FTI OPERATIONS, MAINTENANCE, AND REPAIR MANUAL

FT-B100 Series Cordless PowerPak

Part #2720-129, Log #36592
Revision A

June 17, 2020
Fatigue Technology (FTI) is a world-leading aerospace engineering and manufacturing company. FTI pioneered cold expansion technology (which provides solutions to fatigue problems associated with holes in metal structures) back in 1969 and have advanced this science to develop innovative bushing and fastener products. These proprietary products and associated tooling may be covered by patents or agreements owned by, or exclusively licensed to Fatigue Technology. Use of tooling procured from other than a licensed source may constitute patent infringement.

The detailed tooling information in this manual was compiled and written by FTI. The tooling was designed specifically for use with FTI’s Cold Expansion (Cx™) Systems. FTI cannot be held responsible for damage or injury as a result of operating this equipment if it is used for other than the process intended, with any other tooling not provided by FTI, or not used in accordance with the instructions contained in this manual. To avoid personal injury, please observe all safety precautions and instructions. FTI reserves the right to change specifications or configurations of equipment detailed in this manual as part of our ongoing technical and product improvement programs. If you have any questions about the use or serviceability of this equipment, please contact our Sales Department.

FTI’s systems and processes are the subject matter of one or more of the following patents: 4,809,420, 4,885,829, 4,934,170, 5,083,363, 5,096,349, 5,103,548, 5,127,254, 5,129,253, 5,218,854, 5,245,743, 5,305,627, 5,341,559, 5,380,136, 5,405,228, 5,433,100, 5,468,104, 6,077,010, 6,183,180, 6,487,767, 6,792,657, 6,990,722, 7,024,908, 7,100,264, 1,061,276, 513,898, 692015124, 581,385, 69105390, 643,231, 69414946, 696,686, 785,366, 1032769, and other patents pending. These systems and processes are tooling critical and must be performed in accordance with FTI’s specifications or controlling documents. To ensure proper results from FTI’s cold expansion systems and to be licensed to use FTI’s patented processes, it is essential that FTI’s complete integrated system of tooling be purchased and utilized. The use of tooling purchased from other than a licensed supplier could jeopardize fatigue life enhancement and may constitute patent infringement.

FTI reserves the right to change the specifications or configurations of tooling detailed in this manual as part of its ongoing technical and product information program. Should inconsistencies occur between your tooling and this manual, please contact our Sales Department.

ABOUT FATIGUE TECHNOLOGY

FTI has provided innovative solutions to fatigue problems in metal structures since 1969. Complete systems of tooling are used worldwide to enhance the fatigue life of holes in airframes, turbine engines, and other critical structures.

The FTI staff of professionals provides a full range of support services including:

- Application engineering
- Detailed project planning, implementation and management
- On-site assistance, including training and tool room setup

The Sales Department is always available to assist with special fatigue enhancement requirements. Please contact FTI with questions at any time.

This manual can be made available in other languages. Please contact the Sales Department to request a copy.
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SECTION 1.0:  INTRODUCTION

This instruction manual contains information on the operation and maintenance of the FT-B100 Series Cordless Hydraulic PowerPaks. To obtain optimum performance and many years of trouble-free service, operate the PowerPak properly and follow maintenance procedures carefully. The key to trouble-free operation is maintaining a clean air supply and clean hydraulic oil. Before operating the PowerPak, read this manual and retain it for future reference.

1.1 ABOUT THE FT-B100 SERIES CORDLESS POWERPAKS

The FT-B100 Series A PowerPak is the hydraulic pump that best supports the FTI Rail Tec system of tooling. It is used to operate the FTI RailTec family of puller units.

The FT-B100 contains a battery operated hydraulic pump that generates up to 10,000 ± 500 psi (689.5 ± 34.5 bar) hydraulic pressure.

1.2 GENERAL SPECIFICATIONS

Dimensions: ........................................ 24.5 x 16.3 x 14 inches (64.3 cm x 41.4 cm x 35.6 cm)
Weight: ............................................. 65.5lbs. - 29.7 Kg
Operating Hydraulic Pressure: ..................... 10,000 psi maximum
Operating Temperature Range ................. 40°F to 120°F (4.4°C to 48.8°C)
Hydraulic Fluid Capacity: ............. 1.75 US gallons 6.6 L
Hydraulic Fluid Characteristics: .............. Enerpac HF
  Viscosity Index: .................................. 100 minimum
  Viscosity: ........................................ 48 SUS at 210°F, 215 SUS at 100°F
  Specific Gravity at 60°F: ...................... 0.88
  Flash Point, degrees: ......................... 400°F
  Fire Point, degrees: ......................... 430°F
  Pour Point, degrees: ......................... -30°F
Aniline Point, degrees: ................. 210°F/220°F
Paraffinic Base Color: ...................... ASTM 2.0
Suitable Substitutes for Hydraulic Fluid: ....... Power Team Hydraulic Oil #9637; or
  U.S. MIL-SPEC #5606; MIL-PRF-83282; or meets ISO 46:
  FTI Part Number 1045-154; Aeroshell 41; ASTM 215
SECTION 2.0: SAFETY

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the pump and/or damage to other property. Fatigue Technology 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 any questions or concerns arise, contact Fatigue Technology for clarification.

