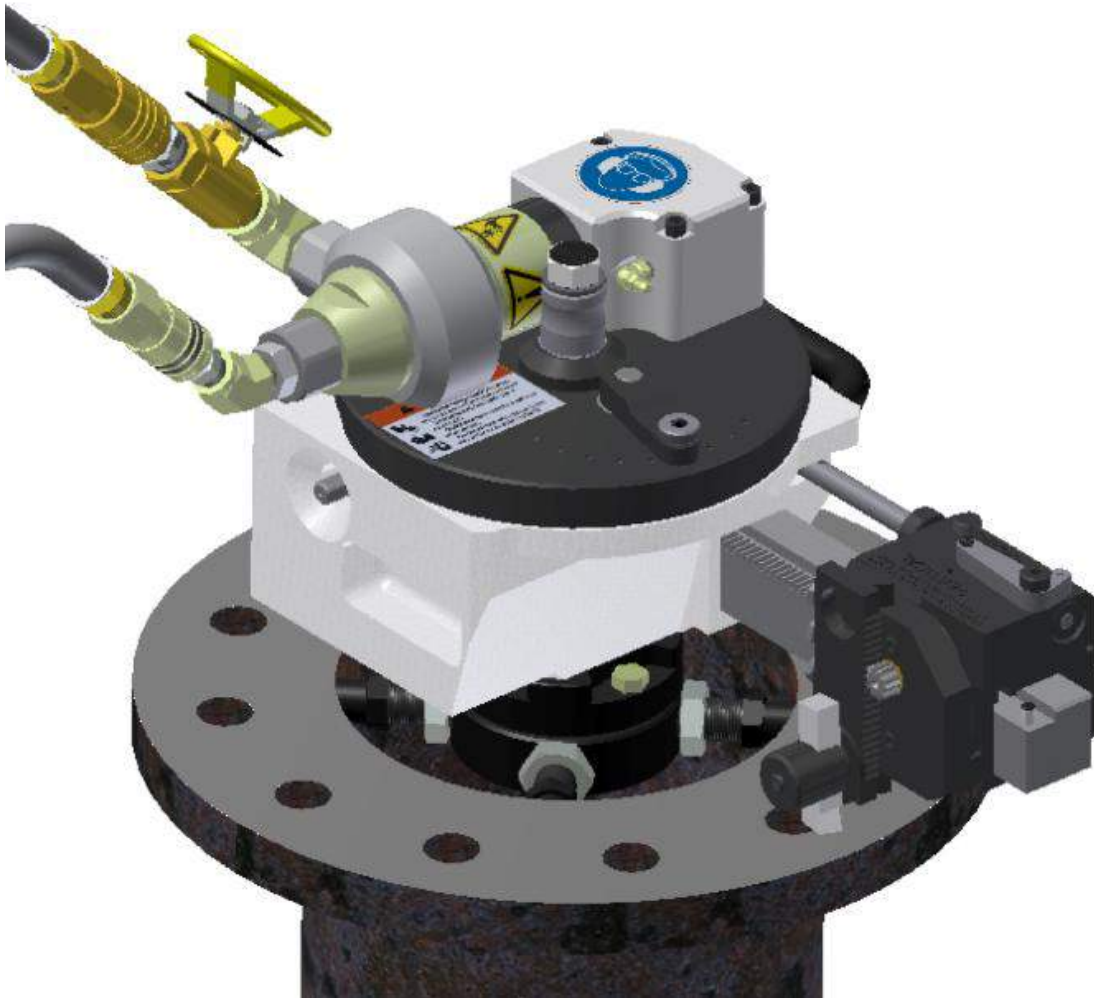


CE

FF5000

FLANGE FACER MACHINE OPERATING MANUAL



**WHAT IS
WHAT COULD BE.**

 **CLIMAX**
Portable Machining & Welding Systems



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For comments or questions about this manual or other Climax documentation, please e-mail documentation@cpmt.com.

For comments or questions about Climax products or services, please call Climax or e-mail info@cpmt.com. For quick and accurate service, please provide your factory representative with the following:

- Your name
- Shipping address
- Telephone number
- Machine model
- Serial number (if applicable)
- Date of purchase.

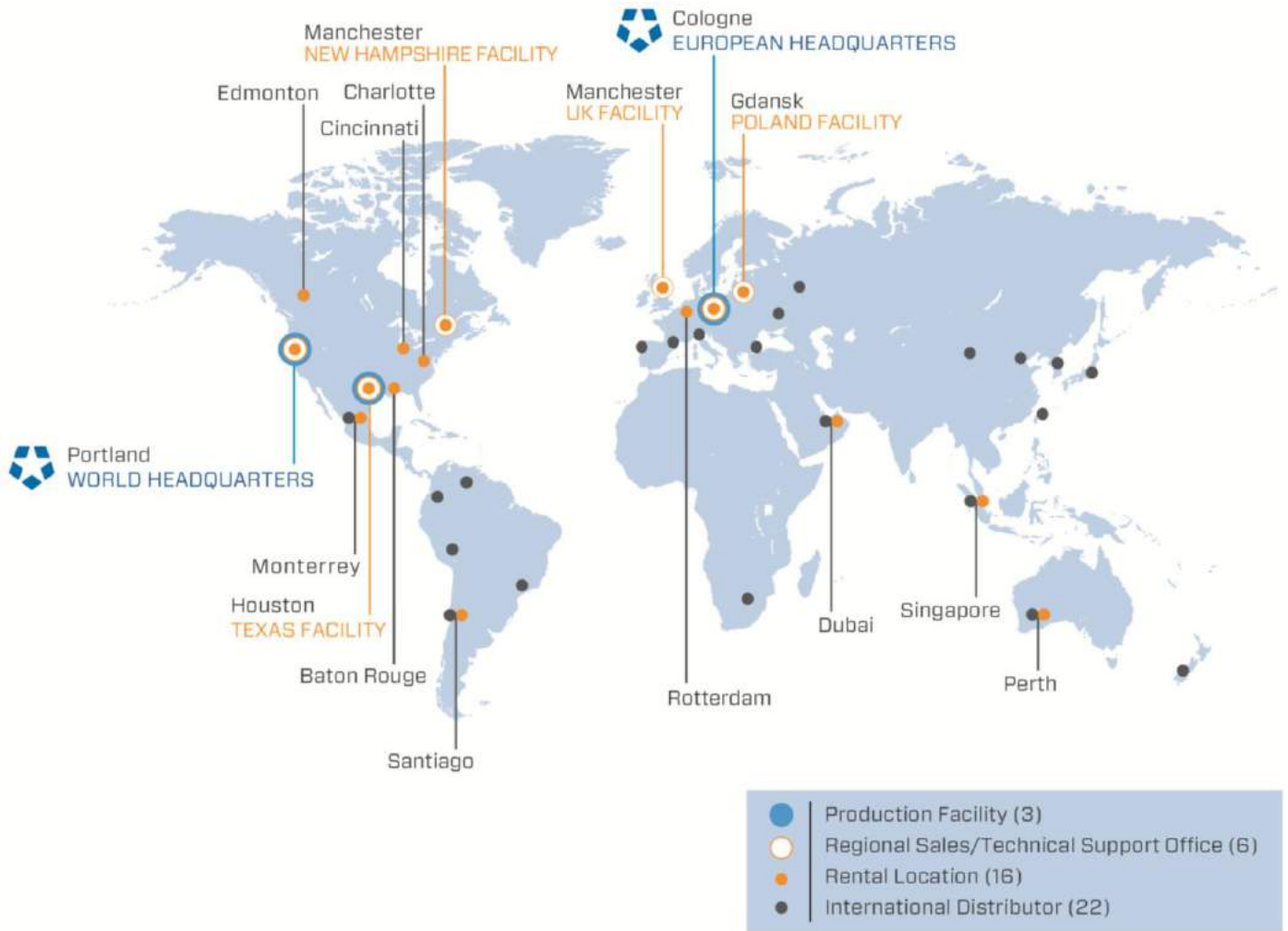
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Effective Date: April 1, 2011

Declaration of Conformity



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Climax GmbH is authorized to compile a technical file for this product.

We hereby declare that the machinery described:

Make: Flange Facer
Models: FF3000, FF4000, FF5000, FF6000, FF6100, FF6200, FF7200,
FF8000, FF8200
Serial Numbers: 11016661 - 15128700

Is in compliance with the following directives:

2006/42/EC - Machinery, 2004/108/EC - EMC

Compliance with the relevant EHSR of the above directives is by application of the following referenced harmonized standards:

EN 349, EN 982 + A1, EN 983 + A1, EN 3744, EN 11201, EN 12100-1, EN 12100-2, EN 12840, EN 13732-1, EN 13849-1, EN 14121-1

(Original Signed)

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	LIMITED WARRANTY.....	1
	<i>TERMS OF SALE</i> 1	
	<i>ABOUT THIS MANUAL</i>	1
1.2	HOW TO USE THIS MANUAL.....	2
	<i>ALERTS</i> 2	
1.3	SAFETY PRECAUTIONS	3
1.4	RISK ASSESSMENT CHECKLIST	3
1.5	ITEMS REQUIRED BUT NOT SUPPLIED.....	4
1.6	NOISE LEVEL 4	
1.7	LABELS 5	
2	OVERVIEW	7
2.1	ABOUT THIS MANUAL	7
2.2	ABOUT THE FF5000	7
2.3	FF5000 SPECIFICATIONS	8
2.4	PNEUMATIC MOTOR OPTION PERFORMANCE SPECIFICATIONS.....	8
3	SETUP.....	11
3.1	RECEIPT AND INSPECTION	11
3.2	SETUP AND ALIGN THE MACHINE	11
	<i>TO SETUP AND ALIGN THE MACHINE</i>	11
3.3	MOUNTING THE INTERFACE PLATE	12
3.4	LEVELING THE MACHINE.....	13
3.5	TO PRECISION LEVEL AND CENTER THE MACHINE	13
3.6	TOOL HEAD SETUP AND ADJUSTMENT.....	14
3.7	ADJUSTING THE TOOL HEAD	15
4	OPERATION	17
4.1	STARTING AND STOPPING	17
	4.1.1 <i>PREPARING THE MACHINE FOR START-UP</i>	18
	4.1.2 <i>STOPPING THE MACHINE</i>	18
4.2	SETTING VERTICAL AND RADIAL TOOL FEED	19
	4.2.1 <i>SETTING THE DRAG</i>	19
	4.2.2 <i>TO SET THE FEED</i>	21
	4.2.3 <i>AUTOMATIC FEED</i>	21
4.3	SETTING TOOL FEED SPEED AND DIRECTION	22
	4.3.1 <i>SETTING THE FEED DIRECTION</i>	22
	4.3.2 <i>TO SET THE FEED SPEED/DIRECTION WHEN FLAT FACING</i>	23
4.4	CUTTING ANGLES, GROOVES AND CHAMFERS	24
	4.4.1 <i>TO ADJUST THE TOOL HEAD</i>	24
5	DISASSEMBLY	27
5.1	POST-OPERATION CHECKS	27
5.2	TO DISASSEMBLE THE MACHINE.....	27
6	MAINTENANCE	29

<i>RECOMMENDED LUBRICANTS</i>	29
6.1 CHUCK ASSEMBLY	29
6.2 ALIGNMENT ASSEMBLY	29
6.3 MAIN BODY ASSEMBLY.....	29
6.4 TOOL HEAD ASSEMBLY	29
6.5 AIR MOTOR AND PNEUMATIC ASSEMBLY MAINTENANCE	30
7 STORAGE	31
7.1 SHORT-TERM STORAGE	31
7.2 LONG-TERM STORAGE.....	31
7.3 SHIPPING 31	
APPENDIX A SPARE PARTS	33
APPENDIX B EXPLODED VIEWS AND PARTS.....	35
APPENDIX A MSDS	51

LIST OF FIGURES

FIGURE 1. CLIMAX MODEL FF5000 PORTABLE FLANGE FACER	7
FIGURE 2. P/N 59246 PNEUMATIC SCHEMATIC	9
FIGURE 3. CHUCKS AND JAWS	12
FIGURE 4. MOUNTING INTERFACE PLATE	12
FIGURE 5. LEVELING THE MACHINE	13
FIGURE 6. PRECISION LEVEING AND CENTERING THE MACHINE.....	14
FIGURE 7. PNEUMATIC AIR CONTROL VALVE SHUT OFF.....	18
FIGURE 8. SETTING TOOL FEED.....	19
FIGURE 9. CAP SCREW LOCATIONS.....	20
FIGURE 10. SET SCREW LOCATIONS	20
FIGURE 11. REMOVE CRANK HANDLE	21

LIST OF TABLES

TABLE 1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP.....	3
TABLE 2. RISK ASSESSMENT CHECKLIST AFTER SET-UP	4
TABLE 3. RECOMMENDED LUBRICANTS	29
TABLE 4. SPARE PARTS LIST	33
TABLE 5. TOOL KIT – P/N 29116	35

1 INTRODUCTION

1.1 Limited warranty

Climax Portable Machine Tools, Inc. (hereafter referred to as “Climax”) warrants that all new machines are free from defects in materials and workmanship. This warranty is available to the original purchaser for a period of one year after delivery. If the original purchaser finds any defect in materials or workmanship within the warranty period, the original purchaser should contact its factory representative and return the entire machine, shipping prepaid, to the factory. Climax will, at its option, either repair or replace the defective machine at no charge and will return the machine with shipping prepaid.

Climax warrants that all parts are free from defects in materials and workmanship, and that all labor has been performed properly. This warranty is available to the customer purchasing parts or labor for a period of 90 days after delivery of the part or repaired machine or 180 days on used machines and components. If the customer purchasing parts or labor finds any defect in materials or workmanship within the warranty period, the purchaser should contact its factory representative and return the part or repaired machine, shipping prepaid, to the factory. Climax will, at its option, either repair or replace the defective part and/ or correct any defect in the labor performed, both at no charge, and return the part or repaired machine shipping prepaid.

These warranties do not apply to the following:

- Damage after the date of shipment not caused by defects in materials or workmanship
- Damage caused by improper or inadequate machine maintenance
- Damage caused by unauthorized machine modification or repair
- Damage caused by machine abuse
- Damage caused by using the machine beyond its rated capacity

All other warranties, express or implied, including without limitation the warranties of merchantability and fitness for a particular purpose are disclaimed and excluded.

Terms of sale

Be sure to review the terms of sale which appear on the reverse side of your invoice. These terms control and limit your rights with respect to the goods purchased from Climax.

About this manual

Climax provides the contents of this manual in good faith as a guideline to the operator. Climax cannot guarantee that the information contained in this manual is correct for applications other than the application described in this manual. Product specifications are subject to change without notice.

1.2 How to use this manual

Alerts

Pay careful attention to the alerts appearing in this manual. Alert types are defined in the following examples.

DANGER

*concerns a condition, procedure, or practice that, if not avoided or strictly observed, **WILL** result in injury or loss of life.*

WARNING

*concerns a condition, procedure, or practice that, if not avoided or strictly observed, **COULD** result in injury or loss of life.*

CAUTION

concerns a condition, procedure, or practice that, if not avoided or strictly observed, could result in minor or moderate injury.

NOTICE

concerns a condition, procedure, or practice worthy of special attention.

TIP:

A tip provides additional information that can aid in completion of a task.

1.3 Safety precautions

Climax Portable Machining and Welding Systems leads the way in promoting the safe use of portable machine tools. Safety is a joint effort. You, the machine operator, must do your part by being aware of your work environment and closely following the operating procedures and safety precautions contained in this manual, as well as your employer's safety guidelines.

Observe the following safety precautions when operating or working around the machine.

Training – Before operating this or any machine tool, you should receive instruction from a qualified trainer. Contact Climax for machine-specific training information.

Intended use – Use this machine in accordance with the instructions and precautions in this manual. Do not use this machine for any purpose other than its intended use as described in this manual.

Personal protective equipment – Always wear the appropriate personal protective gear when operating this or any other machine tool. Eye and ear protection are required when operating or working around the machine. Flame-resistant clothing with long sleeves and legs is recommended when operating the machine, as hot flying chips from the workpiece may burn or cut bare skin.

Work area – Keep the work area around the machine clear of clutter. Keep all cords and hoses away from the work area when operating the machine.

Moving parts – Except for operating controls, avoid contact with moving parts by hands or tools during machine operation. Secure hair, clothing, jewelry, and pocket items to prevent them from becoming entangled in moving parts.

1.4 Risk assessment checklist

Use these checklists as part of your on-site risk assessment and include any additional considerations that may pertain to your specific application.

TABLE 1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP

Before Set-up	
<input type="checkbox"/>	I took note of all the warning labels on the machine.
<input type="checkbox"/>	I removed or mitigated all identified risks (such as tripping, cutting, crushing, entanglement, shearing, or falling objects).
<input type="checkbox"/>	I considered the need for personnel safety guarding and installed any necessary guards.
<input type="checkbox"/>	I read the machine assembly instructions (Section 3.2).
<input type="checkbox"/>	I considered how this machine operates and the best placement for the controls, cabling, and the operator.
<input type="checkbox"/>	I have evaluated and mitigated any other potential risks specific to my work area.

TABLE 2. RISK ASSESSMENT CHECKLIST AFTER SET-UP

After Set-up	
<input type="checkbox"/>	I checked that the machine is safely installed (according to Section 3) and the potential fall path is clear. If the machine is elevated, I checked that the machine is safeguarded against falling.
<input type="checkbox"/>	I identified all possible pinch points, such as those caused by rotating parts, and informed the affected personnel.
<input type="checkbox"/>	I planned for containment of any chips or swarf produced by the machine. I followed the maintenance guidelines (Section 6 Error! Reference source not found.) with the recommended lubricants.
<input type="checkbox"/>	I checked that all affected personnel have the recommended personal protective equipment, as well as any equipment required by the site or other regulations.
<input type="checkbox"/>	I checked that all affected personnel understand the danger zone and are clear of it.
<input type="checkbox"/>	I have evaluated and mitigated any other potential risks specific to my work area.

1.5 Items required but not supplied

There are no items required but not supplied with the FF5000 machine.

1.6 Noise level

Sound power level is 80.3 dB(A)

Operator Sound Pressure Level is 86.2 dB(A)

Bystander Sound Pressure level is 80.0 dB(A)

1.7 Labels

The following labels should be on yhour machine. If any are defaced or missing, contact Climax immediatly for replacements.

	<p>P/N 35772 Plus or minus direction indicator</p>		<p>P/N 59044 Lable safety warning read manual</p>
	<p>P/N 80510 label safety warning cutting of fingers, or rotating blade</p>		<p>P/N 81008 Label safety warnign eye and ear protection required</p>

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2 OVERVIEW

Information in this manual is up-to-date at the time of going to print. However, because of the Climax commitment to ongoing product improvement, the machine you receive may differ slightly from the one described herein.

2.1 About this manual

This manual describes how to use your Model FF5000 Portable Flange Facer. For maximum safety and performance, read the entire instruction manual before operating the machine.

2.2 About the FF5000

The Model FF5000 Portable Flange Facer is an (Inside Diameter) ID-mounted flange re-facer. Its compact design makes it an ideal on-site maintenance tool. The machine fits into bores with ID's from 5.0" to 14.0" (127.0 to 355.6 mm). With the optional larger chuck, the mounting range is increased to 24" (610 mm) and I.D. flanges from 5" to 24" (127 to 610 mm) can be machined. Call Climax if you have special requirements outside of this range.

The FF5000 components are shown in Figure 1.

