury. Property damage could also occur.

- High voltage is present inside the tool even when tool drive motor is off. Before servicing the tool, be sure that the controller power cord is disconnected from the electrical outlet or other electrical power source.
- Do not leave the tool unattended in the workplace when the controller is connected to AC power supply. Take all reasonable precautions to avoid unauthorized use.
- If it is not possible to unplug the power cord from the AC power outlet, the power must be turned off and locked out at the AC power supply.
- Always disconnect the controller from AC power before transporting it.
- Be sure that controller power is switched off before connecting or disconnecting the motor cable.
- Make sure the controller cooling vents are unobstructed and free of dirt or dust.
- Do not service or clean the tool while the tool is operating and/or if controller is connected to AC power supply.

1.4 Grounding Instructions



WARNING

Failure to observe the following instructions and precautions may result in serious personal injury or death.

- The tool must be properly grounded. In the event of malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. The controller is equipped with a cord having an equipment grounding conductor.
- A grounding plug is included with the cord. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.
- Improper connection of the controller grounding conductor can result in electric shock.
- If the cord and/or plug are damaged, do not connect the controller to a live electrical outlet. Repair or replace the damaged items as required and be sure the grounding conductor is properly wired before reconnecting the tool to the outlet. Consult a qualified electrician if grounding conductor wiring procedures are not completely understood or if there is any doubt as to whether the tool is properly grounded.
- Do not modify the plug provided with the controller. If the plug will not fit in the outlet, have a proper outlet installed by a qualified electrician.
- A qualified electrician should be consulted if there is any doubt as to whether an outlet box is properly grounded.
- The controller is equipped with an electric power cord and plug specific to its rated single phase voltage. No adapter should be used with the plug.
- If the controller must be reconnected for use on a different type of electric circuit, the reconnection should be made by a qualified electrician. After the reconnection, the tool should comply with all local codes and ordinances.

1.5 Use of Extension Cords



WARNING

Failure to observe the following instructions and precautions may result in serious personal injury or death.

- Use the proper size extension cord with the controller power cord when use of an extension cord is necessary. A qualified electrician should be consulted to help specify and select the proper size extension cord. The marked electrical rating of the extension cord should be at least as great as the electrical rating of the tool.
- A long extension cord should be arranged so that it will not drape over any working area where it can be tripped over, snagged, or pulled on unintentionally.

- If the tool is to be operated outdoors and an extension cord is needed, use only an outdoor use extension cord. An outdoor use extension cord will be clearly marked with the suffix letter “W” and the statement “Suitable for Use with Outdoor Appliances”.

1.6 Disconnecting Power



WARNING

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Be sure that controller power is switched off before disconnecting plug from electrical outlet.
- Do not unplug the controller by pulling on the cord. To unplug, grasp the plug, not the cord.
- Disconnect plug from electrical outlet when the tool is not in use and before servicing or cleaning the tool.

1.7 Pendant Battery Safety Precautions



WARNING

Lithium ion batteries may explode or burn due to improper use.

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Always use the correct batteries for the pendant. Do not attempt to use a non specified battery. Refer to Section 3.3 for required battery type.
- Install the batteries in the proper polarity. Observe (+) and (-) marks.
- Do not attempt to crush, incinerate, short circuit or disassemble the batteries. Doing so may cause fire, explosion and burns.
- Always store and transport rechargeable batteries in a safe, non-conductive container (never keep a spare battery loose in a pocket, purse, etc. and always use protective cases).
- Keep batteries and pendant away from flames and heat.
- Do not probe the batteries or pendant with conductive materials.
- Do not expose the batteries or pendant to wet conditions or excessive humidity.
- Do not use any rechargeable battery if any visible damage is present, or if known mishandling, accidental or otherwise, has occurred
- Do not attempt to repair or modify the batteries.
- Store spare batteries in a cool, dry environment and in a secured area, away from children and pets.
- Refer to battery manufacturer’s instructions for complete battery safety information.

1.8 Pendant Battery First Aid



Failure to observe and comply with the following precautions could result in death or serious personal injury.

Although uncommon, electrolyte may be ejected from the pendant batteries if damage, short-circuiting, overheating or abuse occurs. Avoid contact with electrolyte. If contact accidentally occurs, proceed as follows:

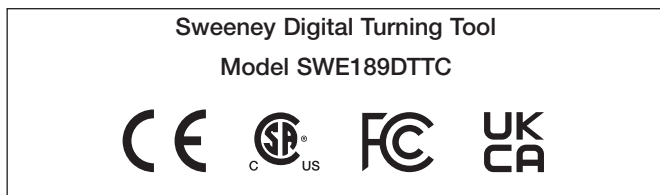
- If you get electrolyte in your eyes, flush with water for 15 minutes without rubbing and immediately contact a physician.
- If you get electrolyte on your skin, wash the area immediately with soap and water. If irritation continues, contact a physician.

If a battery is ingested, call your local poison control center immediately.

Refer to battery manufacturer's instructions for complete battery first aid information.

2.0 COMPLIANCE

2.1 Compliance Statement



Enerpac declares that the Sweeney Model SWE189DTTC Digital Turning Tool (DTT) has been tested, conforms to applicable standards and is approved to carry the CE, CSA, FCC and UKCA certification marks.

NOTICE A copy of the EU Declaration of Conformity is enclosed with each shipment of the product.

2.2 Wireless Certifications

The Sweeney Digital Turning Tool (DTT) uses wireless technologies for the pendant controls. Certified Bluetooth low energy chipsets are used in both the pendant/transmitter and the controller/receiver.

Wireless certification tests, per FCC, ISED and CE-EMC & Wireless were conducted by TUV-SUD America in their wireless lab. The unit passed all the tests and carries the FCC/ISED ID number of the certified chip sets.

3.0 SPECIFICATIONS AND PRODUCT DATA

3.1 Weights

Item	Weight	
	lb	kg
Controller*	5.5	2.5
Foot Pedal**	1.3	0.6
Pendant**	1.8	0.8
Drive Motor**	9.8	4.4
Transport Case	10.8	4.9
Total System (all components)	29.2	13.2
* Includes AC power cord		
** Includes connecting cable		

3.2 Electrical Specifications

Item	Specification
Voltage	100-240 Volts AC
Hertz	50/60 Hz
Watts	200 W
Circuit Breaker Rating	10 Amps
Power Cords (included with unit)	NEMA 5-15 and SCHUKO
NOTE: Mains supply voltage should be within ± 10% of the rated voltage.	

3.3 Additional Specifications

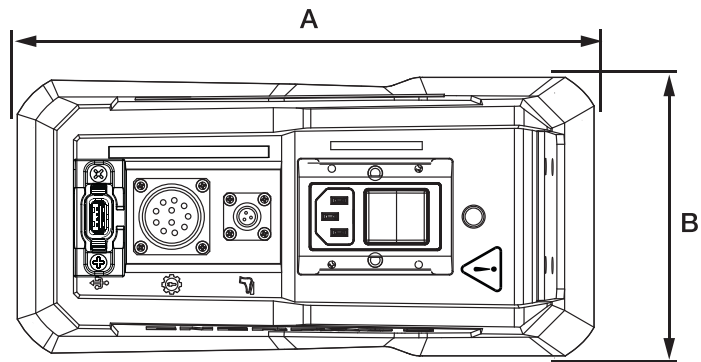
Item	Specification
Pollution Degree	2
Installation Category	II
Max Altitude	6562 ft [2000 m]
Relative Humidity	0 to 95% (non condensing)
Operating Temp Range	41°F to 104°F [5°C to 40°C]
Environment	For indoor use only

3.4 Operating Parameters

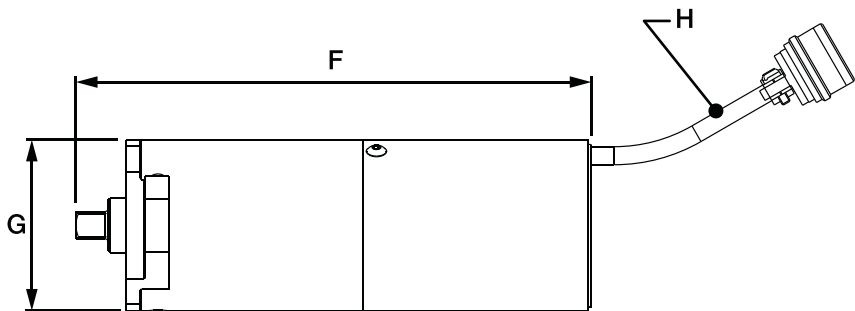
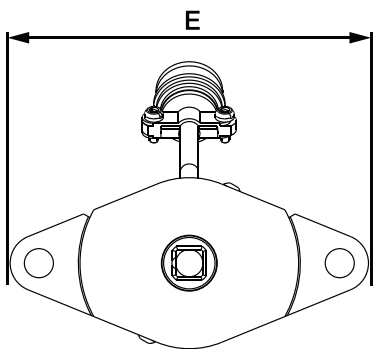
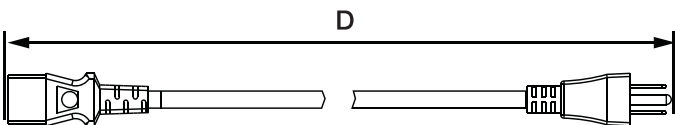
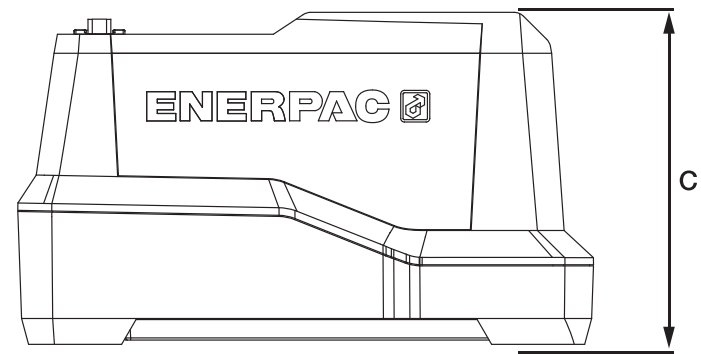
Item	Operating Parameter
Speed	Continuously variable 20°/min - 360°/min
Direction	Bidirectional Adjustable backlash compensation
Torque	30 ft lbs - 150 ft lbs User selectable
Acceleration/ Deceleration	0.2 sec - 5 sec Incrementally adjustable
Dwell Timer	0 - 60 sec Can be held indefinitely by user
Blade Counter	Displays current blade number
Blade Flagging	Maximum 999 flags per stage can be flagged for re-inspection
Pendant	Displays engine, stage and blade information 9-button interface with wireless capability
Pendant Batteries (rechargeable)	Liion Wholesale, Model No. LGMJ1PCB 3.6V, 3500 mAh (each battery) UL 2054 & IEC 62133 certified Quantity: 2 Enerpac Part No. SWE189DTTAK10

