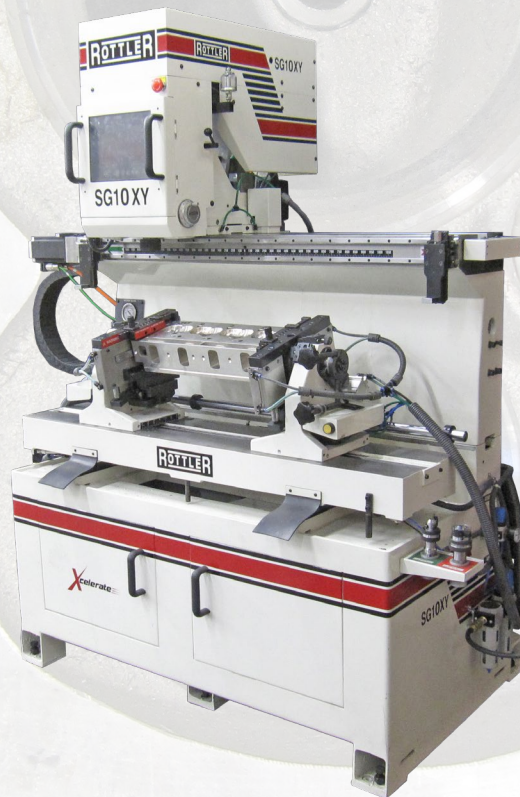


ROTTLER

SG10XY CNC CYLINDER HEAD SEAT & GUIDE MACHINE MACHINE MAINTENANCE AND PARTS MANUAL



PARTS ORDERING

For optional equipment catalogs, please visit <https://www.rottermfg.com/documentation.php>

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@rottermfg.com, for customers outside of the U.S., use intlparts@rottermfg.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

INTRODUCTION

MAINTENANCE

TROUBLESHOOTING

MACHINE PARTS

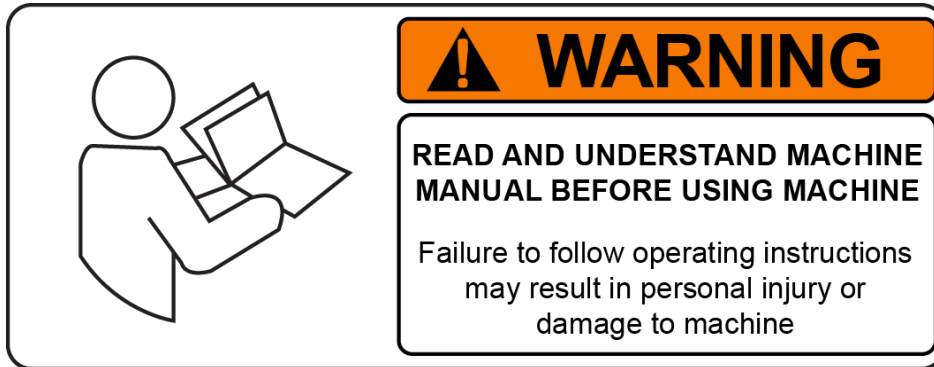
SDS

INTRODUCTION

Contents

Introduction	1-2
Description	1-3
Disclaimer	1-3
Limited Warranty	1-4
Online Documentation Access	1-5

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 SG10XY 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 SG10XY 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 Rottler SG10XY ACTIV spindle is mounted on a sphere which allows the UNIPILLOT to automatically center with the valve guide centerline while the Workhead is floating on air cushions. Once air floating stops and the Workhead clamps, the UNIPILLOT and valve guide centerline are maintained while cutting the valve seat.

ACTIV SPINDLE - Spherical Pneumatic Automatic Alignment System built into the Spindle for fast location of the pilot into the Valve Guide and Accurate Centering (Patent Pending)

Air Float Work Head on Intermediate Base Plate

Heavy Duty Spindle - Diameter 3.150" (80mm) Hardened and Ground with 8" (200mm) of vertical travel.

Rottler Automatic Tightening and Quick Release Spindle Lock Nut System for One Hand Operation for fitting and removing tooling to and from the spindle – never comes loose!

Gives Best Concentricity

Rottler's Rigid Precision carbide centering UNIPILLOTS are manufactured to less than one tenth (.002mm) tolerance.

Combined with the light weight air float Workhead the SG10XY gives perfect centering in the valve guide and the best concentricity of any machine on the market,

Disclaimer

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Rottler Manufacturing and its employees or representatives are not responsible for any information regarding final specifications of any workpiece that is created as a final product when using Rottler equipment. It is the responsibility of the end user of Rottler equipment to determine the final dimensions and finishes of the workpiece that they are working on. Any information regarding final dimensions and finishes that appears in any Rottler literature or that is expressed by anyone representing Rottler is to be regarded as general information to help with the demonstration of or for operator training of Rottler equipment.

Limited Warranty

Rottler Manufacturing Company Model SG10XY 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 if 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.

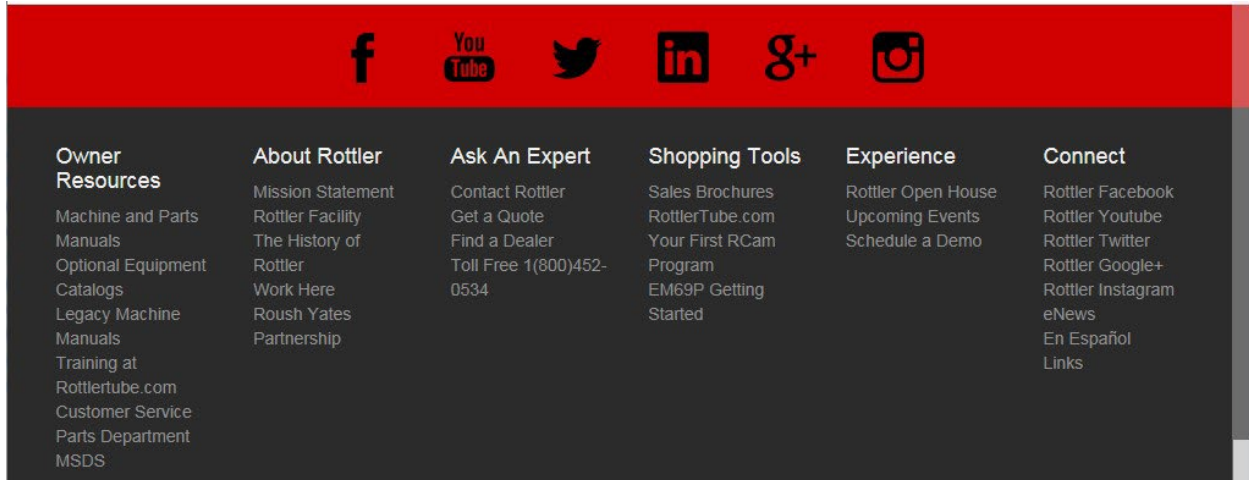
The issuance of a **RGR DOES NOT** guarantee credit - it is only authorization for the return of the goods. Credit for return merchandise is at the sole discretion of Rottler. Credit will be issued only after inspection of returned goods.

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.

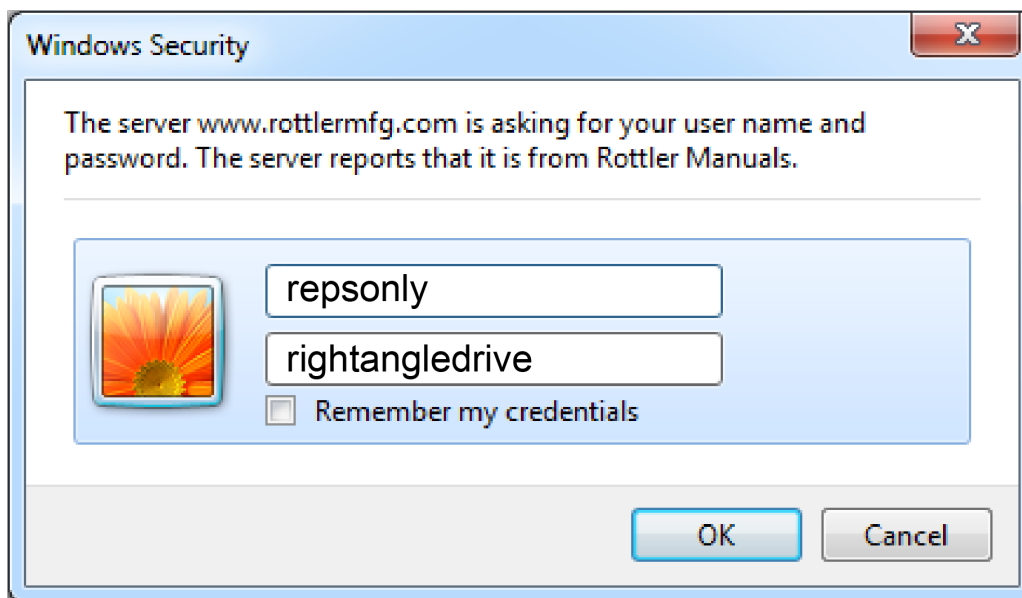
Online Documentation Access

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

Contents

Maintenance	2-1
Quick Reference Lubrication Chart	2-1
Preventative Maintenance Quick Reference Chart	2-1
Air Adjustments	2-2
Float	2-2
Float surfaces	2-2
Calibrating the Digital Level	2-3
Spindle	2-3
Rebuilding the UPT5200 Unipilot Holder	2-4
Adjusting And Aligning The Outer Spindle On SG Models	2-6
Adjusting Outer Spindle Clearance	2-7
Spindle Lock Nut Service Procedure	2-8
Replacing the Motherboard Battery	2-9
Setting the Play of Z-Axis Ball Screw	2-12

Maintenance

Quick Reference Lubrication Chart

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

Assembly	Frequency	Lube Operation	Recommended Lubricant	Date Serviced
Outer Spindle	8 Hours	Clean and Wipe with oil	ISO VG 68 Way Oil	
Brass guide shoes/slide	500 Hours	Clean and wipe with oil	ISO VG 68 Way Oil	
Grease spindle Rack and pinion	500 Hours	Clean and grease	NLGI #2 White Lithium Grease	
Grease spindle worm wheel and worm shaft	500 Hours	Clean and grease	NLGI #2 White Lithium Grease	
Grease spindle drive shaft	500 Hours	Clean and grease	NLGI #2 White Lithium Grease	
Grease rollover clamp fixture bearings	200 Hours	Clean and grease	NLGI #2 White Lithium Grease	
Grease clamp fixture Pins and Acme screw	200 Hours	Clean and grease	NLGI #2 White Lithium Grease	

Preventative Maintenance Quick Reference Chart

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	Date Serviced/Comments
Clean top and bottom float tables	8 Hours	
Outer Spindle Bushing Adjustment	500 Hours	
Brass Shoe Adjustment	500 Hours	
Angle sensor calibration	500 Hours	
Spindle Drive Belt Adjustment	1000 Hours	
Adjust workhead clamp plate bearings	1000 Hours	

CAUTION

Rack and pinion adjustment.	1000 Hours	
Machine Level Adjustment	1000 Hours	

All floating surfaces should be dry and clean do not oil the surfaces, oil will cause the work heat not to float properly.

Air Adjustments**Float**

The float regulators are located on the left side of machine base. Marked “Work Head Air Float Adjustment” If the work head is not floating properly it could be from too much or too little air from the regulator. Starting with all regulators set at 1 bar with “workhead float” button activated, slowly turn all up .5 bar at a time until workhead start to float. Pushing work head front to rear checking for stiff spots. If workhead is dragging in the forward position, (workhead pulled closest to operator) raise the 2 front regulators 1 mark until it floats without dragging. Same for rear. You may have to go back and forth a few times to get this correct. If workhead is not dragging lower the PSI until it does and then raise 1 notch at a time until it is free. Typically the front two regulators will be slightly higher than the rear two. Once the correct float is established lock the regulators in place by pushing in on the blue adjusting knob

CAUTION

Use as little air as possible to achieve correct floatation. Using too much air will could cause the spindle base to vibrate and not center properly on the on the pilot.

Float surfaces**CAUTION**

Wipe clean daily

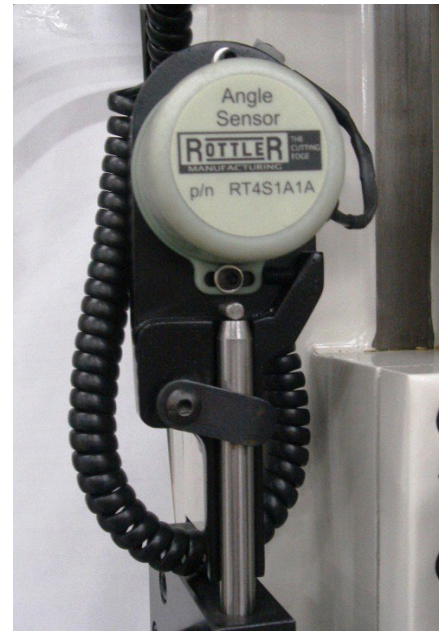
All floating surfaces should be dry and clean do not oil the surfaces, oil will cause the work heat not to float properly.

Calibrating the Digital Level

NOTE: Even though the level has been carefully calibrated at the factory, it is a good idea to recheck calibration before putting the machine into service. In the event that the level is dropped or handled roughly then the following recalibration methods should be implemented.

The level assembly is referenced to the spindle via the level pin. It is there for important to check alignment of pin in reference to the spindle. This is accomplished by mounting a magnetic base dial indicator to the machine spindle and sweeping the pin vertically by raising or lowering spindle to check alignment. Pin alignment should be checked in two positions at 90 degrees to each other. If the pin alignment needs correcting, do so with the set screws located at base of pin block.

Install level on pin. Orient level to read left to right. Tilt head left or right until level reads 0.00. Now rotate level 180 degrees. The reading should be 0.00, if not then it will be necessary to calibrate the inclinometer to the level body. This is accomplished by loosening the inclinometers two retaining screws and pivoting the inclinometer until it repeats when level is rotated 180 degrees.



Example: level reads 0.05 to the left, when rotated 180 degrees to the right it should read minus 0.05.

Check the level reading with the pickup oriented front to back. It should read 0.00 if the machine has been properly leveled with a machinist level.

If the LED does not read 0.00 then chances are the machine's leveling procedures have not been properly followed or there are internal problems with the levels electronics.

The sensitivity of the level is so great that it may not zero totally, even while the machine is not being touched. The alignment tolerance for installing guides is plus or minus .05 degrees, and for forming three angle seats is plus or minus .05 degrees.

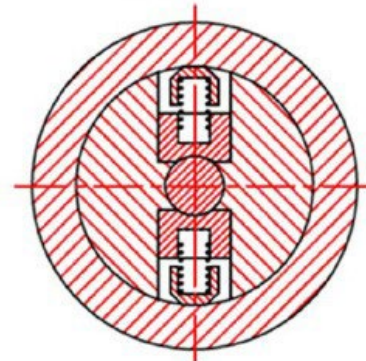
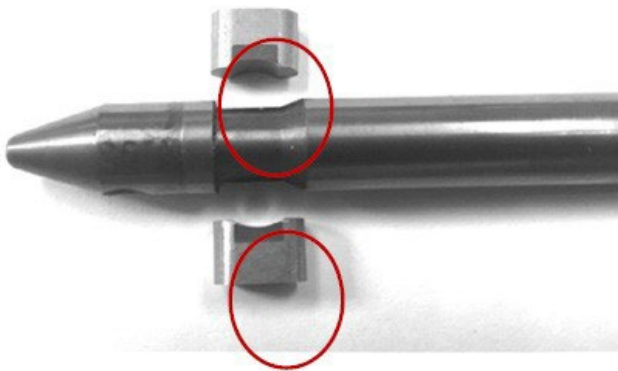
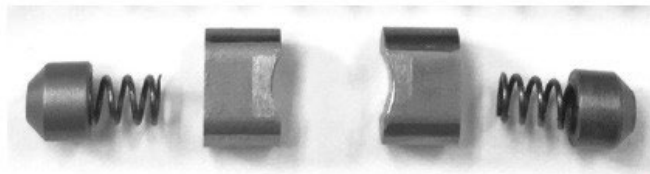
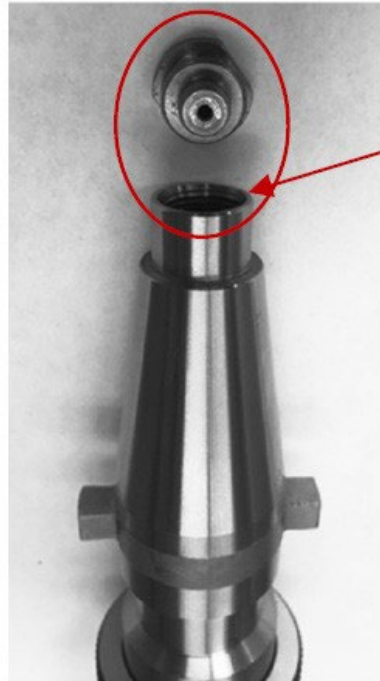
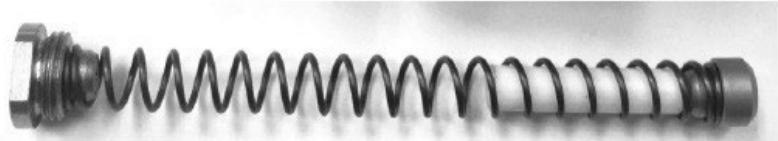
Spindle

