EM69ATC CNC MACHINING CENTER

MACHINE MAINTENANCE AND PARTS MANUAL

8029 S 200th Street, Kent, WA 98032 USA | www.rottlermfg.com | Ph: (253) 872-7050 | Fax: (253) 393-0230
Rev 092621

PARTS ORDERING

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For fastest service ordering parts or equipment, contact us via e-mail with the information below. For customers within the U.S., send emails to parts@rottlermfg.com, for customers outside of the U.S., use intlparts@rottlermfg.com

Have the following information on hand to expedite the ordering process:

1. Your name, business name, and contact number
2. Customer number, or your billing address if you do not have a customer number
3. Shipping address if different from the billing address
4. Machine model and serial number
5. Part number and description of the item(s) to order
6. Preferred method of shipment

For customers outside of the U.S. requiring faster service, contact your local distributor.

In some cases, you may be requested to send a photo of the part you are ordering if it is a replacement part or does not appear in our database.

If you are unsure which part you need to order, contact our service department, and ask to speak to one of our service consultants. They will assist you in determining which part(s) you require.

THERE IS A MINIMUM ORDER OF $25.00

MANUAL SECTIONS

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TROUBLESHOOTING

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SDS

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INTRODUCTION

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Introduction

READ THE SAFETY CHAPTER BEFORE INSTALLING MACHINE. THOROUGHLY UNDERSTAND ALL SAFETY ISSUES BEFORE OPERATING MACHINE.

ATTENTION OWNER/BUSINESS MANAGER

To validate the warranty on your new Rottler machine, please be sure to sign and complete the "Installation Report" located in the Installation Chapter of this manual.

We suggest that the new user of the EM69ATC read the CONTROL DEFINITIONS to get an idea how the machine operates.

The Operating Instructions chapter should be read in order to familiarize the user with the actual button pushing sequences required to carry out a job. These chapters in the manual should be considered an introduction. As the operators of the EM69ATC series machines gain experience with using the different functions of the machine, complicated setups and programs will make more sense.

The rest of the manual contains information and part number reference on fixtures, cutting tools, and machine maintenance. The operator should read and become familiar with these areas as well.

Description

The model EM69ATC machine is a precision, single point boring, and high-speed surfacing unit. The machine can be equipped with tooling and accessories for surfacing and re-boring most American passenger car and truck engines, In-lines, as well as 90 and 60 degree V-types.

F60 machines can be easily tooled, to machine a wide range of engines, including European and Asian engines, also, the machine can be easily adapted to perform other boring and surfacing operations.

The machine is designed, to maintain alignment of cylinder bores, and cylinder head, deck surfaces to the pan rails and main bearing bore locations, as was done in the original factory machining. This overcomes the many inaccuracies and out-of-alignment problems associated with clamping portable boring bars to the cylinder head surface of blocks.

Convenient controls, fast block clamping, precise 3 axis CNC positioning and clamping, means considerable savings in floor to floor time, and operator involvement.

Change over or resetting time required to set up V-type or in-line engines is a minimum, making this machine highly suited to the jobber shop where engines cannot be run through in model lots.

All feeds and rapid travels are power operated and controlled form the control panel.

Disclaimer

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Limited Warranty

Rottler Manufacturing Company Model EM69ATC parts and equipment is warranted as to materials and workmanship. This limited warranty remains in effect for one year from the date of installation or two years from the date of the original shipment from Rottler or whichever date occurs first. This only applies is the machine is owned and operated by the original purchaser and is operated and maintained as per the instructions in the manual. A machine is warranted only if the Installation Report has been properly executed by a certified installation person and received by Rottler at the time of actual installation.

The products are warranted upon delivery to conform to their published specifications and to be free from defects in material and workmanship under normal use for a period of one year from shipment. Should a product not be as warranted, Rottler sole obligation shall be, at its option, to repair, correct or replace the product or to refund the amounts paid for the Product upon its return to a location designated by Rottler. No warranty shall extend to rapid wear Products (including tooling) or to Products which have been subject to misuse (including any use contrary to Rottler instructions), neglect, accident (including during shipment), improper handling or installation, or subject to any modification, repair or service not certified by Rottler. Rottler shall not be liable for any consequential, direct or indirect damages or for any other injury or loss. Buyer waives any right, beyond the foregoing warranty, to make a claim against Rottler. No warranty is provided for any Products not paid in full.

Merchandise cannot be returned to Rottler without prior approval. Customer must contact the Parts Department to get approval and to be issued a Return Goods Authorization number **(RGR#).** Merchandise authorized for return must be returned prepaid. If merchandise is returned with shipping charges collect, the actual amount of these charges may be deducted from any credit which may be due the customer. The **RGR #** assigned by the Parts Department should be written on the shipping label and must appear on a copy of the invoice(s) covering the original shipment. This invoice copy must be included in the box with the parts. Shipment must contain ONLY those items on the **RGR** as approved for return. Merchandise must be received within 10 days of the date of **RGR** or the **RGR** will be canceled. All returned merchandise may be subject to a 20% restocking fee on under $1,000.00 amount or 10% on any items over $1,000.00. Parts or tooling over 30 days old are considered as customer property and can only be returned with prior approval from Rottler Corporation Management.

The issuance of a **RGR DOES NOT** guarantee credit - it is only authorization for the return of the goods. Credit for return merchandise is at the sole discretion of Rottler. Credit will be issued only after inspection of returned goods.

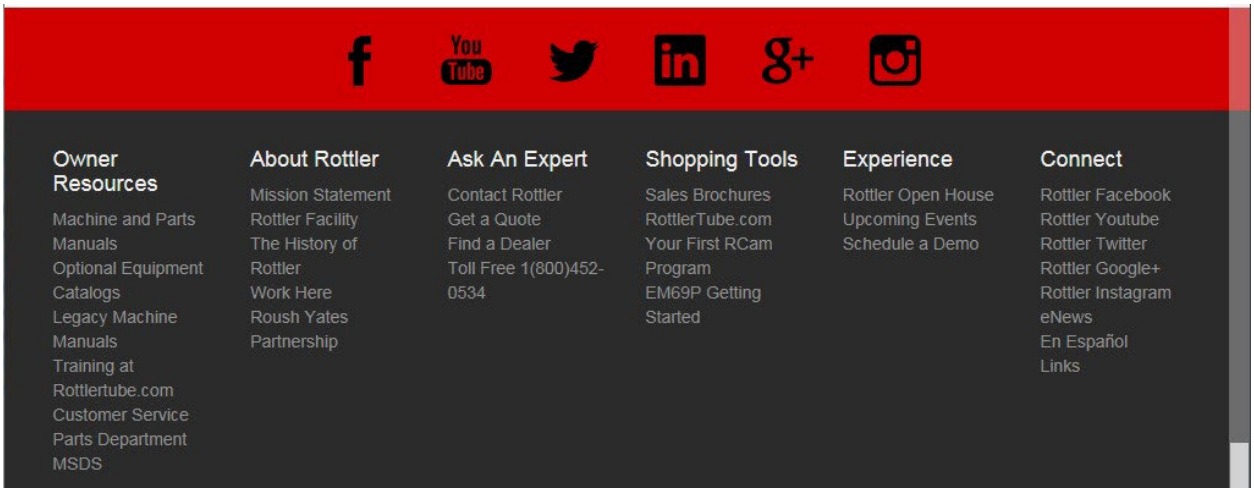
Tools proven to be defective within the warranty period will be repaired or replaced at the factory's option.

We accept no responsibility for defects caused by external damage, wear, abuse, or misuse, nor do we accept any obligation to provide compensation for direct or indirect costs in connection with cases covered by the warranty.

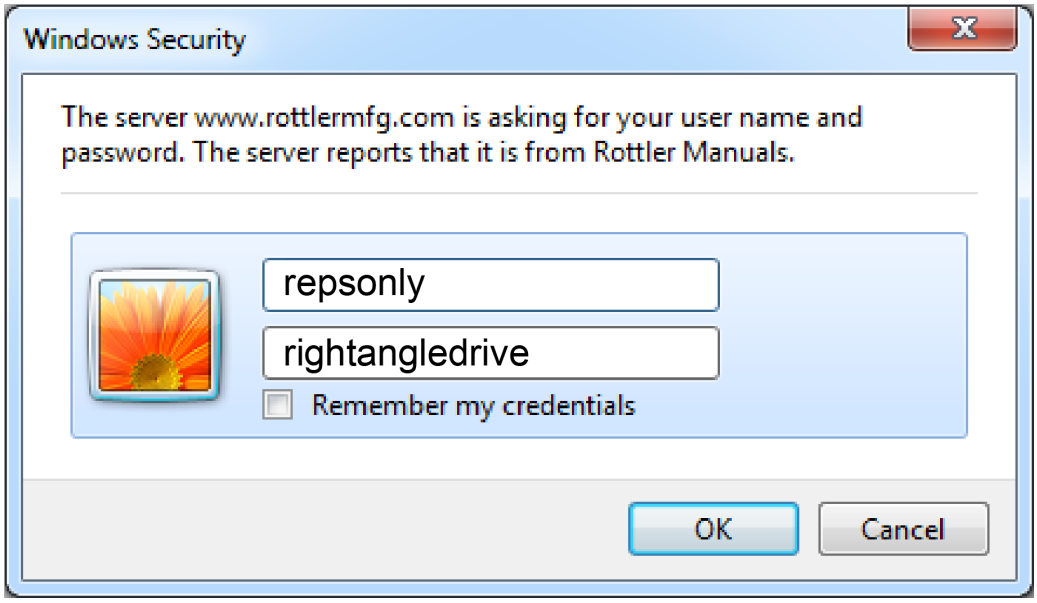
Online Documentation Access

Online documentation for machines and optional equipment can be accessed at the Rottler website. To access documentation open your browser and navigate to https://www.rottlermfg.com.

Scroll to the bottom of the page and under the Owner Resources title click the type of documentation you want to access.



If a log in window pops up asking for user name and password fill in the blanks as shown.



MAINTENANCE

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Maintenance

Quick Reference Lubrication Chart: EM69P

Refer to the maintenance section in the manual for lubrication location points and instruction.

Assembly	Frequency (Hours)	Lube Operation	Recommended Lubricant	Date Serviced
Way Oil Level	40	Fill as needed	Conoco Brand 76 Way Oil HD 68 or ISO VG 68 equivalent	
Drawbar oil level	160	Fill as needed	General Purpose air tool oil	

Quick Reference Preventative Maintenance: EM69P

Refer to the procedures in the maintenance section of the manual to make or check these adjustments. Not all of the items listed in the table below have adjustment. The information should be recorded and the amount of wear tracked so the part can be replaced before down time on the machine occurs.

Procedure	Frequency (Hours)	Date Serviced/Comments
Check Way Oil Functionality	160	
Visually Inspect Way Covers	160	
Check Air Pressure Regulators	480	
Check Backlash	960	
Check Gibbs	960	
Check for Loose Bolts	960	
Check Machine Geometry	960	
Check Incoming Voltage	960	

Removable copy

Quick Reference Lubrication Chart: EM69P

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Procedure	Frequency (Hours)	Date Serviced/Comments
Check Way Oil Functionality	160	
Visually Inspect Way Covers	160	
Check Air Pressure Regulators	480	
Check Backlash	960	
Check Gibbs	960	
Check for Loose Bolts	960	
Check Machine Geometry	960	
Check Incoming Voltage	960	

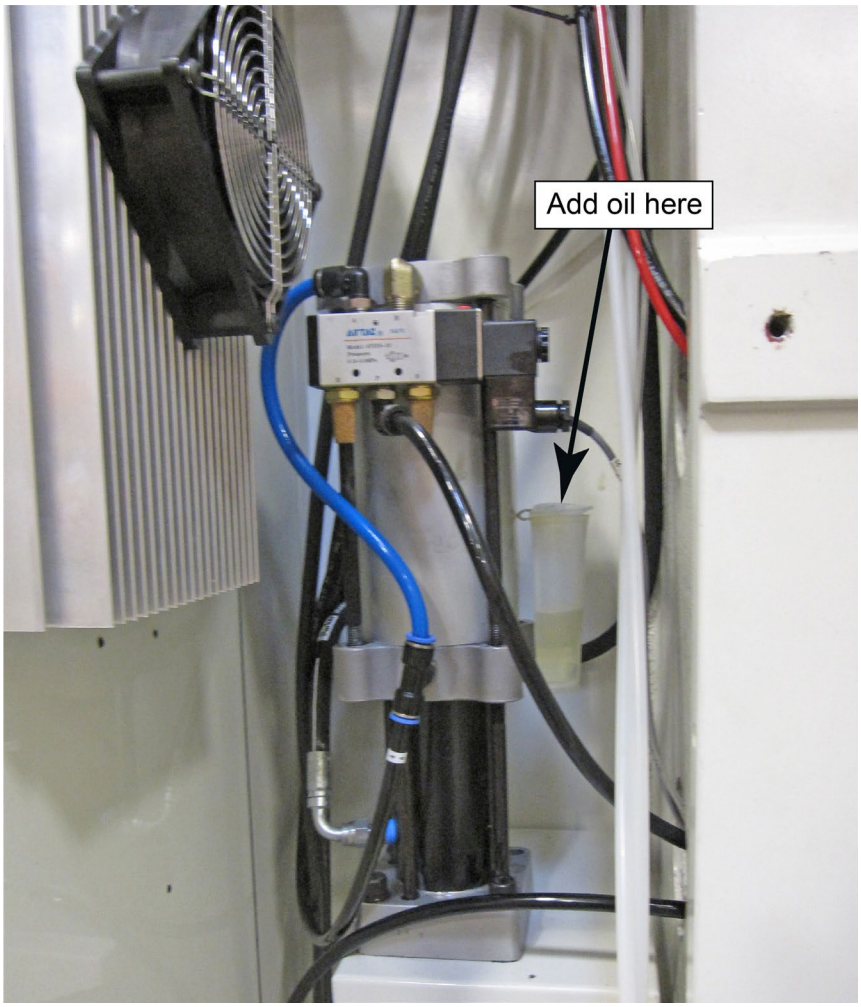
Lubrication

Automatic Lubrication System

The automatic lubrication system includes metering valves for proportional distribution and includes an alarm for low fluid level warning. Still, please check fluid level before operation. Add ***Union 76 Way Oil HD-68***, or equivalent, as needed in reservoir at rear of machine.

Power Draw Bar Lubrication:

The Power Draw Bar assembly has a gravity feed oiling system. Use machine tool oil in this reservoir. The reservoir is located on the side of the Draw Bar Assembly cylinder. The Draw Bar Assembly is located on the back of the machine. Refer to the following illustration for filling location.



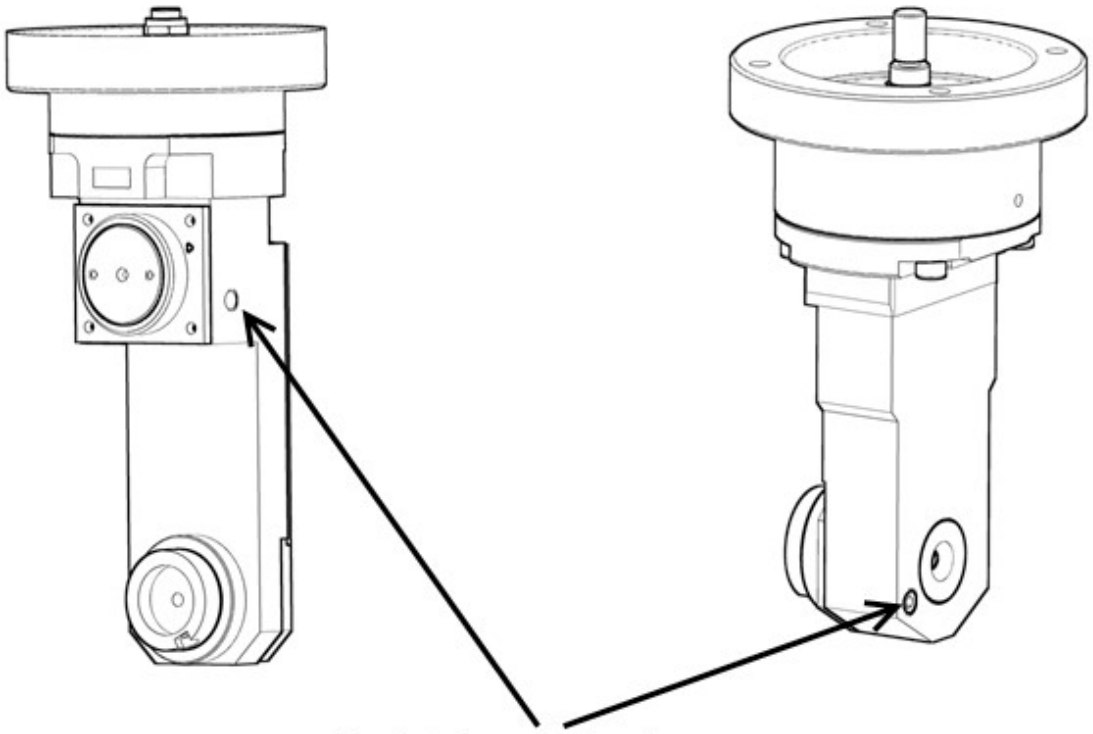
Right Angle Drive Lubrication Information.

All right angle drives require lubrication at the point where the pinion drive intersects with the drive gear. This is generally in the area where the cutterhead is attached, except for the units that have belt drive. There will be a small pipe plug that is removed to check oil level and add oil if needed. See illustration below for general locations.

With the drive mounted on the machine spindle the oil level should be even with the bottom of the pipe plug threads.

All Rottler Right Angle Drives are filled with Union 76 Turbine Oil 68 prior to shipment. Use this or an equivalent ISO VG68 oil if the need to add or change oil arises.

When adding oil, fill until oil starts to run out of fill hole. Allow excess oil to drain, then coat pipe plug threads with anti-seize compound and replace it.



Typical pipe plug locations

Probe “On-Center” Adjustment

This covers setup and calibration of the probe, so it will accurately position your machine.

- Verify that the four adjusting screws and two locking screws are installed in the probe tool holder.
- Assemble probe on either CAT 40 Shank or Rottler Taper
- With the machine breaker that supplies power to the probe receiver turned off;
- Install batteries in the probe WITH stylus deflected.

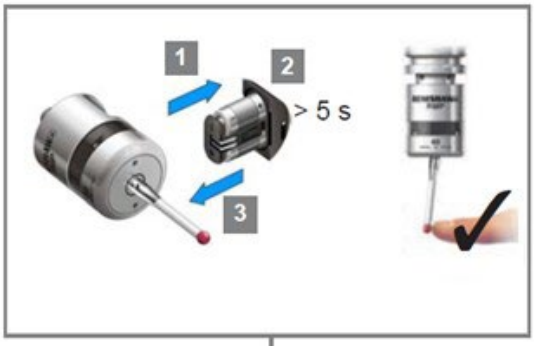
Probe LED check will run.

- Release stylus after battery check this will put you in edit mode.
- First will be Switch off method, you want this at purple, purple, yellow (Radio On). If it is not, deflect and release stylus quickly to change the mode.
- Hold the stylus deflected until the colors change to move to the next setting.
- You should be at Switch Off method; it should be red, red, yellow (134 seconds). If it is not, deflect and release stylus quickly to change the mode.
- Hold the stylus deflected until the colors change to move to the next setting.
- You should be at Enhanced trigger filter; it should be green, green, green (on). If it is not, deflect and release stylus quickly to change the mode.
- Hold the stylus deflected until the colors change again to move to the next setting.
- You should be at Acquisition mode, light blue, light blue, light blue.
- Turn on machine and quickly deflect and release the stylus. This must be done within 10 seconds of turning on the power breaker to the probe. If you are watching the RMI-Q (located ON the machine)

you will see the right light turn red, yellow, red, yellow, red, yellow is shows the partnership has been acquired.

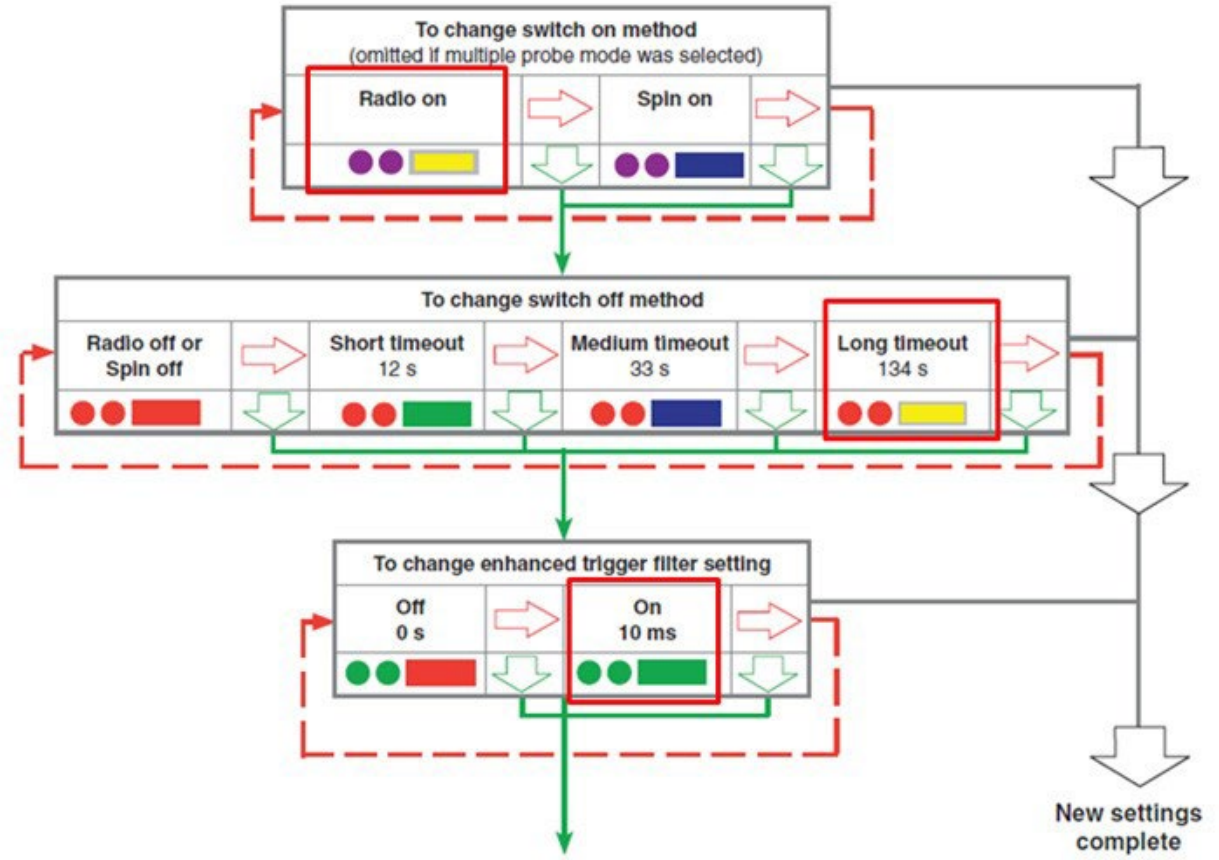
- Go into the software and do a probe auto center and hit start probe to verify that it works correctly.

Key to the symbols	
●	LED short flash
▬	LED long flash
⇨	Deflect the stylus for less than 4 seconds to move to the next menu option.
⇩	Deflect the stylus for more than 4 seconds to move to the next menu.
⇩	To exit, leave the stylus untouched for more than 20 seconds.