3.5 Dimensions - Controller and Drive Motor

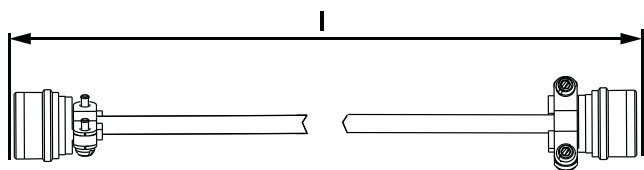
Dimension	in	mm
A	9.93	252.2
B	4.79	121.8
C	5.76	146.2
E	6.55	166.4
F	9.43	239.4
G	3.13	79.4
H	3.13	79.4
Dimension	ft	m
D	6.0	1.8
I	20.0	6.1



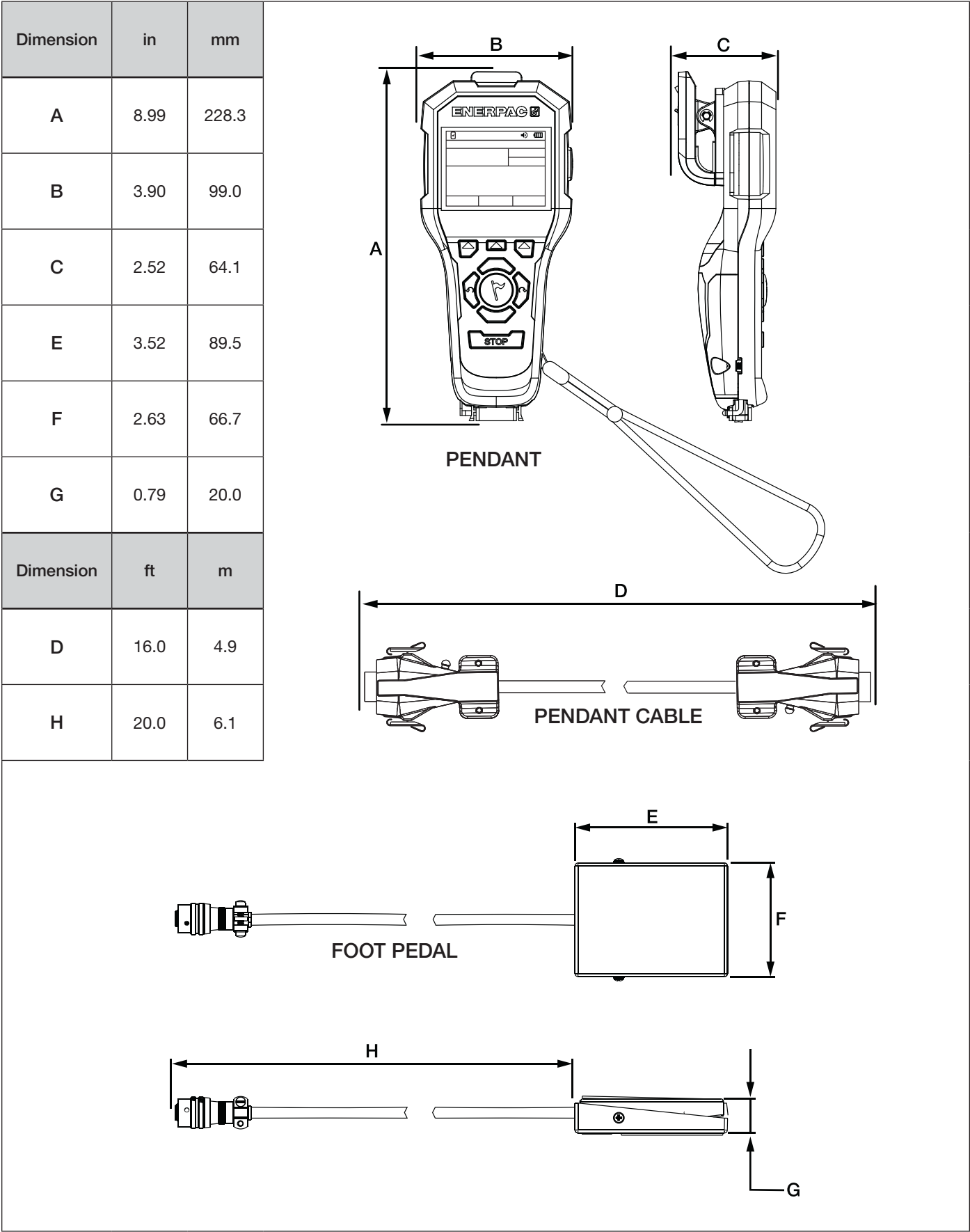
CONTROLLER



DRIVE MOTOR

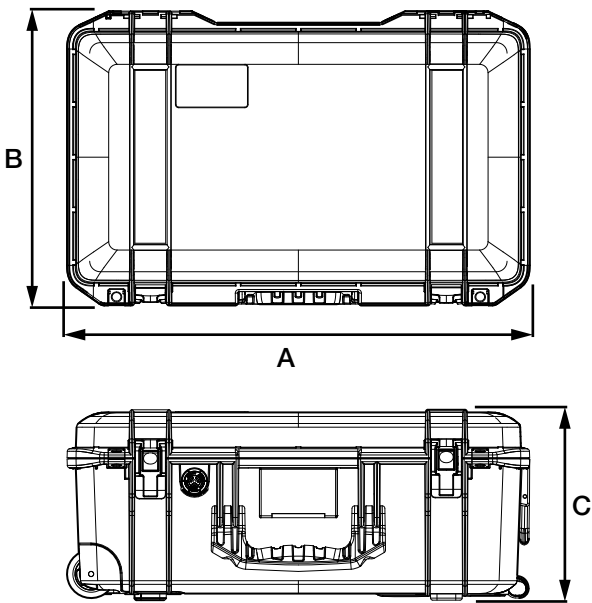


3.6 Dimensions - Pendant and Foot Pedal



3.7 Dimensions - Transport Case (Travel Size)

Dimension	in	mm
A	21.96	557.8
B	13.97	354.8
C	8.85	224.8



4.0 DESCRIPTION

The Sweeney Digital Turning Tool (DTT) provides a highly accurate way of rotating components of a turbine engine to facilitate inspection of the engine with the use of a borescope. The system controls a motor and gear assembly that turns the turbine engine at a controlled rate of rotation by a controlled number of degrees forward or reverse to position engine turbine blades for inspection by the operator.

There are three major components of the DTT system: the controller, the pendant and the drive motor.

The controller acts as the heart of the system to which the pendant, drive motor and foot pedal are connected.

The pendant features a custom membrane keypad with marked, easy to reach buttons. The pendant can be operated wirelessly via Bluetooth or wired using a USB cable. The pendant's graphic display features *wide angle viewing* and *all light readability* characteristics. A clip is included to suspend the pendant for ease of use and clear vision. All movement commands and adjustments to settings and options are communicated through the pendant display.

The drive motor unit consists of a small electric motor and a custom engineered gearbox which can be coupled to various aircraft engine drive pad adaptors. Output torque is adjustable from 30 to 150 ft lbs. Speed is adjustable from 20°/min to 360°/min.

The foot pedal is provided as a convenience and is not required to operate the tool.

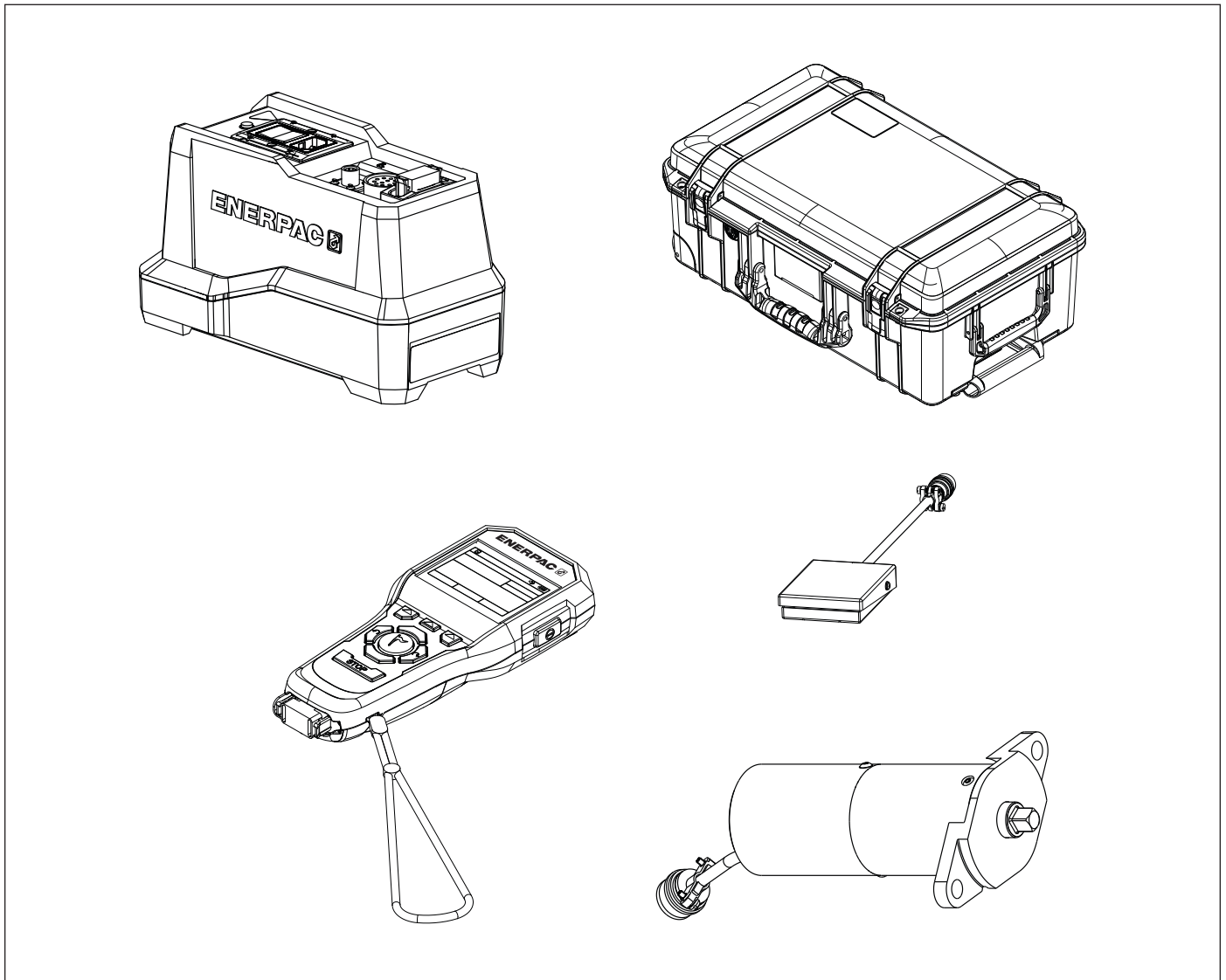
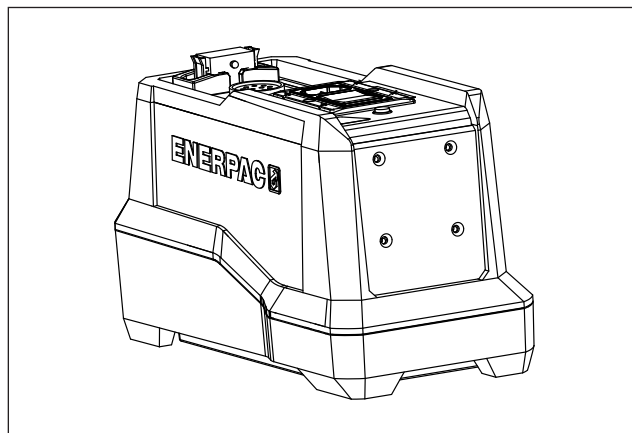
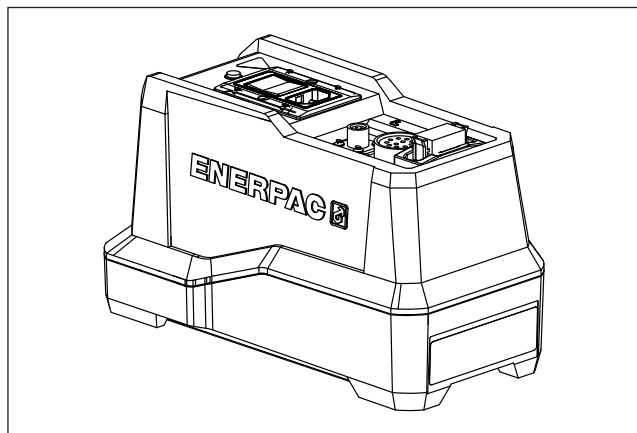


