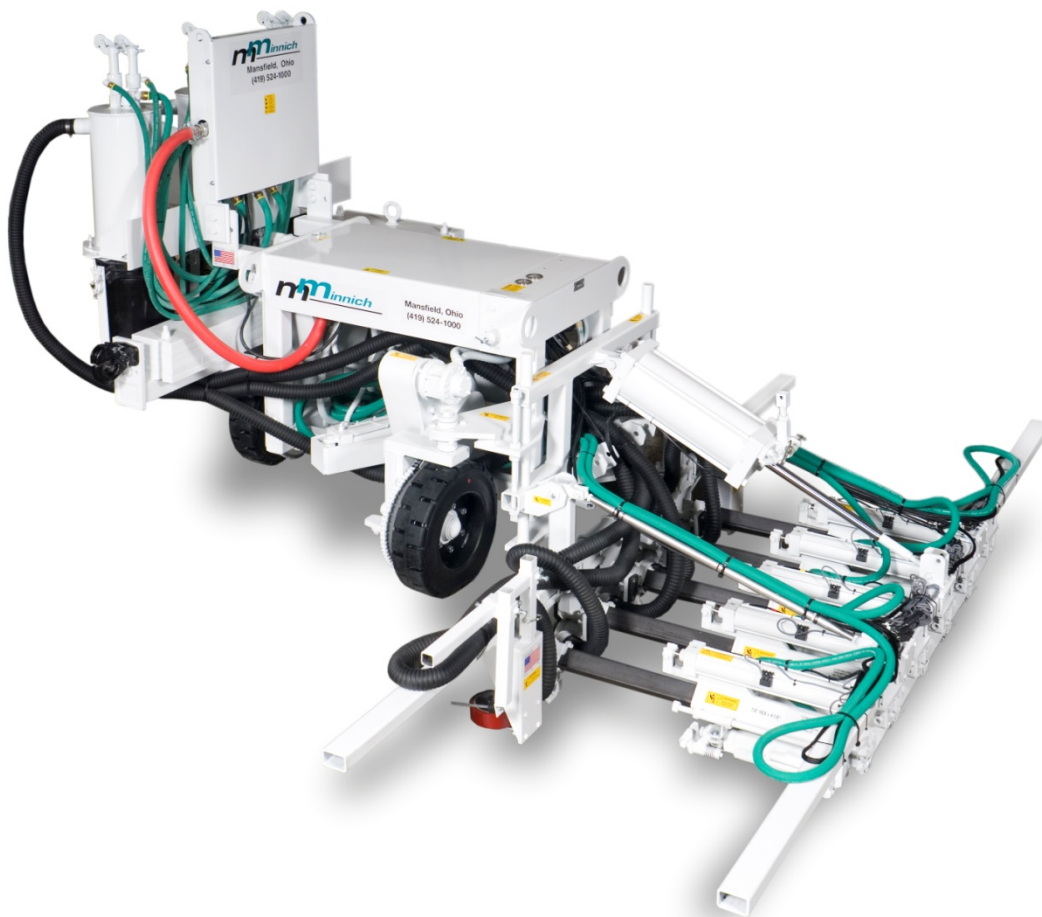




A-4SC/A-5SC Dowel Drill Operator/Service Manual



Hours of Operation

7:30AM to 4:00PM Mon. – Fri. Eastern Standard Time

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Mansfield, OH 44903

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MINNICH MANUFACTURING CO. WARRANTY AND SERVICE AGREEMENT

Minnich Manufacturing Co. warrants to the original purchaser that, if any part of the product proves defective in material or workmanship within 90 days from purchase, and is returned to Minnich Manufacturing Co. within 90 days after the defect is discovered, Minnich Manufacturing Co. will at its option repair or replace said part. Product shipped to Minnich Manufacturing Co. freight prepaid will be returned freight prepaid. Product shipped to Minnich Manufacturing Co. freight collect will be returned freight collect.

LIMITATIONS:

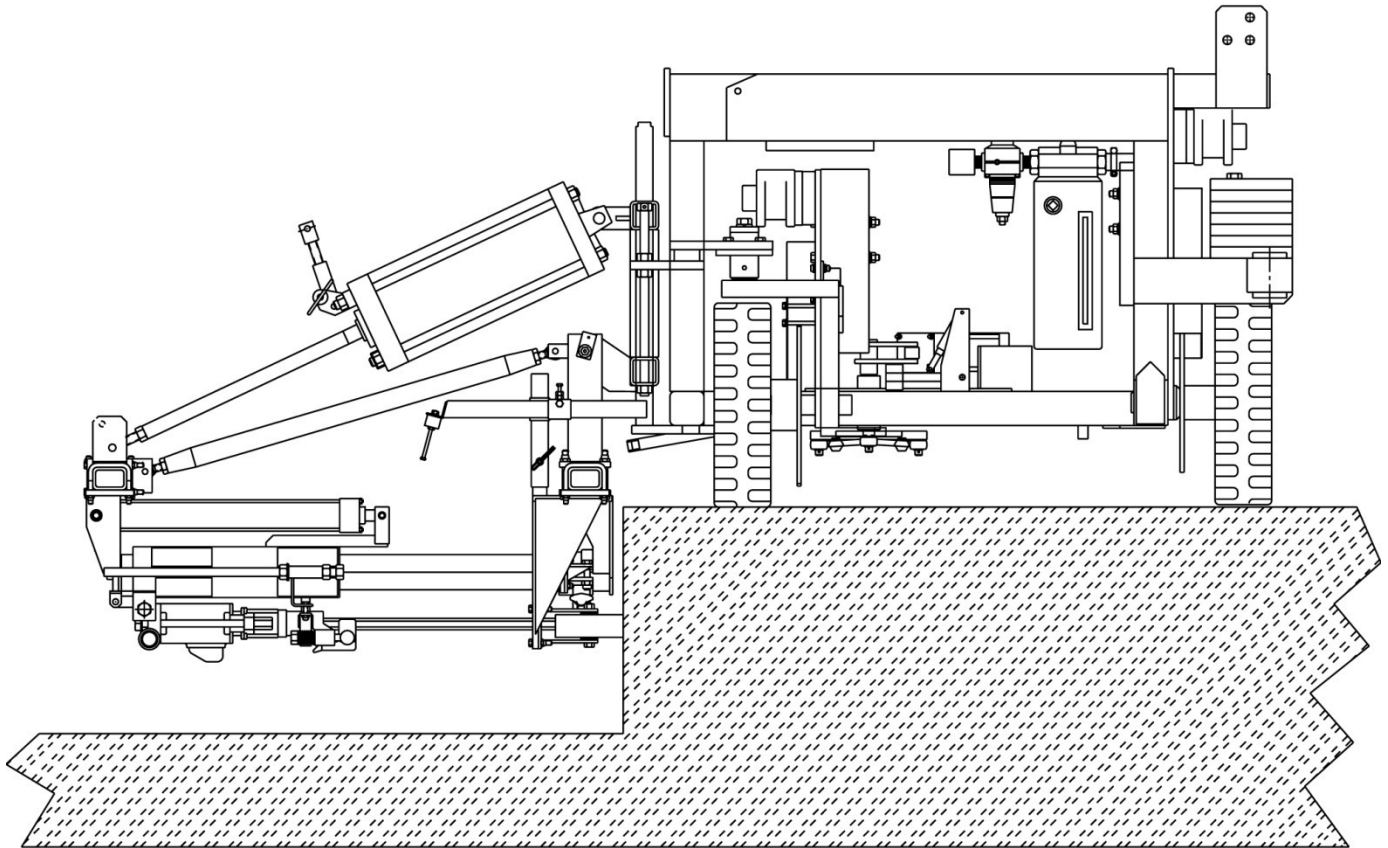
Warranty does not apply to repairs that are required because of normal wear or tear, parts or products that are damaged as a result of misuse, neglect, accident or fire, or of lightning, flooding or other acts of God, or by improper installation or maintenance, of which Minnich Manufacturing Co. will be the sole judge. Warranty does not apply to parts or products that have been modified by an unauthorized party that has in Minnich Manufacturing Co.'s judgment affected their performance or reliability. Warranty does not apply if the part or product substantially fulfills the performance specifications.

Minnich Manufacturing Co. shall not in any event be liable for the cost of any special, indirect, or consequential damages as a result of this product.

SERVICE:

Out of warranty service is available through Minnich Manufacturing Co.

A-4SC/A-5SC Multiple Drill, Self Propelled On Slab Unit



Model	A-4SC/ A-5SC
Drill Steel Shank	.875" x 4.25" (22.2mm x 107.9mm)
Drill Steel Length U.C.	24" (61.0cm)
Drill Bit Diameter	.625" – 2.50" (15.9mm to 63.5mm)
*Maximum Drill Depth	18" (45.7cm)
Drill Distance From Top of Slab	3.5" – 12" (8.9cm to 30.5cm)
Minimum Cutout Width	48" (121.9cm)
SCFM Required Per Drill	92.2 (43.5D m ³ /sec)
PSIG Required	110 (7.58 BAR)
Weight A-4SCW (basic)	3260lbs. (1433kg)
Weight A-5SCW (basic)	3460lbs. (1569kg)

Horizontal and Vertical drilling
Skew drill bed is available on the A-4SCW
On grade kit is available
Capable of towing air compressor
Power crab steering
Power steering
Power brakes
Hole Spacing Pointer
Solid rubber tires
Adjustable drill height, depth and centers
Auto control
Dust collection is available

**Based on 2 piece steel and bits. Whirlybits should be 1" (2.5cm) longer for maximum drilling depth.*

GENERAL SPECIFICATIONS CONT

Pneumatic Connection:

- An approved air disconnect is required to be installed in accordance to all Local and National Codes.

Environmental:

- +5°C to +40°C (+41°F to +104°F)
- 50% Rh at +40°C (+104°F), (90% Rh at +20°C (+68°F))
- Altitude – 1000m (3280ft) above mean sea level
- Unit is to be disposed according to all Local and National Regulations

Transportation and Storage:

- -25°C to +55°C for 24 hours (-13°F to +131°F)

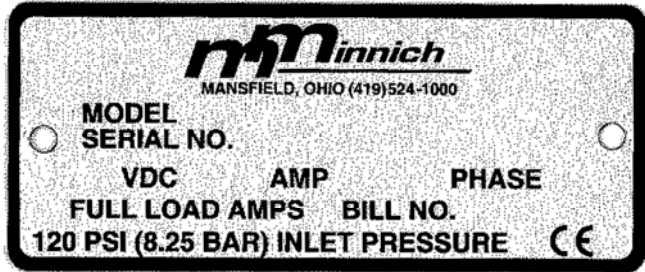
Ingress Protection:

- Protection level IP2X is provided

Sound:

- System operates at sound levels about 85dBA and 85dBC. Hearing protection is required.

System Nameplate:




GENERAL SAFETY RULES

This manual contains **NOTES, CAUTIONS, and WARNINGS**. These **MUST** be followed to prevent the possibility of improper use, incorrect servicing, damaging the equipment, or personal injury. Read and comply with all **NOTES, CAUTIONS and WARNINGS** included in these instructions.

NOTE: Notes contain additional information important to the operation of the equipment.

CAUTION: Cautions provide important information to prevent mistakes that could result in damage to the equipment.

 **WARNING:** Warnings alert one to practices or conditions that could lead to personal injury or death!

 **WARNING**
Read and understand all instructions.
Failure to follow all instructions listed below may result in serious injury.

 **WARNING**
DO NOT USE TOOL IF IT IS IN NEED OF SERVICE!

SAVE THESE INSTRUCTIONS

- WORK AREA -

Keep your work area clean and well lit.

Cluttered and dark areas invite accidents.

Keep bystanders, children, and visitors away while operating a power tool.

Distractions can cause you to lose control.

- PERSONAL SAFETY -

Stay alert, watch what you are doing and use common sense when operating a power tool. DO NOT use tool while tired or under influence of drugs, alcohol or medication.

A moment of inattention while operating power tools may result in serious personal injury.

Dress properly. DO NOT wear loose clothing, or jewelry. Tie up long hair. Keep your hair, clothing, and gloves away from moving parts.

Loose clothes, jewelry, or long hair can be caught in moving parts.

Avoid accidental starting. Be sure switch is off before connecting.

Connecting tools that have switches on invites accidents.

DO NOT overreach. Keep proper footing and balance at all times.

Proper footing and balance enables better control of the tool in unexpected situations.

Use safety equipment. Always wear eye and hearing protection.

Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection device such as earmuffs or earplugs.

Keep a first-aid kit near the power tool.

Safety depends on you.

- TOOL USE AND CARE -

Only qualified persons should operate the power tool.

Make sure you operate and service your power tool correctly.

DO NOT force tool. Use the correct tool for your application.

The correct tool will do the job better and safer at the rate for which it is designed.

DO NOT use tool if switch does not turn it on or off.

Any tool that cannot be controlled with the switch is dangerous and must be repaired.

Disconnect the tool from the power source before making any adjustments, changing accessories, or storing the tool.

Such preventive safety measures reduce the risk of starting the tool accidentally.

Store tools out of the reach of children and other untrained persons.

Tools are dangerous in the hands of untrained users.

Maintain tools with care. Keep tools clean.

Properly maintained tools are less likely to bind and are easier to control.

Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using.

Many accidents are caused by poorly maintained tools.

Use only accessories that are recommended by the manufacturer for your model.

Accessories that may be suitable for one tool may become hazardous when used on another tool.

- SERVICE -

DO NOT run the drill unit while you make adjustments and repairs unless the procedure is approved.

Escaping fluid and air under pressure can have sufficient force to penetrate the skin causing serious personal injury.

If injured by escaping fluid or air, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, tubes and hoses are not damaged.

DO NOT use your hand to search for leaks.

Use a piece of cardboard or wood to search for suspected leaks.

Tool service must be performed only by qualified repair personnel.

Service or maintenance performed by unqualified personnel could result in a risk of injury.

When servicing a tool, use only identical replacement parts.

Use of unauthorized parts or failure to follow maintenance instructions may create a risk of injury.

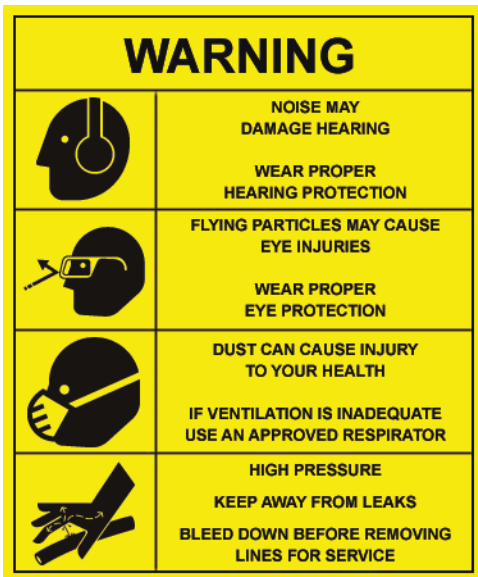
A-4SC/A-5SC Safety Decal Kit Placement (011387-00001)



012287-00005



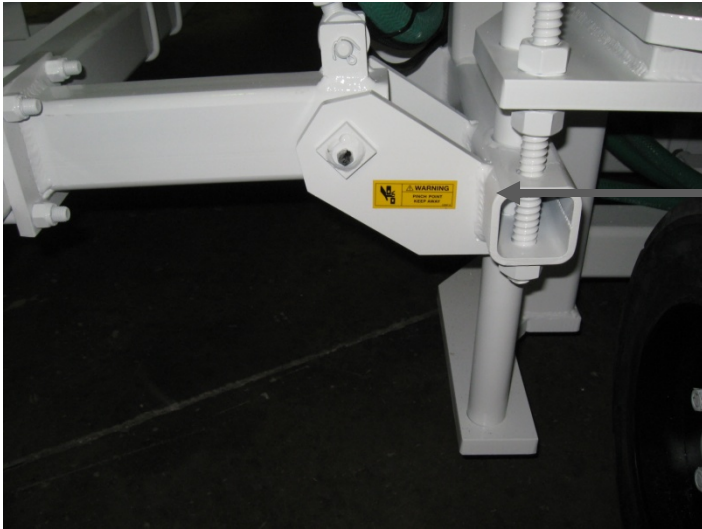
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012287-00003



A-4SC/A-5SC Safety Decal Kit Placement Cont.



012287-00006



012287-00062



A-4SC/A-5SC Safety Decal Kit Placement Cont.



012287-00007



012287-00001



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011387-0000W



012287-00010



A-4SC/A-5SC Safety Decal Kit Placement Cont.

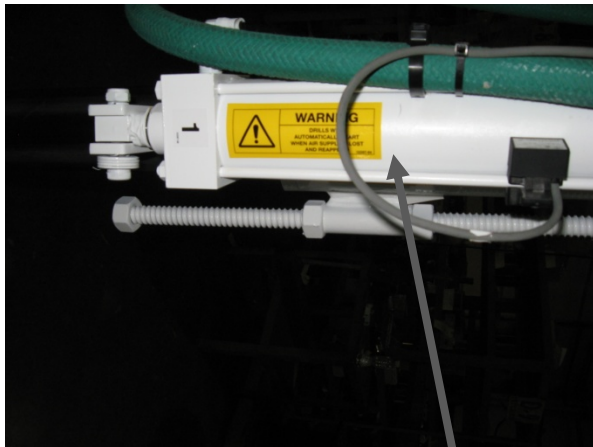


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012287-00009



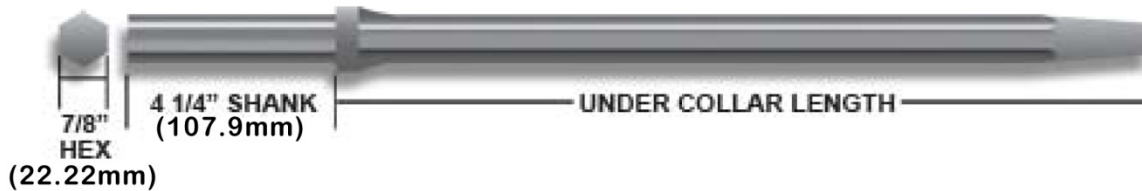
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012287-00064



Drill Steel and Bits

HOW TO MEASURE STEEL FOR ORDER



Warranty Policy

All drill steel and bits sold to customer are intended for use in drilling concrete. It is not capable of drilling through steel mesh, rebar or dowel bars. Use in these applications will void all warranties and dramatically shorten bit life. Bit life is also affected by the sharpness of the bit, type of aggregate and condition of concrete. Minnich Manufacturing's drill steel and bit warranty is limited to the warranty provided by the supplier. All warranty claims must be submitted to Minnich for evaluation and sent to the supplier for authorization.

General Notes

1. 2" (50.8mm) diameter maximum bit for hydraulic drills.
2. 2 1/2" (63.5mm) diameter maximum bit for pneumatic drills.
3. 5/8" (16mm) diameter is the smallest hole diameter.
4. Cutting speed varies from 15 to 30 seconds for a 6" (152.4mm) deep hole, depending on bit diameter and aggregate.
5. On average you can get 180 holes, 9" (228.6mm) deep per bit.
6. On average you can get 600 holes, 9" (228.6mm) deep per drill steel.
7. Removable bits are carbide and

cannot be re-sharpened.

8. Whirly bit steel can be re-sharpened twice.

Drill Steel & Bits In-Stock

1 Piece Steel & Bit (Whirly Bit)			
Part Number	Hole Diameter	Shank Size	UC Length
005367-12.00	5/8" (15.9mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)
005367-24.00	5/8" (15.9mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)
004209-12.00	3/4" (19.1mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)
004209-24.00	3/4" (19.1mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)
004541-12.00	7/8" (22.2mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)
004541-24.00	7/8" (22.2mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)
004745-12.00	1" (25.4mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)
004745-24.00	1" (25.4mm)	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)

All 4 1/4" (107.9mm) shanks can be cut to a 3 1/4" (82.55mm) shanks

Tapered Steel			
Part Number	Shank Size	UC Length	Notes
003749-12.00	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)	For 1" (2.54cm) Bits ONLY 003747-1.000
003749-24.00	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)	
004116-12.00	7/8" x 4 1/4" (22.2mm x 107.9mm)	12" (30.5cm)	For 1 1/8" (2.86cm) & Larger Bits ONLY
004116-24.00	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)	

Tapered Bits			
Part Number	Hole Diameter	Shim Part Number	Notes
003747-1.000	1" (2.54cm)	003839-00000	Use 003749-12.00 or 003749-24.00 Steel ONLY
003747-1.120	1 1/8" (2.86cm)	003901-00000	
003747-1.180	1 3/16" (3.01cm)	003901-00000	Use 004116-12.00 or 004116-24.00 Steel ONLY
003747-1.250	1 1/4" (3.18cm)	003901-00000	
003747-1.310	1 5/16" (3.34cm)	003901-00000	
003747-1.370	1 3/8" (3.49cm)	003901-00000	
003747-1.430	1 7/16" (3.65cm)	003901-00000	
003747-1.500	1 1/2" (3.81cm)	003901-00000	
003747-1.560	1 9/16" (3.97cm)	003901-00000	
003747-1.620	1 5/8" (4.13cm)	003901-00000	
003747-1.750	1 3/4" (4.45cm)	003901-00000	
003747-1.810	1 13/16" (4.60cm)	003901-00000	
003747-1.880	1 7/8" (4.76cm)	003901-00000	
003747-2.000	2" (5.08cm)	003901-00000	

All 4 1/4" (107.9mm) shanks can be cut to a 3 1/4" (82.55mm) shanks

"H" Thread Steel		
Part Number	Shank Size	UC Length
005061-24.00	7/8" x 4 1/4" (22.2mm x 107.9mm)	24" (61.0cm)
05061B-24.00	1" x 4 1/4" (25.4mm x 107.9mm)	24" (61.0cm)

"H" Thread Bits			
Part Number	Hole Diameter	Note	
005140-1.370	1 3/8" (3.49cm)		
005140-1.500	1 1/2" (3.81cm)		
005140-1.620	1 5/8" (4.13cm)		
005140-1.750	1 3/4" (4.45cm)		
005140-1.870	1 7/8" (4.76cm)		
005140-2.000	2" (5.08cm)		
005140-2.250	2 1/4" (5.72cm)		
005140-2.500	2 1/2" (6.35cm)		
			Multiple use bit

All 4 1/4" (107.9mm) shanks can be cut to 3 1/4" (82.55mm) shanks

Usage Calculation

The calculations below are nominal and could vary depending on the hardness of the concrete, aggregates used and the possibility of bits hitting steel reinforcement.