Battery status		
Battery good	or	Battery low
●●●●●		●●●●●●●●

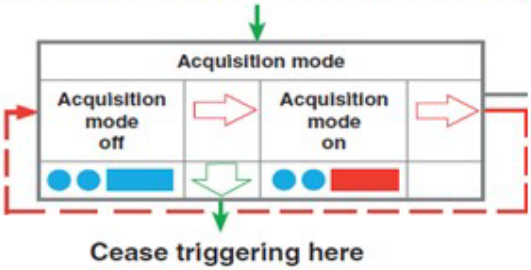
Switch on method, next page



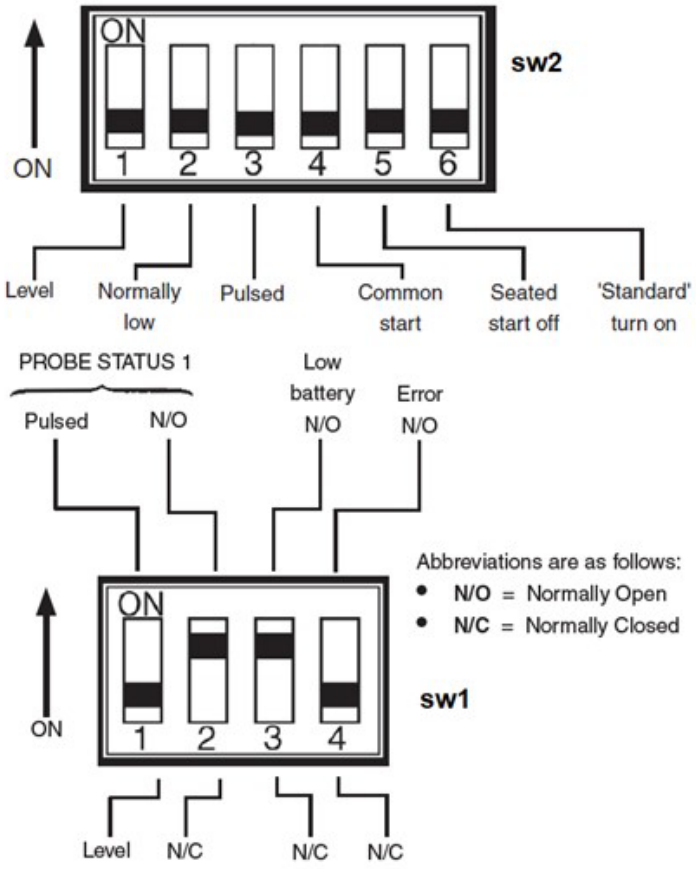
Changing the probe settings (continued)

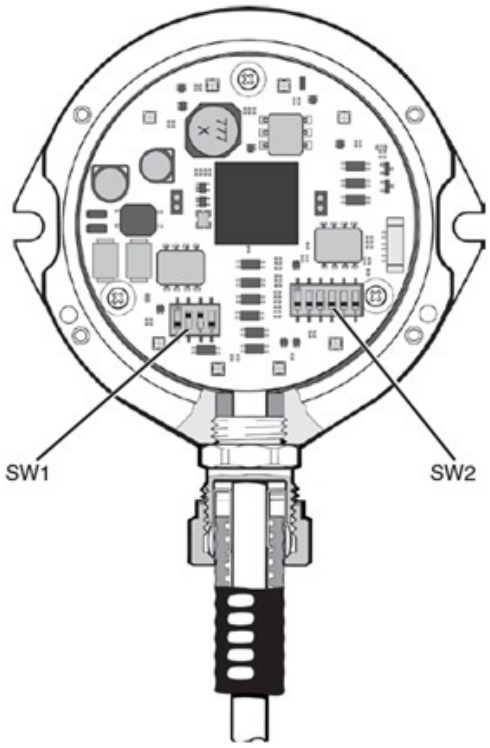
Note: After the RMI has been acquired, the RMP40 will only show Acquisition mode off.

See RMP40 - RMI partnership.



If the Probe does not turn off after 137 seconds you will need to make sure that the RMI-Q switches are shown in the following positions:





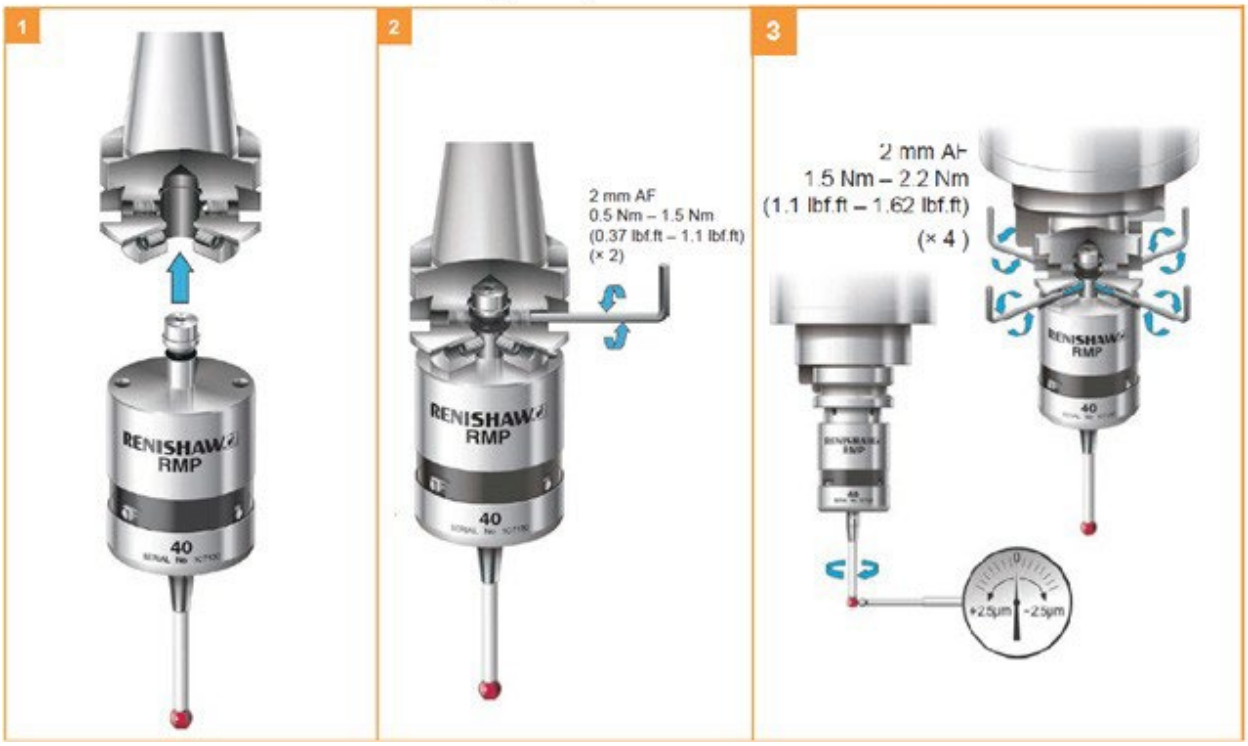
During normal use, the difference between the touch position and the reported position does not change, but it is important that the probe is calibrated in the following circumstances:

- when a probe system is to be used for the first time;
- when a new stylus is fitted to the probe;
- when it is suspected that the stylus has become distorted or that the probe has crashed;
- at regular intervals to compensate for mechanical changes of your machine tool;
- if repeatability of relocation of the probe shank is poor. In this case, the probe may need to be recalibrated each time it is selected.

It is good practice to set the tip of the stylus on center, because this reduces the effect of any variation in spindle and tool orientation. A small amount of run-out is acceptable, and can be compensated for as part of the normal calibration process.

- calibrating either in a bored hole of know size, a ring gauge, or on a datum sphere.

Mounting the probe on a shank



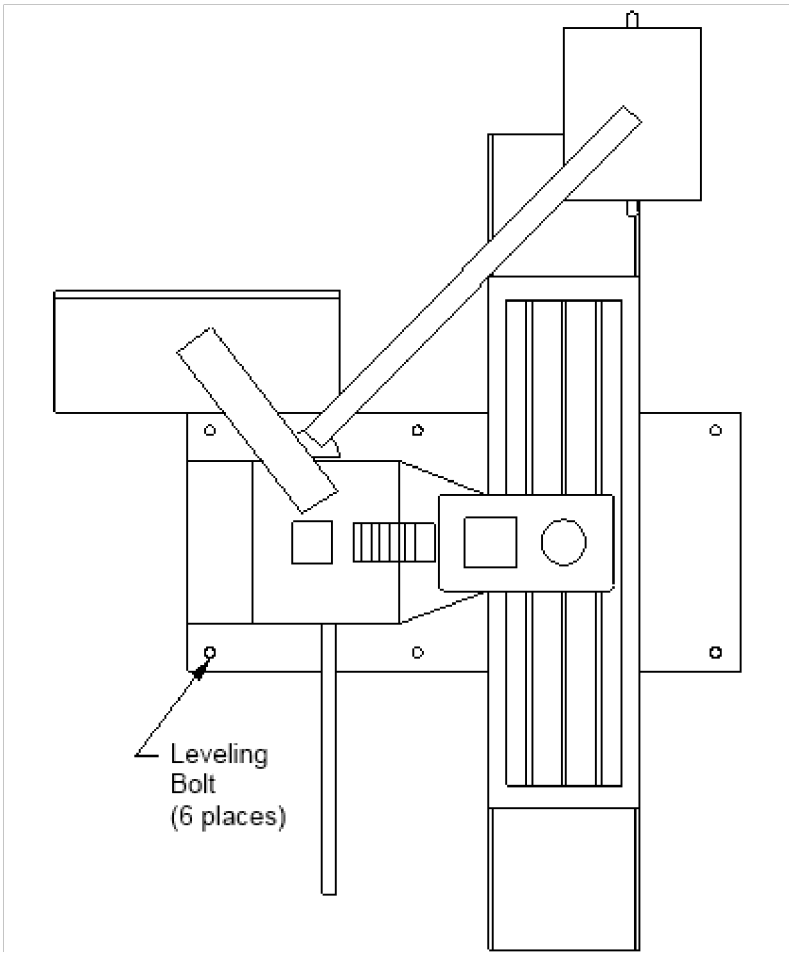
- Dial the probe stylus into center using a .0001” indicator to within .0005” the tighter tolerance you hold the more accurate the machine will be. You must use an indicator that takes very little pressure to get a reading. Excessive pressure on the stylus will deflect the probe and you will not be able to dial it in correctly.
- Go to the Main/Block Model screen and select the Table of Tools. You may only have a Default Tool #0 listed.
- Press Add Tool. This will bring up a dialog box. Change the name from default tool to probe style that you are installing i.e. 50mm stylus, 100mm stylus. Set the diameter to .2360” this is default probe tip on a 50mm,100mm, and 17.5mm.
- Install a block, or parallels onto the machine and secure it solidly to the machine table.
- Place the Ring Gauge onto the top of the block, use Probe Auto Center to find center zero your X and Y axis here. Make sure you use a ring gauge or a hole of a known diameter. This will set the correct probe timing.
- Adjust the probed diameter by going to the IO under Setup Electronics and changing the Probe MS. You will need to increase or decrease the MS of the probe to achieve correct Probe Diameter.
- Repeat until the correct diameter is displayed.
- Probe Auto Center the ring gauge, without moving X or Y, remove the probe up in Z and Install the cutter head. Put a magnet base with the Last Word indicator on the cutter head and sweep the cylinder/ring gauge.
- The variation in X and Y Should be less than .0005.
- If not add compensation to ProbeOffSet under > Setup Eletronics-Addins-ProbeSetup

Leveling and Alignment:

The following is a description of how to properly level and align the EM69P machine. These procedures should be followed in the order they written to obtain correct machine level and alignment.

Leveling the Machine:
After uncrating the EM69P set it down in desired location with leveling bolts and leveling pads installed.

Remove the Y-Axis protective rubber located on the backside of the table. This is where you will position the level to level the machine. A .0005" increment per foot precision level is required.



(Illustration depicts procedure and doesn't show actual layout of machine)

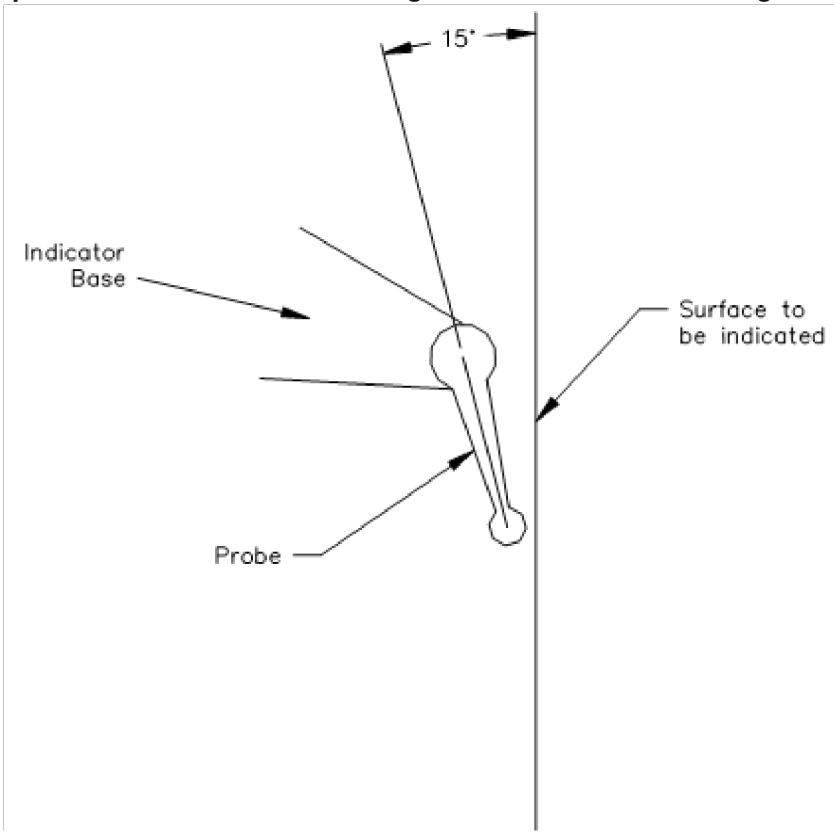
Using the four (4) corner leveling bolt to start with, bring the machine up to level in both directions (front to back and left to right) within .0005" per foot.

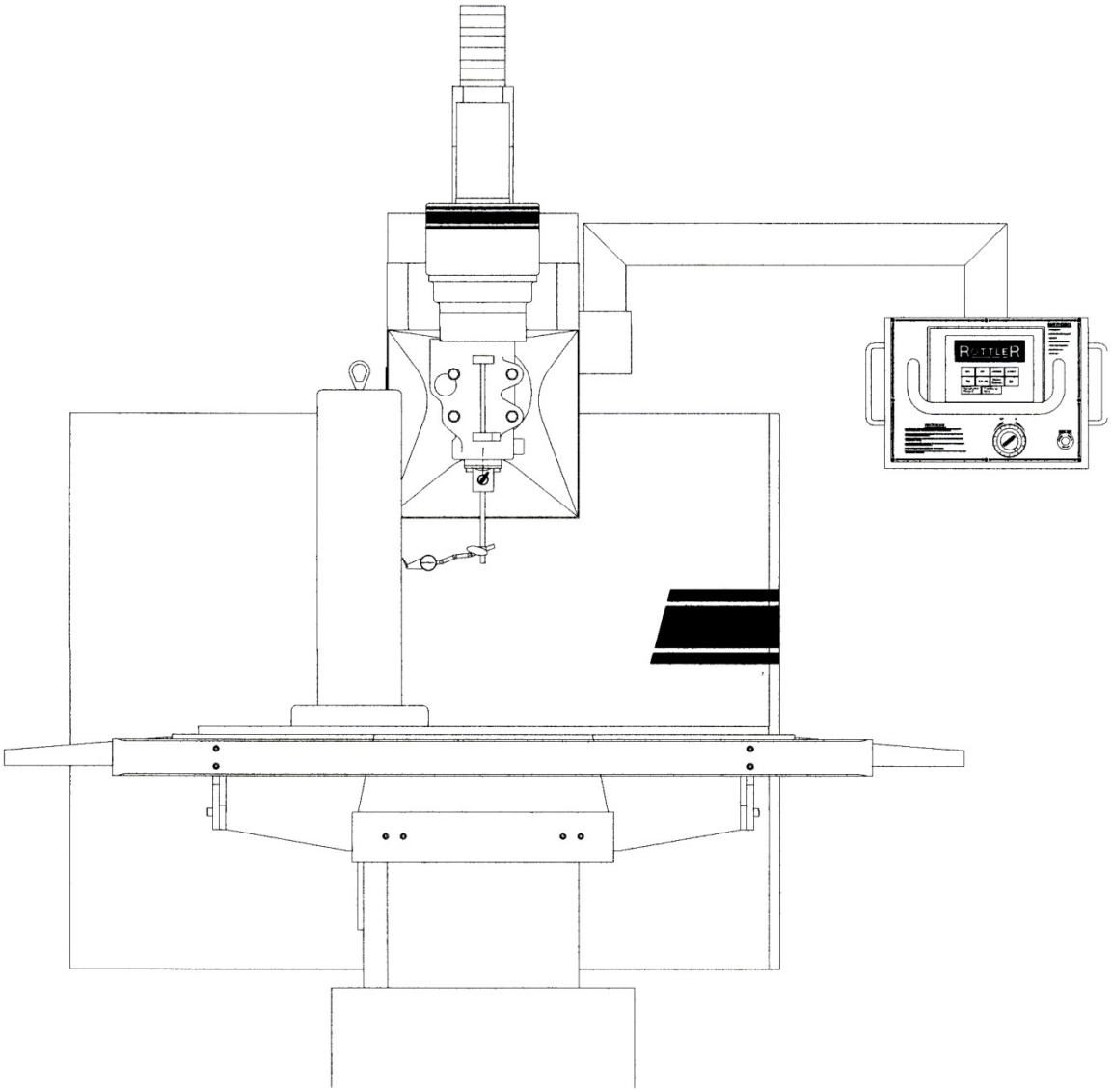
After you have leveled the bed using the four corner bolts, move to the middle leveling bolts. Bring these bolts down until they have approximately the same amount of pressure on them as them as the four corner bolts. Be careful not to throw the level of the machine off while doing this.

This will put the lower casting level.

Alignment
Place the alignment cylinder on the table in roughly the same position as shown on the following page.

Note: The position (angle) of the probe to the surface you are indicating is critical. Using an incorrect angle on the probe will result in inaccurate readings from the surface being indicated. The angle of the probe should be at about 15 degrees from the surface being indicated.

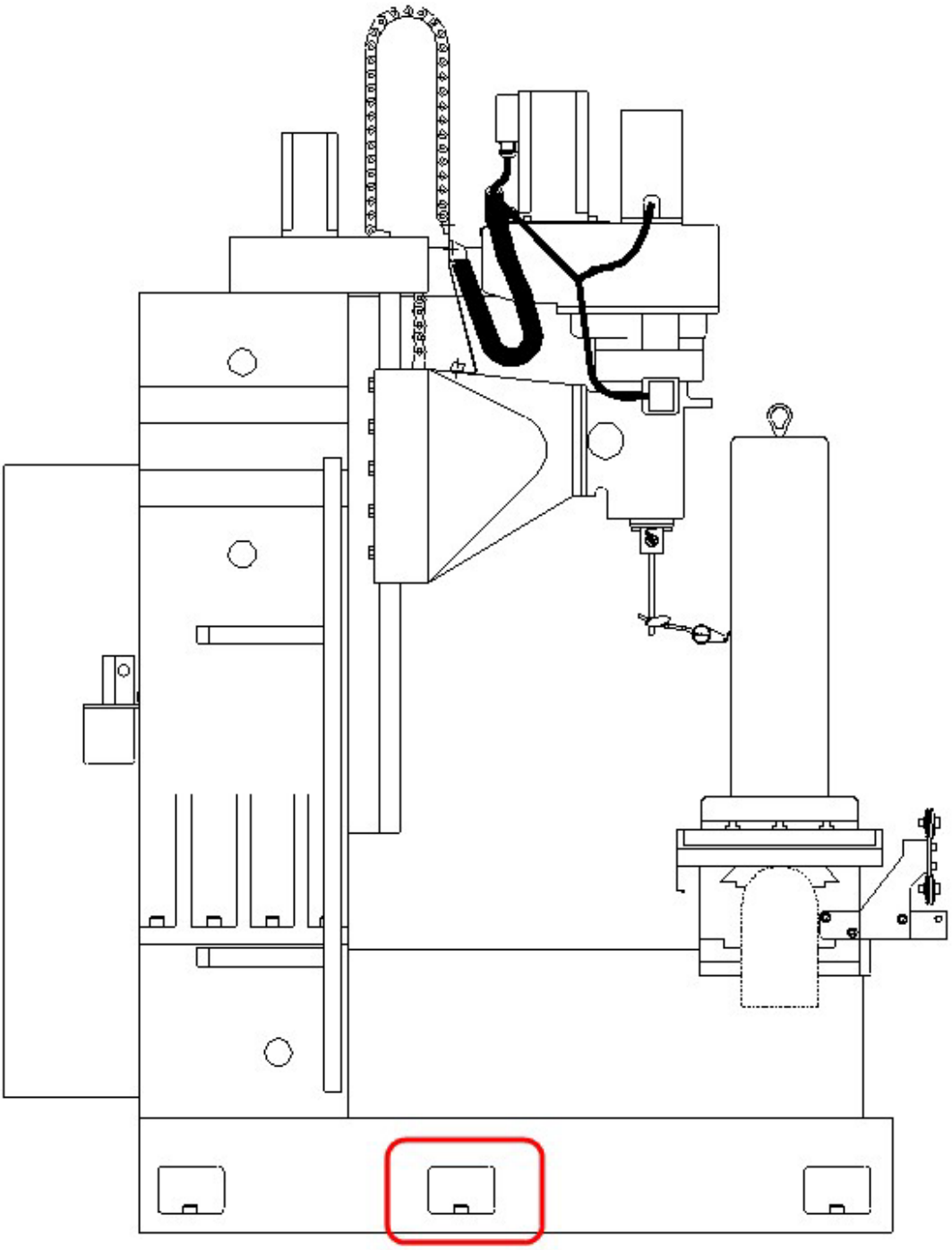




(Illustration depicts procedure and doesn't show actual layout of machine)

Put about .010" pressure on the indicator. Run the vertical throughout its full travel. The runout should not be more than .0005. If the runout is more than this, check the table top as well as the bottom of the alignment cylinder for burrs or debris.

Move the table out and check the perpendicularity of the vertical ways. This should be within .0005".



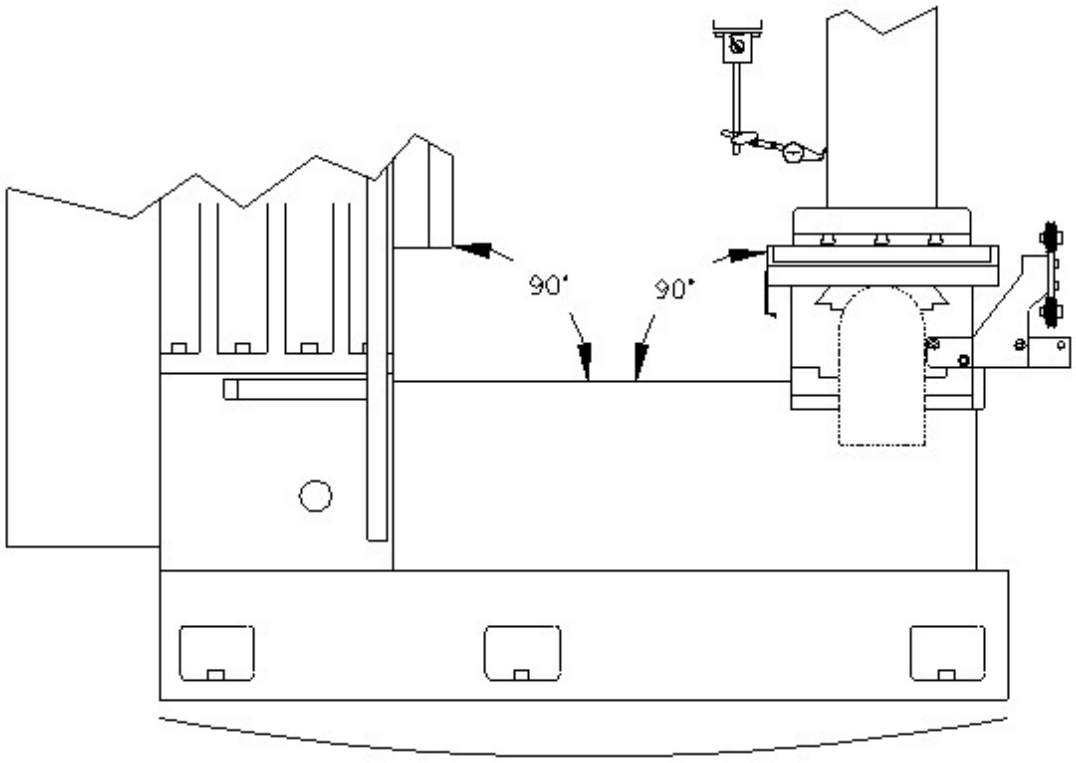
(Illustration depicts procedure and doesn't show actual layout of machine)

If the Vertical perpendicularity is not within tolerance the Middle Leveling Bolts may need to be adjusted.

Middle Leveling Bolts

If the procedures for the Leveling was followed correctly, it is unlikely that the deviance from Front to Back is being caused by the Middle Leveling Bolts. The following are examples of what could be caused by incorrect pressure on the middle leveling bolts.

Example 1: Zero the indicator on the top of the cylinder. When traveling to the bottom of the cylinder, if the reading decreases past -.001" to something such as -.002", then the middle leveling bolts have too little pressure on them and it is bowing the casting slightly in the middle as shown below.