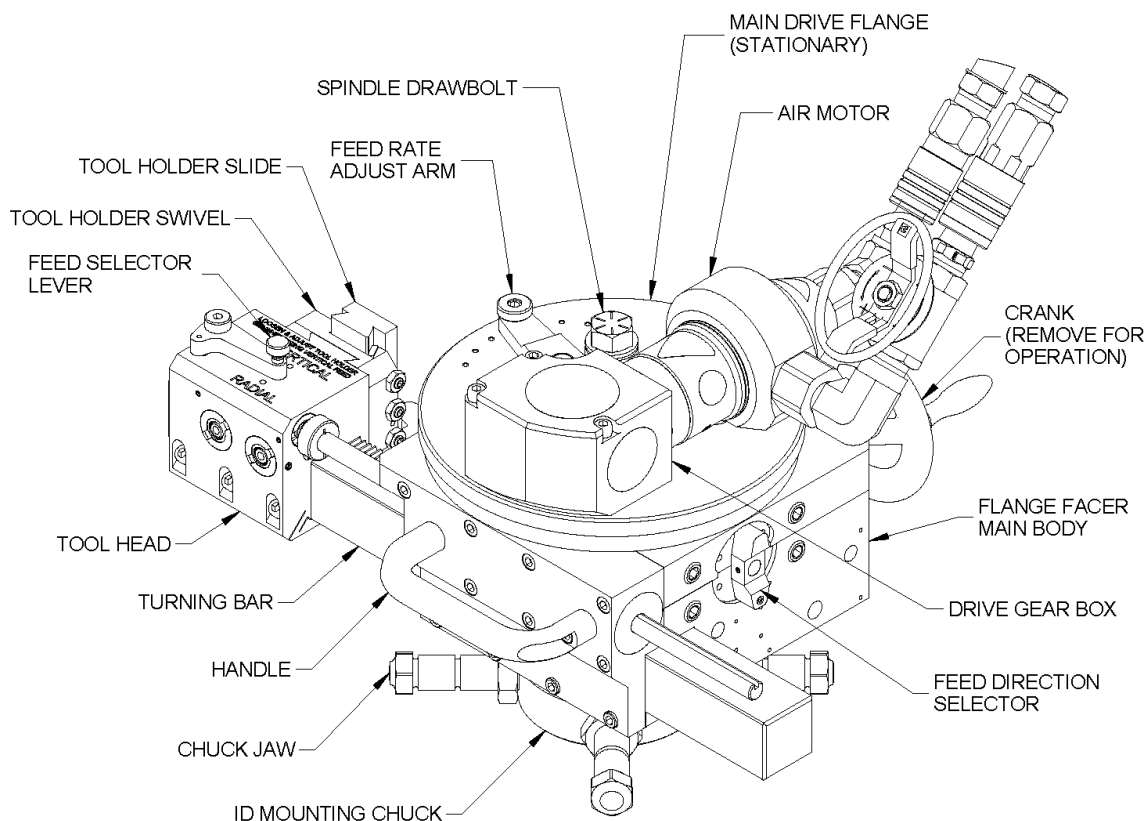


FIGURE 1. CLIMAX MODEL FF5000 PORTABLE FLANGE FACER

2.3 FF5000 specifications

Facing diameter:	5.0 – 24.0 inch (127 – 609.6 mm)
ID mounting range:	5-14 inch standard 5.0 – 18 inch (127 – 457.2 mm) using three chucks, optionally up to 24"
Maximum axial travel:	2.8 inch (71.1 mm) (.10 inch/turn (2.5 mm/turn) effective lead)
Axial travel feed rate:	0 -0.030 inch/rev (0 - .76 mm/rev) fully adjustable (approximate range)
Maximum down-feed travel:	2.0 inch (50.8 mm)
Down feed rate:	0- 0.020 inch/rev (0 - 0.51 mm/rev) fully adjustable (approximate range)
Tool holder rotation:	45 degrees counter-clockwise, 85 degrees clockwise (facing tool head)
Right angle drive ratio:	4:1
Main drive gear ratio:	7.05:1
Overall gear ratio:	28.2:1
Machine weight without chuck:	60 lbs (28 kg)
Shipping weight:	175 lbs (80 kg)
Shipping dimensions:	25" x 25" x 18" (635mm x 635mm x 460mm)

2.4 Pneumatic motor option performance specifications

Maximum rated horsepower:	1.07 hp (800 W)
Cutter head speed:	20 rpm free speed
Torque at cutter:	170 ft-lb (230 Nm) at maximum rated power (assumes .85 efficiency each gearbox)
Air requirements	60 scfm (1700 SLPM) at 90 psi
Air motor torque:	8.25 ft-lbs (11.25 Nm) at maximum power 13.75 ft-lbs (18.75 Nm) stall

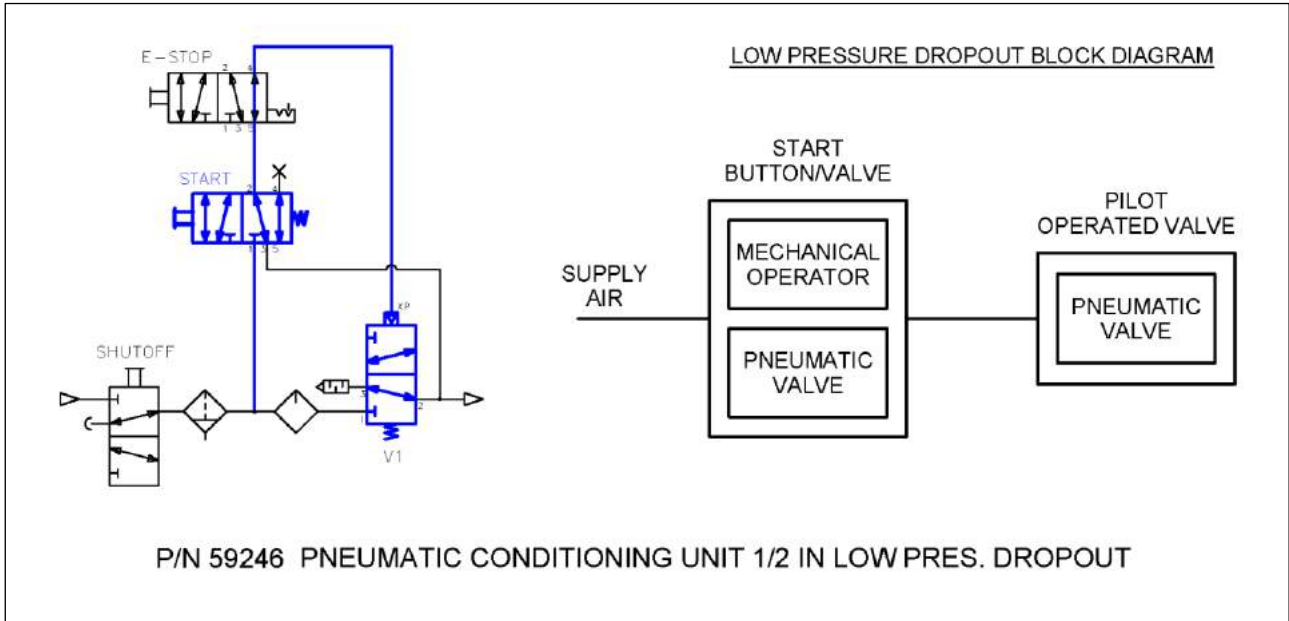


FIGURE 2. P/N 59246 PNEUMATIC SCHEMATIC

NOTICE

Contact Climax right away if there are any errors or questions about this equipment.

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3 SETUP

3.1 Receipt and inspection

Your Climax product was inspected and tested prior to shipment, and packaged for normal shipment conditions. Climax does not guarantee the condition of your machine upon delivery. When you receive your Climax product, perform the following receipt checks.

1. Inspect the shipping containers for damage.
2. Check the contents of the shipping containers against the included invoice to make sure that all components have been shipped.
3. Inspect all components for damage.

Contact Climax immediately to report damaged or missing components.

3.2 Setup and align the machine

The chuck is centered and leveled inside the work piece before the machine is mounted to the chuck.

To setup and align the machine

1. Remove the chuck from the machine (if necessary) in preparation for setup.
2. Remove and store the jam nut used when storing the machine.
3. Measure the ID of the work piece.
4. Using the table and chart below, select the appropriate chuck body and jaws. If using the optional 14" - 18" chuck, select the chuck body and jaws from that assembly. **JAWS MUST ALL BE THE SAME LENGTH** (see Table 1).

TABLE 1 CHUCK BODY AND PARTS TABLE

Bore diameter	Chuck body part number	Jaws part number (length)
5" – 7" ID (127 – 178 mm)	29134	27797 (1.6 in)
7" – 9" ID (178 – 229 mm)	29134	27800 (2.75 in)
9" – 14" ID (229 – 356 mm)	29802	27801 (3.6 in)
14" – 18" ID (356 – 457 mm)	27798	

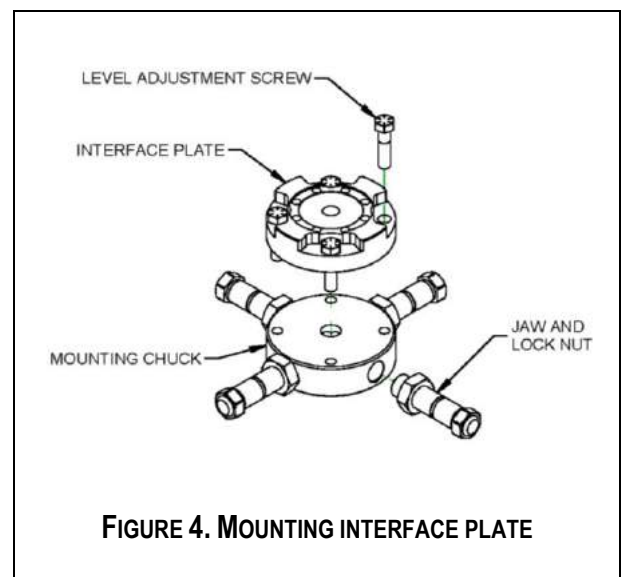
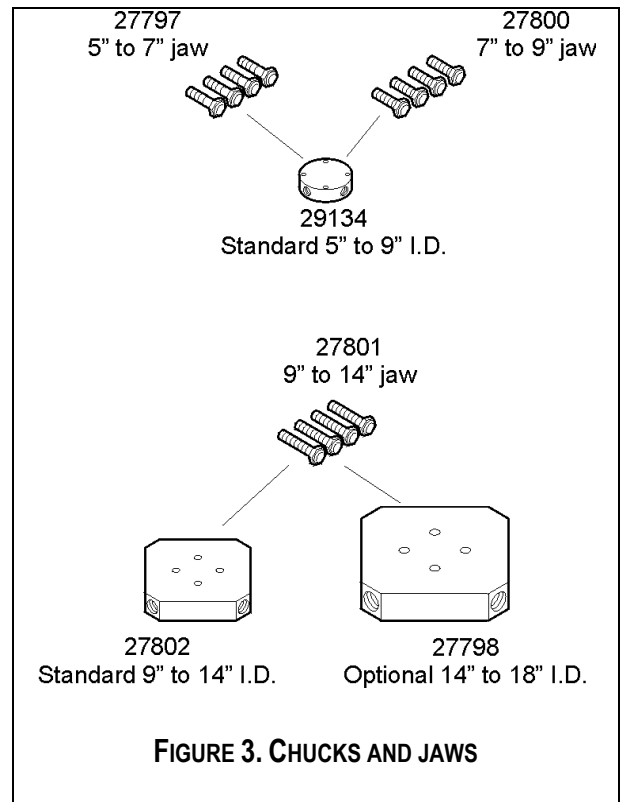
3.3 Mounting the interface plate

1. Mount the interface plate onto the chuck with the four socket-head cap screws provided. Note that the mounting surface of the interface plate is slightly conical to provide precise horizontal alignment by adjusting opposing screws.

TIP:

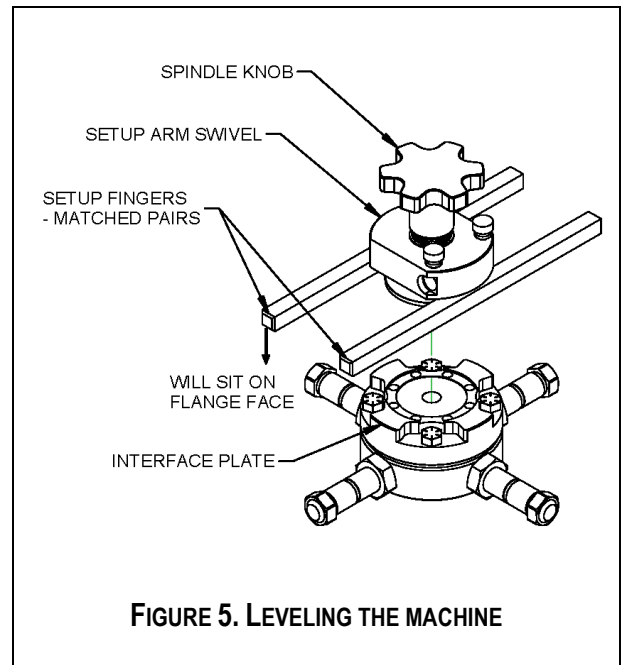
Initially the mounting screws should be equally set to level the interface plate with the chuck.

2. Apply JET LUBE 500 or a similar product to the end of the screws to prevent them from binding.
3. Screw the jaws into the threaded holes on the side of the chuck. Be sure the jaws are screwed in far enough to allow the chuck to be placed inside the work piece.
4. Using the knob, attach the alignment assembly onto the chuck. Do not tighten the knob.



3.4 Leveling the machine

1. Select the setup fingers that will span the flange bore and support the chuck. (Be sure both setup fingers are the same length.)
2. Place the setup fingers between the interface plate and the setup arm swivel, then hand tighten the spindle knob.
3. To make setup easier, position the setup fingers parallel to one set of jaws. This will leave enough clearance to adjust the jaws without moving the setup fingers.
4. Set the chuck assembly inside the bore. The setup fingers should lie flat against the flange face.



5. Screw out each pair of jaws until the chuck is roughly centered and the jaws are tight inside the bore. A ruler or calipers may be used between the interface plate and the ID/OD of the flange. For most jobs, initial alignment within 1/32" is sufficient. For precision centering, fine tuning by alternating between leveling and centering in several steps is required.
6. Loosen the alignment spindle knob.
7. Remove the setup fingers.
8. Lightly retighten the spindle knob. The Spindle knob on top is tightened so that the alignment fixture is registered accurately on its mounting surface, but the spindle can still be rotated.

3.5 To precision level and center the machine

1. Slide the dial indicator rod into the setup arm swivel.
2. Attach the dial indicator to the rod. The rod can be attached to either the end or the back of the dial indicator.
3. Tighten the rod collar just enough to hold the dial indicator.
4. Adjust the rod until the dial indicator is at the desired diameter.
5. Tighten the knurled thumbscrew so that the dial indicator will not move from the set position.
6. Tighten the spindle knob enough to accurately locate the alignment fixture, but to still allow rotation of the spindle.
7. Position the dial indicator until it just touches as it sweeps around the flange.

8. Tighten or loosen opposing screws in the top of the chuck/spindle interface plate, working one axis at a time, until the chuck is level.
9. Repeat the leveling/centering steps until the chuck is level.
10. Precisely center the chuck by sweeping the desired diameter with a dial indicator while adjusting the chuck jaws.
11. Unscrew the spindle knob and remove the alignment assembly from the chuck assembly.
12. Be sure that mating faces of the interface plate and the spindle are clean, dry, and free of burrs. If necessary, use a hand stone to lightly hone any scratches or imperfections in the mating surfaces.
13. Place the machine on the chuck interface plate.
14. Align the dowel pin in the spindle with the receiver holes in the interface plate.
15. The machine should be rotated until the feed control is in a convenient location for the operator.
16. Tighten the spindle screw to 50ft-lbs (68 N-m).

CAUTION

Do not over tighten the spindle screw. Overtightening the spindle screw will undo the leveling procedure.

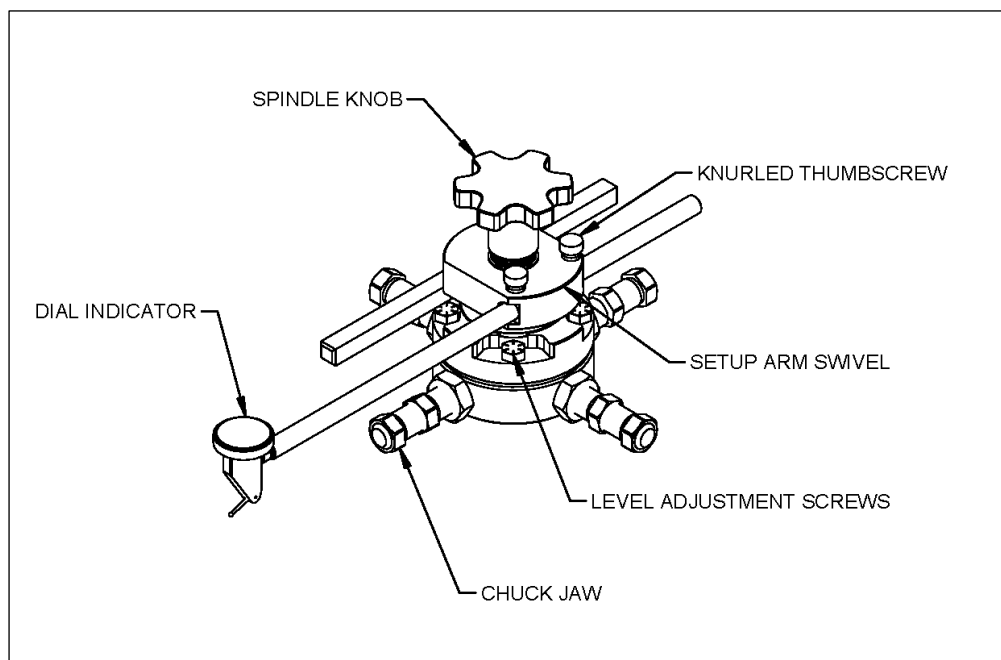


FIGURE 6. PRECISION LEVELING AND CENTERING THE MACHINE

3.6 Tool head setup and adjustment

The FF5000 traverses on a fixed turning bar. Please note that the turning bar can be adjusted to reduce swing radial clearance.

Do the following procedure to roughly adjust the turning bar and tool head.

1. Loosen the eight screws below the handle in the main body.
2. Slide the turning bar to the desired position.
3. Retighten the screws.

The tool head adjusts to enable cutting at many different angles. The tool holder swivel rotates 90° counterclockwise and 72° clockwise, when facing the tool head.

The tool holder slide provides up to 2.0" (50.8 mm) of tool bit travel.

See “Cutting Angles, Grooves, and Chamfers” for more information.

The flange facer rotates counterclockwise as seen from the top.

CAUTION

Swiveling the tool head beyond its stated limits can disengage the slide and cause damage

3.7 Adjusting the tool head

4. Loosen the two screws above and below the feed pinion gear.
 1. Rotate the tool holder to the necessary angle.
 2. Clamp the tool bit into the holder. The tool bit should barely touch the surface of the flange.
 3. Check that the tool bit faces the proper direction for cutting.
 4. Tighten the setscrew.
 5. Attach the crank handle to the side of the machine.
 6. Set the feed to RADIAL by lightly applying pressure on the feed selector lever while turning the crank handle.
 7. Crank the tool head to the start position of the cut.
 8. Set the feed to VERTICAL by lightly applying pressure on the feed selector lever while turning the crank handle.
 9. Crank the tool head down until the tool bit is at the desired cutting depth. An indicator may be placed on the top of the tool bit or tool slide to accurately measure this adjustment.
10. The feed speed/direction arm must be in the neutral (center) position.

The tool bit clamp can be rotated to provide clearance around the tool without having to grind a relief.

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4 OPERATION

WARNING

Falling equipment can cause serious injury. Be sure the machine is secure inside the work piece before connecting the air supply.

WARNING

The motor can operate unexpectedly when the air hose is connected. Close the valve to the pneumatic motor before connecting the air hose.

The Model FF5000 Flange Facer has a premium quality 1.07 hp (.800 W) air motor. The air motor will rotate the machine at approximately 20-rpm free speed. Adjust the motor speed by opening or closing the air control valve.

- Fill the lubricator oil cup with air tool oil before using the machine. The air filter and lubricator supplied with the machine must be used or the machine warranty becomes void. Lubricate at a rate of five drops per minute at full throttle. See the “Maintenance” section for recommended air tool oil.

CAUTION

Some lubricants can cause the seals to dry out, causing major issues with the air motor. Please check to be sure the lubricants used will not damage seals.

CAUTION

Avoid motor damage by routing the incoming air through the air filter and lubricator.

4.1 Starting and stopping

WARNING

Rotating equipment can cause serious injury. Be sure the machine is secure inside the work piece before connecting the air supply.

4.1.1 Preparing the machine for start-up

1. Shut the air control valve completely by turning the handle clockwise until it stops.
2. Connect the male quick disconnect from the air motor to the female quick disconnect of the pneumatic conditioning unit.
3. Open the air control valve to make sure the machine is turning.
4. Close the air control valve and follow the procedures in Sections 4.2, 4.3 and 4.4 for set up procedures.

4.1.2 Stopping the machine

1. Close the air control valve by turning the handle counterclockwise until it stops.
2. Disconnect the air supply line at the quick disconnect.