Whirly Bit, Taper Bit and "H" Thread Bit

(B)Bit=180 holes x 9" (22.86cm)

B=1620" (4114.8cm)

Number of bits needed = (number of holes x hole depth)/1620"

Taper Steel and "H" Thread Steel

(S)Steel=600 holes x 9" (22.86cm)

S=5400" (13716cm)

Number of steels needed = (number of holes x hole depth)/5400"

Example:

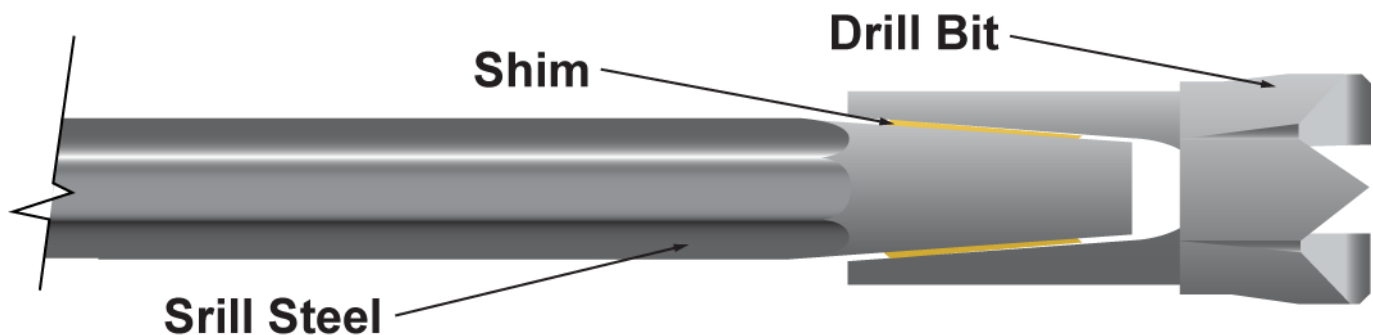
Need 50,000 Holes 12" (30.48cm) Deep for the job.

$(50,000 \times 12)/1620 = 371$ Bits

$(50,000 \times 12)/5400 = 112$ Steels

Drill Bit Installation

1. Check to see that the hole through the center of the drill steel is not blocked, if so remove the object.
2. Clean the tapered end of the drill steel and the inside of the drill bit with a non-oily cleaner, making sure not to leave any oily residue.
3. Make sure a brass shim is in the drill bit. If not, carefully roll a new one and slide it into the bit making sure that the ends do not overlap.
4. Put the drill bit on the tapered end of the drill steel and tap it on a firm surface to seat the bit.



Drill Bit Removal

1. Swing latch so that drill steel can be removed from drill.
2. Pull drill steel out of drill.
3. Using two hammers, place one hammer on bottom side of bit. Using other hammer, strike the bit on the topside. Rotate drill steel 1/4 turn and strike top of bit again. Repeat procedure until bit comes off.

CAUTION: Bit may pop off of drill steel with some force.


A-4SC/A-5SC Set-Up Procedure

1. **CAUTION** Before connecting the air compressor:
 - a. Make sure that all lock pins are in their locked position.
 - b. Make sure all controls are in the “off” position and the lift lever (if so equipped) is in the “up” position.
 - c. Make sure the lubricator is filled with proper lubricant. See recommended lubricants below.
 - d. Make sure air line is cleaned out and is of the proper size and pressure rating for the drill unit.
 - e. Make sure that the air compressor is set at an operating pressure of not more than 120 PSIG (8 Bar).
 - f. Install the drill steel and bits into the drill motors and close the latch retainers and rod guides.
2. Connect the air line to the drill in accordance with hose connection instructions.
3. Start the compressor in accordance with manufacturer’s instructions.
4. Position the drill unit where the first set of holes is to be drilled, keeping the drill unit back from the edge of the slab slightly. Set the brake if so equipped.
5. With the lift lock still engaged, charge the lift cylinder by toggling the lift lever up and down.
6. With the lift valve in the up position and after making sure that there are no obstructions in the path of the drill bed, remove the lift lock pin.
7. Using the lift lever, lower the drill bed into the drilling position.
8. Measure the drilling position from the top of the slab to the center of the drill steel. If necessary loosen the locknuts and, using the adjusting screws to raise or lower the drill bed to the proper drilling position. Tighten the locknuts.
9. Check to make sure the drill bed is parallel with the slab that is to be drilled into. If necessary, loosen the locknut on the lift cylinder and turn the adjusting screw in or out to align the drill bed with the slab to be drilled.
10. To set the drill depth, remove all the rail locking pins and feed the drill bit into the face of the slab without turning on the drills.
 - a. On Standard Machines: Measure the distance between the drill stop rod and the drill stop pad. Adjust the stop bolt so that the distance between the stop pad and the stop bolt equals the drill depth.
 - b. On Wireless Machines: Measure the distance that the feed cylinder rod extended. Add this distance to the required drill depth. Measure along the feed cylinder tube from the trunnion end to the position sensor; adjust the sensor so that it is set at the distance determined above. Note: After drilling the first hole with each drill, it is recommended to measure the actual drill depth and then readjust the position sensor accordingly.
11. Set the feed regulator to 20-24 PSIG (1.4-1.7 Bar).
12. See operating instructions to drill the first set of holes.

Recommended Lubricants For Rock Drills

Supplier	Ambient Temperature (Equivalent SAE)		
	Below 4°C (SAE 10W)	4° - 36° (SAE 20, 30)	Above 36° (SAE 40)
AGIP Product		Rock Drill RD100	
Caltex Product	RPM Vistac Oil 32X or Rock Drill Lube 46	RPM Vistac Oil 100X	RPM Vistac Oil 320X
Texaco Product	Rock Drill Lube 46	Rock Drill Lube 100	Rock Drill Lube 320
Chevron Product	Vistac Oil 32X	Vistac Oil 100X	Vistac Oil 320X
Mobil Product	Almo Oil No. 1	Almo Oil No. 2	Almo Oil No. 5
Shell		Shell Tona Oil R100	Shell Tona Oil R320 (150)
DO NOT USE ENGINE OIL, DIESEL OR HYDRAULIC FLUID			

A-4SC/A-5SC Operation Procedure

1.  **WARNING** Wear proper safety equipment.
 - a. **Flying Debris:** During drilling, chips may be ejected.
 - b. **Dust:** Concrete dust will be ejected from the hole.
 - c. **Loud Noise:** Air compressor and drill unit will create loud noise levels.
 - d. **Pinch Points:** Keep clear of all moving parts.
2. Operator should stand in a safe location with good visibility, not less than 10 feet (3 meters) from the closest point on the machine.
3. Place feed lever(s) in the “in” position to move the bits against the face of the slab.
4. Place the drill lever(s) in the “on” position to turn on the drill motors. Press the initiate lever is so equipped.
5. When drill motors reach the required depth, place the feed lever in the “out” position.
6. When the drill steel is clear of the hole, place the drill lever in the “off” position.
7. On units with the wireless control, the drills will automatically retract and shut off when the hole depth has been reached.
8. Release the brake if so equipped. Position the drill for the next set of holes to be drilled. Reset the brake is so equipped.
9. On units equipped with steering, turn the wheel or press the joy stick right or left to steer the unit right or left.
10. On units with the “crab” feature, it is helpful to turn the crab “on” and then steer right or left to keep the machine tight against the face of the slab while repositioning the unit.

TROUBLE SHOOTING AIR DRILL

IF SYMPTOMS OF POOR PERFORMANCE DEVELOP, THE FOLLOWING CHART CAN BE USED AS A GUIDE TO DETERMINE THE PROBLEM. WHEN DIAGNOSING FAULTS IN OPERATION OF THE AIR DRILL, ALWAYS CHECK THAT THE COMPRESSOR IS SUPPLYING THE CORRECT SCFM AND AIR PRESSURE AS LISTED IN THE TABLE

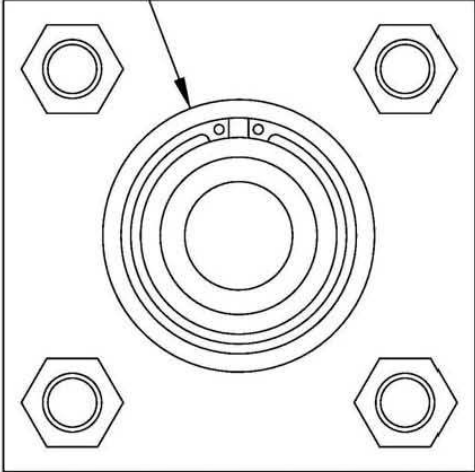
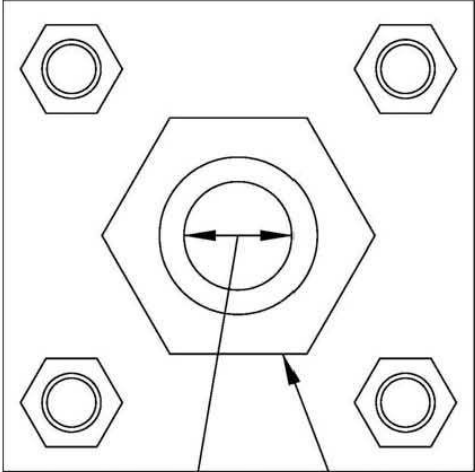
PROBLEM	CAUSE	REMEDY
DRILL DOES NOT RUN	DRILL NOT GETTING AIR	<ol style="list-style-type: none"> 1. ON MULTI DRILL UNITS, SWITCH AIRLINE WITH DRILL THAT IS WORKING PROPERLY. IF DRILL NOW RUNS CHECK THE AIR CONTROL VALVE. IF THE VALVE WORKS, CHECK THE DRILL. 2. CHECK VALVE ON AIR COMPRESSOR AND DRILL UNIT TO BE CERTAIN THEY ARE COMPLETELY OPEN. 3. CHECK COMPRESSOR. IT SHOULD HAVE 100SCFM (47.2Dm³/sec) PER DRILL AND 110PSI (7.6 BAR) AT DRILL MANIFOLD WHEN DRILLING WITH LARGE DRILLS. 4. MAKE CERTAIN ALL FITTINGS ARE CONNECTED PROPERLY AND NOT LEAKING.
	COUPLING OR HOSE OBSTRUCTION	REMOVE OBSTRUCTION.
	FAILURE IN THE ELECTRICAL CIRCUIT	CHECK SWITCHES, CONNECTIONS, COILS, GROUND & VOLTAGE. IF THE POWER UNIT (BACKHOES, GRADER, ETC.) IS BEING JUMP STARTED, CHECK THE AMPS & VOLTAGE BEING SUPPLIED TO COILS FROM THE BATTERY, IT MAY BE TOO LOW.
	FAILURE OF DRILL SOLENOID VALVE (MULTI DRILL UNITS WITH REMOTE ELECTRICAL CONTROLS)	CHECK VALVE - YOU SHOULD BE ABLE TO FEEL THE SOLENOID MOVE WHEN IT IS ACTUATED. MAKE SURE YOU HAVE CURRENT TO THE SOLENOID COIL. REPLACE THE SOLENOID IF THERE IS NO MOVEMENT.
	MECHANICAL FAILURE OF DRILL	DISASSEMBLE THE DRILL & INSPECT IT FOR DAMAGED PARTS.

TROUBLE SHOOTING AIR DRILL

PROBLEM	CAUSE	REMEDY
DRILL RUNS SLOW OR DOES NOT DRILL EFFECTIVELY	NOT ENOUGH AIR REACHING DRILL. IT SHOULD HAVE 100SCFM (47.2dm ³ /sec) PER DRILL AND 110 PSI (7.6 Bar) AT DRILL MANIFOLD WHEN DRILLING WITH LARGE DRILLS	ON MULTI DRILL UNITS, TURN OFF ONE OR TWO DRILLS. IF THE REMAINING DRILLS PICK UP SPEED, CHECK THE AIR COMPRESSOR.
	RESTRICTION IN AIR LINE	A FOREIGN OBJECT IN THE AIR LINE OR POSSIBLY A REDUCTION IN THE AIR LINE CAUSED BY A REDUCER FITTING.
	TOO SMALL AIR LINE	FOLLOWING ARE SUPPLY LINE SIZES FOR DRILLING: A-1 SINGLE DRILL 3/4" (19mm) A-2 TWO DRILLS 1-1/4" (31.75mm) A-3 & A-4 THREE & FOUR DRILLS 1-1/2" (38.1mm) A-5 FIVE DRILLS 2" (50.8mm)
	AIR PRESSURE TO CYLINDER "FEEDING" DRILL INTO CONCRETE NOT ADJUSTED PROPERLY	EXCESSIVE PRESSURE CAN CAUSE DRILL TO "BIND UP" IN THE HOLE. PRESSURE THAT IS TOO LOW WILL NOT "FEED" THE DRILL INTO THE CONCRETE. THE AIR PRESSURE REQUIRED VARIES WITH THE DRILL MODEL. HORIZONTAL – ALL UNITS WITH LARGE DRILLS USE 22-26 PSI (1.5-1.8 Bar). DRILL UNITS USING THE 15LB (6.8kg) CLASS DRILL WILL USE 16-20 PSI (1.1-1.4 Bar). VERTICAL – ALL DRILL UNITS USE 5-6 PSI (0.34-0.41 Bar). WITH THE CORRECT AIR PRESSURE, THE DRILL STEEL SHOULD HAVE A SLIGHT RATTLE.
	INSUFFICIENT AIR FLOW TO KEEP HOLE BLOWN CLEAN	CHECK FOR OBSTRUCTION IN THE BLOW TUBE IN THE DRILL.
	LUBRICATOR PUTTING OUT TOO MUCH OIL TO DRILL	IF YOU NOTICE MORE THAN A LIGHT FILM OF OIL ON THE AIR DEFLECTOR ON THE BOTTOM OF THE DRILL, ADJUST THE LUBRICATOR. MAKE CERTAIN YOU ARE USING THE TYPE OF OIL CALLED FOR IN THE OPERATION AND MAINTENANCE MANUAL.
	MECHANICAL BINDING OF DRILL CARRIER	MAKE SURE THE EIGHT BEARING PADS ARE ADJUSTED CORRECTLY. THE SQUARE TUBE THAT THE DRILL CARRIER SLIDES ON MUST BE FREE OF RUST SO THAT THE CARRIER SLIDES FREELY. DRILL STEEL MUST NOT BE BINDING IN THE GUIDE BEARING.
	BENT DRILL STEEL, WORN DRILL BIT OR DRILLING INTO REBAR	REPLACE THE DRILL STEEL OR BIT. IF DRILLING INTO REBAR, MOVE THE DRILL.
	USING 3 1/4"(8.25cm) SHANK DRILL STEEL IN 4 1/4" (10.8cm) SHANK CHUCK DRILL	THE DRILL STEEL WILL ROTATE BUT IT WILL NOT ALLOW THE DRILL PISTON TO HAMMER PROPERLY. REPLACE IT WITH THE CORRECT 4 1/4" (10.8cm) DRILL STEEL.

Cylinder Service Kits

Obsolete Style Cylinder: Bushing held in place by snap ring. Service parts no longer available.

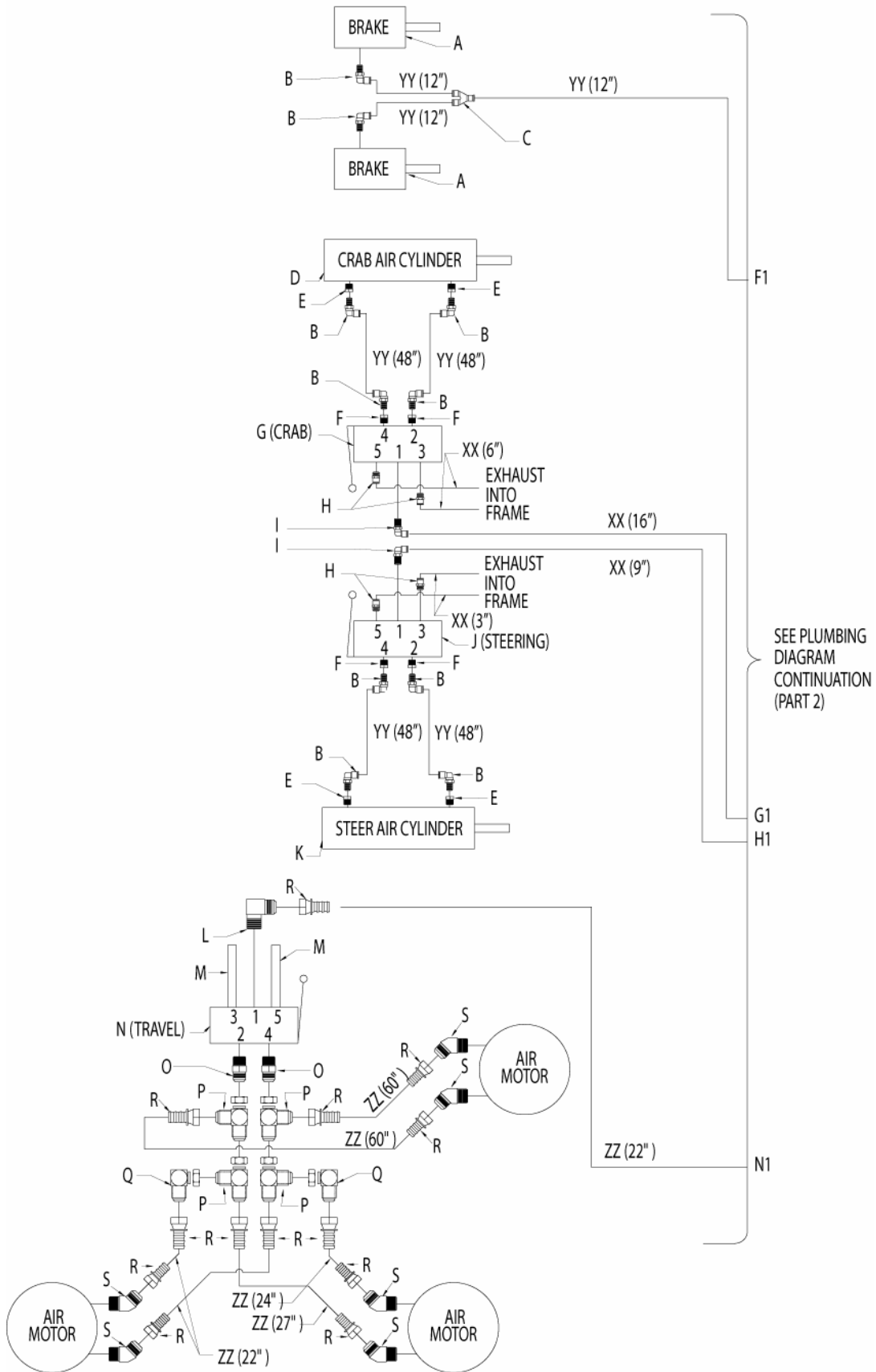


Rod Diameter

Current Style Cylinder: Bushing threaded in place. Service parts listed below.