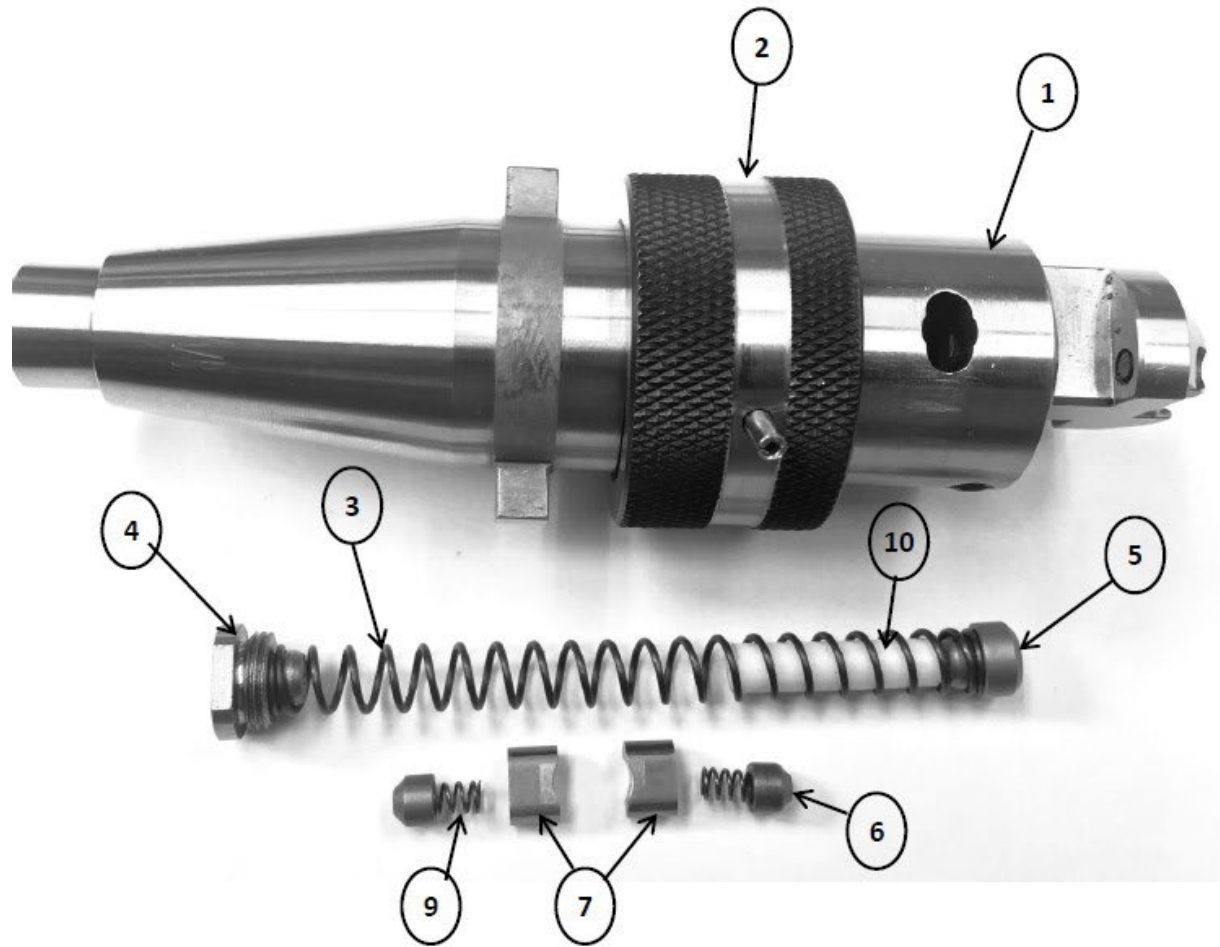
Wipe clean and oil 5 drops daily. To oil, lift lever at top of oiler. To adjust, rotate lever knob.

Rebuilding the UPT5200 Unipilot Holder

Align the pin and push through until To remove the cap unscrew the cap, this cap has left-hand you able get the sleeve up and threads; remove the long spring with the spacing Rod and the remove the components to replace. Trust Pad (See pictures below)







UPT5200 Rebuilding Kit Parts Details

Sr. No.	Part No.	Description	Qty.
1	5201	Toolholder Body Only (UPT5200)	1
2	5207	Toolholder Adapter Collar	1
3	555-19-10	5203-1 – Spring Long	1
4	555-19-9	5202 - Holding Screw	1
5	555-19-12	5104 - Trust Pad.	1
6	555-19-2	5205-1 - Plunger Pin Outer	2
7	555-19-3	5205-2 - Plunger Pin Inner	2
8	UCPXXX	UNIPILOT.375" (9.52mm) Shank	1
9	555-19-4	5203-3 - Compression Spring	2
10	555-19-11	5209 - Spacing Rod	1

Adjusting And Aligning The Outer Spindle On SG Models

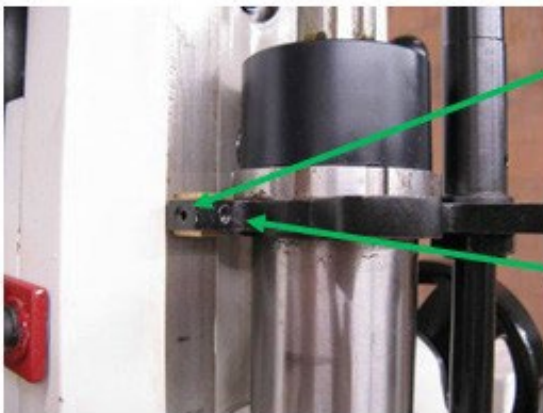
There are 2 brass guide shoes located on the guide plate on top of the spindle that align the rack gear on the back of the spindle with the pinion gear that moves the spindle up and down.

Lower the spindle to the center position of travel.



Check the guide plate at the top of the spindle, tighten if necessary. ¶

Clean and lightly lubricate sliding guide surfaces with grease. Adjust brass guide shoes on guide plate so that there is no twisting movement. Run the spindle through its full travel to confirm that there is no binding.



Loosen locking screw to adjust brass guide shoe. Tighten after adjusting. ¶

Use adjusting screw to adjust brass guide shoe.

Adjusting Outer Spindle Clearance



Loosen the 4 lock bolts.



Loosen the 4 adjusting set screws.

Clean outer spindle and lubricate – add a few drops of oil to a clean cloth and wipe outer spindle.

Starting with the bottom set of lock bolt and adjusting set screws, tighten the lock bolt until there is drag on the spindle when it is move through its range of travel.

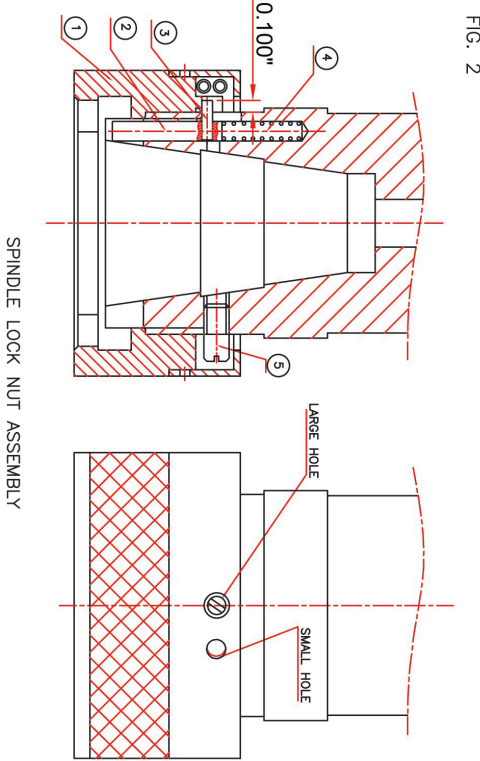
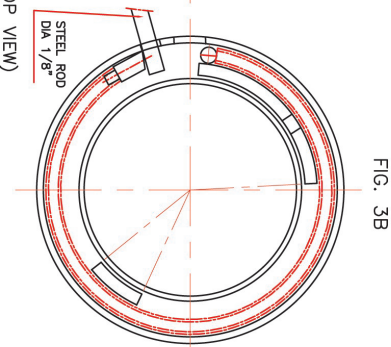
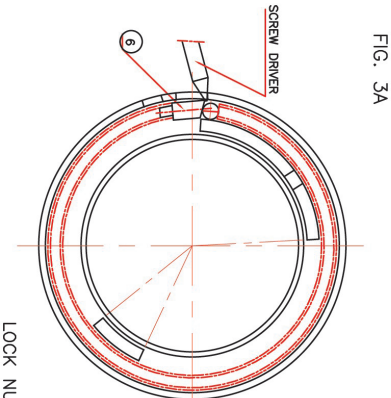
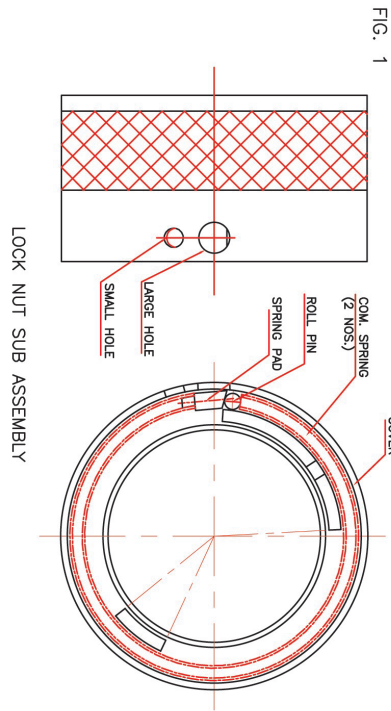
Then tighten the adjusting set screw until the amount of drag on the spindle is reduced to the point that there is a slight drag on the spindle through its range of travel.

You may have to make further adjustment to the lock bolt and set screw the get the spindle adjusted properly.

Repeat the above procedure the other 3 sets of lock bolts and set screws.

Spindle Lock Nut Service Procedure

SEAT & GUIDE MACHINE MODELS : SG-8M/TS, SG-9M/TS, SG-10X & SG-80M/TS
 SPINDLE LOCK NUT ASSEMBLY & DISMANTLING INSTRUCTIONS.



ASSEMBLY OF LOCK NUT (REF. FIG. 2)

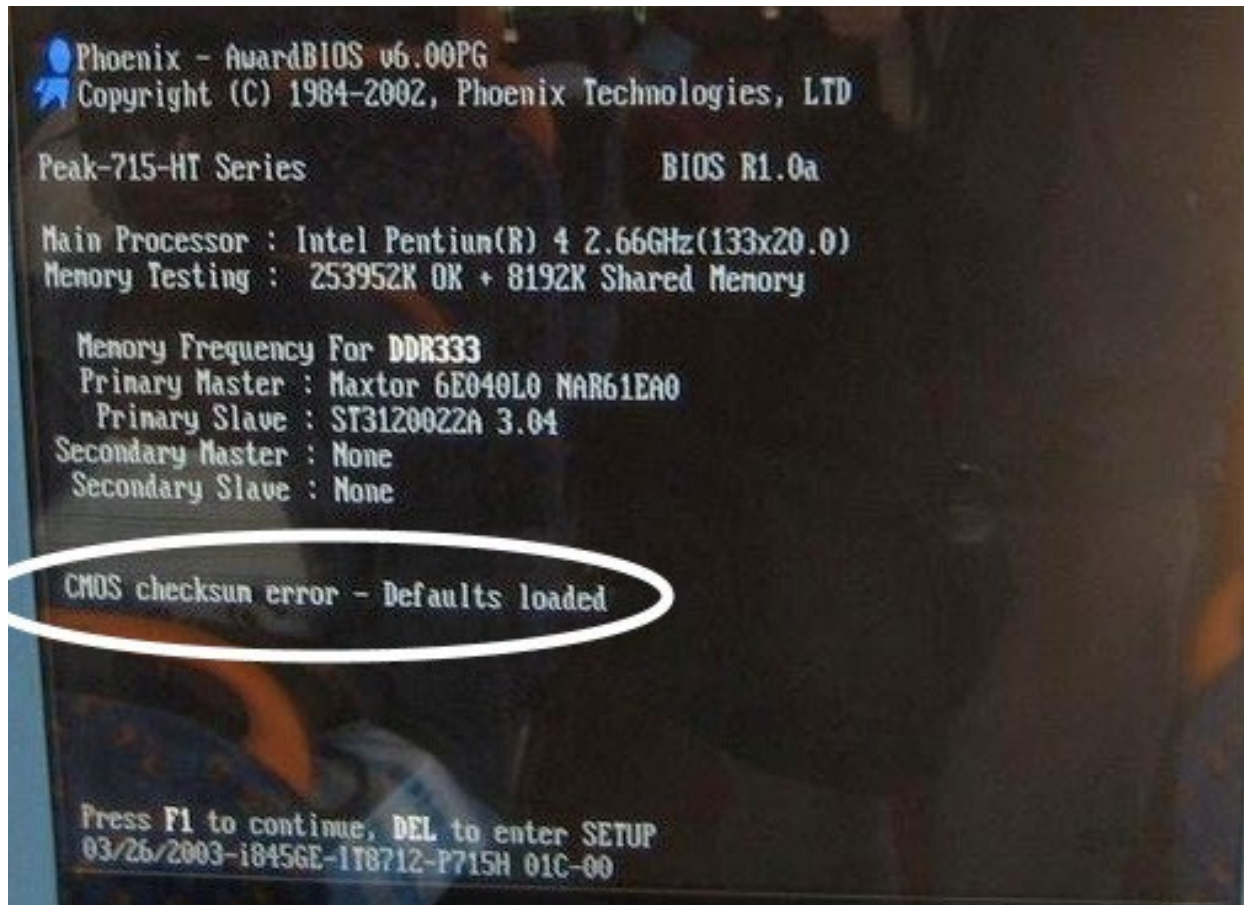
1. INSERT SPRING '4' IN THE SPINDLE HOLE FOLLOWED BY PLUNGER PIN '2', KEEPING HOLE ON THE TOP SIDE.
2. ASSEMBLE STOP PIN '3' BY PRESSING UP PLUNGER PIN '2' TILL THE PIN HOLE IN PLUNGER PIN '1' COMES OPPOSITE TO HOLE IN THE SPINDLE. THE PIN SHOULD PROJECT BY 0.100" (2.5MM) FROM SPINDLE SURFACE.
3. START TIGHTENING LOCK NUT '1' ON THE SPINDLE. WHEN IT STOPS, PRESS THE PLUNGER PIN '2' AND CONTINUE TIGHTENING TILL THE LOCK NUT TOUCHES THE SPINDLE.
4. UNSCREW LOCK NUT '1' SLIGHTLY TILL LARGE HOLE IN THE LOCK NUT COMES OPPOSITE THE TAPPED HOLE IN THE SPINDLE.
5. WITH A SMALL SCREW DRIVER PRESS SPRING PAD '6' THROUGH LARGE HOLE SO THAT IT CLEARS THE SMALL HOLE. INSERT A STEEL ROD IN THE SMALL HOLE TO HOLD THE SPRING PAD '6' IN THAT POSITION. TAKE OUT SCREW DRIVER, REF. FIG. 3A & 3B.
6. TIGHTEN STOP SCREW '5' IN THE SPINDLE THROUGH LARGE HOLE.
7. RELEASE SPRING PAD '6' BY PULLING OUT THE STEEL ROD. THE LOCK NUT ASSEMBLY IS NOW COMPLETED. CHECK ITS FUNCTIONING MANUALLY BEFORE MACHINING.

DISMANTLING OF LOCK NUT (REF. FIG. 2)

1. ROTATE THE SPINDLE TO SEE IF LARGE HOLE IS OPPOSITE TO STOP SCREW '5'. IN CASE IT IS NOT SO, PRESS THE PLUNGER PIN '2' UPWARDS. THIS WILL BRING THE LARGE HOLE OPPOSITE TO STOP SCREW '5'.
2. TAKEOUT STOP SCREW '5' BY UNSCREWING THE SAME.
3. PRESS PLUNGER PIN '2' & START UNSCREWING THE LOCK NUT '1' TILL IT COMES OUT.
4. PUSH STOP PIN '3' TO COME OUT OF PLUNGER PIN '2'
5. TAKE OUT PLUNGER PIN '2' AND SPRING '4'
6. DO NOT TEMPER WITH LOCK NUT SUB-ASSEMBLY. ASK FOR A NEW PIECE IF DAMAGED. SPINDLE LOCK NUT IS ALWAYS SUPPLIED IN SUB-ASSEMBLED CONDUCTION WITH TWO COIL SPRINGS, SPRING PAD, ROLL PIN & COVER AS SHOWN IN FIG. 1

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.



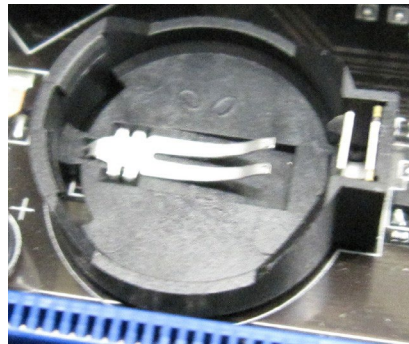
Locate the battery on the motherboard.