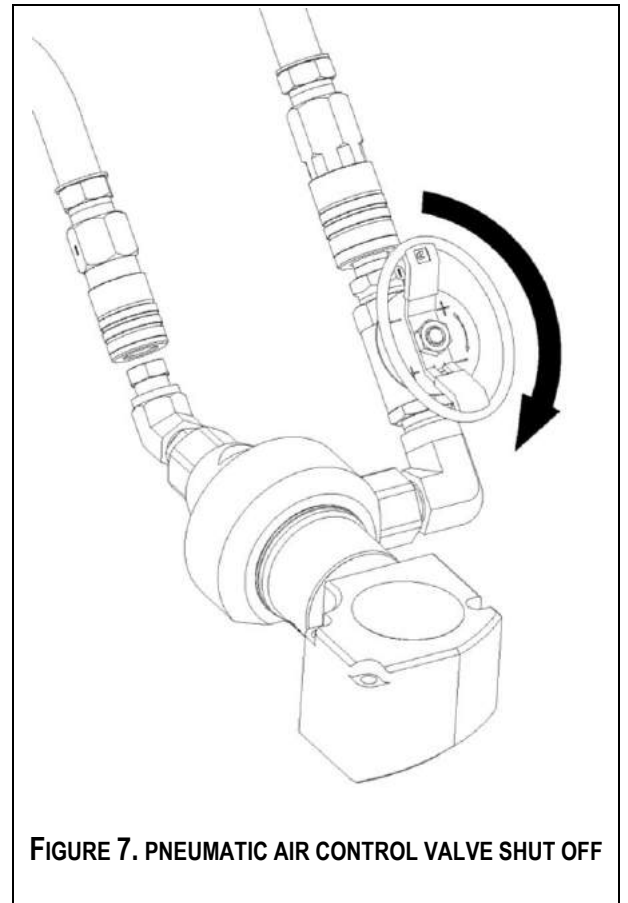


FIGURE 7. PNEUMATIC AIR CONTROL VALVE SHUT OFF

4.2 Setting vertical and radial tool feed

Tool feed is set using the feed selector lever, the direction selector, and spring plunger on the tool head.

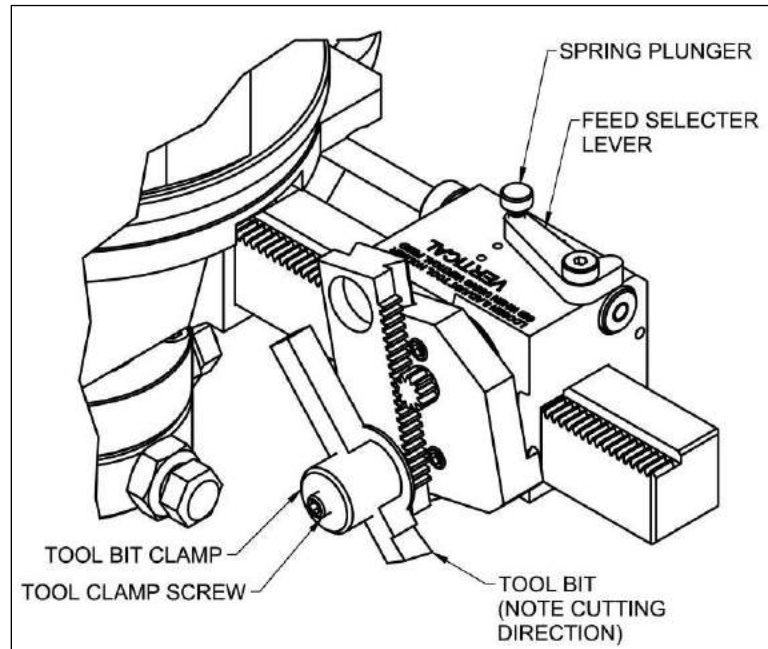


FIGURE 8. SETTING TOOL FEED

Jog the feed

Do the following procedure to manually jog the feed:

1. Set the feed direction selector to the neutral (center) position.
2. Insert the crank in the side of the main body.
3. Crank the tool head to the desired location.

4.2.1 Setting the drag

Before setting the tool feed, the drag must be set. Drag affects cutting performance. To feed in either vertical or radial feed modes the drag must be set correctly. If the drag is set too high, the machine may be damaged when run in auto feed.

4.2.1.1 Setting the radial drag:

1. Loosen the three cap screws in the tool head that clamp the tool head to the turning bar.
2. Insert the crank handle onto the flange facer main body.
3. Pull up the spring plunger and move the feed selector lever to **RADIAL**. Turn the crank till the feed selector lever moves to the radial position.
4. Turn the crank so the tool head moves. Tighten the three cap screws evenly to the point that the drag can be felt at the crank.

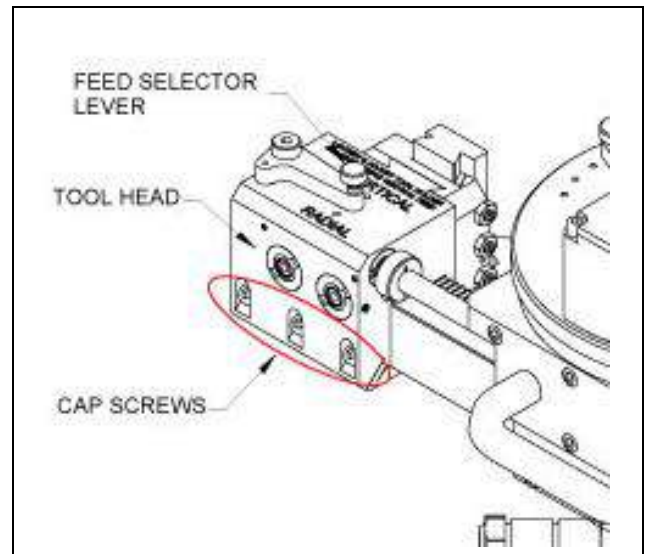


FIGURE 9. CAP SCREW LOCATIONS

4.2.1.2 Setting the vertical drag:

1. Loosen the three set screws in the tool holder swivel that tighten the tool holder slide Gib.
2. Insert the crank handle onto the flange facer main body.
3. Pull up the spring plunger and move the feed selector lever to **VERTICAL**. Turn the crank till the feed selector lever moves to the vertical position.
4. Turn the crank so the tool holder slide moves. Tighten the three set screws evenly to the point that the drag can be felt at the crank. Tighten the set screw jam nuts.

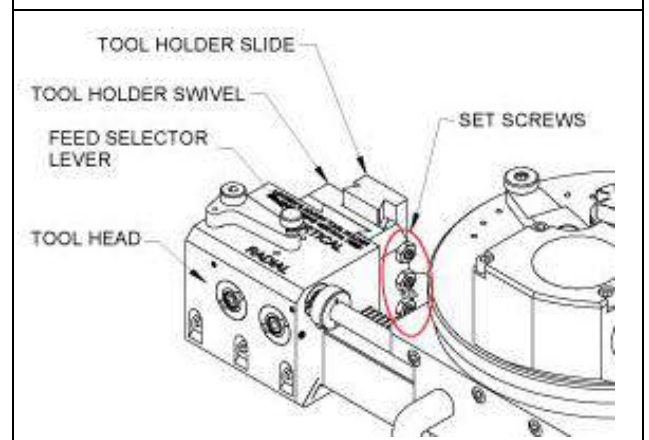


FIGURE 10. SET SCREW LOCATIONS

4.2.2 To set the feed

1. Close the air control valve by turning the valve clockwise until it stops.
2. Pull up the spring plunger (see Figure 8).
3. Move the feed select lever to either **VERTICAL** or **RADIAL** while turning the crank handle attached to the side of the main body. Be sure the plunger seats at the desired position.

4.2.3 Automatic feed

1. Set the feed speed as described Section 4.3.
2. The feed direction selector must be in the neutral (center) position.

CAUTION

The feed crank handle must be removed from the machine before turning the machine on.

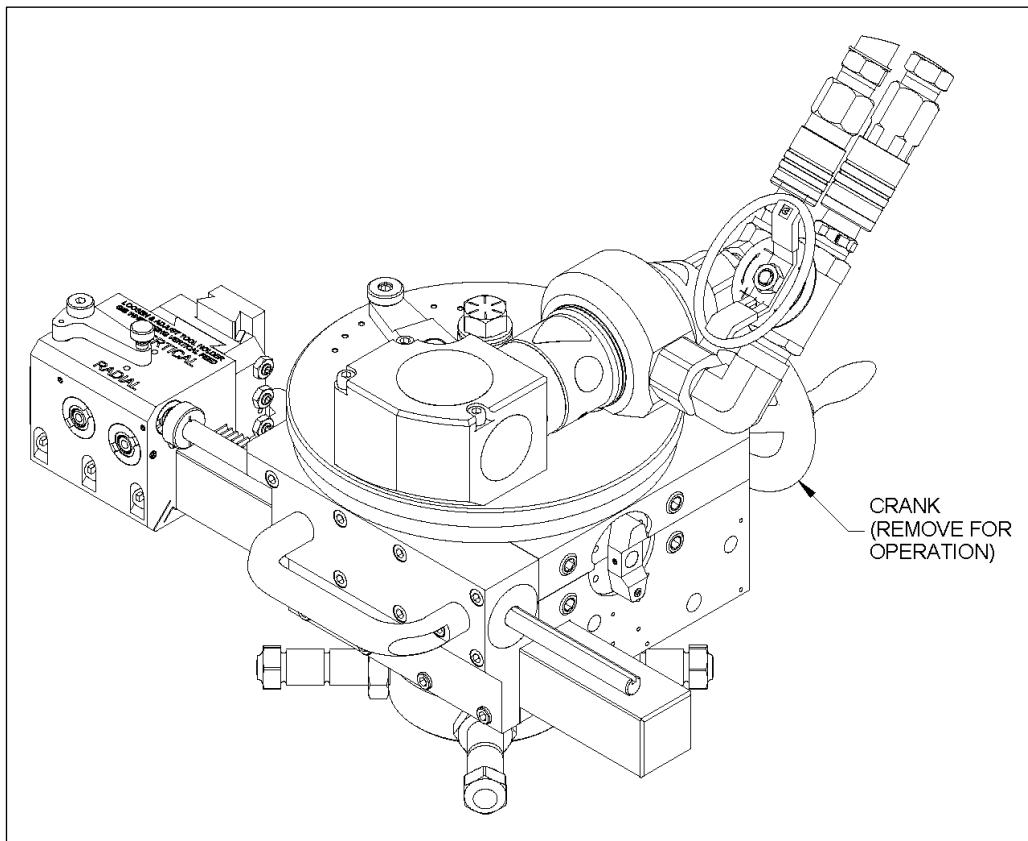


FIGURE 11. REMOVE CRANK HANDLE

4.3 Setting tool feed speed and direction

Radial cutting tool feed is infinitely variable from 0 to 0.030" (0.75 mm) per revolution.

Vertical cutting tool feed is infinitely variable from 0 to 0.020" (0.50 mm) per revolution.

The feed directions are marked on the feed direction selector on the side of the main body:

- IN and OUT for radial feed;
- UP and DOWN for axial feed.

The feed speed is set by the lever on the main drive flange with the markings ZERO to MAX in eight increments. This control does not move while the machine is rotating. The feed speed can be set or adjusted at any time after the machine has started.

CAUTION

If the feed direction selector does not move smoothly, do not force it. Stop the machine and gently work the arm back and forth while joggling the feed mechanism with the manual feed crank handle. Forcing the arm will damage the arm, and may misalign the feed system.

4.3.1 Setting the feed direction:

1. Select the feed direction after positioning the tool manually. Select either OUT/UP or IN/DOWN.
2. Move the Feed Speed adjust lever to ZERO.
3. Start the machine.
4. Move the feed speed adjust arm to the desired feed rate position. The feed rate can be increased, decreased, or set to zero at any time during machine operation.

The feed adjust arm can be placed anywhere along the speed path, including between the increments.

Operate the machine as described in "Facing."

WARNING

To protect yourself from flying chips and machine noise, wear eye and ear protection while operating the machine.

4.3.2 To set the feed speed/direction when flat facing

1. Turn the air control valve clockwise until it is completely closed.
2. Be sure the pneumatic conditioning unit is correctly connected and set up.
3. Connect the supply air line.

WARNING

The motor can operate unexpectedly when the air hose is connected. Close the valve to the pneumatic motor before connecting the air hose.

4. For manual feed, the feed direction selector must be in the neutral position.

CAUTION

Lock out and tag out the pneumatic conditioning unit before making adjustments to rotating parts.

5. To roughly adjust the turning bar and tool head position, loosen the eight screws below the handle in the main body and slide the turning bar to the desired position.
6. Set the feed direction selector to NEUTRAL.
7. Open the air control valve so that the machine will start rotating slowly.
8. Move the feed speed arm to the desired feed rate setting.
9. Open the air control valve counter-clockwise until the machine is rotating at the desired RPM.
10. Allow the flange-facing machine to complete facing the flange.
11. Repeat Steps #1 through #10 as necessary.

WARNING

Rotating machinery can cause serious injury. Turn off the air control valve and disconnect the air line before removing chips. Remove chips with a brush.

12. After facing the flange, close the air control valve and disconnect the air supply.
13. After the flange is completely re-faced, disconnect the air supply.
14. To remove the machine from the work piece, see “Disassembly.”

4.4 Cutting angles, grooves and chamfers

The tool head adjusts in a variety of ways to enable cutting at many different angles. The tool holder swivel can rotate up to 90° clockwise and 72° counterclockwise (seen as the operator is facing the tool head). The tool holder slide provides up to 2.0" (50.8 mm) of tool bit travel.

CAUTION

Rotating the tool swivel past the stated limits can disengage the tool slide and damage the tool head.

4.4.1 To adjust the tool head

1. Grind a 1/2" (12 mm) square tool bit. Climax recommends high-speed steel tool bits.
2. The tool bit clamp can be turned to provide tool clearance without having to grind a relief.
3. Insert the tool bit into the tool bit clamp.
4. The flange facer rotates counterclockwise as seen from the top. Check that the tool bit faces the correct direction for cutting. Tighten the setscrew.
5. Loosen the three setscrews holding the tool swivel. Rotate the tool swivel until the tool bit is at the desired angle. Retighten the setscrews.
6. Roughly adjust the turning bar and tool head by loosening the eight screws below the handle in the main body, slide the turning bar to the desired position, and retighten the screws.
7. With the feed direction selector in the NEUTRAL, set the feed to VERTICAL by lightly applying pressure to the feed selector lever while rotating the hand crank. Adjust the tool head down until the tool bit is at the desired cutting depth.

WARNING

Protect yourself from flying chips and machine noise, by wearing eye and ear protection while operating the machine.

8. Be sure the incoming air control valve is tightly closed.
9. Be sure the pneumatic conditioning unit is connected and adjusted properly.
10. Connect the incoming air line.
11. Be sure the tool bit is facing the correct direction for cutting as described.
12. With the feed direction selector to either OUT/UP or IN/DOWN, set the feed direction lever on the tool head to VERTICAL. Set the feed speed arm to NEUTRAL. See Section 3.6 Tool head setup and adjustment and Section 4.3 Setting tool feed speed/direction for more information.
13. Open the air control valve sufficiently to start the machine slowly rotating.

14. Move the feed speed arm to the desired feed rate setting.
15. Open the air control valve until the machine is rotating at the desired rpm.
16. Allow the flange facer to completely machine the work piece.

WARNING

Rotating machinery can cause serious injury. Turn off the air control valve and disconnect the air line before removing chips. Remove chips with a brush.

17. Rotating machinery can seriously injure the operator. Turn off and lock out the machine before removing chips. Remove chips with a brush.
18. After machining the work piece, close the air control valve and disconnect the air line.
19. Repeat Steps #1 through #18 as necessary.
20. After the work piece is repaired, disconnect the air supply and dismount the machine. (Go to "Disassembly.")

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5 DISASSEMBLY

5.1 Post-operation checks

1. Check for damage.
2. Clean thoroughly.
3. Repair any damage/replace parts as necessary.

5.2 To disassemble the machine

1. Close the air control valve and disconnect the air line.
2. Unscrew the spindle bolt and remove the machine.
3. Mount the setup fingers. So when the jaws are released the chuck stays in place.
4. Loosen the jaws and remove the chuck from the work piece.
5. To store the machine, see Storage (Section 7).

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6 MAINTENANCE

Recommended lubricants

TABLE 3. RECOMMENDED LUBRICANTS

Lubricant	Brand	Where Used
Gear grease	Polytac EP #2	Gears, thrust bearings
Lubricant	JET LUBE 500	Chuck leveling screws
Light oil	LPS1™ or LPS2™	Unpainted surfaces
Cutting oil	UNOCAL KOOLKUT	Tool bits, work piece
Lubricating and Pneumatic Oil	Unax AW 32	Pneumatic lubricator reservoir

CAUTION

To avoid damage to the machine, use only the recommended lubricants.

6.1 Chuck assembly

Prevent leveling screws from seizing by applying JET LUBE 500 to the jaws before and after each use.

6.2 Alignment assembly

Protect the set up fingers from corrosion by applying a light layer of oil after each use. See recommended lubricants.

6.3 Main body assembly

The main body is sealed and lubricated for life. If problems with the main body occur contact Climax immediately.

6.4 Tool head assembly

Apply a light layer of oil to the turning bar and the tool holder slide and tool holder swivel dovetails each time the flange facer is used.

6.5 Air motor and pneumatic assembly maintenance

To extend the life of the air motor do the following.

1. Route the air supply through the lubricator and air filter.

CAUTION

Using air that is not filtered or lubricated can damage the motor. When operating the machine, route the incoming air through the air filter and lubricator.

2. Use nonrestrictive air lines and fittings. Check the air system periodically to be sure the air pressure is 90 psi (620 kPa).

Adjust motor speed by turning the air control valve at the motor.

CAUTION

To avoid machine damage, DO NOT adjust the motor speed by changing the in-line air pressure from 90 psi (620 kPa).

Fill the lubricator oil cup with air oil before using the machine. Use high-quality oil with rust inhibitors and emulsifiers such as Marvel Tool Oil. The lubricator should be added to the air at a rate of five drops of oil per minute at full throttle. Drain the air filter before and after using the machine.

7 STORAGE

Proper storage of the Flange Facer will prevent undue deterioration or damage.

7.1 Short-term storage

Store the FF5000 in its original shipping box.

7.2 Long-term storage

Spray all unpainted machine surfaces with a layer of light oil.

1. Add a desiccant pouch to the shipping container. Replace according to manufacturer instructions.
2. Store the FF5000 in its shipping container.
3. Store the shipping container in an environment out of direct sunlight with temperature < 70°F and humidity < 50%.

7.3 Shipping

The FF5000 can be shipped in its original shipping box.

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APPENDIX A SPARE PARTS

The spare parts list below includes items most frequently required due to wear, loss, or damage. To minimize downtime, these items should be stocked.

