M4592900C

ITEM NUMBER: 4592900, 4593000, 4593100
SERIAL NUMBER: _____

Owner's Manual
Belt-Driven Air Compressor Pumps
Instructions for Installation/Set-up, Operation, Maintenance, & Storage

This NorthStar® belt-driven compressor pump has either a single stage 2-cylinder pump (Model 4592900), 2-stage 3-cylinder pump (Model 4593000) or a 2-stage 2-cylinder pump (Model 4593100), made with heavy-duty cast iron cylinders for long life, and a compact design rated for 130 maximum PSI (4592900) or 175 maximum PSI (4593000 and 4593100). Its continuous-duty rating ensures long-lasting performance, and its cast iron pump head ensures superior heat dissipation.

Read and understand this Owner's Manual completely before using. Keep this manual for future review. Failure to properly set up, operate and maintain the compressor pump in accordance with this manual could result in serious injury or death to operator or bystanders.

⚠ WARNING: SPECIAL HAZARDS

- **Injection Injury**: High-pressure air stream can pierce skin and underlying tissues, leading to serious injury and possible amputation. Such an injection injury can result in blood poisoning and/or severe tissue damage.
- **Flying Debris**: High-pressure air stream can cause flying debris and possible surface damage.
- **Not For Breathing Air:** NorthStar compressor pumps are NOT designed, intended, or approved for supplying breathing air. No compressed air should be used for breathing unless air is treated in accordance with applicable standards.
- **Fire/Explosion**: Sparks from air powered tool heads or attachments can ignite fuel or other flammable liquids or vapors in the vicinity. Exceeding the maximum pressure for air tools or attachments could cause them to explode. Keep a fire extinguisher rated "ABC" nearby.
- **Burns**: Compressor pump, motor and discharge tubing are hot surfaces that can cause burn injuries.

Detailed safety information about these hazards appears throughout this manual.

Equipment Protection Quick Facts

Inspect Upon Delivery: FIRST! Inspect for missing or damaged components. See *"Initial Set-Up"* section for where to report missing or damaged parts.

Check Pump Oil: Pump is NOT shipped with oil. Check the pump oil level before starting. See "*Preparing for Operation*" section of this Owner's Manual for capacity and viscosity.

Install a Regulator: We recommend installing a regulator on the compressor at each distribution point to maintain constant pressure in the outlet hose line and provide reduced pressure appropriate for air tool being used.

Run Pump Unloaded for Break-in Period: Before initial use, open drain valves and run compressor pump for 30 minutes to break in pump parts.

Follow Maintenance Schedule: Pump, air filter, and tank require periodic inspection and servicing to provide efficient function and long life. See "*Maintenance Schedule*" for frequency of servicing.

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About Your Air Compressor Pump

Thank you for purchasing a NorthStar air compressor pump! It is designed for long life, dependability, and top performance.

Intended Use. Provides compressed air used primarily for operating air tools and pressurizing other objects that require high air pressure, such as tires**.** Do not use for low-pressure objects such as balloons, air mattresses, and sport balls, which can explode quickly and easily. Special precautions are necessary when used for cleaning to prevent flying debris hazards. It is not to be used to supply breathing air.

Supplies Required. Normal operation will require you to supply:

- Pressure regulator (recommended)
- Pump oil
- Personal protection equipment

See **"***Specifications***"** section for more detail.

Site Location. Intended for indoor/outdoor use.

Personal Protection. Wear safety apparel during operation, including safety glasses with side and top protection.

Adult Control Only. Only trained adults should set up and operate the air compressor pump. Do not let children operate.

Under The Influence. Never operate, or let anyone else operate, the air compressor pump while fatigued or under the influence of alcohol, drugs, or medication.

Keep this manual for reference and review.

ATTENTION: Rental Companies and Private Owners who loan this equipment to others!

All persons to whom you rent/loan this air compressor pump must have access to and read this Owner's Manual. Keep this manual with the air compressor pump at all times and advise all persons who will operate the machine to read it. You must also provide personal instruction on how to safely set-up and operate the air compressor pump and remain available to answer any questions a renter/borrower might have. Owner's Manuals are available from NorthStar at 1-800-270-0810.

Specifications

MODEL			
Model #	4592900	4593000	4593100
Stages	1-stage	2-stage	2-stage
Cylinders	2-cylinder	3-cylinder	2-cylinder
Outlet Port Size	5/8” Compression	1/2” FNPT	3/4” FNPT
FLOW OUTPUT			
Max. Pressure Rating	130 PSI	175 PSI	175 PSI
Volume Rating @ 90PSI	13.7 CFM	14.9 CFM	17.4 CFM or 24.4 CFM
Pump Flywheel Diameter	10.5”	12.5”	16”
Maximum Pump RPM	1396 RPM	1242 RPM	809 RPM or 1132 RPM
Pump Rotation (looking at pump shaft)	CCW	CCW	CCW
MOTOR / ENGINE HORSEPOWER REQUIREMENT			
Electric Motor	4 HP min.	5 HP min.	5 HP min. or 7.5 HP min.
Gasoline Engine	5.5 HP min.	9 HP min.	9 HP min. or 13 HP min.
DIMENSIONS / COMPONENTS			
Length	14.9”	19.7”	22.8”
Width	12.6”	13.7”	13.8”
Height	12.6”	16.9”	20.5”
Weight	52 lbs.	73 lbs.	123 lbs.
Belt Style	A groove – Qty 1	A groove – Qty 1	A groove – Qty 2
SUPPLIES REQUIRED (not included)			
Pump Oil (shipped with oil, but refills required)	SAE 30 non-detergent pump oil (#4043)	SAE 30 non-detergent pump oil (#4043)	SAE 30 non-detergent pump oil (#4043)
Pump Oil Capacity	15.6 oz.	27 oz.	33.8 oz.