Push the battery retention clip away from the battery. When the clip is released the battery will pop up.



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



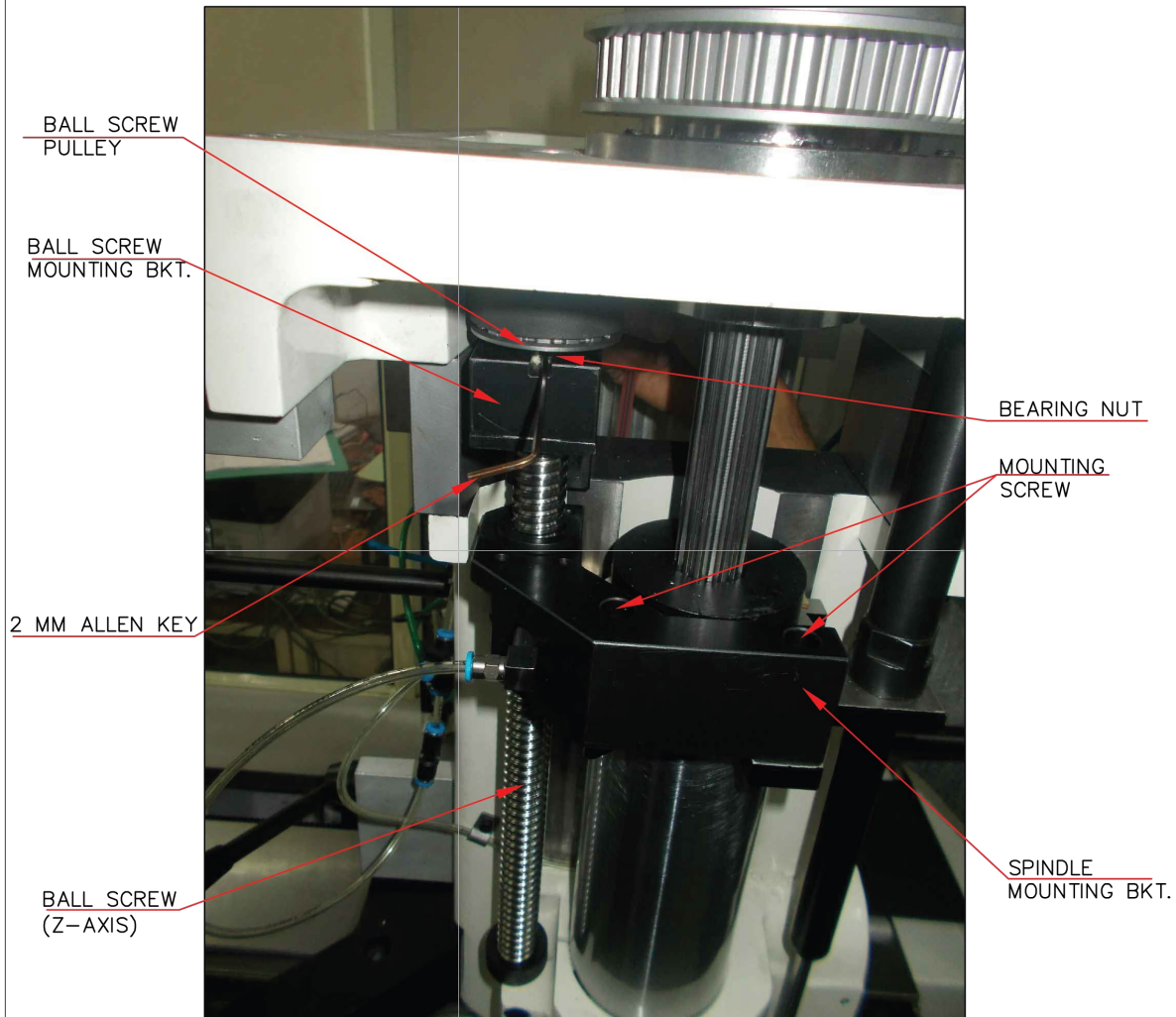
Using your finger tip push down on the battery until the retention clip is in its lock position.



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

Setting the Play of Z-Axis Ball Screw

INSTRUCTIONS FOR SETTING THE PLAY OF BALL SCREW (Z-AXIS) - SG10XY



INSTRUCTIONS FOR SETTING THE PLAY OF BALL SCREW (Z-AXIS)

1. SWITCH OFF ALL THE ELECTRICAL SUPPLIES.
2. REMOVE FRONT COVER & TOP COVER ASSEMBLIES FOR CLEAR VIEW OF BALL SCREW ASSY.(Z-AXIS)
3. FOR CHECKING THE PLAY IN BALL SCREW (Z-AXIS) LOOSE 2 MOUNTING SCREW OF SPINDLE MOUNTING BKT. USING 5 MM ALLEN KEY.
4. FOR SETTING THE PLAY ,HOLD BEARING NUT THROUGH LOCKING SCREW USING 2 MM ALLEN KEY (AS SHOWN IN FIG.) FOR STOPPING BEARING NUT SHOWN UNDER THE PULLEY.
5. ROTATE THE PULLEY TO THE RIGHT SIDE FOR REDUCING THE PLAY OF BALL SCREW.
6. CHECK THE PLAY IN BALL SCREW BY SPINDLE MOUNTING BKT. BY PUSHING UP & DOWN.
7. IF THERE IS NO PLAY THAN LOCK BEARING NUT THROUGH LOCKING SCREW .
8. TIGHT BOTH THE MOUNTING SCREW .
9. ASSEMBLE BACK THE FRONT COVER & TOP COVER ASSEMBLIES.

DOC. NO. : 440-001
DATE : 20.01.17
SHEET NO. 5

TROUBLESHOOTING

Contents

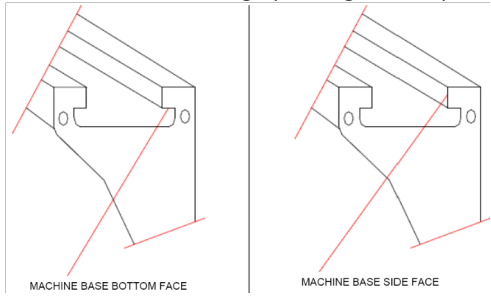
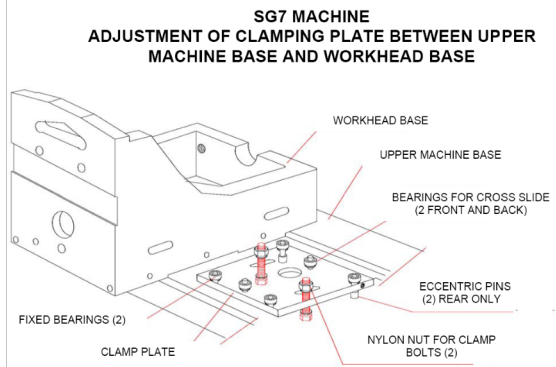
Workhead Base Does Not Float	3-2
Eccentricity Problems When Cutting Three Angle Seats	3-3
Icon On Screen Does Not Move To Area Touched.	3-4

For further assistance in troubleshooting:

Please visit the service tab of our web page at Send a Service Request www.rottermfg.com or contact the Rottler Factory Service at service@rottermfg.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

Problem	Possible Cause	Solution
<p>Workhead Base Does Not Float</p>	<p>Insufficient air pressure</p>	<p>Set air pressure of supplied line should be minimum 85 PSI (6 Bars)</p>
	<p>Clamping plate does not drop when unclamped due to less clearance between upper floating base and ball bearings mounted on clamping plate</p>	<p>Take the workhead to one end of the of the upper floating surfaces (Left or Right side) float the workhead and pull it against the front on the T Slatted guide surfaces, then loose the set screws of the eccentric pin to increase clearance by using a feeler gage of 0.008" to 0.010" (0.20mm to 0.25mm) in between the T slotted guide surfaces of the upper base and the eccentric ball bearing; (see fig. below)</p>  <p>MACHINE BASE BOTTOM FACE MACHINE BASE SIDE FACE</p> <p>Lock the setscrews, remove the feeler gage and inspect if is with the tolerance across the all surfaces. Repeat if it is necessary.</p>
	<p>Clamping plate does not drop when unclamped due to the improper adjustment of the four clamping bolts</p>	<p>Adjust nylock nuts to set he correct clearance between the bottom side face of the locking T-Slot of the floating base (Riser) and the top part of the clamping plate. They are two on the SG7. The dropping clearance when is on the floating mode should be 0.015" (0.38mm)on all the four corners of the workhead clamping plate</p>  <p>SG7 MACHINE ADJUSTMENT OF CLAMPING PLATE BETWEEN UPPER MACHINE BASE AND WORKHEAD BASE</p> <p>WORKHEAD BASE UPPER MACHINE BASE BEARINGS FOR CROSS SLIDE (2 FRONT AND BACK) ECCENTRIC PINS (2) REAR ONLY NYLON NUT FOR CLAMP BOLTS (2) CLAMP PLATE FIXED BEARINGS (2)</p>

Problem	Possible Cause	Solution
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Eccentricity Problems When Cutting Three Angle Seats	Machine is not level	Level machine per instructions in Installation section of this manual
	Workhead is not floating smoothly	Be sure that the work head and main base are clean and floating smoothly side by side and front to back
	Spindle floated to improper center location	Reposition workhead to ensure proper alignment
	Improper setup procedure	<p>The centering switch that is located on the left side of the front panel needs to be on the centering position at the time of centering and machining the valve seat. The Spherical pneumatic switch needs to be on the OFF position and the pilot into the valve guide until reach the proper height or the cutting insert is a few thousands from the valve seat face. Let Workhead flow for few seconds to achieve maximum alignment over the pilot. Be sure there's no contact with the Workhead to allow spindle to stabilize and Cutter to center itself on the valve guide. Release Foot Pedal.</p> <p>Note: Spherical Pneumatic switch should be on the OFF position all the time that you are machining the valve seat; this will give you a positive live centering.</p>
	Toolholder cone dirty	The toolholder cone must be clean before is attached to the spindle and also be sure that the inner spindle cone is clean
	Excessive pressure when cutting seat	Use less pressure when cutting the seat
	Incorrect spindle speed	Adjust spindle speed
	Worn or improperly selected pilot	Check pilot for wear and straightness
	Dull or damaged cutter insert	Replace insert
	Incorrect pilot selection	Follow directions in manual for selecting pilots
	Worn tool holder	Check tool holder with bore gauge to determine if there wear
Worn valve guide	Service valve guides before attempting to cut valve seats	

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.

MACHINE PARTS

Contents

Machine Parts	4-1
Consumable Parts	4-1
Carbide Inserts	4-2
Special Profiles	4-2
Carbide Pilots	4-2
Machine Parts	4-3
Base Table and Riser Assembly	4-3
Base Assembly	4-7
Spindle Assembly	4-10
Transmission Assembly.....	4-14
Head Support Assembly	4-16
Solenoid Valves	4-20
Pneumatic Circuit Diagram	4-21
Pneumatic Circuit Parts	4-22
RBHAR1KIT Repair Kit for RBHAR1	4-23
RBHAR40UPCKIT Repair Kit for RBHAR40UPT	4-24
Air Line Diagram	4-25

Machine Parts

Consumable Parts

REFERENCE	DESCRIPTION
SLEEVE R1	Spindle adapter replacement sleeve
BSW002	Diamond Wheel Cutting Bit Sharpener replacement Wheel (3.000" Diameter OD by .375" ID)
PRW600PIN	Replaceable Pins for PRW600 Pilot Removable wrench tool
PRW375PIN	Replaceable Pins for PRW375 Pilot Removable wrench tool
PRW20PIN	Replaceable Pins for PRW375 Pilot Removable wrench tool
VT-FP1562	Replacement Foam Pad for Round Vacuum Pad 1.562" diameter
VT-FP1875	Replacement Foam Pad for Round Vacuum Pad 1.875" diameter
VT-FP2125	Replacement Foam Pad for Round Vacuum Pad 2.125" diameter
VT-FP3125	Replacement Foam Pad for Round Vacuum Pad 3.125" diameter
VT-FP25X22	Replacement Foam Pad for Square Vacuum Pad 2.500" x 2.250" square
VT-FP31X20	Replacement Foam Pad for Square Vacuum Pad 3.125" x 2.000" square
VT-FP33X27	Replacement Foam Pad for Square Vacuum Pad 3.375"x 2.750" square
511-29-12F	T7 Torx driver for 1/4" insert (straight angle insert holders only)
511-29-12E	TORX SCREW M2.5 X 0.45 X (straight angle insert holders only)
T8S	T8 Torx Tip Holding Screws
T15S	T15 Torx Tip Holding Screws
MHS-375	Fixed Double Replaceable Insert Milling Head Screws for Large diameter milling Head (3/8" insert)
MHS-250	Fixed Double Replaceable Insert Milling Head Screws for Small diameter milling Head (1/4" insert)
S1032-250	BH375R1 and BH600R1 Tip Holder Looking Screw (10/32" X 1/4") Req. 2
S250-28-250	BH375WR1 Tip Holder Looking Screw 1/4"-28" X 1/4" Req. 2
S1032-437	TH1999 Adjusting Screw (10/32" X 7/16")
S1032-375	TH2000 Adjusting Screw (10/32" X 3/8")
S1032-500	TH2001 Adjusting Screw (10/32" X 1/2")
S1032-625	TH2002 Adjusting Screw (10/32" X 5/8")
S600-1570	TH2003 Adjusting Screw (6.00mm X 15.70mm)
S600-2015	TH2004 Adjusting Screw (6.00mm X 20.15mm)
M10X15X35	SG7 Rollover Fixture Hold down swivel Handle Zinc Handle 35mm (1.375") Long stud (KHF-725)
500-13X2	SG9MTS Rollover Fixture Hold down swivel Handle Zinc Handle 2.000" Long stud (KHF-162)
500-13X1375	SG7- SG9MTS Rollover Fixture Lock swivel Handle Zinc Handle 1.375" Long stud (KHF-158)

ICC003	Insert, Indexable carbide, for Fixed milling heads - large size - for 1.562" and larger cutters
ICC002	Insert, Indexable, carbide, for Fixed milling heads - small size - for 1.250" to 1.500" cutters

Carbide Inserts

See Carbide Insert Catalog for a complete list of Insert Profiles available from Rottler Manufacturing.

Special Profiles

Special Profile Cutter Inserts can be manufactured to your exact specifications and can include a combination of angles and radius blends.

There is three different style insert blanks.

A - Style Blank insert, RCA is a small insert for all standard applications.

B - Style Blank insert, RCB in design for long profiles like High Performances profiles with multi angles o Radius or other special applications

C - Style Blank insert, RCC is a much thicker insert for Heavy Duty tooling and can be use for hard seat materials (will work only on the Large Inserts holders series 3000 style insert holders, for the 20.00mm tooling)

Special Order - Special Profile Carbide Cutter Bits are generally considered to be "Customer Proprietary". These are uniquely numbered, exclusively for the ordering customer; prices will vary depending on quantities and additional charge for initial run.

Call us for a quote.

RT312 Insert, triangular positive rake, 3/8 1/32" (.787mm) radius, for the TH3000 series insert holder and RT212 Insert, triangular positive rake, 1/4" (6.35mm) 1/32 " radius for the TH2000 series, for hard seat materials applications (Counterboring and straight angles only)

Carbide Pilots

See Carbide Pilot catalog for a complete list of Pilots available.

Rottler Solid Fixed Carbide Pilots are manufactured from fine grain sintered tungsten carbide and are ground to a very high degree of accuracy, straightness and surface finish - designed for a life time of precision machining!

The part number of the pilot represents the actual diameter in metric of the straight/parallel part of the pilot where the pilot fits into the valve guide.

For example:

UCP0700 means that the diameter of the part of the pilot that goes into the valve guide is 7.00mm (0.2756")

UCP1270 means that the diameter of the part of the pilot that goes into the valve guide is 12.70mm (0.5000")

Pilots are available in increments of .01mm (0.0004"). Normally, a small amount of clearance approx .01mm (0.0004") is required between the pilot and the valve guide.

Most new valve guides are manufactured to a nominal size and the valve stem diameters are manufactured to be smaller than the nominal size to allow clearance for heat expansion of the valve stem when the engine is operating. For example: a 7mm valve guide has an internal diameter of exactly 7.00mm (.2756") The valve stem diameter of the intake valve is 6.98mm (.2748") and the exhaust is 6.96mm (.2740"). In order for the pilot to fit most all valve guides, the first choice could be UCP0699 to give .01mm (0.0004") clearance. If the valve guide is used and has some wear, then the second choice of pilot could be UCP0700(0.2756").