If you have never been trained on high-pressure hydraulic safety, contact FTI for training.

2.1 SAFETY SYMBOLS AND DEFINITIONS

This manual follows a system of safety alert symbols, signal 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 damages 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 personal injury.

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

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

⚠ CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard related (e.g. messages relating to property damages). Please note that the Safety Alert symbol will not be used with this signal word.
2.2 GENERAL HYDRAULIC SAFETY PRECAUTIONs

⚠ WARNING

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

- Do not remove or disable the pressure relief valve.
- Never set the pressure relief value to a higher pressure than the maximum rated pressure of the pump.
- Stay clear of loads supported by hydraulics. To avoid personal injury, keep hands and feet away from puller unit and work piece during operation.
- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, see a doctor immediately.
- Use only rigid pieces to hold loads. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Refer to the installed pressure gage on the pump outlet. It is your window to see what is happening in the system.
- Wear personal protective equipment (P.P.E.) when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dusk mask, non-skid safety shoes, hard hat, or hearing protection should be used in appropriate conditions and will reduce personal injuries.
- Immediately replace worn or damaged parts with genuine Fatigue Technology parts. Standard grade parts will break causing personal injury and property damages.
- Do not operate in an explosive environment.

⚠ CAUTION

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

- Do not use or repair damaged hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose, leading to premature hose failure.
- Do not drop heavy object on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or strap.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance, do not expose equipment to temperatures of 150 °F [65°C] or higher. Protect all hydraulic equipment from weld spatter.
- Immediately replace worn or damaged parts with genuine Fatigue Technology parts. Fatigue Technology parts are designed to fit properly and to withstand high loads. Non-Fatigue Technology parts may break or cause the pump to malfunction.

NOTICE

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact Fatigue Technology.
2.3 BATTERY OPERATED PUMP SAFETY PRECAUTIONS

⚠️ WARNING

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

- Do not use the pump if the remote pendant rocker switch cannot turn the pump on or off. Have the remote pendant repaired before using the pump.
- Do not operate the pump near combustible materials, such as flammable liquid, gases or dust.
- Remove the battery from the pump before making any adjustments, performing maintenance or storing the pump.
- Do not attempt to disable or modify the safety key interlock feature.
- Remove safety key when pump is unattended to prevent unauthorized persons from operating pump.
- Do not probe the battery or battery charger when conductive materials.
- Do not allow metal items or material such as steel wool, aluminum foil or other foreign objects into the battery or battery charger cavity or charger terminal.
- Do not use the pump if the motor assembly is loose or damaged. Have the motor assembly inspected and repaired by Fatigue Technology before using the pump.
- Do not attempt to disable or modify the safety key interlock feature.
- Do not probe the battery or battery charger when conductive materials.
- Do not allow metal items or material such as steel wool, aluminum foil or other foreign objects into the battery or battery charger cavity or charger terminal.
- Do not use the pump if the motor assembly is loose or damaged. Have the motor assembly inspected and repaired by Fatigue Technology before using the pump.
- Do not attempt to charge the non-specified batteries in the charger.
- Do not expose the battery or battery charger to wet conditions or excessive humidity.
- Do not immerse the battery or battery charger.
- Use the Fatigue Technology pump only with the specified Briggs & Stratton 82V LI-ION batteries. Refer to Section 3.1 for approved battery model number.
- Recharge battery only with the charger specified by Briggs & Stratton for the battery being used.
- Do not deliberately short circuit battery or battery charger.
- If battery liquid leaks and contact occurs, flush with water and seek medical help.
- Do not attempt to disassemble, repair or modify the battery or battery charger.
- Unplug battery charger when cleaning or not in use.
- Do not burn, crush or damage battery.
- Do not cover ventilation slots in the top of the charger or sides of the battery.
- Do not place battery charger on a soft surface, such as a blanket or pillow.
- Do not allow battery or battery charger to become too warm. Allow these item to cool before attempting to charge the battery.
- Store battery and battery charger in a cool, dry place. Keep these items in a secured area, away from children and pets.
- Battery and battery charger may not be opened under any circumstances. If the cover is damaged, then these items should no longer be used and must be replaced.
- Pump motor assembly (“powerhead”) in not serviceable and should not be opened. Electric shock may result.
### SECTION 3.0: MAJOR FEATURES AND COMPONENTS

#### Table 3.0-1
Pump Features and Components

<table>
<thead>
<tr>
<th>Key:</th>
<th>Replacement Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Remote Pendant</td>
<td>1199-499</td>
</tr>
<tr>
<td>2. Carrying Handle/Roll bar</td>
<td>N/A</td>
</tr>
<tr>
<td>3. Hydraulic Reservoir Sight Glass</td>
<td>N/A</td>
</tr>
<tr>
<td>4. Hydraulic Reservoir Drain Plug</td>
<td>N/A</td>
</tr>
<tr>
<td>5. Oil Fill Plug</td>
<td>1125-024 (shipping and operation plugs as one part number)</td>
</tr>
<tr>
<td>6. Hydraulic Reservoir</td>
<td>N/A</td>
</tr>
<tr>
<td>7. Pump Motor</td>
<td>N/A</td>
</tr>
<tr>
<td>8. Battery Door</td>
<td>N/A</td>
</tr>
<tr>
<td>9. Battery Release Button</td>
<td>N/A</td>
</tr>
<tr>
<td>10. Battery</td>
<td>1199-497 North America, 1199-513 CE version</td>
</tr>
<tr>
<td>11. Safety Key</td>
<td>N/A</td>
</tr>
<tr>
<td>12. Male Hydraulic Plug</td>
<td>1047-013</td>
</tr>
<tr>
<td>13. Female Hydraulic Plug</td>
<td>1047-072</td>
</tr>
<tr>
<td>14. Fitting Nipple</td>
<td>1047-071</td>
</tr>
</tbody>
</table>