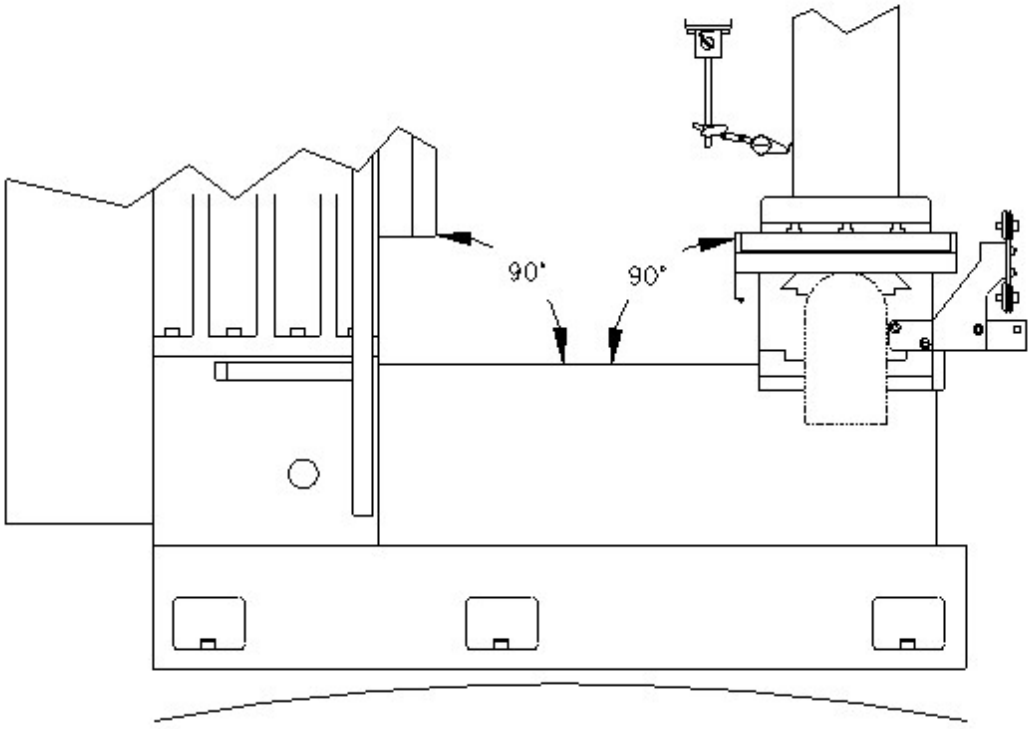


(Illustration depicts procedure and doesn't show actual layout of machine)

The arched line underneath the picture is illustrating the bow to the casting if the middle leveling bolts have too little pressure on them.

To correct the deviance slowly add pressure to the middle bolts equally. Be sure to watch the level of the machine to be sure not to throw it off. After adding pressure from the middle bolts you can remove pressure from the front and rear corner bolts to bring the deviance within .001".

Example 2: Zero the indicator on the top of the cylinder. When traveling to the bottom of the cylinder, if the reading decreases past +.001" to something such as +.002", then the middle leveling bolts have too much pressure on them and it is bowing the casting slightly in the middle as shown below.



(Illustration depicts procedure and doesn't show actual layout of machine)

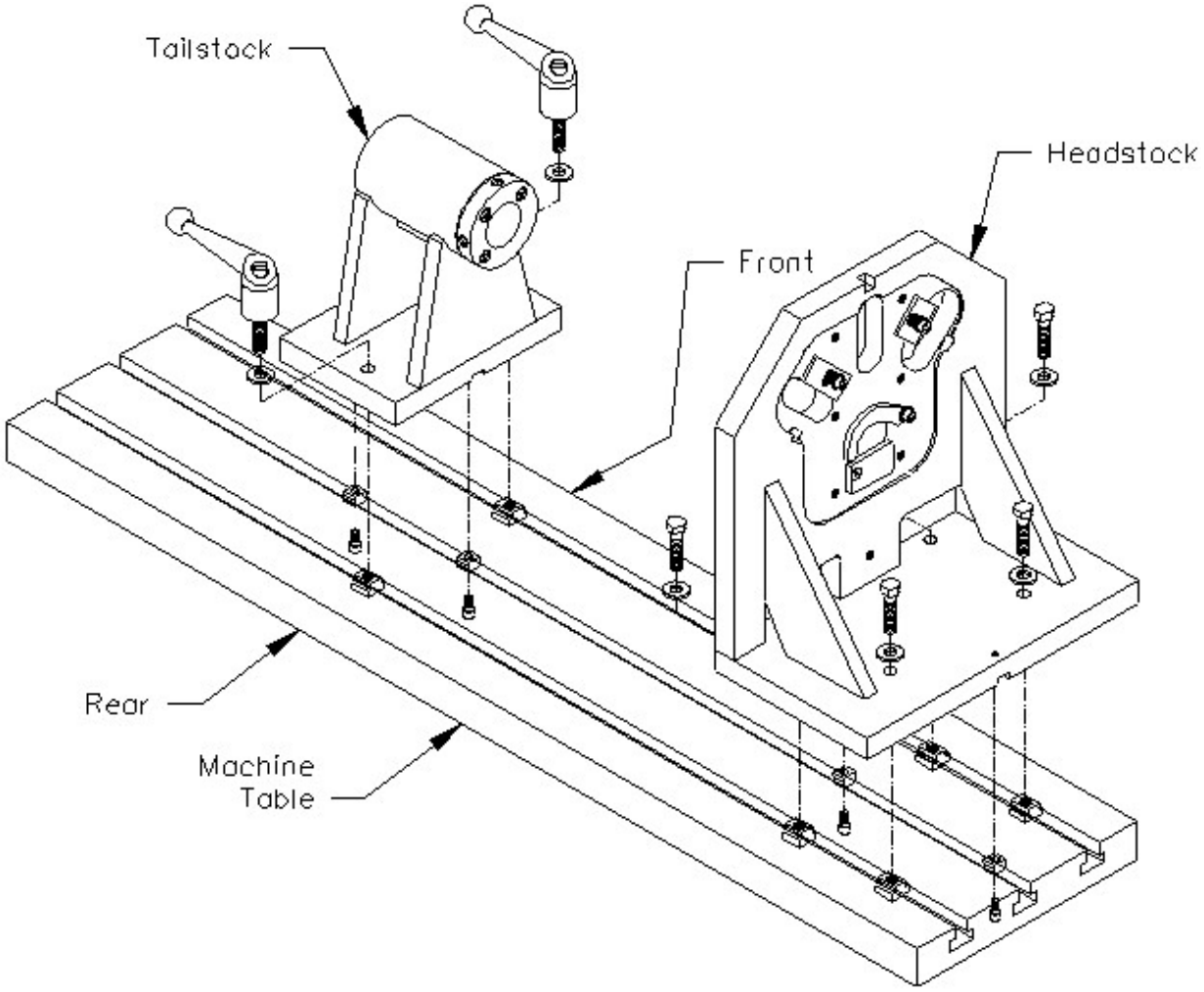
The arched line underneath the picture is illustrating the bow to the casting if the middle leveling bolts have too much pressure on them.

To correct the deviance slowly remove pressure from the middle bolts equally. Be sure to watch the level of the machine to be sure not to throw it off. After relieving pressure from the middle bolts you can apply slightly more pressure to the front corner bolts to bring the deviance within .001".

If you do not know how tight or loose the gibs are adjusted, you can remove the way wipers from the top of the gib. When you look in at the gib you will see a horizontal scribe line on most of the gibs. This can be aligned with the internal casting for a starting point. The gibs may need further adjustment at this point. This is only recommended as a starting point.

If there are any questions on this procedure contact Rottler Manufacturing Service Department.

Performance Fixture Line-Up:
Install the keys for the Head and Tail Stock into the machine bed as shown below. Place the Head and Tail Stock onto the machine table. Install the hold down bolts but do not tighten them down.



Push the head and tail stock toward the rear of the machine until the their keys but up against the table key ways. Snug the hold down bolts and handles. Attach a magnetic base and indicator to the spindle. Run the indicator across the face of the head stock front to back. Adjust the fixture until the indicator runs within .001". Lock the hold down bolts in place. Run the indicator from top to bottom on the head stock. It should be within .001". If it is not, pull the fixture from the table and check for burrs or dings in the head stock and table surface. Be sure there is not debris on the head stock or machine table. Re-install the head stock and follow the previous procedure. Check the face of the head stock again to be sure it did not move while tightening down the bolts.

Install the Main Bar though the tail stock and into the head stock. Run the indicator along the back side of the bar. It should be within .002" through out the travel. Adjust the tail stock in or out as needed to align the bar. Tighten down the locking handles. Run the indicator along the top of the bar. It should be within .002". If it is not, pull the fixture from the table and check for burrs or dings in the tail stock and table surface. Be sure there is not debris on the tail stock or machine table. Re-install the tail stock and follow the previous procedure. Check the bar again to be sure it did not move while tightening down the bolts.

Performance Fixture Line-Up (Cam End Tunnel Boring)

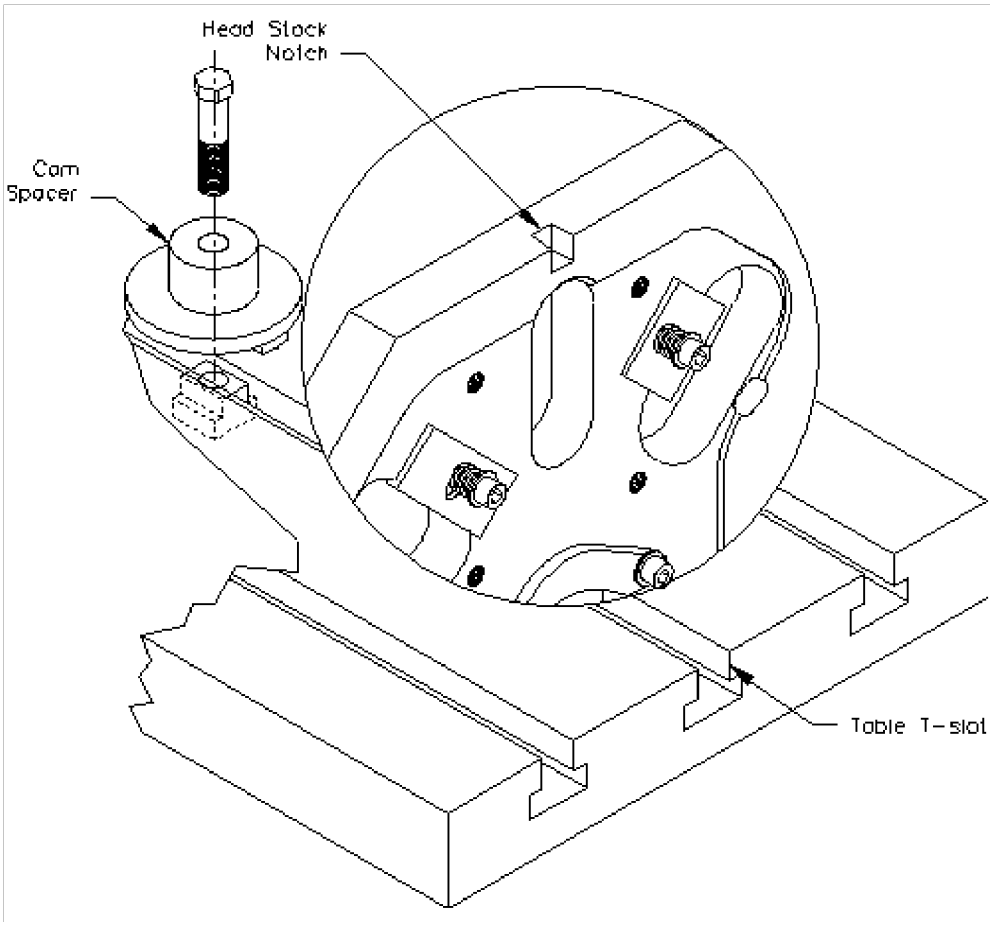
Install the keys for the Head and Tail Stock into the machine bed as shown on previous page. Place the Head and Tail Stock onto the machine table. Install the hold down bolts but do not tighten them down.

The center of the middle table key way needs to be lined up with the center of the Head Stock notch. Using the electronic probe, touch the front side of the middle keyway. Zero the In/Out position. Using the handwheel, move the table out until the probe touches the back side of the key way. Record the numerical reading in the In/Out position box. Divide this number in half, handwheel the In/Out axis until the numerical reading is the same as the halved number. Zero the In/Out axis again. The spindle is now centered over the middle key way. Adjust the head stock In/Out until the center of the Head Stock notch is at the In/Out zero position.

Attach a magnetic base and indicator to the spindle. Run the indicator across the face of the head stock front to back. Adjust the fixture until the indicator runs within .001". Lock the hold down bolts in place. Run the indicator from top to bottom on the head stock. It should be within .001". If it is not, pull the fixture from the table and check for burrs or dings in the head stock and table surface. Be sure there is not debris on the head stock or machine table. Re-install the head stock and follow the previous procedure. Check the face of the head stock again to be sure it did not move while tightening down the bolts.

Mount the End Truing V-End Truing Fixture (650-3-31) to the Head stock. Mount the block to the Truing Fixture. The above procedure has aligned the fixture so the main bore in on the same center line as the middle keyway.

Install the Cam spacer into the middle keyway. Place the bottom Cam Bore on the block over the cam Spacer with the correct bushing installed. This will put the Cam Bore in line with the Main bore.



To Copy Block Info From Your Machine

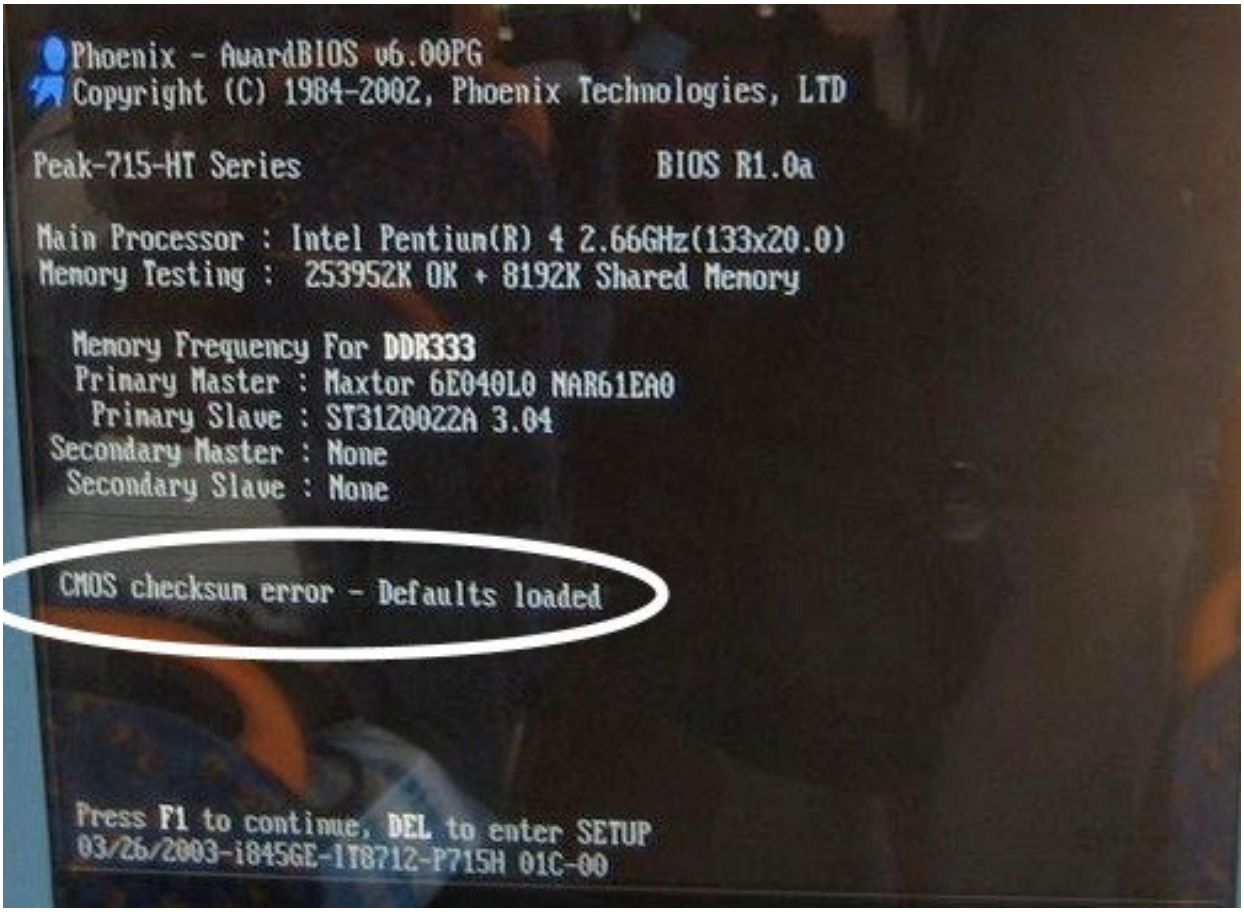
On the machine that has the info to be copied from, with the Rottler program up, go to file, click open, with the new window open scroll to local disk C:, open rottler, open backup 3 axis (if you have an F90 or a F60 with only 3 axis software) or backup 4 axis (if it is newer F60 software or has 4thaxis), open 2008 (or the latest year), open 08 (or the latest month), then pick a date in the following list that comes up (these are constantly added to, they are current dates: 2008 = year, 08 = month), copy it to thumb drive.

To Install Block Info Onto Your Machine

On the machine to copy this to, with the Rottler program up, go to file, click
open, when the new window opens up scroll to USB memory stick and find the copied file, and then open. You will need to select a block and mode, re-input the spindle speed, choose a different mode, so it will ask you if you want to save changes, that is the key.

Replacing the Motherboard Battery

If computer fails to boot up and you get a CMOS error message on the screen, then the battery on the computer motherboard has failed and needs to be replaced.



The following is the procedure for replacing the motherboard battery.

Turn off the power on the electrical enclosure and remove the enclosure cover.

Locate the computer and check to see that the power light is not on. If it is on turn off the power switch.
Note: On some machines it may be necessary to unbolt the computer from the enclosure in order to gain access to the cover screws.

Remove the 6 screws indicated by the arrows from the cover.

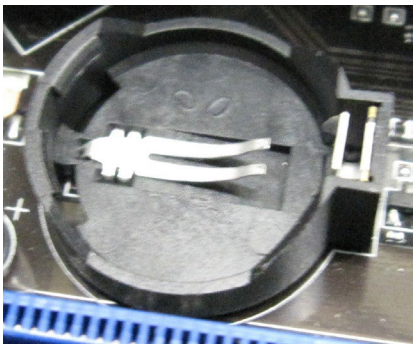
Remove the cover.


650-7-1
RM650
KEYBOARD/MOUSE
ROTTLER
PRINTER
COM 1
ATC
PUMP
DANGER

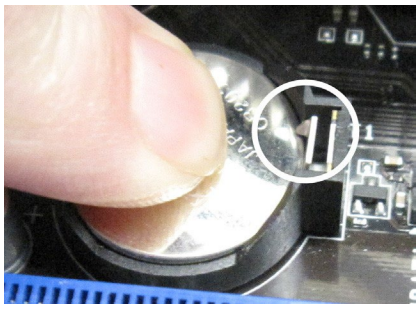
Locate the battery on the motherboard. will pop up.

Push the battery retention clip away from the battery. When the clip is released the battery

Remove the battery and place new battery in the battery holder.



Using your finger tip push down on the battery until the retention clip is in its lock position.



Replace computer cover and make sure that power switch on the computer is on.

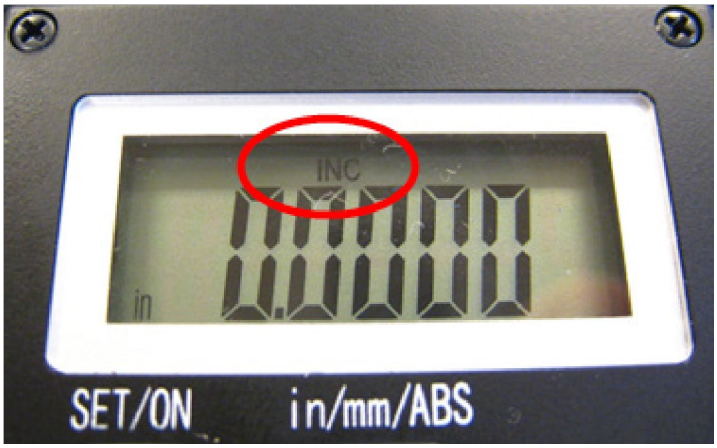
Replace the enclosure cover and switch power back on.

Digital Micrometer setting instructions

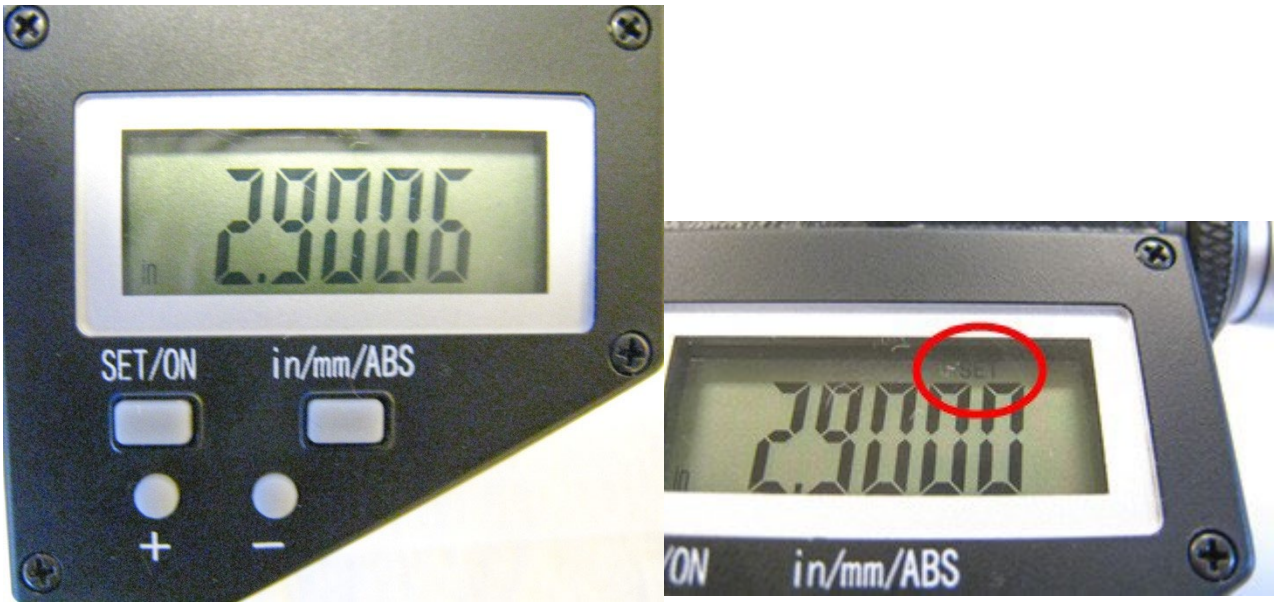
Turn the thimble until the ‘0’ line on the thimble lines up with the vertical line nearest the spindle lock ring.

Determine which cutter head bore range the micrometer is going to be used on. (example; 2.9 – 6.0)
We want to initially set the micrometer to the minimum bore diameter of this cutterhead.

NOTE: MICROMETER CAN NOT BE PROGRAMMED IF THE LETTERS INC APPEAR IN THE DISPLAY. To get rid of INC, quickly press the in/mm/ABS button.



To Set Or Edit Micrometer



Press and hold the set/on button and the + or – button at the same time. “Set” will flash in the display. This places the micrometer in edit mode. (CAUTION: use a pencil tip or something similar to gently push the small round buttons - they are quite small and a bit delicate.)

Press and hold the + or – buttons to change the display number to the minimum bore diameter determined earlier (example; 2.9). Caution: Pushing the + or – buttons and holding in place will cause the numbers to scroll automatically. The numbers will count slowly at first and once 0.010” has been counted off the scrolling speed will pick dramatically.

After you have reached the desired number in the display, press the set/on button twice quickly to exit the edit mode. “Set” should no longer be flashing in the display. The micrometer is now ready for use.

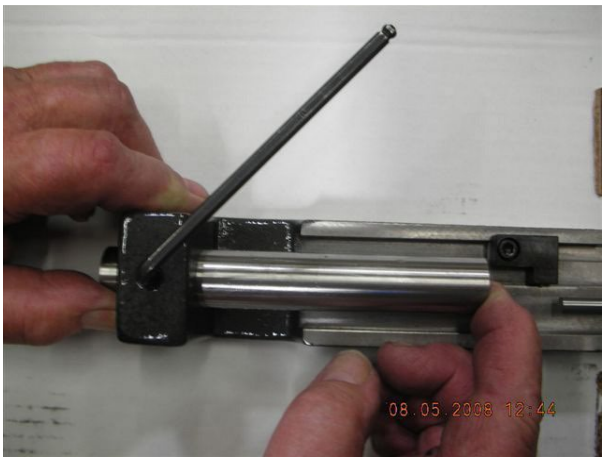
CAUTION: AFTER MICROMETER SET-UP IS COMPLETE, DO NOT PUSH SET/ON BUTTON AGAIN. PUSHING THE SET/ON BUTTON DURING USE WILL RETURN THE DISPLAY TO THE ORIGINAL MINIMUM BORE DIAMETER. THE ONLY TIME YOU SHOULD USE THE SET/ON BUTTON AGAIN IS TO- A. To shut micrometer off at which time you push and hold the button or B. to turn micrometer display back on at which time you push button one time. The display will then show the last reading before micrometer was shut off.

CAUTION: DO NOT BACK THE THIMBLE ALL THE WAY OUT TO THE END OF IT’S TRAVEL. ONCE THE THIMBLE IS BACKED ALL THE WAY OUT, IT WILL NO LONGER ROTATE PROPERLY AND THE DIGITAL HEAD WILL NEED TO BE REPLACED.