Rottler makes 3 sizes of shanks of pilots:

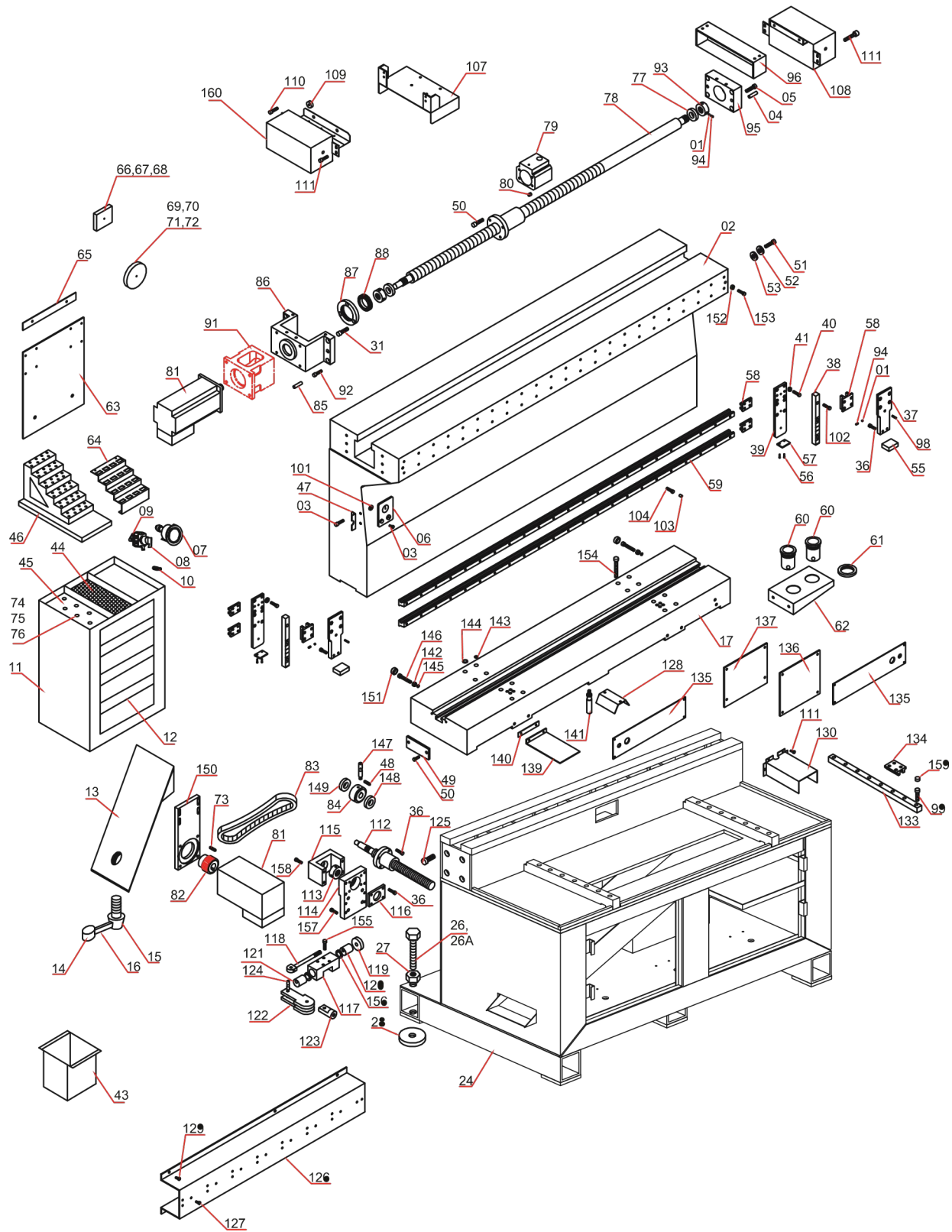
6.00mm (0.2362") for small valves guides 6mm (0.236") and below. The part number for these pilots is UCPM.

0.375" (9.52mm) for common size valve guides, 6-14mm (.236-.625"). The part number for these pilots is UCP.

20mm (0.7874mm) for large valve guides for SG8M0A machine. These pilots are made to order specifications.

Machine Parts

Base Table and Riser Assembly



S. NO.	PART NO.	DRG NO. SG-10XY	DESCRIPTION	QTY/M/C
--------	----------	--------------------	-------------	---------

1.		10 XY-101	NYLON PLUG (Ø0.150"x0.100"THK.)	6
2.	440-102	10XY-102	RISER	1
3.	430-822		BUTTON HEAD SCREW (M6x12)	6
4.			DOWEL PIN Ø8x40	2
5.			ALLEN HEAD SCREW M8x35	4
6.	033-071		PLATE	1
7.	430-830		VACCUM GAUGE 2.5" STD-B X ¼ NPT	1
8.	430-831		N-22-SW (9301)	1
9.	430-832		SV-3-M5 (6817)	1
10.	430-837		QSS-6 (153158)	1
11.	430-807		TOOL CABINET	1
12.	430-816		TOOL TRAY	4
13.	440-113	10XY-113	MOUNTING BRACKET	1
14.	430-802		KNOB (M8x25MM O.D.)	1
15.	430-817-1		CLAMP PIN	1
16.	430-823		CLAMP LEVER	1
17.	440-117	10XY-117	TABLE	1
18.	VGS-804		SPRING WASHER (M8)	4
19.	VGS-803		ALLEN HEAD SCREW (M8x30)	4
20.	430-811		PLAIN WASHER (Ø12MM)	11
21.	430-810		LOCK WASHER (Ø12MM)	14
22.	430-809		ALLEN HEAD SCREW (M12x70)	3
23.	430-812		ALLEN HEAD SCREW (M12x50)	7
24.	440-124	10XY-124	CABINET ASSY	1
25.	430-813		HEX SCREW (M12x50)	4
26.	430-818		LEVELING BOLT (M16x75)	5
26A.	430-818-1		HEX. HEAD SCREW(M16x180)	1
27.	430-818A		HEX NUT (M16)	6
28.	430-819		PAD	6
29.	430-825		HANDLE	2
30.	430-827		MAGNET BLOCK	2
31.		10 XY-131	ALLEN HEAD SCREW M6x12	7
32.				
33.				
34.				
35.				
36.		10 XY-136	ALLEN HEAD SCREW M5x16	14
37.	440-137	10XY-137	STOPPER PLATE	2
38.	440-138	10XY-138	VERTICAL SLIDE	2
39.	440-139	10XY-139	SUPPORT PLATE	2
40.		10 XY-140	ALLEN HEAD SCREW M5x30	4
41.		10 XY-141	NUT M5	4

42.				
43.	430-824		CHIP TRAY	1
44.	430-826-1		RUBBER SHEET	1
45.	430-829-1		TOOL BOARD (L.H)	1
46.	430-839-1		PILOT STAND	1
47.	033-069		SUPPORT BRACKET	1
48.		10 XY-148	KEY 3/16"x3/4"	1
49.	NC-42		STOPPER PLATE	2
50.			ALLEN HEAD SCR EW (M6x16)	8
51.			ALLEN HEAD SCREW (M10x25)	4
52.			SPRING WASHER (10MM)	4
53.			PLAIN WASHER (10MM)	4

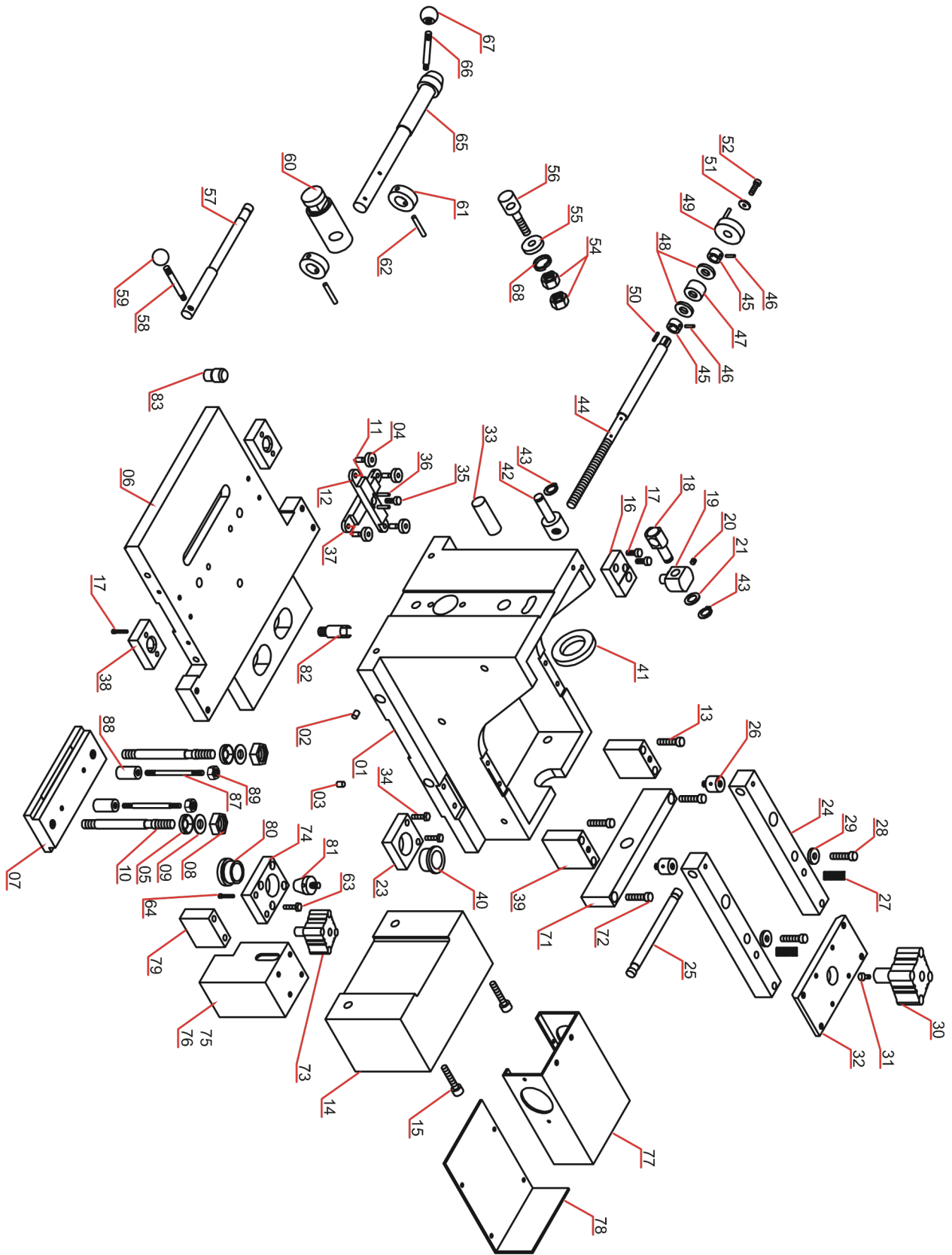
S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
54.			PLAIN WASHER (8MM)	4
55.	440-155	10XY-155	STOPPER	2
56.		10XY-156	ALLEN HEAD SCREW M3x10	4
57.	440-157	10XY-157	END STOPPER	2
58.		10XY-158	CARRIAGE	6
59.	440-159	10XY-159	RAIL SLIDE	2
60.	440-160	10XY-160	TOOL POCKET	2
61.	440-161	10XY-161	NUT	2
62.	440-162	10XY-162	TOOL POST	1
63.	430-839-2		SUPPORT PLATE	1
64.	430-839-3		RACK (INSERT HOLDER)	1
65.	430-839-4		NAME PLATE	2
66.	101A-109		VACUUM PAD	1
67.	101A-110		VACUUM PAD	1
68.	101A-111		VACUUM PAD	1
69.	101A-112		VACUUM PAD	1
70.	101A-113		VACUUM PAD	1
71.	101A-114		VACUUM PAD	1
72.	101A-115		VACUUM PAD	1
73.		10 XY-173	KEY (6X24) (MOTOR SHAFT)	1
74.	430-841		PIN (NOT SHOWN)	4
75.	430-842		PIN (NOT SHOWN)	3
76.	430-843		PIN (NOT SHOWN)	4
77.		10 XY-177	DOUBLE ROW ABNG.CON. BRG (3204A) 2RS-1	2
78.	440-178	10XY-178	BALL SCREW	1
79.	440-179	10XY-179	BRACKET BALL NUT	1
80.	440-180	10XY-180	OIL FITTING	1
81.	440-181	10XY-181	MOTOR(SERVO) (BSM-80-C-375-AB2)	2

82.	NC-11-1	10 XY-182	MOTOR PULL EY	1
83.	NC-53	10 XY-183	TIMI NG BELT (225L-075)	1
84.	440-184	10XY-184	PULLEY	1
85.		10 XY-185	DOWEL PIN Ø8x30	2
86.	440-186	10XY-186	MOTOR MTG. BRACKET	1
87.	440-187	10XY-187	CLAMP RING	1
88.	440-188	10XY-188	LOCK NUT	1
89.	----		----	---
90.	----		----	---
91.	440-191-1	10 XY-191-1	SPACING BKT.	1
92.		10 XY-192	ALLEN HEAD SCREW M8x25	4
93.	440-193	10XY-193	LOCK NUT	2
94.		10 XY-194	GRUB SCREW M5x6	6
95.	440-195	10XY-195	SUPPORT BRACKET	1
96.	440-196-1	10 XY-196-1	MTG. BKT. COVER (RH)	1
97.	----		----	---
98.	430-639		M6-BALL PLUNGER SCREW	2
99.		10 XY-199	ALLEN HEAD SCR EW M6x25	16
100.	----		----	---
101.		10 XY-1-101	PLAIN WASHER M6	4
102.		10 XY-1-102	ALLEN HEAD SCREW M4x16	6
103.		10 XY-1-103	PLUG FOR M4	46
104.		10 XY-1-104	ALLEN HEAD SCREW M4x20	46
105.	----		----	---
106.	----		----	---

S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
107.	440-189-3	10XY-1-107	MTG. BKT. (COVER L.H.)	1
108.	440-284-R	10XY-1-108	COVER	1
109.	440-285-1	10XY-1-109	SPACER	2
110.		10XY-1-110	ALLEN HEAD SCREW M5x20	2
111.		10 XY-1-111	ALLEN HEAD SCR EW M5x12	14
112.	440-166	10XY-1-112	BALL SCREWA SSY.	1
113.	440-167	10XY-1-113	LOCK NUT	2
114.	440-169	10XY-1-114	MTG. BKT. BALL SCREW	1
115.	440-170	10XY-1-115	SUPPORT BRACKET	1
116.	440-171	10XY-1-116	COVER PLATE	1
117.	440-104	10XY-1-117	CLAMP BLOCK	2
118.	440-105	10XY-1-118	PULL STUD	2
119.	440-106	10XY-1-119	SPACER	2
120.	440-107	10XY-1-120	SLIDE CLAMP	2
121.	440-108	10XY-1-121	CLAMP PAD	2
122.	440-109	10XY-1-122	CLAMP LEVER	2

123.	440-110	10XY-1-123	SINGLE KNUCKLE JOINT	2
124.	440-111	10XY-1-124	KNUCKLE PIN	4
125.		10 XY-1-125	ALLEN HEAD SCREW M8x	4
126.	440-142	10XY-1-126	AIR FITTING CHANNEL	1
127.		10 XY-1-127	ALLEN HEAD SCREW M5x	23
128.	440-128	10XY-1-128	SCREW COVER	1
129.		10 XY-1-129	ALLEN HEAD SCREW M6x12	6
130.	440-168	10XY-1-130	BALL SCREW COVER	1
131.	----		----	---
132.	----		----	---
133.	440-163	10XY-1-133	RAIL SLIDE	2
134.	440-164	10XY-1-134	CARRIAGE BLOCK & WIPER	4
135.	440-125	10XY-1-135	BACK COVER	2
136.	440-127	10XY-1-136	BACK COVER BOTTOM	1
137.	440-126	10XY-1-137	BACK COVER MIDDLE	1
138.	----		----	---
139.	440-174	10XY-1-139	FLAP GUARD	2
140.	555-401-S		CLAMP STRIP	2
141.	440-129	10XY-1-141	STOPPER ROD	1
142.		10 XY-1-142	HEX NUT M8	2
143.	440-175	10XY-1-143	PLUG SMALL	8
144.	440-176	10XY-1-144	PLUG LARGE	16
145.		10 XY-1-145	PLAIN WASHER M8	2
146.		10 XY-1-146	HEX BOLT M8x60	2
147.	440-177	10XY-1-147	OIL PIPE	1
148.		10 XY-1-148	DOUBLE ROW ANGULAR CONTACT BEARING (3203)	1
149.		10 XY-1-149	BALL BEARING (6201)	1
150.	440-165	10XY-1-150	MOTOR PLATE	1
151.	440-130	10XY-1-151	STOPPER PAD	2
152.		10 XY-1-152	NUT M6	2
153.		10 XY-1-153	ALLEN HEAD SCREW M6x35	2
154.		10 XY-1-154	ALLEN HEAD SCREW M6x60	8
155.		10 XY-1-155	ALLEN HEAD SCREW M5x55	8
156.		10 XY-1-156	O-RING	4
157.		10 XY-1-157	ALLEN HEAD SCREW M8x16	4
158.		10 XY-1-158	ALLEN HEAD SCREW M6x55	4
159.		10 XY-1-159	PLUG	16
160.	440-284-L	10 XY-1-160	COVER	1