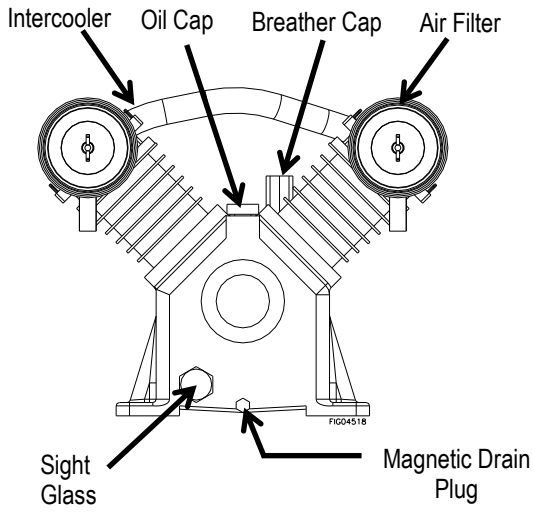
Engine / Motor Pulley Sizing Calculations

$$\text{Engine/Motor Pulley Diameter} = \frac{\text{Pump RPM} \times \text{Pump Flywheel Diameter}}{\text{Engine/Motor RPM}}$$

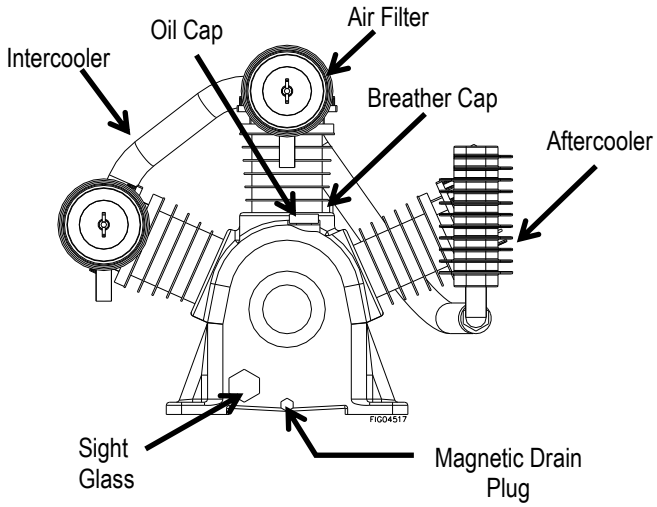
$$\text{Pump RPM} = \frac{\text{Engine/Motor Pulley Diameter} \times \text{Engine/Motor RPM}}{\text{Pump Flywheel Diameter}}$$

Component Identification

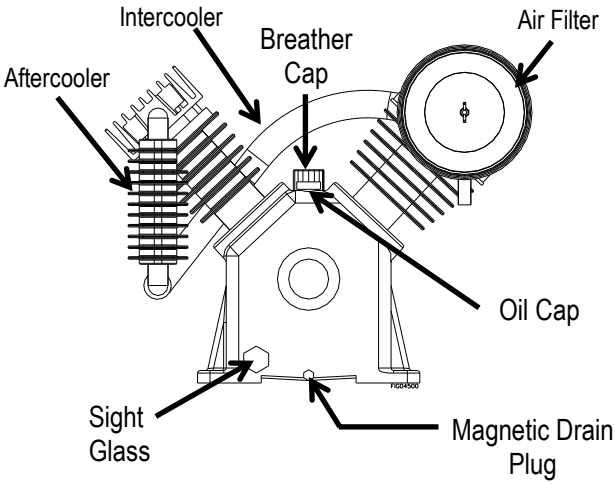
4592900



4593000



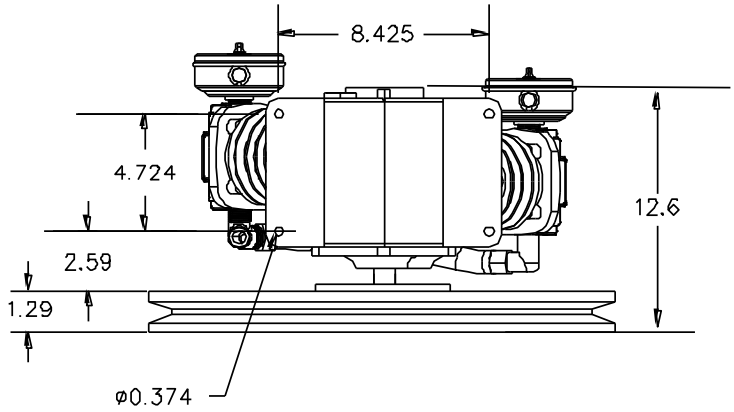
4593100



1. **Oil Cap:** A cover for the hole where the oil is poured in.
2. **Breather Cap:** Allows air to enter/exit the crankcase.
3. **Air Filter:** Removes particles from the air before they reach the pump. Keep clean and particle free. See "*Pump Explosion and Pump Parts List*" for replacement part number.
4. **Sight Glass:** A window through which the level of oil can be checked visually.
5. **Magnetic Oil Drain Plug:** Removal allows for drainage of oil from pump. Attracts metal particles that could damage pump.
6. **Intercooler:** Cools the compressed air as it travels between stages. The flywheel/fan creates an air flow that rushes past and cools the intercooler.
7. **Aftercooler:** Cools the compressed air from the pump before it enters the receiver tank. The heat from the compressed air is transferred outward to the cast iron fins of the Aftercooler, the flywheel/fan creates an air flow that rushes past and cools the cast iron fins.

Mounting Dimensions

4592900



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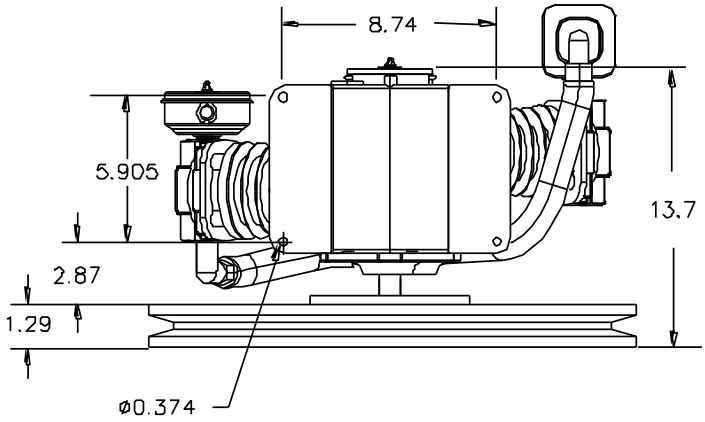

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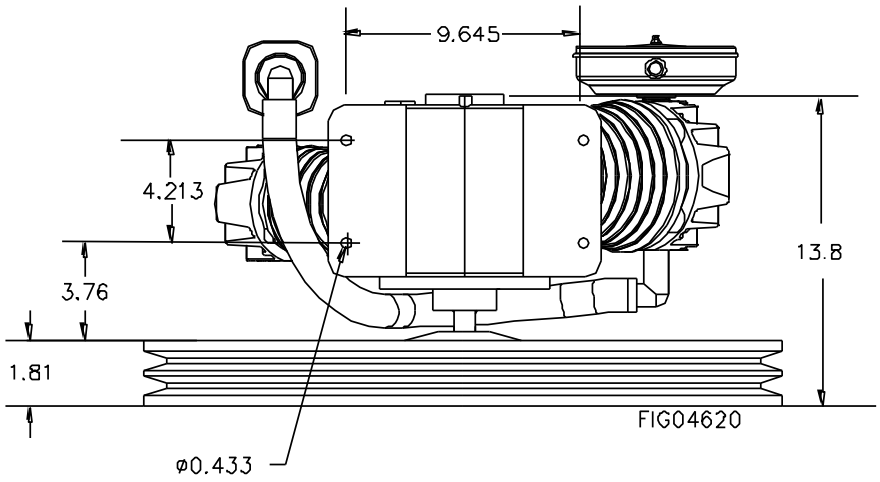


Safety Signal Words

Hazard Signal Word Definitions

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER (red) indicates a hazardous situation, which if not avoided, will result in death or serious injury.