	Oversize Rod Cylinders (Feed)		Standard Rod Cylinders	
	Rod Diameter	Service Kit Part #	Rod Diameter	Service Kit Part #
1.50" (3.81 cm) Bore			5/8" (1.59 cm)	A12899-1.500
2.50" (6.35 cm) Bore	1" (2.54 cm)	A12895-2.500	5/8" (1.59 cm)	A12899-2.500
3.25" (8.26 cm) Bore	1 3/8" (3.49 cm)	A12895.3.250	1" (2.54 cm)	A12899-3.250
4.00" (10.16 cm) Bore			1" (2.54 cm)	A12899-4.000
5.00" (12.70 cm) Bore			1" (2.54 cm)	A12899-5.000
6.00" (15.24 cm) Bore			1 3/8" (3.49 cm)	A12899-6.000
7.00" (17.78 cm) Bore			1 3/8" (3.49 cm)	A12899-7.000

Plumbing Diagram (Part 1)



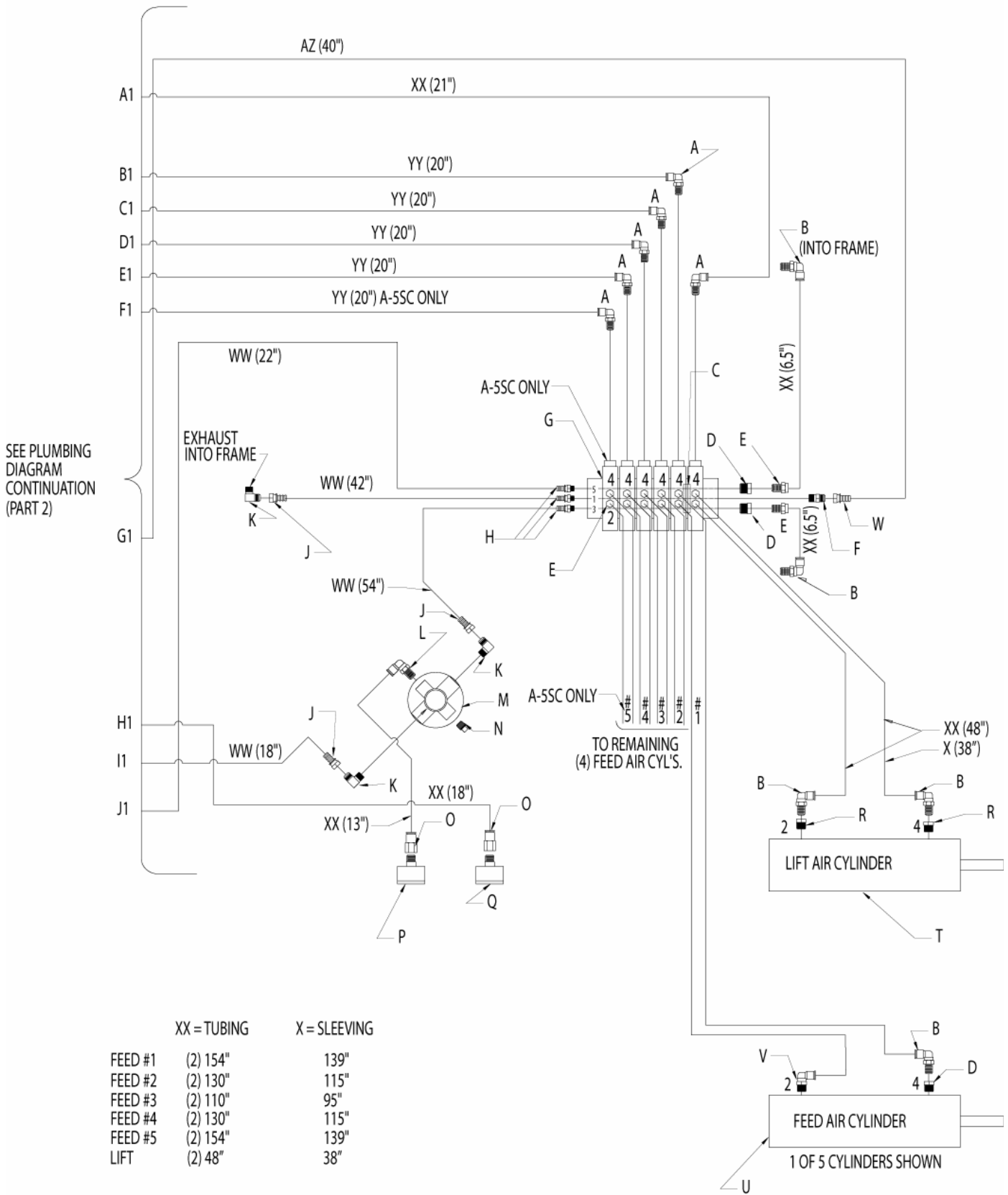
Plumbing Diagram (Part 1)

FIG.	PART NUMBER	DESCRIPTION	QTY
A	011993-00000	BRAKE CALIPER	2
B	010829-00005	FITTING, MALE ELBOW 5/32 TUBE TO 1/8 MALE NPT	10
C	010842-00001	FITTING, 5/32 Y – TUBE TO TUBE	1
D	009070-1.500	CYLINDER, AIR 2-1/2 X 1-1/2	1
E	006296-00015	BUSHING, REDUCER PIPE 06-02	4
F	006296-00016	BUSHING, REDUCER PIPE 04-02	4
G	010935-00000	VALVE (CRAB)	1
G	006256-1.500	#8-32 X 1-1/2 SLOTTED	3
G	006144-00000	#8 LOCKWASHER	3
H	010825-00008	FITTING, 1/4 TUBE TO 1/4 MALE NPT	4
I	010829-00010	FITTING, MALE ELBOW 1/4 TUBE TO 1/4 MALE NPT	2
J	011525-00000	VALVE (STEERING)	1
J	006256-1.500	#8-32 X 1-1/2 SLOTTED	3
J	006144-00000	#8 LOCKWASHER	3
K	009070-7.000	CYLINDER, AIR 2-1/2 X 7	1
L	006019-00024	ELBOW, 90 DEG EXT PIPE 37 DEG 12-12	1
M	006000-00007	NIPPLE, PIPE 3/4 X 3 SCH 40 GALVANIZED	2
N	011526-00000	VALVE (TRAVEL)	1
N	006037-2.750	HHCS, 5/16-18 X 2-3/4	3
N	006148-00000	5/16 LOCKWASHER	3
O	006007-00023	CONNECTOR, 37 DEG MALE/PIPE 12-12	2
P	006024-00007	TEE, SWIVEL RUN 37 DEG 12-12	4
Q	006023-00008	ELBOW, 90 DEG/37 DEG MALE/FEM SWIVEL 12-12	2
R	006032-00006	END, HOSE 37 DEG FEM SWIVEL/BARBED 12	13
S	006021-00016	ELBOW, 45 DEG EXT PIPE/37 DEG 08-12	6
XX	010863-00000	TUBING, NYLON 1/4 BLACK SEMI-RIGID	34
YY	010861-00000	TUBING, NYLON 5/32 BLACK SEMI-RIGID	228
ZZ	003997-00000	HOSE, 3/4 ID, 200 PSI	215

Plumbing Diagram (Part 2)

FIG.	PART NUMBER	DESCRIPTION	QTY
A	010829-00005	FITTING, ELBOW 5/32 TUBE - 1/8 MALE NPT (1 LESS FOR A-4SC)	11
B	010831-00004	FITTING, MALE TEE 5/32 TUBE 1/8 NPT (2 LESS FOR A-4SC)	8
C	010923-00000	LIMIT VALVE, MARKER	1
D	010842-00002	FITTING, 1/4 Y - TUBE TO TUBE	4
E	010825-00003	FITTING, 5/32 TUBE TO MALE NPT (2 LESS FOR A-4SC)	11
F	012135-00000	BREATHER VENT (2 LESS FOR A-4SC)	14
G	010917-00000	VALVE, AIR TOGGLE 2 POSITION IN LINE (2 LESS FOR A-4SC)	14
H	010829-00009	FITTING, MALE ELBOW 1/4 TUBE TO 1/8 MALE NPT	5
I	010434-00000	SWIVEL JOINT	1
J	011879-00000	REWORKED, ELBOW 90 DEG EXT PIPE/37 24-24	1
K	006000-00012	NIPPLE, PIPE 3/8 CLOSE SCH 80	1
L	011874-00011	SWIVEL, NUT ADAPTOR	1
M	006000-00061	NIPPLE, PIPE 2" CLOSE SCH 40	1
N	008988-00000	COUPLING, GROUND JOINT SEAL	1
O	003834-00001	LUBRICATOR	1
P	006000-00017	NIPPLE, PIPE 1-1/2 X 2 SCH 80	1
Q	011703-00000	REGULATOR, AIR	1
R	006680-00004	END, HOSE 37 DEG FEMALE SWIVEL / BARBED 24-24	1
R	006681-00004	CLAMP HOSE, HEAVY DUTY	1
R1	006682-00005	END, HOSE MALE PIPE / BARBED 24-24	1
R1	006681-00004	CLAMP HOSE, HEAVY DUTY	1
S	006019-00032	ELBOW, 90 DEG EXT PIPE/37 DEG 20-24	1
T	006015-00003	TEE, INTERNAL PIPE 06-06	1
U	006296-00001	BUSHING, REDUCER PIPE 06-04	2
V	006007-00012	CONNECTOR, 37 DEG MALE/PIPE 06-06	2
W	006032-00005	END, HOSE 37 DEG FEM SWIVEL / BARBED 06	1
X	010829-00010	FITTING, MALE ELBOW 1/4 TUBE TO 1/4 MALE NPT	3
Y	006019-00024	ELBOW, 90 DEG EXT PIPE / 37 DEG 12-12	4
Z	011163-00009	ADAPTER, SWIVEL NUT 1/2-14 TO 1-1/16-12 (1 LESS FOR A-4SC)	5
AA	010925-00000	VALVE (1 LESS FOR A-4SC)	5
BB	006296-00016	BUSHING, REDUCER PIPE 04-02 (1 LESS FOR A-4SC)	5
CC	006007-00019	CONNECTOR, 37 DEG MALE/PIPE 08-12 (1 LESS FOR A-4SC)	5
DD	006032-00006	END, HOSE 37 DEG FEM SWIV BARBED 12 (2 LESS FOR A-4SC)	11
EE	011321-00012	TEE, RUN EXT PIPE/37 DEG 12-12	1
FF	007612-00005	MANIFOLD	2
FF	006036-3.500	HHCS, 1/4-20 X 3-1/2	4
FF	006147-00000	1/4 LOCKWASHER	4
FF	006104-00000	1/4 FLATWASHER	4
FF	006070-00000	1/4-20 HEXNUT	4
GG	006471-00007	PLUG, PIPE HEX SOC 20	1
HH	006471-00003	PLUG, PIPE HEX SOC 06	3
II	006471-00004	PLUG, PIPE HEX SOC 08	1
JJ	006471-00005	PLUG, PIPE HEX SOC 12	1
KK	006471-00002	PLUG, PIPE HEX SOC 1/4	1
LL	006000-00016	NIPPLE, PIPE 1-1/4 X 1-3/4 SCH 80	1
MM	006032-00002	END, HOSE 37 DEG FEM SWIV/BARBED 08	2
NN	006019-00017	ELBOW, 90 DEG EXT PIPE/37 DEG 08-08	2
OO	006016-00007	ELBOW, 90 DEG EXT/INT PIPE 06-06	1
PP	006296-00015	BUSHING, REDUCER PIPE 06-02	1
QQ	004955-00000	FILTER	1
RR	010836-00006	FITTING, STRAIGHT FEMALE CONNECTOR 1/4 TUBE TO 1/8 NPT	1
SS	006466-00001	NIPPLE, PIPE STEEL 02-02	1
TT	006296-00003	BUSHING, REDUCER	1
UU	006011-00007	PLUG, CAP	1
VV	003819-00001	HOSE, AIR 1-1/2 ID	19
WW	002304-00000	HOSE, AIR 1/2" ID	40
XX	010863-00000	TUBING, NYLON 1/4 BLACK SEMI-RIGID	134
YY	010861-00000	TUBING, NYLON 5/32 BLACK SEMI-RIGID (68 LESS FOR A-4SC)	460
ZZ	003997-00000	HOSE, 3/4 ID, 200 PSI (216 LESS FOR A-4SC)	946
AZ	001807-00000	HOSE, 3/8 AIR	40

Plumbing Diagram (Part 3)

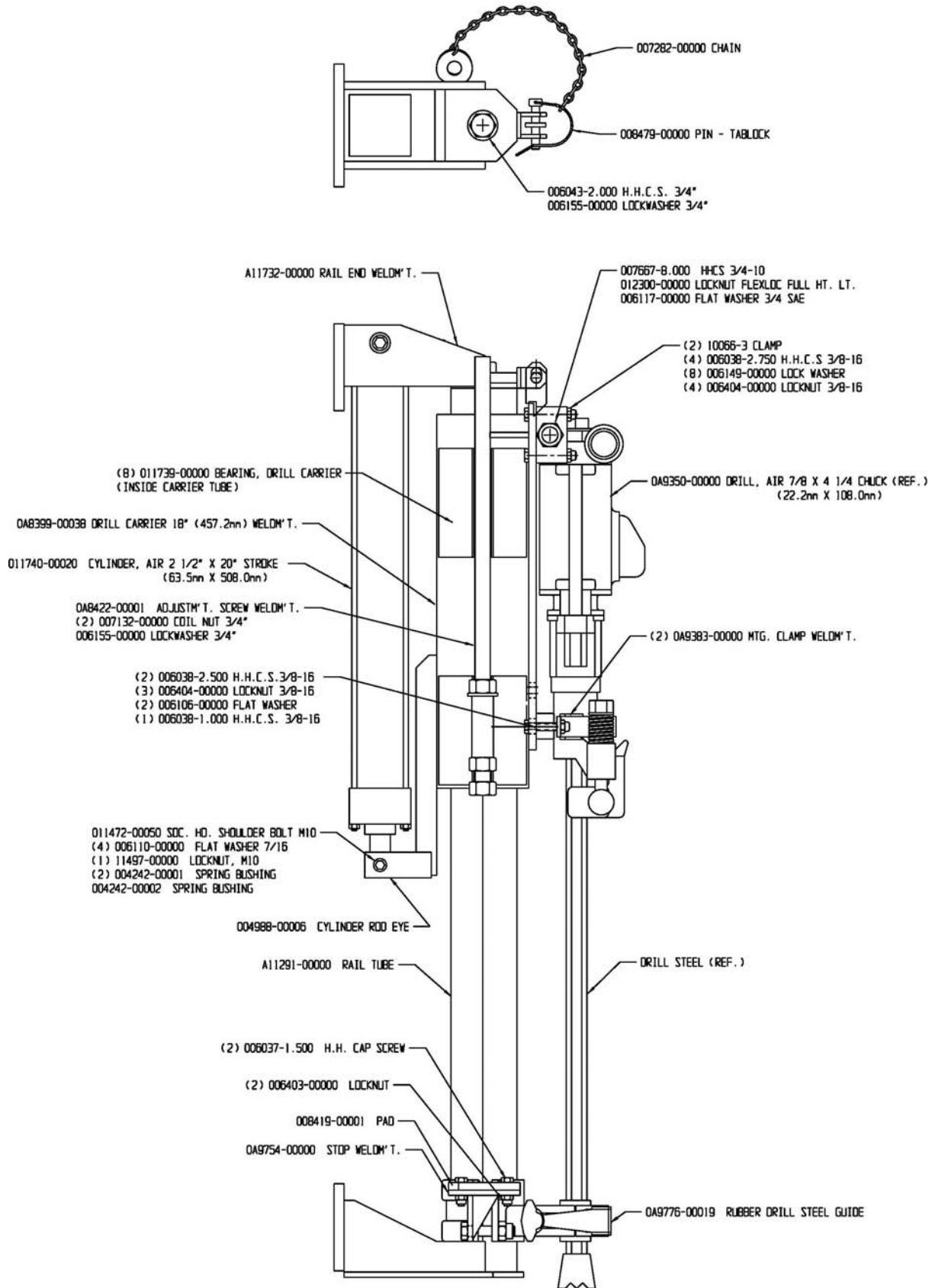


Plumbing Diagram (Part 3)

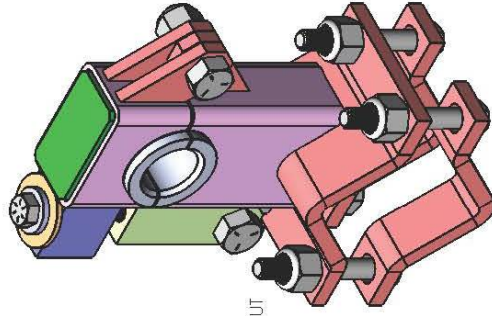
FIG.	PART NUMBER	DESCRIPTION	QTY
A	010829-00005	FITTING, M ELBOW 5/32 TUBE TO 1/8 M NPT (1 LESS FOR A-4SC)	6
B	010829-00010	FITTING, M ELBOW 1/4 TUBE TO 1/4 M NPT (1 LESS FOR A-4SC)	9
C	011700-00000	BLOCKING PLUG	3
D	006296-00001	BUSHING, REDUCER PIPE 06-04 (1 LESS FOR A-4SC)	7
E	010825-00008	FITTING, 1/4 TUBE TO 1/4 MALE NPT (2 LESS FOR A-4SC)	14
F	006007-00012	CONNECTOR, 37 DEG MALE/PIPE 06-06	1
G	011531-00000	MANIFOLD, 6 STATION	1
G	006257-1.750	#10-24 X 1-3/4 SLOTTED	4
G	006145-00000	#10 LOCKWASHER	4
G	006102-00000	#12 FLATWASHER	4
G	006654-00000	#10-24 HEXNUT	4
G	011549-00000	VALVE, AIR (1 LESS FOR A-4SC)	6
G	011532-00000	COVER, BLANK STATION (A-4SC ONLY)	1
H	006010-00006	END, HOSE MALE PIPE/BARBED 06-08	3
J	006032-00002	END, HOSE 37 DEG FEM SWIVEL/BARBED 08	3
K	006019-00012	ELBOW, 90 DEG EXT PIPE/37 DEG 06-08	3
L	010829-00009	FITTING, MALE ELBOW 1/4 TUBE TO 1/8 MALE NPT	1
M	002880-00000	REGULATOR, AIR	1
N	006471-00001	PLUG (SUPPLIED WITH 002880-00000 AIR REGULATOR)	1
O	010836-00007	FITTING, STRAIGHT FEMAL CONNECTOR 1/4 TUBE TO 1/4 NPT	2
P	007059-00001	AIR GUAGE (LOW PRESSURE)	1
Q	007059-00000	AIR GUAGE (HIGH PRESSURE)	1
R	006296-00002	BUSHING, REDUCER PIPE 08-04	2
T	011992-00016	CYLINDER, AIR 7 X 16	1
U	011740-00020	CYLINDER, AIR 2-1/2 X 20 (1 LESS FOR A-4SC)	5
V	010829-00011	FITTING, M ELBOW 1/4 TUBE TO 3/8 M NPT (1 LESS FOR A-4SC)	5
W	006032-00005	END, HOSE 37 DEG FEM SWIV/BARBED 06	1
X	010863-00000	SLEEVING (139 LESS FOR A-4SC)	614
WW	002304-00000	HOSE, AIR 1/2" ID	136
XX	010836-00000	TUBING, NYLON 1/4 BLACK SEMI-RIGID (308 LESS FOR A-4SC)	1517
YY	010861-00000	TUBING, NYLON 5/32 BLACK SEMI-RIGID (20 LESS FOR A-4SC)	100

RAIL ASSEMBLY

MINNICH P/N A11744-00028



DATE	SYM	REVISION RECORD	AUTH.	E.C.O.
3/21/2016		REDRAWN IN SOLIDWORKS		



A10827-1 (REPLACEMENT CAP ONLY)

6040-2.750 HHCS 1/2-13
6112 LOCKW ASHER 1/2
6112 FLAT W ASHER

8433

(2) 006040-1.500 HHCS

A9824-9
DRILL ROD SUPPORT

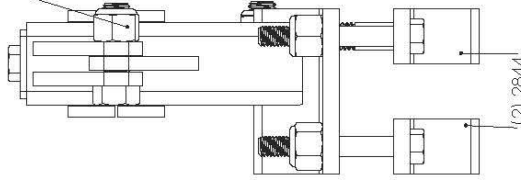
8412-1

(4) 6406-0 LOCKNUT

(3) 0640-2.750 HHCS 1/2-13

6040-2.250 HHCS 1/2-13

(2) 6406 LOCKNUT



0A8458-00000 KIT CONSISTS OF THE FOLLOWING WITH *

- *008433-00000 SPLIT BEARING - USED FOR ALL BITS 1-1/8" (28.6mm) & LARGER
- *008433-00001 SPLIT BEARING - USED FOR ALL 1" (25.4mm) & 1-1/16" (17.0mm) BITS
- *008433-00002 SPLIT BEARING - USED FOR ALL 7/8" (22.2mm) DIA. BITS
- *008433-00003 SPLIT BEARING - USED FOR ALL 3/4" (19.1mm) DIA. BITS
- *008433-00004 SPLIT BEARING - USED FOR ALL 5/8" (15.9mm) DIA. BITS
- 008433-00005 SPLIT BEARING - USED FOR ALL 1" (25.4mm) HEX STEEL BITS

TOLERANCES:
(UNLESS OTHERWISE SPECIFIED)