Base Assembly



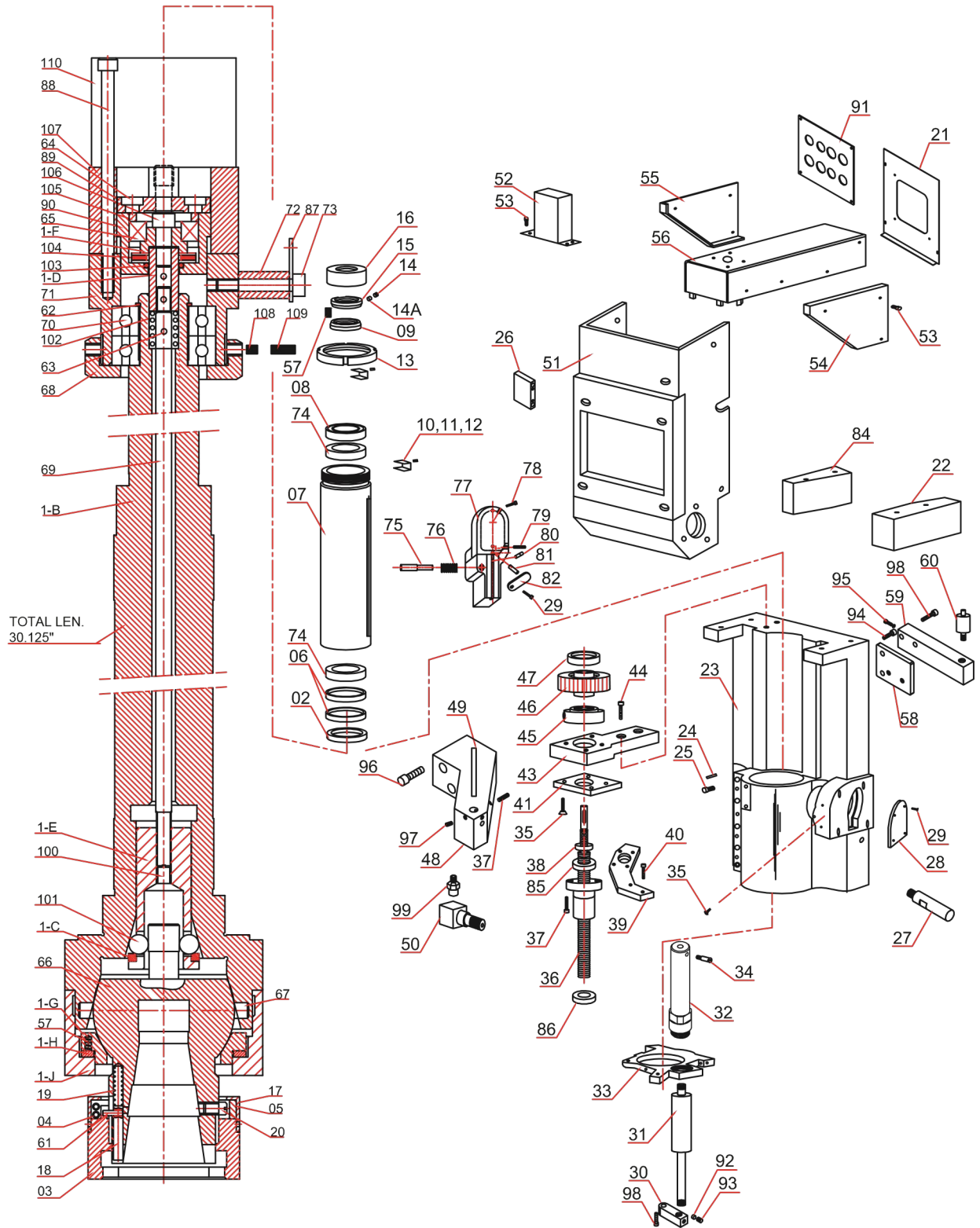
S.NO.	PART NO.	DRG. NO. SG-10XY	DRG.NO. 044(LOCAL)	DESCRIPTION	QTY/M/C
1	440-201	10XY-201		BASE	1
2	VGS-512			PLUG G 1/8" (3568)	4
3	VGS-513			PLUG (BRASS)	26
4	VGS-505			BALL BRG. (626)6 x19x6	4
5	NC-112-I			SPHERICALWASHER	2
6	440-206	10XY-206		BASE PLATE	1
7	440-207	10XY-207		CLAMP PLATE	1
8		10XY-208		NYLOCK NUT M12	2
9	NC-112-II			SPHERICAL WASHER	2
10	440-210	10XY-210		STUD	2
11	430-504-1			PIN	4
12	440-212	10XY-212		CROSS SLIDE	1
13				ALLEN HEAD SCREW (M6x50)	4
14	430-518-1			WEIGHT	1
15	430-519			ALLEN HD. SCREW (M12x90)	2
16	430-521			SWIVALING BLOCK	1
17				ALLEN HD. SCREW (M6x16)	6
18	NC-26	10XY-07		SWIVALING PIN	1
19	430-522			PIN HOLDER	1
20				GRUB SCREW (M6x8)	1
21	NC-27	10XY-08		WASHER	1
22					
23	440-223	10XY-223		LOCATING PLATE	2
24	440-224	10XY-224		CLAMP ARM	2
25	NC-110			CLAMP ARM TIE ROD	1
26	NC-111			SETTING BOLT	2
27	282580			SPRING (1.25x12x9x41)	2
28				ALLEN HEAD BOLT(M6x70)	2
29				PLAIN WASHER (Ø6)	2
30	536363			PNUMATIC CYL. (ADN-80-10-I-P-A)	1
31	NC-114-1			CYL. PAD	1
32	NC-108-1			CYL. MOUNTING PLATE	1
33	430-629-2			PIVOT PIN	1
34		10XY-234		HEX. BOLT M8x30	4
35		10XY-235		ALLEN HEAD SCREW M6x16	1
36	440-236	10XY-236		DOWEL PIN (Ø0.157"x0.750")	2
37	440-237	10XY-237		LOCATING FLAT	1
38	440-238	10XY-238		LOCATING PAD	2
39	NC-136			SUPPORT BLOCK	2

40	440-240	10XY-240		TAPER BUSH	2
41	430-520		044-L-241	SPACER	1
42	430-523			ADJUSTING NUT	1
43	430-524			EXT. CIRCLIP (½")	2
44	440-244	10XY-244		INCLINATION ROD	1
45	430-548			RETAINING RING	2
46	430-549			SPRING PIN 1/8"x 3/4"	2
47	430-551			NEEDLE BEARING (HK 1210)	1
48	430-550			THRUST BEARING(12x26x4)	2
49	440-249	10XY-249		HAND WHEEL (GN-321-80K12D)	1
50		10XY-250		KEY (4x4x12)	1
51	440-251	10XY-251		WASHER	1
52		10XY-252		ALLEN HEAD SCREW M4x12	1
53					
54			044-L-254	HEX. NUT (M10)	2

S.NO.	PART NO.	DRG. NO. SG-10XY	DRG.NO. 044(LOCAL)	DESCRIPTION	QTY/M/C
55	VGS-640-1		044-L-255	WASHER	1
56	430-670		044-L-256	EYE BOLT	1
57	NC-35			ECC. CLAM P	1
58	NC-39		044-L-258	LEVER PIN	1
59	430-802			KNOB (M8x25)	1
60	430-629 -1		044-L-260	CLAM P PIN	1
61	430-510		044-L-261	ECC. COLLAR	2
62	430-552		044-L-262	TAPER PIN	2
63		10XY-263		ALLEN HEAD SCREW M6x20	8
64		10XY-264		ALLEN HEAD SCREW M8X70	4
65	NC-34			CLAM P	1
66	430-516		044-L-266	LEVER	1
67	430-517		044-L-267	KNOB (M8x50)	1
68			044-L-268	SPRING WASHER (Ø10MM)	1
69					
70					
71	NC-115-1			PIVOT SUPPORT	1
72				ALLEN HEAD SCREW (M8x40)	2
73	SMC	10XY-273		AIR CYLINDER (40x15)	2
74	440-274	10XY-274		CYL. MTG. PLATE	2
75	440-275	10XY-275		CYL. COVER L.H.	1
76	440-276	10XY-276		CYL. COVER R.H.	1
77	NC-44	10XY-10		CABLE TRAY	1

78	NC-45	10XY-11		TRAY COVER	1
79	440-279	10XY-279		SUPPORT PLATE	2
80	440-280	10XY-280		GUIDE BUSH	2
81	440-281	10XY-281		CENTERING CONE	2
82	440-282	10XY-282		STOPPER PIN	1
83	440-283	10XY-283		PIN	1
84					
85					
86	440-286	10XY-286		DOG CARRIER(1 PC FOR TESTING ONLY) (NOT SHOWN)	1
87	440-287	10XY-287		STUD	2
88	440-288	10XY-2 88		SPACER	2
89	440-289	10XY-2 89		NYLOCK NUT (M6)	2

Spindle Assembly



S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
1-A	NC-151-00		DRIVE SHAFT COMP. ENCLOSED	1

1-B	NC-151-C	10XY-301	DRIVE SHAFT ASSY.	1
1-C	NCL-71-S		SPACER	1
1-D	NCL-72-1		ROTATING PIN	1
1-E	NCL-74-1		PLUNGER	1
1-F	NCL-72-2		BEARING HOLDER	1
1-G	NCL-77		LOWER CONE	1
1-H	NCL-78		SPACER	1
1-J	FH-079-S		SPHERE CAP	1
2	430-671		RUBBER SEAL (50x70x10)	1
3	KS-08-07		QUICK NUT	1
4	KS-08-03		SPRING	2
5	KS-08-02		PAD	2
6	430-659-1		ANG. CONT. (PAIR) BRG. (40x68x30)	1
7	NC-43	10 XY-307	COLUMN	1
8	430-648-1		ANG. CONT. BEARING (40x68x15)	1
9	430-605-1		SPACER	1
10	NC-32		BRASS PAD	2
11	430-623A		C.PT. GRUB SCREW (M5x16)	2
12	430-623B		F.PT GRUB SCR.(M5x6)	2
13	NC-33		STOP PLATE LOCK NUT	1
14	430-603A		GRUB SCREW (M6x6)	2
14A	430-603B		PLUG	2
15	430-603		LOCK NUT	1
16	430-601		END STOPPER	1
17	KS-08-06		COVER	1
18	KS-08-05		PIN	1
19	KS-08-04		SPRING	1
20	KS-08-01		STOP PIN	1
21	440-321	10XY-321	BACK COVER	1
22	NC-16-1	10 XY-322	EXT. BLOCK (RIGHT)	1
23	NC-15-1	10 XY-323	SPINDLE HOUSNI G	1
24	430-627		GRUB SCR. D.PT. (M8x25)	4
25	430-609		ALLEN HEAD SCR EW (M8x30)	4
26	440-326	10XY-326	SPACING FLAT L.H	1
27	440-327	10XY-327	COVER STIFFNER	1
28	430-668-1	10 XY-328	COVER PLATE	1
29	430-666		BUTTON HEAD SCREW (M5x10)	5
30	430-712 R	10 XY-330	HOLDER	1
31	430-714-R		GAS SPRING (150N)	1
32	NC-147		TUBE	1
33	NC-7	10 XY-333	PLATE	1
34	NC-173		PIVOT PIN	1

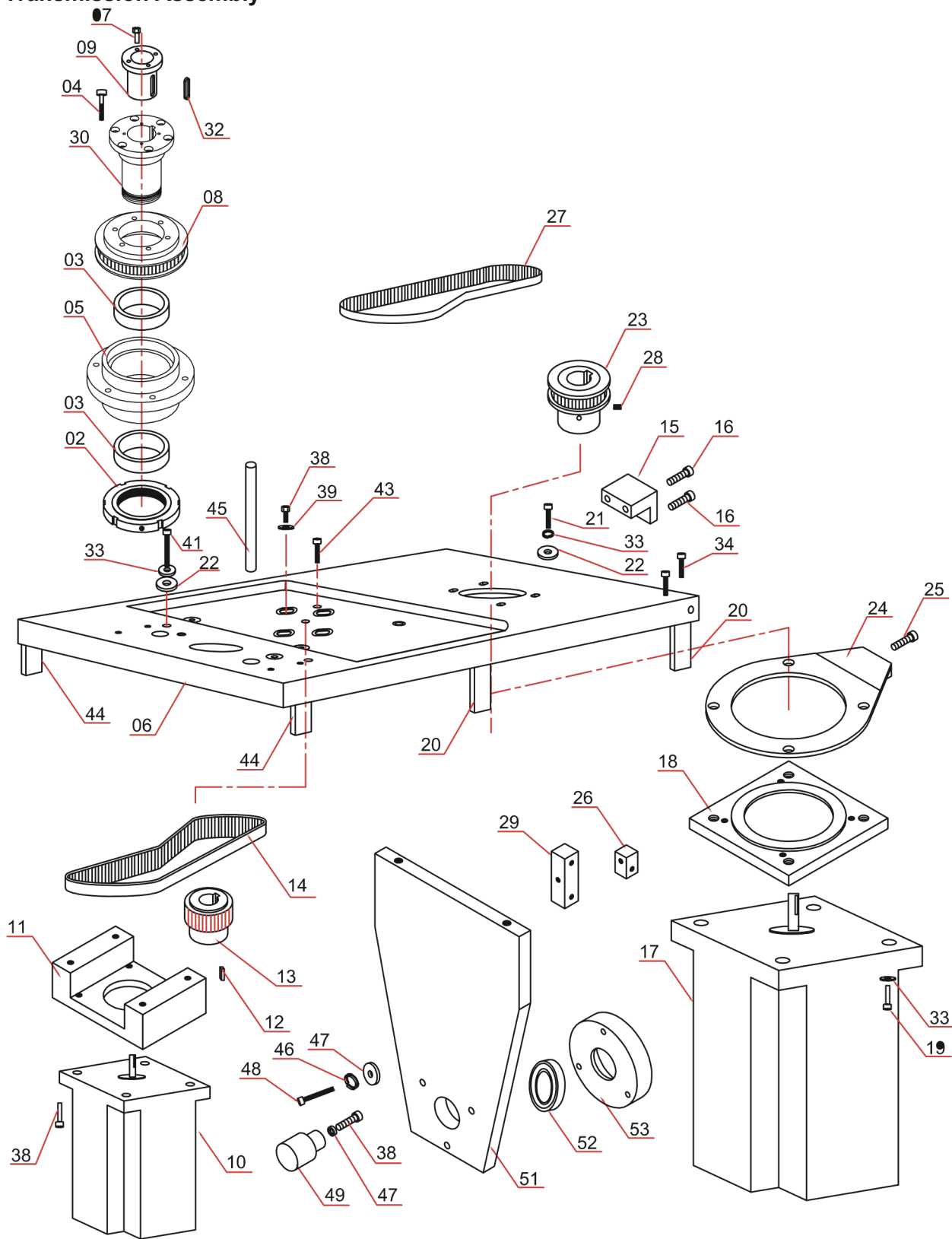
35			C' SINK SCREW (M5x12)	6
36	NC-1A,NC-2A	10 XY-336	BALL SCREWA SSEMBLY.	1
37		10 XY-337	ALLEN HEAD SCREW (M5x20)	5
38		10 XY-338	ANG. CONT. BRG. (7201) (12x32x20)	PAIR
39	NC-3-A		BRACKET BALL NUT	1
40		10 XY-340	ALLEN HEAD SCREW (M6x25)	2
41	NC-9	10 XY-341	COVER PLATE	1
42				
43	NC-8-1	10XY-343	SUPPORT BRACKET	1
44		10 XY-344	ALLEN HEAD SCREW (M8x40)	2
45	NC-10	10 XY-345	NUT	1
46	NC-12	10 XY-346	PULLEY (FEED)	1
47		10 XY-347	BALL BRG. (6000-2RS-1) (10x26x8)	1

S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
48	NC-37		PLATE (LEVELING PIN)	1
49	430-616		LEVELING PIN	1
50	NC-2A-2	10XY-350	OIL FITTING (FOR BALL SCREW)	1
51	440-351	10XY-351	FRONT COVER ASSY.	1
52	NCL-81-2		CYLINDER COVER	1
53			BUTTON HEAD SCREW (M5x12)	31
54	440-354	10XY-354	RIGHT SIDE COVER	1
55	440-355	10XY-355	LEFT SIDE COVER	1
56	NC-49	10XY-356	TOP COVER	1
57			SPRING(5203-3)	7
58	NC-103	10XY-358	OIL PUMP MTG. BKT.	1
59	055A-337		LUB. FEEDER	1
60		10XY-360	OIL PUMP	1
61			ROLL PIN DIA. 0.093"x0.312"	1
62			EXT. CIRCLIP (DIA.20MM)	1
63			PIN (DIA. 0.093")	1
64			ALLEN HEAD SCREW (M5x12)	4
65			BALL BEARING (6001-2RS-1)	1
66	NCL-76-1		DRIVE ADAPTOR	1
67			PIN (DIA.0.250"x0.750"LONG)	2
68	NCL-70-2		CLAMP NUT	1
69	NCL-73-S		TIE ROD	1
70			BEARING (20x42x12) 600-42Z	2
71	NCL-70-1		BEARING HOUSING	1
72	NC-93		STOPPER	1
73			ALLEN HEAD SCREW (M10x55)	1
74	NC-150		SPACER	2
75	430-1026		CLAMP PIN	1