TABLE 4. SPARE PARTS LIST

PART No.	DESCRIPTION	QTY	WHERE USED
27797	Jaw 5" - 7" ID	4	Chuck assembly
27800	Jaw 7" - 9" ID	4	
27801	Jaw 9" - 14" ID	4	
29169	Indicator support rod	1	Alignment assembly
29121	10" setup fingers	2	
29122	14" setup fingers	2	
29123	20" setup fingers	2	
81084	Handwheel	1	Tool kit
29173	7/8" combination wrench	1	
11082	3/16" short arm hex wrench	1	
14649	3/16" x 6" T-handle hex wrench	1	
16807	5/16" x 6" T-handle hex wrench	1	
14668	1-1/8" Open end wrench	1	
31859	1/2" x 4" HSS tool bit LH finishing	As needed	Not included in tool kit
31868	1/2" x 4" HSS tool bit LH roughing	As needed	

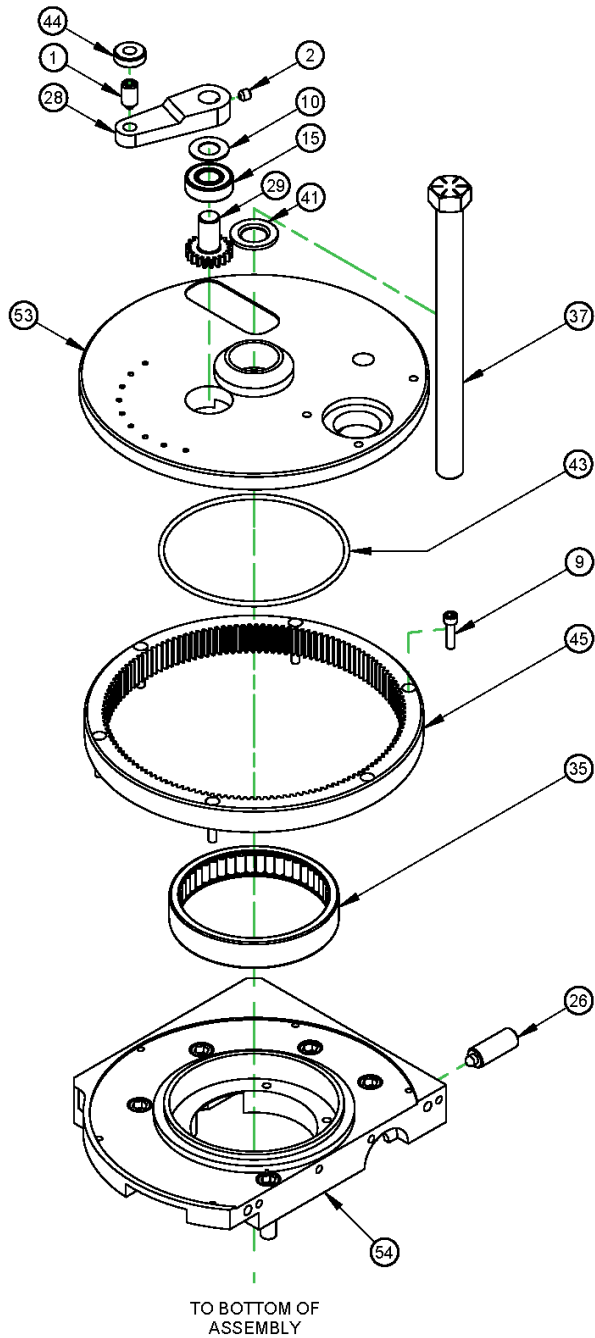
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APPENDIX B EXPLODED VIEWS AND PARTS

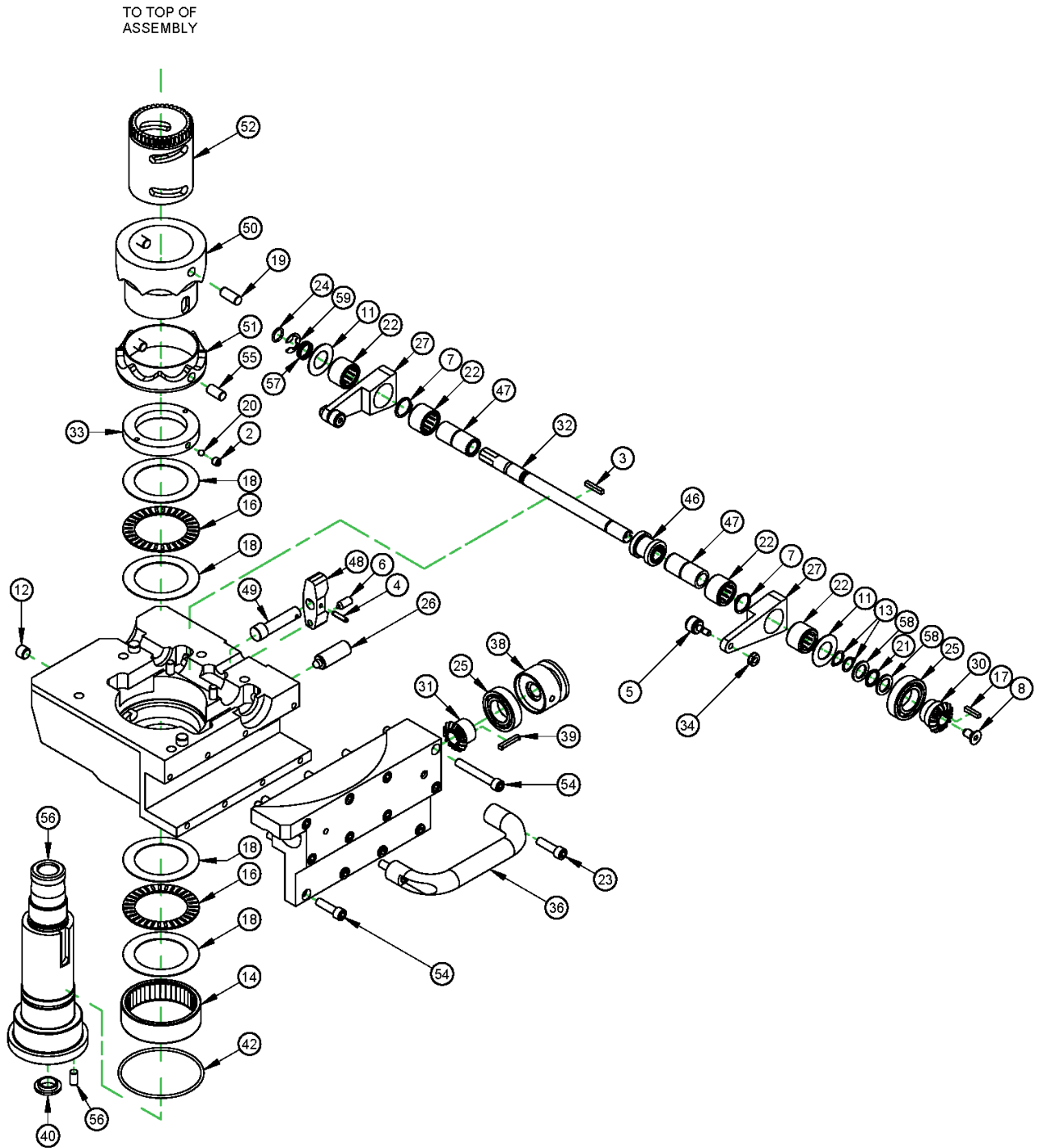
The following diagrams and parts lists are for reference purposes only. The machine Limited Warranty is void if the machine has been altered by anyone who has not been authorized in writing by Climax Portable Machining & Welding Systems to service the machine.

TABLE 5. TOOL KIT – P/N 29116

P/N	DESCRIPTION	QTY	UOM
14668	WRENCH END 1-1/8 THIN BLACK OXIDE	1	Piece
16479	WRENCH END 9/16 COMBINATION LONG (KB)	1	Piece
25710	BIT TOOL HSS 1/2 X 4.0 LH & RH PRE-GROUND	1	Piece
81084	HANDLE WHEEL	1	Piece
29173	WRENCH END 7/8 COMBINATION LONG CHROME	1	Piece
31868	BIT TOOL HSS 1/2 X 4.0 LH ROUGHING SINGLE (KB)	1	Piece
33999	WRENCH HEX SET .050 - 3/8 BONDHUS BALL END (KB)	1	Piece
36668	MANUAL INSTRUCTION FF5000 FLANGE FACER (KB)	1	Piece
39517	PRINT LAYOUT FF5000 PACKAGING	1	Piece



45187 - FF5000 MAIN BODY - REV A

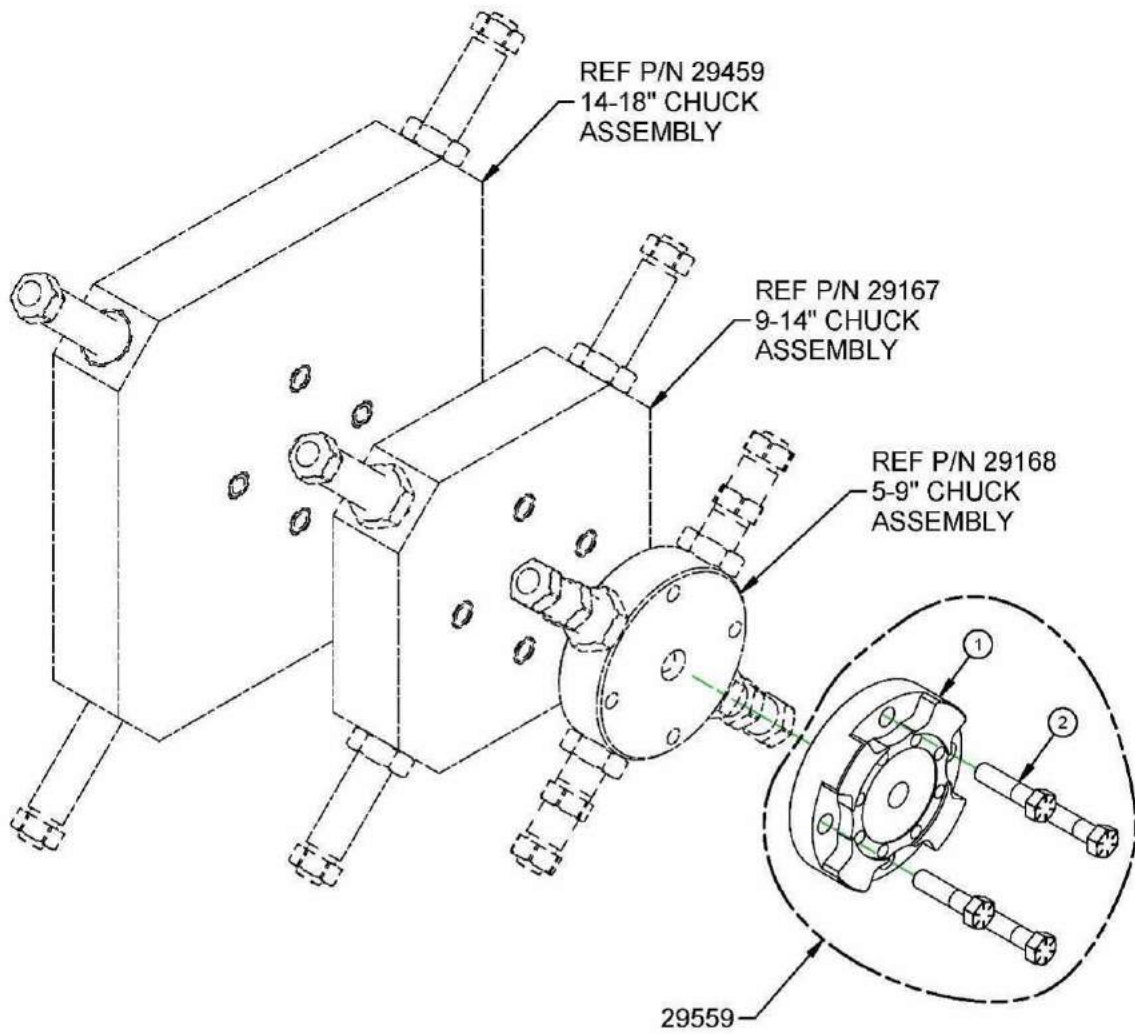


45187 - FF5000 MAIN BODY - REV A

PARTS LIST			
ITE	QT	P/N:	DESCRIPTION
1	1	10441	SPRING PLUNGER 3/8-16 HEAVY FORCE
2	2	10464	SCREW 1/4-20 X 1/4 SSSCP
3	1	10465	KEY 1/8 SQ X .75 SQ BOTH ENDS
4	1	10819	PIN ROLL 1/8 DIA X 5/8
5	2	10836	BRG CAM FOLLOW .500 X .344
6	1	10848	PLUNGER DETENT SPRING STUBBY 1/4-20 X .531
7	2	11019	RING SNAP 5/8 OD X .035 THICK
8	1	11675	SCREW 1/4-20 X 1/2 FHSCS
9	5	11676	SCREW 10-32 X 3/4 SHCS
10	1	11736	WASHER THRUST .500 ID X .937 OD X .030
11	2	11823	WASHER THRUST .625 ID X 1.125 OD X .030
12	1	12616	FTG PLUG 1/8 NPTM SOCKET
13	2	12910	RING SNAP 7/16 OD EXTERNAL
14	1	14343	BRG NEEDLE 2-1/4 ID X 2-5/8 OD X .750 OPEN
15	1	14956	BRG BALL .500 ID X 1.125 X .375
16	2	15605	BRG THRUST 1.750 ID X 2.500 OD X .0781
17	1	15725	KEY 1/8 SQ X .62 SQ
18	4	15908	THRUST WASHER
19	2	16540	PIN DOWEL 5/16 DIA X 3/4
20	1	16594	BALL NYLON 3/16 DIA
21	1	16599	RING O 1/16 X 7/16 ID X 9/16 OD
22	4	17071	BEARING ROLLER CLUTCH 5/8 ID X 7/8 OD X .625
23	2	17131	SCREW 1/4-20 X 7/8 SHCS
24	1	21797	RING O 1/16 X 3/8 X 1/2 OD
25	2	21994	BRG BALL .7874 ID X 1.4567 OD X .3543 (VMI)
26	4	25955	SPRING PLUNGER 1/2-13 LIGHT FORCE
27	2	27759	ARM RATCHET
28	1	27774	ARM FEED ADJUST FF5000
29	1	27775	GEAR FEED ADJUST
30	1	27777	GEAR BEVEL MODIFIED - INPUT
31	1	27778	GEAR BEVEL MODIFIED OUTPUT
32	1	27779	SHAFT INPUT FEED FOR FF5000
33	1	27785	NUT THRUST
34	2	28060	NUT, 10-32 UNF KEPS
35	1	28258	BRG NEEDLE 3.500 X 4.000 X .750 OPEN
36	1	29005	HANDLE U STYLE
37	1	29149	SCREW MODIFIED FF5000 SPINDLE
38	1	29166	PLUG HANDLE
39	1	29179	KEY DRIVE INTERMEDIATE
40	1	29427	RETAINER NUT SPINDLE BOLT
41	1	29495	WASHER CHAMFERED .625 ID X 1.125 OD X .092
42	1	29672	RING O 3/32 X 2-5/8 X 2-13/16 OD
43	1	29870	RING O 1/8 X 4-1/4 X 4-1/2 OD
44	1	30558	NUT 3/8-16 FINGER CHECK NUT
45	1	30603	GEAR RING MAIN DRIVE
46	1	39332	SPOOL ACTUATOR FEED DIRECTION
47	2	39333	BUSHING FEED DRIVE
48	1	42119	LEVER SHIFT FEED DIRECTION
49	1	42120	SHAFT ECCENTRIC SHIFT FEED DIRECTION
50	1	42121	CAM FEED UPPER HALF
51	1	42122	CAM FEED LOWER HALF
52	1	42123	CAM GEAR DRIVEN FEED SHIFT SELECTOR
53	1	42503	PLATE FLANGE MAIN DRIVE FF5000
54	1	42531	BODY MAIN FF5000 3RD
55	2	44098	PIN DOWEL 5/16 DIA X 5/8
56	1	47825	SPINDLE TORQUE PINNED FF5000 WITH PILOT
57	1	73581	SPRING HIGH LOAD LOW PROFILE .48 ID X .60 OD X .24 LG
58	2	73837	WASHER SHIM 12MM ID X 18MM OD X 1.5MM THK 18-8 SS
59	1	74379	RING SNAP 7/16 ID X .687 OD E-CLIP X .035 YELLOW ZINC

45187 - FF5000 MAIN BODY - REV A

FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	29135	PLATE INTERFACE CHUCK/SPINDLE FF5000
2	4	30038	SCREW 3/8-24 X 1-1/2 HHCS GRADE 8

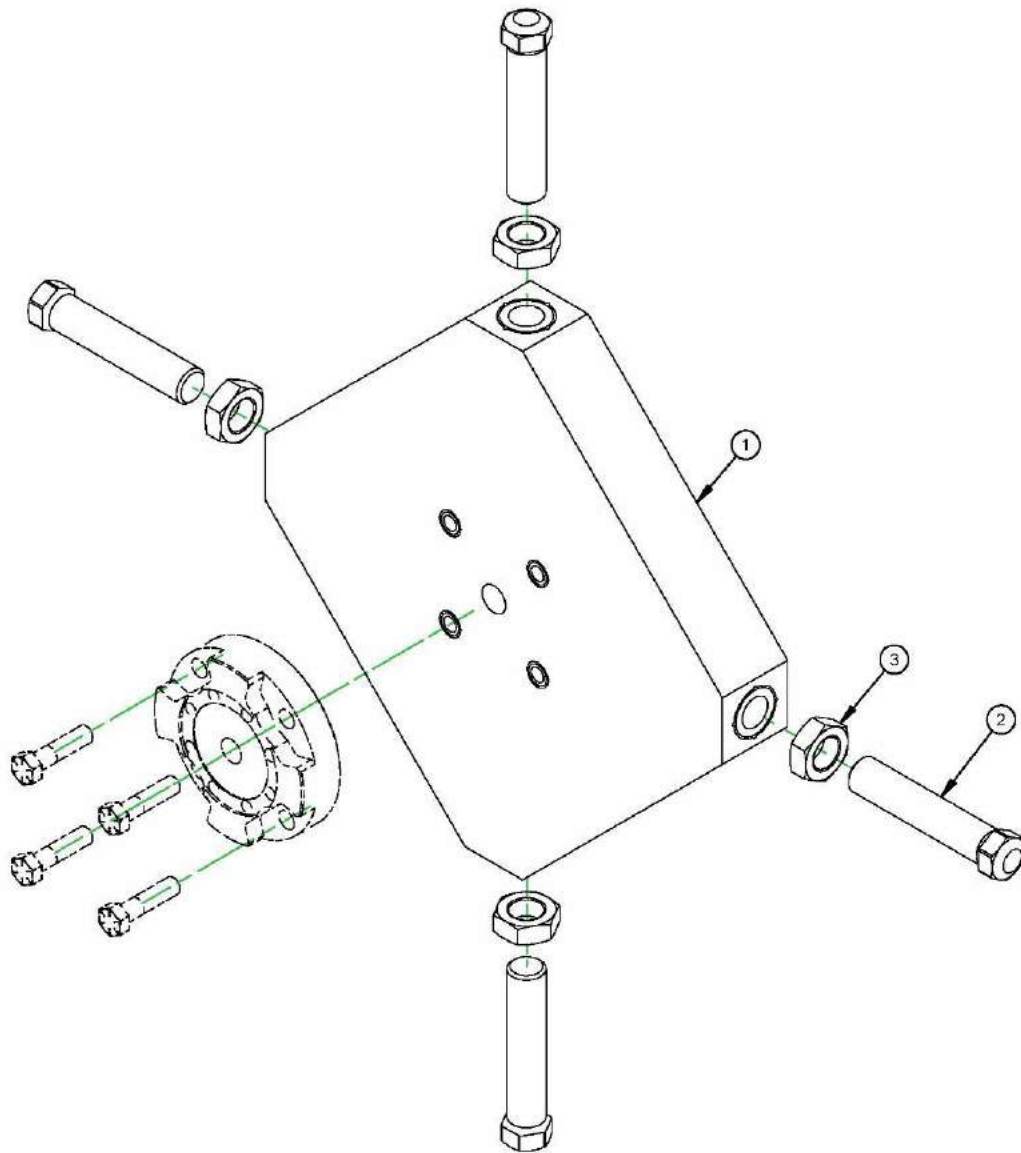
ASSY INTERFACE CHUCK/SPINDLE

29559



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WWW.CPMT.COM inside U.S. 1-800-333-8311



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	27798	PLATE CHUCK 14 TO 18 ID
2	4	27801	JAW 9 TO 14 AND 14 TO 18 ID MTG
3	4	31555	NUT 3/4-16 JAM