DECIMAL	DO NOT SCALE DRAWING	
X ± .030	MATL	SCALE
.XX ± .015		1:2
.XXX ± .005		

FRANCIONAL TITLE
DRILL SUPPORT ASSEMBLY

DATE	DATE	DRAWING NUMBER
3/21/2016		A9776-19

FEATURE NO.	LOCATION	ANGULAR
		± 1°

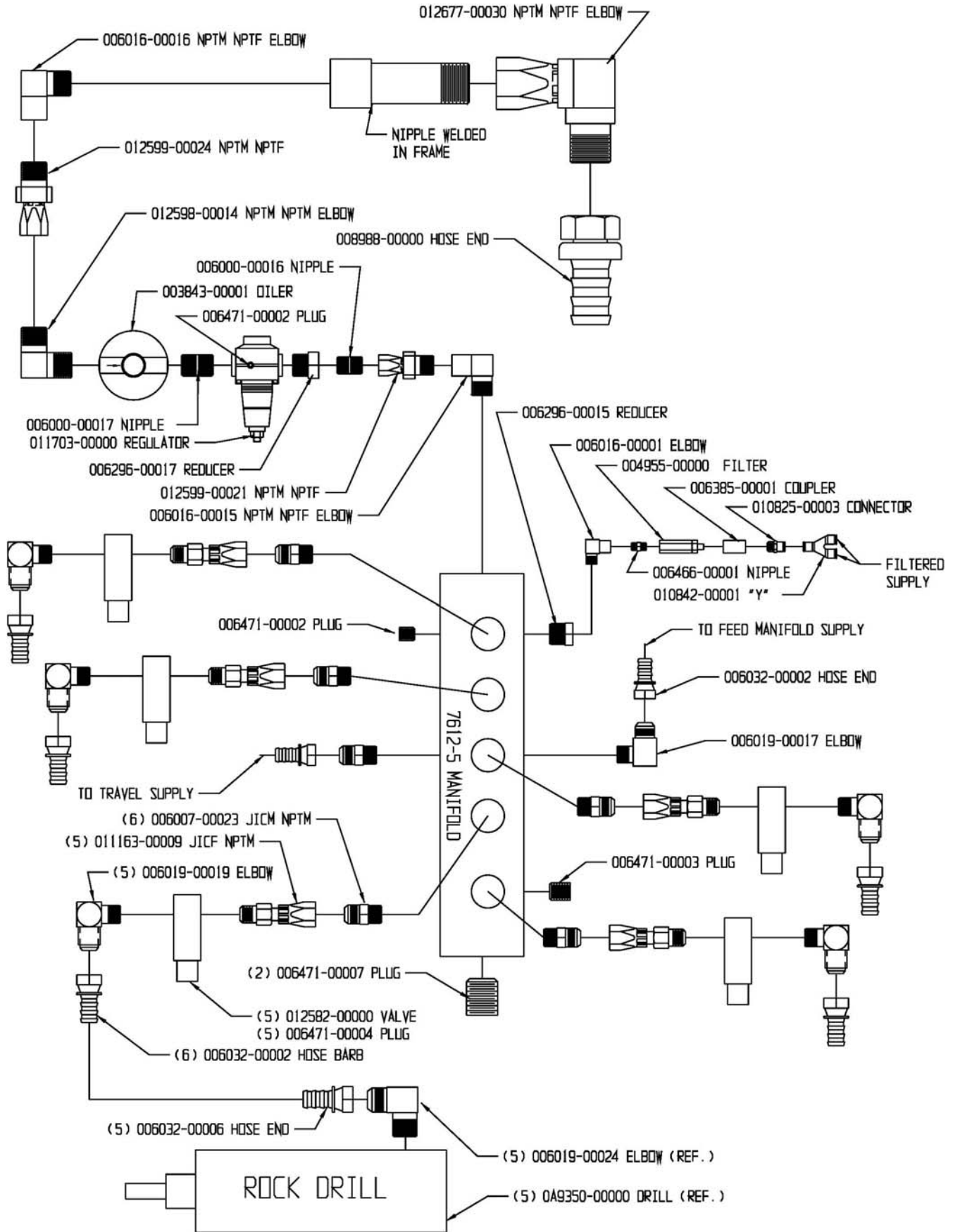
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DO NOT SCALE DRAWING
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1:2

DATE 3/21/2016
DRAWING NUMBER A9776-19

DRILL MANIFOLD ASSEMBLY

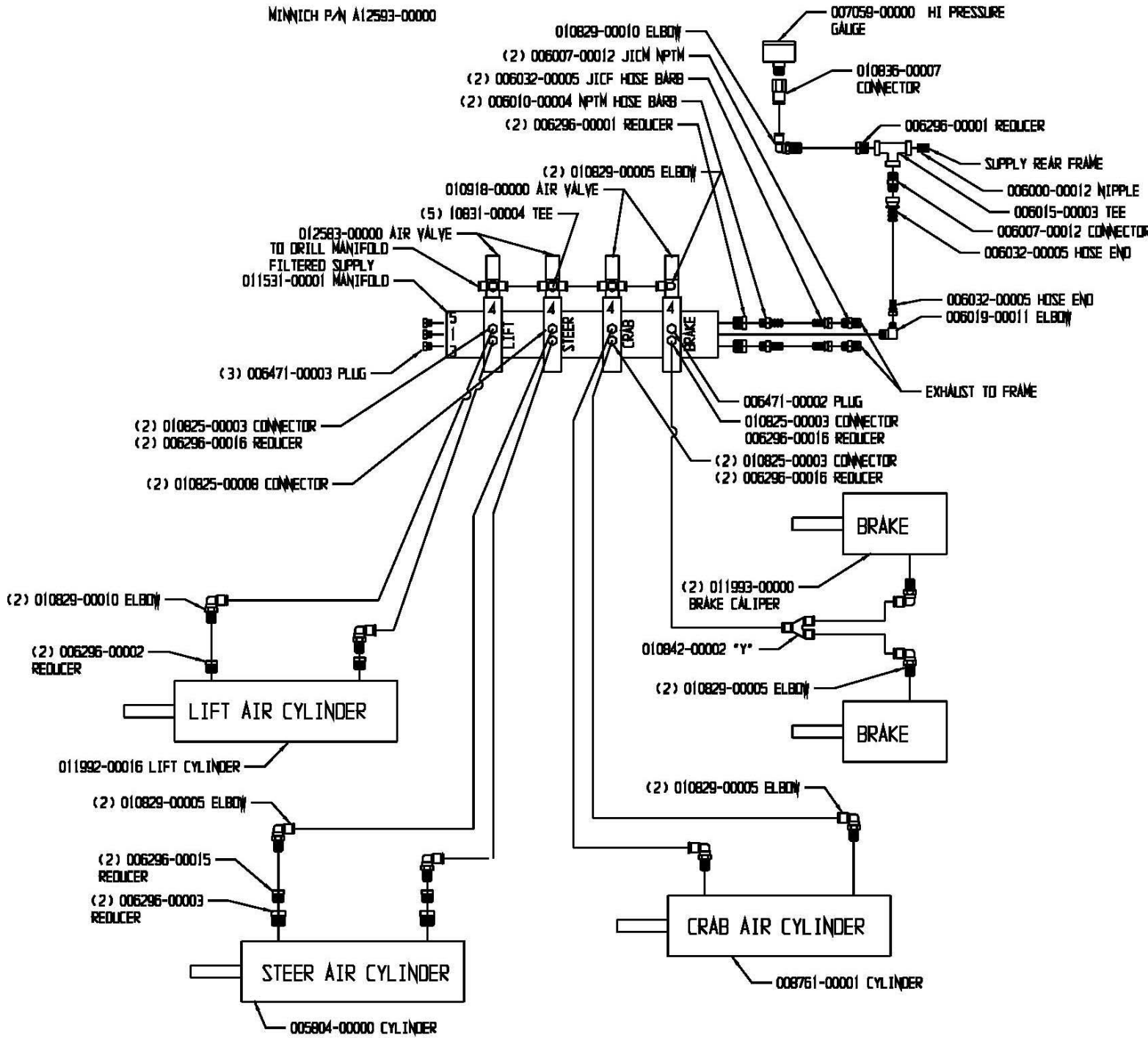
MINNICH P/N A12592-00000



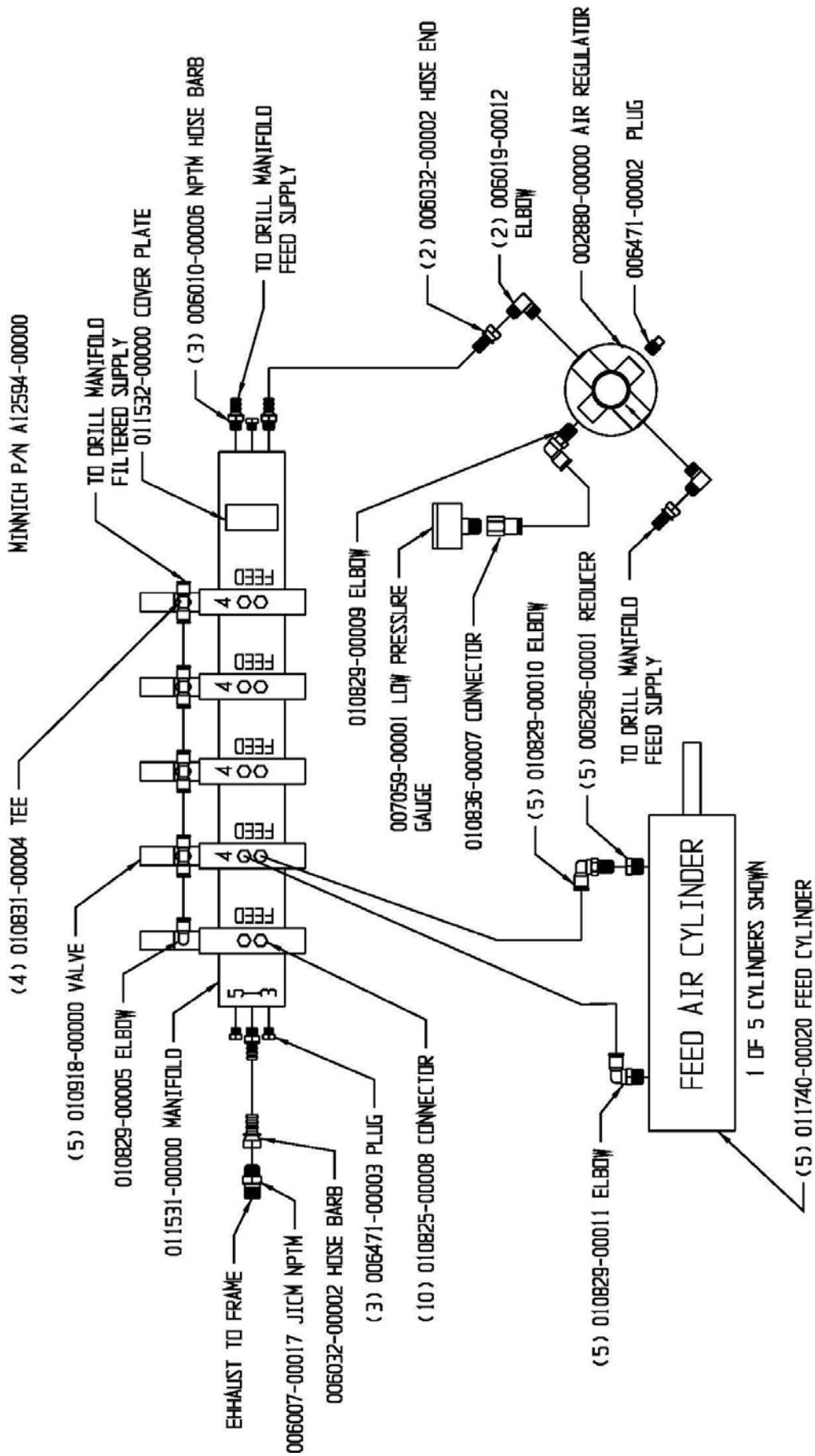
1 OF 5 DRILLS SHOWN

MULTI FUNCTION MANIFOLD ASSEMBLY

MINNICH P/N A12593-0000

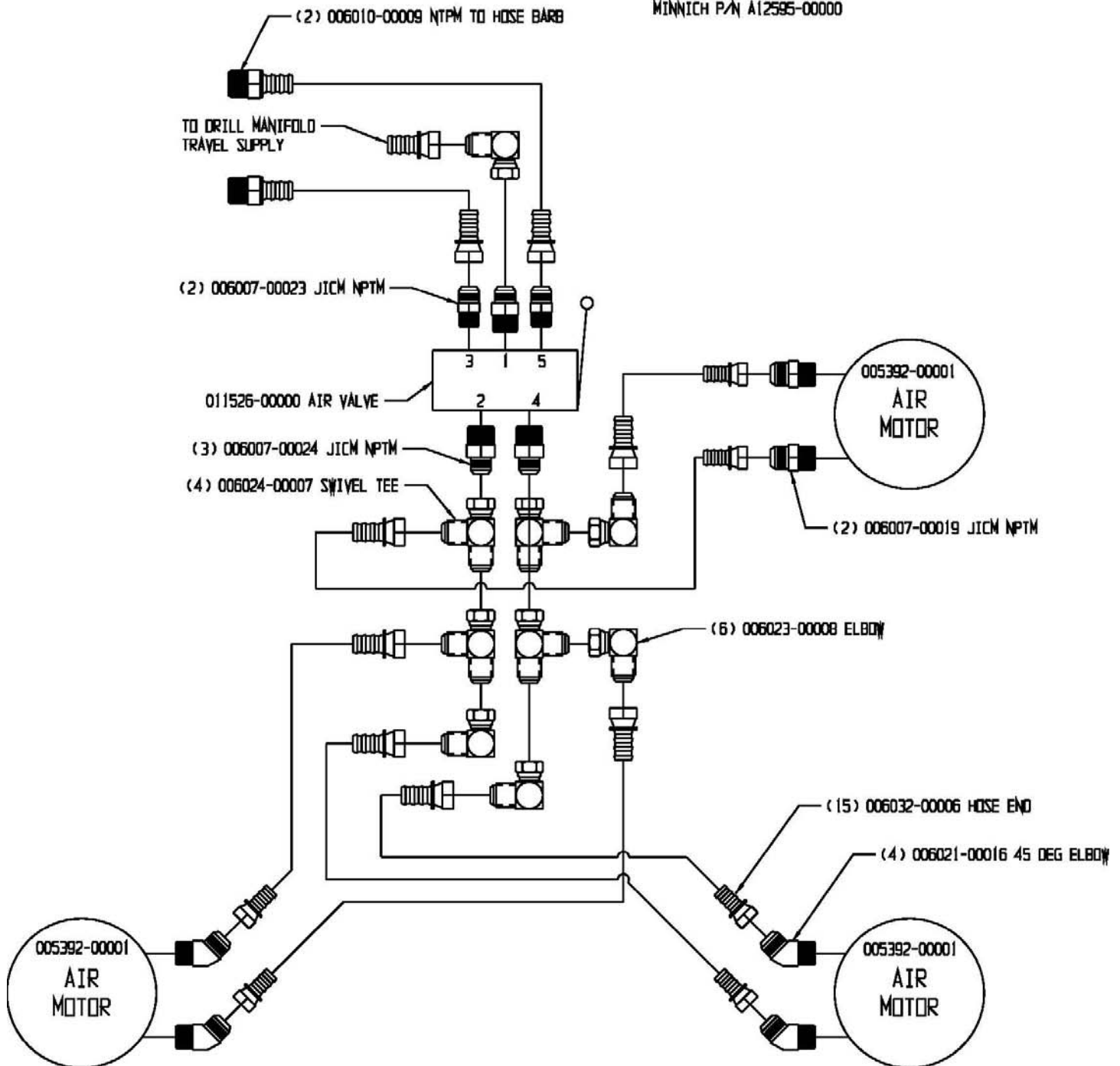


FEED MANIFOLD ASSEMBLY



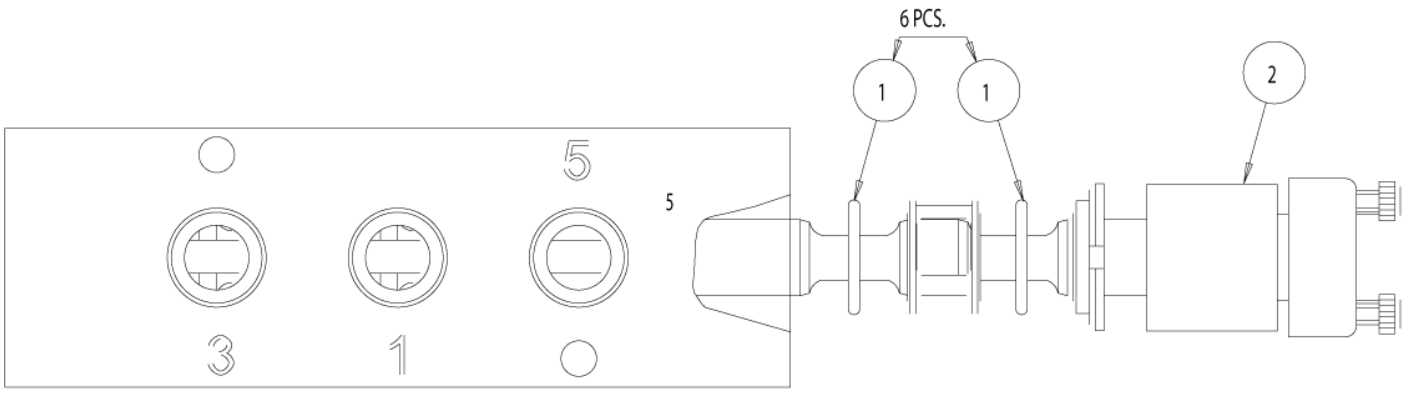
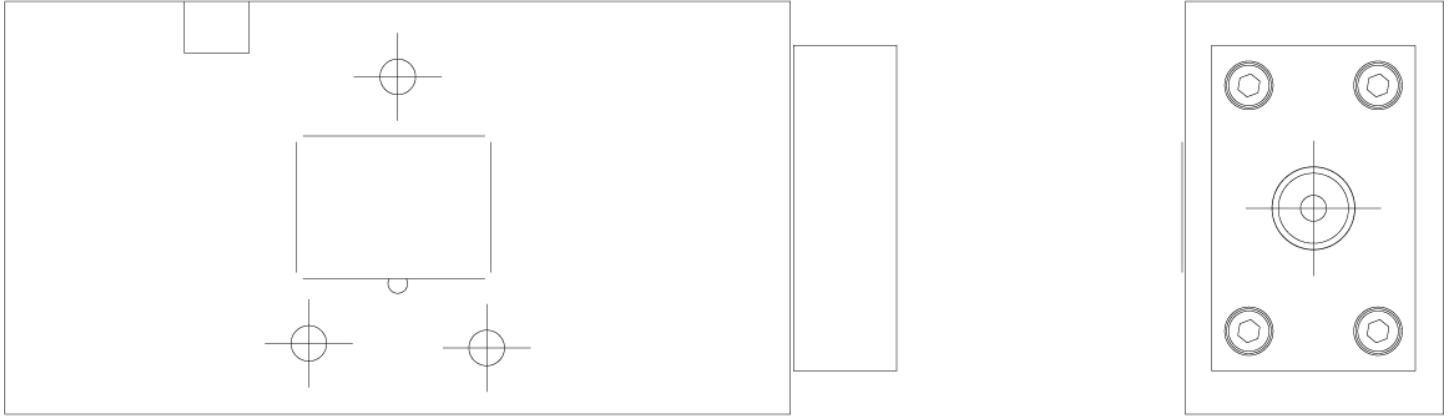
TRAVEL CIRCUIT ASSEMBLY

MINNICH P/N A12595-00000



VALVES

MINNICH P/N 011549-00000



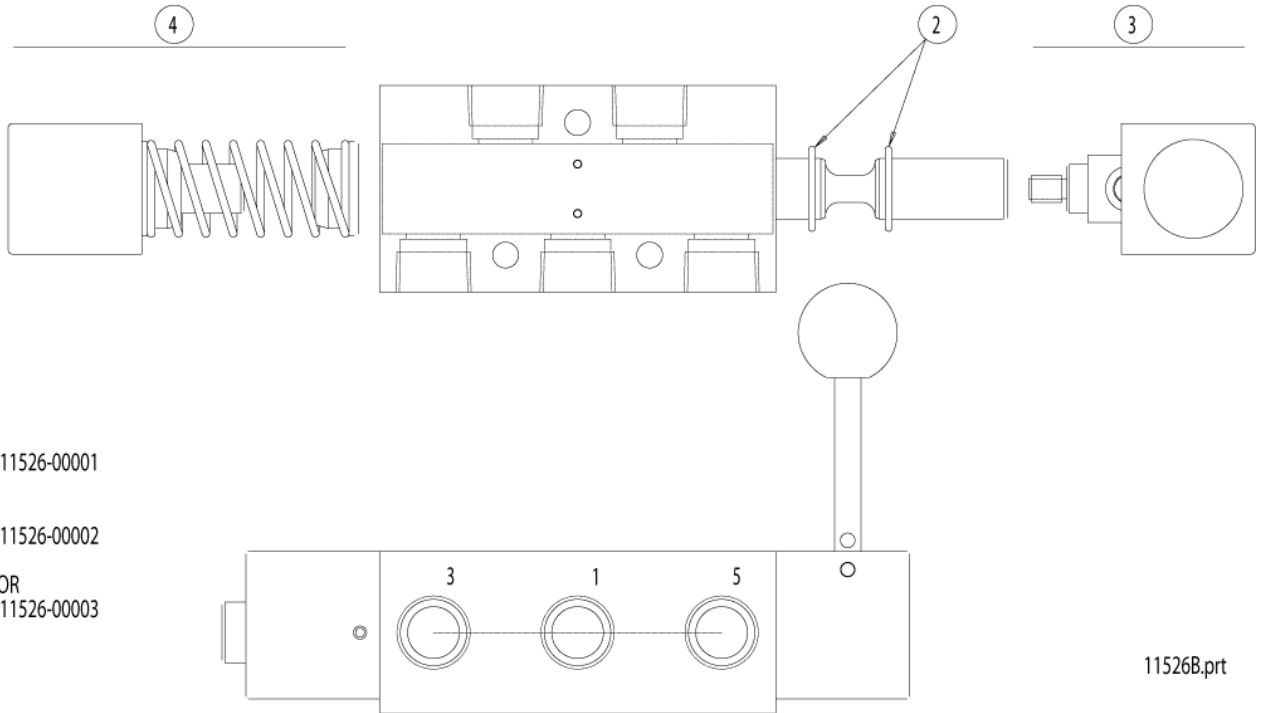
1 011549-00001 SEAL KIT (LUBRICATE FOR INSTALLATION) (6 TEE SEALS)

2 011549-00002 PISTON SEALS

11549B prt

VALVES (TRAVEL)