![Figure 3.1-1](image1)

**Figure 3.1-1**
Pump Features and Components
3.1 PRODUCT DATA

<table>
<thead>
<tr>
<th>Pump Model</th>
<th>For Use With</th>
<th>Operating Temp Range</th>
<th>Motor Rating</th>
<th>Sound Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-B100</td>
<td>RailTec Puller Unit</td>
<td>40 to 120 °F +4 to +49°C</td>
<td>1.4HP 1.0kW</td>
<td>75 dBA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump Model Number</th>
<th>Maximum Hydraulic Pressure</th>
<th>Flow Rate No Load</th>
<th>Flow Rate 4,000psi 276 bar</th>
<th>Flow Rate 10,000psi 700bar</th>
<th>Reservoir Size</th>
<th>Pump Weight</th>
<th>Hydraulic Oil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-B100</td>
<td>10,000psi 700bar</td>
<td>310 in³/min 5.0 l/min</td>
<td>80 in³/min 1.3l/min</td>
<td>32 in³/min .52l/min</td>
<td>1.75gal 6.6l</td>
<td>65.5lbs 29.7kgs</td>
<td>Enerpac HF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump Series</th>
<th>Pump Model #</th>
<th>Includes Charger</th>
<th>Charger Model Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-B100</td>
<td>FT-B100-120V</td>
<td>Battery Charger, 120V AC, 50/60 Hz Input NA</td>
<td>FTI 1199-495 Briggs &amp; Stratton 1760263</td>
</tr>
<tr>
<td></td>
<td>FT-B100-220V</td>
<td>Battery Charger, 220V AC, 50/60 Hz Input EU/AU CE certified</td>
<td>FTI 1199-494 Briggs &amp; Stratton 1760264</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump Model #</th>
<th>Battery FTI Part Number</th>
<th>FTI CE Certified</th>
<th>Briggs &amp; Stratton North America</th>
<th>Briggs &amp; Stratton CE Certified</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-B100-120V</td>
<td>1199-496</td>
<td>N/A</td>
<td>1760265</td>
<td>N/A</td>
</tr>
<tr>
<td>FT-B100-220V</td>
<td>1199-513</td>
<td>Yes</td>
<td>N/A</td>
<td>1760515</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pump Series</th>
<th>Pump Model #</th>
<th>Includes Charger</th>
<th>Pressure Relief Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-B100</td>
<td>FT-B100-120V</td>
<td>Battery Charger, 120V AC, 50/60 Hz Input NA</td>
<td>FTI 1187-770 Enerpac # CT-604</td>
</tr>
<tr>
<td></td>
<td>FT-B100-220V</td>
<td>Battery Charger, 220V AC, 50/60 Hz Input EU/AU CE certified</td>
<td>FTI 1187-770 Enerpac # CT-604</td>
</tr>
</tbody>
</table>
### 3.2 EXTERNAL DIMENSIONS

#### Table 3.2-1
Pump Specifications - Key Dimensions

<table>
<thead>
<tr>
<th>Item</th>
<th>Dimension In mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25.48 647</td>
</tr>
<tr>
<td>B</td>
<td>14.00 356</td>
</tr>
<tr>
<td>C</td>
<td>9.69 246</td>
</tr>
<tr>
<td>D</td>
<td>8.09 205</td>
</tr>
<tr>
<td>E</td>
<td>4.22 107</td>
</tr>
<tr>
<td>F</td>
<td>5.66 144</td>
</tr>
<tr>
<td>G</td>
<td>16.28 414</td>
</tr>
<tr>
<td>H</td>
<td>10.92 277</td>
</tr>
</tbody>
</table>

#### Figure 3.2-1
Pump Key Dimensions
3.3 PRIOR TO PUMP OPERATION

Consult the appropriate puller unit manual for safety precautions before installing a puller unit onto a PowerPak.

When used in accordance with these instructions, the FT-B100 PowerPak is safe and easy to use. All general safety precautions associated with hydraulic operated power tools should be observed. Many of these are noted in this section. Ultimately, the operator is responsible for personal safety; however, the following general safety precautions should be observed.

Note that the FT-B100 series pumps are not sealed units and must not be tipped or shipped wet. Tipping the unit while filled will result in oil leaks, and cause operational issues. A shipping cap is included and can be put back in place for shipping.

1. Wear eye and ear protection when operating the FT-B100 PowerPak.

2. Disconnect the remove battery when:
   - Maintenance is to be performed.
   - Hydraulic hose is disconnected.
   - PowerPak is not in use.