Figure 1: Digital Turning Tool

5.0 FEATURES AND COMPONENTS



Key:

- | | |
|--------------------------------|--|
| 1. Pendant USB Connection | 4. AC Power Inlet Connector (NEMA C14) |
| 2. Drive Motor Cable Connector | 5. Power On-Off Switch and Circuit Breaker |
| 3. Foot Pedal Cable Connector | 6. Power Indicator Light |

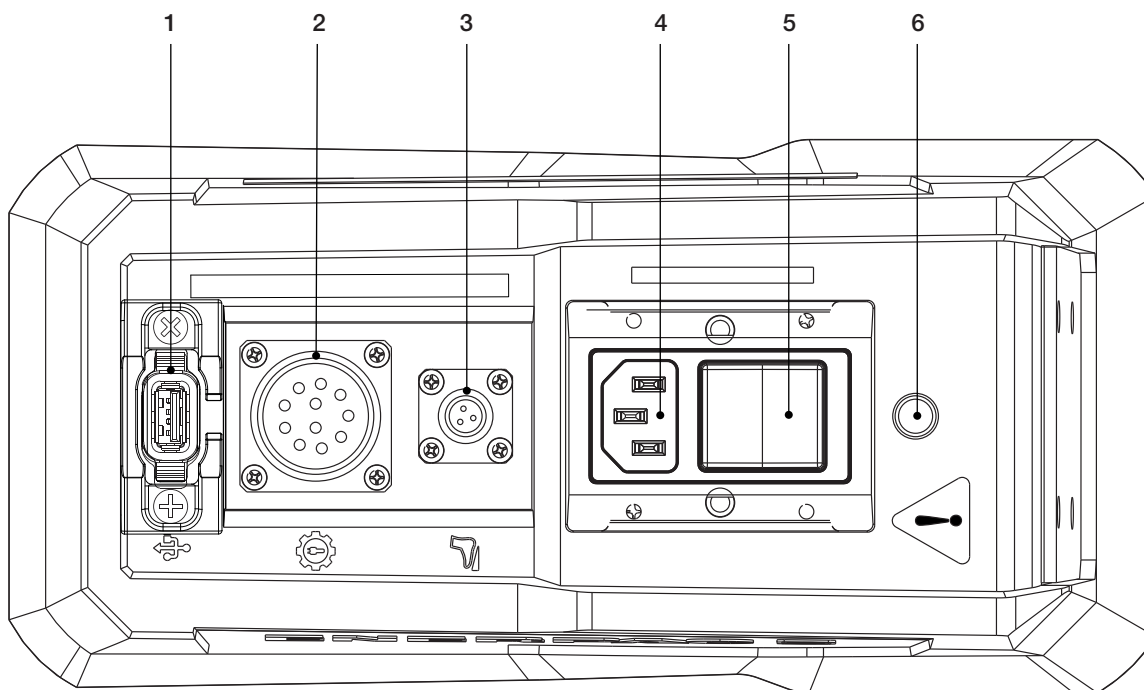
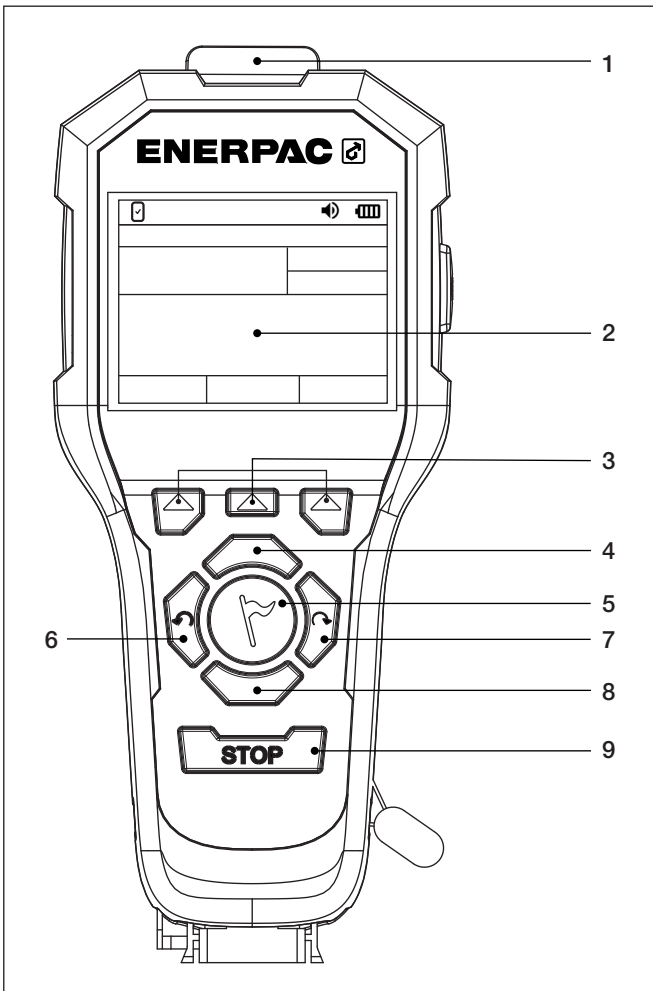


Figure 2: Controller



Key:

1. Adjustable Clip
2. LCD Screen Display
3. Function Buttons
4. Up Arrow Button
5. Flag Button
6. Counter-Clockwise (CCW) Rotation Button
7. Clockwise (CW) Rotation Button
8. Down Arrow Button
9. Stop Button
10. Pendant On-Off Button
11. Wrist Strap
12. Pendant USB Connection *
(under protective cover)
13. Pendant USB Cable *

* For pendant battery charging and wired pendant operation.

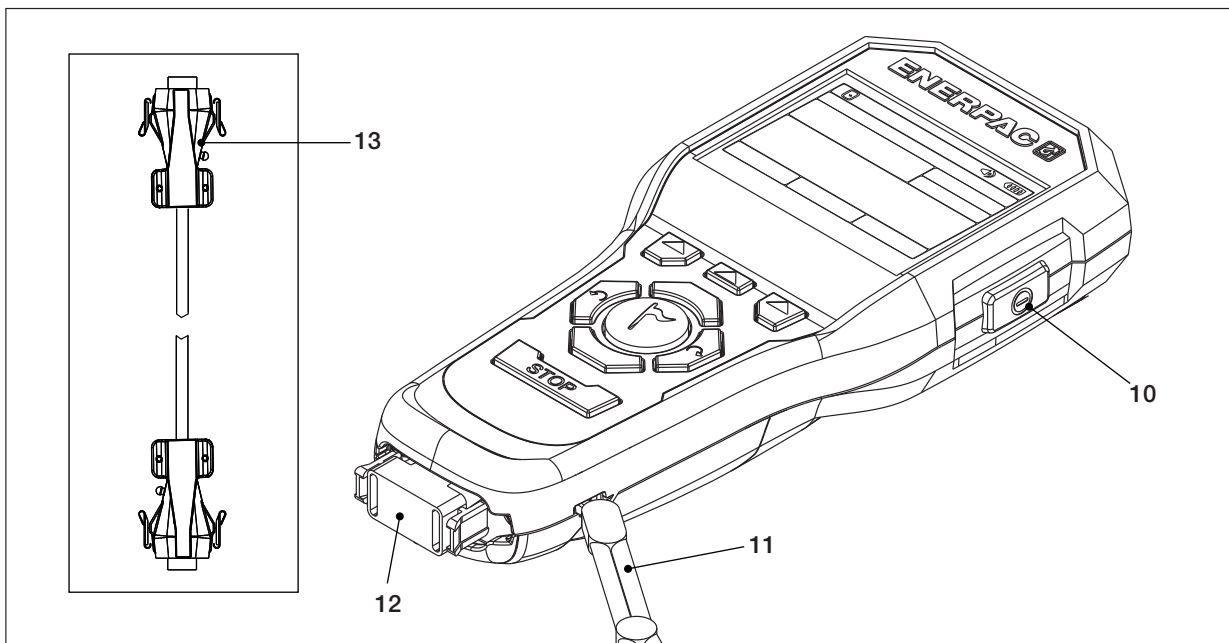


Figure 3: Pendant

NOTICE To prevent damage to controller electrical circuits, be sure power on-off switch is in the OFF (●) position before connecting or disconnecting drive motor cable.