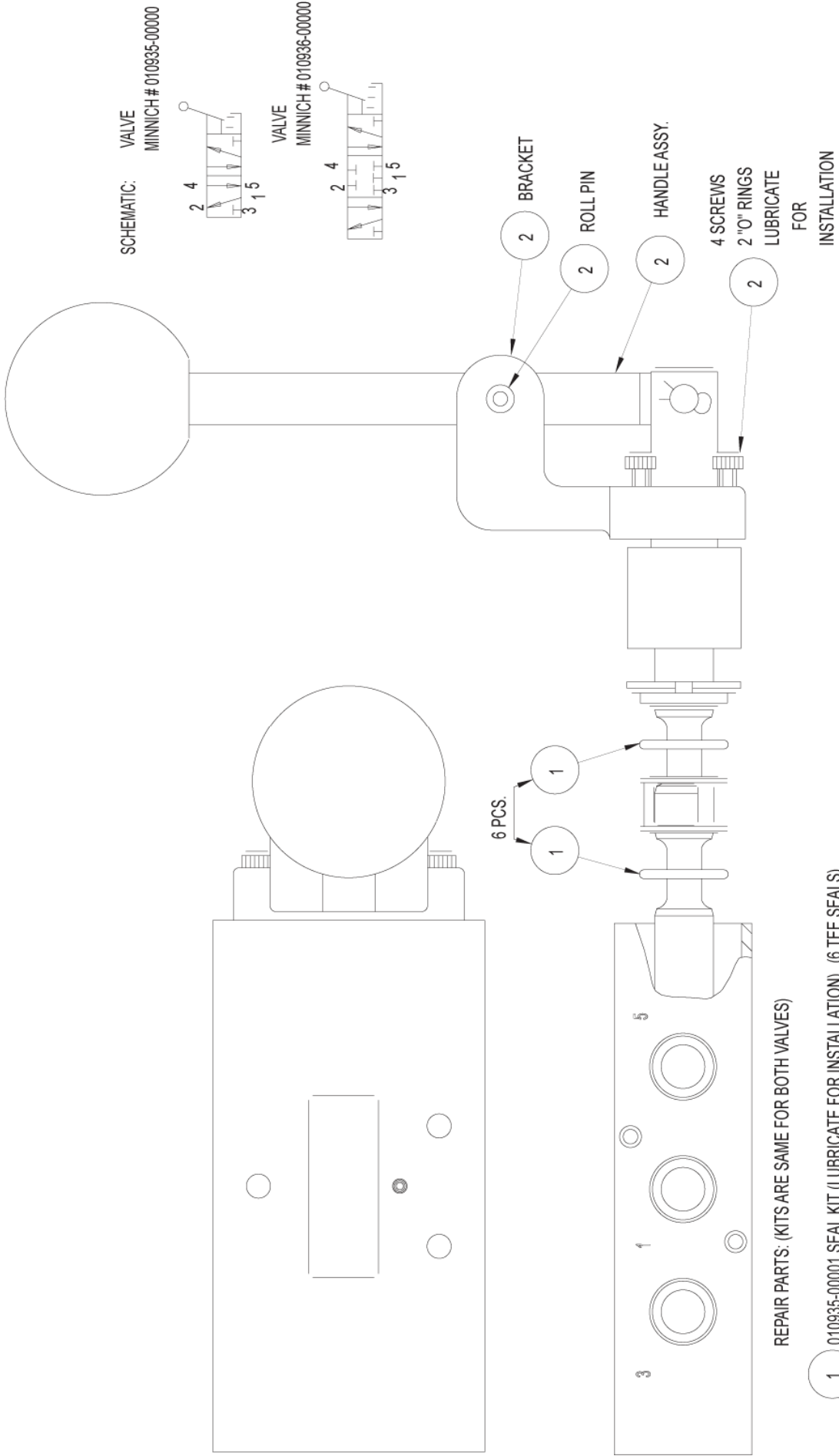
MINNICH P/N 011526-00000



- REPAIR PARTS
- ② SPOOL SEALS
MINNICH P/N 011526-00001
 - ③ HANDLEVER
MINNICH P/N 011526-00002
 - ④ SPRING OPERATOR
MINNICH P/N 011526-00003

11526B.prt

VALVES
 MINNICH P/N 010935-00000
 010936-00000



REPAIR PARTS: (KITS ARE SAME FOR BOTH VALVES)

1 010935-00001 SEAL KIT (LUBRICATE FOR INSTALLATION) (6 TEE SEALS)

2 010935-00002 HAND LEVER KIT

4 SCREWS
 2 "O" RINGS
 LUBRICATE
 FOR
 INSTALLATION

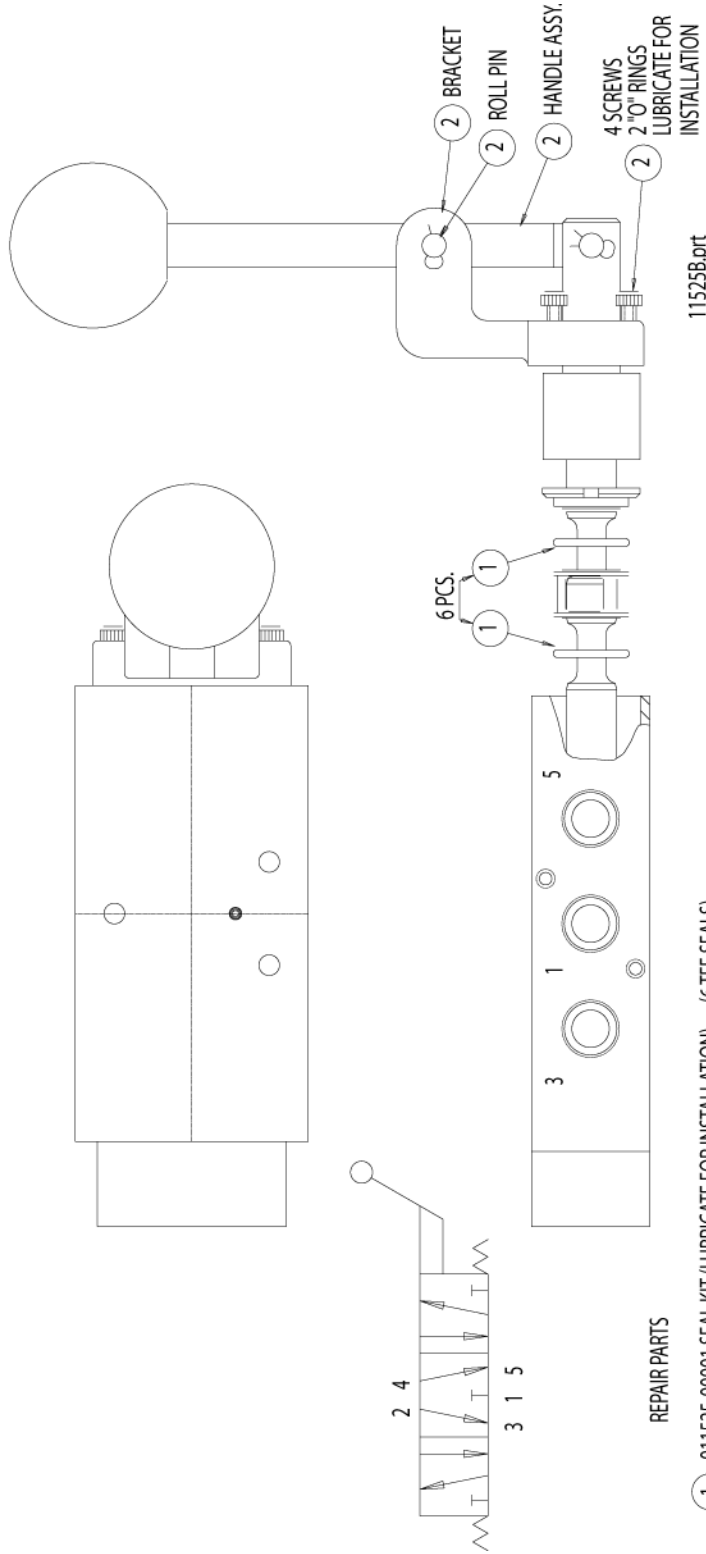
6 PCS.

SCHEMATIC: VALVE
 MINNICH # 010935-00000

SCHEMATIC: VALVE
 MINNICH # 010936-00000

VALVES (STEER)

MINNICH P/N 011525-00000

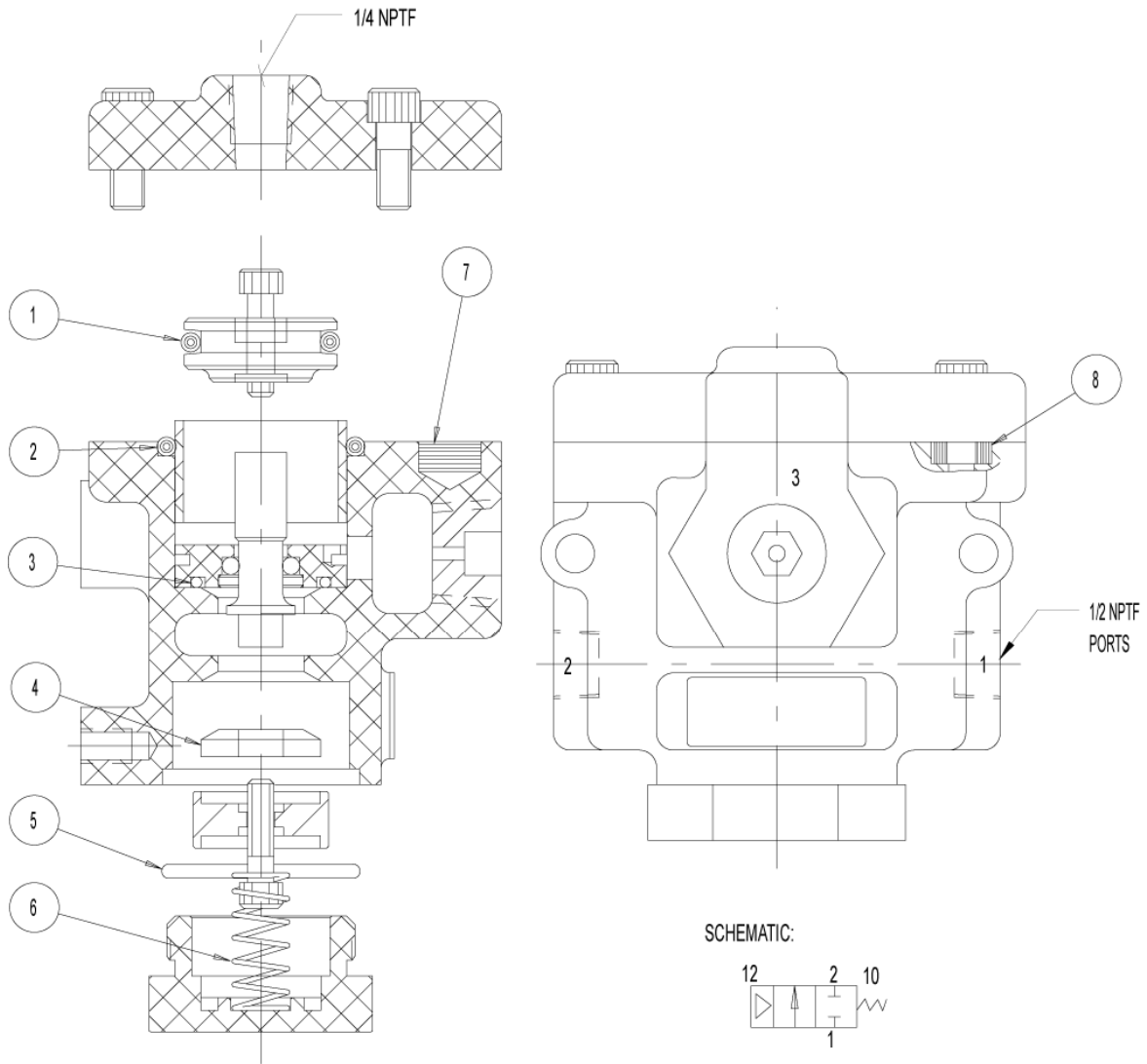


REPAIR PARTS

- ① 011525-00001 SEAL KIT (LUBRICATE FOR INSTALLATION) (6 TEE SEALS)
- ② 010935-00002 HAND LEVER KIT

VALVE (DRILL)

MINNICH P/N 010925-00000



SERVICE KIT # 010925-00001

KEY ITEM	DESCRIPTION	QTY
+ 1	O RING IN.139X.859X1.137	1
+ 2	O RING IN.139X1.234X1.512	1
+ 3	O RING IN.103X.799X1.005	1
+ 4	CUSH N SEAL N03	1
+ 5	O RING IN.103X1.237X1.430	1
6	SPRING 238/338 N03	1
7	PLUG RUBBER .188 X .438D	1
+ 8	SEAL POPPET N03	1

+ LUBRICATION REQUIREMENT

10925B.pt

MARKER ASSEMBLY

MINNICH P/N A10940-00000

NOTE:
1 NEVER SIZE ALL PARTS
2 USE #242 BLUE LOCTITE ON
BOTH THREADS INDICATED.

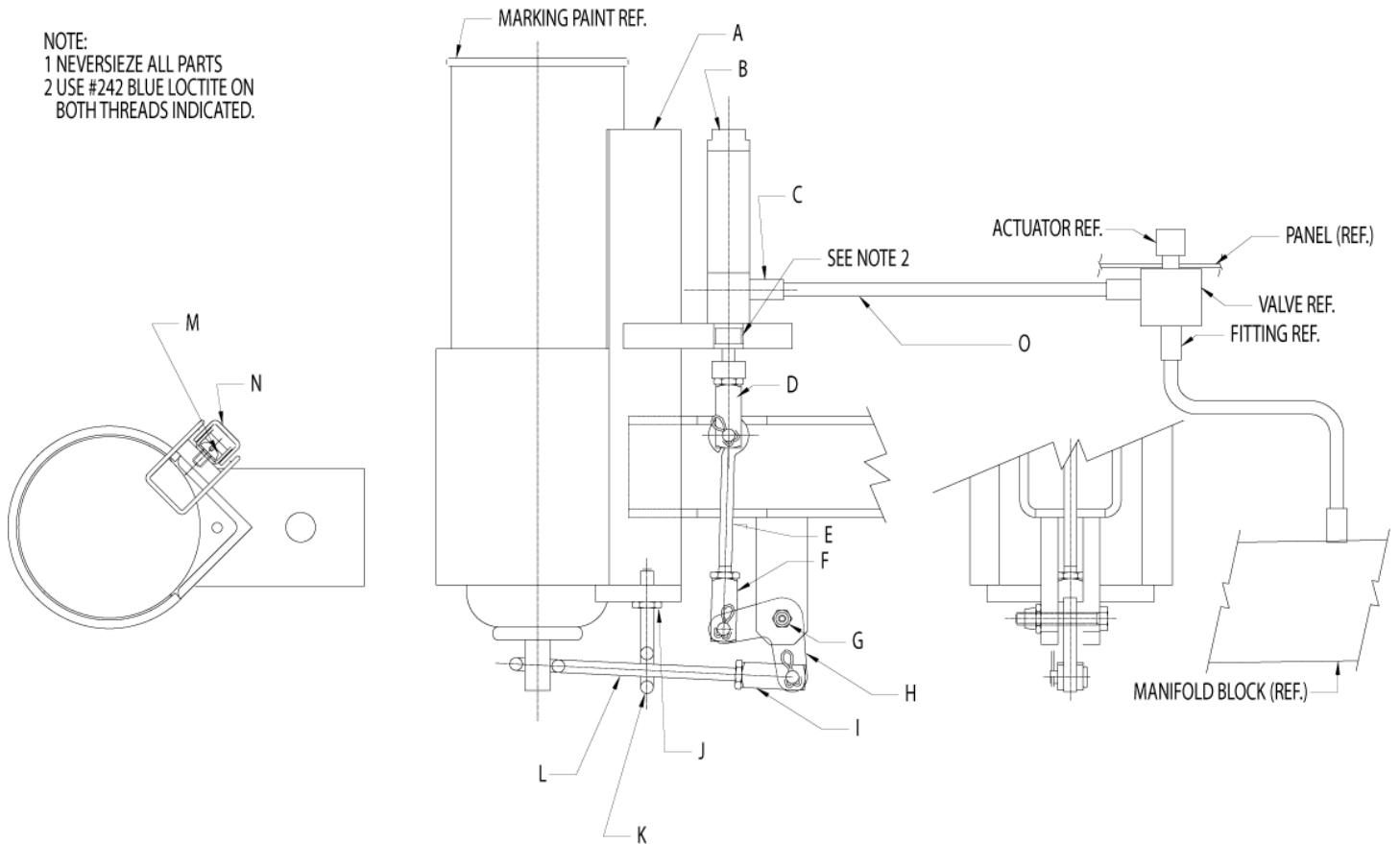
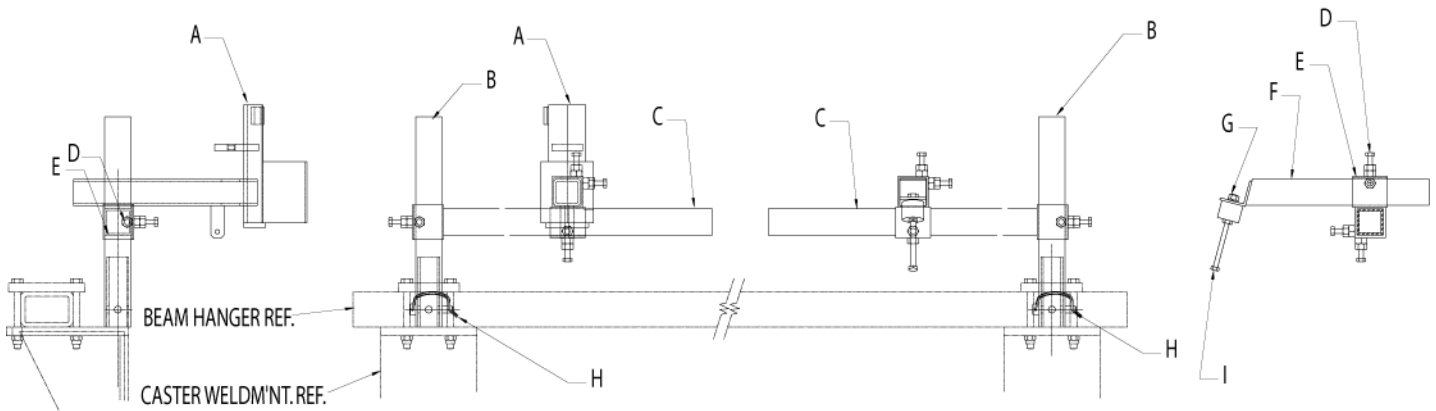


FIG.	PART NUMBER	DESCRIPTION	QTY
A	A10953-00000	WELDM'T SPRAY CAN HOLDER	1
B	008761-00000	CYLINDER, AIR .562 X .5	1
C	010826-00001	FITTING, 5/32 TUBE TO 10-32 UNF	1
D	008764-00000	CYLINDER ROD EYE	1
D	011914-00004	HOSE, 1/4 HYDRAULIC AR17	.25
E	010941-00000	EYEBOLT	1
F	008764-00000	CYLINDER ROD EYE	1
G	006036-1.250	HHCS, 1/4-20 X 1-1/4 GR.5	1
G	006402-00000	LOCKNUT 1/4-20	1
H	010943-00000	LEVER BLANK	1
I	008764-00000	CYLINDER ROD EYE	1
J	006654-00000	NUT, HEX #10-24 NC THREAD	1
K	010954-00000	EYEBOLT	1
L	010942-00000	EYEBOLT	1
M	006256-0.250	RHMS, #8-32 X 1/4 SLOTTED	2
M	006144-00000	LOCKWASHER, #8	2
N	010955-00000	DRAW LATCH	1
O	010861-00000	TUBING, NYLON 5/32 BLACK SEMI-RIGID	120

POINTER & MARKER ASSEMBLY

P/N 0A6964-00000



MINNICH P/N A6964

FIG.	PART NUMBER	DESCRIPTION	QTY
A	A10940-00000	ASSY, MARKER	1
B	012006-00000	TUBE, EXTENSION	1
C	0A6959-00000	WELDM'T TUBE	1
C	006038-1.250	HHCS, 3/8-16 X 1-1/4 GR.5	2
C	006072-00000	NUT HEX 3/8-16	2
D	006038-1.250	HHCS, 3/8-16 X 1-1/4 GR.5	4
D	006072-00000	NUT HEX 3/8-16	4
E	0A6961-00000	WELDM'T ADJUSTMENT	1
F	0A6965-00000	WELDM'T GUIDE BRACKET	1
G	002042-00000	ISOLATOR	1
G	006071-00000	NUT, HEX 5/16-18	1
G	006148-00000	LOCKWASHER 5/16	1
H	008479-00001	PIN, TAB LOCK	1
I	006037-5.000	HHCS, 5/16-18 X 5 GR.5	1
I	006071-00000	NUT, HEX 5/16-18	1
I	006148-00000	LOCKWASHER 5/16	1

PRESSURE REGULATOR

MINNICH P/N 002880-00000

OPERATION

A regulator is used in a compressed air system to maintain nearly constant outlet pressure despite changes in the inlet air pressure and changes in downstream flow requirements.

Outlet pressure is controlled by the adjusting screw (1). clockwise rotation increases and counter-clockwise rotation decreases outlet pressure setting. When the adjustment (1) is rotated fully counter-clockwise, no force is applied to the regulating spring (2), and the valve (6) is held closed by the valve spring (7). clockwise rotation of the adjustment (1) compresses the regulating spring (2) which applies a downward force on top of the diaphragm (4). The diaphragm (4) and valve pin (5) move downward forcing valve (6) off its seat (10) which allows air to flow through the regulator to the downstream system.