WARNING

WARNING (orange) indicates a hazardous situation, which if not avoided, could result in death or serious injury.

CAUTION

CAUTION (yellow), used with the safety alert symbol, indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.

CAUTION

CAUTION (yellow), without the safety alert symbol, is used to address practices not related to personal injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Initial Set-Up

Step 1. Inspect & Unpack

Upon receipt, inspect air compressor pump for missing or damaged parts. Verify that it is the compressor pump you ordered.

See *"Component Identification"* section of this manual for a diagram of the compressor pump and its components.

- For missing or damaged components, please contact Product Support at 1-800-270-0810.
- If complete, fill out product serial number information. See *"Limited Warranty"* section of this manual.

Step 2. Assembly

Attach Regulator (Recommended)

We recommend using a regulator with these compressor pumps since most pre-set tank pressure ranges are between 145 and 175 PSI and that is usually greater than what is needed by tools.

Without the addition of a regulator, the pressure switch or unloader will maintain a tank pressure within the pre-set range that may have a max of 130 or 175 PSI. This is considered an overly high pressure for many tools. A user-installed regulator can maintain a lower constant pressure in the outlet hose line and prevent over pressurization of tools.

⚠ WARNING: Bursting hazard

Too much air pressure causes a hazardous risk of bursting. Check the manufacturer's maximum pressure rating for air tools and accessories. Regulators must never be set to exceed the maximum pressure rating of tank or tools.

Step 3. Select Suitable Location

Location Criteria:

- Where no flammable vapors, dusts, and gases are present.
- At least 15" away from walls and other objects.
- Away from other heat-generating equipment.
- Away from dusty/dirty conditions.
- In a well illuminated area.

Airflow:

- Provide access to adequate, clean and unobstructed airflow for cooling and air supply.
- Do not allow debris to accumulate or block airflow.
- Do not operate with a tarp, blanket, or cover surrounding the machine, which blocks air flow..

Ideal operating temperatures:

- 40° and 100°F (4° and 37°C).

Operating Limitations:

- 15°F (-9°C) or above 125°F (52°C).

If temperatures consistently drop below 32° F (0°C), install within a heated building. If this is not possible, protect the safety/relief and drain valves from freezing.

Note: Excessive moisture is likely to occur if unit is stored in an unheated area subject to large temperature changes. Moisture forming in pump can produce sludge in the oil, causing parts to wear out prematurely. Excessive condensation on the pump when it cools down is a sign that this may be occurring.

Operation

Follow Operation Safety Rules

Before starting the compressor pump, review the safety rules found below and throughout the manual.

⚠ WARNING

Failure to follow safety rules may result in serious injury or death to the operator or bystanders.

Instruct Operators. Owner must instruct all operators in safe set-up and operation. Do not allow anyone to operate the compressor pump who has not read the Owner's Manual.

Safety Guarding. Only operate with safety covers, guards and barriers secured and in good working order.

Moving Parts. Keep hands, feet, hair and apparel away from moving parts. Never remove any guards while the unit is operating. Do not reach into an air vent or cavity, as they may cover dangerous moving parts.

Ear Protection. Hearing can be damaged from prolonged, close-range exposure to the noise level produced by this compressor. Ear plugs or other hearing protection is recommended for persons working who are exposed within 15-20 feet of the running compressor for an extended period of time.

Eye Protection. Wear ANSI/OSHA required "Z87.1" safety glasses when operating or servicing the compressor. Pressurized air spray from this unit can cause severe injury to the eyes. Also, small objects will become airborne as the air spray contacts them.

Respirator. Wear a respirator when using the compressed air for spraying. Spray in a well-ventilated area to prevent health and fire hazards.

Prepare for Operation

Make sure that any regular maintenance has been performed as prescribed in *"Maintenance & Repair"* section.

- Drain receiver tank of any moisture.
- Inspect for oil leaks.
- Check for any unusual noise/vibration.
- Ensure the area around compressor pump is free from rags, tools, debris and flammable or explosive materials.
- Ensure belt guards and covers are securely in place.

⚠ WARNING: Entanglement hazard

Do NOT operate with protective covers or guards removed. Beneath these covers are high speed moving components, which can entangle the operator or bystanders. Entanglement in this equipment may result in serious injury, amputation or death.

Check/Add Oil to the Pump

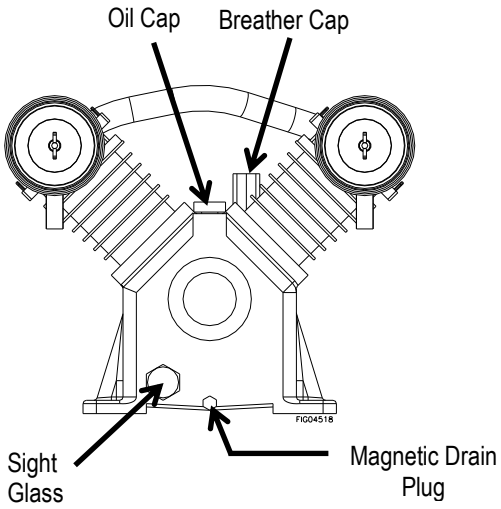
Check the oil level in the pump. Use sight glass for pump oil level. Add oil as needed.

⚠ WARNING: Burn hazard

Never open oil port while compressor pump is running. Hot oil can spray over face and body.

⚠ CAUTION: Inadequate lubrication hazard

Never operate compressor pump with inadequate lubricant. This will cause overheating and severe damage to the pump.



4592900 Model Pump: The compressor pump capacity is 15.6 oz. Use SAE 30 non-detergent pump oil (part #4043) prior to break-in. You may use synthetic lubricants after 50 hour break-in period. See "*Lubricants and Compatibility*" for a list of suitable and alternative lubricants.