76	430-1026-1		SPRING	1
77	430-1049 B		LEVEL BLOCK	1
78			ALLEN HEAD SCREW (M3 x 12)	2
79			DOWEL PIN (Ø3/16 x 3/4 LONG)	1
80	430-1049C		SLIDE PIN	1
81			GRUB SCREW (M5 x 16)	1
82	430-1025		CLAMP	1
83				
84	NC-13-1	10XY-384	EXT. BLOCK (LEFT)	1
85	NC-31	10XY-385	SPACER	1
86	NC-50	10XY-386	STOPPER	1
87	NCL-97		CABLE BRACKET	1
88			SCREW (M5x95)	4
89	NC-141		SUPPORT PLATE	1
90	NC-140		BEARING HOUSING	1
91	440-391	10XY-387	NAME PLATE	1
92			NYLON PLUG M5	1
93			GRUB SCREW M5x5	1
94		10XY-394	ALLEN HEAD SCREW M6x16	2
95		10XY-395,395-1	PLAIN WASHER & PLUG (3843)	1 EACH
96			ALLEN HEAD SCREW M8x45	2
97			ALLEN HEAD SCREW M5x10	3
98			ALLEN HEAD SCREW (M6x20)	3
99		10XY-399	FITTING QSM 153304	1
100			GRUB SCREW (M6x8)	1
101			BALL 5/16	4
102			SPRING (033-KIT)	1
103	NC-145		O-RING	1

S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
104	NC-144		THRUST BEARING (12x26x4)	1
105	NC-142		SPACER	1
106			ALLEN HEAD SCREW M6x16	1
107	NC-143		SPACING BLOCK	1
108			NYLON PLUG(Ø0.140"x0.080"L)	2
109			F. PT. GRUB SCREW M5x6	2
110	536279-B008		AIR CYLINDER	1

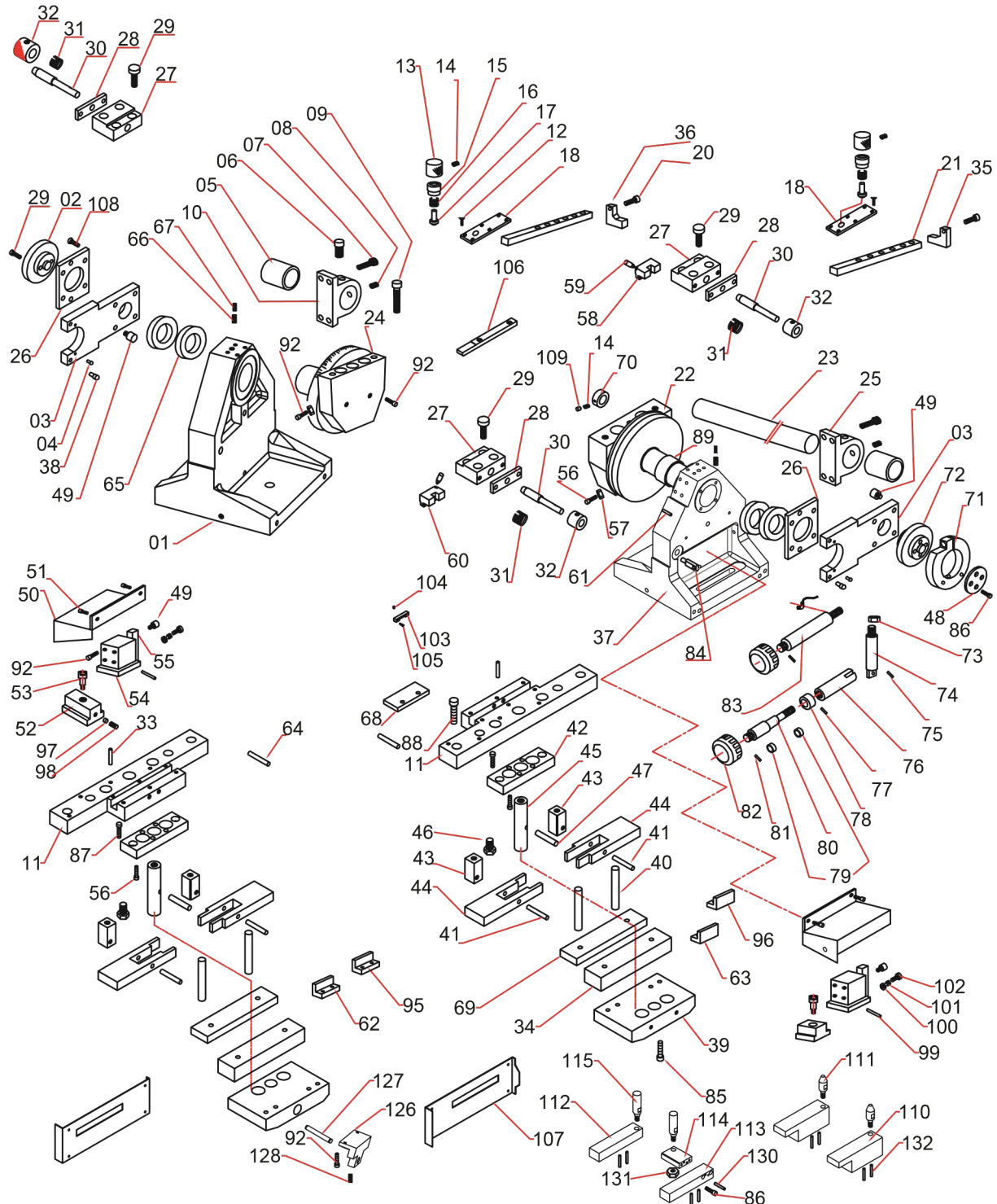
Transmission Assembly



S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
1				
2	NC-155-1		LOCK NUT	1
3			BALL BEARING (6910-2RS 1)	2
4	430-705A		ALLEN HEAD SCREW (M6x20)	4
5	NC-117-2		BEARING HOUSING	1
6	NC-14-2	10XY-42	TOP PLATE	1
7			ALLEN HEAD SCREW M4x16	4
8	445-702		SPINDLE PULLEY	1
9	430-701-1		SPLINE BUSH	1
10	NC-22	10XY-410	FEED MOTOR (BSM 80N-275 AA)	1
11	NC-4	10XY-44	MOTOR PLATE	1
12		10XY-412	KEY (FEED MOTOR)	1
13	NC-11-1	10XY-45	MOTOR PULLEY	1
14	NC-53	10XY-414	TIMING BELT (225L-075)	1
15	NC-134		BACK PLATE	1
16			ALLEN HEAD SCREW (M6x40)	2
17	NC-21	10XY-417	MOTOR (SERVON -90) (BSM 90N-3250AA)	1
18	NC-20-1	10XY-48	MOTOR PLATE (DRIVE)	1
19		10XY-419	ALLEN HEAD SCREW (M10x25)	4
20	NC-38	10XY-47	MTG. BRACKET	4
21	VGS-731		ALLEN HEAD SCREW (M3/8"x1.1/2")	4
22	VGS-732		WASHER	6
23	440-423	10XY-49	MOTOR PULLEY	1
24	NC-133		MOTOR FLANGE	1
25			ALLEN HEAD SCR EW (M8x45)	1
26	430-720		COVER SUPPORT	4
27	440-427		POLYCHAIN BELT (8M-1200-12)	1
28	VGS-753		GRUB SCREW F. PT. (M5x10)	3
29	430-720-1		SUPPORT BLOCK	2
30	NC-153		FLANGE	1
31				
32	NC-156		KEY (6MMx30)	1
33			SPRING WASHER (Ø10)	10
34			ALLEN HEAD SCR EW (M6x55)	12
35				
36				
37				
38			ALLEN HEAD SCR EW (M6x20)	9
39			PLAIN WASHER (Ø6MM)	4
40				

41		10XY-441	ALLEN HEAD SCR EW (M10x125)	4
42	430-735W		SPACER	3
43			ALLEN HEAD SCR EW (M8x55)	2
44	NC-38-1	10XY-54	MTG. BRACKET	2
45	NC-90-1	10XY-43	DOWEL PIN	2
46			SPRING WASHER (Ø8)	3
47	VGS-740		WASHER	1
48			ALLEN HEAD SCR EW (M8x35)	3
49	430-534-A		PIVOT PIN	1
50				
51	NC-152	10XY-46	SUPPORT FLAT	1
52			BALL BEARING (6206-2RS1)	1
53	430-534-B		BRG. SUPPORT	1

Head Support Assembly



S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
1	440-501	10XY-501	HEAD SUPPORT LEFT	1
2	440-502	10XY-502	END PIECE	1
3	440-503	10XY-503	CYL. MTG. FLAT.	2
4	440-504	10XY-504	THRUST PAD	4
5	430-901		BUSH	2

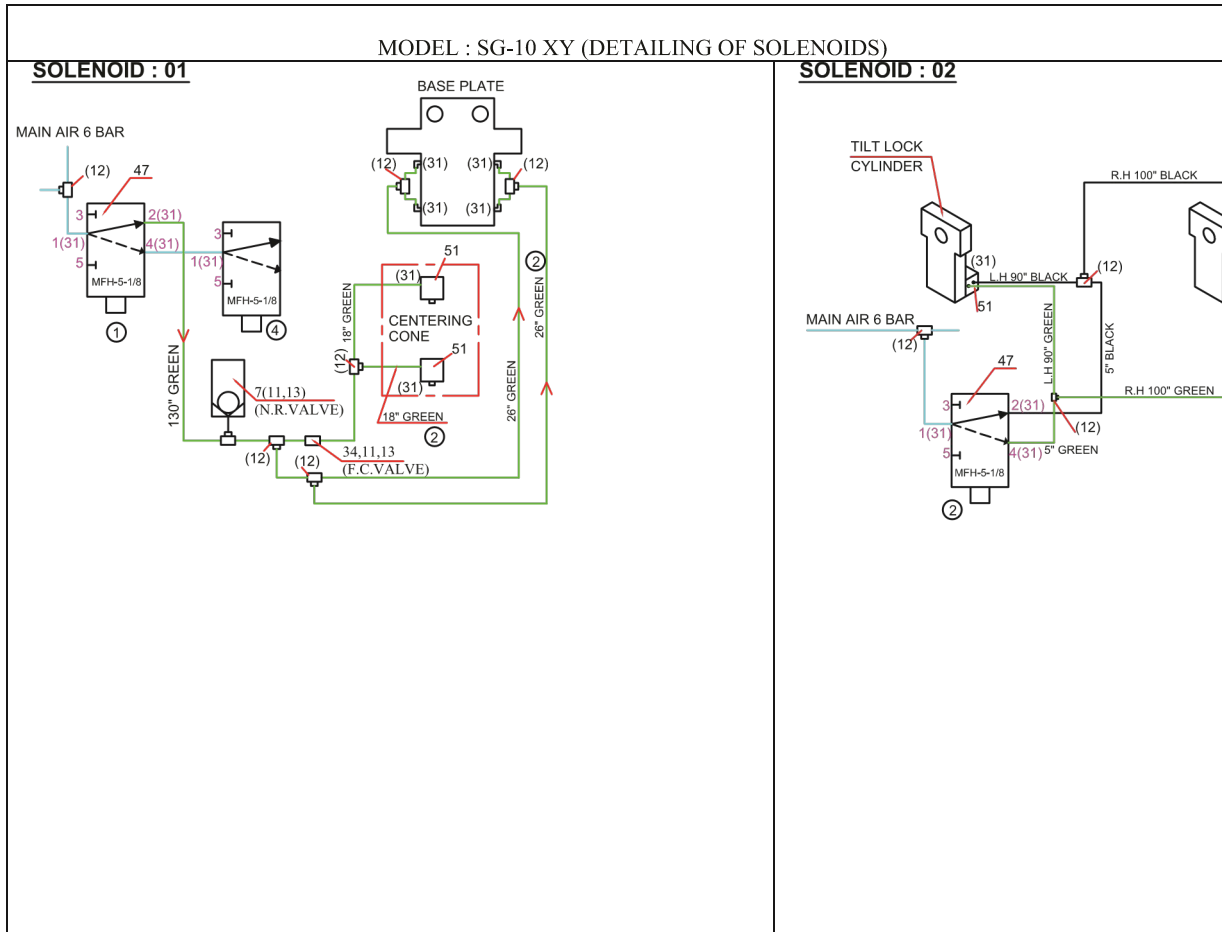
6	430-911		KNOB	1
7	430-906		ALLEN HEAD BOLT (M8x20)	8
8		10XY-508	GRUB SCREW (M8x10)	2
9	VGS-959		AL. HD. BOLT (M10x35 LONG)	4
10	430-902		BEARING BUSH LEFT	1
11	SF-149-WE		SUPPORT PLATE (L.H & R.H)	1 EACH
12	430-925		C'SINK SCREW (M5x12)	12
13	430-918		KNURLING COLLAR	2
14	430-917		GRUB SCREW (M6x6)	6
15	430-916		PIN HOLDER	2
16	430-921		SPRING (SAME AS #100-057)	2
17	430-919		PLUNGER	2
18	430-915		PLATE	2
19				
20	430-936		ALLEN HEAD SCREW (M6x20)	2
21	440-521	10XY-521	FLAT	2
22	440-522-WE		HOLDER R.H.	1
23	430-914		GUIDE ROD	1
24	440-524-WE		HOLDER L.H.	1
25	430-907		BEARING BUSH RIGHT	1
26	440-526	10XY-526	HOLDING PLATE	2
27	440-527	10XY-527	GUIDE BLOCK	3
28	440-528	10XY-528	HOLDING PLATE	3
29			AL HD. SCREW M6x20	12
30	SF-163		STOPPER PIN	3
31	SF-1641-		SPRING	3
32	SF-165		KNOB	3
33		10XY-533	DOWEL PIN (DIA.8X40)	4
34	SF-161-WE		PARALLEL FLAT	2
35	430-935-I		STOP PLATE R. H.	1
36	430-937-I		STOP PLATE L. H.	1
37	440-537	10XY-537	HEAD SUPPORT RIGHT	1
38	440-538	10XY-538	PIVOT PIN	4
39	SF-151-WE		CLAMP PLATE	2
40	SF-152-WE		GUIDE PIN	4
41	SF-153	10XY-541	PIVOT PIN	4
42	SF-154-WE		PIVOT PLATE	2
43	SF-155-WE		PIVOT BLOCK	4
44	SF-156-WE		CLAMP LEVER FRONT & REAR	2 EACH
45	SF-157-WE		CLAMP ROD	2
46	SF-158	10XY-546	CYLINDER PAD	4
47	SF-159	10XY-547	CLAMP PIN	2

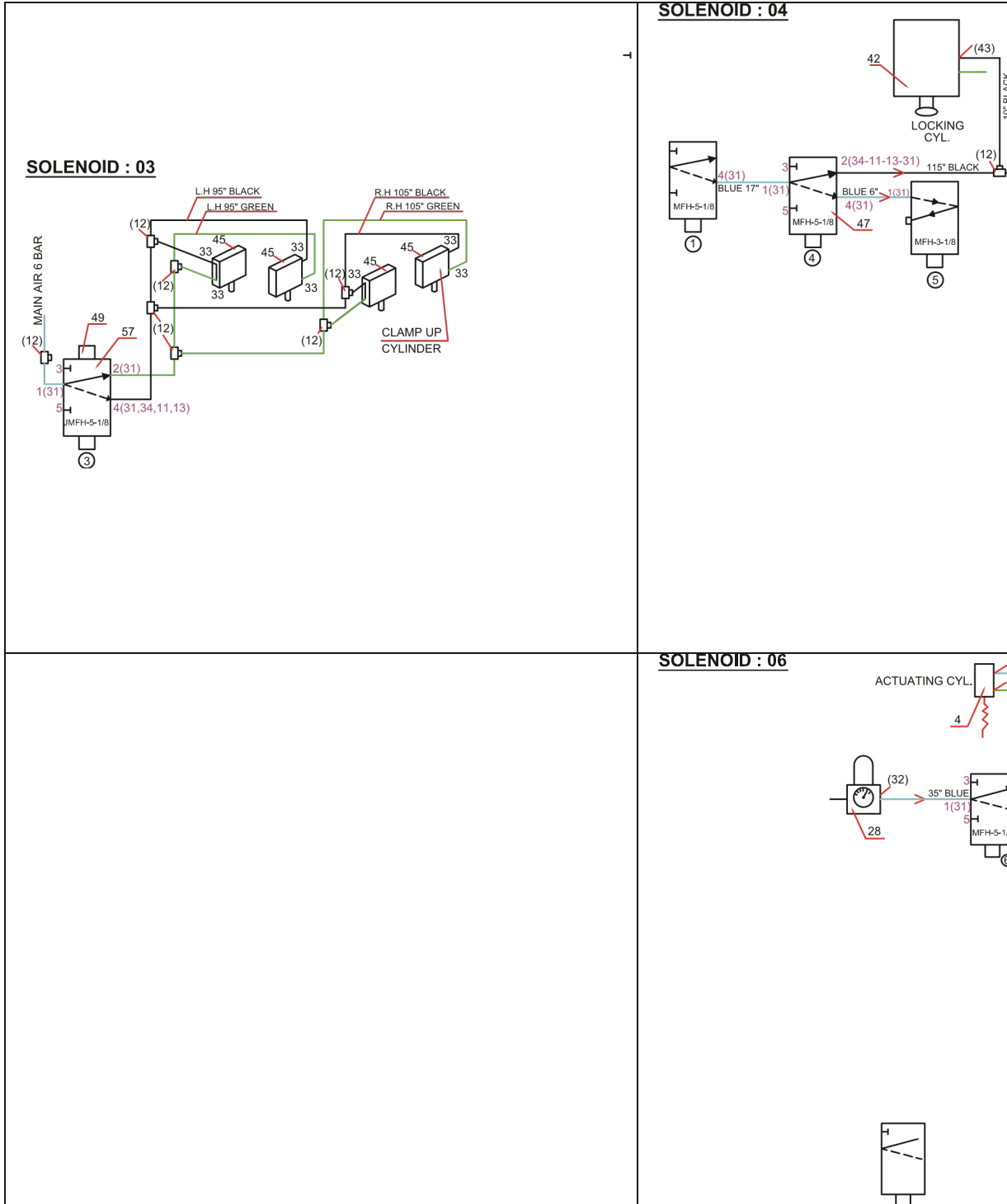
48	440-548	10XY-548	SIDE COVER	1
49	NC-52-1	10XY-549	CYL. PAD	4
50	SF-058	10XY-550	CYL. COVER LH. & RH	1 EACH
51		10XY-551	ALLEN HEAD SCREW (M5x12)	4
52	NC-065	10XY-552	T-NUT	2
53	NC-088	10XY-553	CLAMP BOLT	2
54	NC-066-W		CYL. MTG. BRACKET	2
55	NC-067	10XY-555	LEVER	2