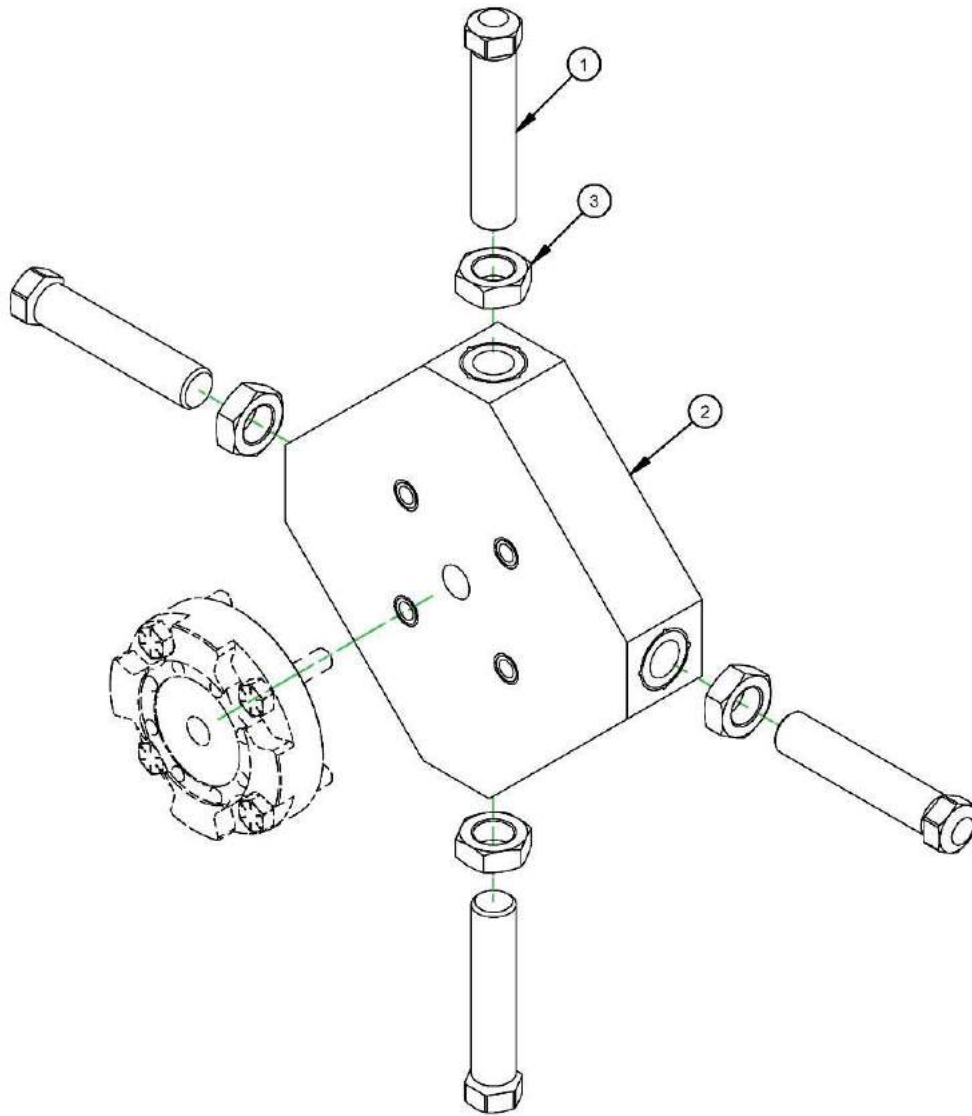
CHUCK MTG ASSY 14 TO 18 ID FF5000

29459



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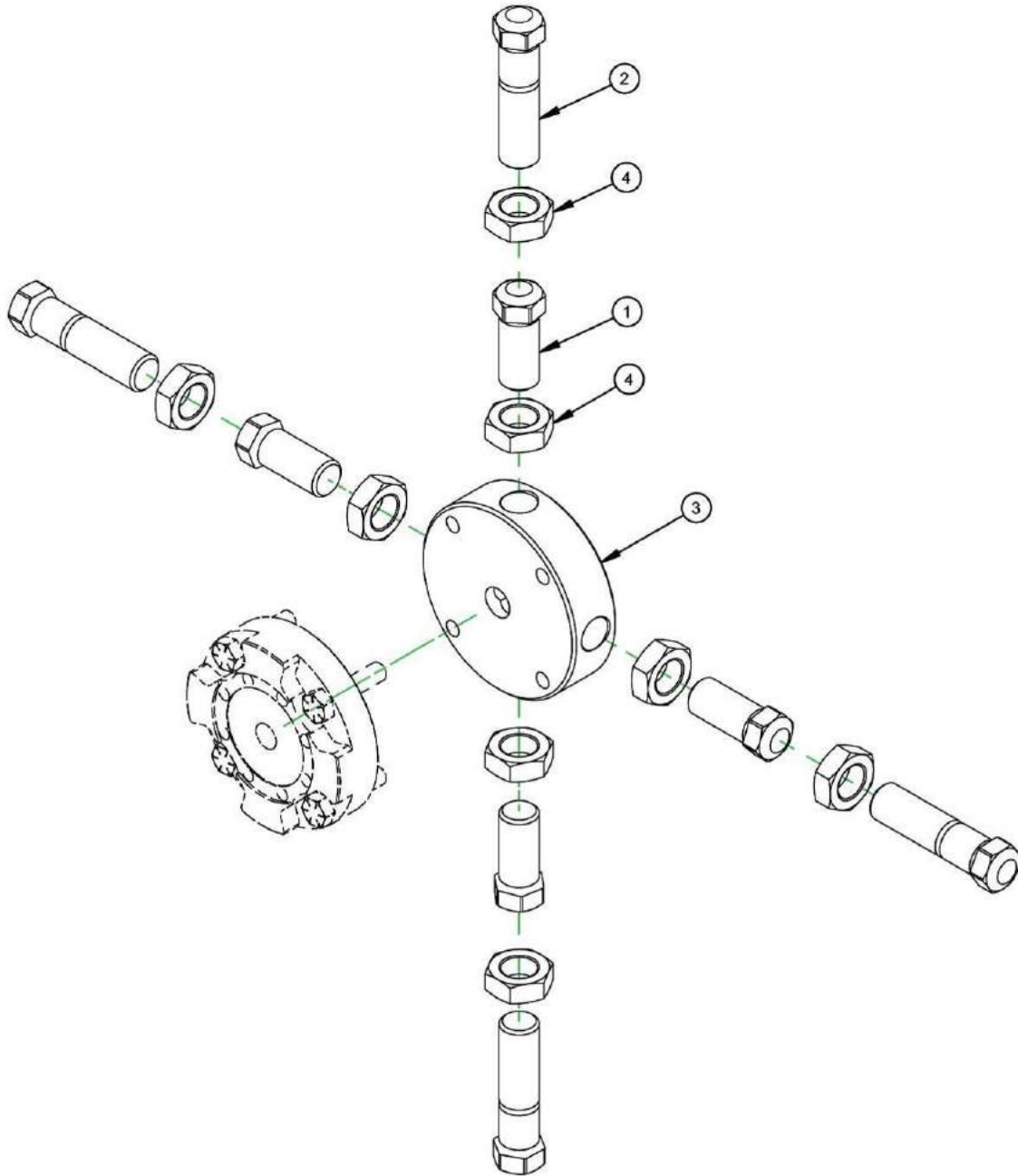
WWW.CPMT.COM inside U.S. 1-800-333-8311



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	4	27801	JAW 9 TO 14 IN MTG
2	1	27802	PLATE CHUCK 9 TO 14 ID
3	4	31555	NUT 3/4-16 JAM

CHUCK MOUNTING ASSY 9 TO 14 ID MOUNT

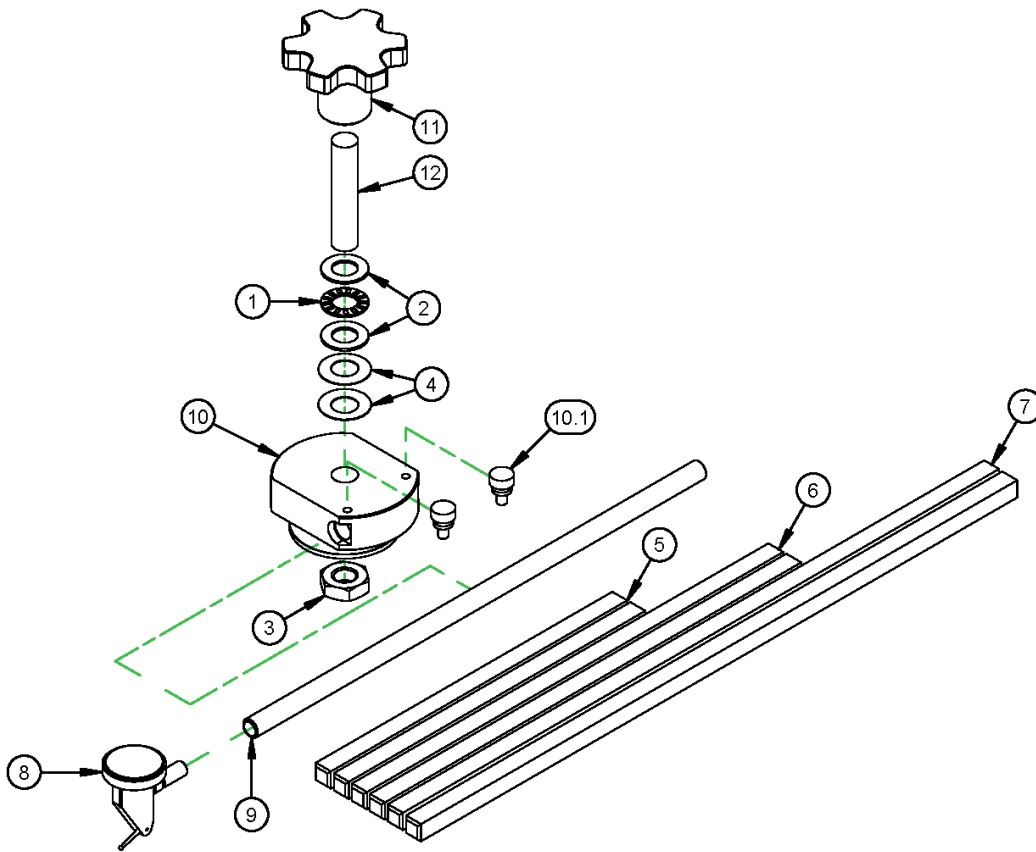
29167



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	4	27797	JAW 5 TO 7 ID MTG
2	4	27800	JAW 7 TO 9 ID MTG
3	1	29134	PLATE CHUCK 5" TO 9" ID MOUNTING
4	8	31555	NUT 3/4-16 JAM

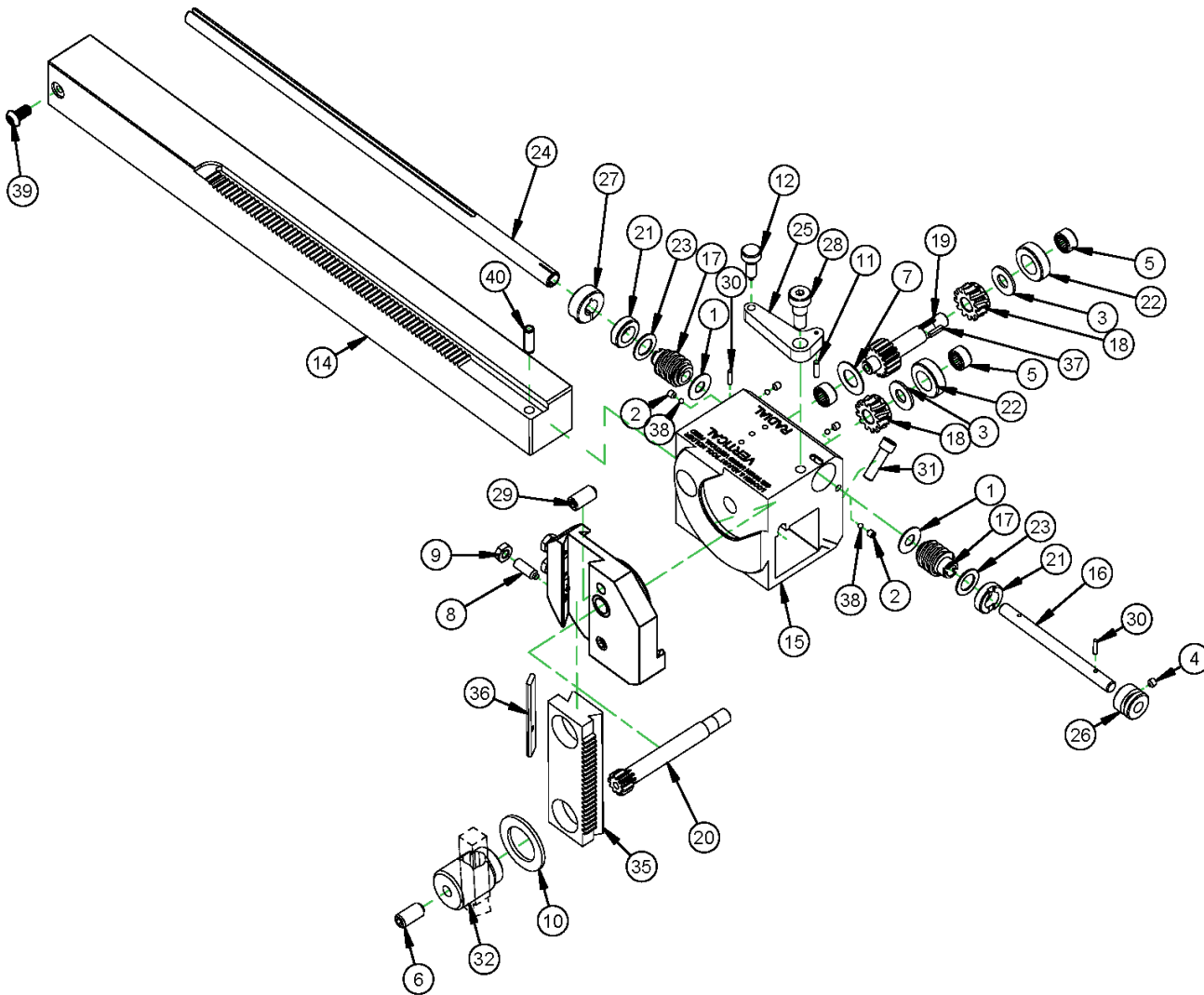
CHUCK MTG ASSY 5 TO 9 ID FF5000

29168



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10538	BRG THRUST .625 ID X 1.125 OD X .0781
2	2	11165	WASHER THRUST .625 ID X 1.125 OD X .060
3	1	18688	NUT 5/8-11 JAMN HEAVY DUTY
4	2	27172	WASHER SPRING BELLEVILLE 5/8 X 1-1/4 X .040
5	2	29121	FINGERS SETUP 10 INCH
6	2	29122	FINGERS SETUP 14 INCH
7	2	29123	FINGERS SETUP 20 INCH
8	1	29138	INDICATOR, DIAL INCH VERTICAL MITUTOYO
9	1	29169	ROD INDICATOR SUPPORT FF5000
10	1	29959	SWIVEL SETUP ARM FF5000
10.1	2	41489	THUMB SCREW 1/4-20 WASHER FACE
11	1	29962	KNOB 3 X 2 X 1-1/2 X 5/8-11 UNC
12	1	29963	STUD 5/8-11 X 3

29960 - ASSY ALIGNMENT FF5000 2ND

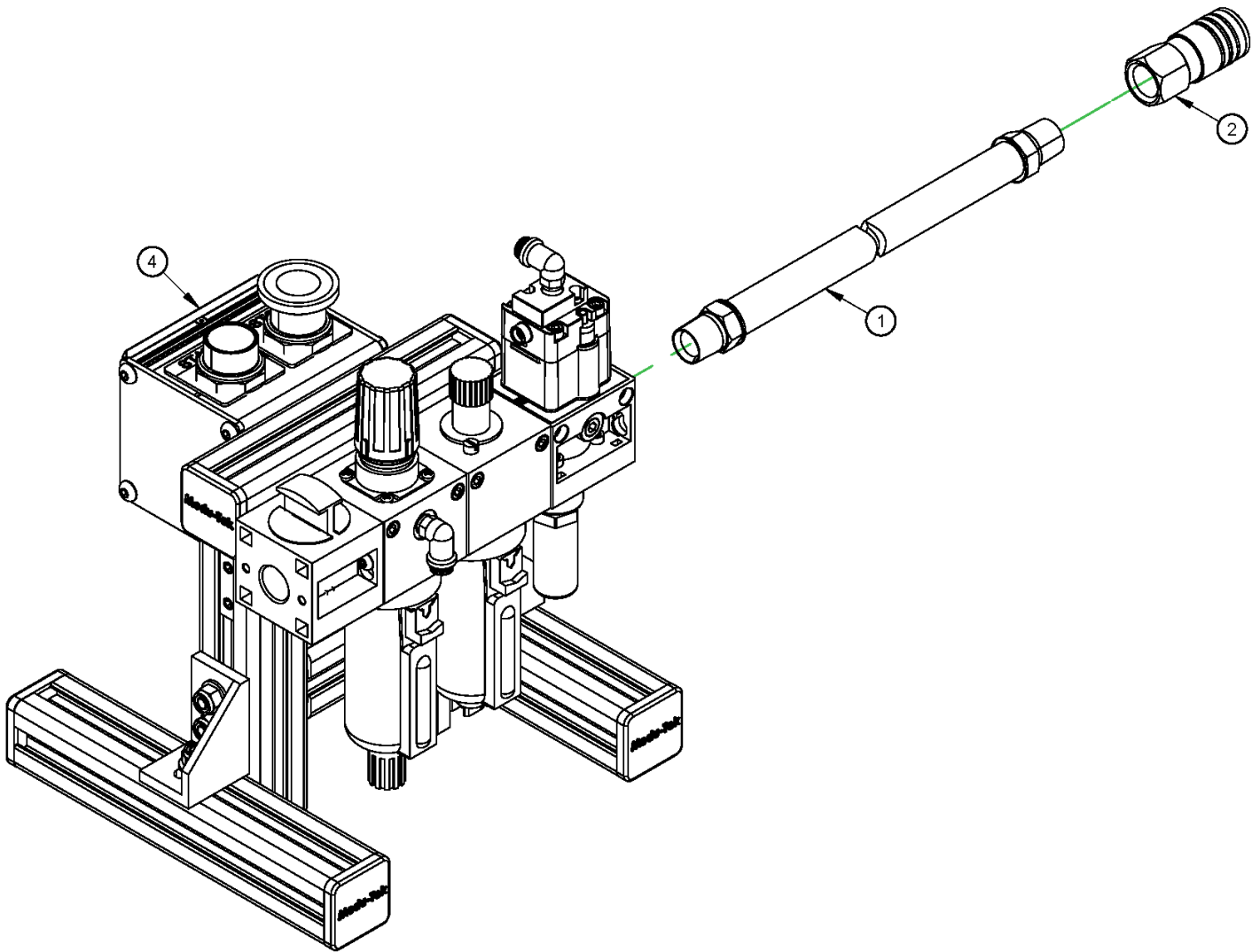


34138 - TOOL HEAD ASSY SWIVELING GIBBED SLIDE - REV B

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	10770	WASHER THRUST .75 OD X .312 ID X .03
2	4	10841	SCREW 8-32 X 3/16 SSSCP
3	2	11040	WASHER THRUST .375 ID X .812 OD X .060
4	1	11050	SCREW 10-32 X 3/16 SSSCP
5	3	11253	BRG NEEDLE 3/8 ID X 9/16 OD X .312 OPEN
6	1	11734	SCREW 3/8-16 X 3/4 SSSCP
7	1	11736	WASHER THRUST .500 ID X .937 OD X .030
8	3	11927	SCREW 1/4-20 X 3/4 SSSHDP
9	3	12894	NUT 1/4-20 JAMN
10	1	22402	WASHER THRUST 1.000 ID X 1.562 OD X .095
11	1	22480	PIN DOWEL 1/8 DIA X 1/2
12	1	25448	PLUNGER HAND RETRACTABLE 1/4-20
13	1	26296	SCREW 3/8-16 X 1/2 SSSFP
14	1	27804	BAR TURNING 5 TO 24 INCH DIAM
15	1	27806	HEAD TOOL FF5000
16	1	27810	SHAFT FEED ENGAGE
17	2	27811	GEAR WORM MODIFIED
18	2	27812	WORM GEAR .75 PD 16 DP SINGLE RH
19	1	27813	SHAFT PINION RADIAL FEED
20	1	27814	SHAFT PINION DOWN FEED
21	2	27815	NUT WORM
22	2	27816	NUT WORM RETAINING
23	2	27817	WASHER THRUST MODIFIED
24	1	27818	SHAFT FEED DRIVE
25	1	29098	LEVER FEED SELECTOR
26	1	29108	COLLAR SHIFTING TOOL HEAD
27	1	29130	CLAMP COLLAR 7/16 ID X 15/16 OD X 3/8
28	1	29286	SCREW 3/8 X 3/8 X 5/16-18 SHLDCS
29	1	29378	SCREW 3/8-16 X 3/4 SSSFP
30	2	29384	PIN 3/32 DIA X 1/2
31	3	29476	SCREW 1/4-28 X 7/8 SHCS
32	1	30699	CLAMP TOOL BIT
33	1	33579	PLUG TOOL HEAD
34	1	34135	SWIVEL TOOL HEAD FF5000
35	1	34136	SLIDE TOOL HOLDER FF5000
36	1	34137	GIB TOOL SLIDE FF5000
37	2	41128	KEY 3/32 SQ X .43 SQ BOTH ENDS
38	4	43489	BALL NYLON 1/8 DIA
39	1	82091	SCREW 1/4-20 X 1/2 PIN IN HEX BHSCS
40	1	11729	PIN DOWEL 1/4 DIA X 3/4

34138 - TOOL HEAD ASSY SWIVELING GIBBED SLIDE - REV B

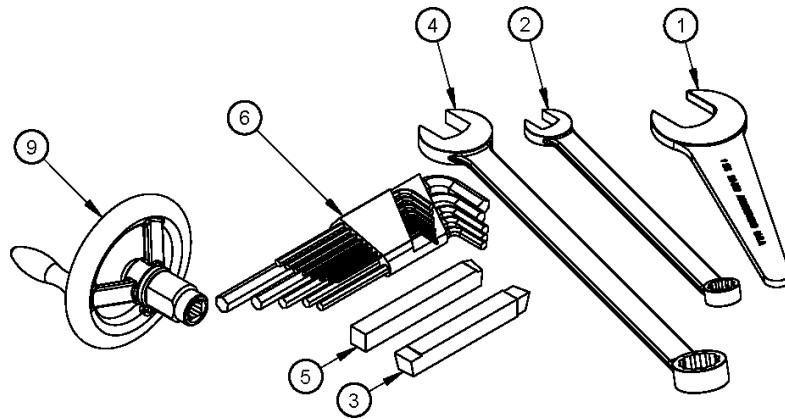
FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	15915	HOSE ASSY 801 1/2 X 1/2 NPTMS X 1/2 NPTMS X 72
2	1	19297	FTG QUICK COUPLER 3/8B 1/2 NPTF FEMALE AIR
3	1	34866	OIL AIRTOOL COMPLETE (NOT SHOWN)
4	1	78264	PNEUMATIC CONDITIONING UNIT 1/2 IN LOW PRES. DROPOUT