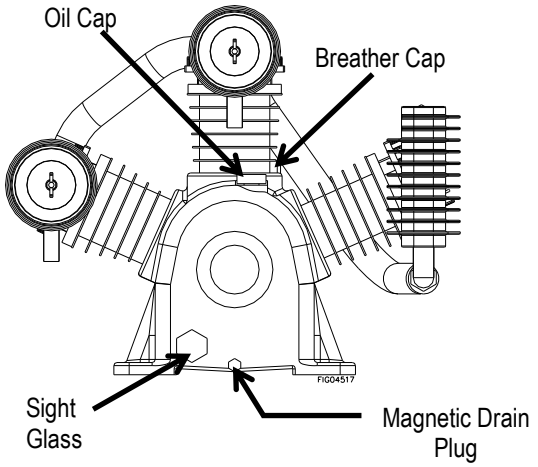


Figure 8

4593000 Model Pump: The compressor pump capacity is 27 oz. Use SAE 30 non-detergent pump oil (part #4043) prior to break-in. You may use synthetic lubricants after 50 hour break-in period. See "*Lubricants and Compatibility*" for a list of suitable and alternative lubricants.

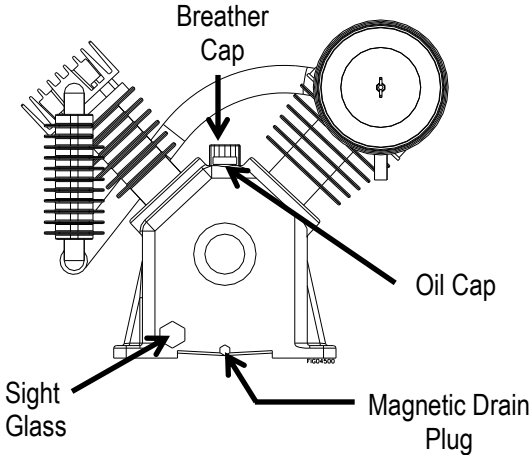


Figure 9

4593100 Model Pump: The compressor pump capacity is 33.8 oz. Use SAE 30 non-detergent pump oil (part #4043) prior to break-in. You may use synthetic lubricants after 50 hour break-in period. See "*Appendix A: Lubricants and Compatibility*" for a list of suitable and alternative lubricants.

CAUTION: Synthetic lubrication damage

If you will be using a synthetic lubricant, all downstream piping material and system components must be compatible.

CAUTION: Break-in period

Before initial use, open the drain valves and run the compressor pump without air tools attached and through open air line for 30 minutes to break-in pump parts.

⚠ WARNING: Inflatables/Low PSI tire

Never use compressor to inflate small low-pressure objects, i.e., balloons/inflatables, small or low volume PSI tires. It is easy to over-pressurize them, causing them to rupture. Identify the inflation capacity of an object prior to filling it with air. Use a gauge to check the pressure regularly when inflating anything.

Proper Air Hose and Tool Use

Pressure Control Related Devices

Never remove, adjust, bypass, change, modify or make substitutions for safety/relief valves, pressure switches or other pressure control related devices. Pressurizing beyond the limits of the compressor could result in an explosion.

⚠ WARNING: Overpressurization hazard

NEVER over-pressurize the receiver tank or air tools beyond nameplate capacity. Exceeding the pressure rating could cause them to explode or fly apart.

Compressor - Tool Requirements

- Compressor and attachments must be sized properly for pressure and air volume.
- Consider the maximum pressure requirements and air volume requirements of each. (The volume rating of your compressor pump is listed in the "*Specifications*" section.)

⚠ CAUTION: Tool overpressure hazard

Do not operate this unit with any tool rated less than the maximum operating pressure of the unit (130 PSI or 175 PSI) unless a properly sized regulator limiting pressure is used before the tool.

Using Compressor Pump for Spraying

Flammable Materials

Always follow precautions on container labels or MSDS' before spraying flammable materials, such as paint.

Moisture in Compressed Air

Moisture in supply air when compressed will form into droplets as it leaves air compressor pump and enters receiver tank. When humidity is high or when a compressor is in continuous use for an extended period of time, a significant amount of moisture will collect in the tank. Part of the moisture will be discharged in the outlet air.

When using a paint spray or sandblast gun, this water will be carried from the tank through the hose, and out of the gun as droplets mixed with the spray material. If this is not acceptable for your application, an external air dryer must be added to the system.

⚠ WARNING: Risk of bursting

Drain air receiver tank daily or after each use to prevent moisture buildup in the air tank. Serious injury or death may occur from a tank explosion caused by moisture induced tank corrosion.

For Malfunction During Operation

Immediately turn off the compressor pump if any of the following conditions arise during operation:

- Excessive change in motor speed, slow or fast
- Overheating
- Excessive vibration
- Unusual noise
- Flame or smoke
- Air leakage

Pull ring on safety valve to immediately relieve pressure.

⚠ WARNING: Shutdown hazards

Do not leave an operating machine unattended. Always shut the machine OFF and relieve the pressure before leaving the machine. NEVER disconnect the high-pressure outlet hose from the unit while the tank and air line are pressurized. A hazardous high pressure air stream will result as receiver tank is quickly emptied.

Maintenance & Repair

⚠ WARNING: Maintenance hazards

ALWAYS disconnect, lock out and tag the main power supply and then release air pressure from the receiver tank before cleaning, adjusting, or servicing the compressor pump. Make sure all guards and shields are replaced before re-starting.

Maintenance Schedule Summary

Item	Frequency
Inspect safety/relief valves	Weekly
Check pump oil level	Weekly
Inspect air filter	• Weekly • Replace every 12 months or 1000 hours of use
Inspect for air leaks	Monthly
Change pump oil/ Clean magnetic drain plug	• After first 50 hours of use • Every 3 months or 500 hours of use after that
Check drive belt tension and alignment	Monthly
Dust/debris removal	Monthly

See detailed instructions for each maintenance item below.

Detailed Instructions – Maintenance & Repair

NOTICE

Dispose of used motor and pump oil in a manner that is compatible with the environment and in accordance with local, state, and federal laws and regulations.

- Take used oil in a sealed container to your local recycling center or service station for reclamation.
- Do not throw it in the trash, pour it on the ground, or pour it down a drain.

No Modifications. Never modify or alter the compressor pump in any way. Modifications can create serious safety hazards and will void the warranty.

Inspect Safety/Relief Valve

This valve should be inspected and tested on a weekly basis. The safety valve automatically releases air if the tank pressure exceeds the preset maximum.

- Check the safety/relief valve by pulling the rings. It is spring loaded and should not be stuck but come out about ¼" and then snap back into position when released.
- Replace safety/relief valves that do not operate freely with a valve of the same pressure rating.