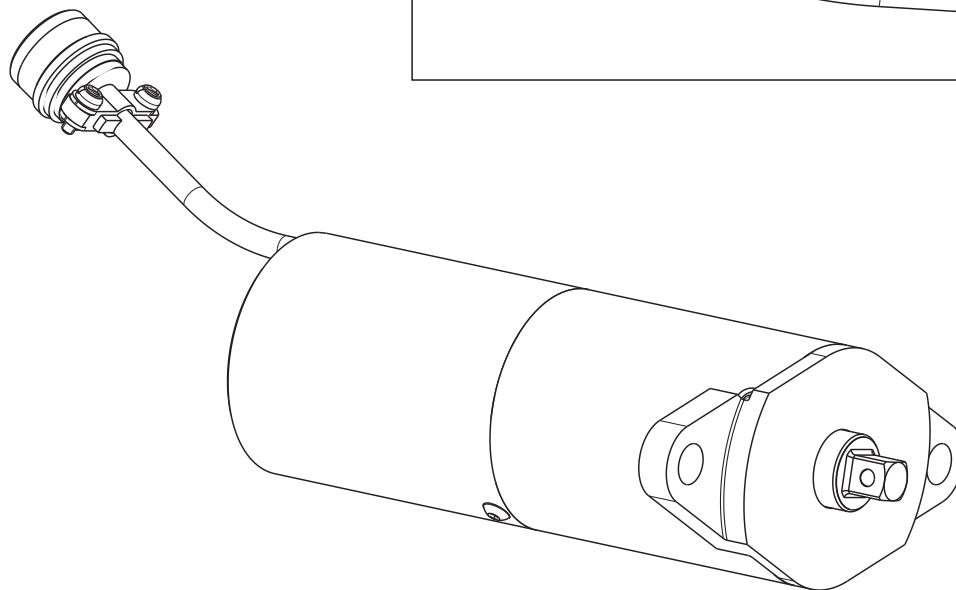


Figure 4: Drive Motor and Connecting Cable

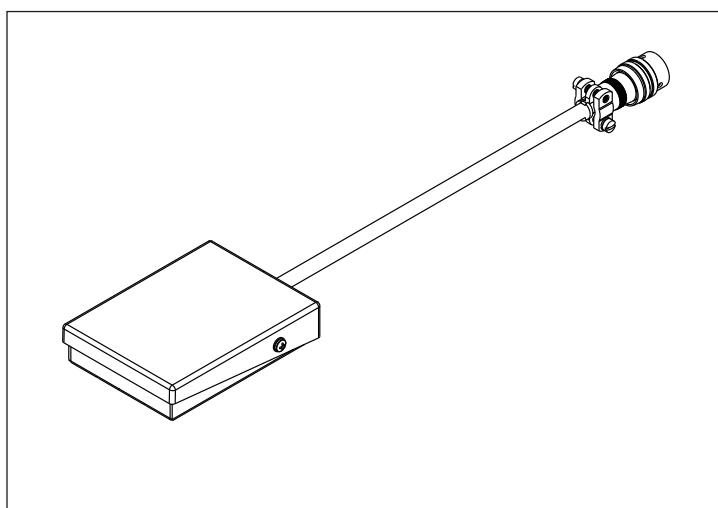


Figure 5: Foot Pedal

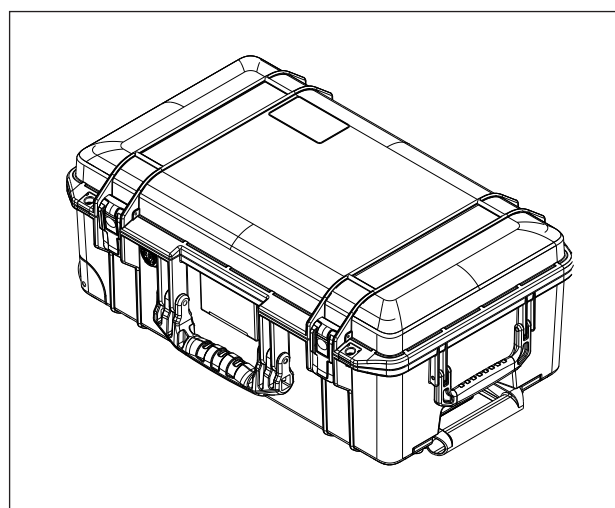


Figure 6: Transport Case

5.1 Drive Motor

The drive motor consists of a small electric motor with a custom gearbox capable of coupling to various aircraft engine drive pad adaptors.

Output torque is adjustable from 30 to 150 ft lbs. Speed is adjustable from 20°/min to 360°/min.

5.2 Pendant

A remote control pendant is provided with the DTT. The back of the pendant contains an adjustable clip capable of accepting 3/4 inch diameter tubing for placement on non magnetic surfaces.

The pendant can be operated via the standard 16 ft [4.9 m] USB Type A cable or wirelessly via a Bluetooth connection (Refer to Section 7.5 of this manual).

Tool operation is controlled using the 9 button interface on the pendant. Operational status is communicated via the pendant LCD screen.

5.3 Controller

The controller consists primarily of a housing, cover, power supply and printed circuit boards capable of tracking and executing all communications between the pendant and drive motor. Refer to Section 6.0 for power requirements.

The top of the controller features unique connectors to ensure that the drive unit, foot pedal, AC power cord and pendant are connected in the proper locations.

One USB type A port is provided for charging the pendant batteries or applying system level firmware updates via a USB drive. If desired, this port can also be used for wired pendant operation.

5.4 Foot Pedal

The foot pedal consists of a switch unit and cable assembly, which is connected to the pedal connector located on the front panel of the controller. When in MANUAL mode, the foot pedal is used to control engine rotation. When in AUTO mode, the foot pedal provides a hands-free way to flag blades during the inspection.

5.5 Transport Case

A Pelican™ brand transport case is provided for safely moving and storing the tool. The tool can be operated while leaving the controller in the case if the lid is open.

This travel size case is supplied with most DTT units. However, if the tool is ordered with attachments, a special larger size transport case may be provided.

6.0 POWER REQUIREMENTS

The controller features auto-voltage sensing circuitry and operates at 100-240 VAC, 50/60 Hz. The power inlet is a NEMA C14 connection.

Two different power cords are provided with the controller.

One power cord has a NEMA 15-5 plug for use with North American 120V/60Hz electrical outlets. The other power cord has a SCHUKO plug for use with European 230V/50Hz electrical outlets.

Before connecting AC power to the controller, be certain that power being supplied at the electrical outlet is in accordance with the previously stated electrical requirements, which are also shown on the controller nameplate.

Also refer to sections 1.4 and 1.5 of this manual for important electrical safety information and precautions.

⚠ WARNING Failure to follow the electrical safety precautions contained in sections 1.4 and 1.5 of this manual could result in electric shock. Death or serious personal injury could occur.

7.0 SET UP

7.1 Delivery and Handling

Upon delivery, all components must be inspected for damage incurred during shipping. If damage is found, the carrier should be notified at once. Shipping damage is not covered by the Enerpac warranty.

7.2 Before Start-up

- Be sure that the shipment includes all components and that there is no obvious damage.
- Read the following sections of this manual to become familiar with DTT features and safety devices.
- Verify that the AC power supply is of the correct specifications and capacity to power the tool.

7.3 Cable Connections

Ensure that all cables are properly connected to the controller before using the tool. Each connector is labelled with the corresponding cable icon to help prevent improper connections.

1. Be sure that the controller power on-off switch is in the OFF (o) position.

NOTICE Be certain that controller power is off before connecting the drive motor cable in the following steps. Connecting or disconnecting the drive motor cable while power is on may result in permanent damage to controller electrical circuits. Such damage is not covered under the product warranty.

2. Connect the drive motor cable to the controller by lining up the bosses on the male connector with the notches in the female connector.
3. Push the male connector into the female connector. With the connector fully inserted, turn the locking ring a quarter turn to lock the connectors together.
4. At the drive motor end, connect the drive motor cable by aligning the bosses with the notches and pushing the male connector into the female connector. With the connector fully inserted, turn the locking ring a quarter turn to lock the connectors together.

5. (OPTIONAL) If the foot pedal is being used, connect the foot pedal cable by aligning the bosses with the notches and pushing the male connector into the female connector.
6. Connect the AC power cord to the controller power inlet connection and to an electrical power source of the correct specifications. Refer to Section 6.0 for AC power requirements.

7. Connect the pendant to the controller using the provided USB cable.

NOTICE The USB cable connectors can be inserted only one way. Before inserting, align protruding tab on USB connector with matching notch in USB socket. To prevent damage, do not force USB connector into socket if it does not fit.

NOTICE As part of the initial setup process, the pendant must first be connected and paired to the controller using the USB cable. After completing the wired pairing process, the pendant can then be paired to the controller via Bluetooth for wireless operation. Refer to instructions in sections 7.5.1 and 7.5.2 of this manual.