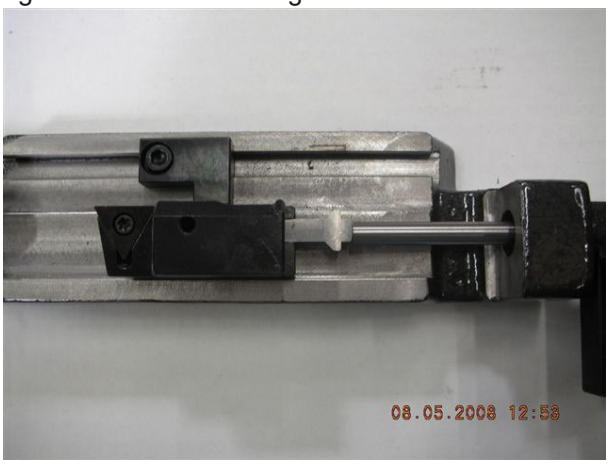
Micrometer is calibrated in inch mode. If metric is desired, press and hold in/mm/ABS button until mode changes to metric (approximately 3-4 seconds). A quick press of the in/mm/ABS button will put micrometer in ABS mode: 0.000, with another quick press returning it to initial setting.

Set up the cutter head and bore a set up hole. Measure the bore accurately. Set the digital display to this bore dimension and then -

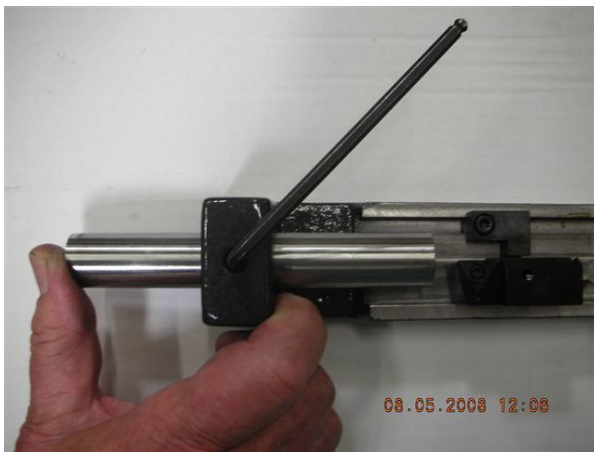
Loosen the set screw holding the large diameter anvil. Slide the anvil back out of the way.

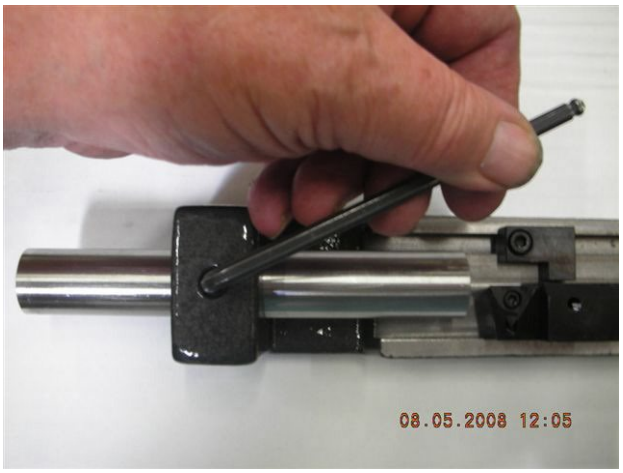


Place the tool holder used to bore the hole into the micrometer frame. Slide the location nub on the back of the tool holder gently up against the end of the digital micrometer shaft.



Slide the large diameter anvil up until it touches the end of the cutting tip of the tool holder. Tighten the set screw.





Back the digital micrometer shaft off, then bring it up to touch the tool holder and recheck that the numbers in the display are the same as the numbers previously shown.

The micrometer is now set up for use with this cutter head.

Note: this procedure must be repeated to set the micrometer to a different cutter head. The micrometer can only be set to one cutter head at a time.

To shut off micrometer press and hold set/on button until screen goes blank or let micrometer set until display disappears.

With initial setting of micrometer it is recommended that you use the procedure detailed below in the event you think you have size problems.

Procedure:

The short vertical lines that cross the horizontal scale on the micrometer sleeve are reference marks. Set the zero on the micrometer thimble even with the first vertical line and note the size shown in the digital display. Record this size for future reference. Now follow the same procedure for each line and record the sizes. At any time you feel your micrometer is reading incorrectly, you can quickly refer to the recorded size of the line closest to the range you are using and check that the micrometer is still accurate.

TROUBLESHOOTING

Problem:

Icon on screen does not move to area touched.

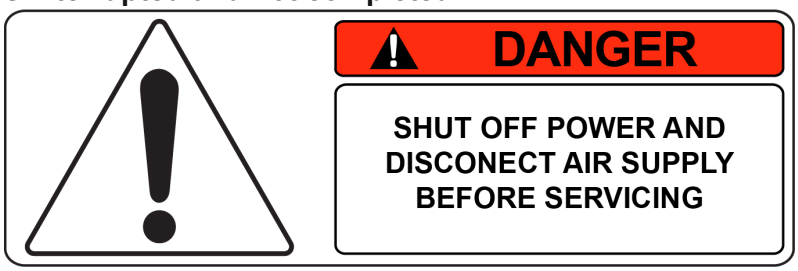
Solution:

Follow the procedure below to recalibrate the touchscreen.

1. Get to the Alignment screen.
    1. If an Elo icon is available in the tool tray at the lower right side of the desktop, click it, then click Align.
    2. Otherwise, go to the Windows Control Panel, double-click Elo Touchscreen and click the Align button on the General tab.
        1. If Windows XP and no Elo icon, click the “Switch to Classic View” button on the left
        2. If Windows 7 and no Elo icon, look for “View by: Category” text toward the upper right; click it and select “Small icons”
2. Touch and release the upper left target; the target should jump to the lower right.
3. Touch and release the lower right target; the target should jump to the upper right.
4. Touch and release the upper right target; a check screen should appear.
5. Touch and release the green check mark; the check screen should disappear.
6. The cursor should now jump to the point of touch.
7. If the Elo Control Panel is open, close it and the Windows Control Panel.

Problem:

Tool change was interrupted and not completed



Solution:

If a tool change is interrupted and not completed, the machine must be shut down. Disconnect the power supply and remove the air supply from the machine. Remove the tool by hand.

Section 7 Troubleshooting 7-2

For further assistance in troubleshooting:

Please visit the service tab of our web page at Send a Service Request www.rottlermfg.com or contact the Rottler Factory Service at service@rottlermfg.com for assistance and your service request.

You may also call Rottler at 1-800-452-0534 or 1-253-872-7050

Please ensure you have the Machine Model and Serial Number available when contacting Rottler for Service

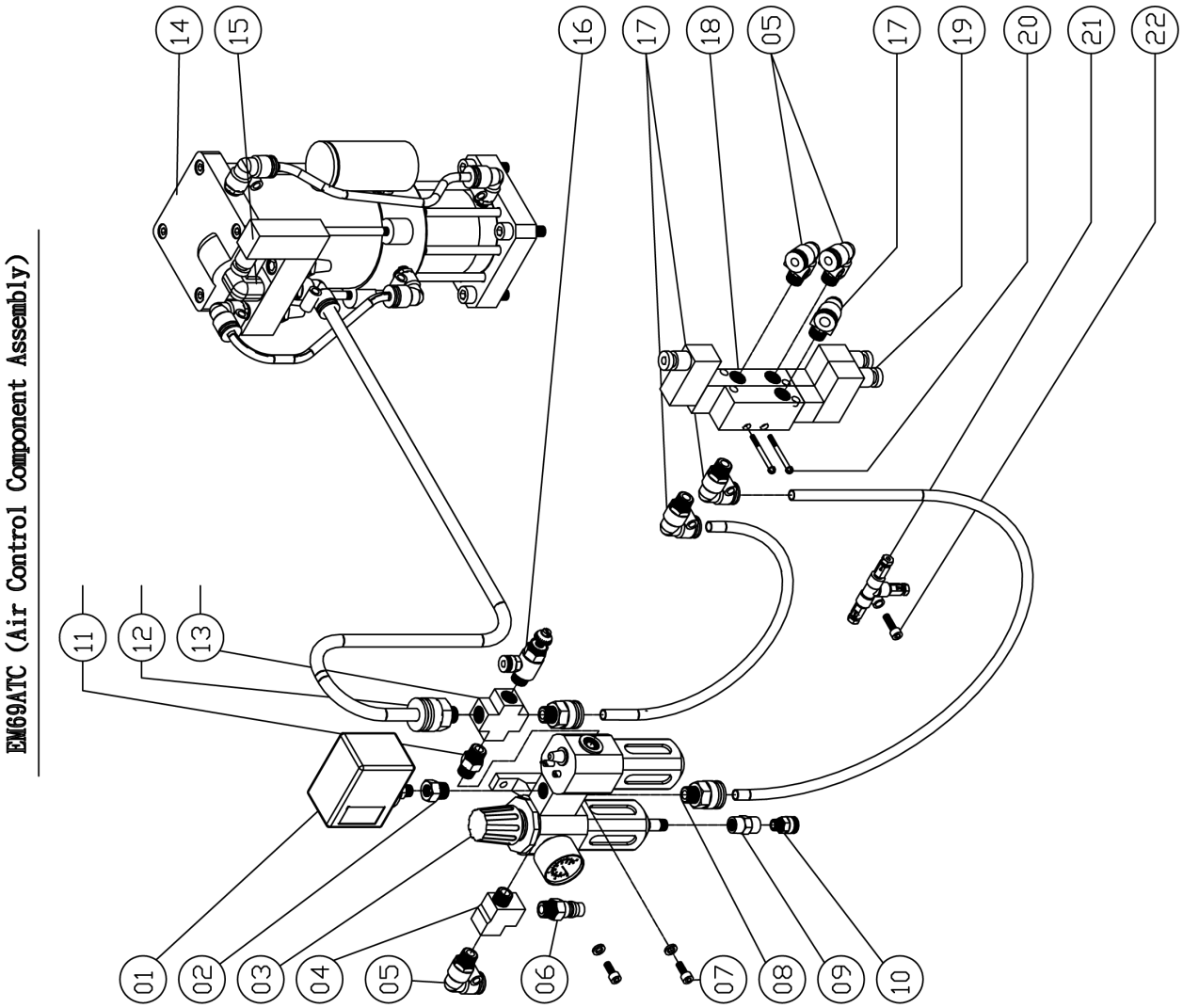
I

MACHINE PARTS

Contents

Machine Parts

Air Control Assembly Parts

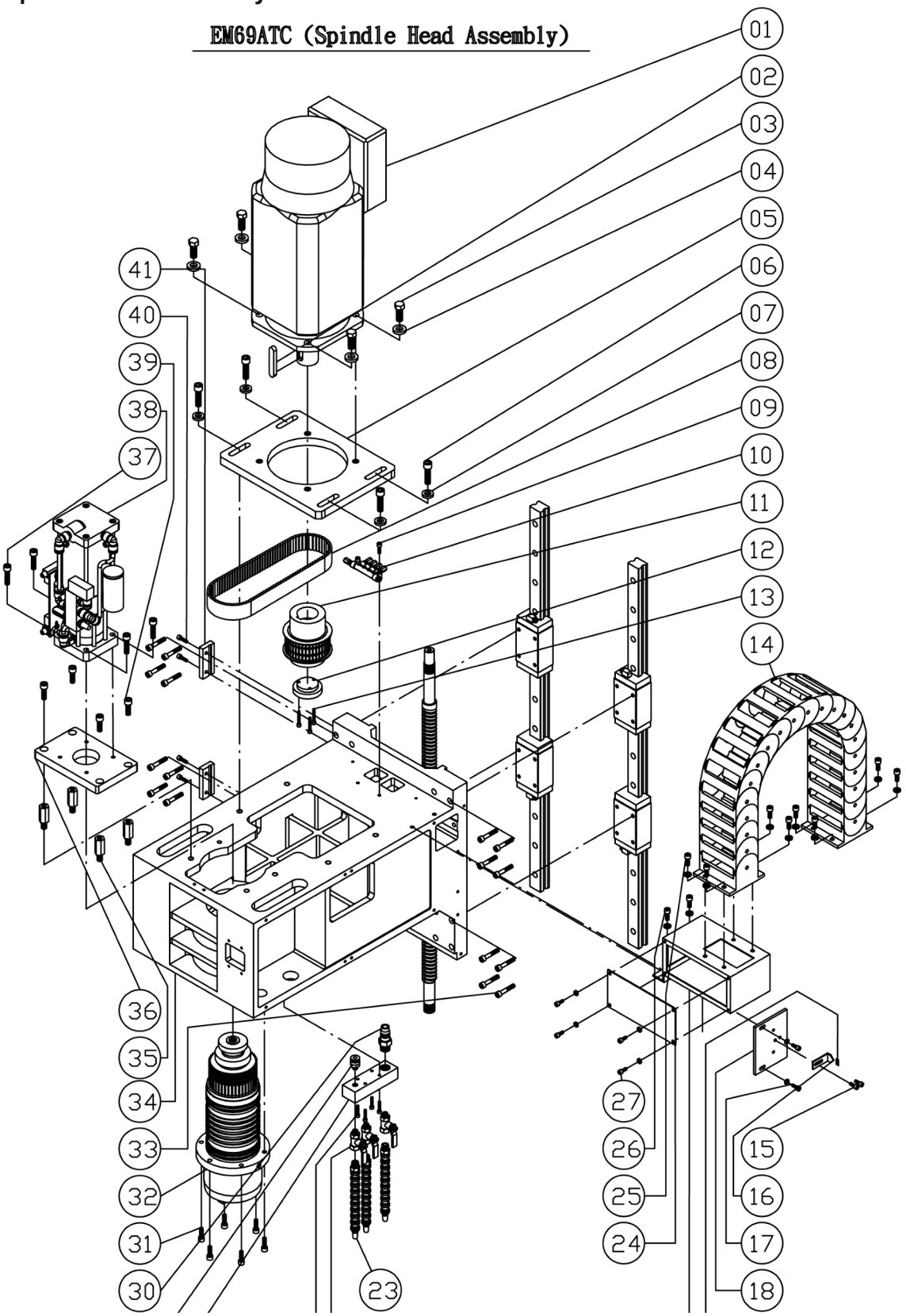


EM69ATC Part List

Air Control Component Assembly

	Part Number	Part name	Specification	Qty	Remark
01		Gauge pressure switch	SAFE-S971	1	
02		Bushing joint	PT3/8xPF1/4	1	
03	MV13601020-7	Three way connector	MACP300-10A	1	
04		Thread connector	PT3/8xPT3/8xPT3/8	1	
05		90° Quick joint	PT3/8x⌀8	3	
06		Double hose end join	PT3/8x⌀1/2"	1	
07		Cap Screw	M6x1Px16L	2	
08		Air quick connector	PT3/8x⌀10	1	
09		Bushing joint	PT1/4xPT1/4	1	
10		Quick joint	PT1/4x⌀6	1	
11		Joint	PT3/8xPT3/8	1	
12		Quick joint	PT3/8x⌀12	1	
13		4 Way thread connector	PT3/8xPT3/8	1	
14		Air to oil cylinder	90~100kgf/Cm², 80C.C	1	
15		Air solenoid valve	4V310-10(DC21.6~26.4V)	1	
16		Quick joint	PT3/8x⌀6	1	
17		90° Quick joint	PT3/8x⌀10	3	
18		Air solenoid valve	MVSC-220-4E2(DC24V	1	
19		Air solenoid valve	MVSC-220-4E1(DC24V	1	
20		Cross recessed pan head screw	M4x0.7Px45L	2	
21	EM-154-17	3 Way junction		1	

Spindle Head Assembly Parts

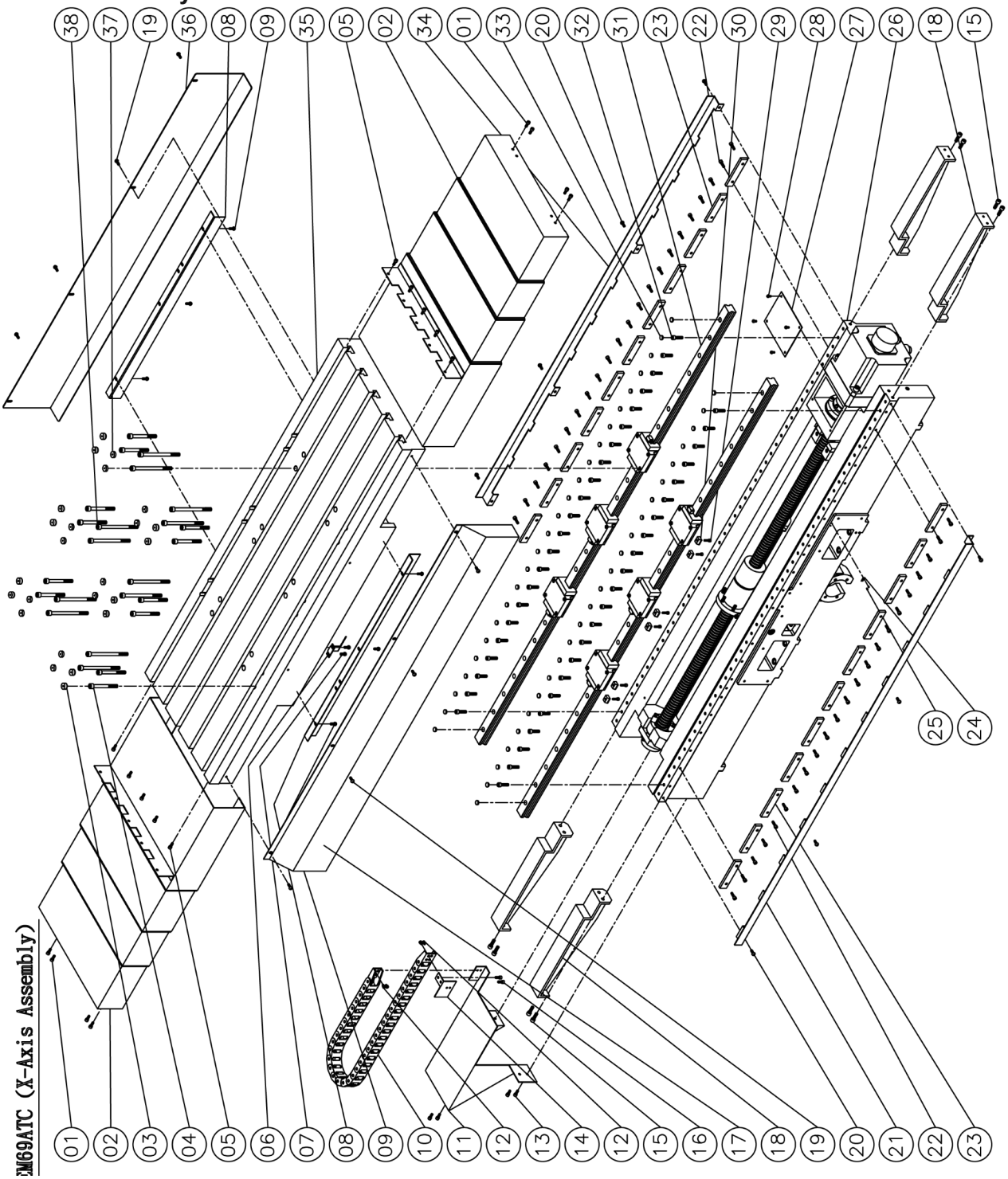


EM69ATC Part List

Spindle Head Assembly

	Part Number	Part Name	Specification	Qry	Remark
01		Spindle Motor		1	
02		Parallel Key	14x9x80L	1	
03		Hex Head Bolt	M14x2Px40L	4	
04		Washer		4	
05		Motro Adaptor		1	
06		Cap Screw	M12x1.75Px45L	4	
07	MV13540711	Washer		4	
08		Belt		1	
09		Cap Screw	M6x1Px25L	2	
10	EM-154-15	Volume Distributor		1	
11		Pulley		1	
12		Push Plate		1	
13		Cap Screw	M5x0.8Px35L	3	
14	7540060	Cable Chain	SQ303-IIIxKR150x945L-N	1	
15		Cap Screw	M6x1Px8L	2	
16	7540191	Origin Indicator		1	
17		Cap Screw	M6x1Px16L	2	
18	7540051	Plate		1	
19	CE-0050	Origin		1	
20	7550230	Cable Chain Bracket		1	
21		Cap Screw	M5x0.8Px25L	4	
22		Ball Valve	PT1/4xTH1/4	3	
23		Adjustable Hose	TH1/4x10P	3	
24	7550260	Cover		1	
25		Cap Screw	M6x1Px20L	8	
26		Cap Screw	M8x1.25Px16L	2	

X-Axis Assembly Parts



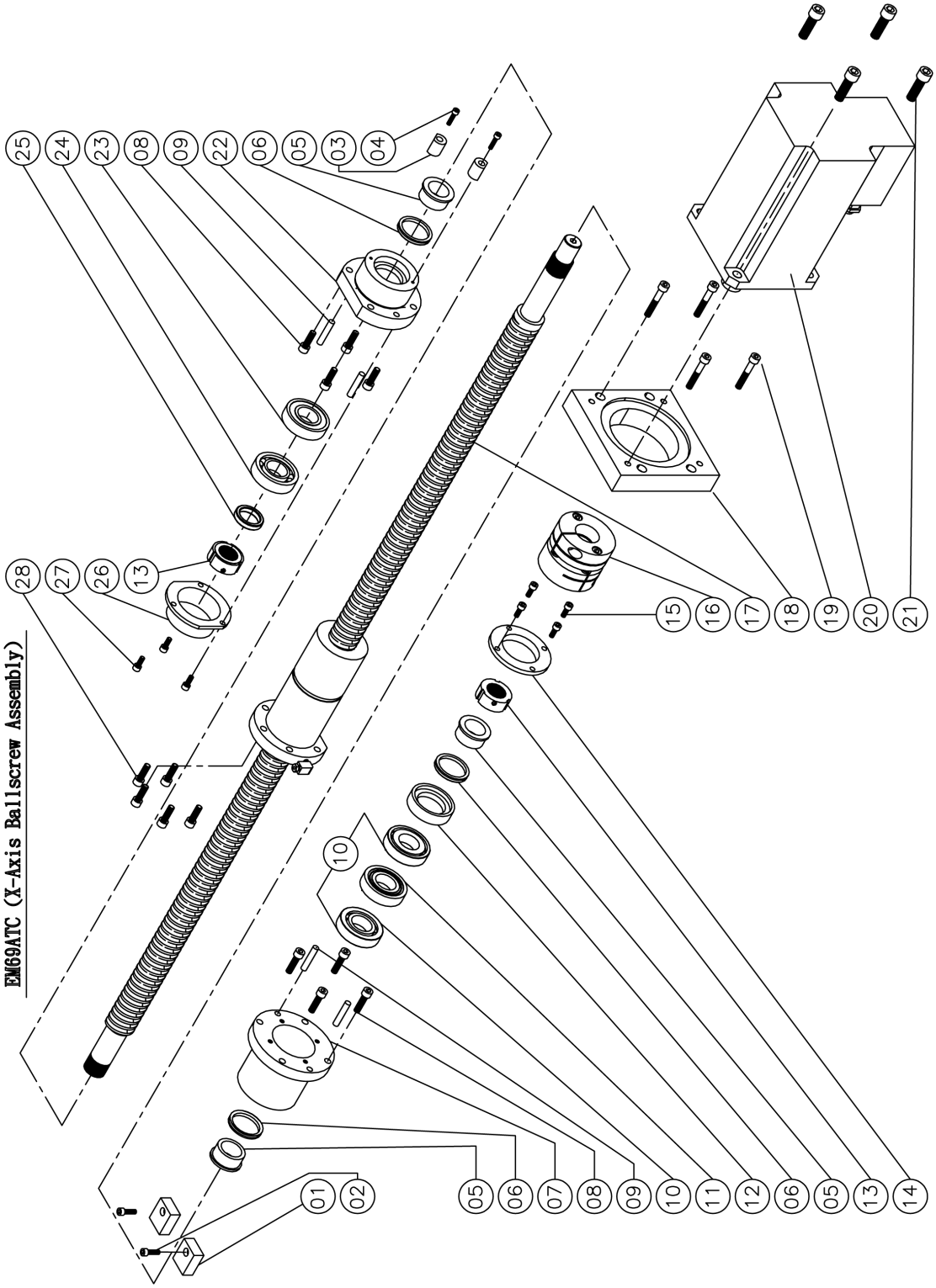
EM69ATC Part List

X-Axis Assembly

	Part Number	Part name	Specification	Qty	Remark
01		Cap Screw	M6x1Px16L	8	
02	10521220	X Telescopic Covers		2	
03	7520251	Copper Bolt Cap		12	
04		Cap Screw	M10x1.5Px95L	12	
05		Cap Screw	M6x1Px20L	10	
06	10520340	Origin Indicator		1	
07		Cap Screw	M6x1Px14L	2	
08	10520331	Guideway Cover		2	
09		Cap Screw	M6x1Px14L	6	
10		Cable Chain	SQ603xIIIxKR75x1020L	1	
11	10520200	Cable Chain Support		1	
12		Cap Screw	M5x0.8Px8L	4	
13		Cap Screw	M6x1Px14L	4	
14	10520211	Cable Chain Bracket		1	
15		Cap Screw	M8x1.25Px25L	8	
16		Cap Screw	M6x1Px14L	2	
17	10520250	Table Cover		1	
18	10520230	Telescopic Covers Bracket		4	
19		Button Head Cap Screws	M6x1Px14L	8	
20		Button Head Cap Screws	M6x1Px14L	8	
21	10520300	Guideway Cover		1	
22		Cap Screw	M6x1Px20L	44	
23	10531030	Push Plate		22	
24	CE-0050	Origin		1	
25		Rivet	⌀2x5L	2	
26	10531013	Saddle		1	