⚠ WARNING: Safety/Relief valve hazards

If the safety/relief valve does not work properly, over-pressurization may occur causing air tank rupture or explosion. Occasionally pull the ring on the safety valve to make sure the safety valve operates freely. If the valve is stuck or does not operate smoothly, it must be replaced with a valve having the same pressure rating.

Inspect Air Filter

Inspect the compressor pump's air filter on a weekly basis. A dirty air filter will not allow the air compressor pump to operate at full capacity.

- Clean air filter if dirty and restricted air flow.
- Replace the air filter every 12 months or 1000 hours.

Note: Do not operate with the air filter removed.

Keep Compressor Clean

Do not allow air intakes to become blocked. If dust or debris accumulates in the compressor, clean with a damp cloth or soft bristle brush.

Note: Do not spray compressor with a garden hose or pressure washer. Water may enter the compressor and cause damage to the motor and pump.

Inspect Compressor for Air Leaks

Inspect system for air leaks on a monthly basis. To test:

- Squirt soapy water around joints during compressor operation and watch for bubbles. Developing bubbles indicate a leak is present.
- Tighten fittings, if necessary.

Change Pump Oil

⚠ WARNING: Burn hazard

Never open oil fill port while compressor is running. Hot oil can spray over face and body.

Every 3 months or 500 hours, change pump oil while crankcase is still warm. (See "*Appendix A: Lubricants*" for suitable alternatives.)

1. Remove the oil fill and drain plugs. Collect the oil in a suitable container.
2. Replace the oil drain plug and refill compressor pump crankcase with clean oil.
3. Replace the oil fill plug.
4. Start the unit and run for several minutes. Shut down the air compressor and recheck the oil level. If necessary, add more oil. (Figure 12)

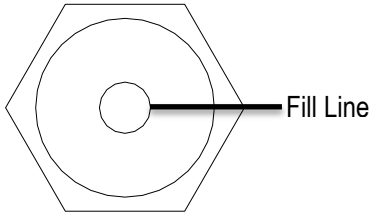


Figure 12

Check Drive Belt for Tension and Alignment

⚠ CAUTION: Pulley/sheave hazard

Improper pulley/sheave alignment and belt tension can result in motor overload, excessive vibration and premature belt and/or bearing failure. To prevent this from happening, check the pulley/sheave alignment and belt tension on a regular basis.

Belts will stretch from normal use. When properly adjusted, a 5 lb. force applied to the belt between the motor pulley and the pump will deflect the belt about ½".

To align and adjust drive belt tension:

1. Remove the belt guard cover.
2. Loosen the four fasteners securing the motor to the compressor unit.
3. Slide the motor to achieve proper belt tension. (Usually 1/8" to 1/4" is sufficient.) The belt must be properly aligned before refastening the motor.
4. To align belt, lay a straight edge against the face of the compressor sheave (flywheel) touching the rim at two places. (Figure 13)

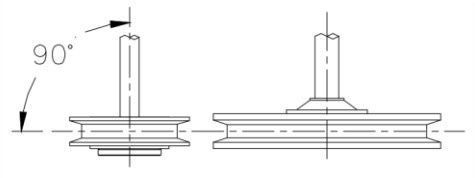


Figure 13

5. Adjust the motor pulley by shifting the motor so that the belt runs parallel to the straight edge.
6. If necessary, use a gear puller to move the motor pulley. Tighten set screw after motor pulley is positioned.
7. Check for proper belt tension. (Figure 14)

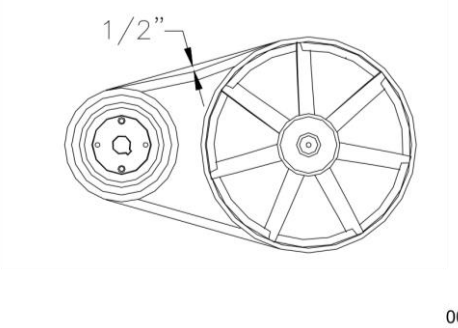


Figure 14

8. Tighten the four fasteners holding the motor to the top plate while tension and alignment is maintained.
9. Attach the belt guard cover.

Keep Compressor Clean

Do not allow air intakes to become blocked. If dust or debris accumulates in the compressor, clean the compressor with a damp cloth or soft bristle brush.

Note: Do not spray compressor with a garden hose or pressure washer. Water may enter the compressor and cause damage to the engine and pump.

IMPORTANT

If a part needs replacement, only use parts that meet the manufacturer's part number specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the compressor. Major service, including installation or replacement of parts, should be made by a qualified electrical service technician.

Troubleshooting

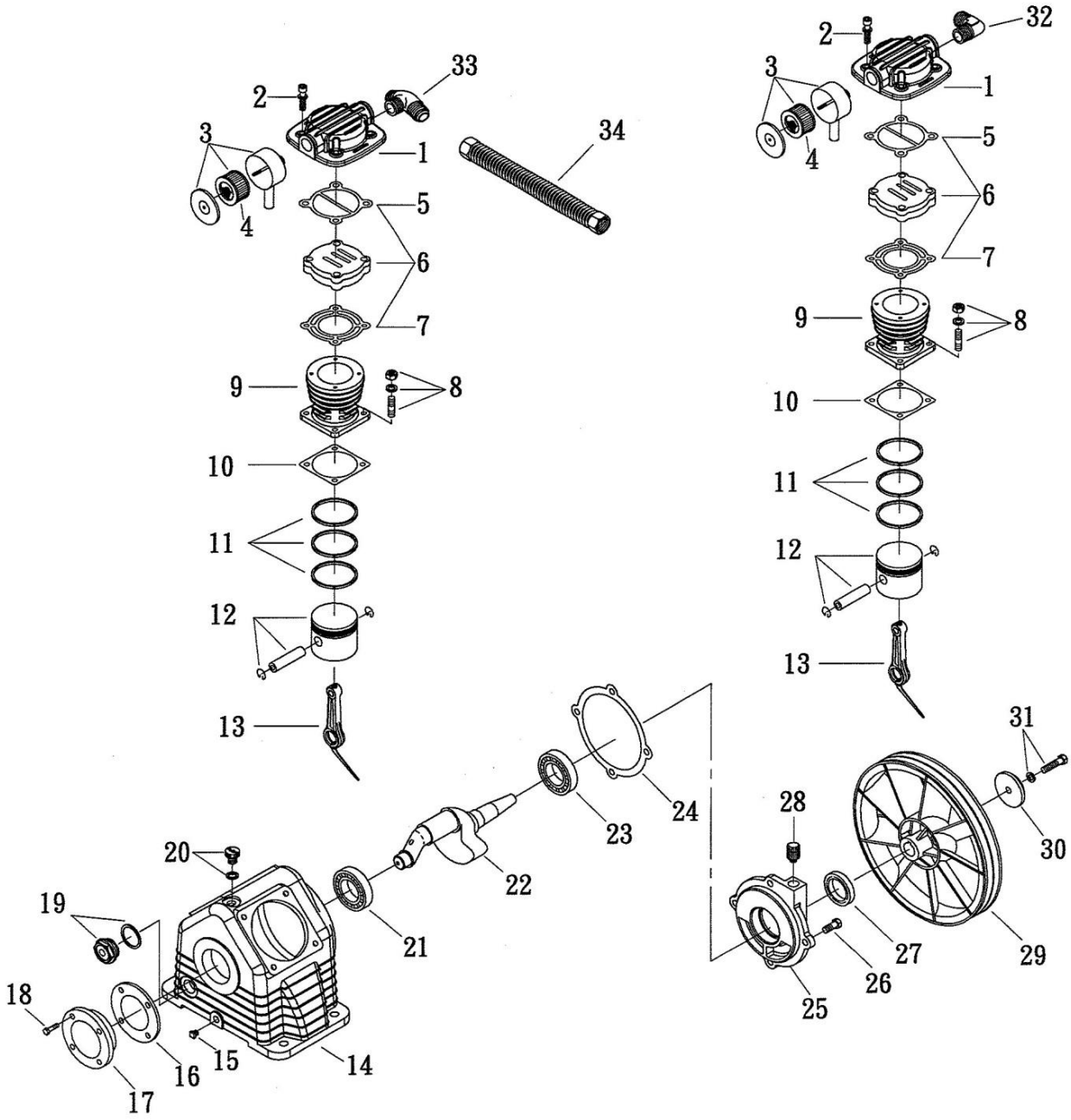
This section provides a list of the more frequently encountered compressor pump malfunctions, their causes and corrective actions. Some corrective actions can be performed by the operator or maintenance personnel, but others may require assistance of a qualified Service Center.