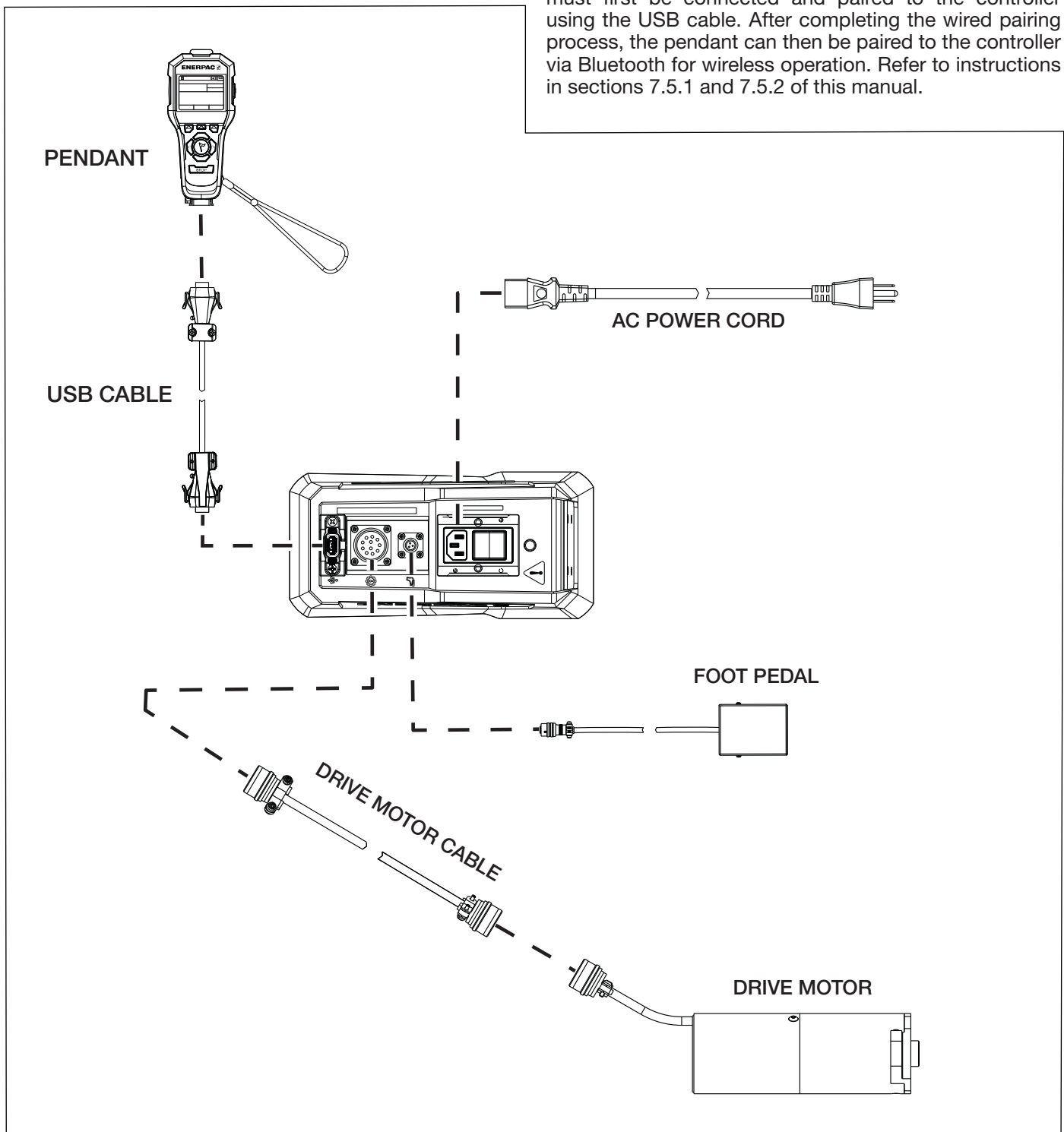


Figure 7: Connections Overview

7.4 Powering Up

1. To power-up the controller: Press the ON (I) half of the power on-off switch located on the top of the controller. The controller power indicator will illuminate with a white light, indicating that the unit is on.
2. To power-up the pendant: Press and hold the power button on the side of the pendant housing until the pendant emits two audible beeps. Then, release the button. The pendant screen will illuminate approximately 3 seconds after the power button is pressed.

NOTICE If the pendant screen will not illuminate, or if the pendant low battery alert appears, charge the pendant batteries. Refer to Sections 11.1 and 11.2 for instructions.

7.5 Pendant Setup

After the initial power-up of a new DTT unit, the pendant must be connected to the controller via the supplied USB cable and the pendant must be paired with the controller as described in Section 7.5.1.

This wired pairing process must be performed for complete new DTT systems or whenever a new (replacement) pendant or controller is being used.

After this initial tethered connection is made, the controller and pendant will remember each other, and wireless pairing is possible as described in Section 7.5.2.

7.5.1 Wired Pairing

NOTICE If this is the first time the pendant and controller have been paired, the pendant must be paired **with the pendant cable connected**, as described in the following steps.

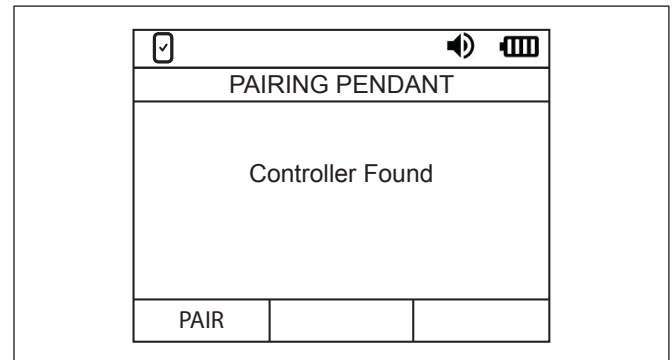
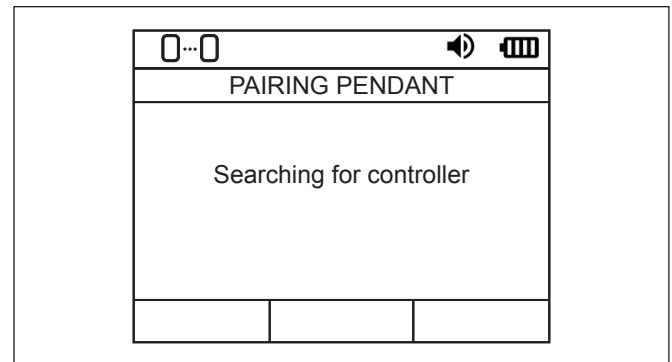
1. Using the provided USB cable, connect the pendant to the controller USB port.

NOTICE The USB cable connectors can be inserted only one way. Before inserting, align protruding tab on USB connector with matching notch in USB socket. To prevent damage, do not force USB connector into socket if it does not fit.

2. Upon pendant power-up, a screen will display indicating that the pendant is searching for a controller to pair to.
3. A confirmation screen indicating the controller has been found will appear.
4. Press PAIR to confirm the pairing.
5. The boot-up screen will appear with the current software revision displayed.

NOTICE After the boot-up screen appears in step 5, the pendant cable can be disconnected if wireless operation is desired. Or, it can remain connected for wired operation.

6. If wireless operation is desired, follow the steps in Section 7.5.2 to complete the Bluetooth wireless pairing procedure.



7.5.2 Wireless Pairing

1. Ensure pendant batteries are sufficiently charged.
2. If the pendant is being used wirelessly and has previously been paired with the controller using the USB cable, a screen will display upon power-up indicating that the pendant is searching for the controller to pair to.
3. If a nearby controller is found, a confirmation screen will appear, indicating the controller has been found.
4. Press PAIR to confirm the pairing.
5. The boot-up screen will appear with the current software revision displayed.

7.5.3 Pendant Lost Signal Alarm

If the pendant moves out of the controller's wireless range (wireless mode) or if the USB cable is disconnected from the pendant (wired mode), a beeping alarm will sound, alerting the user that the pendant signal has been lost.

If this occurs, the pendant power must be cycled off and on, and the pendant must then be re-paired with the controller as described in sections 7.5.1 and 7.5.2.

8.0 TURNING TOOL INSTALLATION

Always follow the steps in this section in sequential order when installing the tool.

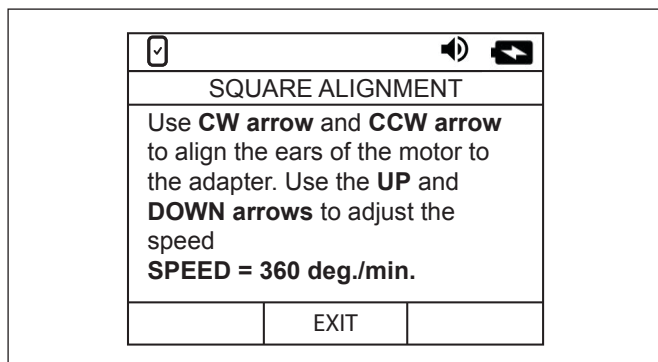
8.1 Mount the Engine Adaptor

Mount the engine interface adaptor on the respective drive pad of the engine gearbox.

Captive screws are included with each adaptor for mounting. However, mounting methods will vary and may include hex bolts, studs, captive screws, or clamps (user-supplied). Ensure the proper mounting fasteners are being used for the engine being inspected.

8.2 Attach Drive Motor to Engine Adaptor

1. Ensure the controller is powered on, the pendant is paired, and the drive motor is properly connected to the controller. The square alignment screen will be visible after pairing is completed.

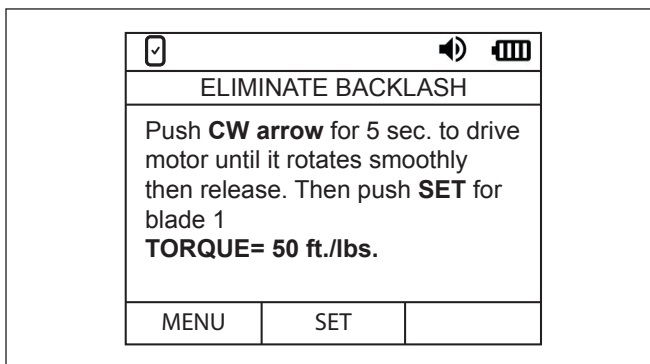


2. To install the drive motor on the engine interface adaptor, first line up the square drive and the flange bolt pattern.
3. Use the CCW or CW buttons on the pendant to change the direction of the motor so the drive motor flange bolts line up with the engine interface adaptor.
4. After the ears of the motor are aligned to the adaptor, secure the drive motor to the adaptor.
5. Torque by hand or wrench to set.
6. After securing the drive motor, press EXIT.

8.3 Perform Backlash Elimination Procedure

NOTICE It is recommended that the backlash elimination procedure be performed before starting any borescope inspection in order to remove all clearance in the gear train between the DTT drive motor and the engine to be inspected. This ensures that when the motor rotates, the engine blades are in sync with motor input.

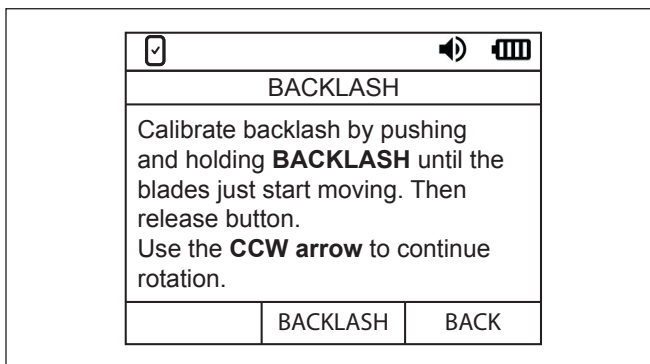
After performing the square alignment procedure, the eliminate backlash screen will automatically appear:



1. Press and hold the CW key until the engine rotates. Then immediately release the CW key.
2. Press SET to designate the Blade 1 location.
3. Backlash is now eliminated. You are ready to begin your engine inspection.