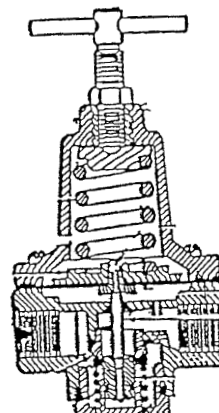
Outlet pressure increases in the downstream system and sensing chamber (9) and applies an upward force on bottom of the diaphragm (4). The diaphragm (4), valve pin (5); and valve (6) move upward, compressing the regulator spring (2). Upward movement stops when the forces below the diaphragm balance the forces above the diaphragm. When there is no downstream flow demand, the balance of forces occurs with the valve (6) closed. When there is downstream flow demand, the balance of forces occurs when the valve opens sufficiently to compensate for demand, thus maintaining the desired outlet pressure.

RELIEVING TYPE REGULATORS. With relieving regulators, outlet pressure can be reduced even though the system is dead-ended. When the adjustment (1) is turned counterclockwise, the force on the regulating spring (2) is reduced, and air pressure in the sensing chamber (9) moves the diaphragm (4) upward. This upward movement opens the relief passage (8) in the diaphragm and allows air to escape from the outlet side of the regulator through the relief passage (8) and vent (3) to atmosphere. As the outlet air pressure decreases to the reduced pressure setting, the diaphragm moves downward and closes the relief passage.

The diaphragm will likewise move upward in a response to an increase in outlet pressure above the regulator setting, allowing air to escape to the atmosphere as described above. However, the flow capacity of the relief passage is limited, and depending upon the source of the overpressure condition, the outlet pressure might increase to a point significantly higher than the regulator setting. For this reason, the relief feature of a regulator must not be relied upon as an overpressure safety device. See WARNING note below.

ADJUSTMENT

1. Before turning on system air pressure, turn regulator adjustment counterclockwise until all load is removed from regulating spring.
2. Turn on system air pressure.
3. Turn regulator adjustment clockwise until the desired outlet pressure is reached.
4. To avoid minor readjustment after making a change in pressure setting, always approach the desired pressure from a lower pressure. When reducing from a higher to a lower setting, first reduce to some pressure less than the desired, then bring up to the desired point.
5. Tighten jam out to lock pressure setting.



Feed Regulator
P/N 002880-00000
Repair Kit
P/N 002880-00001
Regulating Spring
P/N 002880-00004

MAINTENANCE

The regulator can be disassembled for servicing without removal from pipe line. to disassemble, shut off the inlet air and reduce pressure in inlet and outlet lines to zero. Turn adjusting screw (1) counterclockwise until all load is removed from regulating spring (7 or 7a): Remove bonnet screws (4), bonnet (3), upper springrest (5), spring (7), and diaphragm assembly (8). The intermediate springrest (6) and compound spring (7a) are used only on 3/4" (19mm) and 1" (25.4mm) models with 5 to 125 PSI (0.34 to 8.62 Bar) adjustment range. Unscrew and remove bottom plug (16), O-ring (15) and valve spring (14). Pull valve assembly (11) together with O-ring (12) out of body. Do not remove valve seat (10) unless replacement is necessary. Remove O-ring (9) using a hook shaped tool, taking care not to damage O-ring seating surfaces or valve seat.

Clean parts using warm water and soap. Dry thoroughly. Inspect each part carefully. Replace any parts which are damaged.

At reassembly, apply a wipe coat of silicone base grease to O-rings (9, 12, 15), to stem and body of valve assembly (11), and to center bore in bottom plug (16). Apply a light even coat of light grease to full length of threads and tip of adjusting screw (1). Tighten valve seat (10), if previously removed, to 80-100 inch-pounds torque (9-11.3 N-m) (1/4", 3/8" and 1/2" sizes) (6.35mm, 9.53mm, and 12.77mm sizes) or 25-30 foot-pounds torque (33.9-40.7 N-m) (3/4" and 1" sizes) (19mm and 25.4mm sizes). Tighten bottom plug (16) snugly by hand. Tighten bonnet screws (4) to 20-30 inch-pounds torque (2.3-3.4 N-m) (1/4", 3/8" and 1/2" sizes) (6.35mm, 9.53mm, and 12.77mm sizes) or 50-60 inch-pounds torque (5.6-6.8 N-m) (3/4" and 1" sizes) (19mm and 25.4mm sizes).

WARNING

THESE REGULATORS ARE INTENDED FOR USE IN INDUSTRIAL COMPRESSED AIR SYSTEMS ONLY. DO NOT USE THESE REGULATORS WHERE PRESSURE OR TEMPERATURE CAN EXCEED RATED OPERATING CONDITIONS. SEE SPECIFICATIONS.

IF OUTLET PRESSURES IN EXCESS OF THE REGULATOR PRESSURE SETTING COULD CAUSE DOWNSTREAM EQUIPMENT TO RUPTURE OR MALFUNCTION, INSTALL A PRESSURE RELIEF DEVICE DOWNSTREAM OF THE REGULATOR. THE RELIEF PRESSURE AND FLOW CAPACITY OF THE RELIEF DEVICE MUST SATISFY SYSTEM REQUIREMENTS.

BEFORE USING WITH FLUIDS OTHER THAN AIR, FOR NON-INDUSTRIAL APPLICATIONS, OR FOR LIFE SUPPORT SYSTEMS,

PRESSURE REGULATOR MINNICH P/N 011703-00000

Standard Units: Relieving

Maximum supply Pressure: 250 PSI (17 Bar)

Operating Temperature Range: 40°F to 120°F (4.4°C to 48.9°C)

WARNING

FOR COMPRESSED AIR SERVICE ONLY. NOT TO BE USED ON LIFE SUPPORT SYSTEMS.

INSTALLATION

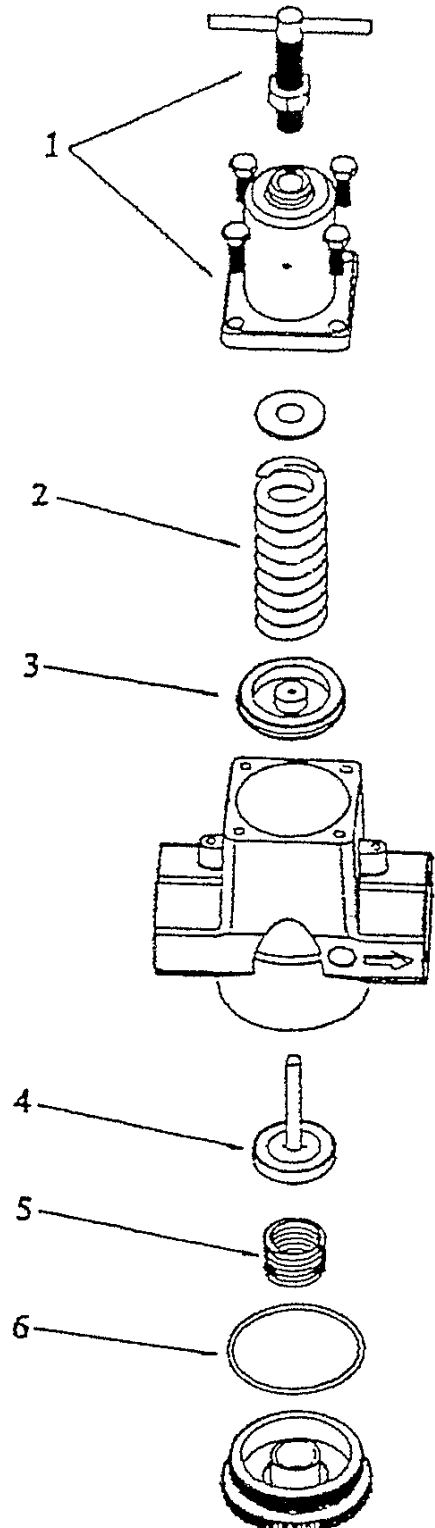
Install regulators so the airflow is in the direction of the arrow as indicated on the head of unit. Regulators should be installed downstream from filters and upstream from lubricators, but as close as possible to the pneumatic tools or appliances being serviced. The regulator will accurately control secondary pressure between 5 and 200 PSI (0.34 and 13.8 Bar), maximum primary pressure is 250 PSI (17 Bar). The self-bleed feature permits use on dead-end applications. **WARNING! Units are die cast aluminum. Do not over torque when installing regulator or gauge. Use of Teflon tape is not recommended.**

OPERATION ADJUSTMENTS

After the regulator is installed, back off pressure by adjusting T-handle counter-clockwise before the air is turned on. Turn on air supply and adjust T-handle clockwise until the pressure gauge shows desired pressure. To lock the T-handle, tighten lock nut on adjustment screw.

MAINTENANCE

On detection of air leaks, pressure fluctuation, or "creep", depressurize system and remove bottom cap. Inspect valve seat for damage or wear. Inspect seat in head casting for foreign material or damage. Clean with naphtha or kerosene and blow out with air. Replace any damaged parts. If leaks persist, remove spring cage, inspect piston and piston seat for wear or foreign materials. Replace any damaged parts.



Part Number	Item	Kit Description	Contents
011703-00004	4, 5, 6	Valve Kit	Valve Assembly, Valve Spring, O-Ring
011703-00003	3	Piston Kit	Relieving Piston Assembly (STD)
011703-00002	2	Spring Kit	Spring, 0-125 PSI (0-8.6 Bar) Range (STD)
011703-00001	1	Spring Cage Kit	T-Handle Adjusting Screw Assembly, Spring Cage, Screws

Form: MM-A4/A5SC Revised 07/13/16

Lubricator (003843-00001)

Warning: DO NOT place plastic bowl unit in service without metal bowl guard installed.

Plastic bowl units are sold only with metal bowl guards. To minimize the danger of flying fragments in the event of plastic bowl failure, the metal bowl guards should not be removed. If the unit is in service without the metal bowl guard installed, manufacturer's warranties are void, and the manufacturer assumes no responsibility for any resulting loss.

**If unit has been in service and does not have a metal bowl guard,
order one and install before placing back in service.**

CAUTION:

Certain compressor oils, chemicals, household cleaners, solvents, paints and fumes will attack plastic bowls and can cause bowl failure. Do not use near these materials. When bowl becomes dirty replace bowl or wipe only with a clean, dry cloth. Reinstall metal bowl guard or buy and install a metal bowl guard. Immediately replace any crazed, cracked, damaged or deteriorated plastic bowl with a metal bowl or a new plastic bowl and a metal bowl guard.

WE CANNOT POSSIBLY LIST ALL HARMFUL SUBSTANCES. CHECK WITH A MOBAY CHEMICAL OR GENERAL ELECTRIC OFFICE FOR FURTHER INFORMATION ON POLYCARBONATE PLASTIC.

Except as otherwise specified by the manufacturer, this product is specifically designed for compressed air service, and used with any other fluid (liquid or gas) is a misapplication. For example, use with or injection of certain hazardous liquids or gases in the system (such as alcohol or liquid petroleum gas) could be harmful to the unit or result in a combustible condition or hazardous external leakage. Manufacturers warranties are void in the event of misapplication, and manufacturer assumes no responsibility for any resulting loss. Before using with fluids other than air, or for non-industrial applications, or for life support systems consult manufacturer for written approval.

INSTALLATION

1. Refer to warning above.
2. Install as close as possible to the equipment requiring lubrication.
3. Install the unit with the air flowing through the body in the direction indicated by the arrow.
4. Install the same pipe-size unit as the pipeline in use. Avoid using fittings, couplings, etc., that restrict the airflow or baffle the oil out of the air at the lubricator outlet.
5. The lubricator may be filled under pressure by slowly removing the fill plug and pouring oil into the bowl through the fill tube. The tank may be taken off after the fill plug is removed. Do not replace the fill plug until the tank is secured in place. NOTE: As the fill plug is removed, the air pressure in the tank will be released.
6. Use only clean non-detergent oil. SAE 10 or lighter is usually best.
7. The rate of oil delivery can be controlled counterclockwise for more and clockwise for less delivery. This lubricator delivers all of the oil downstream that passes through the sight dome. The oil delivery rate will change automatically to deliver more oil during higher air flows and less oil for air flows lower than that at which the original setting was made.
8. Maximum pressure and temperature ratings for metal tanks are 200 PSI (14 Bar) and 175°F (79°C).

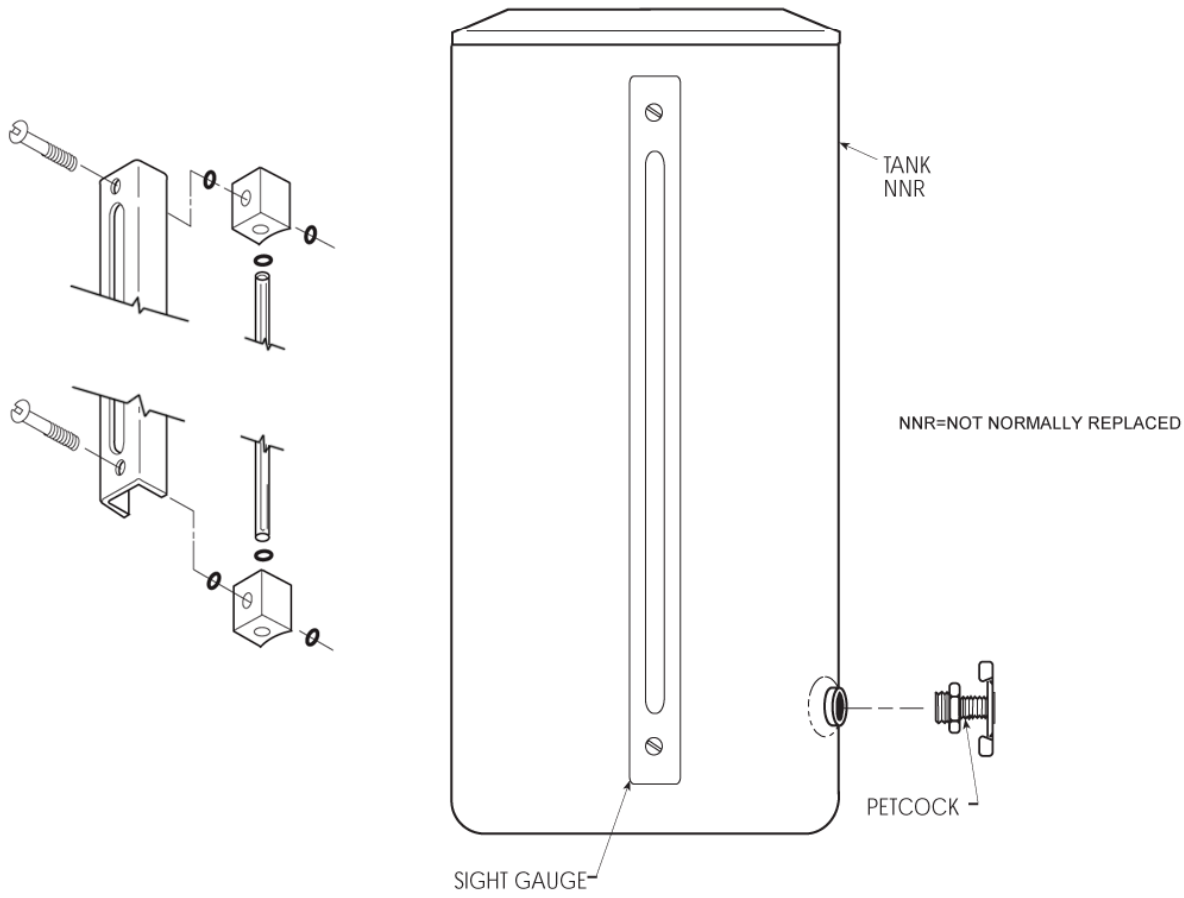
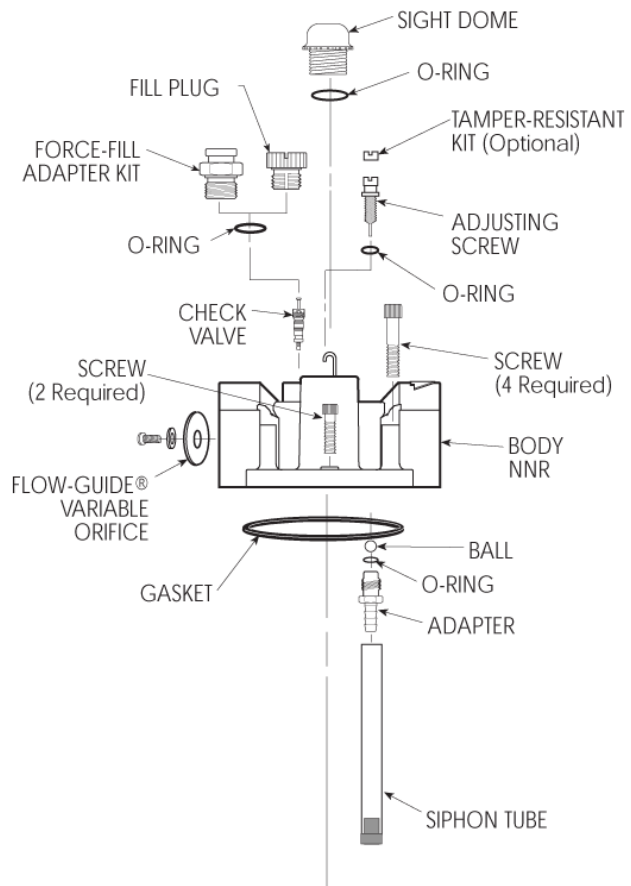
MAINTENANCE

1. Given clean operating conditions, this unit should be trouble-free. Contaminants from dirty oil may collect on the siphon tube inlet filter, requiring the filter to be cleaned by tapping on a hard surface and blowing off with an air blow gun. Drain off any contaminants which collect in the bottom of the bowl.
2. IF THE OIL DELIVERY RATE DROPS, shut off the air supply to the lubricator and reduce the pressure in the unit to zero. Remove the Flow-Guide® variable orifice screw and clean its air passage with a small wire. Check the bore that the screw fits into for contaminants and clean, if necessary. Be sure that the passageway from the sight dome cavity into the Flow-Guide® variable orifice post is open. Remove the adjusting screw and clean the needle and the seat in the body. Inspect and clean the passage from the needle seat down into the adaptor.
3. Drain off any contaminants which collect in the bottom of the bowl.
4. Lubricate o-rings with Parker O-Lube before assembly.
5. Clean plastic bowl with a clean, dry cloth only.