PROBLEM	POSSIBLE CAUSE
Excessive noise, vibration, knocking or rattling.	B, C, D, F, G, K
Lights flicker or dim when running.	E
Air delivery drops off.	D, E, F, G, H, K, L, M
Compressor pump does not come up to speed.	A, B, D, E
Compressor pump is slow to come up to speed.	A, B, D, E, F
Compressor pump will not unload cycle.	F
Compressor pump will not unload when stopped.	F
Moisture in crankcase, “milky” substance in oil.	I
Oil in discharge air.	J
Safety/relief valve “pops”.	F, G
Low interstage pressure.	M
High interstage pressure.	L

POSSIBLE CAUSE	POSSIBLE SOLUTION
A.) Pump oil viscosity too high for ambient temperature	Drain existing lubricant and refill with proper lubricant.
B.) Belt tension too tight or sheaves not aligned	Check tension/ alignment.
C.) Compressor pump components leaky, broken, loose	Inspect components. Clean or replace as required.
D.) Loose flywheel or motor pulley, excessive end play in motor shaft or loose drive belts	Check flywheel, motor pulley, crankshaft drive belt tension/alignment. Replace or repair as required.
E.) Leaking check valve or check valve seat blown out	Replace check valve.
F.) Clogged or dirty inlet and/or discharge line	Clean or replace.
G.) Defective safety/relief valve	Replace.
H.) Inadequate ventilation around flywheel	Relocate compressor pump for better air flow.
I.) Detergent lubricant in crankcase.	Replace with proper lubricant.
J.) Lubricant level too high	Drain excess lubricant.
K.) Worn cylinder finish	Deglaze cylinder with 180 grit flex-hone.
L,) Low pressure inlet valve leaking	Inspect, clean or repair as required.
M.) High pressure inlet valve leaking	Inspect, clean or repair as required.

Any Questions, Comments, Problems or Parts Orders call NorthStar Product Support at 1-800-270-0810.

4592900 Pump Explosion – Rev C



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4592900 Pump Parts List – Rev C

Ref#	Part#	Description	Qty	Kit #
1	N/A	Cylinder head	2	Kit # 1
2	N/A	Allen bolt set	8	Kit # 1
3	789354	Air filter *	2	N/A
4	789355	Filter element	2	N/A
5	N/A	Cylinder head gasket	2	Kit # 2
6	N/A	In.& ex. valve assembly	2	Kit # 3
7	N/A	Valve seat gasket	2	Kit # 2
8	N/A	Double head screw set	8	Kit # 4
9	N/A	Cylinder	2	Kit # 5
10	N/A	Cylinder gasket	2	Kit # 2, 5 or 6
11	N/A	Piston ring	2	Kit # 5, 6
12	N/A	Piston	2	Kit # 5
13	N/A	Rod	2	N/A
14	N/A	Crankcase	1	N/A
15	789384	Oil draining plug	1	N/A
16	N/A	Front cover gasket	1	Kit # 2
17	N/A	Front cover	1	N/A
18	N/A	Bolt M6 x 20	4	N/A

Ref#	Part#	Description	Qty	Kit #
19	788880	Oil sight gauge	1	N/A
20	789386	Oil filling plug	1	N/A
21	N/A	Bearing	1	N/A
22	N/A	Crankshaft and balancer	1	N/A
23	N/A	Bearing	1	N/A
24	N/A	Rear bearing seat gasket	1	Kit # 2
25	N/A	Rear bearing seat	1	N/A
26	N/A	Bolt M8 x 20	4	N/A
27	N/A	Oil seal	1	Kit # 2
28	788882	Breathing cover	1	N/A
29	789348	Pulley	1	N/A
30	N/A	Plate washer	1	Kit # 7
31	N/A	Hexagon bolt	1	Kit # 7
32	N/A	Exhaust elbow	1	Kit # 8
33	N/A	Exhaust three way pipe	1	Kit # 8
34	789352	Exhaust tube set	1	N/A
*	789524	Wing nut, air filter	2	N/A

4592900 Pump Kits – Rev C

Kit # 1 - Cylinder Head Kit– Part # 789336

Ref#	Description	Qty	Kit Qty
1	Cylinder head	1	2
2	Allen bolt set	4	

Kit # 2 – Gasket Seal Kit– Part # 789339

Ref#	Description	Qty	Kit Qty
5	Cylinder head gasket	2	1
7	Valve seat gasket	2	
10	Cylinder gasket	2	
16	Front cover gasket	1	
24	Rear bearing seat gasket	1	
27	Oil seal	1	