8.4 Perform Backlash Calibration Procedure (only if direction is changed)

The drive motor rotates by default in the clockwise (CW) direction after the controller is powered on. When the drive motor direction is changed from clockwise (CW) to counter-clockwise (CCW) rotation for the first time, the backlash screen will appear automatically:



The backlash calibration procedure calculates the difference between the gear mesh in each direction and is performed as described in the following steps:

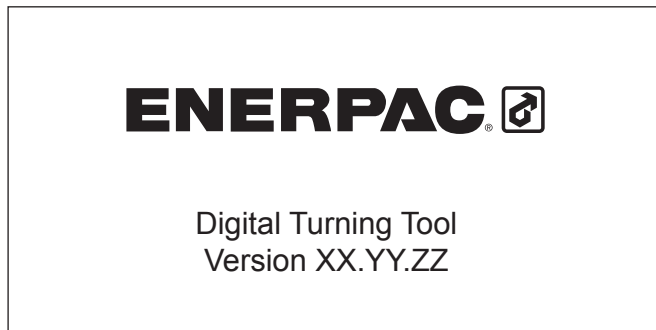
1. When the backlash screen appears, Press and hold the backlash button until the engine just begins to turn, then immediately release the button.
2. The digital turning tool has automatically captured the correct backlash value. Resume engine inspection in the newly chosen direction.

After the backlash has been calibrated, the DTT will automatically implement the proper backlash gap in the meshed gearing after every future direction change. This gap will continue to be maintained until the controller is powered off and restarted or until a different engine model is selected.

9.0 PENDANT SCREENS OVERVIEW

9.1 Splash Screen

Upon successful calibration of backlash, a splash screen will display the Enerpac logo as well as the current firmware version of the tool.

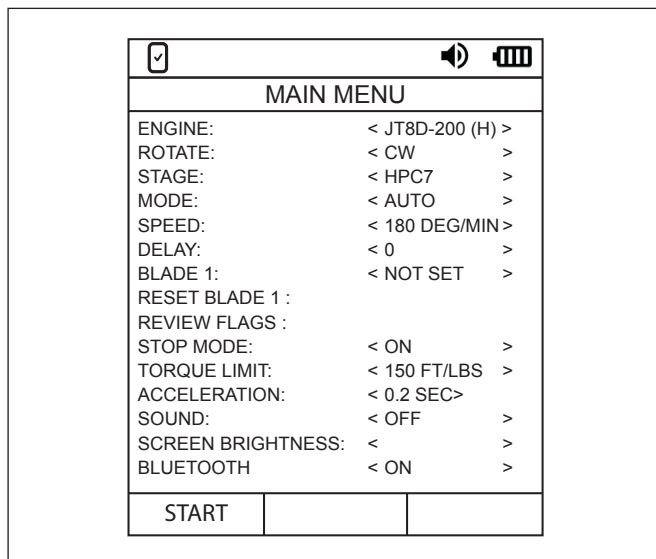


- XX is the pendant version
- YY is the controller version
- ZZ is the engine library version

When applying firmware updates provided by Enerpac, this numerical sequence will update to correspond with the numerical sequence of the applied firmware update.

9.2 Main Menu

The main menu contains user adjustable settings which allow the user to tailor the DTT to specific engine rotation requirements and user inspection preferences.



9.2.1 Engine

Select to scroll through all engines that are in memory.

9.2.2 Rotate

Select to change the direction of rotation, CW (clockwise) or CCW (counter-clockwise).

9.2.3 Stage

Select to change the selected engine stage.

9.2.4 Mode

Select to change between MANUAL or AUTO mode:

- MANUAL mode enables engine turning by pressing and holding the CW or CCW button, or depressing the foot pedal.
- AUTO mode cycles the blade automatically, stopping at each blade for the time specified in the DELAY menu.

9.2.5 Speed

Select to determine the number of degrees per minute the engine will rotate, adjustable from 20 to 360 degrees per minute.

9.2.6 Delay

Select to change the length of time of the pause at each blade when in AUTO mode.

9.2.7 Set Blade

To set the Blade 1 position, select this option. Blade 1 must be set in order to track blade numbers on the pendant screen. If Blade 1 is not set, "?" will appear instead of a number.

9.2.8 Reset Blade 1

Press to reset the Blade 1 position. To set Blade 1 from the main menu, highlight "Reset Blade 1" and then press the flag button.

9.3 Review Flags

After inspection, use this option to review all flagged blades (up to 999 blades can be flagged per engine).

To select review flags, press the flag button.

If you want to rotate to a flagged blade, press the GOTO button and the engine will automatically rotate to that blade.

Continue until all blades that you want to review have been reviewed. Press EXIT to return to the main inspection menu.

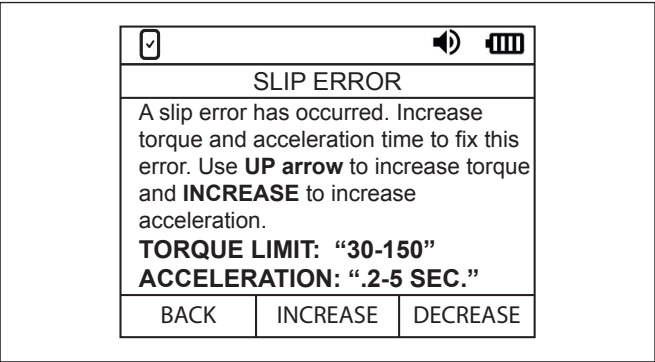
NOTICE If the user selects the review flags option and presses the start button, the inspection screen will appear (not the review flags screen).

9.3.1 Stop Mode

Select to turn stop mode on or off. This is a YES or NO selection. When in stop mode, rotation stops at Blade 1 after 360 degrees of rotation have been achieved. Stop Mode is on by default.

9.3.2 Torque Limit

Select to determine the torque level at which the engine will be rotated. If this limit is exceeded, the drive motor will slip and a SLIP ERROR message will appear.



9.3.3 Acceleration

Select to set the acceleration/deceleration at which the motor will perform before it reaches next blade.

9.3.4 Sound

Select to mute or unmute pendant sounds. When sound is on, the speaker icon appears at the upper right of the pendant screen. When sound is muted, the muted speaker icon appears.

Note that the pendant will still sound an alarm if the wired or wireless connection to the controller is disrupted, even when sound is muted.

9.3.5 Screen Brightness

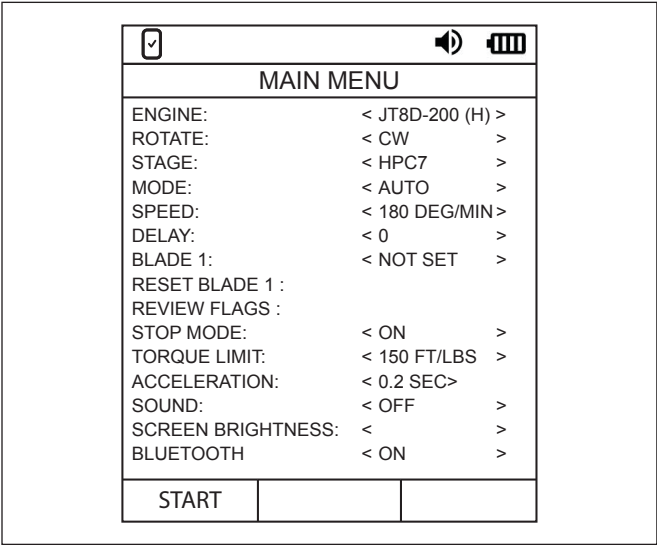
Select to adjust the screen brightness.

9.3.6 Bluetooth

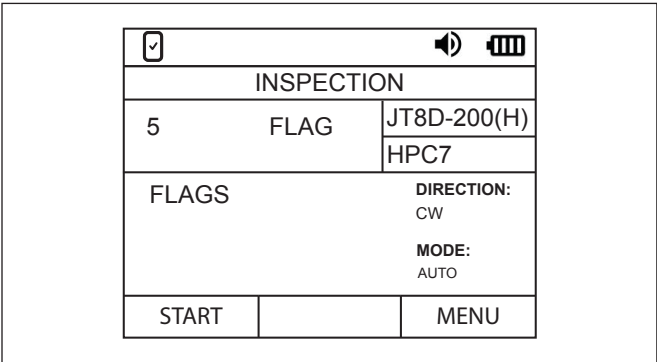
Select to turn the remote pendant Bluetooth signal on or off.

10.0 BEGINNING THE INSPECTION

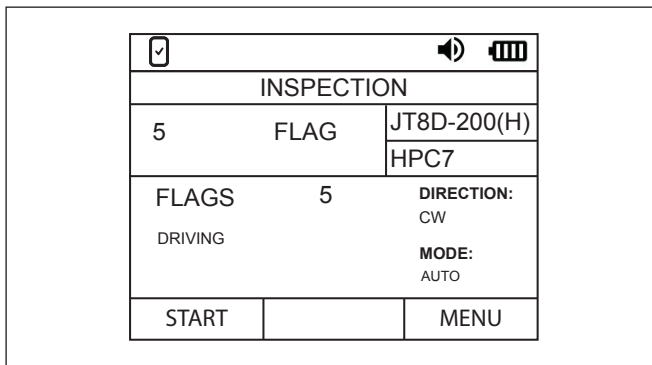
After all options have been set to the appropriate values in the main menu screen, it is time to begin the inspection. Use the left most function key to press START.



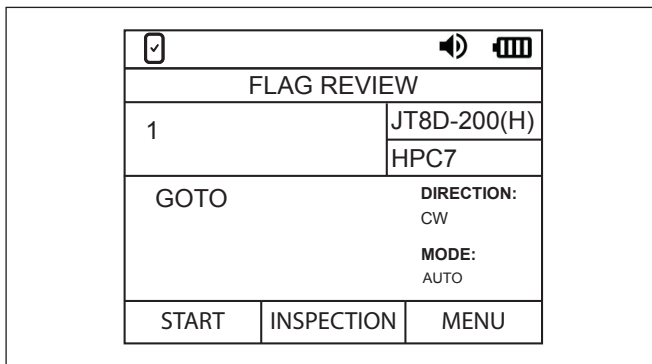
Upon pressing START, you will be taken to the main inspection screen.



- If in manual mode, press and hold the CW or CCW button to start rotating the engine. Release the button to make the engine come to a controlled stop.
- If in AUTO mode, the controller will cycle the blade automatically, stopping at each blade for the time specified in the DELAY menu.
- At any time, press the FLAG button to flag a blade. This allows you to return to potentially damaged blades for further review after the inspection is complete. Upon flagging a blade, the blade number flagged will appear on screen; this list will build with each blade number flagged.



- If for any reason you need to change any of the preset values, press STOP and then EXIT to return to the main menu. After any changes are made, press START and START again to continue the inspection where you left off.
- After the inspection is complete, you can review flagged blades.