0A3843-00021 Rebuild Kit (Includes all parts except tank, body and sight gauge kit)

003843-00004 Sight Gauge kit for 003843-00001 (not included in 0A3843-00021)

003843-00005 Sight Dome Kit (included in 0A3843-00021)



Air Motor

005392-00001

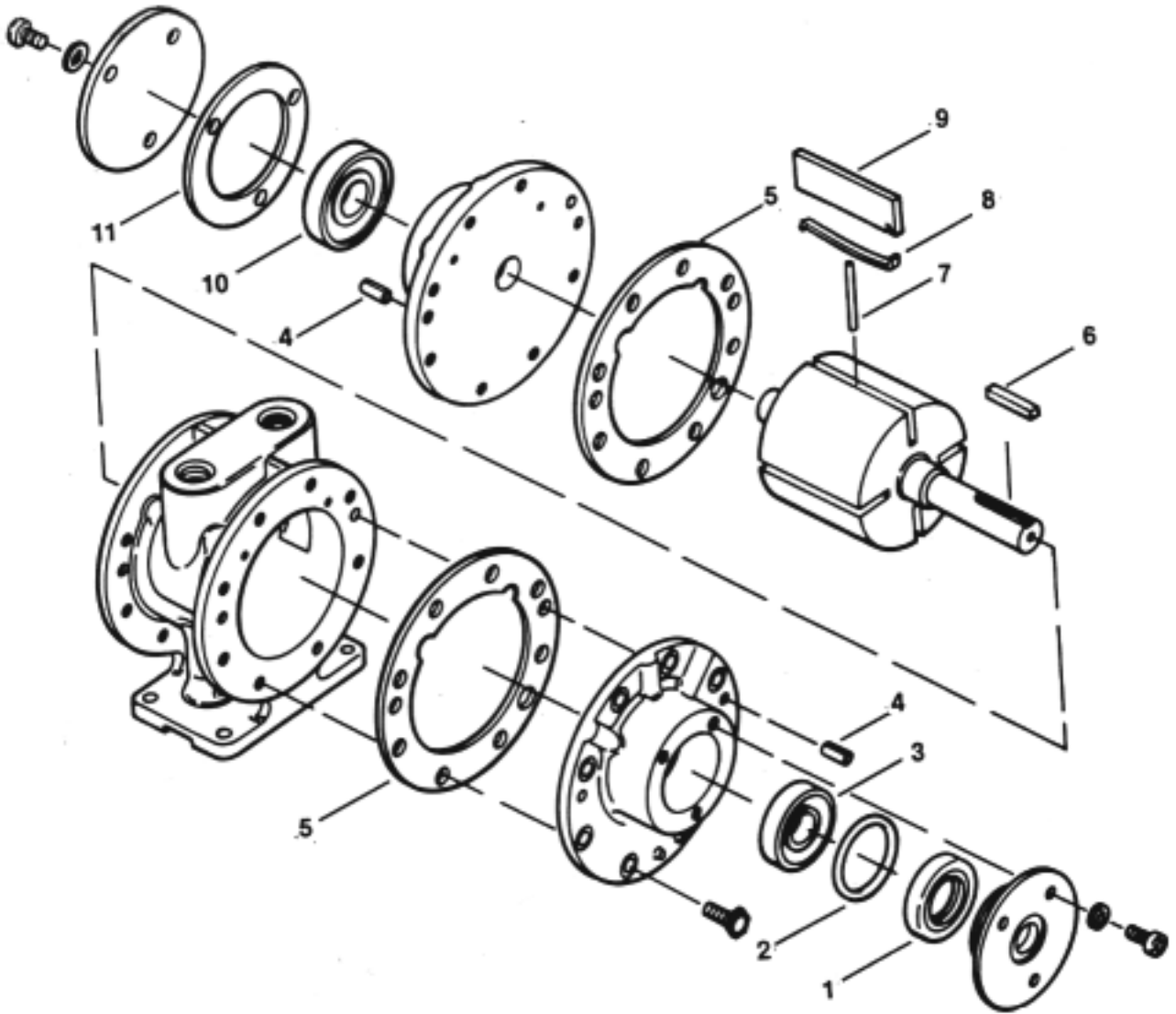
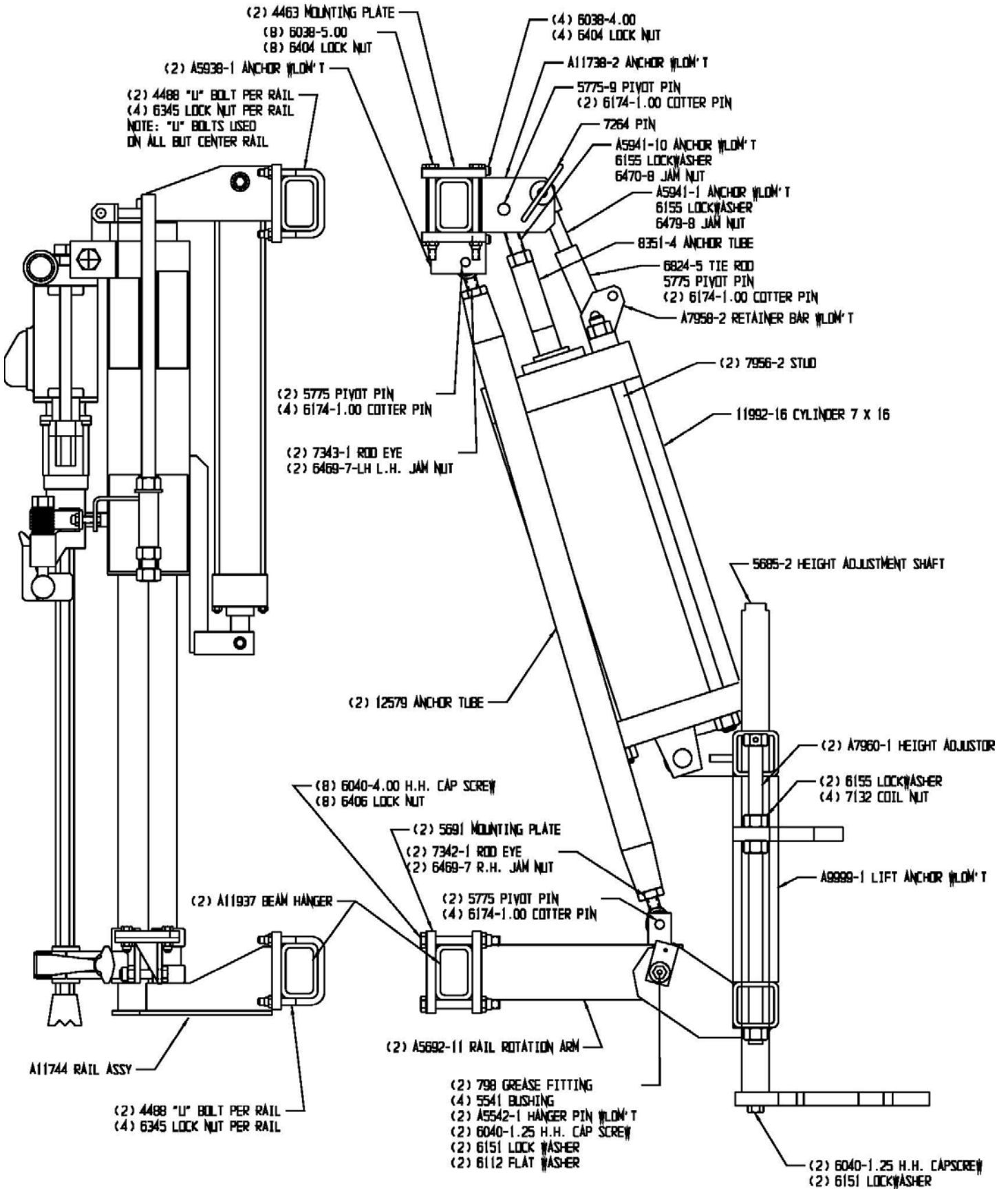


FIG.	PART NUMBER	DESCRIPTION	QTY
1*	005392-01-02	SHAFT SEAL	1
2*	005392-01-03	O-RING	1
3*	005392-01-04	BEARING, DRIVE END	1
4	005392-01-05	DOWEL PIN	4
5*	005392-00003	BODY GASKET	2
6	005392-01-08	KEY	1
7*	005392-00004	PUSH PIN	4
8*	005392-00005	VANE SPRING	8
9*	005392-00006	VANE	8
10*	005392-01-10	BEARING, DEAD END	1
11*	005392-00007	END CAP, GASKET	1
*	005392-01-13	FELT	1
	005392-00002	SERVICE KIT	1

* Parts included in service kit (005392-00002).

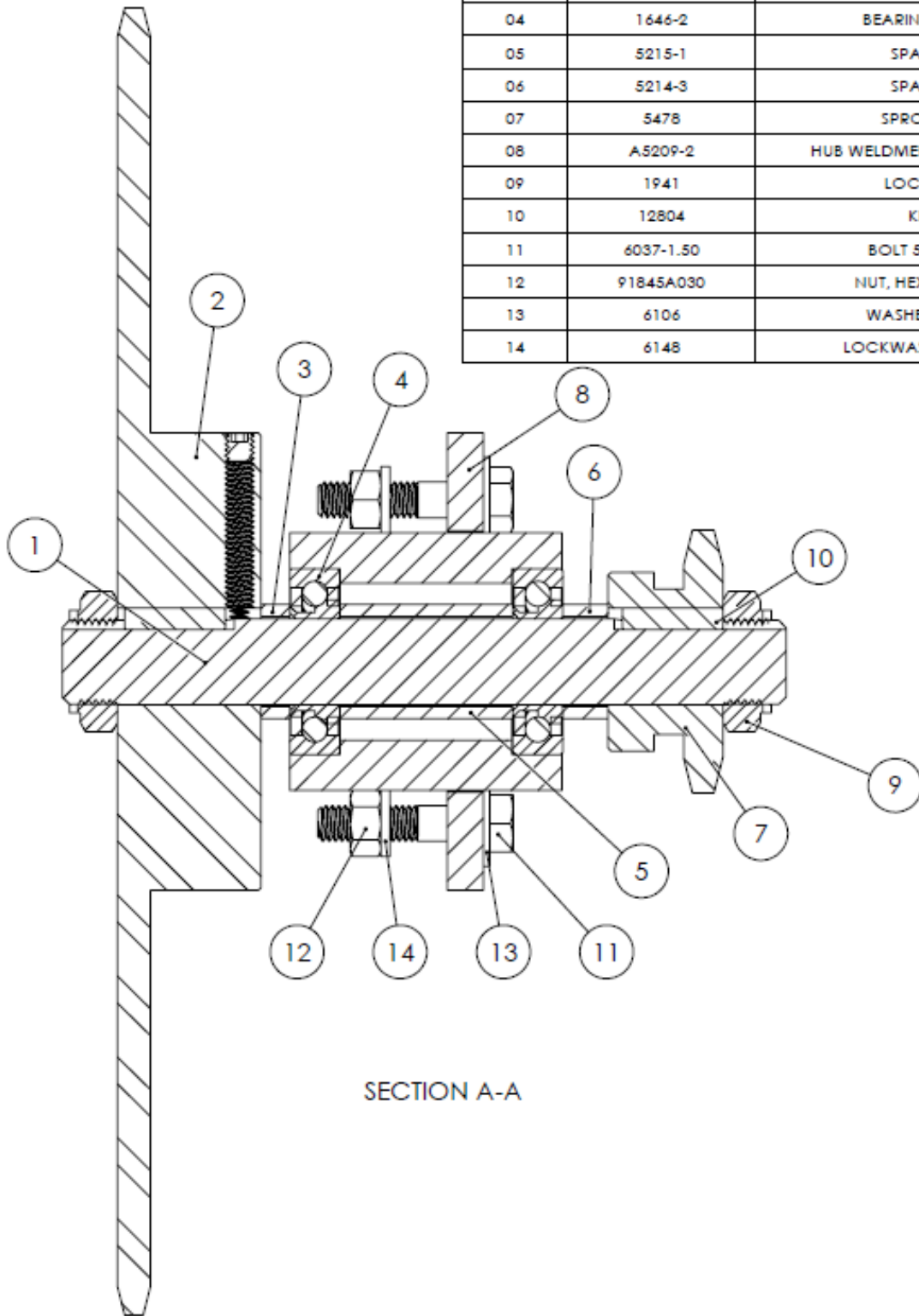
LIFT GROUP ASSEMBLY

MINNICH PART NUMBER: A7927-11

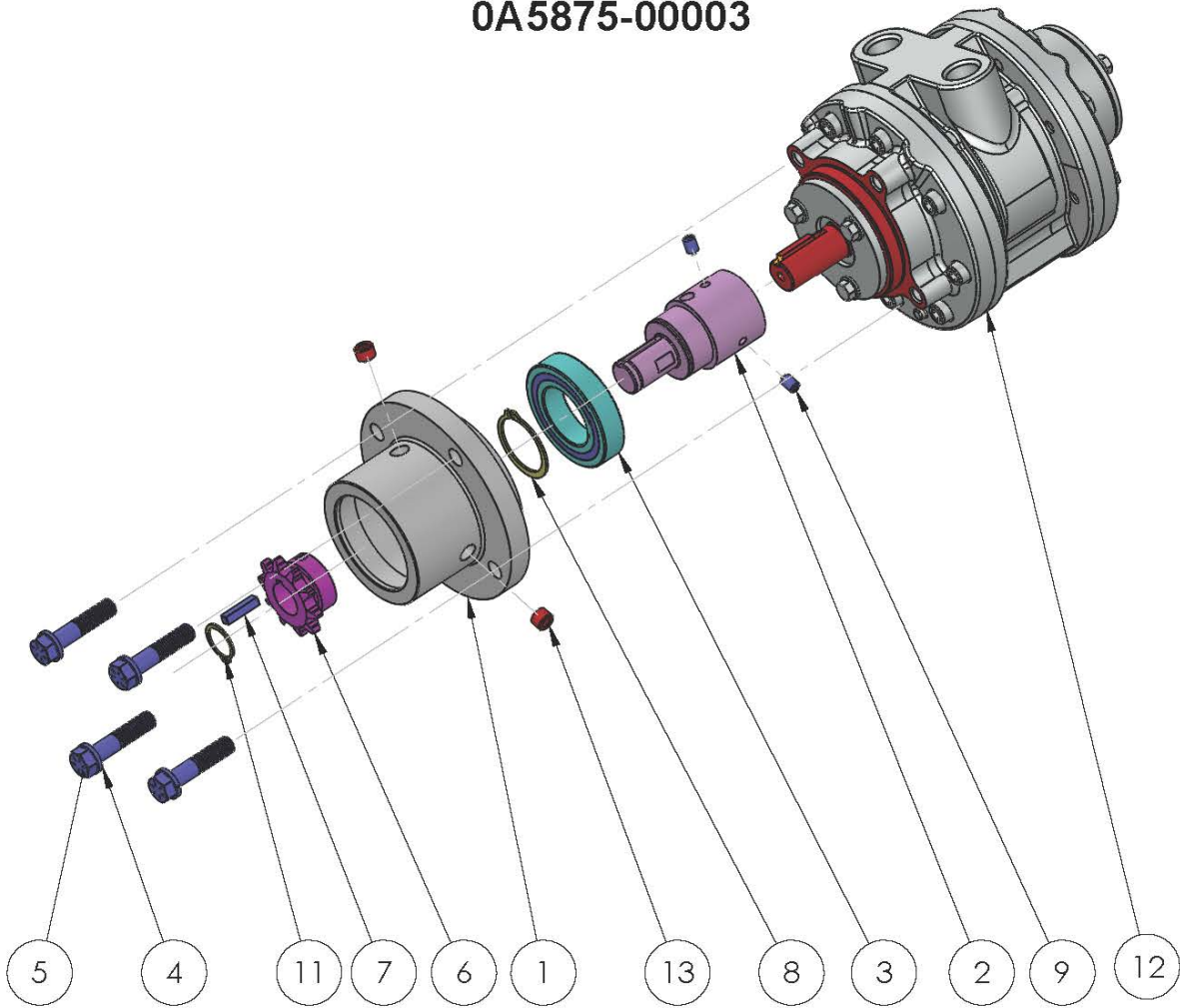


0A5910-00007

ITEM	PART NUMBER	TITLE	QTY.
01	5660-2	SHAFT, REDUCTION	1
02	5481-2	SPROCKET	1
03	5214-4	SPACER	1
04	1646-2	BEARING, BALL	2
05	5215-1	SPACER	1
06	5214-3	SPACER	1
07	5478	SPROCKET	1
08	A5209-2	HUB WELDMENT MACHINED	1
09	1941	LOCKNUT	2
10	12804	KEY	2
11	6037-1.50	BOLT 5/16"-18	4
12	91845A030	NUT, HEX 5/16-18	4
13	6106	WASHER 5/16"	4
14	6148	LOCKWASHER, 5/16	4



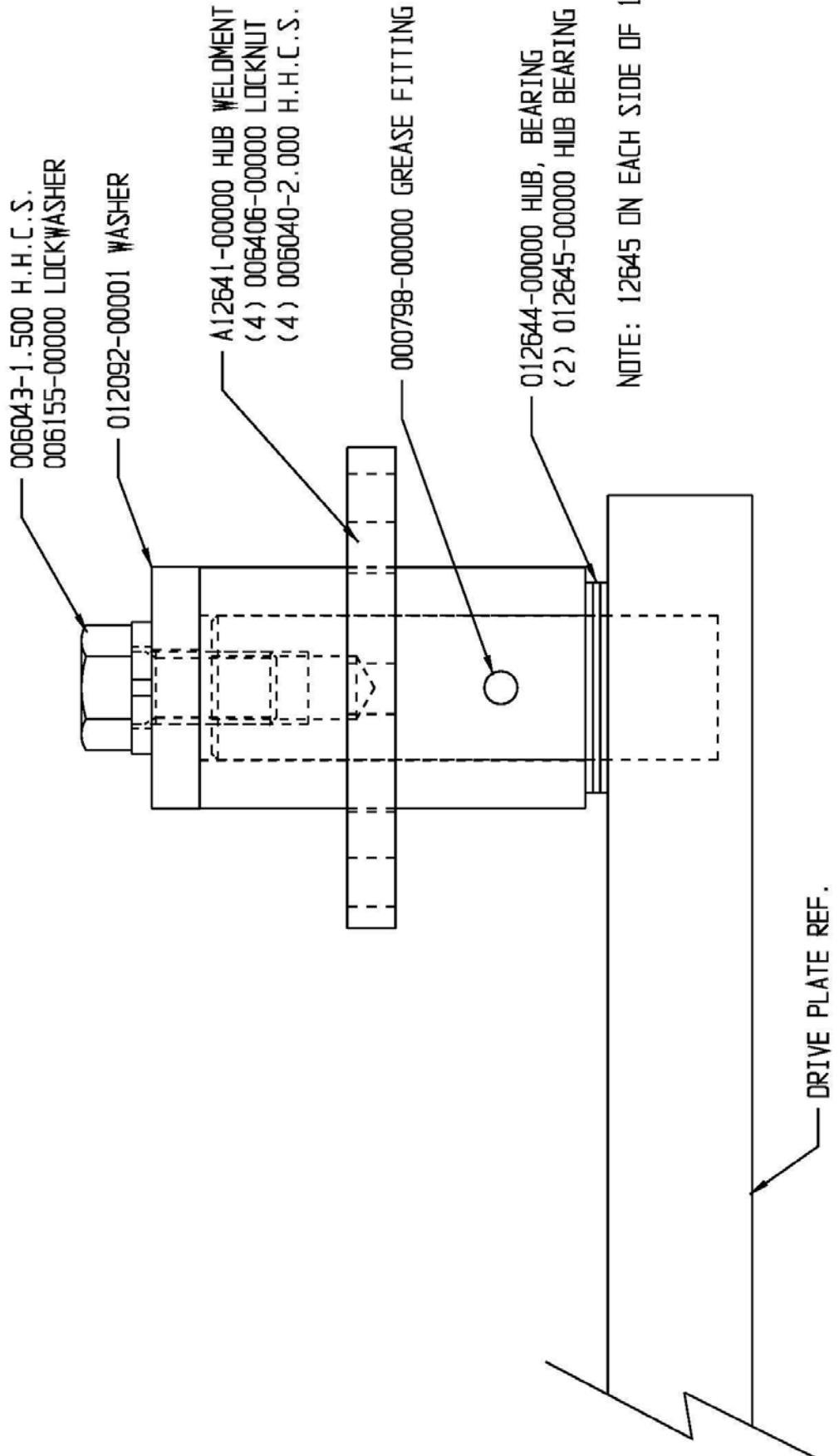
DRIVE ASSEMBLY
MINNICH PART NUMBER
0A5875-00003



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	013508-00000	SPINDLE HOUSING	1
2	013509-00000	SPINDLE	1
3	005870-00000	BALL BEARING	1
4	006149-00000	LOCK WASHER 3/8	4
5	6038-1.75	HHCS 3/8-16 X 1-3/4 GRADE 8	4
6	005480-00003	SPROCKET W KEYWAY	1
7	012804-0.875	KEY	1
8	006377-00010	RETAINING RING	1
9	013523-0.375	SOC SET SCREW FP 1/4-20 X 3/8	1
10	006321-0.375	SOC SET SCREW CP 1/4-20 X 3/8	1
11	6377-4	RETAINING RING	1
12	005392-00001	AIR MOTOR	1
13	006471-00001	1/8 NPT PIPE PLUG	2

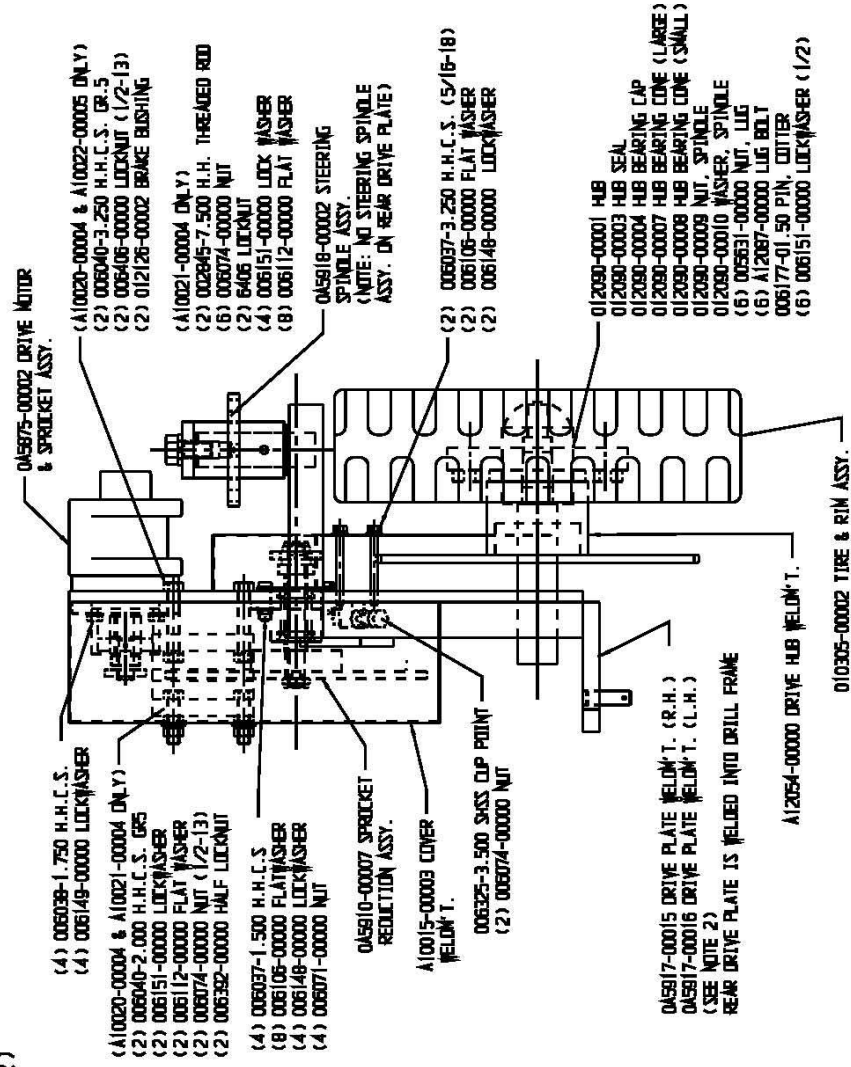
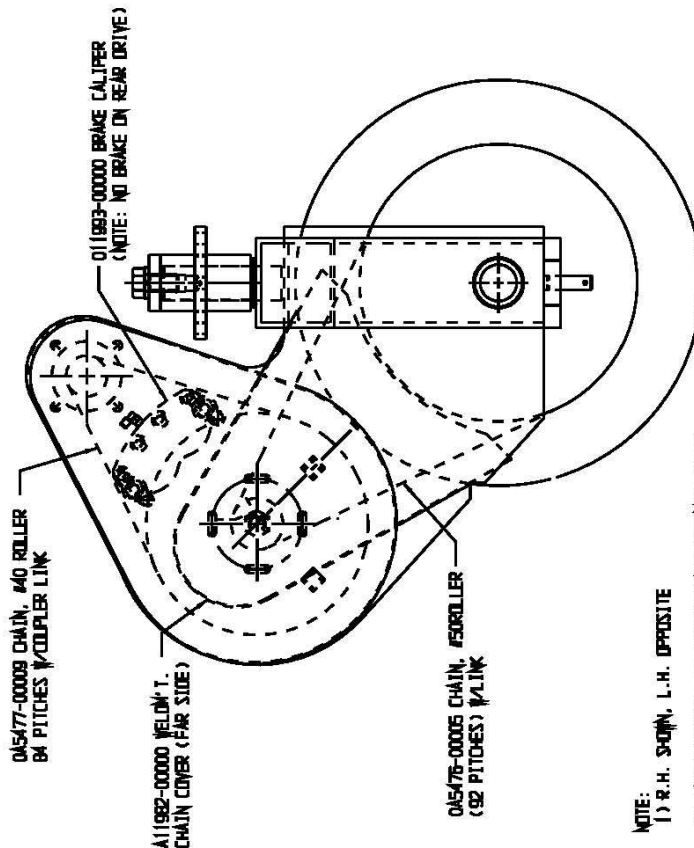
STEERING SPINDLE ASSEMBLY