27	10520280	Plate		1	
28		Button Head Cap Screws	M5x0.8Px12L	4	
29		Button Head Cap Screws	M5x0.8Px16L	6	
30		Tapper Gib	T1	6	
31	10521021	Linear Guideway		2	
32		Cap Screw	M8x1.25Px35L	90	
33		Bolt Cap	C8	98	
34	10520310	Guideway Cover		1	
35	10521010	Table		1	
36	10521320	Table Cover		1	
37	7520251	Copper Bolt Cap		12	
38		Cap Screw	M10x1.5Px145L	12	

X-Axis Ballscrew Assembly Parts

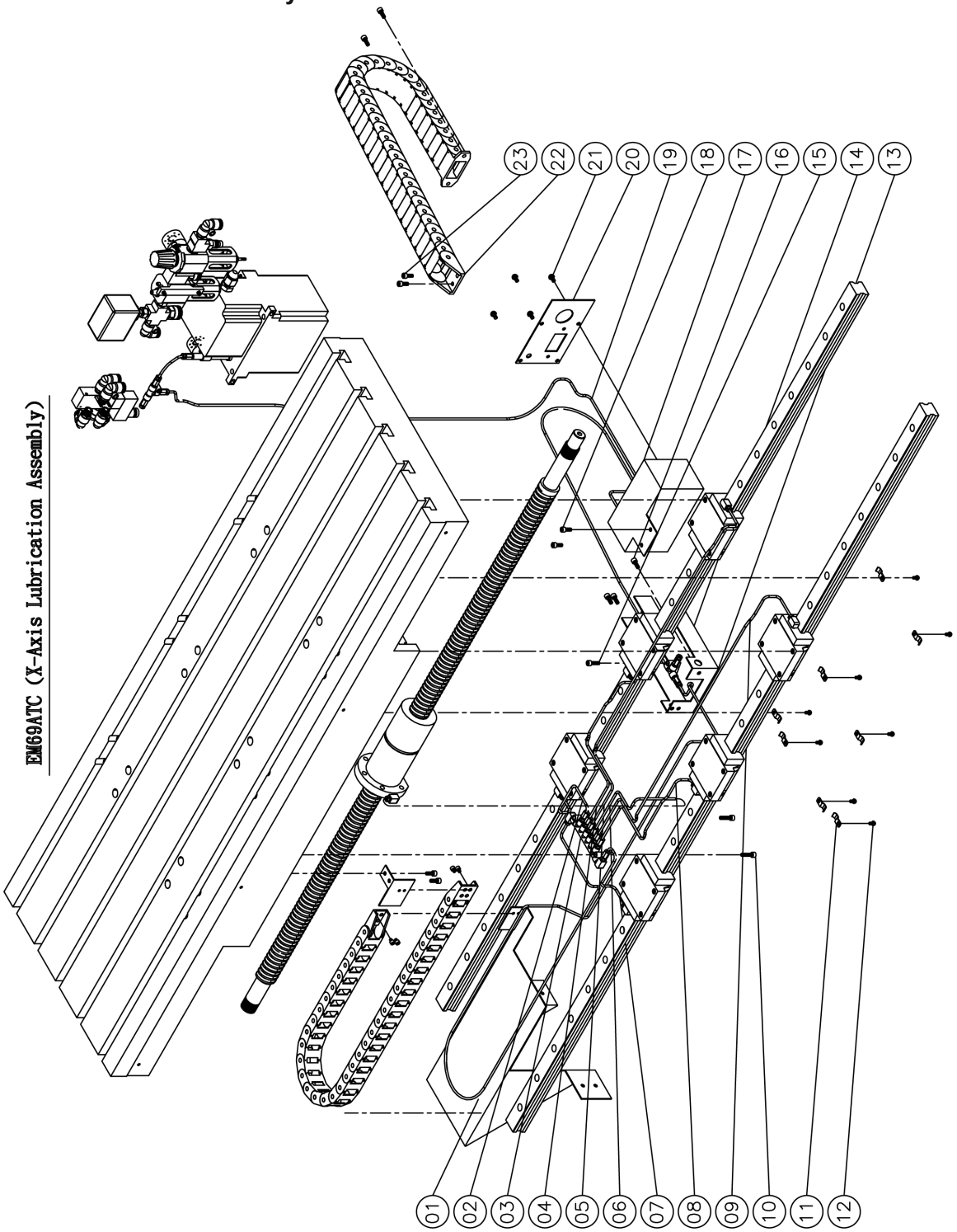


EM69ATC Part List

X-Axis Ballscrew Assembly

	Part Number	Part Name	Specification	Qty	Remark
01	7530070	Bumper		2	
02		Cap Screw	M6x1Px20L	2	
03	7520171	Bumper		2	
04		Cap Screw	M5x0.8Px20L	2	
05	8521090	Spacer		3	
06		Oil Seal	V-40A	3	
07	7520032	Bearing Housing		1	
08		Cap Screw	M8x1.25Px30L	8	
09		Location Pin	⌀8x40L	4	
10	Q-30TAC62C	Bearing	30TAC62C(DB)	2	
11	8521190	Spacer		1	
12	7520051	Spacer		1	
13		Lock Nut	YSF30-M30x1.5P	2	
14	7520062	Push Plate		1	
15		Cap Screw	M6x1Px16L	4	
16	8541120	Coupling		1	
17	1052040	X-Axis Ballscrew		1	
18	8520120	Motor Adaptor		1	
19		Cap Screw	M8x1.25Px50L	4	
20		Server Motor	BSM100C-3150	1	
21		Cap Screw	M12x1.75Px40L	4	
22	8521081	Bearing Housing		1	
23	Q-6206Z	Bearing	6206Z	1	
24	Q-7206BW	Bearing	7206BW	1	
25	MV13200080	Spacer		1	
26	MV13200110	Cover		1	
27		Cap Screw	M6x1Px12L	3	
28		Cap Screw	M8x1.25Px25L	5	

X-Axis Lubrication Assembly Parts

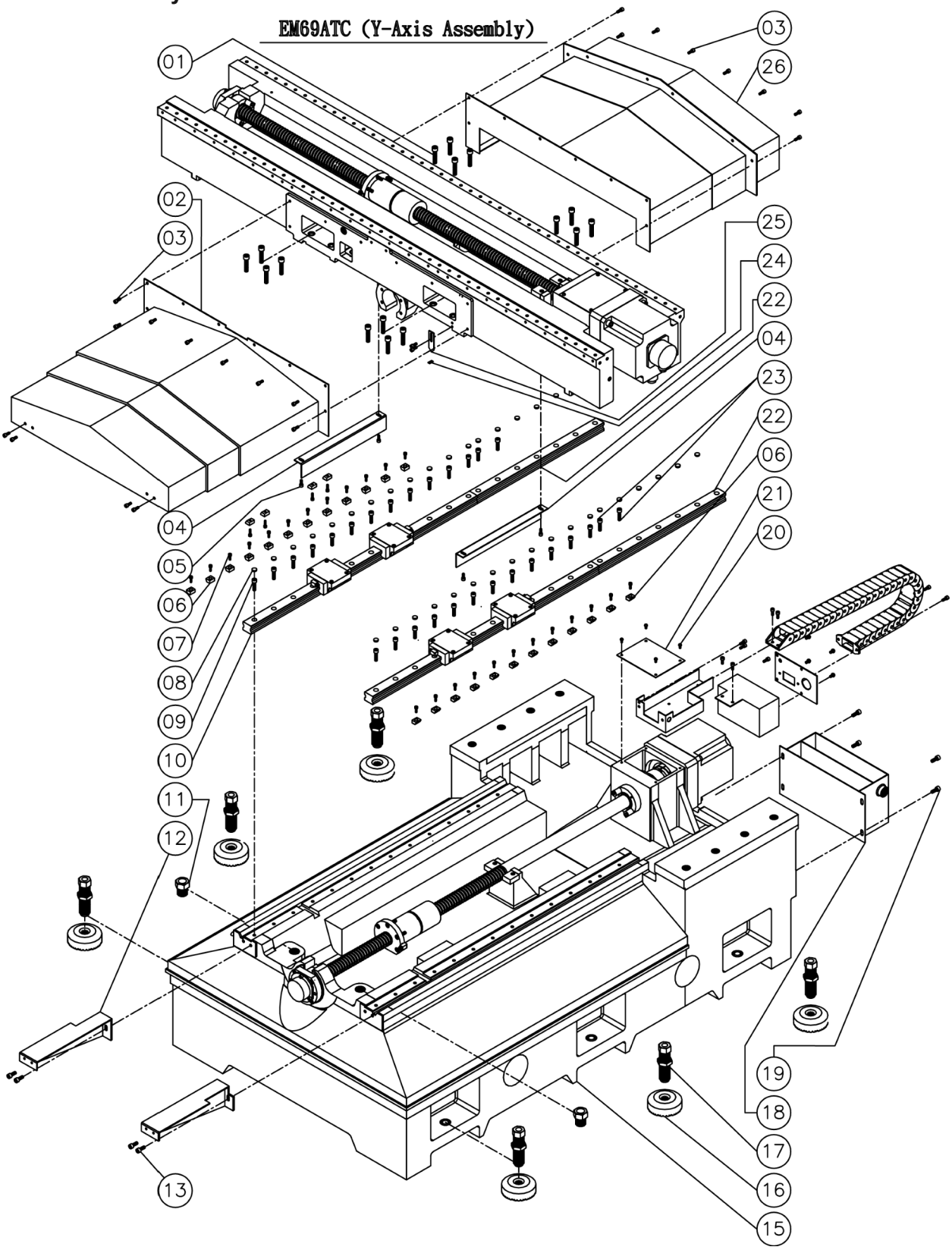


EM69ATC Part List

X-Axis Lubrication Assembly

	Part Number	Part Name	Specification	Qty	Remark
01		Nylon Pipe	⌀4x2400L	1	
02		Nylon Pipe	⌀4x280L	1	
03	EM-154-29	Volume Distributor		1	
04		Nylon Pipe	⌀4x480L	1	
05		Nylon Pipe	⌀4x940L	1	
06		Nylon Pipe	⌀4x315L	1	
07		Nylon Pipe	⌀4x250L	1	
08		Nylon Pipe	⌀4x460L	1	
09		Nylon Pipe	⌀4x930L	1	
10		Cap Screw	M6x1Px25L	2	
11		Pipe Clamps	⌀4	8	
12		Button Head Cap Screws	M5x0.8Px12L	8	
13	7530242	Cable Chain Bracket		1	
14	EM-154-17	3 Way Junction		1	
15		Cap Screw	M6x1Px25L	1	
16		Cap Screw	M6x1Px16L	3	
17	7530172	Cable Chain Bracket		1	
18		Cap Screw	M6x1Px16L	2	
19		Nylon Pipe	⌀4x2700L	1	
20	7530172-1	Plate		1	
21		Button Head Cap Screws	M6x1Px12L	4	
22	7530150	Cable Chain	SQ303-I-KR100-850L-No1	1	
23		Cap Screw	M6x1Px14L	4	

Y-Axis Assembly Parts

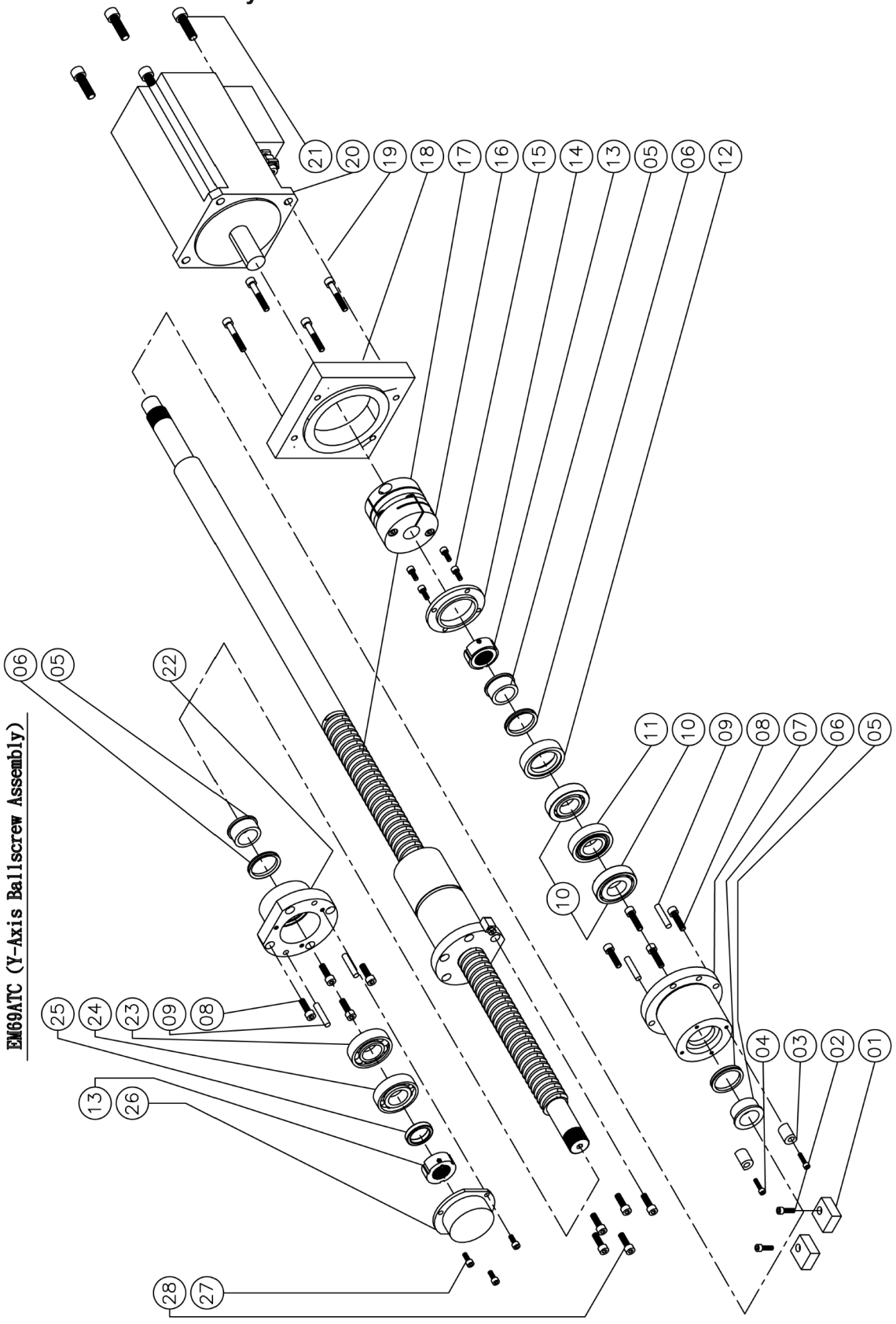


EM69ATC Part List

Y-Axis Assembly

	Part Number	Part Name	Specification	Qty	Remark
01		Cap Screw	M10x1.5Px45L	16	
02	7530112	Y Telescopic Covers(Front)		1	
03		Cap Screw	M6x1Px16L	16	
04	8520391	Cover		2	
05		Cap Screw	M6x1Px16L	4	
06		Tapper Gib	T1	46	
07		Cap Screw	M5x0.8Px16L	46	
08		Bolt Cap	C8	60	
09		Cap Screw	M8x1.25Px30L	24	
10	7531020	Linear guideway(Y)		2	
11		Hex Head Bolt	M30x3.5Px25L	2	
12	7530123	Telescopic Cover Bracket		1 set	
13		Cap Screw	M8x1.25Px20L	4	
14					
15	7531033	Base		1	
16	ECL-10600	Leveling pads		6	
17	7530280	Leveling bolts		6	
18	7530061	Oil/Water Separating Tank		1	
19		Cap Screw	M8x1.25Px20L	4	
20		Button Head Cap Screws	M5x0.8Px12L	4	
21	7520100	Plate		1	
22	7531180	Linear guideway		2	
23		Cap Screw	M8x1.25Px30L	4	
24	CE-0050	Origin		1	
25	7530221	Origin Indicator		1	
26	7530132	Y Telescopic Covers(Behind)		1	

Y-Axis Ballscrew Assembly Parts

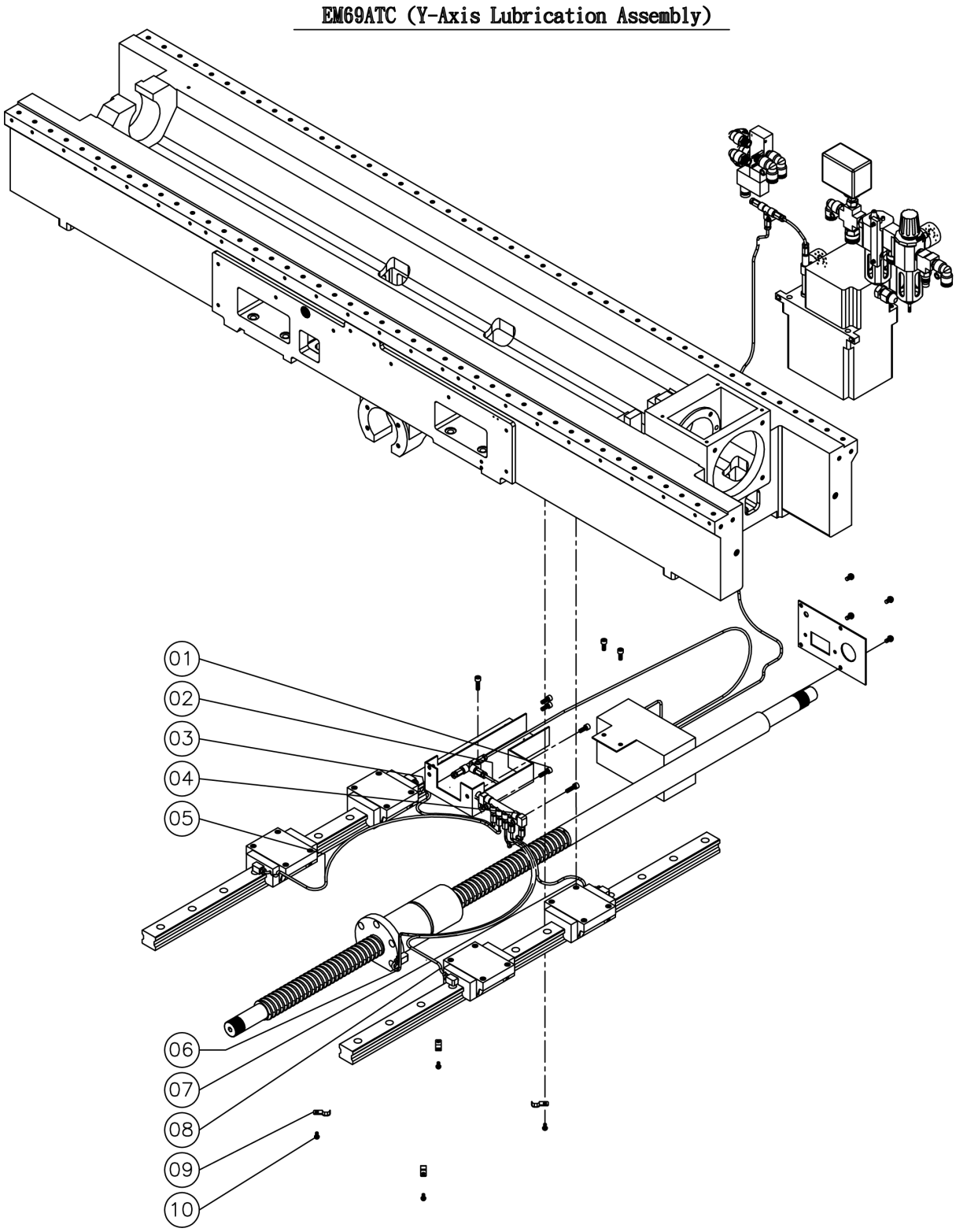


EM69ATC Part List

Y-Axis Ballscrew Assembly

	Part Number	Part Name	Specification	Qty	Remark
01	7530070	Bumper		2	
02		Cap Screw	M6x1Px20L	2	
03	7520171	Bumper		2	
04		Cap Screw	M5x0.8Px20L	2	
05	8521090	Spacer		3	
06		Oil Seal	V-40A	3	
07	7520032	Bearing Housing		1	
08		Cap Screw	M8x1.25Px30L	8	
09		Location Pin	⌀8x40L	4	
10	Q30TAC62C	Bearing	30TAC62C(DB)	2	
11	8521190	Spacer		1	
12	7520051	Spacer		1	
13		Lock Nut	YSF30-M30x1.5P	2	
14	7520062	Push Plate		1	
15		Cap Screw	M6x1Px16L	4	
16	8541120	Coulping		1	
17	7531040	Y-Axis Ballscrew		1	
18	8520120	Adaptor		1	
19		Cap Screw	M8x1.25Px50L	4	
20		Server Motro	BSM100C-3150	1	
21		Cap Screw	M12x1.75Px40L	4	
22	8521081	Bearing Housing		1	
23	Q-6206Z	Bearing	6206Z	1	
24	Q-7206BW	Bearing	7206BW	1	
25	MV13200080	Spacer		1	
26	MV13200110	Cover		1	
27		Cap Screw	M6x1Px12L	3	
28		Cap Screw	M8x1.25Px25L	5	

Y-Axis Lubrication Assembly Parts

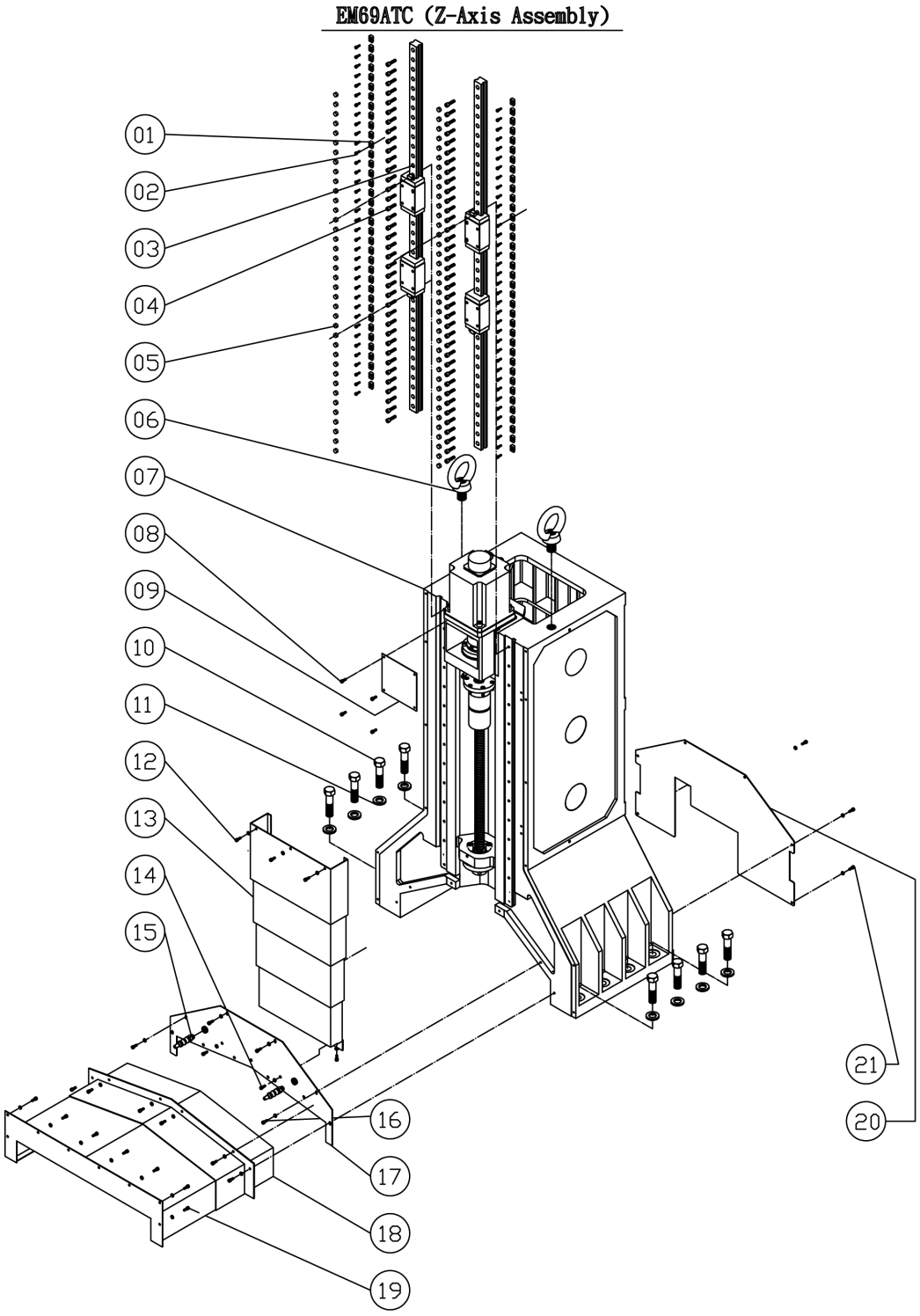


EM69ATC Part List

Y-Axis Lubrication Assembly

	Part Number	Part Name	Specification	Qty	Remark
01		Cap Screw	M6x1Px25L	2	
02		Nylon Pipe	⌀4x130L	1	
03		Nylon Pipe	⌀4x300L	1	
04	EM-154-16	Volume Distributor		1	
05		Nylon Pipe	⌀4x650L	1	
06		Nylon Pipe	⌀4x720L	1	
07		Nylon Pipe	⌀4x300L	1	
08		Nylon Pipe	⌀4x650L	1	
09		Pipe Clamps		4	
10		Button Head Cap Screws	M5x0.8Px12L	4	