11.0 MAINTENANCE

11.1 Charging the Pendant Batteries

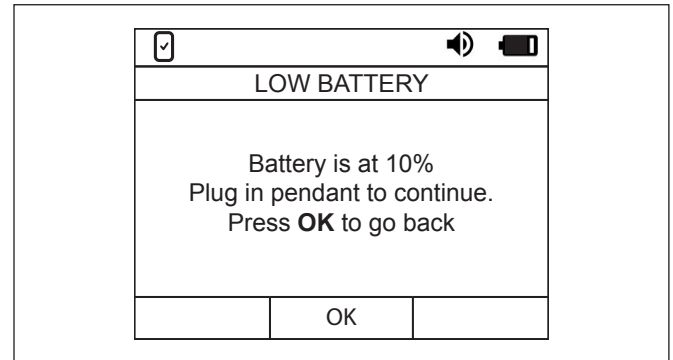
The pendant batteries should be charged before use. A visual indicator located in the upper right hand corner of the pendant screen indicates the battery charge level.

ICON	CHARGE LEVEL
	FULL CHARGE
	75%
	50%
	25%
	CHARGING

Figure 8: Pendant Battery Charge Indicator

Run time between battery charges is dependent on the application, pendant run time, and other factors.

A low battery alert will appear if the battery charge drops to about 10 percent of maximum charge.



If the pendant screen does not illuminate when the pendant on-off button is pressed, connect the pendant USB charging cable and charge as needed.

11.2 Additional Battery and Charging Information

In order to charge the pendant batteries via the USB port on the controller, the controller must be powered on. The pendant will not charge via the USB port if the controller is off.

The pendant batteries can also be charged via a standard AC electrical outlet using a certified compatible USB power adaptor (user-supplied).

NOTICE The pendant batteries are not fully charged for new product shipments. It is recommended that batteries be fully charged before first use to ensure maximum run time can be achieved.

- For best results, the pendant batteries should be charged in a location with a temperature between 43°F [6.1°C] and 104°F [40°C]. The batteries are lithium-ion devices. They will not develop a memory and may be charged at any time.
- Battery life between charges will gradually decrease over time as the pendant is used. Replace pendant batteries if they fail to hold a charge or require frequent recharging.
- Dispose of used lithium-ion batteries in accordance with local regulations and laws.

11.3 Pendant Battery Replacement

If the pendant batteries fail to hold a charge, it is an indication that they may require replacement.

To ensure compatibility and proper operation, use only the correct replacement batteries (Enerpac Part No. SWE189DTTAK10) obtained from an authorized Enerpac distributor or service center. Follow the installation instructions packed with the batteries.

NOTICE Replacement batteries are not available from Enerpac in Japan and must be purchased directly from the battery manufacturer. Refer to Section 3.4 of this manual for battery information.

12.0 CIRCUIT BREAKER

The DTT controller contains a built-in circuit breaker to protect the system in the event of an electrical malfunction.

⚠ WARNING Never attempt to disable or bypass circuit breakers. Failure to observe this precaution could result in fire hazards, improper operation and/or risk of electric shock. Death or serious personal injury could occur.

12.1 Description

The circuit breaker is integrated into the controller power on-off switch. It is rated at 10 amps.

When the circuit breaker trips, the controller power on-off switch moves to an internal neutral-off position.

At this time, power to the controller electrical circuits will be disconnected and the power indicator light on the top of the controller will turn off.

In addition, the pendant “lost signal” alarm will also begin to beep, and the pendant screen will display “*Controller not Found*”.

12.2 Reset Procedure

Reset the controller circuit breaker as described in the following procedure:

1. Press the OFF (o) half of the power on-off switch.
2. Be sure the power indicator light is OFF.
3. Wait at least 2 minutes to allow time for the tripped circuit breaker to cool.
4. Press the ON (i) half of the power on-off switch to restart the controller. Verify that the power indicator light on top of the controller is on.

NOTICE If the circuit breaker trips repeatedly, a serious electrical problem may be present. If this occurs, immediately discontinue use of the digital turning tool and take it to an Enerpac Authorized Service Center for diagnosis and repair.

NOTICE If the circuit breaker trips and the “lost signal” alarm sounds, the pendant will need to be re-paired with the controller. Refer to sections 7.5.1 and 7.5.2 for pendant pairing instructions.

13.0 CLEANING

- Unplug AC power cord from electrical outlet before cleaning.
- Use antistatic dry cloth or damp cloth only.
- Ensure the unit is completely dry prior to reconnecting power.

14.0 STORAGE

- Store the system in a clean, dry and secure location.
- Storage area ambient temperature must not be less than -4°F [-20°C] and must not exceed +122°F [+50°C].
- To prevent possible damage to system components, always disconnect all cables from the controller before placing components in the storage case.
- Ensure the pendant batteries are charged at least once per year to prevent battery degradation.

15.0 PRODUCT DISPOSAL

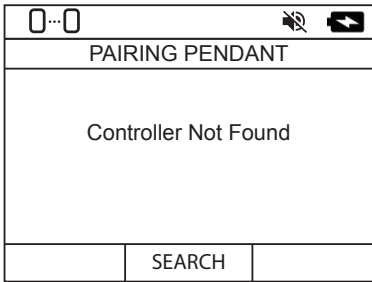
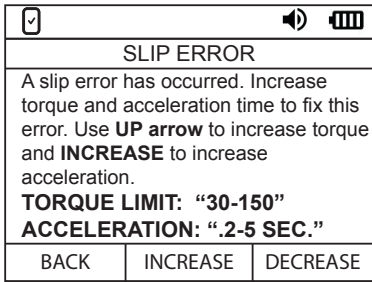
When the tool has reached the end of its useful life, dispose of it as described in the following steps:

1. Disconnect controller AC power cord from electrical outlet.
2. Disconnect all interconnecting cables from controller and drive motor.
3. Disconnect pendant from controller. Remove batteries from pendant.
4. Take all items to an approved industrial recycling facility for disposal.

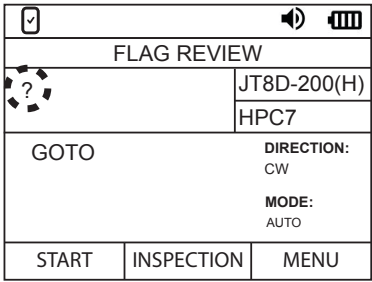
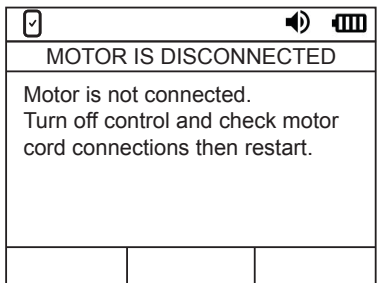
NOTICE Dispose of all items in accordance with all local regulations and laws.

16.0 TROUBLESHOOTING

The information in the Troubleshooting Guide is intended as an aid to help diagnose and correct various possible problems that may occur. For repair service, contact your nearest Enerpac Authorized Service Center. Only an Enerpac Authorized Service Center should be permitted to service the DTT and its components.

Troubleshooting Guide		
Problem	Possible Cause	Action
1. Controller will not start.	a. No power.	Be sure that the controller AC power cord is connected to the electrical outlet. Check the power supply circuit breaker or fuses. Check controller power indicator light to verify that unit is powered on.
	b. Worn or broken AC power cord.	Replace old cord with a new cord of the same specifications.
	c. Controller main circuit breaker tripped.	Reset controller main circuit breaker as described in Section 13.2. Determine cause if breaker trips again when power is reconnected.
2. Pendant will not start. (no display)	a. Pendant batteries not charged.	Fully charge the pendant batteries.
	b. Pendant batteries missing or improperly installed.	Check that batteries are installed and that polarity is correct. Observe (+) and (-) marks.
	c. Screen malfunction.	Contact Enerpac Authorized Service Center.
3. Pendant will not wirelessly pair with controller.	a. Pendant out of range.	Move pendant closer to the controller.
	b. Pendant had not previously been connected to controller and paired using USB cable.	Connect pendant USB cable and pair pendant with controller. Pendant must be paired using USB cable before wireless pairing can occur. Refer to Section 7.5 for additional information.
4. <i>Controller Not Found</i> screen appears:	a. Pendant located too far from controller.	Move closer to the controller and try again.
	b. Pendant had not previously been connected to controller and paired using USB cable.	Connect pendant USB cable and pair pendant with controller. Pendant must be paired using USB cable before wireless pairing can occur. Refer to Section 7.5 for additional information.
5. <i>Slip Error</i> screen appears:	Torque limit of the engine was exceeded.	Adjust torque limit values. Adjust acceleration time.
		

(continued on next page)

Troubleshooting Guide (continued)		
Problem	Possible Cause	Action
6. Blade number displays a “?” 	Blade 1 is not set.	Reset blade in the main menu.
7. <i>Motor is Disconnected</i> screen appears: 	Drive motor cable is not connected.	Be sure that the drive motor cable is properly connected to the controller.

17.0 ENGINE LIBRARY

Engine Library Table							
Item	Engine Model	Turbine Stage	Compressor Stage	Location	Adapter	Shaft	Extra Equipment
1	JT8D-200 (H)	1	7 THRU 13	hyd. pump pad	18904-40	18904-10	
2	JT8D (H)	1	7 THRU 13	hyd. pump pad	18904-40	18904-10	
3	JT8D (S)	1	7 THRU 13	starter pad	18904-40	18904-10	
4	JT8D-200 (S)	1	7 THRU 13	starter pad	18904-40	18904-10	
5	FT8 (S)	1	7, 9, 10, 12, 13	starter pad			
6	FT8 (T)	1	7, 9, 10, 12, 13	tach pad	18994-40		
7	JT9D-7A (S)	1, 2	5 THRU 15	Allied Signal starter pad	18983-40	18983-15	
8	JT9D-7F (S)	1, 2	5 THRU 15	Ham. Std. starter pad	18983-50	18983-15	
9	JT9D-7J (S)	1, 2	5 THRU 15	Allied Signal starter pad	18983-40	18983-15	
10	JT9D-7Q (S)	1, 2	5 THRU 15	Ham. Std. starter pad	18983-50	18983-15	
11	JT9D7R4D1 (G)	1, 2	5 THRU 15	generator pad	18903-40	948505	949024

(continued on next page)