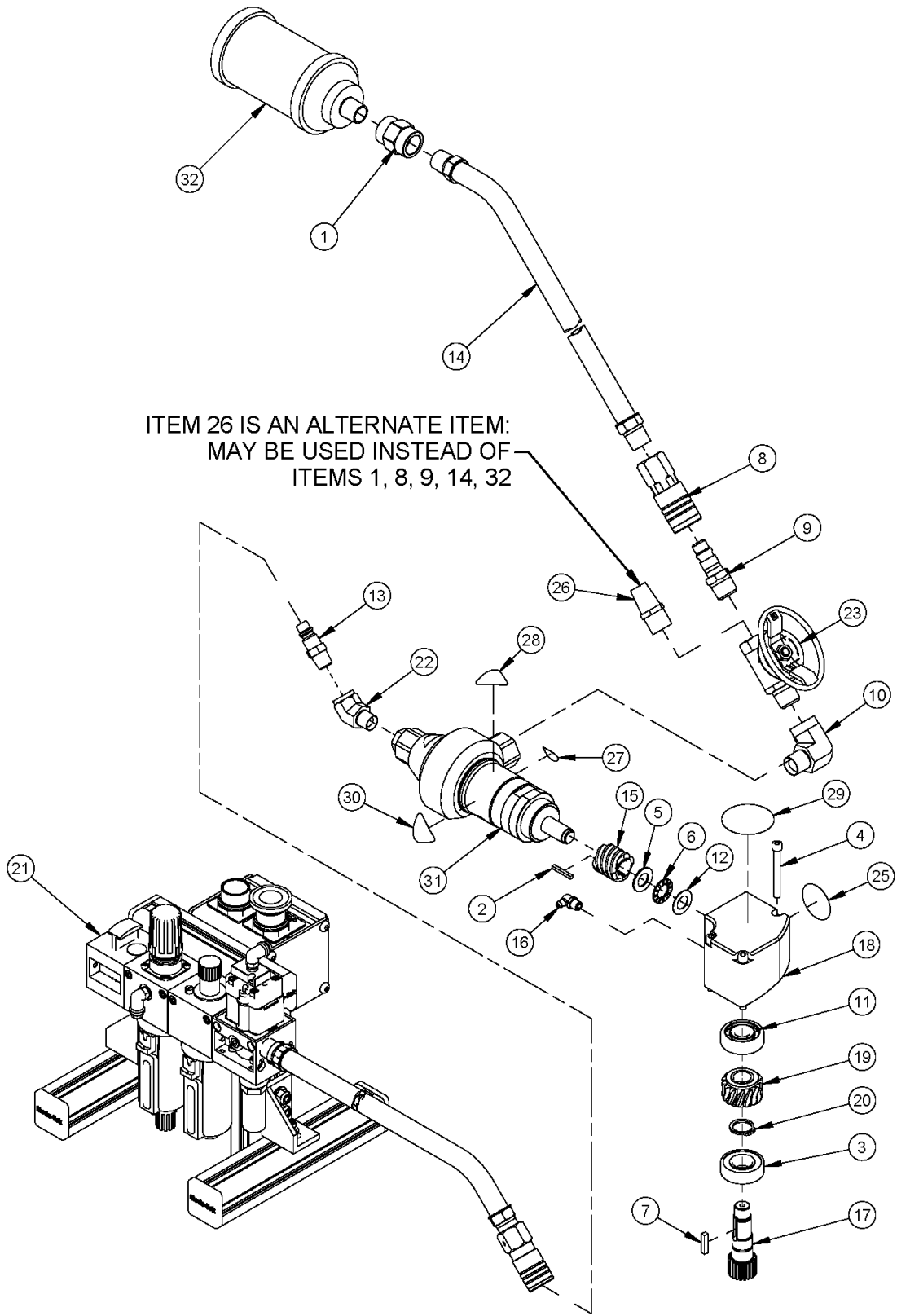
29245 - PNEUMATIC ASSY MODEL FF5000 - REV A

FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	14668	WRENCH END 1-1/8 THIN SATIN CHROME
2	1	16479	WRENCH END 9/16 COMBINATION LONG
3	1	25710	BIT TOOL HSS 1/2 X 4.0 LH & RH PRE-GROUND
4	1	29173	WRENCH END 7/8 COMBINATION LONG CHROME
5	1	31868	BIT TOOL HSS 1/2 X 4.0 LH ROUGHING SINGLE
6	1	33999	SET HEX WRENCH .050 - 3/8 BONDHUS BALL END
7	1	36668	MANUAL INSTRUCTION FF5000 FLANGE FACER (NOT SHOWN)
8	1	39517	PRINT LAYOUT FF5000 PACKAGING (NOT SHOWN)
9	1	81084	ASSY HANDWHEEL FF5000

29116 - KIT TOOL FF5000 - REV A



81071 - ASSY DRIVE PNEUMATIC FF5000 3RD MODEC - REV B

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10319	FTG COUPLING 1/2 NPTF X 1/2 NPTF STEEL ZINC PLATED
2	1	10678	KEY 1/8 SQ X 1.00 SQ BOTH ENDS
3	1	10807	BRG BALL .7874 ID X 1.6535 OD X .4724 W/SEALS
4	3	11358	SHCS 1/4-20 X 2-1/4
5	1	12445	WASHER THRUST .562 ID X 1.000 OD X .060
6	1	12446	BRG THRUST .562 ID X 1.000 OD X .0781
7	1	12657	KEY 3/16 SQ X .87 SQ BOTH ENDS
8	1	13208	FTG QD COUPLER 1/2B 1/2 NPTF PNEUMATIC
9	1	13209	FTG QD NIPPLE 1/2B 1/2 NPTM PNEUMATIC
10	1	13211	FTG ELBOW 1/2 NPTM X 1/2 NPTF STREET 90 DEG
11	1	14322	BRG BALL .5906 ID X 1.6535 OD X .5118
12	1	15173	WASHER THRUST .562 ID X 1.000 OD X .030
13	1	15397	FTG QUICK COUPLER 3/8B 3/8 NPTM MALE AIR
14	1	15915	HOSE ASSY 801 1/2 X 1/2 NPTMS X 1/2 NPTMS X 72
15	1	16183	WORM 12 DP QUAD THREAD .652 BORE
16	1	23585	FTG GREASE 1/8 NPTM 90 DEG
17	1	27771	GEAR SPUR MAIN DRIVE
18	1	27776	BOX MOTOR AND WORM MTG
19	1	27786	GEAR WORM MODIFIED
20	1	29126	RING SNAP 3/4 OD X .078 TH HEAVY DUTY
21	1	29245	PNEUMATIC ASSY MODEL FF5000
22	1	29432	FTG ELBOW 3/8 NPTM X 3/8 NPTF STEEL 45 DEG
23	1	36825	VALVE BALL 1/2 OVAL HANDLE ASSY W/ LABEL
24	3	37749	(NOT SHOWN) WIRE TIE VELCRO 11 LONG
25	1	59044	LABEL WARNING - CONSULT OPERATOR'S MANUAL
26	1	61033	MUFFLER 1/2 INCH SINTERED BRASS
27	1	79328	LABEL WARNING - CONSULT OPERATOR'S MANUAL GRAPHIC .75 DIA
28	1	80510	LABEL WARNING CUTTING OF FINGERS/ROTATING BLADE
29	1	81008	LABEL WEAR HEARING AND EYE PROTECTION 2 INCH ROUND
30	1	82144	LABEL WARNING - GENERAL DANGER GRAPHIC 1.30 X 1.13
31	1	84484	MOTOR AIR .8KW RIGHT 594RPM 10:1 EXH COLL MODIFIED MODEC
32	1	84515	MUFFLER AIR MOTOR 1/2 NPTM

81071 - ASSY DRIVE PNEUMATIC FF5000 3RD MODEC - REV B

FOR REFERENCE ONLY

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APPENDIX A MSDS

The following MSDSs are found on the pages listed.

MSDS	Page
Polytac EP.....	52
Jet-Lube Anti-Seize Compound.....	59
LPS 1.....	61
LPS 2.....	70
Koolkut Spectrum.....	78
Unax AW.....	84

Safety Data Sheet



Section 1: Identification of the substance or mixture and of the supplier

Product Name: Polytac® EP
SDS Number: 778593

Synonyms/Other Means of Identification: Polytac® EP No. 2

Intended Use: Lubricating Grease

Manufacturer: Phillips 66 Company
P.O. Box 4428
Houston, Texas 77210

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

Customer Service: U.S.: 1-800-822-6457 or International: +1-83-2486-3363

Technical Information: 1-877-445-9198

SDS Information: Phone: 800-762-0942
Email: SDS@P66.com
URL: www.Phillips66.com

Section 2: Hazard(s) Identification

This material is not considered hazardous according to OSHA criteria.



Section 3: Composition / Information on Ingredients

Component	CASRN	Concentration ¹
Lubricant Base Oil (Petroleum)	VARIOUS	>80
Calcium Carbonate	471-34-1	<15
Additives	Proprietary	<10

¹All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

778593 - Polytac® EP
Date of Issue: 19-Jul-2012

Page 1/7
Status: FINAL

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Medical Conditions Aggravated by Exposure: Conditions which may be aggravated by exposure include skin disorders.

Section 5: Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal Precautions: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from flames and hot surfaces. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

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 apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

Spills will produce extremely slippery surfaces. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconitioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Component	ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m ³ STEL: 10 mg/m ³ as oil mist, if generated	TWA: 5 mg/m ³ as Oil Mist, if generated	---
Calcium Carbonate	TWA: 10 mg/m ³	15 mg/m ³ (Total) TWA 5 mg/m ³ (Resp) TWA	---

Note: 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.

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

Eye/Face Protection: The use of eye/face protection is not normally required; however, good industrial hygiene practice suggests the use of eye protection that meets or exceeds ANSI Z.87.1 whenever working with chemicals.

Skin/Hand Protection: The use of skin protection is not normally required; however, good industrial hygiene practice suggests the use of gloves or other appropriate skin protection whenever working with chemicals. Suggested protective materials: Nitrile

Respiratory Protection: Respiratory protection is not normally required under intended conditions of use. Emergencies or conditions that could result in significant airborne exposures may require the use of NIOSH approved respiratory protection. An industrial hygienist or other appropriate health and safety professional should be consulted for specific guidance under these situations.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Green
Physical Form:	Semi-Solid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Density (air=1):	> 5
Initial Boiling Point/Range:	No data

Melting/Freezing Point:	No data
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Bulk Density:	8.57 lb/gal @ 60 °F / 15°C 1.0292 kg/m ³
Evaporation Rate (nBuAc=1):	<1
Flash Point:	> 400 °F / > 204 °C
Test Method:	Cleveland Open Cup (COC), ASTM D92
Lower Explosive Limits (vol % in air):	No data
Upper Explosive Limits (vol % in air):	No data
Auto-ignition Temperature:	No data

Section 10: Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Inhalation is not anticipated		No Data
Skin Absorption	Unlikely to be harmful		> 2 g/kg (estimated)
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg (estimated)

Aspiration Hazard: Not expected to be an aspiration hazard.

Skin Corrosion/Irritation: Not expected to be irritating. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Not expected to be irritating.

Signs and Symptoms: Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea.

Skin Sensitization: No information available on the mixture, however none of the components have been classified for skin sensitization (or are below the concentration threshold for classification).

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Specific Target Organ Toxicity (Repeated Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Carcinogenicity: No information available on the mixture, however none of the components have been classified for carcinogenicity (or are below the concentration threshold for classification).

Germ Cell Mutagenicity: No information available on the mixture, however none of the components have been classified for germ cell mutagenicity (or are below the concentration threshold for classification).

Reproductive Toxicity: No information available on the mixture, however none of the components have been classified for reproductive toxicity (or are below the concentration threshold for classification).

Information on Toxicological Effects of Components

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Section 12: Ecological Information

Toxicity: Experimental studies on the base oil component of lubricating greases show that acute aquatic toxicity values are greater than 1000 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. However, there is insufficient information available on the toxicity of the thickening agents used in greases. They should be regarded as capable of causing long term adverse effects in the aquatic environment. Classification: No classified hazards.

Persistence and Degradability: The base oil constituents of greases are expected to be inherently, but not readily biodegradable. Some of the thickening agents may be readily biodegradable.

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to greater than 6, and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

Mobility in Soil: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. Components may behave differently in the aquatic environment with soaps dispersing and dissolving to some extent in water while the hydrocarbons will float on the surface due to their low water solubility. The hydrocarbon portion would be expected to show low mobility in soil and water. The major environmental fate would be expected to be biodegradation.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle used oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description: *Not regulated*
Note: *If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)*

International Maritime Dangerous Goods (IMDG)

Shipping Description: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

Section 15: Regulatory Information

778593 - Polytac® EP
 Date of Issue: 19-Jul-2012

Page 6/7
 Status: FINAL

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: No
 Chronic Health: No
 Fire Hazard: No
 Pressure Hazard: No
 Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

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

EPA (CERCLA) Reportable Quantity (in pounds):

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

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Silica-Crystalline (Quartz)	Cancer

International Hazard Classification

GHS Classification
 None

Canada:
 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 Regulations.

WHMIS Hazard Class:
 None

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
 All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue: 19-Jul-2012
 Status: FINAL
 Previous Issue Date: 30-Jul-2009
 Revised Sections or Basis for Revision: Manufacturer (Section 1)
 Format change
 Physical Properties (Section 9)
 Toxicological (Section 11)
 Regulatory information (Section 15)
 SDS Number: 778593

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

550[®] NONMETALLIC ANTI-SEIZE COMPOUND

DESCRIPTION

550[®] Anti-Seize Compound is a premium formulation for a wide variety of applications over a wide temperature range. **550** is the ideal product for petrochemical plants' maintenance needs. Its homogeneous composition offers maximum protection against seizure and heat freeze, eases assembling and dismantling, and saves man hours. It assures protection against rust, oxidation, and corrosion. It will not harden, evaporate, or settle out; and it requires no thinning.

550 contains carefully balanced proportions of molybdenum disulfide (MoS₂), graphite, and low friction fillers in an aluminum complex base grease that is fortified with effective rust and corrosion inhibitors. Each principal anti-seize, low-friction ingredient has important properties and characteristics.

Molybdenum disulfide (MoS₂) has an affinity for ferrous metals, bonds itself to steel working surfaces and offers protection from frictional wear and fret corrosion while sustaining lubrication. Graphite provides extreme pressure characteristics.

The aluminum-complex base grease in **550** contains **JET-LUBE's CZ-EX[®]**, an extreme pressure additive. This package increases performance because it maintains the proper dispersion and suspension of solid ingredients.

- Lead Free
- Protects against seizure, heat freeze, galling, rust, and corrosion
- Lowers friction; reduces wrench torque
- Provides easy makeup and breakout
- Reduces maintenance costs
- Not affected by contraction, expansion, or vibration
- Will not run, drip, or settle out
- Color: Steel Blue

APPLICATIONS

Use **550** on:

Tubular	Threads	Flange Faces	Keyways/Keys
Gaskets	Slides	Guides	Fittings

Well suited for steel and aluminum. **550** works equally well on stainless steel, cast iron, titanium, copper, brass, alloys, plastic, and gasket materials. **550** is an effective anti-seize on LPG and other gases. For sealing applications, use **V-2[®]**.

NOTE: Not for use on oxygen lines.

CONFORMS TO: Military Specification MIL-PRF-907E	SERVICE RATING: -65°F (-54°C) to 2400°F (1316°C)
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PRODUCT CHARACTERISTICS

Thickener	Aluminum Complex
Fluid Type	Petroleum
Color/Appearance	Steel Blue/Smooth Paste
Dropping Point (ASTM D-566)	450°F (232°C)
Specific Gravity	1.19
Density (lb/gal)	9.90
Oil Separation	<5.0
Wt. % Loss @ 212°F (100°C)	
Flash Point (ASTM D-92)	>430°F (221°C)
NLGI Grade	1 - 1½
Penetration @77°F (ASTM D-217)	300 - 330
K-Factor	0.17
1" B7 Studs @ 80,000 psi Contact Stress	
Copper Strip Corrosion (ASTM D-4048)	1A
4-Ball (ASTM D-2596)	
Weld Point, kgf	500
Load Wear Index	100
Salt Fog Resistance	+200
20% NaCl @ 100°F,	
Hrs. Free of Corrosion (ASTM B-117)	

PACKAGING

Code No.	Container Size	Container
15555	¼ lb.	Brush Top can
15502	½ lb.	Brush Top can
15504	1 lb.	Brush Top can
15507	2 lb.	Plug Top can
15523	10 lb.	Pail
15515	50 lb.	Pail
15524	150 lb.	Drum
15529	500 lb.	Drum

LIMITED WARRANTY

Jet-Lube, Inc. makes the Limited Express Warranty that at the date of delivery, this product shall be free from defects in Jet-Lube, Inc. materials and workmanship.

This Limited Express Warranty is expressly in lieu of any other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, and of any other obligation on the part of Jet-Lube, Inc.

The sole remedy for breach of the Limited Express Warranty shall be the refund of the purchase price. All other liability is negated and disclaimed, and Jet-Lube, Inc. shall not be liable for incidental or consequential damages.

CORPORATE LOCATIONS

Houston, Texas—World Headquarters

Maidenhead, England

Edmonton, Canada

JET-LUBE, INC.
4849 HOMESTEAD RD.,
P.O. BOX 21258 (77226-1258)
HOUSTON, TX 77028

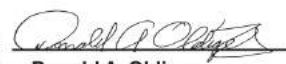
WATS: 800-538-5823
PHONE: 713-674-7617
FAX: 713-678-4604
E-MAIL: sales@jetlube.com
www.jetlube.com

INDUSTRIAL

JET-LUBE, INC.

MATERIAL SAFETY DATA SHEET

I	Product Name: 550® NATO Stock Number: 8030-21-579-1625 (4 oz.) 8030-00-251-3980 (1 lb.) Chemical Family: Anti-seize (MIL-PRF-907E) and lubricant. Use: Equipment lubrication, lubricant for threaded connections or slides.	Manufacturer/Supplier: JET-LUBE, INC. Address: 4849 Homestead Rd., Ste. #200 Houston, TX, 77028 USA Phone: 713-674-7617 Emergency Phone: 713-674-7617 Fax: 713-678-4604 Chemtrec 24 hours (USA): 800-424-9300																		
II	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Hazardous Components</th> <th style="width: 15%;">CAS No.</th> <th style="width: 10%;">Wt%</th> <th style="width: 15%;">OSHA PEL</th> <th style="width: 10%;">ACGIH TLV</th> <th style="width: 20%;">Other Limits of Exposure</th> </tr> </thead> <tbody> <tr> <td>Petroleum oil</td> <td>64742525/64742014</td> <td>40-60</td> <td>Oil mist TWA-5mg/m³</td> <td>N/A</td> <td>STEL: 10mg/M³</td> </tr> <tr> <td>Nonhazardous Blend</td> <td>1317335/82980549 1317653/1314132 7782425</td> <td>40-60</td> <td>UN</td> <td>UN</td> <td>UN</td> </tr> </tbody> </table>		Hazardous Components	CAS No.	Wt%	OSHA PEL	ACGIH TLV	Other Limits of Exposure	Petroleum oil	64742525/64742014	40-60	Oil mist TWA-5mg/m ³	N/A	STEL: 10mg/M ³	Nonhazardous Blend	1317335/82980549 1317653/1314132 7782425	40-60	UN	UN	UN
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Nonhazardous Blend	1317335/82980549 1317653/1314132 7782425	40-60	UN	UN	UN															
III	Main Hazards-Health Effects Eyes: May cause irritation. Inhalation: Viscous nature may block breathing passages if inhaled. Ingestion: May cause diarrhea. Skin: For hypersensitive persons, may irritate the skin after prolonged periods of contact.																			
IV	Eyes: Flush with water until all residual material is gone. If irritation persists, seek medical help. Inhalation: Clear air passage. If respiratory difficulty continues, seek medical help. Ingestion: Wash out mouth immediately. Consult physician. Skin: Wash thoroughly with hand cleanser, followed by soap & water. Contaminated clothing should be dry cleaned before reuse.																			
V	Extinguishing Media: Foam, dry powder, Halon®, carbon dioxide, sand, earth & water mist. Unsuitable Extinguishing Media: Water jet. Protective Equipment for Fire fighting: Self-contained breathing apparatus.																			
VI	Personal Precautions: Wear gloves & protective overalls. Environmental Precautions: Do not allow it to enter drains. Spillage: Scrape up bulk, then wipe up remainder with cloth. To prevent walking hazard, pick up remaining residue with diatomaceous earth.																			
VII	Handling: No special handling precautions necessary. Storage: Do not store at elevated temperatures.																			
VIII	Respiratory Protection: None needed. Hand Protection: Protective gloves for hypersensitive persons. Eye Protection: Glasses, if applied to parts in motion. Body Protection: Overalls.																			
IX	Physical State: Semisolid paste Color: Steel Blue Odor: Slight pH: Neutral Boiling Range/Point °F (°C): <600 (316) Melting Point °F (°C): >450 (232) Flash Point (COC) °F (°C): 430 (221) Autoignition Temperature °F (°C): >500 (260) Explosive Properties: LEL: 0.9% UEL: 7% Evaporation Rate (Butyl Acetate): <0.01 Partition Coefficient (Log Pow): N/A Vapor Pressure (kPa): <0.01 Percent Volatiles: Nil Density (g/cm³): 1.19 Flammability: Not flammable at ambient temperature. OAR Value: N/A Oxidizing Properties: None Water Solubility: Slight Vapor Density: >4.8																			
X	Stability: Chemically stable under normal conditions. No photoreactive agents. Conditions to Avoid: Powerful sources of ignition and extreme temperatures. Materials to Avoid: Strong inorganic & organic acids, oxidizing agents. Hazardous Decomposition Products: Burning generates smoke, airborne soot, hydrocarbons and oxides of carbon and sulfur. Burning aerosol could result in halogenated by-products. Residue mainly comprised of soot & mineral oxides.																			
XI	Acute Toxicity: Not known. Irritancy-Skin: Very mild. Skin Sensitization: Not known. Genotoxicity: None known. Subacute/Sub-chronic Toxicity: Not known. Chronic Toxicity: None known. Carcinogen: NTP: No IARC: No OSHA: No California Prop 65: N/A EC Class (67/548/EEC): No LC-50: >2000mg/l-extrapolated from component data. LD-50: N/A Allergens: None known.																			
XII	Possible Effects: In extreme cases, may generate oil fractions that could act as a marine pollutant. Occurrences of this nature are highly unlikely. Behavior: Relatively well behaved. Bioaccumulation potential nil. Environmental Fate: Highly unlikely to cause wide-spread contamination. Nontoxic to marine or land organisms.																			
XIII	Product Disposal: Do not incinerate. Contact waste disposal company or local authority for advice. Container Disposal: Pails without liner—see Product Disposal section above. Pails with plastic liner—pail may only be disposed of via standard waste disposal services, recycled or reused. Liner—see Product Disposal section above.																			
XIV	DOT: Consumer Commodity ORM-D UN No.: Bulk Nonhazardous Aero 1950, Class 2.2 Air Transport (ICAO & IATA): Bulk Nonhazardous Aero Hazardous-pressurized container Sea Transport (IMO & IMDG): Bulk Nonhazardous Aero 1950, Class 2.2 Road & Rail Transport (ADR/RID): Bulk Nonhazardous Aero Class 2.2, Aerosols																			
XV	Labeling Information: None needed EC Annex 1 Classification: Not Applicable. R Phrases: R22—harmful if swallowed. S Phrases: None applicable, as known. Ozone Depleting Chemicals: Not applicable. TSCA: All components are listed. WHMIS (Canada): Bulk Not controlled. Aero Class A, B-5 Canadian DSL: All components listed. 40 CFR Part 372 (SARA 313): N/A CERCLA: Nonhazardous RCRA Hazard Class: Nonhazardous SARA 311/312: None TSCA 12B Components: None																			
XVI	SDS first issued. SDS data revised. New Jersey Right To Know: See Section II																			