Z-Axis Assembly Parts

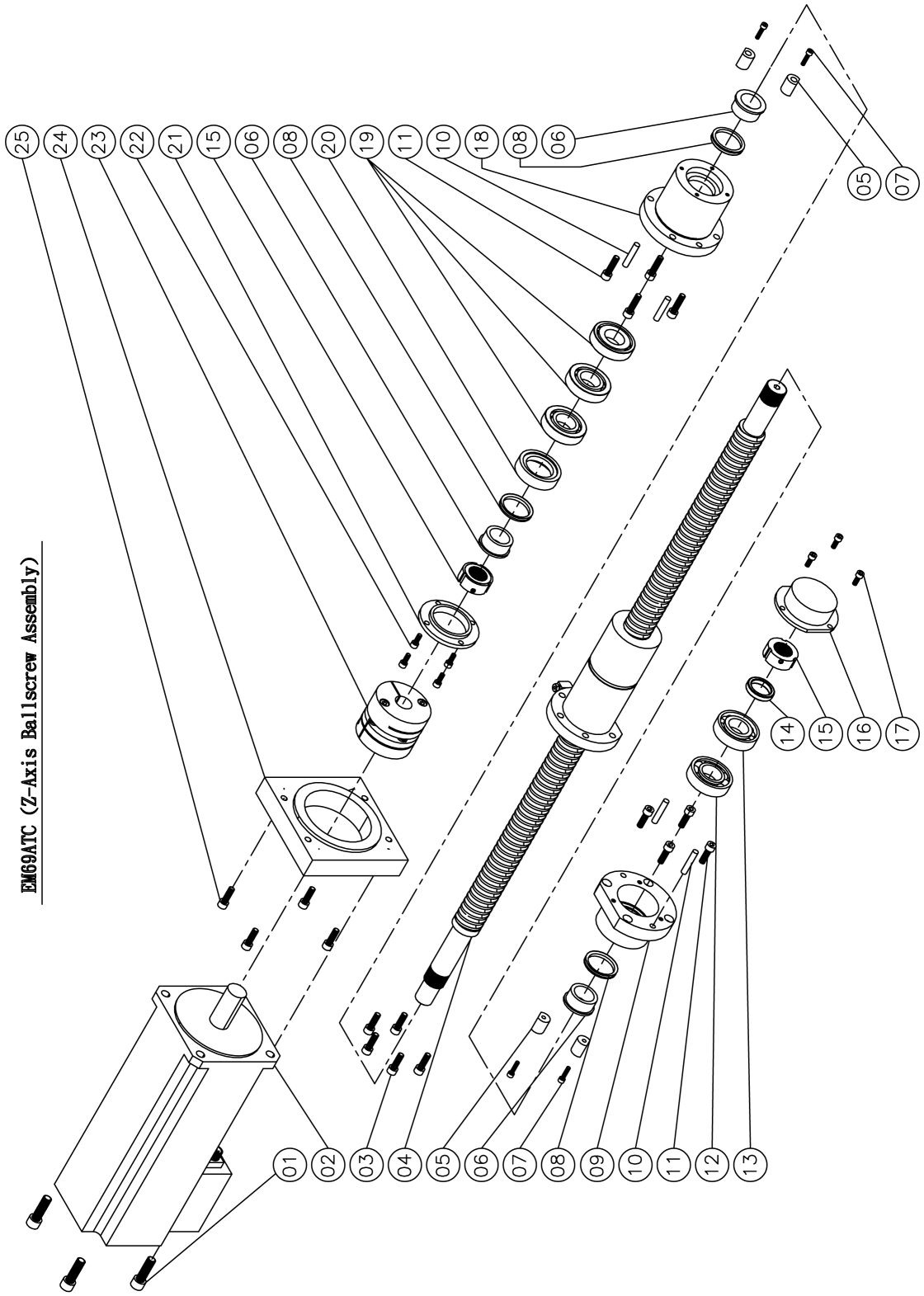


EM69ATC Part List

Z-Axis Assembly

	Part Number	Part Name	Specification	Qty	Remark
01		Tapper Gib	T1	74	
02		Cap Screw	M5x0.8Px16L	26	
03	8543020	Linear Guideway		2	
04		Cap Screw	M8x1.25Px30L	76	
05		Bolt Cap	C8	26	
06		Lifting Eye Bolt	M30x3.5P	2	
07	8543010	Column		1	
08		Cap Screw	M5x0.8Px16L	4	
09	7540070	Plate		1	
10		Hex Head Bolt	M24x3Px90L	8	
11	7540150	Washer		8	
12		Cap Screw	M6x1Px16L	5	
13	8543100	Z Telescopic Covers		1	
14		Cap Screw	M6x1.0Px16L	3	
15	7530290	Adjustable Hose		2	
16		Cap Screw	M6x1Px16L	4	
17	7540083	Cover		1	
18	7530132	Y Telescopic Covers(Behind)		1	
19		Cap Screw	M6x1Px16L	14	
20	7540200	Cover		1	
21		Cap Screw	M6x1Px16L	6	

Z-Axis Ballscrew Assembly Parts



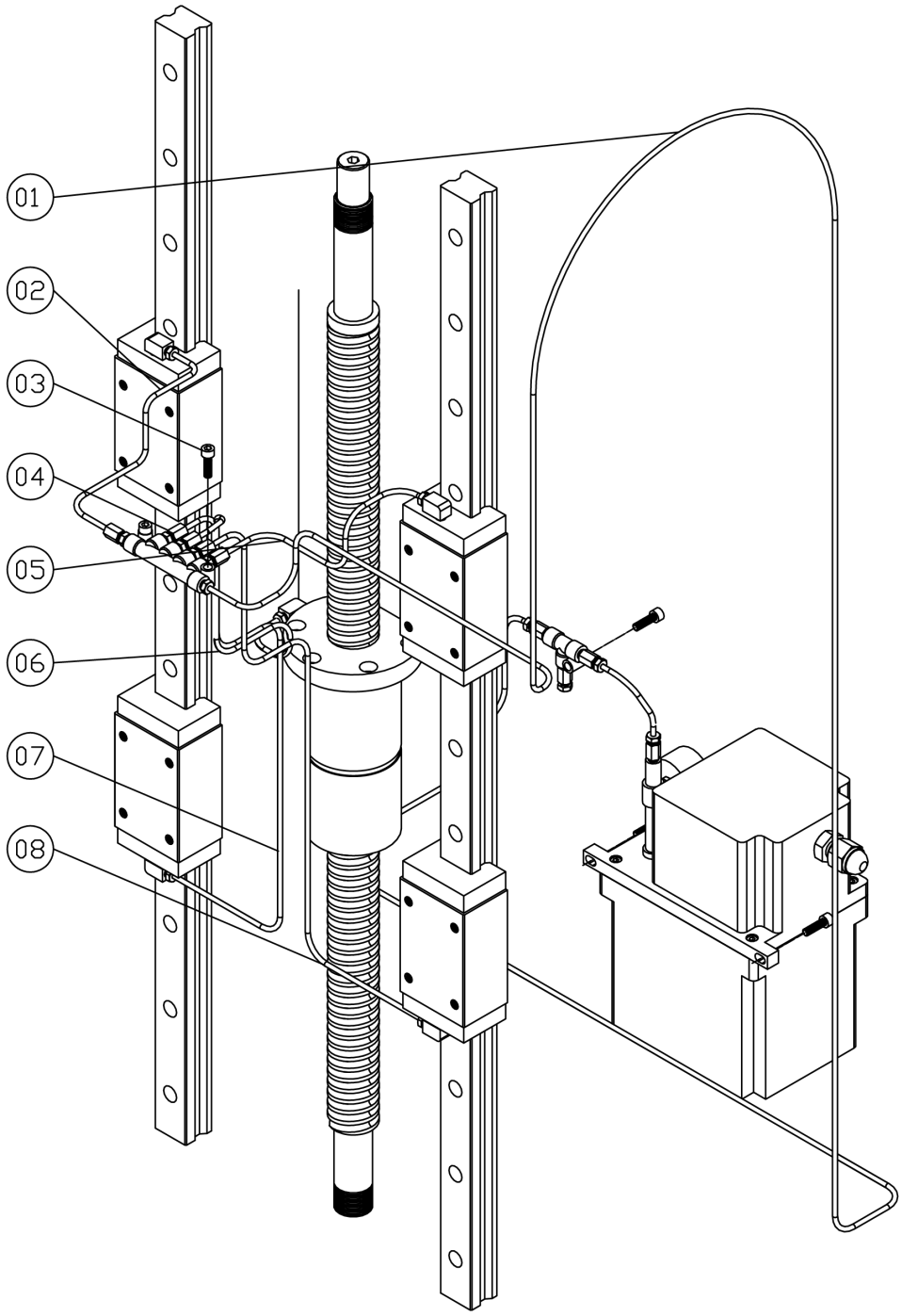
EM69ATC Part List

Z-Axis Ballscrew Assembly

	Part Number	Part Name	Specification	Qty	Remark
01		Cap Screw	M12x1.75Px40L	4	
02		Server Motor	BSM100C-4150-BB0	1	
03		Cap Screw	M8x1.25Px25L	5	
04	8543040	Z-Axis Ballscrew		1	
05	7520171	Bumper		4	
06	8521090	Spacer		3	
07		Cap Screw	M5x0.8Px20L	4	
08		Oil Seal	V-40A	3	
09	8521081	Bearing Housing		1	
10		Location Pin	⌀8x40L	4	
11		Cap Screw	M8x1.25Px30L	8	
12	Q-6206Z	Bearing	6206Z	1	
13	Q-7206BW	Bearing	7206BW	1	
14	MV13200080	Spacer		1	
15		Lock Nut	YSF30-M30x1.5P	2	
16	MV13200110	Cover		1	
17		Cap Screw	M6x1Px12L	3	
18	7520032	Bearing Housing		1	
19	Q-30TAC62C	Bearing	30TAC62C(DB)	3	
20	7520051	Spacer		1	
21	7520062	Push Plate		1	
22		Cap Screw	M6x1Px16L	4	
23	8541120	Coulping		1	
24	8540120	Motor Adaptor		1	

Z-Axis Lubrication Assembly Parts

EM69P (Z-Axis Lubrication Assembly)



EM69ATC Part List					
Z-Axis Lubrication Assembly					
	Part Number	Part Name	Specification	Qty	Remark
01		Nylon Pipe	⌀4x3800L	1	
02		Nylon Pipe	⌀4x270L	1	
03		Cap Screw	M6x1Px25L	2	
04	EM-154-15	Volume Distributor		1	
05		Nylon Pipe	⌀4x290L	1	
06		Nylon Pipe	⌀4x350L	1	
07		Nylon Pipe	⌀4x540L	1	
08		Nylon Pipe	⌀4x540L	1	

SDS

The Safety Data Sheets list shown in this section are the substances and materials that an operator is most likely to come in contact with while using this machine.

Other substances and materials are used in the manufacture, testing, and shipping of this machine. A complete list of the Safety Data Sheets of substances and materials used by Rottler Manufacturing during manufacturing, testing, and shipping is located on the Manual flash drive shipped with the machine. Safety Data Sheets are also located on the company web site: http://www.rottlermfg.com/documentation.php

1) Phillips 66 CP Oil

2) Dyna Cool K-2002

3) Mobil Vactra Oil #2

4) Valvoline High Performance Gear Oil

5) Valvoline Synpower Synthetic Oil

6) Molywhite #00 Grease

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910,1200)
Health Canada HPR (SOR/2015-17), and
Mexico NOM-018-STPS-2015

SECTION 1: Identification

Product Identifier:	**CP Oil**
Other means of identification:	Phillips 66 CP Oil 22 Phillips 66 CP Oil 32
Code:	LBPH817726
Relevant identified uses:	Industrial Oil
Uses advised against:	All others
24 Hour Emergency Phone Number:	CHEMTREC: 1-800-424-9300 CHEMTREC Mexico: 01-800-681-9531

Manufacturer/Supplier	**SDS Information**	**Customer Service**
Phillips 66 Lubricants	URL: www.phillips66.com/SDS	U.S.: 800-368-7128
P.O. Box 4428	Phone: 800-762-0942	International: 1-832-765-2500
Houston, TX 77210	Email: SDS@P66.com	**Technical Information**
		1-877-445-9198

SECTION 2: Hazard Identification

Classified Hazards	**Hazards Not Otherwise Classified (HNOC)**
No classified hazards	PHNOC: None known
	HHNOC: None known
Label Elements	
No classified hazards	

SECTION 3: Composition/Information on Ingredients

Chemical Name	**CASRN**	**Concentration**
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7	>95%

All 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.

Inhalation: 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.

Most important symptoms and effects, both acute and delayed: 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. Prolonged or repeated contact may dry skin and cause irritation.

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.

SECTION 5: Firefighting Measures

NFPA 704: National Fire Protection Association		
Health: 0 **Flammability:** 1 **Instability:** 00=minimal hazard		1=Slight Hazard
		2=Moderate Hazard
		3=Severe Hazard
		4=Extreme Hazard

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.

Specific Hazards arising from the chemical:

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.

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.

Special protective actions for firefighters: 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 the hazard area and deny entry to unnecessary and unprotected personnel. 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.

See Section 9 for Flammability Properties including flash point and flammable (explosive) limits.

SECTION 6: Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures: 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 downwind 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 and contain 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 and material for containment and cleaning 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). Spills will produce very slippery surfaces. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29 CFR 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 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.

“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.

SECTION 8: Exposure Controls/Personal Protection

Occupational exposure limits
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time the other constituents have no known exposure limits.

Chemical Name	ACGIH	OSHA	Mexico	Phillips 66
Distillates, petroleum, hydrotreated heavy paraffinic	TWA: 5mg/m^3 STEL: 10 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 you local agencies, for further information.

Biological Occupational Exposure Limits
Note: This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies

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 rubber.

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% 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.

SECTION 9: Physical and Chemical Properties

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

Appearance:	Amber, Transparent	**Flash Point:**	> 302°F (150°C)
Physical Form:	Liquid	**Test Method:**	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Odor:	Petroleum	**Initial Boiling Point/Range:**	No Data
Odor Threshold:	No Data	**Vapor Pressure:**	< 1mmHg
pH:	Not applicable	**Partition Coefficient (n-octanol/water)(Kow):**	No Data
Vapor Density (1=air):	>1	**Melting/Freezing Point:**	< -11°F (-24°C)
Upper Explosive Limits (vol % in air):	No Data	**Auto-ignition Temperature:**	No Data
Lower Explosive Limits (vol % in air):	No Data	**Decomposition Temperature:**	No Data
Evaporation Rate (nBuAc=1):	No Data	**Specific Gravity (water=1):**	0.86 @ 60°F (15.6°C)
Particle Size:	Not applicable	**Bulk Density:**	7.1-7.2 lbs/gal
Percent Volatile:	No Data	**Viscosity:**	4.0-6 cSt @ 100°C; 20.5-35 cSt @ 40°C
Flammability (solid, gas):	Not applicable	**Pour Point:**	< -11°F (-24°C)
Solubility in Water:	Negligible		

SECTION 10: Stability and Reactivity

Reactivity: Not chemically reactive.

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

Possibility of Hazardous Reactions: Hazardous reactions not anticipated.

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

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

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

SECTION 11: Toxicological Information

Information on Toxicological Effects

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Unlikely to be harmful		>5 mg/L (mist, estimated)
Dermal	Unlikely to be harmful		>2 g/kg (estimated)
Oral	Unlikely to be harmful		>5 g/kg (estimated)

Likely Routes of Exposure: Inhalation, eye contact, skin contact

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

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): Not expected to cause organ effects from single exposure

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure

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

Distillates, petroleum, hydrotreated heavy paraffinic
Carcinogenicity: This oil has been highly refined by a variety of process to reduce aromatics and improve performance characteristics. It meets the IP-346 criteria of less than 3 percent PAH's and is not considered a carcinogen by the International Agency for Research on Cancer.

SECTION 12: Ecological Information

GHS Classification: No classified hazards

Toxicity: All acute aquatic toxicity studies on samples of lubricant base oils show acute toxicity values greater than 100 mg/L for invertebrates, algae, and fish. These tests were carried out on water accommodated fractions and the results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

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.

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material are greater than 5.3, and therefore 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. In water, base oils will float and spread over the surface at a rate dependent on viscosity. There will be significant removal of hydrocarbons from the water by sediment absorption. In soil and sediment, hydrocarbon components will show low mobility with absorption to sediments being the predominant physical process. The main process is expected to be slow biodegradation of the hydrocarbon constituents in soil and sediment.

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 SDS 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)

UN Number:	Not regulated
UN Proper Shipping Name:	None
Transport Hazard Class(es):	None
Packing Group:	None
Environmental Hazards:	This product does not meet the DOT/UN/IMDG/IMO criteria of a marine pollutant
Special Precautions for User:	If shipped by land in a packaging having capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply (contains oil).

Transport in Bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 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)
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

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 know to the State of California to cause cancer, birth defects, or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

International 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.

SECTION 16: Other Information

Issue Date:	Previous Issue Date:	SDS Number	Status:
17-Apr-2018	23-Jun-2016	LBPH817726	FINAL

Revised Sections or Basis for Revision:
Exposure limits (Section 8); Regulatory information (Section 15)

Legend (pursuant to NOM-018-STPS-2015):
The information within is considered correct but is not exhaustive and will be used for guidance only, which is based on the current knowledge of the substance or mixture and is applicable to the appropriate safety precautions for the product.

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; HPR = Hazardous Products Regulations; 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 Safety Data Sheet is based on data believed to be accurate as of the date this 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.

SAFETY DATA SHEET

Section 1 – Chemical Product and Company Identification

Product/Chemical Name: DYNA COOL K-2002
Chemical Formula: 5428
General Use: CUTTING FLUID
Manufacturer: DYNA TECH CHEMICAL CORPORATION
P.O. BOX 71
PEWAUKEE, WI 53072
Phone: 262-646-7600
Emergency: 800-535-5053

Section 2 – Composition / Information on Ingredients

Ingredient Name	CAS No.	%wt *or* % vol
Mineral Oil	Proprietary	< 20%
Triethanolamine	102-71-6	< 10%

Trace Impurities:

Ingredient	OSHA PEL	ACGIH TLV	NIOSH REL
Mineral Oil	5 mg/m3 (As mist)	5 mg/m3 (As mist)	
Triethanolamine	5 mg/m3	5 mg/m3	

Toxicity Data:
No information available

Section 3 – Physical and Chemical Properties

Physical State:	Liquid	**Water Solubility:**	Emulsifies
Appearance and Odor:	Clear blue color, characteristic	**Boiling Point:**	212°F
Vapor Pressure:	N/A	**Vapor Density (Air=1):**	N/A
Specific Gravity (H_2O=1, at 4°C):	1.020	**Evaporation Rate:**	N/A
pH:	N/A		

Section 4 – Firefighting Measures

Flash Point:	None
Flash Point Method:	N/A
LEL:	None
UEL:	None
Flammability Classification:	None
Extinguishing Media:	Water fog, Dry chemical, Foam, and CO2
Unusual Fire or Explosion Hazard:	None known
Firefighting Instruction:	Do not release runoff from fire control methods to sewers or waterways
Firefighting Equipment:	Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 5 – Stability and Reactivity

Stability:	DYNA COOL K-2002 is stable at room temperature in closed containers under normal storage and handling conditions.
Polymerization:	Hazardous polymerization cannot occur.
Chemical Incompatibilities:	Strong oxidizing agents.
Conditions to Avoid:	Avoid contact with incompatible materials and expose to extreme temperatures.
Hazardous Decomposition Products:	Thermal oxidative decomposition of DYNA COOL K-2002 can produce oxides of Carbon, traces of Formaldehyde, Ammonia, and Oxides of Nitrogen

Section 6 – Health Hazard Information

Potential Health Hazards

Primary Entry Routes: Inhalation – Skin contact – Eye – Ingestion

Acute Effects

Inhalation: Low volatility, is not expected to cause irritation while used under normal conditions, exposure to high mist levels in poorly ventilated areas may irritate the upper respiratory tract with symptoms of itching eyes and nasal passages.

Eye: Mild irritation and redness may result upon direct contact or when exposed to high mist levels in poorly ventilated areas.

Skin: Skin contact may result in slight temporary irritation.

Ingestion: This product is not expected to cause irritation while used under normal conditions.

Carcinogenicity: IARC, NTP, and OSHA do not list DYNA COOL K-2002 as a carcinogen.

Medical Conditions Aggravated by Long-Term Exposure: None

Chronic Effects: None

Emergency and First Aid Procedures

Inhalation: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen, call a physician.

Eye Contact: Immediately flush eye with plenty of water for at least 15 minutes. Hold eyelids open during this flushing with water. Call a physician immediately.

Skin Contact: Flush area with water while removing contaminated clothes and shoes. Follow by washing with soap and water. Do not reuse clothing or shoes until cleaned. If irritation persists, get medical attention. Do not apply oils or ointments, unless ordered by physician.

Ingestion: If conscious, drink a quart of water. Do not induce vomiting. Call a physician immediately. If unconscious or if in convulsions, take immediately to a hospital or physician. Never induce vomiting or give anything by mouth to an unconscious victim. After dilution with water, fruit juice may be administrated to accomplish neutralization. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect. Get medical attention.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: None

Special Precautions/Procedures: None

Section 7 – Spill, Leak, and Disposal Procedures

Spill/Leak Procedures: Evacuate unprotected personnel from area. Maintain adequate ventilation. Use proper safety equipment. Sweep up material into containers and dispose of properly. Avoid direct discharge to sewers and surface waters. Notify authorities if entry occurs.

Spills

Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120)

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, State, and Local regulations.

Disposal Regulatory Requirements: Observe all Local, State, and Federal regulations.

Container Cleaning and Disposal: Observe all Local, State, and Federal regulations. Dispose of at approved waste treatment facility. If approved, neutralize material and flush to sewer. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, flame, sparks, or other sources of ignition.

Ecological Information: N/A

EPA Regulation: N/A

This information may be subject to the provision reporting requirements of Section 313 of the Superfund Amendment and Reauthorization Act of 1986 (SARA). All sections – CERCLA, RCRA, and OSHA.

Section 8 – Exposure Controls / Personal Protection

Engineering Controls:

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls:

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910-134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work area. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 – Special Precautions and Comments

Handling Precautions: Wear chemical safety goggles or face shield with safety goggles, and protective clothing. Use self-contained breathing apparatus if necessary. Do not use in poorly ventilated or confined spaces. When making solutions, heat may be generated. Add slowly to surfaces of solution while stirring to avoid splattering. Never use pressure to empty containers. Empty containers. Empty containers may contain explosive vapors or dangerous residues. Do not cut, puncture, or weld on or near container. All labelled hazardous precautions must be observed. Do not reuse empty container without commercial cleaning or reconditioning.

Storage Requirements: Store in cool, well-ventilated area away from heat and out of direct sunlight. Do not store open, unlabeled, mislabeled, or empty containers. Keep containers tightly closed. Store away from incompatible materials. Do not eat, drink, or smoke in work area.