Engine Library Table (continued)							
Item	Engine Model	Turbine Stage	Compressor Stage	Location	Adapter	Shaft	Extra Equipment
12	JT9D7R4D (H)	1, 2	5 THRU 15	hyd. Pump pad	18903-40	948590	
13	JT9D7R4G2 (S)	1, 2	5 THRU 15	Ham. Std. starter pad	18983-50	18983-15	
14	F100-100	1, 2	4, 6, 7, 12, 13	PTO coupling	18970-40		18970-50
15	F100-200	1, 2	4, 6, 7, 12, 13	PTO coupling	18970-40		18970-50
16	F100-220	1, 2	4, 6, 7, 12, 13	PTO coupling	18970-40		18970-50
17	F100-220E	1, 2	4, 6, 7, 12, 13	PTO coupling	18970-40		18970-50
18	F100-PW-229	1, 2	4, 6, 7, 12, 13	PTO coupling	18970-40		18970-50
19	F108	1	1 THRU 9	drive pad	18923-40	948601	
20	F117	1, 2	6 THRU 17	hyd. pump pad	18945-40		18945-15
21	F135-PW	1	4 THRU 9	drive pad	18992-40		
22	F402RR408A	1, 2	1 THRU 8	drive pad	18977-40		
23	PW1100G-JM	1, 4	3 THRU 8	drive pad	18993-4011		
24	PW1200G	1, 5	3 THRU 8	drive pad	18993-4012		
25	PW1400G-JM	1, 7	3 THRU 8	drive pad			
26	PW1500G	1, 8	3 THRU 8	drive pad	18993-4015		
27	PW1700G	1, 9	3 THRU 8	drive pad	18993-4012	*Use PW1200G program	
28	PW1900G	1, 10	3 THRU 8	drive pad	18993-4015	*Use PW1500G program	
29	PW2000	1, 2	6 THRU 17	drive pad	18965-40		
30	PW2000 (S)	1, 2	6 THRU 17	Ham. Std. starter pad	18984-40	18984-10	
31	PW4000	1, 2	5 THRU 15	drive pad	18934-40		
32	PW4000 (S)	1, 2	5 THRU 15	Ham. Std. starter pad	18983-50	18983-15	Allied Sig. 18913-50
33	PW4084	1, 2	5 THRU 15				
34	PW4084 (S)	1, 2	5 THRU 15	Ham. Std. starter pad	18983-50	18983-15	
35	PW4087	1, 2	5 THRU 15				
36	PW4087 (S)	1, 2	5 THRU 15				
37	CF34-3A	1	1 THRU 14	starter pad	18963-40	18963-10	
38	CF34-3B	1, 2	1 THRU 14	starter pad	18963-40	18963-10	
39	CF34-8C(B)	1, 2	1 THRU 10	drive pad			
40	CF34-8C(G)	1, 2	1 THRU 10	starter pad			

(continued on next page)

Engine Library Table (continued)							
Item	Engine Model	Turbine Stage	Compressor Stage	Location	Adapter	Shaft	Extra Equipment
41	CF34-10A	1	1 THRU 9	starter pad	18963-40	18963-10	
42	CF34-10E	1	1 THRU 9	starter pad	18963-40	18963-10	
43	CF6-50	1,2	1 THRU 14	drive pad	18910-40	18910-10	
44	CF6-6	1,2	1 THRU 16	drive pad	18910-40	18910-10	
45	CF6-80A	1,2	1 THRU 14	drive pad	18910-40	18910-10	
46	CF6-80A (S)	1,2	1 THRU 14	starter pad	18929-40	18929-10	
47	CF6-80C2 (S)	1,2	1 THRU 14	starter pad	18929-40	18929-10	
48	CF6-80C2(M)	1,2	1 THRU 14	drive pad	18946-50	18946-10	18946-10
49	CF6-80C2(A)	2,3,4,5	2, 3, 4, 5	drive pad	18986-40	18946-10	18946-10
50	CF6-80E1(M)	1,2	1 THRU 14	drive pad	18951-40	18946-10	18946-10
51	CFM56-2(M)	1	1 THRU 9	drive pad	18926-50	18926-41	18923-40, 948601
52	CFM56-3(M)	1	1 THRU 9	drive pad	18935-40		18933-40, 948514
53	CFM56-5A (S)	1	1 THRU 9	starter pad	18947-40	18947-10	
54	CFM56-5A (M)	1	1 THRU 9	drive pad			
55	CFM56-5B(S)	1	1 THRU 9	starter pad	18974-40	18947-10	
56	CFM56-5B(M)	1	1 THRU 9	drive pad			
57	CFM56-5C(S)	1	1 THRU 9	starter pad	18947-40	18947-10	
58	CFM56-5C(M)	1	1 THRU 9	drive pad			
59	CFM56-7B(G)	1	1 THRU 9	drive pad	18972-50A		
60	CFM56-7BE(G)	2	2 THRU 9	gearbox	18972-50A		
61	LEAP-1A	1,2	1 THRU 10	drive pad	18995-50		
62	LEAP-1B	1,2	1 THRU 10	drive pad	18995-40		
63	LEAP-1C	1,2	1 THRU 10	drive pad	18995-50		
64	V2500-A1	1,2	3 THRU 12	drive pad	18938-40		
65	V2500-A5	1,2	3 THRU 12	drive pad	18938-40		
66	V2500-D5	1,2	3 THRU 12	drive pad	18949-40		
67	RB211-22B	1	1 THRU 6	drive pad	18950-40	18967-10	
68	RB211-524	1	1 THRU 6	drive pad	18950-40	18967-10	
69	RB211-524 MD	1	1 THRU 6	drive pad	18950-40	18967-10	
70	RB211-535C	1	1 THRU 6	drive pad	18950-40	18966-10	

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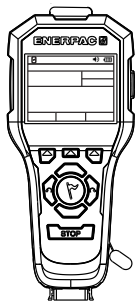
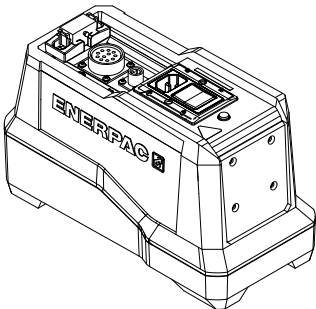
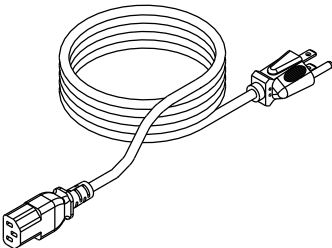
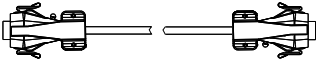
Engine Library Table (continued)							
Item	Engine Model	Turbine Stage	Compressor Stage	Location	Adapter	Shaft	Extra Equipment
71	RB211-535E	1	1 THRU 6	drive pad	18950-40	18966-10	
72	Trent 700	1	1 THRU 6	breather shaft pad	18950-40	18950-10	
73	Trent 800	1	1 THRU 6	breather shaft pad	18950-40	18950-10	
74	LM1600	1	1 THRU 6	drive pad	18937-40	18937-15	
75	LM2500(M)	1, 2	1 THRU 16	drive pad	18937-40	18937-10	
76	LM2500AGH	1, 2	1 THRU 16	acc. gear housing	18937-40	18918-10	
77	LM2500(F)	1, 2	1 THRU 16	fuel pump pad	18917-600	18917-650	18937-40, 18918-10 marine
78	LM2500+(M)	1, 2	0 THRU 16	drive pad	18937-40	18937-10	
79	LM2500+AGH	1, 2	0 THRU 16	acc. gear housing	18937-40	18918-10	
80	LM2500+(F)	1, 2	0 THRU 16	fuel pump pad	18917-600	18917-650	
81	LM6000(M)	1, 2	1 THRU 14				
82	LM6000AGH	1, 2	1 THRU 14	acc. gear housing	18937-40	18937-10	
83	LM 6000 (F)	1, 2	1 THRU 14	fuel pump pad	18917-600	18917-650	
84	GE90	1, 2	1 THRU 10	drive pad	18946-40	18946-10	18946-10
85	GE90-115K	1, 2	1 THRU 10	drive pad	18946-40	18946-10	18946-10
86	GE9x	1, 2	1 THRU 11	drive pad	18946-60A		18946-40
87	Genx	1, 2	1 THRU 10	drive pad	18991-40	18946-10	18946-10
88	GE F404	1	1, 7				
89	AE2100 (AGB)	1, 2	1 THRU 14	acc. gear housing	18987-40		18987-45
90	AE2100 (PGB)	3, 4	NONE	prop. Gearbox	18987-10		18987-45
91	AE3007 (PMA)	1, 2	1 THRU 14	perm. mag. alt.	18988-40	948598	

18.0 REPLACEMENT PARTS LIST

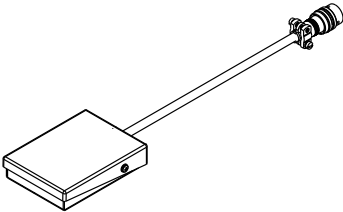
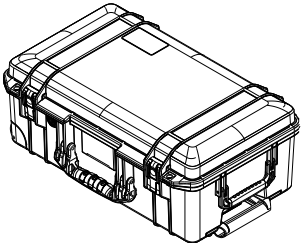
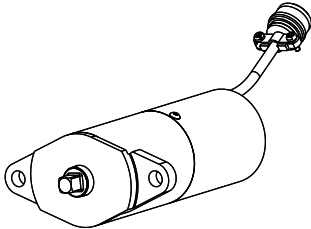
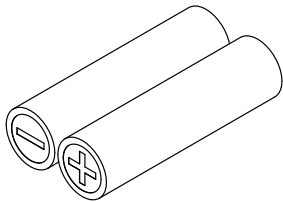
The following parts list is applicable to the Sweeney Digital Turning Tool, model SWE189DTTC.

Components listed are available to order as individual items should a replacement be required in the event of malfunction or loss.

Always state product serial number (located on controller nameplate) when ordering parts.

Replacement Parts List			
Item	Description	Part Number	Image
1	Pendant	SWE189DTTAK1	
2	Controller	SWE189DTTCK2 (100-240V)	
3	Power Cord	SWE189DTTAK3 (with NEMA 5-15 Plug - 120V) SWE189DTTAK11 (with European "SCHUKO" Plug - 230V)	
4	USB Charging Cable	SWE189DTTAK4	

(continued on next page)

Replacement Parts List (continued)			
Item	Description	Part Number	Image
5	Drive Motor Cable	SWE189DTTAK5	
6	Foot Pedal Assembly	SWE189DTTAK6	
7	Transport Case	SWE189DTTAK7	
8	Drive Motor	SWE189DTTAK8	
9	Pendant Batteries (quantity 2) NOTICE Batteries not available from Enerpac in Japan.	SWE189DTTAK10	

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NOTES

[illegible]



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