Kit # 3 – Valve Kit– Part # 789340

Ref#	Description	Qty	Kit Qty
6	In.& ex. valve assembly	2	1

Kit # 4 – Screw Kit– Part # 789358

Ref#	Description	Qty	Kit Qty
8	Double head screw set	4	2

Kit # 5 – Cylinder and Piston Kit– Part # 789342

Ref#	Description	Qty	Kit Qty
9	Cylinder	1	2
10	Cylinder gasket	1	
11	Piston ring	1	
12	Piston	1	

Kit # 6 – Piston Ring Kit– Part # 789359

Ref#	Description	Qty	Kit Qty
10	Cylinder gasket	2	1
11	Piston ring	2	

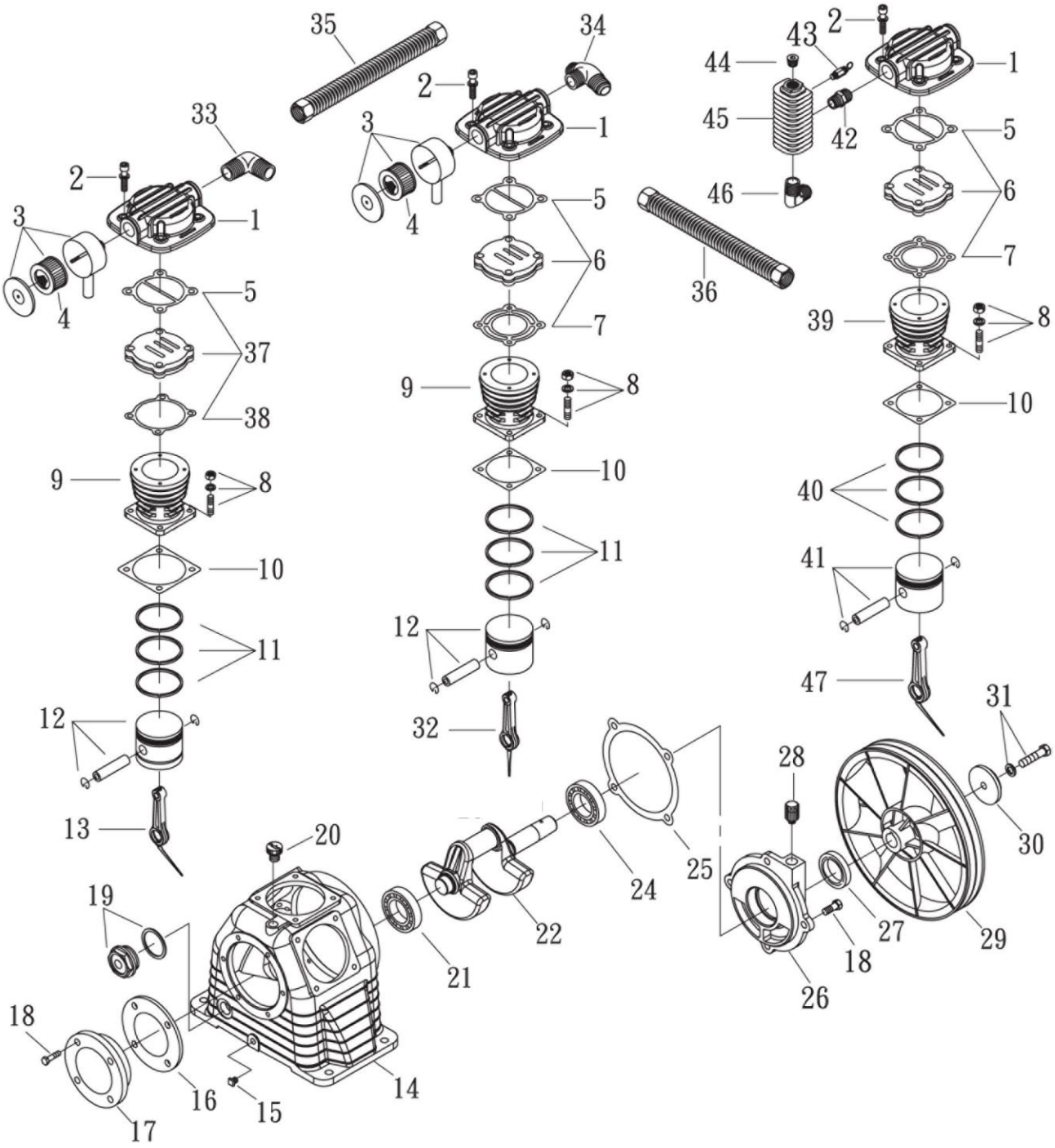
Kit # 7 – Plate and Bolt Kit– Part # 789367

Ref#	Description	Qty	Kit Qty
30	Plate washer	1	1
31	Hexagon bolt	1	

Kit # 8 – Elbow and Pipe Kit–Part # 789351

Ref#	Description	Qty	Kit Qty
32	Exhaust elbow	1	1
33	Exhaust three way pipe	1	

4593000 Pump Explosion – Rev C



4593000 Pump Parts List – Rev C

Ref#	Part#	Description	Qty	Kit #
1	N/A	Cylinder head	3	Kit # 1
2	N/A	Allen bolt set	12	
3	789354	Air filter *	2	N/A
4	789355	Filter element	2	N/A
5	N/A	Cylinder head gasket	3	Kit # 2
6	N/A	In.& ex. valve assembly	2	Kit # 3
7	N/A	Valve seat gasket	2	Kit # 2
8	N/A	Double head screw set	12	Kit # 4
9	N/A	Cylinder	2	Kit # 5
10	N/A	Cylinder gasket	3	Kit # 2, 5, 6, 9
11	N/A	Piston ring	2	Kit # 5, 6
12	N/A	Piston	2	Kit # 5
13	N/A	Rod	1	N/A
14	N/A	Crankcase	1	N/A
15	789384	Oil draining plug	1	N/A
16	N/A	Front cover gasket	1	Kit # 2
17	N/A	Front cover	1	N/A
18	N/A	Bolt M6 x 20	8	N/A
19	788880	Oil sight gauge	1	N/A
20	789386	Oil filling plug	1	N/A
21	N/A	Bearing	1	N/A
22	N/A	Crankshaft and balancer	1	N/A
24	N/A	Bearing	1	N/A
25	N/A	Rear bearing seat gasket	1	Kit # 2
26	N/A	Rear bearing seat	1	N/A
27	N/A	Oil seal	1	Kit # 2
28	788882	Breathing cover	1	N/A
29	789365	Pulley	1	N/A
30	N/A	Plate washer	1	Kit # 7
31	N/A	Hexagon bolt	1	
32	N/A	Rod	1	N/A
33	N/A	Exhaust elbow	1	Kit # 8
34	N/A	Exhaust three way pipe	1	
35	789369	Exhaust tube set	1	N/A
36	789370	Exhaust tube set	1	N/A
37	N/A	In.& ex. valve assembly	1	Kit # 3
38	N/A	Valve seat gasket	1	Kit # 2
39	N/A	Cylinder	1	Kit # 9
40	N/A	Piston ring	1	Kit # 6, 9
41	N/A	Piston	1	Kit # 9
42	N/A	Nipple	1	Kit # 10
43	789396	Pressure relief valve	1	N/A
44	N/A	Plug	1	Kit # 10
45	N/A	Intercooler	1	
46	N/A	Exhaust elbow	1	
*	789524	Wing nut, air filter	2	N/A