DOT Transportation Data (49 CFR 172.101)

Shipping Name: Not DOT hazardous as packaged
Hazard Class: None
Packaging Group: III
Label: None

Prepared By: SLW
Revision Notes: None

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL VACTRA OIL NO. 2**
Product Description: Base Oil and Additives
Product Code: 201560901015, 600494-85
Intended Use: Lubricant

COMPANY IDENTIFICATION

Supplier: **East Coast Lubes Pty Ltd (Queensland and Northern Territory)**
A.B.N. 37 117 203 611
Cnr North and Mort Streets
Toowoomba, Queensland 4350, Australia

24 Hour Emergency Telephone 1300 131 001
Supplier General Contact 1800 069 019

Supplier: **Southern Cross Lubes (Victoria and Tasmania, New South Wales and Australian Capital Territory)**
58-66 Ajax Road
Altona, Victoria 3018, Australia

24 Hour Emergency Telephone 1300 131 001
Product Technical Information 1300 466 245
Supplier General Contact 1300 552 861

Supplier: **Perkal Pty Ltd Trading as Statewide Oil (Western Australia)**
A.B.N. 43 009 283 363
14 Beete Street
Welshpool, Western Australia 6106 Australia

24 Hour Emergency Telephone (8:00am to 4:30pm Mon to Fri) 1300 919 904
Product Technical Information (08) 9350 6777
Supplier General Contact (08) 9350 6777

Supplier: **Perkal Pty Ltd Trading as Statewide Oil (South Australia)**
A.B.N. 43 009 283 363
6-10 Streiff Rd
Wingfield, South Australia 5013 Australia
24 Hour Emergency Telephone (8:00am to 4:30pm Mon to Fri) 1300 919 904
Product Technical Information (08) 8359 8995
Supplier General Contact (08) 8359 8995

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Contains: PHOSPHORIC ACID ESTERS, AMINE SALT May produce an allergic reaction.

Other Hazard Information:

Physical / Chemical Hazards:
No significant hazards.

Health Hazards:
High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

Environmental Hazards:
No significant hazards.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration	GHS Hazard Codes
2.6-DI-BUTYL-P-CRESOL	128-37-0	0.1 - < 1%	H400 (M factor 1) H410 (M factor 1)
PHOSPHORIC ACID ESTERS, AMINE SALT	Confidential	0.1 - < 1%	H227, H302, H317, H318, H401, H411

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Other ingredients determined not to be hazardous up to 100%.

SECTION 4 FIRST AID MEASURES

INHALATION
Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT
Wash contact areas with soap and water. 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 a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT
Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION
First aid is normally not required. Seek medical attention if discomfort occurs.

NOTE TO PHYSICIAN
None

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulphur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >205°C (401°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for firefighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.
Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The type of container used to store the material may affect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

Material is defined under the National Standard [NOHSC:1015] Storage and Handling of Workplace Dangerous Goods.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard			Note	Source
2,6-DI-TERT-BUTYL-P-CRESOL		TWA	10 mg/m^3			Australia OELs
2,6-DI-TERT-BUTYL-P-CRESOL	Inhalable fraction and vapour	TWA	2 mg/m^3			ACGIH

Exposure limits/standards for materials that can be formed when handling this product:

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

Biological limits

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Particulate

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Nitrile, Viton

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State:	Liquid
Colour:	Amber
Odour:	Characteristic
Odour Threshold:	N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C):	0.883
Flammability (Solid, Gas):	N/A
Flash Point [Method]:	>205°C (401°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air):	LEL: 0.9 UEL: 7.0
Autoignition Temperature:	N/D
Boiling Point / Range:	> 316°C (600°F)
Decomposition Temperature:	N/D
Vapour Density (Air = 1):	> 2 at 101 kPa
Vapour Pressure:	< 0.013 kPa (0.1 mm Hg) at 20 ºC
Evaporation Rate (n-butyl acetate = 1):	N/D
pH:	N/A
Log Pow (n-Octanol/Water Partition Coefficient):	> 3.5
Solubility in Water:	Negligible
Viscosity:	68 cSt (68 mm2/sec) at 40 ºC | 8.6 cSt (8.6 mm2/sec) at 100°C
Oxidizing Properties:	See Hazards Identification Section.

OTHER INFORMATION

Freezing Point:	N/D
Melting Point:	N/A
Pour Point:	-6°C (21°F)
DMSO Extract (mineral oil only), IP-346:	< 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

INCOMPATIBLE MATERIALS: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material	Minimally Toxic. Based on assessment of the components
Irritation: No end point data for material	Negligible hazard at ambient/normal handling temperatures
Ingestion	
Acute Toxicity: No end point data for material	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material	Minimally Toxic. Based on assessment of the components
Skin Corrosion/Irritation: No end point data for material	Negligible irritation to skin at ambient temperatures. Based on assessment of the components
Eye	
Serious Eye Damage/Irritation: No end point data for material	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physicochemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

For the product itself:

Component concentrations in this formulation would not be expected to cause skin sensitization, based on tests of the components, this formulation, or similar formulations.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

IARC Classification:
The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--
1 = IARC 1 2 = IARC 2A 3 = IARC 2B

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

This material is not considered hazardous according to Australia Model Work Health and Safety Regulations.

Product is not regulated according to Australian Dangerous Goods Code.

No Poison Schedule number allocated by the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the Therapeutic Goods Act.

AS1940 COMBUSTIBLE CLASS: C2

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AICS, DSL, ENCS, IECSC, KECI, PICCS, TCSI, TSCA

SECTION 16 OTHER INFORMATION

KEY TO ABBREVIATIONS AND ACRONYMS:
N/D = Not determined, N/A = Not applicable, STEL = Short-Term Exposure Limit, TWA = Time-Weighted Average
KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H227: Combustible liquid; Flammable Liquid, Cat 4
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H317: May cause allergic skin reaction; Skin Sensitization, Cat 1
H318: Causes serious eye damage; Serious Eye Damage/Irr, Cat 1
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Southern Cross Lubes (Victoria and Tasmania): Section 01: Supplier Mailing Address information was deleted.
Southern Cross Lubes (Victoria and Tasmania, New South Wales and Australian Capital Territory): Section 01: Supplier Mailing Address information was added.
Section 11 Acute Toxicity data - Header information was deleted.
Section 11 Substance Name - Header information was deleted.
Section 11 Substance Toxicity table - Header information was deleted.
Section 11 Substance Toxicology table information was deleted.
Section 12: information was modified.

DGN: 7053124DAU (1014681)

Prepared by: Exxon Mobil Corporation
EMBSI, Clinton NJ USA

Contact Point: See Section 1 for Local Contact number

End of (M)SDS

SAFETY DATA SHEET

Valvoline™ High Performance SAE 80W-90 Gear Oil

VV838

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Trade Name: Valvoline™ High Performance SAE 80W-90 Gear Oil

Relevant identified uses of the substance or mixture and uses advised against

Details of the Supplier and the safety data sheet

Valvoline LLC
3499 Blazer Parkway
Lexington, KY 40509
United States of America (USA)
1-800-TEAMVAL

Emergency Telephone Number

1-800-VALVOLINE

Regulatory Information Number

1-800-TEAMVAL

Product Information

1-800-TEAMVAL

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification

Skin sensitization: Class 1

GHS Label Elements

Hazard Pictograms:	
Signal Word:	Warning
Hazard Statements:	May cause an allergic skin reaction.
Precautionary Statements:	**Prevention:** Avoid breathing dust/fume/gas/mist/vapors/spray. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves. **Response:** IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. **Disposal:** Dispose of contents/container to an approved waste disposal plant.

Other Hazards

None known.

SECTION 3: COMPOSITION ON INGREDIENTS

Substance/Mixture: Mixture

Chemical Nature: Defatter

Hazardous Components:

Chemical Name	CAS-No.	Classification	Concentration (%)
RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED	64742-62-67	This material is not considered hazardous under the OSHA Hazard Communication Standard (HazCom 2012)	21.105
DISTALLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	Asp. Tox. 1; H304	1.393
AMINES, C12-14-TERT-ALKYL	68955-53-3	Flam. Liq. 4; H227 Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 3; H311 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1A; H317	0.343

SECTION 4: FIRST AID MEASURES

General Advice:	Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled:	If breathed in, move person into fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact:	Remove contaminated clothing. If irritation develops, get medical attention. If on skin, rinse well with water. First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water. Wash contaminated clothing before reuse.
In case of eye contact:	Flush eyes with water as precaution. Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.
If swallowed:	Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed:	Acute aspiration 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. Repeated aspiration of small quantities of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Signs and symptoms of expose to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach, or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), Headache, Dizziness. May cause an allergic skin reaction.
Notes to physician:	No hazards which require special first aid measures

SECTION 5: FIREFIGHTING MEASURES

Suitable extinguishing media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water Spray Foam Carbon Dioxide (CO2) Dry Chemical
Unsuitable extinguishing media:	High volume water jet
Specific hazards during firefighting:	Do not allow run-off from firefighting to enter drains or water courses.
Specific extinguishing methods:	Product is compatible with standard firefighting agents.
Further information:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures:	Use personal protective equipment Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Environmental precautions:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains, inform respective authorities.
Methods and materials for containment and cleaning up:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust. Keep in suitable, closed containers for disposal.
Other information:	Comply with all applicable federal, state, and local regulations.

SECTION 7: HANDLING AND STORAGE

Advice on safe handling:	Do not breathe vapors/dust. Do not smoke. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Container hazardous when empty. Avoid exposure – obtain special instructions before use. Avoid contact with skin and eyes. Smoking, eating, and drinking should be prohibited in the application area. For personal protection, see Section 8. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage:	Keep container tightly closed in dry, well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Chemical Name	CAS-No.	Value type (Form of exposure)	Control Parameters / Permissible concentration	Basis
DISTALLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	TWA	5 mg/m3 Mist	OSHA Z-1
		TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
		TWA	5 mg/m3 Mist	OSHA P0
		TWA	5 mg/m3 Mist	NIOSH REL
		ST	10mg/m3 Mist	NIOSH REL
		PEL	5 mg/m3 Particulate	CAL PEL

Hazardous components without workplace control parameters

Chemical Name	CAS-No.
AMINES, C12-14-TERT-ALKYL	68955-53-3

Engineering Measures: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected, or apparent adverse effects.

Personal protective equipment

Respiratory protection:	Respiratory protection is not required under normal conditions of use.
Hand protection remarks:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection:	Not required under normal conditions of use. Wear splash-proof safety goggles if material could be misted or splashed into eyes.
Skin and body protection:	Wear as appropriate: Impervious clothing Safety shoes Choose body protection according to the amount and concentration of the dangerous substance at the workplace. Discard gloves that show tears, pinholes, or signs of wear. Wear resistant gloves (consult your safety equipment supplier).
Hygiene measures:	Wash hands before breaks and at the end of workday.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Colour:	Amber
Odour:	No data available
Odour Threshold:	No data available
pH:	No data available
Melting point/Freezing point:	No data available
Boiling point/Boiling range:	>424.9°F / 218.3°C (1013.33hPa)
Flash point:	>222°C Method: Cleveland open cup
Evaporation rate:	>1 Ethyl Ether
Flammability (solid, gas):	No data available
Upper explosion limit:	No data available
Lower explosion limit:	No data available
Vapor pressure:	<0.1000000 mmHg
Relative vapor density:	>1AIR=1
Relative density:	0.89 (60.00°F)
Density:	0.8916 g/cm3 (15.56°C)
Solubility(ies)	
Water solubility:	No data available
Solubility in other solvents:	No data available
Partition coefficient, n-octanol/water:	No data available
Thermal decomposition:	No data available
Viscosity	
Viscosity, dynamic:	No data available
Viscosity, kinematic:	146 mm2/s (40°C)
Oxidizing properties:	No data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No decomposition if stored and applied as directed.
Chemical Stability:	Stable under recommended storage conditions.
Possibility of hazardous reactions:	Product will not undergo hazardous polymerization.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Aldehydes Carbon Dioxide and Carbon Monoxide Carbon Monoxide

SECTION 11: TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:	Inhalation Skin contact Eye contact Ingestion

Acute toxicity
Not classified based on available information

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Acute oral toxicity:	LD50 (Rat): >5,000 mg/kg
Acute inhalation toxicity:	LC50 (Rat): >5.58 mg/L Exposure time: 4 h Test atmosphere: dust/mist Assessment: Not classified as acutely toxic by inhalation under GHS Remarks: No mortality observed at this dose.
Acute dermal toxicity:	LD50 (Rabbit): >5,000 mg/kg Remarks: No mortality observed at this dose. LD50 (Rabbit): >2,000 mg/kg Assessment: Not classified as acutely toxic by dermal absorption under GHS.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:	
Acute oral toxicity:	LD50 (Rat): >5,000 mg/kg
Acute dermal toxicity:	LD50 (Rabbit): >3,160 mg/kg Assessment: No adverse effect has been observed in acute dermal toxicity tests.
AMINES, C12-14-TERT-ALKYL:	
Acute oral toxicity:	LD50 (Rat): 612 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity:	LC50 (Rat, female): 1.19 mg/L Exposure time: 4 h Test atmosphere: vapor Method: OECD Test Guideline 403
Acute dermal toxicity:	LD50 (Rat): 251 mg/kg Method: OECD Test Guideline 402

Skin corrosion/irritation
Not classified based on available information

Product:
Remarks: May cause skin irritation in susceptible persons

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Species:	Rabbit
Result:	No skin irritation
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:	
Result:	Slight, transient irritation
AMINES, C12-14-TERT-ALKYL:	
Species:	Rabbit
Result:	Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation
Not classified based on available information.

Product:
Remarks: Vapors may cause irritation to the eyes, respiratory system and the skin.
Remarks: Unlikely to cause eye irritation or injury.

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Species:	Rabbit
Result:	No eye irritation
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:	
Result:	Slight, transient irritation
AMINES, C12-14-TERT-ALKYL:	
Species:	Rabbit
Result:	Corrosive

Respiratory or skin sensitization

Skin sensitization: May cause an allergic skin reaction.
Respiratory sensitization: Not classified based on available information.

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Test Type:	Buehler Test
Species:	Guinea pig
Assessment:	Does not cause skin sensitization
AMINES, C12-14-TERT-ALKYL:	
Test Type:	Buehler Test
Species:	Guinea pig
Assessment:	The product is a skin sensitizer, sub-category 1A

Germ Cell Mutagenicity

Not classified based on available information.

Components:

AMINES, C12-14-TERT-ALKYL:	
Genotoxicity in vitro:	Test type: Ames test Test species: Salmonella typhimurium Metabolic activation: with and without metabolic activation Result: negative
Genotoxicity in vivo:	Test type: Micronucleus test Test species: Mouse Cell type: Bone marrow Method: OECD Test Guideline 474 Result: negative

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT – Single Exposure

Not classified based on available information.

STOT – Repeated Exposure

Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

Product:
No aspiration toxicity classification.

Components:
RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:
No aspiration toxicity classification

DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:
May be fatal if swallowed and enters airways.

Further Information

Product:
Remarks: No data available.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Product:
Ecotoxicology Assessment

Acute aquatic toxicity:	Acute aquatic toxicity Category 3; Harmful to aquatic life.
Chronic aquatic toxicity:	Chronic aquatic toxicity Category 3; Harmful to aquatic life with long lasting effects.

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Toxicity to Fish:	LL50 (Pimephales promelas (fathead minnow)): >100mg/L Exposure time: 96 h Test type: static test Test substance: WAF Method: OECD Test Guideline 203 Remarks: No toxicity at the limit of solubility
Toxicity to daphnia and other aquatic invertebrates:	EL50 (Daphnia magna (water flea)):>10,000 mg/L Exposure time: 48 h Test type: static test Test substance: WAF Method: OECD Test Guideline 202
Toxicity to algae:	NOEL (Pseudokirchneriella subcapitata (green algae)): >=100 mg/L End point: Growth inhibition Exposure time: 72 h Test type: static test Test substance: WAF Method: OECD Test Gudieline 201

Toxicity to fish (Chronic toxiticy):	NOELR (Oncorhynchus mykiss (rainbow trout)): Calculated >=1,000 mg/L Exposure time: 14 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	NOEL (Daphnia (water flea)): 10 mg/L Exposure time: 21 d Test substance: WAF Method: OECD Test Guideline 211
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:	
Toxicity to Fish:	LC50 (Oncorhynchus mykiss (rainbow trout)): 2-5 mg/L Exposure time: 96 h Test type: semi-static test Test substance: WAF Method: OECD Test Guideline 203 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates:	EL50 (Daphnia magna (water flea)): 1.4 mg/L Exposure time: 48 h Test type: static test Test substance: WAF Method: OECD Test Guideline 202 Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae:	EL50 (Pseudokirchneriella subcapitata (green algae)): >1-3 mg/L Exposure time: 72 h Test type: static test Test substance: WAF Method: OECD Test Guideline 201 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	NOEL (Daphnia magna (water flea)): 0.48 mg/L Exposure time: 21 d Test type: semi-static test Test substance: WAF Method: OECD Test Guideline 211 Remarks: Information given is based on data obtained from similar substances.
AMINES, C12-14-TERT-ALKYL:	
Toxicity to Fish:	LC50 (Oncorhynchus mykiss (rainbow trout)): 1.3 mg/L Exposure time: 96 h Test type: static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates:	EC50 (Daphnia magna (water flea)): 2.5 mg/L Exposure time: 48 h Test type: static test

Toxicity to algae:	Er50 (Pseudokirchneriella subcapitata (green algae)): 0.44 mg/L End point: growth inhibition Exposure time: 72 h Test type: static test Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 0.05 mg/L End point: growth inhibition Exposure time: 72 h Test type: static test Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity):	1
Toxicity to fish (chronic toxicity):	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.078 mg/L Exposure time: 96 d Test type: flow-through test Method: OECD Test Guideline 210
M-Factor (Chronic aquatic toxicity):	1

Persistence and Degradability

Components:

RESIDUAL OILS (PETROLEUM), SOLVENT-DEWAXED:	
Biodegradability:	Result: Not readily biodegradable Biodegradation: 2-4% Exposure time: 28 d Method: OECD Test Guideline 301B
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT:	
Biodegradability:	Result: Inherently biodegradable Biodegradation: 58.6% Exposure time: 28 d Method: OECD Test Guideline 301F Remarks: Expected to be biodegradable
AMINES, C12-14-TERT-ALKYL:	
Biodegradability:	Result: Not readily biodegradable. Biodegradation: 22% Exposure time: 28 d Method: OECD Test Guideline 301D

Bio-accumulative Potential

Components:

AMINES, C12-14-TERT-ALKYL:	
Partition coefficient: n-octanol/water	Log Pow: 2.9

Mobility in Soil

Components:
No data available.

Other adverse effets
No data available.

Product:

Additional ecological information:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods

General advice:	The product should not be allowed to enter drains, water courses, or the soil. Do not contaminate ponds, waterways, or ditches with chemical or used container. Send to a licensed waste management company. Dispose of in accordance with all applicable local, state, and federal regulations.
Contaminated packaging:	Empty remaining contents. Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14: TRANSPORT INFORMATION

International Transport Regulations

U.S. DOT – ROAD	Not dangerous goods
CFR_RAIL_C	Not dangerous goods
U.S. DOT – INLAND WATERWAYS	Not dangerous goods
TDG_ROAD_C	Not dangerous goods
TDG_RAIL_C	Not dangerous goods
TDG_INWT_C	Not dangerous goods
INTERNATIONAL MARITIME DANGEROUS GOODS	Not dangerous goods
INTERNATIONAL AIR TRANSPORT ASSOCIATION – CARGO	Not dangerous goods
INTERNATIONAL AIR TRANSPORT ASSOCIATION – PASSENGER	Not dangerous goods
MX_DG	Not dangerous goods

***ORM=ORM-D, CBL=COMBUSTIBLE LIQUID**

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-user, or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15: REGULATORY INFORMATION

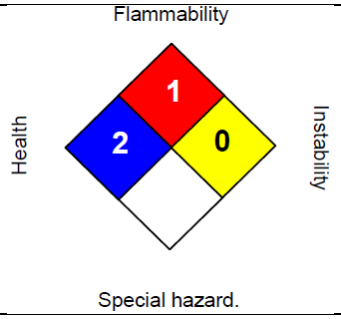
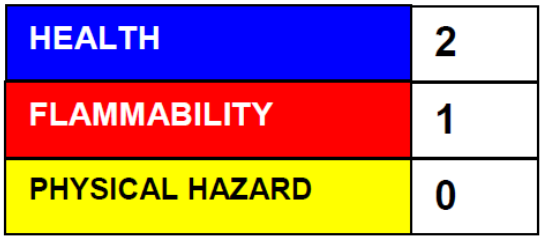
SARA 311/312 Hazards:	Acute health hazard
SARA 313:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
California Prop 65:	This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

TSCA:	On TSCA Inventory
DSL:	All components of this product are on the Canadian DSL
AICS:	On the inventory, or in compliance with the inventory
ENCS:	On the inventory, or in compliance with the inventory
KECL:	On the inventory, or in compliance with the inventory
PICCS:	On the inventory, or in compliance with the inventory
IECSC:	On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECL (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

SECTION 16: OTHER INFORMATION

NFPA:	HMIS III:
	

0=Not significant, 1=Slight, 2=Moderate, 3=High, 4=Extreme, *=Chronic

NFPA Flammable and Combustible Liquids Classification
Combustible Liquid Class IIIB

Full text of H-Statements

H227	Combustible Liquid.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H330	Fatal if inhaled.

Sources of key data used to compile the Safety Data Sheet
Valvoline internal data, including own and sponsored test reports.
The UNECE administers regional agreements implementing harmonized classification for labeling (GHS) and transport.

The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Valvoline's Environmental Health and Safety Department (1-800-VALVOLINE).

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet:

ACGIH:	American Conference of Industrial Hygienists
BEI:	Biological Exposure Index
CAS:	Chemical Abstracts Service (Division of the American Chemical Society)
CMR:	Carcinogenic, Mutagenic, or Toxic for Reproduction
FG:	Food Grade
GHS:	Globally Harmonized System of Classification for Labeling of Chemicals
H-Statement:	Hazard Statement
IATA:	International Air Transport Association
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA)
ICAO:	International Civil Aviation Organization

ICAO-TI (ICAO: Technical Instructions by the “International Civil Aviation Organization”
IMDG: International Maritime Code for Dangerous Goods
ISO: International Organization for Standardization
logPow: octanol-water partition coefficient
LCxx: Lethal Concentration, for xx percent of test population
LDxx: Lethal Dose, for xx percent of test population
ICxx: Inhibitory Concentration, for xx percent of test population
Ecxx: Effective Concentration of xx
N.O.S.: Not Otherwise Specified
OECD: Organization for Economic Cooperation and Development
OEL: Occupational Exposure Limit
P-Statement: Precautionary Statement
PBT: Persistent, Bioaccumulative and Toxic
PPE: Personal Protective Equipment
STEL: Short-term Exposure Limit
STOT: Specific Target Organ Toxicity
TLV: Threshold Limit Value
TWA: Time-weighted Average
vPvB: Very Persistent and Very Bioaccumulative
WEL: Workplace Exposure Level
CERCLA: Comprehensive Environment Response, Compensation, and Liability Act
DOT: Department of Transportation
FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act
HMIRC: Hazardous Materials Information Review Commission
HMIS: Hazardous Materials Identification System
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration
PMRA: Health Canada Pest Management Regulatory Agency
RTK: Right to Know
WHMIS: Workplace Hazardous Materials Information System

SAFETY DATA SHEET

Synpower™ 75W-90 Synthetic Gear Oil

VV975

29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Trade Name: Synpower™ 75W-90 Synthetic Gear Oil

Recommended use of the chemical and restrictions on use

Details of the Supplier and the safety data sheet

Valvoline LLC
3499 Blazer Parkway
Lexington, KY 40509
United States of America (USA)
1-800-TEAMVAL

Emergency Telephone Number

1-800-VALVOLINE

Regulatory Information Number

1-800-TEAMVAL

Product Information

1-800-TEAMVAL

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification

Eye irritation: Category 2A
Skin sensitization: Class 1

GHS Label Elements

Hazard Pictograms:	
Signal Word:	Warning
Hazard Statements:	May cause an allergic skin reaction.
Precautionary Statements:	**Prevention:** Avoid breathing dust/fume/gas/mist/vapors/spray. Wash skin thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Wear eye protection/face protection. Wear protective gloves. **Response:** IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

	If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Wash contaminated clothing before reuse. **Disposal:** Dispose of contents/container to an approved waste disposal plant.

Other Hazards
None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture: Mixture

Chemical Nature: Defatter

Hazardous Components:

Chemical Name	CAS-No.	Classification	Concentration (%)
HEAVY PARAFFINIC DISTILLATE	64742-54-7	Asp. Tox. 1; H304	61.42
DI-TERT-BUTYL POLYSULFIDE	68937-96-2	Flam. Liq. 4; H227 Skin Sens. 1B; H317	4.99
WHITE MINERAL OIL	8042-47-5	Not a hazardous substance or mixture.	2.90
Phosphoric acid esters, amine salt	91745-46-9	Acute Tox. 4; H302 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Acute 2; H401 Aquatic Chronic 2; H411	1.99

SECTION 4: FIRST AID MEASURES

General Advice:	Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled:	If breathed in, move person into fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact:	Remove contaminated clothing. If irritation develops, get medical attention. If on skin, rinse well with water. First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water. Wash contaminated clothing before reuse.
In case of eye contact:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye.