3. In the event of a ruptured or leaking hydraulic hose, IMMEDIATELY TURN OFF. Never use your hands to grasp a leaking hose under pressure. The force of escaping hydraulic fluid could cause serious injury. If hydraulic oil should penetrate the skin, medical attention must be sought immediately.

4. DO NOT attempt to disconnect the hydraulic hose while the pump is running.

5. DO NOT expose hoses to potential hazards such as extreme heat or cold, sharp surfaces, heavy impact, or vehicular traffic.

6. DO NOT allow hoses to kink, twist, curl, or bend so tightly that the oil flow within the hose is blocked or reduced.

7. Periodically inspect the hose and fittings for wear or damage that could cause premature failure of the hose or fittings and possibly result in injury. Replace damaged hoses or fittings prior to use.

8. Hose material and coupler seals must be compatible with the hydraulic fluid used (see Section 1.2 for hydraulic fluid requirements). Hoses and fittings must have a minimum working pressure of 10,000 psi with a minimum burst pressure of 20,000 psi. Note: Hydraulic hoses supplied by FTI meet these requirements.

9. Hoses must not come in contact with toxic materials such as creosote-impregnated objects and some paints. Keep clean and never paint couplers or hoses. Hose deterioration due to chemical degradation may cause the hose to fail under pressure.
10. Use caution when operating the PowerPak near electric power sources. The PowerPak is not generally insulated for coming into contact with electric power sources.

11. Do not use in potentially explosive atmospheres.

12. Two ISO safety labels have been placed on machinery to alert the operator of certain precautions that must be met to ensure proper and safe operation of the machinery. These safety labels and their definitions are shown in Figure 3.3.2.

![6017-ISO: “Read Operator’s Manual”](image)

The operator must read the Operator’s Manual prior to operating the machinery.

![6040-ISO: “Wear Eye Protection”](image)

The operator must wear eye protection while operating the machinery.

Notes:
- Safety labels are not shown actual size. Actual size is Ø0.75 inch (Ø19.05 mm).
- Actual colors on the safety labels are a white image on a blue background.

Figure 3.3-2
Safety Labels

13. **DO NOT** exceed the psi hydraulic pressure rating noted on the pump nameplate or tamper with the internal high relief valve. Creating pressures beyond rated capacities may result in personal injury.

14. Before operating the pump, tighten all hose connections. Do not overtighten the connections. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure, or cause high-pressure fittings to split at pressures lower than their rated capacities.

15. Periodically pump clean oil through the entire length of hose, then pressurize the hose and check for leaks at the crimped connectors, between the hose material and the fitting, and between the fitting and coupler.

16. Before replenishing the oil level, retract all cylinders to prevent overfilling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when cylinders are retracted.

17. **DO NOT use the hose to move attached equipment.** Stress may damage the hose and cause personal injury.

18. Pump should be placed on a level surface when operated.

19. Pump should not be moved during operation.
4.1 INTRODUCTION, HYDRAULIC POWERPAK SETUP PROCEDURE AND OPERATION

The FTI-B100 combines the high performance of an electric AC-powered pump with the convenience of a cordless, battery powered pump. It is ideal solution for remote locations, where electrical or pneumatic power sources are not available.

Major features include a brushless DC electric motor, three-stage pump element and 1.75 gallon [6.6 liter] hydraulic reservoir.

The pump is powered by a rechargeable 82V lithium-ion battery, manufactured by Briggs & Stratton Corporation. The lithium-ion battery is capable of providing impressive run time, even under extreme job site conditions.

Figure 4.1-1
Battery and Charger

4.1.1 Additional Information - Battery Charger
- The Briggs & Stratton logo is trademarked and intellectual property of Briggs & Stratton.
- Portions of this publication are subjected to copyright of Briggs & Stratton Corporation and Enerpac Corporation.

4.1.2 Conformance to National and International Standards
FTI declares that the FT-B100 series cordless electric pump has been tested and conforms to applicable standards and is approved to carry the CE, TUV C and US certification marks. An EU Declarations of conformity is enclosed separately. Note: battery and battery charger may be CE certified depending on model ordered, see Table 3.1-1.

4.1.3 Electromagnetic Compatibility (EMC)
The FT-B100 Series cordless electric pump has been tested and certified to conform to CE-EMC emission and immunity standards.
4.1.4 Important Receiving Instructions
Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement cost resulting from damage in shipment.

**Note:** Personnel should read this and associated puller unit manuals prior to use. Operators should be trained on the contents of this manual prior to use.

4.1.5 Hydraulic Reservoir Breather
A shipping plug is installed in the breather port on the top of the reservoir. Before using the pump, replace the shipping plug with the adaptor fitting and breather.

4.1.6 Hydraulic Connections
To ensure proper operation, avoid kinking or tightly bending hoses. If a hose becomes kinked or otherwise damaged, it must be replaced. Damaged hoses may rupture at high pressure. Serious personal injury may result.

Installation of a pressure gauge in each hydraulic line is strongly recommended. All hoses and fitting must be rated to at least 10,000 psi [700 bar].

4.1.7 Battery Capacity Indicator
New Batteries should be charged before use. Each battery contains four indicator lights. The battery capacity indicator lights show the approximate battery capacity level.

Press the battery capacity indicator button to display the lights. The battery capacity indicator light will stay lit for two seconds after the button is pressed. Refer to Figure 4.1-2 to determine the level of charge.