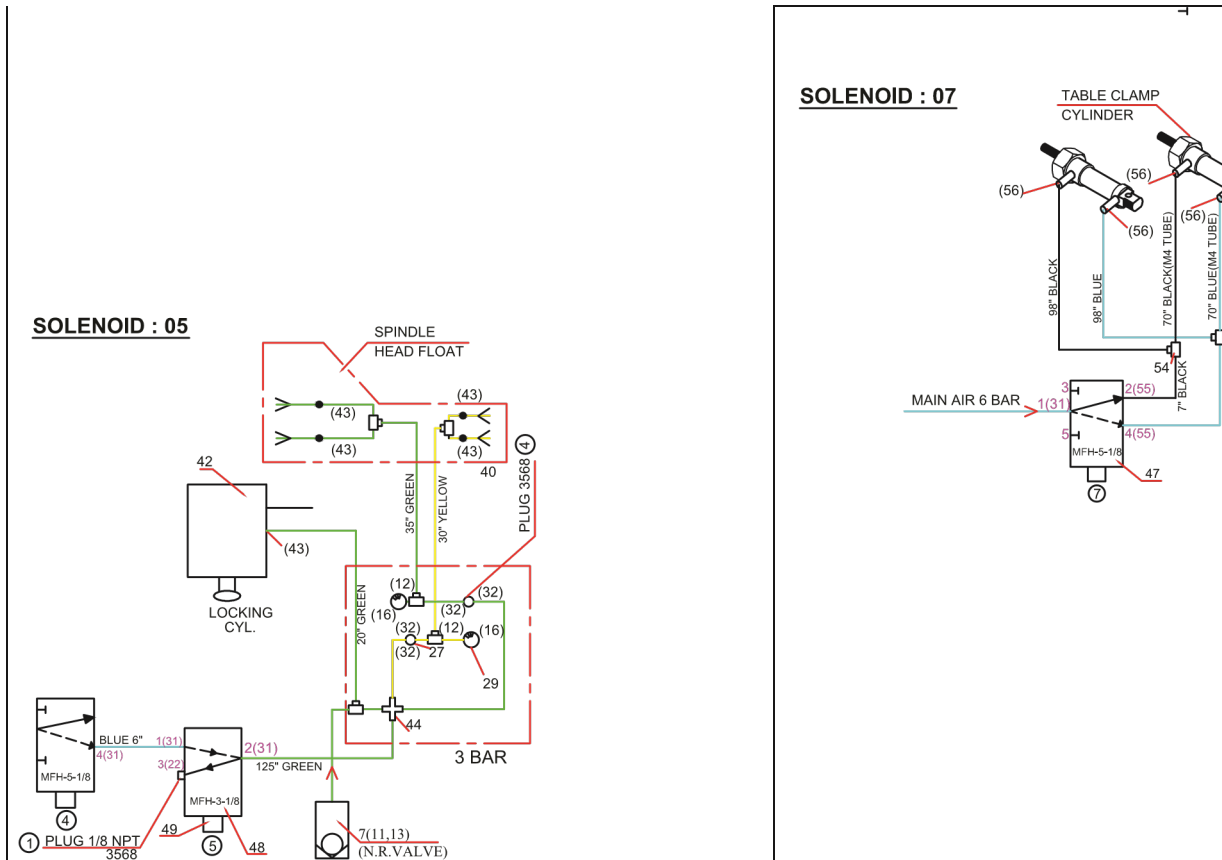
S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
56		10XY-556	ALLEN HEAD SCREW (M6x25)	18
57		10XY-557	HEX. NUT M6	4
58	440-558	10XY-558	STOPPER BLOCK UPPER	1
59	440-559	10XY-559	LOCK SCREW	2
60	440-560	10XY-560	STOPPER BLOCK FRONT	1
61	440-561	10XY-561	PIN	2
62	SF-106-A	10XY-562	NEST PLATE L.H.	1
63	SF-105-A	10XY-563	NEST PLATE R.H.	1
64	440-564	10XY-564	PIN	2
65	430-950	10XY-565	NEEDLE ROLLER BEARING	4
66	430-951-1	10XY-566	SETTING SCREW (SMALL)	2
67	430-952		GRUB SCREW M8xØ	2
68	SF-168	10XY-568	EXTENSION PLATE	2
69	SF-1604	10XY-569	PARALLEL FLAT	2
70	SF-166	10XY-570	STOP RING	4
71	430-933		COLLAR	2
72	440-572	10XY-572	END PIECE R.H.	1
73		10XY-573	NUT M10	1
74	430-929		ARM	1
75	VGS-928		PIN (1/8"x5/8")	1
76	430-927		CLAMP	1
77	430-904		ROLL PIN (1/8"x3/4")	1
78	430-548		RETAINING RING	1
79	430-550	10XY-579	THRUST BEARING (12x26x4)	2
80	430-926		ADJUSTING SCREW	1
81	430-924		PIN (1/8" x1 1/16")	2
82	430-923		KNOB	2
83	430-931		LOCK COLLAR SCREW	1
84	440-584	10XY-584	PIVOT BLOCK	1
85		10XY-585	ALLEN HEAD SCREW M10x25	2
86		10XY-586	ALLEN HEAD SCREW M6x45	6
87		10XY-587	ALLEN HEAD SCREW M8x16	4
88		10XY-588	ALLEN HEAD SCREW M8x25	8
89	430-950-1	10XY-589	INNER RING	4
90				
91				
92		10XY-592	ALLEN HEAD SCREW M6x16	18
93				
94				
95	SF-106-SP	10XY-595	NEST PLATE WIDE L.H.	1
96	SF-105-SP	10XY-596	NEST PLATE WIDE R.H.	1
97		10XY-597	BRASS PAD	2
98		10XY-598	GRUB SCREW M6xØ	2
99	NC-067-1	10XY-599	PIVOT PIN	2
100		10XY-5-100	WASHER DIA. 5MM	2
101	555-240		SPRING	2
102		10XY-5-102	ALLEN HEAD SCREW M5x40	2
103	SF-120	10XY-5-103	EXPENDING KEY	2
104	SF-126	10XY-5-104	SCREW (DOG)	2
105	SF-119	10XY-105	PIN	2
106	440-522-1WE		SIDE FLAT	2
107	SF-58WE		CYL. COVER (R.H & L.H)	1 EACH
108		10XY-5-108	CSK SCREW (M 6x16)	8
109		10XY-5-109	BRASS PLUG(DIA.0.195"x0.150")	4

S. NO.	PART NO.	DRG. NO. SG-10XY	DESCRIPTION	QTY/M/C
110	440-5110	10XY-5-110	CLAM P FLAT (L.H & R.H)	1
111	440-5111	10XY-5-111	WEDGE STOPPER	2
112	440-5112	10XY-5-112	CLAM P FLAT (L.H)	1
113	440-5113	10XY-5-113	CLAM P FLAT (R.H)	1
114	440-5114	10XY-5-114	STOPPER BKT.	1
115	440-5115	10XY-5-115	WEDGE STOPPER	2
OPTIONAL	116	440-5116	AIR CY LIND ER(AEVUZ 32-25 PA)	2
	117			
	118	440-5118	CYL. MTG. PLATE	2
	119	440-5119	SPACING BLOCK	2
	120	440-5120	BUSH	2
	121	440-5121	STOP PIN	2
	122	440-5122	PIN EXTENSION	2
	123		ALLEN HEAD SCR EW M5x100	8
	124		ALLEN HEAD SCR EW M6x25	4
	125		WASHER (M6)	4
126	SF-169	10XY-5-126	SWING BLOCK	2
127	430-949		PIVOT PIN	2
128			GRUB SCREW (M5x6)	2
129				
130		10XY-5-129	DOWEL Ø5X30	2
131		10XY-5-130	HEX NUT M12	1
132		10XY-5-131	DOWEL Ø6X35	8

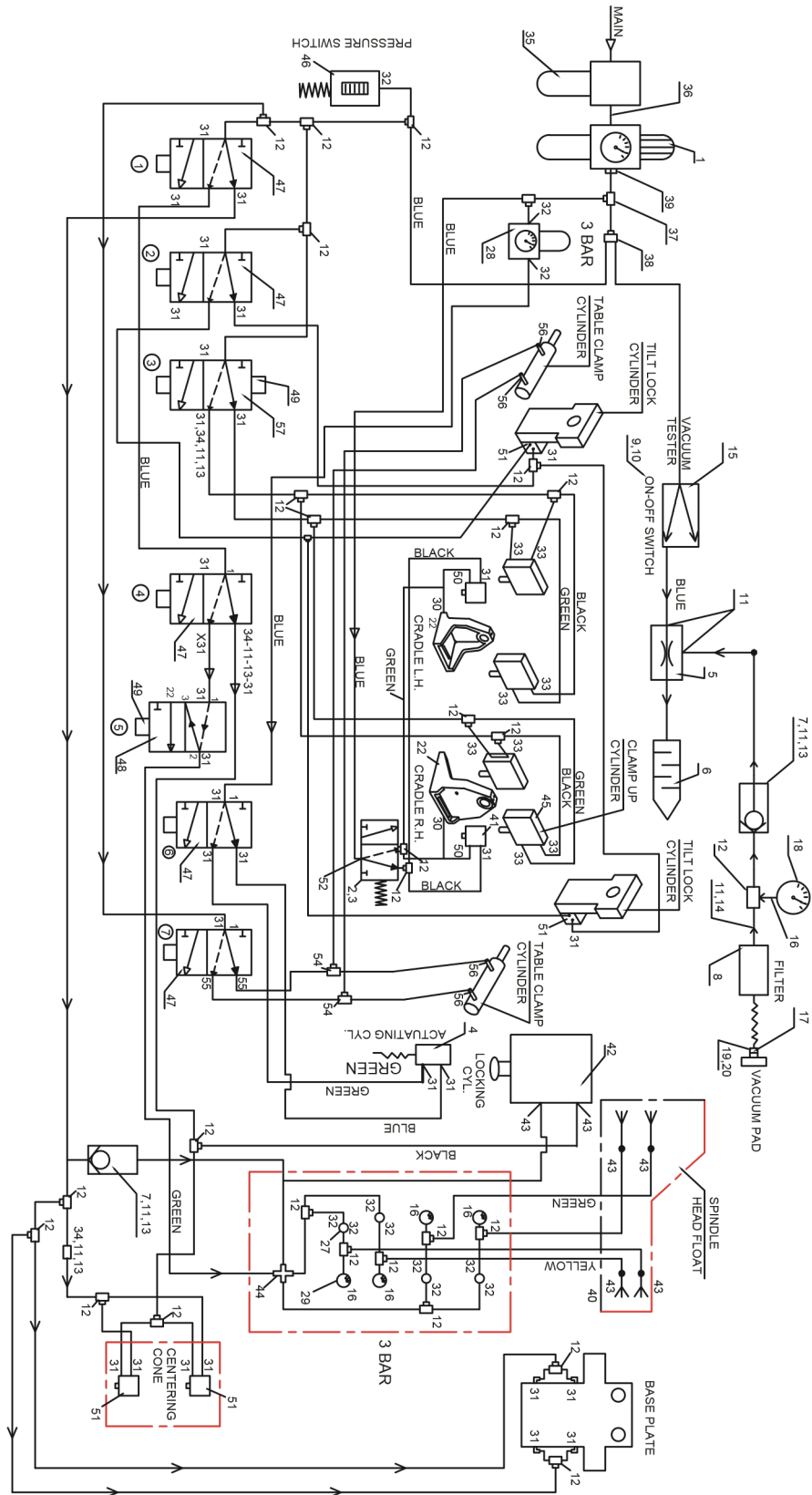
Solenoid Valves







Pneumatic Circuit Diagram



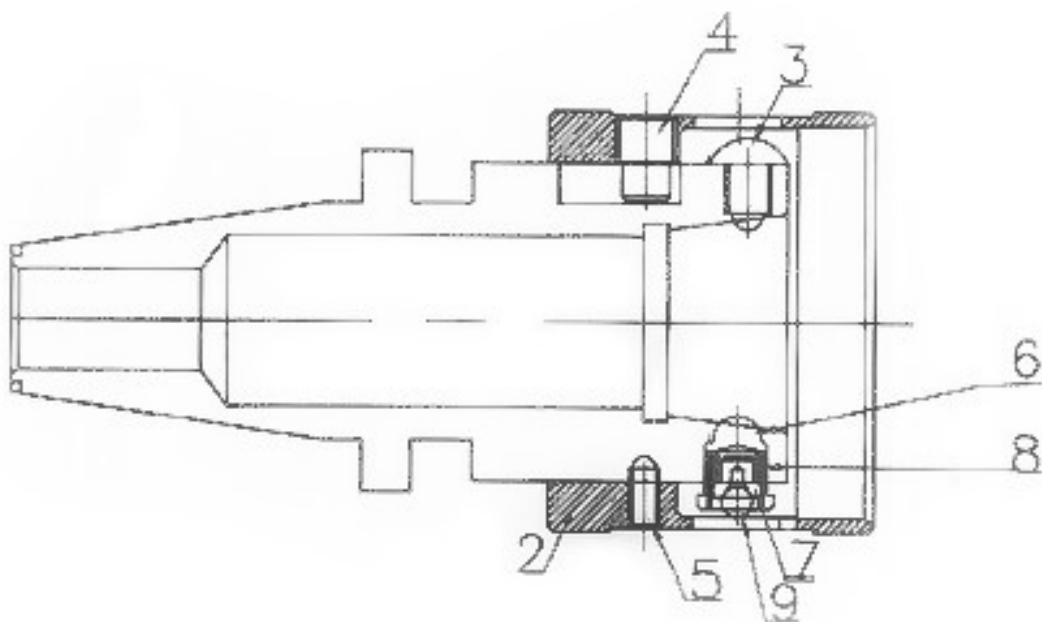
Pneumatic Circuit Parts

PART LIST	
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MACHINE TYPE: PNEUMATIC PART S				
MODEL : S G-10XY				
S. NO.	PART NO.	DESCRIPTION	QTY	REMARKS
1	162721	FILTER REGULATOR	1	LFR-3/8-D-5M-MIDI
2	11914	BASIC VALVE	1	SV-5-M5B
3	9290	PUSH BUTTON ACTUATOR	1	T-22-G
4	536279	AIR CYLINDER B 008	1	ADN 32-10-1-P-A
5	14015	VACUUM GENERATOR	1	VAD 1/8
6	2307	SILENCER	1	U-1/8
7	3324	NON RETURN VALVE	2	H-1/8 A/I
8	160239	VACUUM FILTER	1	V-AF-PK-6
9	9301	SELECTOR ACTUATER	1	N-22-S
10	6817	BASIC VALVE	1	SV-3-M5
11	153002	PUSH-IN/ THREADED FITTING	7	QS-1/8-6
12	153367	PUSH IN T CONNECTOR	28	QSMT-6
13	153023	PUSH-IN/THREADED FITTING	5	QSF-1/8-6-B
14	153165	PUSH-IN/THREADED BULK HEAD FITTING	1	QSSF-1/8-8-B
15	153306	PUSH IN/THREADED FITTING	4	QSM-M5-6
16	153024	PUSH IN/THREADED FITTING	5	QSF-1/4-6-B
17	153004	PUSH IN/THREADED FITTING	1	QS-1/8-8
18		VACUUM GAUGE	1	
19	92142110	FEMALE BODY	1	
20	90872110	MALE THREAD	7	
21		RE COIL TUBE OF 8MM OD & 3MTR LONG BLUE COLOUR WITHOUT END FITTINGS	1	
22	02851100	INT. HEX. HEAD PLUG 1/8 NTP	11	
23		TUBE 6x4 MM BLACK	16M	
24		TUBE 6x4 MM BLUE	10M	
25		TUBE 8x55 MM BLUE	2M	
26		TUBE 6x4 MM GREEN	13M	
26-1		TUBE 6x4 MM YELLOW	1M	
27	162591	PRESSURE REGLUATER	4	LR-1/4-D-MINI
28	159625	PRESSURE REGLUATER	1	LR-1/4-D-MINI
29	159596	PRESSURE GAUGE	4	FMA-40-10-1/4-EN
30	153077	PUSH IN/THREADED-L- FITTING	2	QSL-1/8-6
31	130927	PUSH IN/THREADED-L- FITTING	33	QSL-1/8-6
32	153047	PUSH IN/THREADED-L- FITTING	11	QSL-1/4-6
33	153098	ELBOW	8	QSLV-1/4-6-1
34	151165	FLOW CONTROL VALVE	3	GRLA-1/8-B
35	159576	FILTER	1	LF-3/8-D-MIDI
36	15625	DOUBLE NIPPLE	1	E-3/8-3/8-MS
37	153135	PUSH IN T CONNECTOR	1	QST-8-6
38	153154	PUSH IN Y CONNECTOR	1	QSY-8-6
39	153006	PUSH IN/THREADED FITTING	1	QS-3/8-8
40	3568	PLUG	4	1/8
41	SMC	AIR CYLINDER	2	1CQ2A 40-10 DZ
42	536363	AIR CYLINDER	1	ADN-80-10-I-P-A
43	132111	PUSH IN THREADED L-FITTING	6	SMALL
44	153380	PUSH IN X CONNECTOR	2	
45	164068	FLAT CYLINDER	4	DZF50-40-P-A
46	10773	PRESSURE SWITCH	1	PEV-1/4-B