If swallowed:	Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed:	Acute aspiration 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. Repeated aspiration of small quantities of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Signs and symptoms of expose to this material through breathing, swallowing, and/or passage of the material through the skin may include: acne, stomach, or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways). May cause an allergic skin reaction.
Notes to physician:	No hazards which require special first aid measures

SECTION 5: FIREFIGHTING MEASURES

Suitable extinguishing media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water Spray Foam Carbon Dioxide (CO2) Dry Chemical
Unsuitable extinguishing media:	High volume water jet
Specific hazards during firefighting:	Do not allow run-off from firefighting to enter drains or water courses.
Hazardous combustion products:	Carbon Dioxide and Carbon Monoxide Hydrocarbons Aldehydes Sulfur oxides Hydrogen chloride gas Nitrogen oxides (NOx) Oxides of phosphorus
Specific extinguishing methods:	Product is compatible with standard firefighting agents.
Further information:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures:	Use personal protective equipment Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Environmental precautions:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains, inform respective authorities.
Methods and materials for containment and cleaning up:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust. Keep in suitable, closed containers for disposal.
Other information:	Comply with all applicable federal, state, and local regulations.

SECTION 7: HANDLING AND STORAGE

Advice on safe handling:	Do not breathe vapors/dust. Do not smoke. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Container hazardous when empty. Avoid exposure – obtain special instructions before use. Avoid contact with skin and eyes. Smoking, eating, and drinking should be prohibited in the application area. For personal protection, see Section 8. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage:	Keep container tightly closed in dry, well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Electrical installations/working materials must comply with the technological safety standards.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Chemical Name	CAS-No.	Value type (Form of exposure)	Control Parameters / Permissible concentration	Basis
WHITE MINERAL OIL	8042-47-5	REL	5 mg/m3 Mist	NIOSH/GUIDE
		STEL	10 mg/m3 Mist	NIOSH/GUIDE
		PEL	5 mg/m3 Mist	OSHA_TRANS
		TWA	5 mg/m3 Mist	TN OEL
		TWA	5mg/m3 Inhalable fraction.	ACGIH

Engineering Measures: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected, or apparent adverse effects.

Personal protective equipment

Hand protection remarks:	The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection:	Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor, or mist.
Skin and body protection:	Wear as appropriate: Impervious clothing Safety shoes Choose body protection according to the amount and concentration of the dangerous substance at the workplace. Discard gloves that show tears, pinholes, or signs of wear. Wear resistant gloves (consult your safety equipment supplier).
Hygiene measures:	Wash hands before breaks and at the end of workday. When using, do not eat or drink. When using, do not smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Odour:	Mild
Odour Threshold:	No data available
pH:	No data available
Melting point/Freezing point:	No data available
Boiling point/Boiling range:	No data available
Flash point:	>390°F / 199°C Method: Cleveland open cup
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper explosion limit:	6% (V) Calculated explosive limit
Lower explosion limit:	1% (V) Calculated explosive limit
Vapor pressure:	1.333333 hPa (20°C) Calculated vapor pressure
Relative vapor density:	No data available
Relative density:	No data available
Density:	0.86 g/cm3 (15.56°C)
Solubility(ies)	
Water solubility:	No data available
Solubility in other solvents:	No data available
Partition coefficient, n-octanol/water:	No data available
Thermal decomposition:	No data available
Viscosity	
Viscosity, dynamic:	No data available
Viscosity, kinematic:	100 mm2/s (40°C)
Oxidizing properties:	No data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No decomposition if stored and applied as directed.
Chemical Stability:	Stable under recommended storage conditions.
Possibility of hazardous reactions:	Product will not undergo hazardous polymerization.
Conditions to avoid:	Excessive heat. Exposure to sunlight.
Incompatible materials:	Iron Steel Strong Acids Strong oxidizing agents

Hazardous decomposition products:	Carbon Dioxide and Carbon Monoxide Hydrocarbons Hydrogen chloride gas Nitrogen oxides (NOx) Oxides of phosphorus Sulfur oxides

SECTION 11: TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:	Inhalation Skin contact Eye contact Ingestion

Acute toxicity
Not classified based on available information

Components:

HEAVY PARAFFINIC DISTILLATE:	
Acute oral toxicity:	LD50 (Rat): >15 g/kg
Acute dermal toxicity:	LD50 (Rabbit): >5 g/kg
DI-TERT-BUTYL POLYSULFIDE:	
Acute oral toxicity:	LD50 (Rat): >2,000 mg/kg Method: OECD Test Guideline 401
Acute dermal toxicity:	LD50 (Rat): >2,000 mg/kg Method: OECD Test Guideline 402
WHITE MINERAL OIL:	
Acute oral toxicity:	LD50 (Rat): 50,000 mg/kg
Acute dermal toxicity:	LD50 (Rabbit): >2,000 mg/kg Assessment: Not classified as acutely toxic by dermal absorption under GHS.
PHOSPHORIC ACID ESTERS, AMINE SALTS:	
Acute oral toxicity:	LD50 (Rat): 2,000 mg/kg

Skin corrosion/irritation
Not classified based on available information

Product:
Remarks: May cause skin irritation in susceptible persons

Components:

HEAVY PARAFFINIC DISTILLATE:	
Result:	Mildly irritating to skin
DI-TERT-BUTYL POLYSULFIDE:	
Result:	Slightly to moderately irritating to skin
WHITE MINERAL OIL:	
Result:	Not irritating to skin
PHOSPHORIC ACID ESTERS, AMINE SALTS:	
Result:	Mildly irritating to skin

Serious eye damage/eye irritation
Not classified based on available information.

Product:
Remarks: Vapors may cause irritation to the eyes, respiratory system, and the skin. Causes serious eye irritation.

Components:

HEAVY PARAFFINIC DISTILLATE:	
Result:	Not irritating to eyes
DI-TERT-BUTYL POLYSULFIDE:	
Result:	Slightly irritating to eyes
WHITE MINERAL OIL:	
Result:	Not irritating to eyes
PHOSPHORIC ACID ESTERS, AMINE SALTS:	
Result:	Severely irritating to eyes

Respiratory or skin sensitization

Skin sensitization: May cause an allergic skin reaction.
Respiratory sensitization: Not classified based on available information.

Components:

DI-TERT-BUTYL POLYSULFIDE:	
Test type:	Maximization Test (GPMT)
Species:	Guinea pig
Assessment:	The product is a skin sensitizer, sub-category 1B
Method:	OECD Test Guideline 406
PHOSPHORIC ACID ESTERS, AMINE SALTS:	
Assessment:	May cause sensitization by skin contact.

Germ Cell Mutagenicity

Not classified based on available information.

Components:

DI-TERT-BUTYL POLYSULFIDE:	
Genotoxicity in vitro:	Test type: in vitro assay Result: Positive results were obtained in some in vitro tests.
Genotoxicity in vivo:	Test type: Micronucleus test Test species: Mouse Cell type: Bone marrow Method: OECD Test Guideline 474 Result: Negative

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT – Single Exposure

Not classified based on available information.

STOT – Repeated Exposure

Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

Components:
HEAVY PARAFFINIC DISTILLATE:
May be fatal if swallowed and enters airways

Further Information

Product:
Remarks: No data available.

Carcinogenicity:

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by NTP.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Components:

HEAVY PARAFFINIC DISTILLATE:	
Toxicity to Fish:	LL50 (Fish) >100mg/L
Toxicity to daphnia and other aquatic invertebrates:	EL50 (Aquatic invertebrates): >10,000 mg/L
Toxicity to algae:	EL50 (Algae, algal mat (Algae)): >100 mg/L
Toxicity to fish (Chronic toxiticy):	NOEC (Fish): 10 mg/L
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	NOEC (Aquatic invertebrates): 10 mg/L
DI-TERT-BUTYL POLYSULFIDE:	
Toxicity to daphnia and other aquatic invertebrates:	EC50 (Daphnia magna (water flea)): 0.24 mg/L Exposure time: 48 h Test type: static test Method: OECD Test Guideline 202

Toxicity to algae:	EC50 (Pseudokirchneriella subcapitata (green algae)): 2.45 mg/L End point: Growth inhibition Exposure time: 72 h Test type: static test Method: OECD Test Guideline 201
PHOSPHORIC ACID ESTERS, AMINE SALT:	
Acute aquatic toxicity:	Toxic to aquatic life.
Chronic aquatic toxicity:	Toxic to aquatic life with long lasting effects.

Persistence and Degradability

Components:

DI-TERT-BUTYL POLYSULFIDE:	
Biodegradability:	Result: Not readily biodegradable Biodegradation: 13% Exposure time: 28 d Method: OECD Test Guideline 301B

Bio-accumulative Potential

Components:

DI-TERT-BUTYL POLYSULFIDE	
Partition coefficient: n-octanol/water	Log Pow: 5.6 (20°C) pH: 7

Mobility in Soil

Components:
No data available.

Other adverse effets
No data available.

Product:

Additional ecological information:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods

General advice:	The product should not be allowed to enter drains, water courses, or the soil. Do not contaminate ponds, waterways, or ditches with chemical or used container. Send to a licensed waste management company. Dispose of in accordance with all applicable local, state, and federal regulations.
Contaminated packaging:	Empty remaining contents. Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14: TRANSPORT INFORMATION

International Transport Regulations

U.S. DOT – ROAD	Not dangerous goods
CFR_RAIL_C	Not dangerous goods
U.S. DOT – INLAND WATERWAYS	Not dangerous goods
TDG_ROAD_C	Not dangerous goods
TDG_RAIL_C	Not dangerous goods
TDG_INWT_C	Not dangerous goods
INTERNATIONAL MARITIME DANGEROUS GOODS	Not dangerous goods
INTERNATIONAL AIR TRANSPORT ASSOCIATION – CARGO	Not dangerous goods
INTERNATIONAL AIR TRANSPORT ASSOCIATION – PASSENGER	Not dangerous goods
MX_DG	Not dangerous goods

***ORM=ORM-D, CBL=COMBUSTIBLE LIQUID**

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-user, or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15: REGULATORY INFORMATION

SARA 311/312 Hazards:	Acute health hazard	
SARA 313:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.	
Pennsylvania Right to Know		
HEAVY PARAFFINIC DISTILLATE	64742-54-7	50.00-70.00%
VISCOSITY MODIFIER	Not Assigned	20.00-30.00%
DI-TERT-BUTYL POLYSULFIDE	68937-96-2	1.00-5.00%
WHITE MINERAL OIL	8042-47-5	1.00-5.00%
New Jersey Right to Know		
HEAVY PARAFFINIC DISTILLATE	64742-54-7	50.00-70.00%
VISCOSITY MODIFIER	Not Assigned	20.00-30.00%
DI-TERT-BUTYL POLYSULFIDE	68937-96-2	1.00-5.00%
WHITE MINERAL OIL	8042-47-5	1.00-5.00%
LUBRICANT ADDITIVE	Not Assigned	1.00-5.00%
California Prop 65:	This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.	

The components of this product are reported in the following inventories:

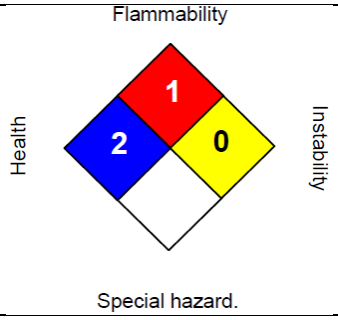
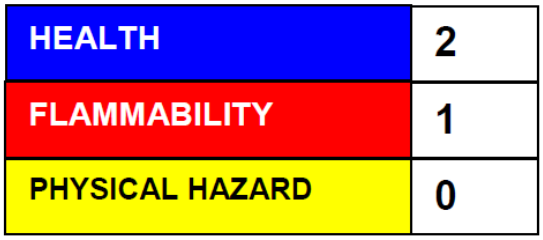
TSCA:	On TSCA Inventory
DSL:	All components of this product are on the Canadian DSL
AUSTR:	On the inventory, or in compliance with the inventory
NZIOC:	Not in compliance with the inventory.
ENCS:	On the inventory, or in compliance with the inventory
KECL:	On the inventory, or in compliance with the inventory
PICCS:	On the inventory, or in compliance with the inventory
IECSC:	On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

SECTION 16: OTHER INFORMATION

Further Information
Revision Date: 07/31/2016

NFPA:	HMIS III:
	

0=Not significant, 1=Slight, 2=Moderate, 3=High, 4=Extreme, *=Chronic

NFPA Flammable and Combustible Liquids Classification
Combustible Liquid Class IIIB

Full text of H-Statements

H227	Combustible Liquid.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Sources of key data used to compile the Safety Data Sheet
Valvoline internal data, including own and sponsored test reports.
The UNECE administers regional agreements implementing harmonized classification for labeling (GHS) and transport.

The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Valvoline's Environmental Health and Safety Department (1-800-VALVOLINE).

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet:

ACGIH:	American Conference of Industrial Hygienists
BEI:	Biological Exposure Index
CAS:	Chemical Abstracts Service (Division of the American Chemical Society)
CMR:	Carcinogenic, Mutagenic, or Toxic for Reproduction
FG:	Food Grade
GHS:	Globally Harmonized System of Classification for Labeling of Chemicals
H-Statement:	Hazard Statement
IATA:	International Air Transport Association
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA)

ICAO:	International Civil Aviation Organization
ICAO-TI (ICAO:	Technical Instructions by the “International Civil Aviation Organization”
IMDG:	International Maritime Code for Dangerous Goods
ISO:	International Organization for Standardization
logPow:	octanol-water partition coefficient
LCxx:	Lethal Concentration, for xx percent of test population
LDxx:	Lethal Dose, for xx percent of test population
ICxx:	Inhibitory Concentration, for xx percent of test population
Ecxx:	Effective Concentration of xx
N.O.S.:	Not Otherwise Specified
OECD:	Organization for Economic Cooperation and Development
OEL:	Occupational Exposure Limit
P-Statement:	Precautionary Statement
PBT:	Persistent, Bioaccumulative and Toxic
PPE:	Personal Protective Equipment
STEL:	Short-term Exposure Limit
STOT:	Specific Target Organ Toxicity
TLV:	Threshold Limit Value
TWA:	Time-weighted Average
vPvB:	Very Persistent and Very Bioaccumulative
WEL:	Workplace Exposure Level
CERCLA:	Comprehensive Environment Response, Compensation, and Liability Act
DOT:	Department of Transportation
FIFRA:	Federal Insecticide, Fungicide, and Rodenticide Act
HMIRC:	Hazardous Materials Information Review Commission
HMIS:	Hazardous Materials Identification System
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
OSHA:	Occupational Safety and Health Administration
PMRA:	Health Canada Pest Management Regulatory Agency
RTK:	Right to Know
WHMIS:	Workplace Hazardous Materials Information System

SAFETY DATA SHEET

1. Identification

Product Identifier:	**MOLYWHITE RE No. 00**
Recommended use of the chemical and restrictions on use:	
	Lubricating grease
Manufacturer	
Name:	KYODO YUSHI CO., LTD.
Address:	2-2-30, Tsujido Kandai, Fujisawa-Shi, Kanagawa, Japan
TEL:	+81-466-33-3157
Emergency Phone Number:	+81-466-33-3157

2. Hazards Identification

GHS Classification	
Physical Hazards	
Flammable liquids:	Not classified
Health Hazards	
Acute toxicity – Oral:	Not classified
Acute toxicity – Dermal:	Not classified
Environment Hazards	
Hazardous to the aquatic environment (Long-term hazard):	Category Chronic 3
OSHA Defined Hazards:	(Pyrophoric gas, Simple asphyxiant, Combustible dust):
	Classification not possible
GHS Labeling Elements	
Symbol:	Not applicable
Signal Word:	Not applicable
Hazard Statements:	(H412) Harmful to aquatic life with long lasting effects
Precautionary Statements	
Prevention:	(P273) Avoid release to the environment.
Response:	Not applicable
Storage:	Not applicable
Disposal:	(P501) Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Hazards not otherwise classified (HNOC):	Not applicable

3. Composition/Information on Ingredients

Formula:
Not applicable

Components:

Component	Content (%)
Base oil (Synthetic hydrocarbon oil, refined mineral oil)	85-95
Thickener (Lithium soap)	< 10
EP additive (Containing molybdenum compounds)	< 5
Oxidation inhibitor (Butylated hydroxytoluene (BHT))	< 5
Additive(s) (Containing barium compounds)	< 5

Hazardous Ingredients:

Component	CAS No.	Content (%)
Molybdenum compounds	Confidential	1-3

See Section 8 for exposure limits (if applicable).
See Section 15 for legal controlled substance (if applicable).

4. First-aid Measures

Eye Contact:	Immediately flush with water for at least 15 minutes. Get medical attention.
Skin Contact:	Thoroughly remove with cloth or paper and wash carefully with soap and water.
Inhalation:	Remove the victim from the contamination to fresh air. Cover the victim in a blanket to keep warm and quiet. Consult a physician.
Ingestion:	Do not induce vomiting. Immediately consult a physician.
Notes to Physicians:	Supportive care. Treatment based on judgement of the physician in response to reactions of the patient.

5. Firefighting Measures

Flammable Limits:	No data available.
Autoignition Temperature:	No data available.
Extinguishing media:	Foam, dry chemical, CO2, dry sand
Unsuitable extinguishing media:	Do not use water. Water can be dangerous, possibly leading to fire spread.
Specific hazards during firefighting:	Thermal decomposition and combustion may produce carbon monoxide and/or carbon dioxide.
Specific Methods of Firefighting:	In the early stages of fire, use dry chemical, CO2, dry sand, etc. fire extinguisher. In case of massive fire, use foam fire extinguisher to shut off the air supply. Get all persons to safety. Authorized personnel only at the fire site.
Protection of Firefighters:	Firefighters should wear protective equipment. Start firefighting from the windward side.

6. Accidental Release Measures

Personal precautions:	Wear protective equipment during cleanup work.
Environmental precautions:	Prevent spills from entering sewers or waterway.
Methods clean up:	For small spills, absorb with inert material (e.g. dry sand, sawdust, waste cloth), then place in a chemical waste container with a cover for disposal. For large spills, dike to keep spillage in a safe place for later disposal.
Prevention of Secondary Hazards:	Immediately shut off all sources of ignition.

7. Handling and Storage

Handling	
Technical Measures:	Handle the product in a well-ventilated place. Do not leak, flood, or scatter the product to prevent unwanted evaporation.
Precautions:	Contact with eye may cause irritation. Use protective glasses to avoid contact with eyes. Contact with the skin may cause irritation. Use protective gloves to avoid skin contact. Do not swallow. (Drinking the product may cause diarrhea and vomiting.) Close container after each use.
Precautions for safe Handling:	Wear gloves to avoid injury on hands at opening the container.
Storage	
Appropriate Storage Conditions:	Keep container closed to protect from dust/water ingress after use. Store in a cool, dry place, away from direct sunlight, heat sources, and fire. Keep out of reach of children.
Safe Packaging Materials:	Do not expose empty container to pressure. Do not weld, heat, drill, or cut container. Residue ignition and explosion hazards.

8. Exposure Controls/Personal Protection

Exposure Guidelines	
ACGIII	Butylated hydroxytoluene (BHT): TWA 2 mg/m3 Mineral oil: TWA 5 mg/m3
Engineering Controls:	When vapor or mist exhales, install an apparatus to close the vapor/mist source or ventilation equipment.
Protective Equipment	
Respiratory Protection:	Wear a gas mask for organic gas when needed (not necessary under normal conditions).
Hand Protection:	Wear oil-resistant protective gloves in case of prolonged and/or repeated skin contact.
Eye Protection:	Wear chemical safety goggles whenever the product splashes.
Skin and Body Protection:	Wear long-sleeved, oil-resistant working clothes whenever handling for many hours and/or getting wet. Immediately take off the wet clothes and thoroughly wash them before reusing.

9. Physical and Chemical Properties

Appearance:	
Form:	Semi-fluid
Color:	Yellow
Odour:	Slight odor
pH:	No data available
Melting point/Freezing point:	No data available
Flash point:	190°C (Seta)
Evaporation rate:	No data available
Vapor pressure:	No data available
Solubility in water:	Insoluble in water.
Vapor density:	No data available
Density:	0.87 g/cm3 (25°C)
Partition coefficient, n-octanol/water:	No data available
Viscosity:	No data available
Dropping point:	193°C

10. Stability and Reactivity

Reactivity, Conditions to avoid:	Avoid contact with strong oxidant.
Chemical Stability:	Stable under recommended storage conditions.
Possibility of hazardous reactions:	Not available.
Materials to avoid:	Strong oxidizers.
Hazardous decomposition products:	This product is expected to be stable under normal conditions of use.

11. Toxicological Information

Information on likely routes of exposure:	Not applicable
Delayed and immediate effects, chronic effects from short- and long-term exposure	
Acute toxicity – Oral:	Not classified based on the category of each ingredient or the product properties. Refined mineral oral LD50 Acute oral >5 g/kg (Rat)
Acute toxicity – Dermal:	Not classified based on the category of each ingredient or the product properties.
Acute toxicity – Inhalation (Gases):	No data available.
Acute toxicity – Inhalation (Vapors):	No data available.
Acute toxicity – Inhalation (Dusts and mists):	No data available.
Skin corrosion/irritation:	No data available.
Eye damage/irritation:	No data available.
Sensitization – Respiratory:	No data available.
Sensitization – Skin:	No data available.
Germ cell mutagenicity:	No data available.
Carcinogenicity:	No data available.
Toxic to reproduction:	No data available.
Effects on or via lactation:	No data available.

Specific target organ toxicity (Single exposure):	No data available.
Specific target organ toxicity (Repeated exposure):	No data available.
Aspiration hazard:	No data available.
Other Toxicity Information	
NTP Report on Carcinogens:	Not listed.
IARC Monographs:	Not listed.

12. Ecological Information

Ecotoxicity	
Hazardous to the aquatic environment (Acute hazard):	No data available
Hazardous to the aquatic environment (Long-term hazard):	Classified under Category Chronic 3 based on the category of each ingredient or the product properties.
Persistence and Degradability:	No data available.
Mobility in Soil:	No data available.
Hazardous to the ozone layer:	No data available.

13. Disposal Considerations

Waste Residues:	Properly dispose of in accordance with any relevant regulations. Properly dispose of bi a licensed waste disposer. For in-house incineration disposal, ensure exhaust gas treatment (washing treatment, etc.) to prevent air pollution from sulfur oxide. No dumping. When burning, be sure to do so on someone's watch in a safe place and in the way that burning and/or explosion will never pose a potential hazard.
Contaminated packaging:	Dispose of container after completely removing the contents.

14. Transport Information

DOT Hazardous Materials:	Not applicable
UN Transport of Dangerous Goods	
UN Number:	Not applicable
UN Proper Shipping Name:	Not applicable
Transport Hazard Class:	Not applicable
Packing Group:	Not applicable
Land (RID/ADR):	Not applicable
Sea (IMO/IMDG):	Not applicable
Air (ICAO/IATA):	Not applicable
Specific Precautionary Transport Measures and Conditions:	Contains combustible liquid. Keep fire away. Handle with care to prevent container damage. Ensure proper packaging before shipping to avoid load shifting and falling accident.

15. Regulatory Information

Regulatory information with regard to this product in your country or your region should be examined by your own responsibility.

US TSCA (Toxic Substances Control Act)

ALL components of this product are listed on the TSCA inventory of Chemical Substances.

US OSHA (Occupational Safety and Health Administration)

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200, since this product contains OSHA Hazardous Substances;

Component	CAS No.	Content (%)
Molybdenum compounds	Confidential	1-3

US CERCLA

(Comprehensive Environment Release, Compensation, & Liability Act):
CERCLA Hazardous Substances:

Component	CAS No.	Content (%)
Zinc compounds	Confidential	0.1-.05

US SARA (Superfund Amendment & Reauthorization Act) Tittle III:

SARA Extremely Hazardous Substances: None
SARA Hazard Categories (311/312): None
SARA Toxic Release Inventory (TRI) (313):

Component	CAS No.	Content (%)
Barium compounds	Confidential	0.3-0.7
Zinc compounds	Confidential	0.1-0.5

16. Other Information

NFPA

Health Hazards: 1
Flammability: 1
Instability: 0
Special Hazards: -

Contact Information

Name: KYODO YUSHI CO., LTD.
International Business Dept.
Address: 2-2-30, Tsujido Kandai, Fujisawa-Shi, Kanagawa, Japan
TEL: +81-466-33-3157

Name: KYODO YUSHI USA INC.
Address: Continental Towers – Tower I, 1701 Golf Road, Suit 1108
Rolling Meadows, IL, U.S.A., 60008
TEL: +1-847-364-2020
E-Mail: info@kyodoyushiusa.com

Original Date: Oct / 31 / 2014
Revision Date: - / - / -

References

1. OSHA Hazard Communication Standard 29 CFR 1910.1200
2. Threshold limit values for chemical substances and physical agents and biological exposure indices, ACGIH (2012)
3. IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICAL TO HUMANS VOLUME 33
4. Report on Carcinogens Twelfth Edition 2011, NTP
5. EU CLP Regulation (EC No 1272/2008 ANNEX VI Harmonized classification and labeling for certain hazardous substances)
6. Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Third revised edition.

Disclaimer

This SDS is an addition and complementary document beside the technical data sheet. The information is based upon our knowledge about the product at the date of edition.
Since we cannot anticipate or control the different condition under which these information or our product may be used, we make no guarantee that recommendations will be adequate for all individuals and situations.