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

If none of the battery capacity indicator lights illuminate when the battery capacity is pressed, place the battery on the charger and charge as needed.

![Battery Capacity Indicator](image)

**Figure 4.1-2 Battery Capacity Indicator**

<table>
<thead>
<tr>
<th>When Battery Capacity Indicator Button is pressed:</th>
<th>Percent Charge: (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Lights ON</td>
<td>80 - 100%</td>
</tr>
<tr>
<td>3 Lights ON</td>
<td>60 - 80%</td>
</tr>
<tr>
<td>2 Lights ON</td>
<td>40 - 60%</td>
</tr>
<tr>
<td>1 Light ON</td>
<td>25 - 40%</td>
</tr>
<tr>
<td>0 Lights ON</td>
<td>&lt; 25%</td>
</tr>
</tbody>
</table>
4.1.8 **Battery Installation**
1. Ensure that remote pendant switch is in the OFF (O) position.
2. Lift battery door and hold it open.
3. Align ribs on battery and battery bracket. Then, slide the battery fully into the battery compartment until it stops.
4. Ensure battery release button snaps in place and that the battery is fully seated and secured before beginning operation.
5. Close the battery door.

![Battery Installation](image)

**Figure 4.1-3**
Battery Installation

To ensure compatibility and proper operation, use only Briggs & Stratton 82V lithium-ion batteries with the pump. Refer to Table 3.1-1 for battery model number information.

4.1.9 **Battery Removal**
1. Ensure Pump motor is switched off.
2. Lift the battery door and hold it open.
3. Press the release button located above battery.
4. Slide the battery outwards and remove it from the battery compartment. Refer to Figure 4.1-3.

4.1.10 **Battery Management System**
The battery management system monitors and controls battery operation:

- A low voltage cut-off feature will shut down the battery when the battery voltage drops to below the acceptable limit.
- A high temperature shut down feature will shut down the battery if its internal temperature rises to above the acceptable limit.
- If the low voltage cut-off or high temperature shut down feature is activated while the pump is operating, the pump motor will emit a beeping sound and the pump will stop.
- If the high temperature shut down feature is activated, the battery must cool down to an acceptable internal temperature before the pump can be restored.
4.1.11 Additional Battery and Charger Information

- The battery is not shipped fully charged. It is recommended that battery be fully charged before first use to ensure maximum run time can be achieved.
- For best result, the battery should be charged in a location with a temperature between 43° F [61° C] and 104° F [40° C]. The battery is a lithium-ion device. It will not develop a memory and may be charged at any time.
- If the battery charger light glows green and blinks when the battery is placed in the battery charger, this indicates that the battery is being charged. A solid green light indicates that the battery is fully charged.
- If the battery charger light glows solid red when the battery is placed in the battery charger, this indicates that the battery temperature is above acceptable limits. Leave the battery in the charger and allow time (up to 30 minutes) for the battery to cool. The charger should resume charging after the battery has cooled.
- If the battery has been stored with little to no charge for a long period of time, the charger goes into recovery mode, which will take 20 hours to full charge the battery. This will enhance the life of the battery. Once the battery is fully charged, the next charge will return to standard charging.

4.2 OPERATION

4.2.1 Before start up
1. Check all hydraulic fittings and connections to be sure they are tight and leak free.
2. Install hydraulic reservoir breather. Refer to Figure 3.1-1.
3. Check the hydraulic oil level. Add oil if necessary. Refer to Figure 5.0.
4. Install a fully charged battery on the pump. Refer to Section 4.1.8.
5. Verify safety key is installed.
6. Connect puller unit hydraulic hose(s) to pump as described in Puller unit manual.

4.2.2 Starting the Pump Motor
1. Place RailTec Puller Unit in the neutral (handle centered position).
2. To start the pump motor, press the upper half of the remote pendant rocker switch.

4.2.3 Stopping the Pump Motor
To stop the pump motor, press the lower half of the remote pendant rocker switch.

In an emergency, the pump motor can also be stopped by removing either the safety key or the battery.
4.2.4 Operating Precautions

⚠ WARNING

Failure to observe the following precautions and instructions could allow load to drop on persons working in the area. Death or serious personal injury could result.

- Keep persons away from area under load during lifting, lowering and whenever the control value lever is moved.
- To prevent the lifted load from dropping, always immediately support it with jack stand or other mechanical blocking device of adequate rated capacity. Be certain that blocking is fully in place before moving the control value lever from one position to another. An unsupported load can drop when the control valve is shifted.
### SECTION 5.0: MAINTENANCE

5.0.1 *Check Oil Level*
1. Be sure hydraulic cylinder or other tool is fully retracted.
2. Remove the battery from the pump.
3. Place the pump on a level surface.
4. Visually check the oil level by looking through the hydraulic reservoir sight glass. Reservoir is FULL when oil level is about halfway between the top and bottom of the sight glass. Refer to Figure 5.0-1.
5. If the oil level is low:
   a. Add oil as described in Section 5.0.3.

5.0.2 *Hydraulic Oil Information*
Use only Enerpac HF hydraulic oil when adding additional oil or when performing an oil change. Enerpac HF hydraulic oil is available from Fatigue Technology.