Signature: 
 Prepared by: Donald A. Oldiges
 Date Issued: June 1, 2008

As of issue date, the information contained herein is accurate and reliable to the best of JET-LUBE'S knowledge. JET-LUBE® does not warrant or guarantee its accuracy or reliability and shall not be liable for any loss or damage arising out of the use thereof. It is the user's responsibility to satisfy itself that the information offered for its consideration is suitable for its particular use.

LEGEND	
I.	IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY
II.	COMPOSITION INFORMATION ON INGREDIENTS
III.	HAZARDS IDENTIFICATION
IV.	FIRST AID MEASURES
V.	FIRE FIGHTING MEASURES
VI.	ACCIDENTAL RELEASE MEASURES
VII.	HANDLING AND STORAGE
VIII.	EXPOSURE CONTROL/PERSONAL PROTECTION
IX.	PHYSICAL AND CHEMICAL PROPERTIES
X.	STABILITY AND REACTIVITY
XI.	TOXICOLOGICAL INFORMATION
XII.	ECOLOGICAL INFORMATION
XIII.	WASTE DISPOSAL
XIV.	TRANSPORT INFORMATION
XV.	REGULATORY INFORMATION
XVI.	OTHER INFORMATION

HMIS SYMBOL	
HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PPI	N/A





MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: **October 7, 2013**

Supersedes: **September 19, 2011**

Section 1 • Product and Company Identification

Product Name: LPS® 1

Part Number(s): 00116 (aerosol), 00144 (wipe), 00122, 01128, 00105, 00155, C30116 (aerosol), C00144 (wipe), C00122, C01128, C00105, C00155

Chemical Name: Petroleum Distillates

Product Use: An industrial lubricant designed to displace moisture from mechanical and electrical equipment, provide light-duty lubrication and short-term rust prevention.

Manufacturer Information: LPS Laboratories, 4647 Hugh Howell Road, Tucker, GA, USA 30084
TEL: USA & Canada: 1 800 241-8334
 Outside USA and Canada: +1 770 243-8800
FAX: USA & Canada: 1 800 543-1563
 Outside USA and Canada: +1 770 243-8899

Emergency Telephone Number: Chemtec: USA & Canada: 1 800 424-9300
 Outside USA and Canada: +1 703 527-3887

Website: <http://www.lpslabs.com>

Section 2 • Hazards Identification

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Emergency Overview:

Aerosol: DANGER: Flammable. Contents under pressure. Harmful or fatal if swallowed.

Bulk: DANGER: Combustible. Keep away from heat and flame. Harmful or fatal if swallowed.

Primary route(s) of entry: Skin and eye contact. Inhalation.

Potential Acute Health Effects:

Eyes: Irritating to eyes.

Skin: Repeated exposure may cause skin dryness or cracking.

Inhalation: Excessive inhalation of vapors can cause irritation of the respiratory tract, nausea, dizziness or headache.

Ingestion: Product has a low order of acute oral toxicity, but ingestion of large quantities may cause nausea, vomiting, and gastrointestinal irritation. May cause injury if aspirated into lungs.

Potential Chronic Health Effects:

Carcinogenic Effects: NTP: No IARC: No OSHA: No ACGIH: No

Mutagenic Effects: None

Teratogenic Effects: None

Target Organs: None



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Medical conditions aggravated by exposure:

Persons with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure.

Signs and Symptoms

Stinging in eyes. Repeated or prolonged skin contact can cause redness, irritation, and scaling of the skin (dermatitis). Breathing of high vapor concentrations may cause headaches, stupor, irritation of throat and eyes, and kidney effects.

Section 3 • Composition / Information on Ingredients

Component	CASRN	Weight Percent
Distillates (Petroleum), Hydrotreated Light	64742-47-8	70 - 80%
Distillates (Petroleum), Hydrotreated Middle	64742-46-7	20 - 30%
Carbon Dioxide (aerosol only)	124-38-9	1 - 5%

Section 4 • First Aid Measures

Eyes:	Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. DO NOT use eye ointment. Seek medical attention immediately.
Skin:	Remove contaminated shoes and clothing. Clean affected area thoroughly with mild soap and water. DO NOT use ointments. Seek medical attention if irritation persists.
Inhalation:	Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, seek medical attention immediately.
Ingestion:	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. DO NOT leave victim unattended. Seek medical attention immediately.



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 5 • Fire Fighting Measures

Products of Combustion:	Carbon monoxide and carbon dioxide.
General Fire Hazards:	High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers. Aerosols may explode upon heating, spread fire and overcome sprinkler systems.
Firefighting media:	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use CO2, water spray, fog or foam. Cool containing vessels with water jet in order to prevent pressure build-up, auto-ignition or explosions.
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Protection Clothing (Fire):	Wear protective clothing and equipment suitable for the surrounding fire, including helmet, face mask, and self-contained breathing apparatus.
Special Remarks on Explosion Hazards:	
High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers. Aerosols may explode upon heating, spread fire and overcome sprinkler systems.	

Section 6 • Accidental Release Measures

Containment Procedures:	Small Spill and Leak:	Absorb with an inert material and dispose of properly.
	Large Spill and Leak:	Secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Pick up free liquid for disposal using absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal.
Clean-Up Procedures:	Contain and recover spilled material when possible.	
Evacuation Procedures:	Ventilate area of leak or spill. Keep unnecessary and unprotected people away.	
Special Procedures:	Remove all sources of ignition. Ventilate area. Wear personal protective equipment during cleanup.	

Section 7 • Handling and Storage

Handling:	DO NOT spray into or around ignition sources. DO NOT allow material to come in contact with eyes or skin. Wear appropriate protective equipment during handling. Keep container closed. Avoid breathing vapors or mists. Use only with adequate ventilation. Wash thoroughly after handling.
Storage:	Keep container in a cool, well-ventilated area. Avoid all sources of ignition (spark or flame). Store between 40°F and 120°F (4.4°C and 49°C).
Precautions to be taken in handling and storage:	
Store aerosols as Level 3 Aerosol (NFPA 30B). Store all materials in a dry, well-ventilated area. Avoid breathing vapors.	



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 8 • Exposure Controls / Personal Protection

Exposure Guidelines:

Component	CASRN	OSHA	ACGIH	NIOSH	Supplier
Distillates (Petroleum), Hydrotreated Light	64742-47-8	5 mg/m ³ (oil mist) PEL	5 mg/m ³ (oil mist) TLV 10 mg/m ³ (oil mist) STEL	5 mg/m ³ (oil mist) TWA 10 mg/m ³ (oil mist) STEL	100 ppm TWA 525 mg/m ³ TWA
Distillates (Petroleum), Hydrotreated Middle	64742-46-7	5 mg/m ³ (oil mist) PEL	5 mg/m ³ (oil mist) TLV 10 mg/m ³ (oil mist) STEL	5 mg/m ³ (oil mist) TWA 10 mg/m ³ (oil mist) STEL	None reported
Carbon Dioxide (aerosol only)	124-38-9	5000 ppm PEL	5000 ppm TLV 30000 ppm STEL	5000 ppm TWA 30000 ppm STEL	None reported

Engineering Controls: Provide general and/or local exhaust ventilation to keep exposures below the exposure guidelines listed above.

Personal protective equipment

Eye protection: Safety glasses with side shields conforming to appropriate regulations. Eye wash fountain and emergency shower facilities are recommended.

Hand protection: Normally no hand protection is required; however, if product will be sprayed for an extended period, "overspray" onto skin may occur. If so, wear chemical resistant gloves conforming to appropriate regulations. Please observe the instructions regarding permeability and breakthrough time that are provided by the supplier of the gloves.

Respiratory protection: Typical use of this product under normal conditions does not require the use of respiratory protection. If airborne concentrations are above the applicable exposure limits (listed above), use NIOSH approved respiratory protection (i.e. organic vapor cartridge).

General Hygiene Considerations: Wash thoroughly after handling. Have eye-wash facilities immediately available.



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 9 • Physical and Chemical Properties

Appearance:	Liquid	Color:	Pale amber
Odor:	Characteristic	Evaporation Rate:	< 0.1 (BuAc = 1)
Solubility Description:	Not soluble in water	Flash Point:	79°C (175°F) - dispensed liquid
Boiling Point:	213°C (415°F)	Flash Point Method:	Tag-Closed Cup
Specific Gravity (H₂O=1):	0.79 - 0.81 @ 20°C	Decomposition Temperature:	Not established
Vapor Density (air = 1):	> 1	Auto ignition temperature:	> 228°C (442°F)
Vapor Pressure:	< 0.05 mm Hg @ 20°C	Flammable limits (estimated):	LOWER: 0.6% UPPER: 7.0%
Rule 1171 PPc:	Not applicable	Partition Coefficient (octanol/water):	< 1
V.O.C. Content:	Aerosol: 0.4% per US State & Federal Consumer Product Regulations Bulk: 0.4% per US State & Federal Consumer Product Regulations	Odor Threshold:	Not established
Melting Point:	< -50°C (-58°F)	Viscosity:	< 3.8 cSt @ 25°C
pH:	Not applicable	Volatiles:	95 - 96%
Heat of combustion:	Aerosol: Not established Bulk: Not established		

Section 10 • Stability and Reactivity

Chemical Stability:	Product is stable under recommended storage conditions.
Conditions to Avoid:	Keep away from heat and ignition sources.
Incompatibility:	Reactive or incompatible with oxidizing agents.
Hazardous Decomposition:	Combustion will generate smoke, possibly thick and choking, resulting in zero visibility and combustion products include carbon monoxide and carbon dioxide.
Hazardous Polymerization:	Will not occur.



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 11 • Toxicological Information

Acute and Chronic Toxicity

A: General Product Information

An acute toxicity study of this product has not been conducted. Information given in this section relates only to individual constituents contained in this preparation.

B: Component Analysis

Component	CASRN	LC-50	LD-50
Distillates (Petroleum), Hydrotreated Light	64742-47-8	> 6.8 mg/L*	> 5 g/kg*
Distillates (Petroleum), Hydrotreated Middle	64742-46-7	Not established	Not established
Carbon Dioxide (aerosol only)	124-38-9	470000 ppm / rat / 30 minutes	Not appropriate

* Supplier Data

Section 12 • Ecological Information

Mobility: Semi-volatile. Readily absorbed into soil. **Persistence / Degradability:** Only slightly biodegradable

Bioaccumulative potential: No bioaccumulation potential **Other adverse effects:** None known

Ecological studies have not been conducted for this product. The following information is available for component(s) of this product.

Ecotoxicity

Effects on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	Distillates (Petroleum), Hydrotreated Light	64742-47-8	96-hr LC50	Oncorhynchus Mykiss	3,200 µg/L*
Acute Toxicity on Daphnia	No data available				
Bacterial Inhibition					
Growth inhibition of algae					
Bioaccumulation in fish					

* Supplier Data

For the 64742-47-8 component, no toxicity has been observed in water due to extremely low water solubility. However, hydrocarbon and petroleum distillates are potentially toxic to freshwater and saltwater ecosystems. If material is spilled on soil, some potential toxic effects could occur before biodegradation could remove material.

If spilled, the 64742-46-7 constituent may kill grasses and small plants by interfering with transpiration. Spilled material may coat gill structures of fish resulting in suffocation if spilled in shallow, running water. This product may be toxic to amphibians by preventing dermal respiration. This product may also cause gastrointestinal distress to birds and mammals through ingestion. Biodegradation of this product is possible within 90 to 120 days in aerobic environments at temperatures above 21°C.



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 13 • Disposal Considerations

Waste Status: In its purchased form, non-aerosol material does not meet the definition of a RCRA hazardous waste. Aerosol products, if depressurized and emptied to less than 1 inch (2.54 cm) of fluid contents are classified as non-hazardous waste under 40 CFR 261.7 (U.S.). However, if disposed of in its received form, an aerosol carries the waste code D003. (U.S.).

Disposal: Waste must be disposed of in accordance with any and all applicable environmental control rules and/or regulations.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information inaccurate, incomplete, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive than federal laws and regulations.

Section 14 • Transport Information

Aerosol

D.O.T. Ground	Shipping Name:	Aerosols, flammable	UN No.:	1950
	Hazard Class:	2.1	Technical Name:	NA
	Subclass:	NA	Hazard Label:	LTD QTY Already on box
	Packing Group:	NA		
Road/Rail - ADR/RID	UN No.:	1950	ADR Class:	2
	Packing Group:	NA	Classification Code:	5F
	Name and description:	AEROSOLS, flammable	Hazard ID No.:	NA
	Labeling:	2.1	Technical Name:	NA
IMDG-IMO	UN No.:	1950	Class:	2
	Shipping Name:	Aerosols	Subsidiary Risk:	2.1
	Labeling:	NA	Packing Group:	NA
	Packing Instructions:	P003, LP02	EmS:	F-D, S-U
	Marine pollutant:	No	Technical Name:	NA
IATA - ICAO:	UN No.:	1950	Class:	2.1
	Shipping Name:	Aerosols, flammable	Subclass:	NA
	Packing Instructions:	203, Y203 (Ltd. Qty.)	Packing Group:	NA
	Labeling:	Flammable Gas	Technical Name:	NA

Non-aerosol versions of this product are not regulated by any mode of transportation.

The preceding information is subject to change and must be verified prior to shipment. It is the responsibility of anyone offering hazardous materials for shipment to ensure compliance with all applicable regulations.



MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 15 • Regulatory Information

U.S. Federal Regulations

RCRA Hazardous Waste No.: D003 (aerosol only)

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA):
None

Toxic Substances Control Act (TSCA):
All components of this product are TSCA inventory listed and/or are exempt.

Superfund Amendments and Reauthorization Act (SARA) Title III SARA Section 311/312 (40 CFR 370) Hazard Categories:
Sudden Release of Pressure (aerosols only), Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

This product contains the following toxic chemical(s) subject to reporting requirements of SARA Section 313 (40 CFR 372):
No individual section 313 component is present at or above 1%.

Section 112 Hazardous Air Pollutants (HAPs): None

State Regulations

California: This product does not contain chemical(s) known to the State of California to cause cancer, birth defects or other reproductive harm.

California and OTC States: This product conforms to consumer product regulations.

New Jersey Right to Know:

Aerosol: Distillates (Petroleum), Hydrotreated Light 64742-47-8 • Distillates (Petroleum), Hydrotreated Middle 64742-46-7 • Carbon Dioxide 124-38-9 • Calcium Sulfonate 61789-86-4 • Sorbitan Trioleate 26266-58-0

Bulk: Distillates (Petroleum), Hydrotreated Light 64742-47-8 • Distillates (Petroleum), Hydrotreated Middle 64742-46-7 • Calcium Sulfonate 61789-86-4 • Sorbitan Trioleate 26266-58-0 • C18 Unsaturated Dimer Fatty Acids 61788-89-4

International Regulations

Canadian Environmental Protection Act (CEPA):

All of the components of this product are included on the Canadian Domestic Substances list (DSL).

Canadian Workplace Hazardous Materials Information System WHMIS:

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

WHMIS Classification:

Aerosol: Class A, Class B5, Class D2B



WHMIS Classification:

Bulk: Class B3, Class D2B



Other Regulations:

Montreal Protocol listed ingredients:

None

Stockholm Convention listed ingredients:

None

Rotterdam Convention listed ingredients:

None

RoHS Compliant:

Yes




MATERIAL SAFETY DATA SHEET
LPS® 1

Revision Date: October 7, 2013

Supersedes: September 19, 2011

Section 16 • Other Information

MSDS#: 10116 MSDS Preparation Responsible Name: Elena Badiuzzi Compliance Manager Telephone: +1 770 243-8800	HMIS 1996		HMIS III		NFPA Flammability  Health Reactivity Special
	Health:	1	Health:	[/] 1	
	Flammability:	2	Flammability Aerosol:	4	
			Flammability Bulk:	2	
	Reactivity:	0	Physical Hazard Aerosol:	2	
			Physical Hazard Bulk:	0	

Notice to Reader:

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Elena Badiuzzi, Compliance Manager
LPS Laboratories, a division of Illinois Tool Works



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 1 • Product and Company Identification

Product Name: LPS® 2 (Bulk)

Part Number(s): 00222, 02128, 00205, 00255, C00222, C02128, C00205, C00255

Chemical Name: Petroleum Distillates

Product Use: An industrial lubricant designed to displace moisture from equipment, provide heavy-duty lubrication and rust prevention.

Manufacturer Information: LPS Laboratories, 4647 Hugh Howell Road, Tucker, GA, USA 30084
TEL: USA & Canada: 1 800 241-8334
Outside USA and Canada: +1 770 243-8800
FAX: USA & Canada: 1 800 543-1563
Outside USA and Canada: +1 770 243-8899

Emergency Telephone Number: Chemtrec: USA & Canada: 1 800 424-9300
Outside USA and Canada: +1 703 527-3887

Website: <http://www.lpslabs.com>

Section 2 • Hazards Identification

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Emergency Overview:

Aerosol: Not applicable

Bulk: DANGER: Combustible. Keep away from heat and flame. Harmful or fatal if swallowed.

Primary route(s) of entry: Skin and eye contact. Inhalation.

Potential Acute Health Effects:

Eyes: Irritating to eyes.

Skin: Repeated exposure may cause skin dryness or cracking.

Inhalation: Excessive inhalation of vapors can cause irritation of the respiratory tract, nausea, dizziness or headache.

Ingestion: Product has a low order of acute oral toxicity, but ingestion of large quantities may cause nausea, vomiting, and gastrointestinal irritation. May cause injury if aspirated into lungs.

Potential Chronic Health Effects:

Carcinogenic Effects: NTP: No IARC: No OSHA: No ACGIH: No

Mutagenic Effects: None

Teratogenic Effects: None

Target Organs: None



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Medical conditions aggravated by exposure:

Persons with pre-existing central nervous system (CNS) disease, neurological conditions, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure.

Signs and Symptoms

Stinging in eyes. Repeated or prolonged skin contact can cause redness, irritation, and scaling of the skin (dermatitis). Breathing of high vapor concentrations may cause headaches, stupor, irritation of throat and eyes, and kidney effects.