MINNICH P/N: 0A5918-2



DRIVE ASSEMBLY

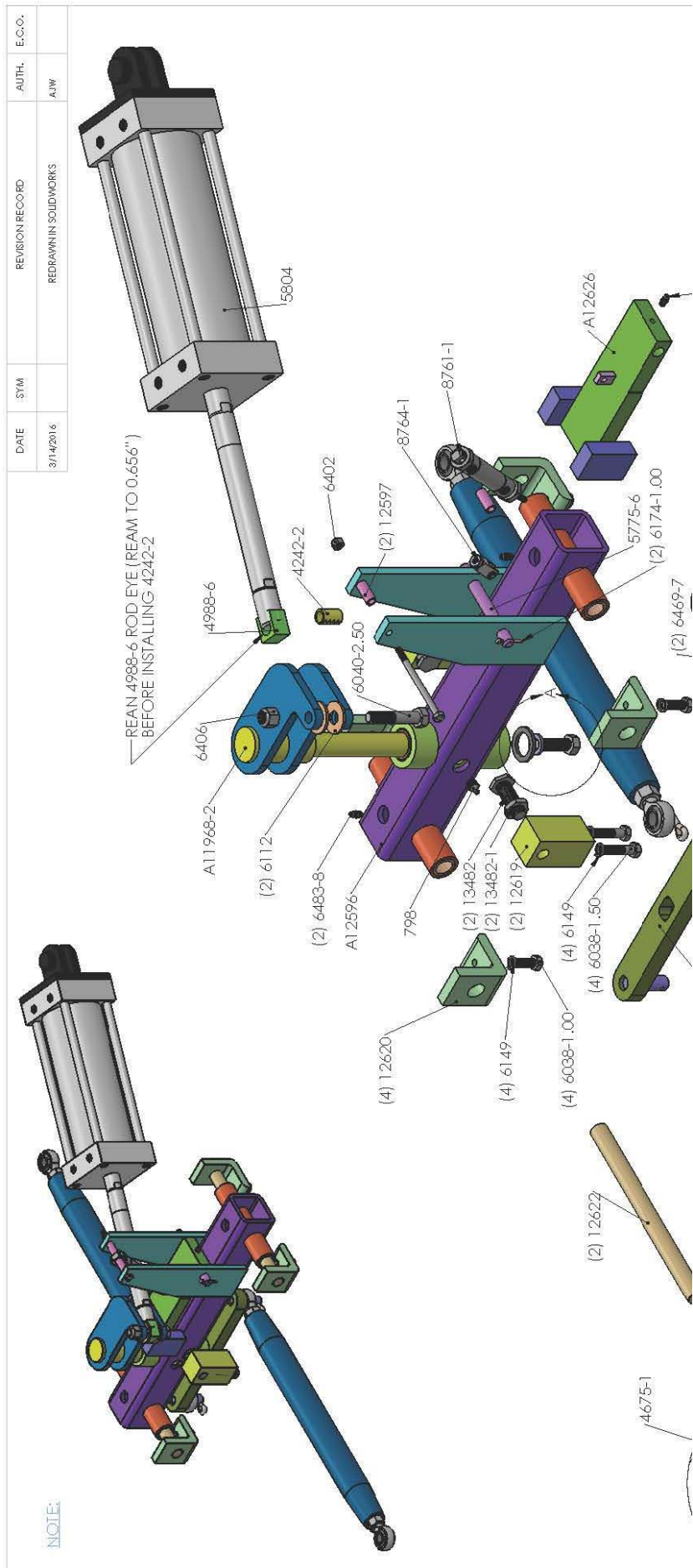
A10020-00004 (R.H.) & A10021-00004 (L.H.)
 A10022-00005 (REAR)



NOTE:
 1) R.H. SHOWN, L.H. OPPOSITE

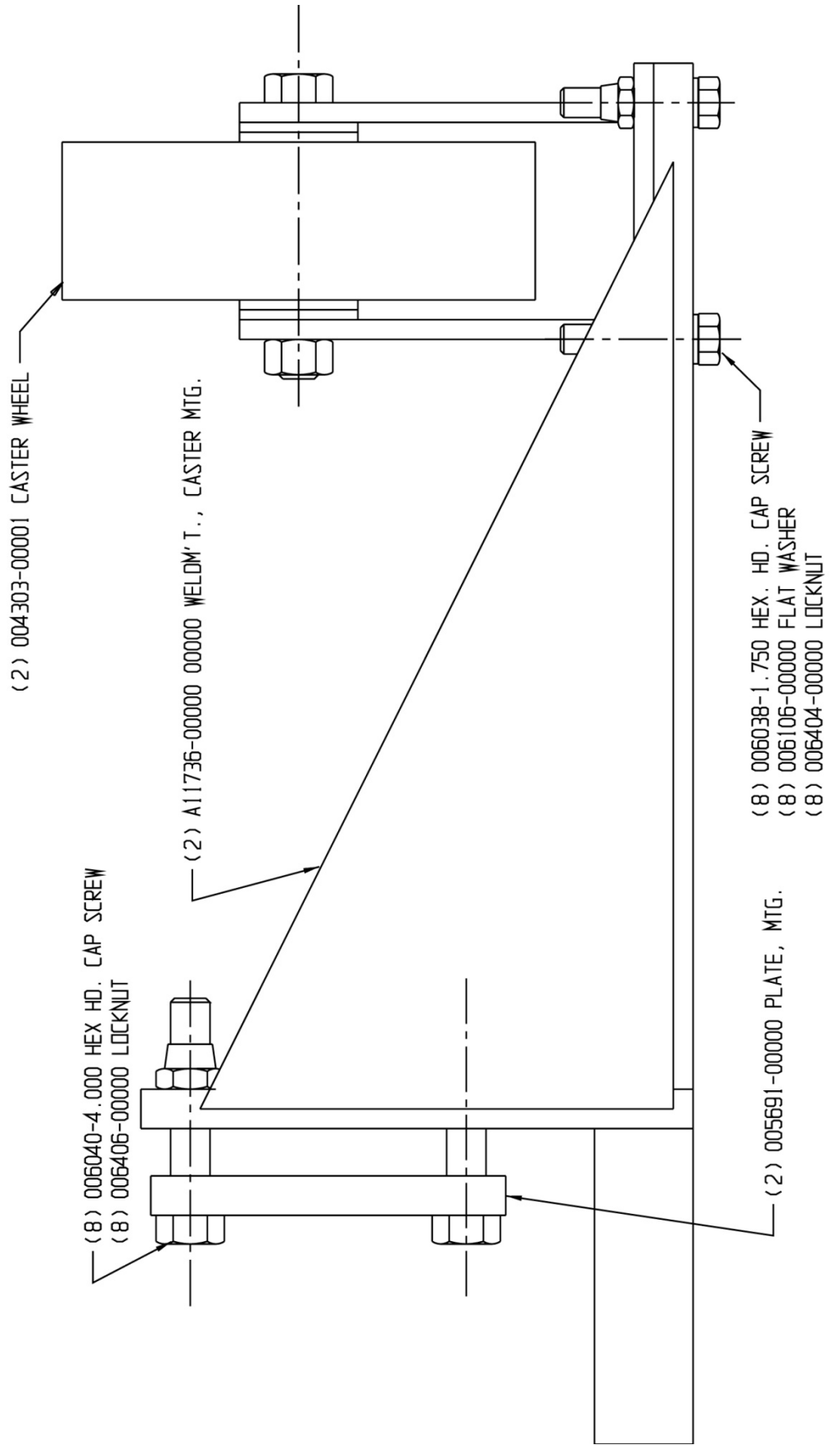
2) 045817-00016 L.H. DRIVE PLATE WELD'M T. DOES
 NOT APPLY TO A10020-00004 R.H. DRIVE ASSEMBLY.
 045817-00015 R.H. DRIVE PLATE WELD'M T. DOES
 NOT APPLY TO A10021-00004 L.H. DRIVE ASSEMBLY.

DATE	SYM	REVISION RECORD	AUTH.	E.C.O.
3/14/2016		REDRAWN IN SOLIDWORKS	A/JW	



CASTER ASSEMBLY

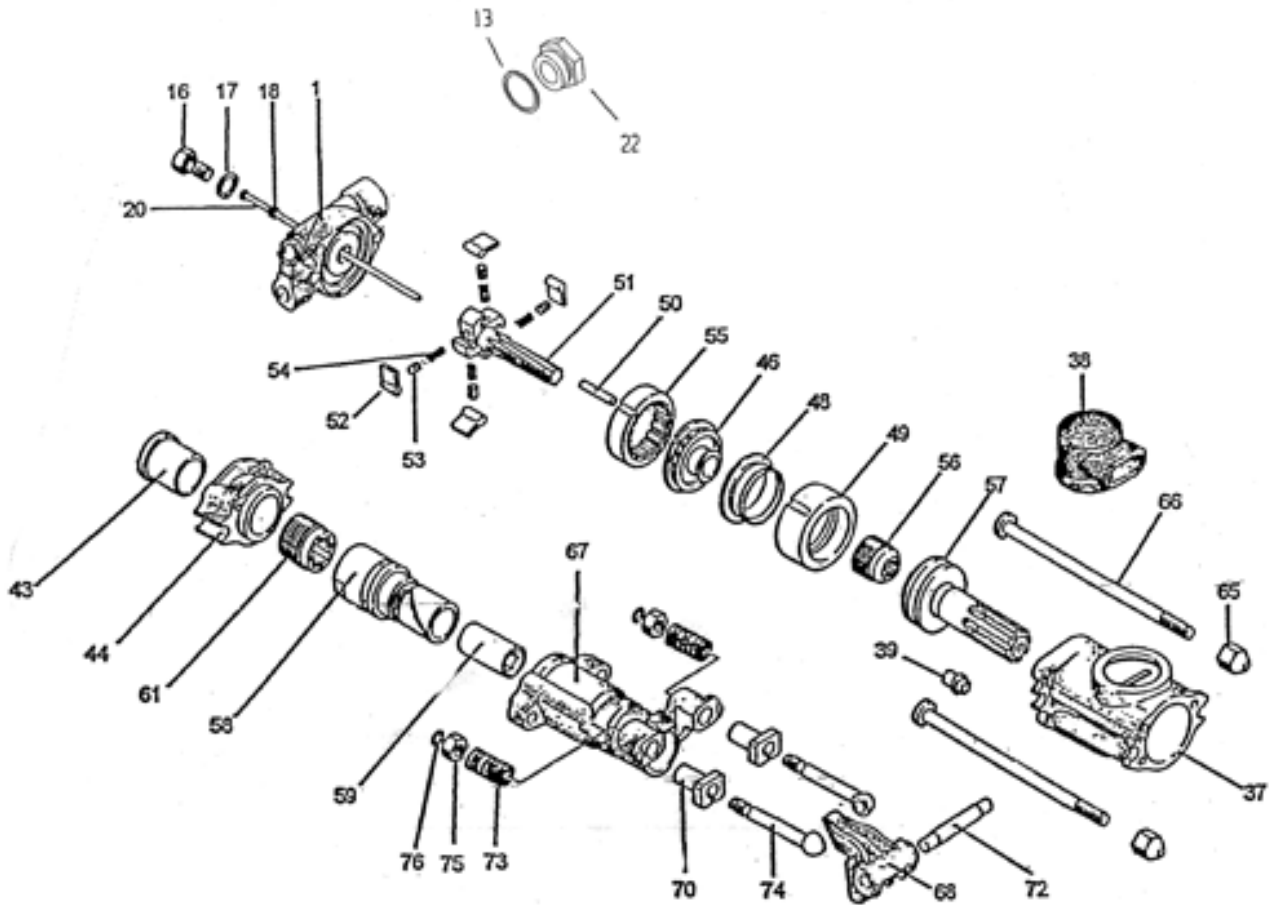
MINNICH P/N 0A5934-00005



**50# (23kg) Rock Drill
0A9350-00000**

When ordering replacement parts you need to furnish the model and serial number of the drill tool.

Specifications	
Net Weight	51lbs. (23kg)
Blows Per Minute	2300
Chuck Size	7/8" x 4 1/4" (22.2mm x 107.9mm)
Air Inlet (NPT)	3/4" (19.1mm)
Air Consumption	92.2cfm (2.6m3/min)



WARNING: Always disconnect the air supply before changing steel or dismantling the tool for service or repair. For maximum safety we advise the installation of a shut-off valve at the end of the air line.

FIG.	PART #	DESCRIPTION	QTY
1	009350-00001	BACKHEAD ASSEMBLY	1
13	009350-00013	AIR CONNECTION WASHER	1
16	009350-00016	BLOW TUBE GLAND	1
17	009350-00017	TUBE GLAND GASKET	1
18	009350-00018	BLOW TUBE GASKET	1
20	009350-00020	BLOW TUBE	1
22	009350-00022	PLUG ADAPTOR	1
37	009350-00037	CYLINDER	1
38	009350-00038	EXHAUST DEFLECTOR	1
39	009350-00039	BLOWING CONNECTION	1
43	009350-00043	FRONT WASHER BUSHING	1
44	009350-00044	FRONT WASHER	1
46	009350-00046	VALVE CHEST COVER	1
48	009350-00048	AUTOMATIC VALVE	1
49	009350-00049	VALVE CHEST	1
50	009350-00050	VALVE DOWEL PIN	1
51	009350-00051	RIFLE BAR	1
52	009350-00052	ROTATION PAWL	4
53	009350-00053	PAWL PLUNGER	4
54	009350-00054	PAWL SPRING	4
55	009350-00055	RATCHET RING	1
56	009350-00056	RIFLE NUT	1
57	009350-00057	PISTON	1
58	009350-00058	ROT. SLEEVE 1" X 4-1/4" (2.5cm X 10.8cm)	1
59	009350-00059	SLEEVE BSG 1" HEX. X 4-1/4" (2.5cm HEX X 10.8cm)	1
59A	009350-0059A	SLEEVE BSG 7/8" HEX. X 4-1/4" (2.2cm X 10.8cm)	1
61	009350-00061	SLEEVE NUT	1
65	009350-00065	SIDE ROD NUT	2
66	009350-00066	SIDE ROD	2
67	009350-00067	FRONTHEAD 1" X 4-1/4" (2.5cm X 10.8cm)	1
68	009350-00068	STEEL RET. 1" X 4-1/4" (2.5cm X 10.8cm)	1
68A	009350-0068A	STEEL RET. 7/8" X 4-1/4" (2.2cm X 10.8cm)	1
70	009350-00070	FRONTHEAD BSG.	2
72	009350-00072	STEEL RET. PIN	1
73	009350-00073	STEEL RET. SPRING	2
74	009350-00074	STEEL RET. BOLT	2
75	009350-00075	STEEL RET. NUT	2
76	009350-00076	RET. BOLT CLIP	2

OPTIONAL ON GRADE ATTACHMENT

MINNICH P/N: A10321-00002

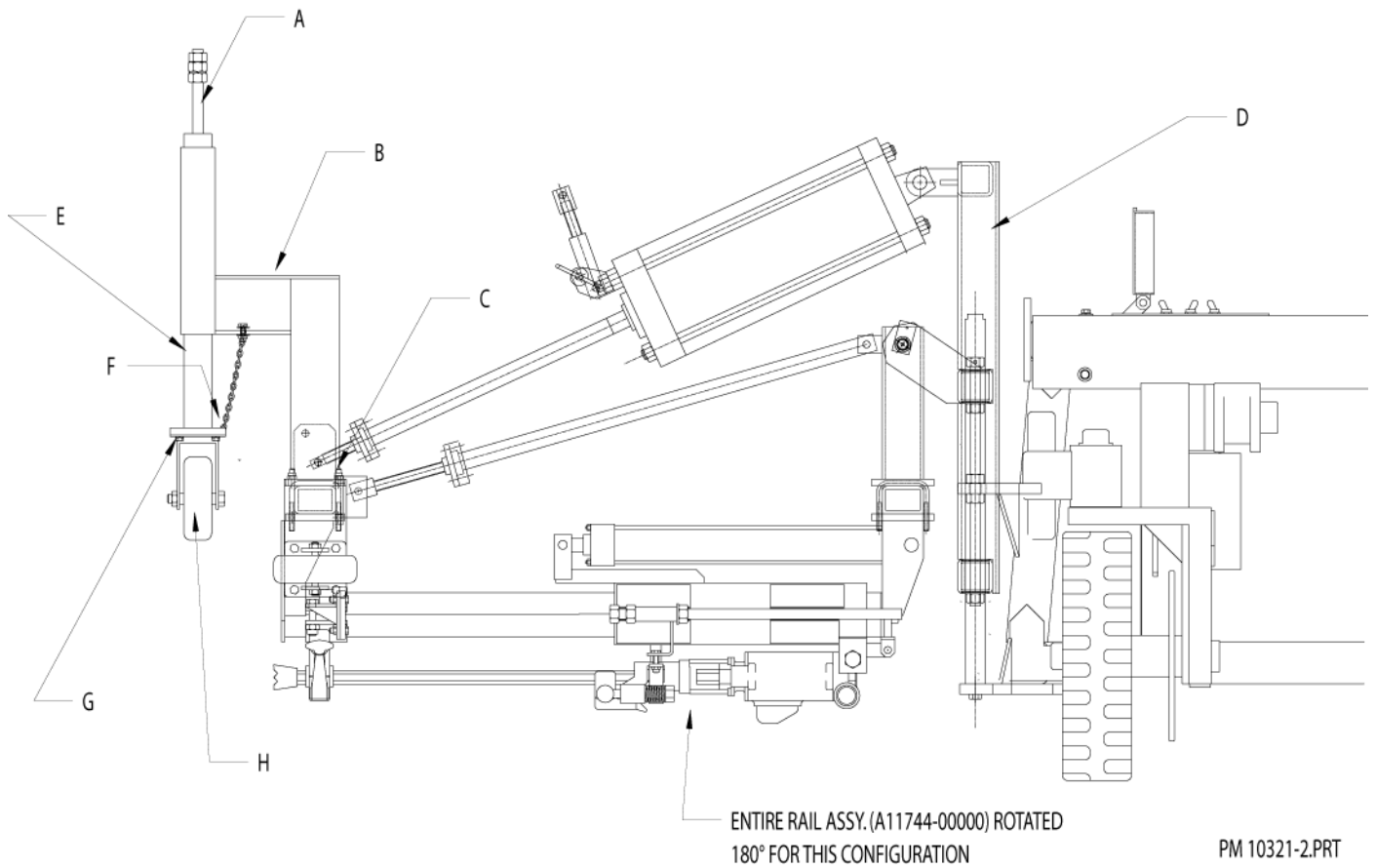


FIG.	PART NUMBER	DESCRIPTION	QTY
A	0A8422-00000	WELDM'T, ADJUSTMENT SCREW	1
A	007132-00000	COIL NUT	1
A	006155-00000	LOCKWASHER, 3/4	1
B	0A9960-00002	WELDM'T, DRILL BED HEIGHT ADJUSTMENT	1
C	004463-00008	PLATE, MOUNTING	1
C	006040-4.000	HHCS, 1/2-13 X 4 GR.5	4
C	006406-00000	LOCKNUT, 1/2-13	4
D	0A9999-00004	WELDM'T, LIFT ANCHOR ADAPTOR	1
E	0A9958-00000	WELDM'T, DRILL BED EXTENSION TUBE	1
F	007102-00002	CHAIN, 3/16 CLOSE LINK	13
F	006038-1.250	HHCS, 3/8-16 X 1-1/4 GR.5	1
F	006106-00000	FLATWASHER 5/16	3
F	006404-00000	LOCKNUT 3/8-16	2
F	006038-1.750	HHCS, 3/8-16 X 1-3/4 GR.5	1
G	006038-1.500	HHCS, 3/8-16 X 1-1/2 GR.5	3
G	006106-00000	FLATWASHER 5/16	3
G	006404-00000	LOCKNUT 3/8-16	3
H	004303-00001	CASTER WHEEL, RIGID	1