Recommended use only Enerpac HF hydraulic oil. Use of other oils may result in damage to pump components. Such damage is not covered under the product warranty.

5.0.3 *Adding Oil*
1. Be sure hydraulic cylinder or tool is fully retracted.
2. Disconnect hydraulic hoses.
3. Remove the battery from the pump.
4. Place the pump on a level work surface.
5. Remove SAE #10 plug from cover plate.
6. Slowly fill the reservoir with new oil until level is about halfway between the top and the bottom of the hydraulic reservoir sight glass. Refer to Section 3.1 for oil requirements.

DO NOT overfill. Be certain that all hydraulic cylinders are fully retracted before adding any oil. Over filling hydraulic reservoir may cause damage to the pump.

5.0.4 *Oil Change*
Change the hydraulic oil in the pump reservoir at least once a year or whenever it is suspected that the oil has become contaminated.

To properly drain and refill the reservoir, change the oil as described in the following steps. Refer to Figure 5.0-1.
1. Be sure hydraulic cylinder or tool is fully retracted.
2. Remove the battery from the pump.
3. Disconnect hydraulic hoses from pump.

FT-B100 Series pumps are equipped with a 1.75 gallon [6.6 liter] hydraulic reservoir. Be sure the pan or container is large enough to hold all the drained oil.

4. Place a suitable pan or container or appropriate capacity under the hydraulic reservoir drain plug.
5. Remove hydraulic reservoir drain plug.
6. Allow used oil to drain completely from reservoir.
7. Clean hydraulic reservoir drain plug and remove any metal shavings (plug is magnetic).
8. Reinstall hydraulic drain plug.
9. Refill hydraulic reservoir with new oil.

Dispose of used oil in accordance with all applicable laws and regulations.
5.1 TRANSPORTATION AND SHIPMENT

1. A PowerPak will leak if tipped or inverted. Therefore, it is essential to DRAIN ALL HYDRAULIC FLUID prior to shipment. This is especially important because many federal and international regulations restrict shipment of containers that may leak fluids.
**SECTION 6.0: TROUBLESHOOTING**

This section provides some basic steps to identify possible causes of trouble, together with troubleshooting solutions. If you cannot solve your maintenance or operation problem with the information provided in this section, contact the nearest FTI representative.

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

- Never tighten or loosen hydraulic fitting while the pump hydraulic system or connected components are pressurized. Escaping oil under pressure can penetrate the skin, causing serious personal injury.
- Keep hands, finder, and other body parts clear of pinch points and move parts when observing operation during troubleshooting.
- To prevent accidental start-up of pump servicing, always remove battery from pump before performing any maintenance or repair procedures.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump will not start.</td>
<td>A. Battery is not installed.</td>
<td>Install Battery.</td>
</tr>
<tr>
<td></td>
<td>B. Safety key is not inserted.</td>
<td>Insert safety key.</td>
</tr>
<tr>
<td></td>
<td>C. Battery is discharged.</td>
<td>Charge Battery.</td>
</tr>
<tr>
<td></td>
<td>D. Electrical contacts are dirty or corroded.</td>
<td>Clean contacts on the battery, pump and charger.</td>
</tr>
<tr>
<td>Pump clicks when remote pendant switch is on, but does not start.</td>
<td>A. Battery is discharged.</td>
<td>Charge Battery.</td>
</tr>
<tr>
<td></td>
<td>B. Battery is damaged or not functioning.</td>
<td>Replace battery.</td>
</tr>
<tr>
<td></td>
<td>C. Electrical contacts are dirty or corroded.</td>
<td>Clean contacts on the battery, pump and charger.</td>
</tr>
<tr>
<td></td>
<td>D. Pump is jammed due to obstruction. Possible internal damage to pump.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td>Low fluid output.</td>
<td>A. Pump needs priming.</td>
<td>To prime the pump. Be sure that the pump reservoir is filled with oil. Then, run the pump with the control value in the neutral position (&quot;3&quot;) while gently rocking the pump from side-to-side.</td>
</tr>
<tr>
<td></td>
<td>B. Bypass value malfunction.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td></td>
<td>C. Oil intake screen is clogged with debris.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td></td>
<td>D. Internal damage to pump.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td>Pump does not build pressure.</td>
<td>A. Pressure relief value issues.</td>
<td>Contact Fatigue Technology</td>
</tr>
<tr>
<td>Battery charge is reduced after more than one month of use.</td>
<td>The Battery has automatically performed self-maintenance to extend its life.</td>
<td>Fully recharge battery before use.</td>
</tr>
<tr>
<td>Pump slows down and stops.</td>
<td>Battery is discharged.</td>
<td>Charge Battery.</td>
</tr>
<tr>
<td>Symptom</td>
<td>Possible Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Noisy and/or vibrating pump operation.</td>
<td>A. Pump element piston is sticking.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td></td>
<td>B. Motor is damaged.</td>
<td></td>
</tr>
<tr>
<td>Cylinder will not advance or retract.</td>
<td>A. Oil level low.</td>
<td>Add oil until reservoir is full.</td>
</tr>
<tr>
<td></td>
<td>B. Pump needs priming.</td>
<td>To prime the pump. Be sure that the pump reservoir is filled with oil.</td>
</tr>
<tr>
<td></td>
<td>C. Oil intake screens are clogged</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder advances and retract erratically.</td>
<td>A. Air is in the system.</td>
<td>Advance and retract the cylinder until operation is smooth.</td>
</tr>
<tr>
<td></td>
<td>B. External hydraulic leak.</td>
<td>Tighten connections. Replace damaged components.</td>
</tr>
<tr>
<td></td>
<td>C. Internal leakage in value.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td></td>
<td>D. Internal damage to value.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td></td>
<td>E. Internal damage to pump.</td>
<td>Contact Fatigue Technology.</td>
</tr>
<tr>
<td>Pump builds full pressure without puller attached and will not release</td>
<td>Pressure locked in pump.</td>
<td>Use pressure relief tool Enerpac CT-604, Figure 6.0-1, FTI part number 1187-770. See solution steps below:</td>
</tr>
<tr>
<td>pressure or allow puller unit to be attached.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Solution Steps:
- Once hydraulic pressure has been introduced to the hydraulic hose, the pressure must be relieved before the coupler can be sufficiently tightened.