Section 3 • Composition / Information on Ingredients

Component	CASRN	Weight Percent
Distillates (Petroleum), Hydrotreated Light	64742-47-8	70 - 80%
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	20 - 30%

Section 4 • First Aid Measures

Eyes:	Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. DO NOT use eye ointment. Seek medical attention immediately.
Skin:	Remove contaminated shoes and clothing. Clean affected area thoroughly with mild soap and water. DO NOT use ointments. Seek medical attention if irritation persists.
Inhalation:	Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, seek medical attention immediately.
Ingestion:	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. DO NOT leave victim unattended. Seek medical attention immediately.
Notes to Physician:	This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 2 - Ingestion) when deciding whether to induce vomiting. Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias.



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 5 • Fire Fighting Measures

Products of Combustion: Carbon monoxide and carbon dioxide.

General Fire Hazards: High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers.

Firefighting media: SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use CO₂, water spray, fog or foam. Cool containing vessels with water jet in order to prevent pressure build-up, auto-ignition or explosions.

Sensitivity to Impact: None **Sensitivity to Static Discharge:** None

Protection Clothing (Fire): Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles.

Special Remarks on Explosion Hazards:
High heat will cause product to boil, evolving vapor that could cause explosive rupture of closed containers.

Section 6 • Accidental Release Measures

Containment Procedures: **Small Spill and Leak:** Absorb with an inert material and dispose of properly.

Large Spill and Leak: Secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Pick up free liquid for disposal using absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal.

Clean-Up Procedures: Contain and recover spilled material when possible.

Evacuation Procedures: Ventilate area of leak or spill. Keep unnecessary and unprotected people away.

Special Procedures: Remove all sources of ignition. Ventilate area. Wear personal protective equipment during cleanup.

Section 7 • Handling and Storage

Handling: DO NOT spray into or around ignition sources. DO NOT allow material to come in contact with eyes or skin. Wear appropriate protective equipment during handling. Keep container closed. Avoid breathing vapors or mists. Use only with adequate ventilation. Wash thoroughly after handling.

Storage: Keep container in a cool, well-ventilated area. Avoid all sources of ignition (spark or flame). Store between 40°F and 120°F (4.4°C and 49°C).

Precautions to be taken in handling and storage:
Store all materials in a dry, well-ventilated area. Avoid breathing vapors.



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 8 • Exposure Controls / Personal Protection

Exposure Guidelines:

Component	CASRN	OSHA	ACGIH	NIOSH	Supplier
Distillates (Petroleum), Hydrotreated Light	64742-47-8	5 mg/m ³ (oil mist) PEL	5 mg/m ³ (oil mist) TLV 10 mg/m ³ (oil mist) STEL	5 mg/m ³ (oil mist) TWA 10 mg/m ³ (oil mist) STEL	100 ppm TWA 525 mg/m ³ TWA
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	5 mg/m ³ PEL	5 mg/m ³ (oil mist) 10 mg/m ³ (oil mist)	5 mg/m ³ (oil mist) TWA 10 mg/m ³ (oil mist) STEL	None reported

Engineering Controls: Provide general and/or local exhaust ventilation to keep exposures below the exposure guidelines listed above.

Personal protective equipment

Eye protection: Safety glasses with side shields conforming to appropriate regulations. Eye wash fountain and emergency shower facilities are recommended.

Hand protection: Normally no hand protection is required; however, if product will be sprayed for an extended period, "overspray" onto skin may occur. If so, wear chemical resistant gloves conforming to appropriate regulations. Please observe the instructions regarding permeability and breakthrough time that are provided by the supplier of the gloves.

Respiratory protection: Typical use of this product under normal conditions does not require the use of respiratory protection. If airborne concentrations are above the applicable exposure limits (listed above), use NIOSH approved respiratory protection (i.e. organic vapor cartridge).

General Hygiene Considerations: Wash thoroughly after handling. Have eye-wash facilities immediately available.



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 9 • Physical and Chemical Properties

Appearance:	Liquid	Color:	Brown
Odor:	Petroleum / Cherry	Evaporation Rate:	< 0.1 (BuAc = 1)
Solubility Description:	< 3% in water	Flash Point:	79°C (175°F) - dispensed liquid
Boiling Point:	195°C (383°F)	Flash Point Method:	Tag-Closed Cup
Specific Gravity (H₂O=1):	0.82 - 0.86 @ 20°C	Decomposition Temperature:	Not established
Vapor Density (air = 1):	4.7	Auto ignition temperature:	> 228°C (442°F)
Vapor Pressure:	< 0.05 mm Hg @ 20°C	Flammable limits (estimated):	LOWER: 0.6% UPPER: 7.0%
Rule 1171 PPc:	Not applicable	Partition Coefficient (octanol/water):	< 1
V.O.C. Content:	Aerosol: Not applicable Bulk: 0% per State & Federal Consumer Product Regulations	Odor Threshold:	Not established
Melting Point:	< -50°C (-58°F)	Viscosity:	< 7 cSt @ 25°C
pH:	Not applicable	Volatiles:	92 - 95%
Heat of combustion:	Aerosol: Not applicable Bulk: > 30 kJ/g		

Section 10 • Stability and Reactivity

Chemical Stability:	Product is stable under recommended storage conditions.
Conditions to Avoid:	Keep away from heat and ignition sources.
Incompatibility:	Reactive or incompatible with oxidizing agents.
Hazardous Decomposition:	Combustion will generate smoke, possibly thick and choking, resulting in zero visibility and combustion products include carbon monoxide and carbon dioxide.
Hazardous Polymerization:	Will not occur.



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 11 • Toxicological Information

Acute and Chronic Toxicity

A: General Product Information

An acute toxicity study of this product has not been conducted. Information given in this section relates only to individual constituents contained in this preparation.

B: Component Analysis

Component	CASRN	LC-50	LD-50
Distillates (Petroleum), Hydrotreated Light	64742-47-8	> 6.8 mg/L*	> 5 g/kg*
Mineral Seal (Petroleum) Oil	64742-47-8 / 64742-52-5	Not established	Not established

* Supplier Data

Section 12 • Ecological Information

Mobility: Semi-volatile. Readily absorbed into soil. **Persistence / Degradability:** Only slightly biodegradable

Bioaccumulative potential: No bioaccumulation potential **Other adverse effects:** See below

Ecological studies have not been conducted for this product. The following information is available for component(s) of this product.

Ecotoxicity

Effects on Organisms	Component	CASRN	Test	Species	Results
Acute Toxicity on Fishes	Distillates (Petroleum), Hydrotreated Light	64742-47-8	96-hr LC50	Oncorhynchus Mykiss	3,200 µg/L*
Acute Toxicity on Daphnia	No data available				
Bacterial Inhibition					
Growth inhibition of algae					
Bioaccumulation in fish					

* Supplier Data

For the 64742-47-8 component, no toxicity has been observed in water due to extremely low water solubility. However, hydrocarbon and petroleum distillates are potentially toxic to freshwater and saltwater ecosystems. If material is spilled on soil, some potential toxic effects could occur before biodegradation could remove material.

If spilled, the 64742-46-7 constituent may kill grasses and small plants by interfering with transpiration. Spilled material may coat gill structures of fish resulting in suffocation if spilled in shallow, running water. This product may be toxic to amphibians by preventing dermal respiration. This product may also cause gastrointestinal distress to birds and mammals through ingestion. Biodegradation of this product is possible within 90 to 120 days in aerobic environments at temperatures above 21°C.



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

Section 13 • Disposal Considerations

Waste Status: In its purchased form, this material does not meet the definition of a RCRA hazardous waste (40 CFR 261).

Disposal: Waste must be disposed of in accordance with any and all applicable environmental control rules and/or regulations.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information inaccurate, incomplete, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive than federal laws and regulations.

Section 14 • Transport Information

Non-aerosol versions of this product are not regulated by any mode of transportation.

The preceding information is subject to change and must be verified prior to shipment. It is the responsibility of anyone offering hazardous materials for shipment to ensure compliance with all applicable regulations.

Section 15 • Regulatory Information

U.S. Federal Regulations

RCRA Hazardous Waste No.: None

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA):
None

Toxic Substances Control Act (TSCA):
All components of this product are TSCA inventory listed and/or are exempt.

Superfund Amendments and Reauthorization Act (SARA) Title III SARA Section 311/312 (40 CFR 370) Hazard Categories:
Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

This product contains the following toxic chemical(s) subject to reporting requirements of SARA Section 313 (40 CFR 372):
No individual section 313 component is present at or above 1%.

Section 112 Hazardous Air Pollutants (HAPs): None

State Regulations

California: This product does not contain chemical(s) known to the State of California to cause cancer, birth defects or other

California and OTC States: This product conforms to consumer product regulations.

New Jersey Right to Know:

Aerosol: Not applicable
Bulk: Distillates (Petroleum), Hydrotreated Light 64742-47-8 • Mineral Seal (Petroleum) Oil 64742-46-7 / 64742-52-5 • Proprietary NJ TS RN 800959-5152P • Proprietary NJ TS RN 800959-5153P • Alkyd Acid Phosphate 68307-94-8



MATERIAL SAFETY DATA SHEET
LPS® 2 (Bulk)

Revision Date: May 15, 2012

Supersedes: May 14, 2009

International Regulations

Canadian Environmental Protection Act (CEPA):

All of the components of this product are included on the Canadian Domestic Substances list (DSL).

Canadian Workplace Hazardous Materials Information System WHMIS:

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

WHMIS Classification:

Bulk: Class B3, Class D2B



Other Regulations:

Montreal Protocol listed ingredients:	None
Stockholm Convention listed ingredients:	None
Rotterdam Convention listed ingredients:	None
RoHS Compliant:	Yes

Section 16 • Other Information

MSDS#: 10222 MSDS Preparation Responsible Name: Elena Badiuzzi Compliance Manager Telephone: +1 770 243-8800	HMIS 1996	HMIS III	NFPA Flammability Special
	Health: 1	Health: [] 1	
Flammability: 2	Flammability Aerosol: NA Flammability Bulk: 2	Flammability	
Reactivity: 0	Physical Hazard Aerosol: NA Physical Hazard Bulk: 0	Physical Hazard	

Notice to Reader:

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Elena Badiuzzi, Compliance Manager
LPS Laboratories, a division of Illinois Tool Works



Koolkut® Spectrum

Material Safety Data Sheet

1. Product and Company Identification

Product Name:	Koolkut® Spectrum
MSDS Number:	778731
Intended Use:	Metalworking Fluid
Manufacturer/Supplier:	ConocoPhillips Lubricants 600 N. Dairy Ashford Houston, Texas 77079-1175
Emergency Health and Safety Number:	Chemtrec: 800-424-9300 (24 Hours)
Customer Service:	888-766-7676
Technical Information:	800-255-9556
MSDS Information:	Internet: http://w3.conocophillips.com/NetMSDS/

2. Hazards Identification

<u>Emergency Overview</u>	<u>NFPA</u>
May be harmful to breastfed babies	

Appearance: Amber
Physical Form: Liquid
Odor: Petroleum

Potential Health Effects

Eye: 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 information available on skin absorption.

Inhalation (Breathing): No information available on acute toxicity.

Ingestion (Swallowing): Low to moderate degree of toxicity by ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Pre-Existing Medical Conditions: Conditions which may be aggravated by exposure include skin disorders.

See Section 11 for additional Toxicity Information.

778731 - Koolkut® Spectrum
Date of Issue: 15-Oct-2008

Page 2/6
Status: Final

3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Lubricant Base Oil (Petroleum)	VARIOUS	>90
Chlorinated Paraffins (C14-C17)	61788-76-9	<5
Additives	PROPRIETARY	<5

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

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

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on the left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestions of large amounts (more than 5 ounces in an adult) preferably under direction from a physician or poison center. Do not leave victim unattended and observe closely for adequacy of breathing.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a 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.

5. Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 Flammability: 1 Instability: 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

OSHA Flammability Category: None

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. 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 down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal.

7. Handling and Storage

Precautions for safe handling: Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Lubricant Base Oil (Petroleum)	TWA: 5mg/m ³ STEL: 10 mg/m ³ as Oil Mist, if generated	TWA: 5 mg/m ³ as Oil Mist, if generated	---

Note: 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.

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

Eye/Face 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/Hand 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 breakthrough performance of their products. Suggested protective materials: Nitrile.

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R 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 (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Amber
Physical Form:	Liquid
Odor:	Petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1 mm Hg
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	<-4°F / <-20°C
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.89 @ 60°F (15.6°C)
Bulk Density:	7.4 lbs/gal
Viscosity:	5.4 cSt @ 100°C; 32 cSt @ 40°C
Evaporation Rate (nBuAc=1):	No data
Flash Point:	>399°F / >204°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

10. Stability and Reactivity

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. Toxicological Information

Chronic Data:

A mortality study sponsored by General Motors and the United Auto Workers suggested a link between cutting oils or machining fluids and various forms of cancer (e.g., esophageal, laryngeal, and rectal). The study evaluated workplace exposures from 1940-1984. Since the composition of these materials has changed substantially since 1940, and because the most notable effects were seen among those with work histories dating back to that time, the relevance of these findings to present-day exposures is uncertain. Cutting oils or machining fluids have not been identified as carcinogens by NTP, IARC, or OSHA.

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Chlorinated Paraffins (C14-C17)

Carcinogenicity: Certain Chlorinated paraffins mixtures have caused an increase in tumors when given in very high oral doses to mice and rats. This particular chlorinated paraffin has not been identified as a carcinogen by NTP, IARC or OSHA.

Target Organs: Administration of intermediate length chlorinated paraffins has demonstrated limited evidence of liver toxicity in experimental animals. Effects seen include increased liver:body weight ratios and hepatocellular hypertrophy.

Reproductive: Animal studies in both rats (up to 5000 mg/kg, orally) and rabbits (up to 100 mg/kg), orally did not demonstrate effects on the developing fetus. However, the rat studies found increased mortality in pups exposed to chlorinated paraffins via lactation.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No data
Chlorinated Paraffins (C14-C17)	>4 g/kg (rat)	>10 ml/kg (rabbit)	No Data

12. Ecological Information

Ecotoxicity: Experimental studies show that acute aquatic toxicity values are greater than 1000 mg/l. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

Mobility: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of base oil components in soil and sediment.

Persistence and degradability: The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by microorganisms, they are regarded as inherently biodegradable.

Bioaccumulation Potential: Log Kow values measured for the hydrocarbon components of this material range from 4 to over 6, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

14. Transportation Information

U.S. Department of Transportation (DOT)

Shipping Description:

Not regulated

Note:

If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)

International Maritime Dangerous Goods (IMDG)

Shipping Description:

Not regulated

Note:

U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #:

Not regulated

Note:

U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:

No

778731 - Koolkut® Spectrum
 Date of Issue: 15-Oct-2008

Page 6/6
 Status: Final

Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:

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

EPA (CERCLA) Reportable Quantity (in pounds):

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.

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 Regulations.

WHMIS Hazard Class
 None

National Chemical Inventories:

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
 All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. Other Information

Date of Issue:	15-Oct-2008
Status:	Final
Previous Issue Date:	20-Jun-2007
Revised Sections or Basis for Revision:	Emergency Overview (Section 2) Toxicological (Section 11)
MSDS Number:	778731

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



MATERIAL SAFETY DATA SHEET

76 Unax AW 32, 46, 68

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 76 Unax AW 32, 46, 68
Product Code: 4641032000, 4642046000, 4643068000
Synonyms: 76 Unax AW 32
 76 Unax AW 46
 76 Unax AW 68
Intended Use: Industrial oil
Chemical Family: Petroleum hydrocarbon
Responsible Party: 76 Lubricants
 A Division of ConocoPhillips
 600 N. Dairy Ashford
 Houston, TX 77079-1175
For Additional MSDSs 800-762-0942
Technical Information: 800-435-7761

The intended use of this product is indicated above. If any additional use is known, please contact us at the Technical Information number listed.

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:

Spill, Leak, Fire or Accident California Poison Control System: (800) 356-3129
 Call CHEMTREC
 North America: (800)424-9300
 Others: (703)527-3887 (collect)

Health Hazards/Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Keep away from all sources of ignition.

Appearance: Clear and bright
Physical form: Liquid
Odor: Mild petroleum

NFPA Hazard Class:

Health: 1 (Slight)
 Flammability: 1 (Slight)
 Reactivity: 0 (Least)

HMIS Hazard Class

Health: 1 (Slight)
 Flammability: 1 (Slight)
 Physical Hazard: 0 (Least)

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>HAZARDOUS COMPONENTS</u>	<u>%WEIGHT</u>	<u>EXPOSURE GUIDELINE</u>		
		<u>Limits</u>	<u>Agency</u>	<u>Type</u>
Zinc Compound CAS# Proprietary	<1	Not Established		

(MSDS: 722330)

Page 2 of 7

<u>OTHER COMPONENTS</u>	<u>% WEIGHT</u>	<u>EXPOSURE GUIDELINE</u>		
		<u>Limits</u>	<u>Agency</u>	<u>Type</u>
Lubricant Base Oil (Petroleum) CAS# Various	>99	(See: Oil Mist, If Generated)		
Additives CAS# Proprietary	<1	Not Established		

<u>REFERENCE</u>	<u>EXPOSURE GUIDELINE</u>		
	<u>Limits</u>	<u>Agency</u>	<u>Type</u>
Oil Mist, If Generated CAS# None	5 mg/m3	ACGIH	TWA
	10 mg/m3	ACGIH	STEL
	5 mg/m3	OSHA	TWA
	2500 mg/m3	NIOSH	IDLH
	5 mg/m3	NOHSC	TWA

The base oil for this product can be a mixture of any of the following highly refined petroleum streams: CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS 64742-65-0; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1

Note: 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.

1%=10,000 PPM.

All components are listed on the TSCA inventory.

3. HAZARDS IDENTIFICATION

Potential Health Effects:

Eye: 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 worsen irritation by causing drying and cracking of the skin leading to dermatitis (inflammation). No harmful effects from skin absorption are expected.

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): No harmful effects expected from ingestion.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea and diarrhea.

Cancer: Inadequate evidence available to evaluate the cancer hazard of this material. See Section 11 for carcinogenicity information of individual components, if any.

Target Organs: No data available for this material.

Developmental: No data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Wipe material from skin and remove contaminated shoes and clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Note To Physicians: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. Often these injuries require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash Point: >384°F/>196°C (COC)
OSHA Flammability Class: Not applicable
LEL/UEL%: No Data
Autoignition Temperature: No Data

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

(MSDS: 722330)

Page 4 of 7

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Use good personal hygiene practices.

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 apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required.

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

Eye/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance: Clear and bright

Physical State: Liquid

Odor: Mild petroleum

pH: Not applicable

Vapor Pressure (mm Hg): <1

Vapor Density (air=1): >1

Boiling Point/Range: No Data

Freezing/Melting Point: <-27°F / <-33°C

Solubility in Water: Negligible

Specific Gravity: 0.855-0.871

Percent Volatile: Negligible

Evaporation Rate (nBuAc=1): Negligible

Viscosity: 22-68 cSt @ 40°C / 4.3-8.7 cSt @ 100°C

Bulk Density: 7.13-7.26 lb/gal

Flash Point: >384°F / >196°C (COC)

Flammable/Explosive Limits (%): No Data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions To Avoid: Extended exposure to high temperatures can cause decomposition.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield carbon, nitrogen, sulfur, phosphorus, and zinc oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Lubricant Base Oil (Petroleum) (CAS# Various)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

(MSDS: 722330)

Page 6 of 7

13. DISPOSAL CONSIDERATIONS

This material under most intended uses would become used oil due to contamination by physical or chemical impurities. RECYCLE ALL USED OIL. While being recycled, used oil is regulated by 40 CFR 279. Use resulting in chemical or physical change or contamination may also subject it to regulation as hazardous waste. Under federal regulations, used oil is a solid waste managed under 40 CFR 279. However, in California, used oil is managed as hazardous waste until tested to show it is not hazardous. Consult state and local regulations regarding the proper handling of used oil. In the case of used oil, the intent to discard it may cause the used oil to be regulated as hazardous waste.

Contents should be completely used and containers emptied prior to discard. Rinsate may be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or a drum reconditioner. To assure proper disposal of small empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Not classified as hazardous

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health: No
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

SARA 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Component	CAS Number	Weight %
Zinc Compound	Proprietary	<1

California Proposition 65:

Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

--None Known--

Carcinogen Identification:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any.

EPA (CERCLA) Reportable Quantity:

--None--

Canada - Domestic Substances List: Listed

WHMIS Class:

Not regulated

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.

16. OTHER INFORMATION

Issue Date: 02/06/03

(MSDS: 722330)

Page 7 of 7

Previous Issue Date: 01/01/02
Product Code: 4641032000, 4642046000, 4643068000
Revised Sections: New Format
Previous Product Code: 4641032000
MSDS Number: 722330
Status: Final

Disclaimer of Expressed and Implied Warranties:

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