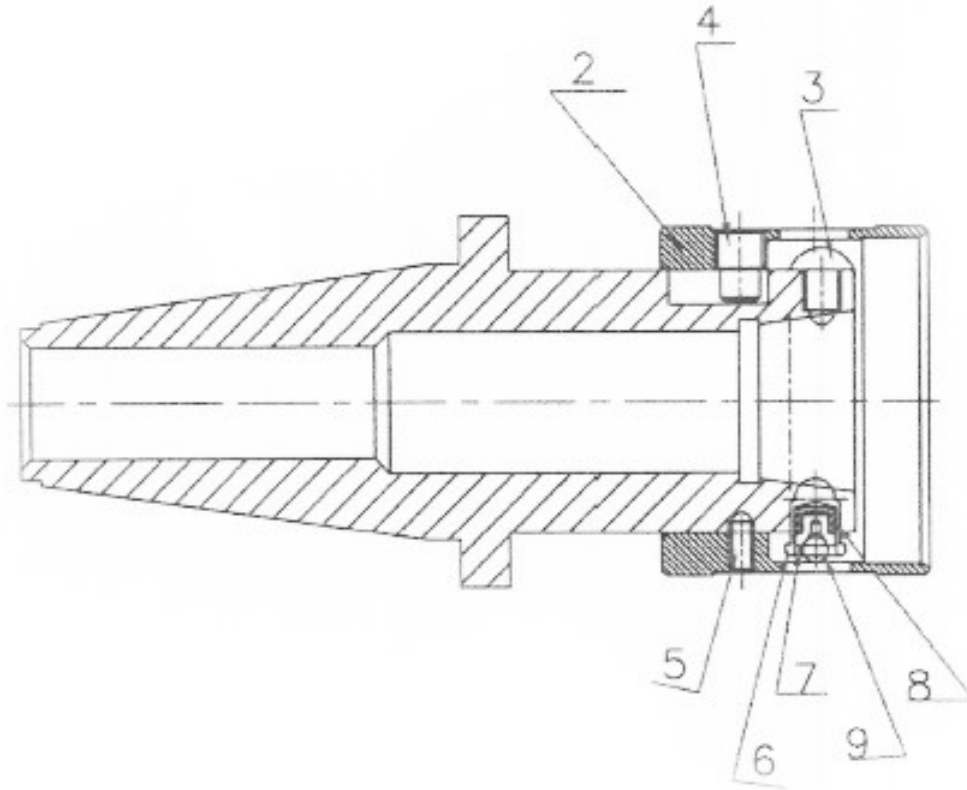
47	9982	SOLENOID VALVE	5	MFH-5-1/8
48	7802	SOLENOID VALVE	1	MFH-3-1/8
49	4540	SOLENOID COIL	8	MSFW-230 AC
50	130939	PUSH IN THREADED T-FITTING	2	QST-1/8-6
51	SMC	AIR CYLINDER	4	1CQ2A 40-15 DZ
52	130896	PUSH IN THREADED FITTING	3	QSM-BM5-6
53	19201	TABLE CLAMP CYLINDER	2	DSNU-16-50-PA-
54	130973	PUSH IN T CONNECTOR	2	QST-B-4
55	132110	PUSH IN THREADED L-FITTING	2	QSML-B1/8-4
56	130900	PUSH IN THREADED L-FITTING	4	QSML-B-M5-4
57	8820	SOLENOID VALVE (DOUBLE)	1	JMFH-5-1/8

RBHAR1KIT Repair Kit for RBHAR1



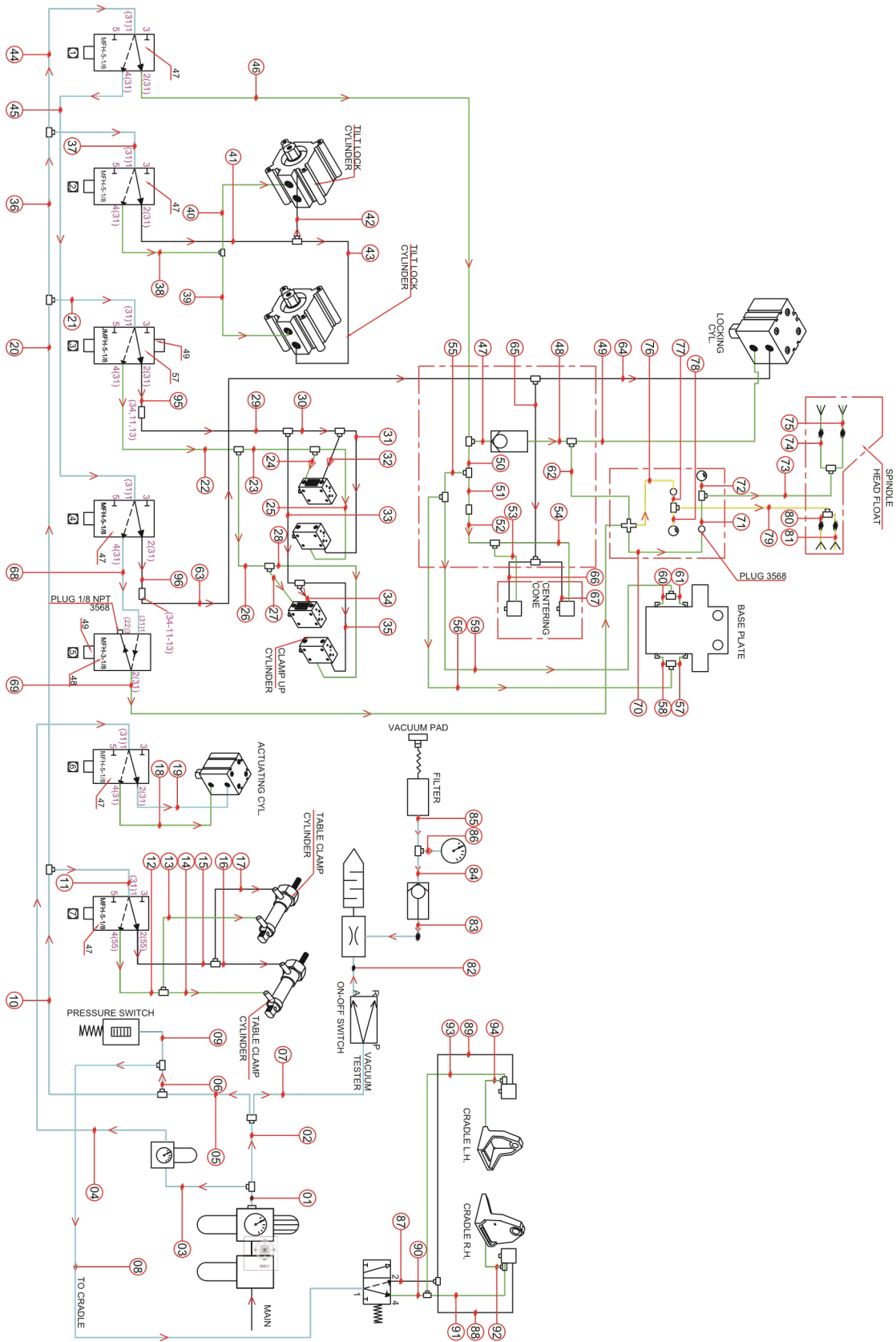
Item	Part #	Description	Quantity
2	RBHAR1COL	Collar	1
3	555-19-19	Stop Screw	2
4	555-19-20	Dog Point Screw	2
5	555-19-21	Ball Point	2
6	555-19-22	Detent	4
7	555-19-23	Ball Seat	4
8	555-19-24	Spring	4
9	555-19-25	Ball (4mm)	4

RBHAR40UPCKIT Repair Kit for RBHAR40UPT



Item	Part #	Description	Quantity
2	RBHAR40UPCCOL	Collar	1
3	555-19-19	Stop Screw	2
4	555-19-20	Dog Point Screw	2
5	555-19-21	Ball Point	2
6	555-19-22	Detent	4
7	555-19-23	Ball Seat	4
8	555-19-24	Spring	4
9	555-19-25	Ball (4mm)	4

Air Line Diagram



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TUBE NO.	TUBE COLOUR	TUBE DESCRIPTION	TUBE NO.	TUBE COLOUR	TUBE DESCRIPTION
1.	BLUE	M8 x 3"	53.	GREEN	M6 x 21"
2.	BLUE	M8 x 23"	54.	GREEN	M6 x 21"
3.	BLUE	M6 x 14"	55.	GREEN	M6x 2"
4.	BLUE	M6 x 3.5"	56.	GREEN	M6 x 30"
5.	BLUE	M6 x 3"	57.	GREEN	M6 x 5"
6.	BLUE	M6 x 12"	58.	GREEN	M6 x 5"
7.	BLUE	M6 x 95"	59.	GREEN	M6 x 30"
8.	BLUE	M6 x 3"	60.	GREEN	M6 x 5"
9.	BLUE	M6 x 10"	61.	GREEN	M6 x 5"
10.	BLUE	M6 x 20"	62.	GREEN	M6 x 2.5"
11.	BLUE	M6 x 5"	63.	BLACK	M6 x 115"
12.	GREEN	M4 x 7"	64.	BLACK	M6 x 28"
13.	GREEN	M4 x 98"	65.	BLACK	M6 x 5"
14.	GREEN	M4 x 70"	66.	BLACK	M6 x 21"
15.	BLACK	M4 x 7"	67.	BLACK	M6 x 21"
16.	BLACK	M4 x 70"	68.	BLUE	M6 x 6"
17.	BLACK	M4 x 98"	69.	GREEN	M6 x 125"
18.	GREEN	M6 x 180"	70.	GREEN	M6 x 10"
19.	BLUE	M6 x 180"	71.	GREEN	M6 x 4"
20.	BLUE	M6 x 16"	72.	GREEN	M6 x 5"
21.	BLUE	M6 x 5"	73.	GREEN	M6 x 22"
22.	GREEN	M6 x 5"	74.	GREEN	M6 x 3"
23.	GREEN	M6 x 95"	75.	GREEN	M6 x 3"
24.	GREEN	M6 x 13"	76.	YELLOW	M6 x 4"
25.	GREEN	M6 x 13"	77.	YELLOW	M6 x 5"
26.	GREEN	M6 x 105"	78.	YELLOW	M6 x 5"
27.	GREEN	M6 x 13"	79.	YELLOW	M6 x 17"
28.	GREEN	M6 x 13"	80.	YELLOW	M6 x 3"
29.	BLACK	M6 x 4"	81.	YELLOW	M6 x 3"
30.	BLACK	M6 x 95"	82.	BLUE	M6 x 4"
31.	BLACK	M6 x 13"	83.	BLUE	M6 x 1.5"
32.	BLACK	M6 x 13"	84.	BLUE	M6 x 1.5"

33.	BLACK	M6 x 105"	85	BLUE	M6 x 4"
34.	BLACK	M6 x 13"	86	BLUE	M6 x 3"
35.	BLACK	M6 x 13"	87	BLACK	M6 x 4"
36.	BLUE	M6 x 4"	88	BLACK	M6 x 5"
37.	BLUE	M6 x 5"	89	BLACK	M6 x 192"
38.	GREEN	M6 x 5"	90	GREEN	M6 x 4"
39.	GREEN	M6 x 100"	91	GREEN	M6 x 5"
40.	GREEN	M6 x 90"	92	GREEN	M6 x 18"
41.	BLACK	M6 x 5"	93	GREEN	M6 x 192"
42.	BLACK	M6 x 90"	94	GREEN	M6 x 18"
43.	BLACK	M6 x 100"	95	BLACK	M6 x 4"
44.	BLUE	M6 x 9"	96	BLACK	M6 x 4"
45.	BLUE	M6 x 17"	97		
46.	GREEN	M6 x 130"	98		
47.	GREEN	M6 x 3"	99		
48.	GREEN	M6 x 24"	100		
49.	GREEN	M6 x 8"			
50.	GREEN	M6 x 5"			
51.	GREEN	M6 x 5"			
52.	GREEN	M6 x 5"			

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) Way Oil

2) Multi-Purpose EP 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:	Multi-Way Oil HD
Other means of identification:	Phillips 66 Multi-Way Oil HD 22 Phillips 66 Multi-Way Oil HD 32
Code:	LBPH81776
Relevant identified uses:	Way 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	>40%
Distillates, petroleum, solvent-dewaxed heavy paraffinic	64742-65-0	>40%
Residual oils, petroleum, solvent-dewaxed	64742-62-7	>10%

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.

Ingestion: First aid is not normally required; however, if swallowed and symptoms develop, seek 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	---	---	---
Distillates, petroleum, solvent-dewaxed heavy paraffinic	TWA: 5mg/m ³ STEL: 10 mg/m ³ as Oil Mist, if Generated	---	---	---
Residual oils, petroleum, solvent-dewaxed	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:	> 320°F (160°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:	< -5°F (-15°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):	0.86-0.89 @ 60°F (15.6°C)
Particle Size:	Not applicable	Bulk Density:	7.2-7.4 lbs/gal
Percent Volatile:	No Data	Viscosity:	5-20 cSt @ 100°C; 29-235 cSt @ 40°C
Flammability (solid, gas):	Not applicable	Pour Point:	< -5°F (-15°C)
Solubility in Water:	Insoluble		

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

International 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:
16-Apr-2018	23-Jun-2016	LBPH81776	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

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:	Alco Super-Lube Multi-Purpose EP-0 Grease
Other means of identification:	
Code:	829364
Relevant identified uses:	Lubricating Grease
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 Spectrum Corporation	URL: www.phillips66.com/SDS	U.S.: 800-368-7128
500 Industrial Park Drive	Phone: 800-762-0942	International: 1-832-765-2500
Selmer, TN 38375-3276	Email: SDS@P66.com	Technical Information
		1-800-264-6457 or +1-731-645-7972

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 naphthenic	64742-52-5	40-70%
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7	20-40%
Boron lithium oxide	12007-60-2	< 4%

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. If product is injected into or under the skin, or into any part of the body, regardless of appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)


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.

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

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). High pressure injection of hydrocarbon fuels, hydraulic oils, or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus, or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

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 naphthenic	TWA: 5mg/m ³ STEL: 10 mg/m ³ as Oil Mist, if Generated	---	---	---
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.

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

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

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products.

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

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

SECTION 9: Physical and Chemical Properties

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

Appearance:	Green	Flash Point:	257°F / 125°C
Physical Form:	Semi-Solid	Test Method:	Cleveland Open Cup (COC), ASTM D92
Odor:	Slight hydrocarbon	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:	No Data
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):	0.87 @ 60°F (15.6°C)
Particle Size:	Not applicable	Bulk Density:	7.5lbs/gal
Percent Volatile:	No Data	Viscosity:	No Data
Flammability (solid, gas):	Not applicable	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)

Aspiration Hazard: Not expected to be an aspiration hazard

Skin Corrosion/Irritation: Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking

Serious Eye Damage/Irritation: Causes mild eye irritation.

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

Lubricant Base Oil (Petroleum)

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

SECTION 12: Ecological Information

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: None
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)

US EPA has published a final rule aligning hazardous chemical reporting under sections 311 and 312 of the Emergency Planning and Community Right-to-Know Act (EPCRA) with OSHA HCS. See Section 2 for hazard classifications under EPCRA.

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.

Chemical Name	Concentration	De minimis
Zinc Compound(s)	<2%	1.0%

EPA (CERCLA) Reportable Quantity (in pounds)

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

California Proposition 65

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

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:
02-May-2017	31-Jul-2015	829364	FINAL

Revised Sections or Basis for Revision:

Identified Hazards (Section 2); Composition (Section 3); Format change

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.