Procedure for relieving hydraulic pressure:
1. Remove Battery.
2. Disconnect coupler from PowerPak if connected.
3. Connect Enerpac CT-604 to the female coupler and bleed off hydraulic oil to relieve the built-up pressure. Figure 6.0-1 shows the Enerpac CT-604 Pressure Relief Tool.
4. Once pressure is relieved, coupler may be tightened and reinstalled onto PowerPak.
5. Replace the battery.
6. Check oil level in PowerPak Reservoir.

Figure 6.0-1
Enerpac CT-604 Pressure Relief Tool

The information in the Troubleshooting Guide is intended as an aid to help diagnose and correct various possible problem that may occur. For repair service. Contact Fatigue Technology. Only Fatigue Technology should be permitted to service the pump and components.
Figure 6.0-2
Overall System Hydraulic Circuit Diagram
Figure 6.0.3
Hydraulic Piston Circuit Showing “Pull” Action

Figure 6.0-4
Hydraulic Piston Circuit Showing “Stop” Action
Figure 6.0-5
Hydraulic Piston Circuit Showing “Return” Action
SECTION 7.0: MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET
NAME OF PRODUCT: AW Hydraulic Oil ISO 46
FILE NO. 9636, 9637, 9638, 9616, 11360
MSDS DATE: December, 2009

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: AW Hydraulic Oil ISO 46
SYNONYMS: hydraulic fluid
PRODUCT CODES: 9616, 9636, 9637, 9638, 11360, CG46WBlue

MANUFACTURER: CGF INC
DIVISION: N/A
ADDRESS: 317 Peoples Avenue Rockford, IL 61104 USA

EMERGENCY PHONE: 800/224-9300
CHEMTREC PHONE: 800/224-9300
OTHER CALLS: 815-967-4400
FAX PHONE: 815-967-4404

PRODUCT USE: Hydraulic Fluid
PREPARED BY: Irena Larson/Denise Brauer

SECTION 1 NOTES:

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT: Petroleum base oils, additive package.

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>% WT</th>
<th>% VOL</th>
<th>SARA 313 REPORTABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>64741-98-4</td>
<td>75-85</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>64742-01-4</td>
<td>15-25</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Proprietary Additive(s)</td>
<td>0.5-1.5</td>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This material is not considered hazardous according to OSHA criteria.

ROUTES OF ENTRY: Skin contact or inhalation.

POTENTIAL HEALTH EFFECTS

EYES: Contact may cause mild eye irritation including stinging, watering, and redness.

SKIN: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin and possibly dermatitis (inflammation). No harmful effects from skin absorption are expected.

INGESTION: No harmful effects expected from ingestion.

INHALATION: No information available on acute toxicity.

ACUTE HEALTH HAZARDS: No

CHRONIC HEALTH HAZARDS: No

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin disorders may be aggravated by exposure.

CARCINOGENICITY

OSHA: None
ACGIH: None
NTP: None
IARC: None

SECTION 3 NOTES:
SECTION 4: FIRST AID MEASURES

EYES: If irritation or redness develops, flush eyes with clean water. If symptoms persist, seek medical attention.

SKIN: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with a mild soap and water or a waterless hand cleaner. If irritation persists, seek medical attention.

INGESTION: First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

INHALATION: If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing wound. Often these injuries require emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

Acute aspirations of large amounts of mineral oil-laden material may produce serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

SECTION 4 NOTES:

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, foam, or water spray is recommended.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing of materials heated above 212 F. Carbon dioxide can displace oxygen. Use caution when applying dioxide in confined spaces.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of fire.

HAZARDOUS DECOMPOSITION PRODUCTS: No data

Flash Point: C(F): >210(410) (ASTM D-92)
Flammable Limits (approx: % vol. in air)- LEL: 0.9%, UEL: 7.0%
NFPA HAZARD ID: Health: 1, Flammability: 1, Reactivity: 0

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES:
Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant.

Environmental Precautions: Stop spill/release if it can be done with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Contact appropriate agency for spills into or upon navigable waters that cause a sheen or discoloration on the water surface.

Methods for Containment and Clean Up:
Notify fire authorities and appropriate regulatory authorities. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE:
Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment. High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection...
SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Component
Lubricant Base Oil-Petroleum

ACGIH
TWA: 5mg/m³
STEEL: 10mg/m³

OSHA
TWA: 5mg/m³
As oil mist, if generated

ENGINEERING CONTROLS: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

RESPIRATORY PROTECTION: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with P100 or P95 filters may be used. A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator’s use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (MUC) as directed by regulation or the manufacturer’s instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

EYE PROTECTION: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

SKIN PROTECTION: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the performance of their products. Suggested protective materials: Nitrile

SECTION 8 NOTES: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear Blue Liquid

ODOR: Mild petroleum

PHYSICAL STATE: Liquid

pH AS SUPPLIED: Not applicable

pH (Other):

BOILING POINT: No data
F: >600
C: >316

FLASH POINT:
F: >410
C: >210

METHOD USED: (ASTM D-92)

AUTOIGNITION TEMPERATURE:
F: 671
C: 355

MELTING POINT: No data
F:
C:

FREEZING POINT: No data
F:
MATERIAL SAFETY DATA SHEET
NAME OF PRODUCT: AW Hydraulic Oil ISO 46

FILE NO. 9636, 9637, 9638, 9616, 11360
MSDS DATE: December, 2009

C:

VAPOR PRESSURE (mmHg): <1
@ 20 C : < 0.1

VAPOR DENSITY (AIR = 1): >2
@ F: 68
C: 20

SPECIFIC GRAVITY (H2O = 1): 0.87
@ F: 60
C: 15.6

EVAPORATION RATE: n/a

BASIS (=1):

SOLUBILITY IN WATER: not soluble

PERCENT SOLIDS BY WEIGHT: n/a

PERCENT VOLATILE: Negligible
BY WT/ BY VOL @
F: 68
C: 20

VOLATILE ORGANIC COMPOUNDS (VOC): no data

WITH WATER: LBS/GAL
WITHOUT WATER: LBS/GAL

MOLECULAR WEIGHT: no data

VISCOITY:
200-300 SUS @ 100 Degree F
@ 40 C cST 47.25

SECTION 9 NOTES: Data represents typical values and are not intended to be specifications.

SECTION 10: STABILITY AND REACTIVITY

STABLE UNSTABLE

STABILITY: YES

CONDITIONS TO AVOID (STABILITY): Avoid excessive heat, formations of vapors or mists.

INCOMPATIBILITY (MATERIAL TO AVOID): Strong oxidizing agents

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: None under normal storage.

HAZARDOUS POLYMERIZATION: No

CONDITIONS TO AVOID (POLYMERIZATION): n/a

SECTION 10 NOTES:

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and/or dewaxing to remove aromatics and improve performance characteristics. No components in this formulation have been identified as a carcinogen.

Component Oral LD50 Dermal LD50 Inhalation LC50
Lubricant Base Oil >5g/kg >2g/kg No data

PAGE 4 OF 6
SECTION 11 NOTES:

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: Ecotoxicological data have not been determined specifically for this product. Information given is based on knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity: Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/L50 > 100 mg/l (to aquatic organisms) (LL/L50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Mobility: Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence/degradability: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation: Contains components with the potential to bioaccumulate.

Other Adverse Effects: Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
TSCA (TOXIC SUBSTANCE CONTROL ACT): All components of this formulation are listed on the US EPA-TSCA inventory or not regulated under TSCA.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling is not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSI, KOREA, and PHILIPPINES.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

311/321 HAZARD CATEGORIES: None
Acute Health: No
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

313 REPORTABLE INGREDIENTS: This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

STATE REGULATIONS: This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

INTERNATIONAL REGULATIONS:

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WhMIS Hazard Class
None

SECTION 15 NOTES:

SECTION 18: OTHER INFORMATION

OTHER INFORMATION:

PREPARATION INFORMATION: Issue Date: August 2009 Rev. #1

DISCLAIMER:
The information presented herein has been compiled from sources considered to be dependable and accurate to the best of Cutting & Grinding Fluids Inc., knowledge. However, CCF INC., makes no warranty whatsoever expressed or implied of merchantability or fitness for the particular purpose, regarding the accuracy of such data or the results to be obtained from the use thereof. Cutting & Grinding Fluids, Inc. assumes no responsibility for the injury to recipient or to the third persons or for any damage to any property and recipient assumes all such risks.
E.C. DECLARATION OF CONFORMITY

Manufacturer: Fatigue Technology
401 Andover Park East
Seattle, WA 98188-7605

Telephone: (206) 246-2010
Fax: (206) 244-9886

Responsible Person in E.C.: Jean-Michel Derisson
4 rue d’Austerlitz
31490 Léguevin
FRANCE

Telephone: 33 5-34-559-916
Fax: 33 5-34-569-047

The undersigned declares that the machinery described:

Type:

Serial Number:

Conforms to the following directives:

ISO 11148-1 Hand-Held Non-Electric Power Tools – Safety Requirements – Part 1
ISO 4413 Hydraulic fluid power – General rules and safety requirements for systems and their components
ISO 4414 Pneumatic fluid power – General rules and safety requirements for systems and their components

and complies with the relevant health and safety requirements.

[Signature]
Jeff Sageman
Logistics Manager

4/14/2020
Date