4593000 Pump Kits – Rev C

Kit # 1 - Cylinder Head Kit– Part # 789336

Ref#	Description	Qty	Kit Qty
1	Cylinder head	1	2
2	Allen bolt set	4	

Kit # 2 – Gasket Seal Kit– Part # 789356

Ref#	Description	Qty	Kit Qty
5	Cylinder head gasket	2	1
7	Valve seat gasket	2	
10	Cylinder gasket	2	
16	Front cover gasket	1	
25	Rear bearing seat gasket	1	
27	Oil seal	1	
38	Valve seat gasket	1	

Kit # 3 – Valve Kit– Part # 789357

Ref#	Description	Qty	Kit Qty
6	In.& ex. valve assembly	2	1
37	In.& ex. valve assembly	1	

Kit # 4 – Screw Kit– Part # 789358

Ref#	Description	Qty	Kit Qty
8	Double head screw set	4	2

Kit # 5 – Cylinder and Piston Kit– Part # 789342

Ref#	Description	Qty	Kit Qty
9	Cylinder	1	2
10	Cylinder gasket	1	
11	Piston ring	1	
12	Piston	1	

Kit # 6 – Piston Ring Kit– Part # 789360

Ref#	Description	Qty	Kit Qty
10	Cylinder gasket	2	1
11	Piston ring	2	
40	Piston ring	1	

Kit # 7 – Plate and Bolt Kit– Part # 789367

Ref#	Description	Qty	Kit Qty
30	Plate washer	1	1
31	Hexagon bolt	1	

Kit # 8 – Elbow and Pipe Kit–Part # 789368

Ref#	Description	Qty	Kit Qty
33	Exhaust elbow	1	1
34	Exhaust three way pipe	1	

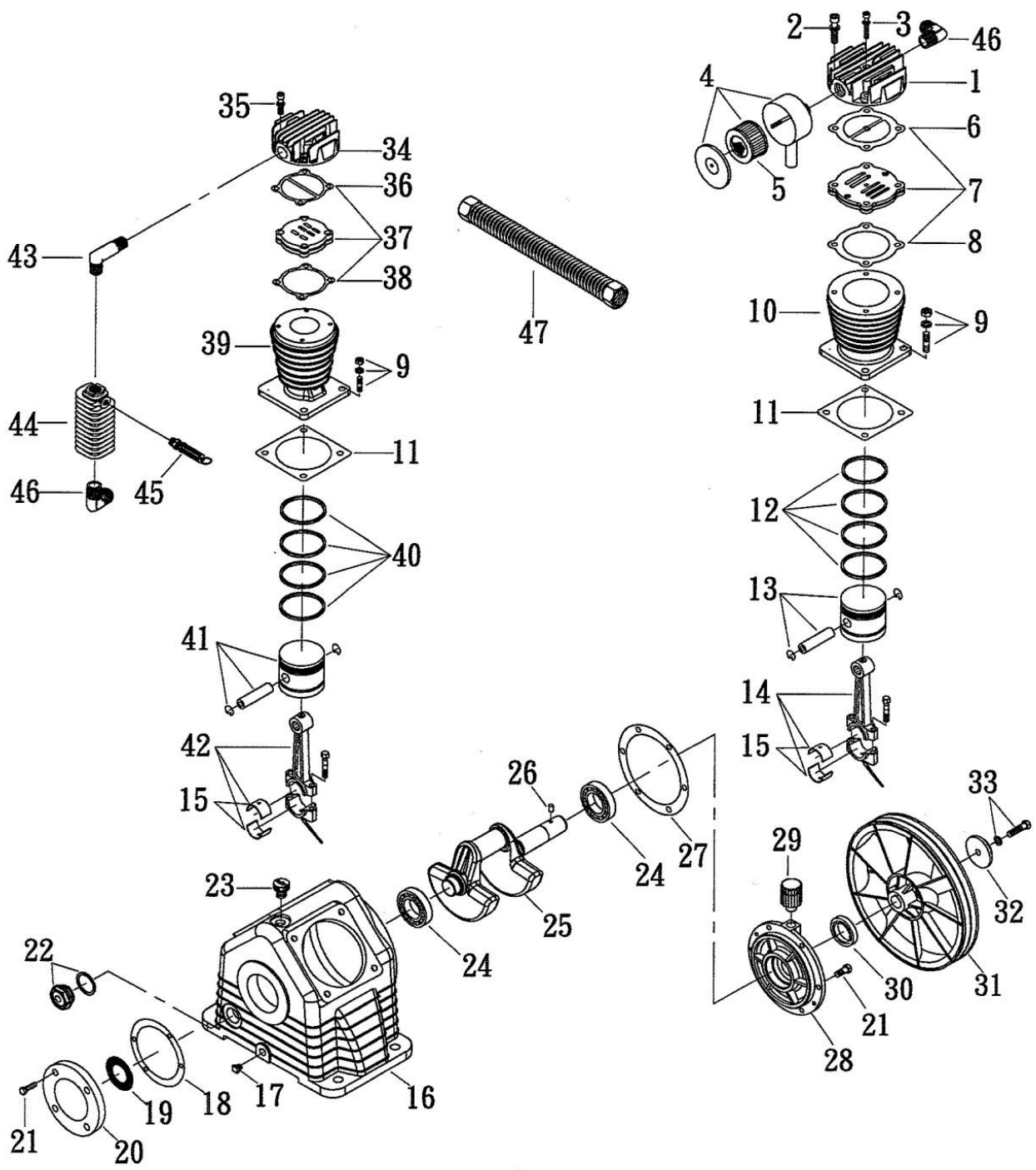
Kit # 9 – Cylinder and Piston Kit– Part # 789371

Ref#	Description	Qty	Kit Qty
10	Cylinder gasket	1	1
39	Cylinder	1	
40	Piston ring	1	
41	Piston	1	

Kit # 10 – Intercooler Kit– Part # 789372

Ref#	Description	Qty	Kit Qty
42	Nipple	1	1
44	Plug	1	
45	Intercooler	1	
46	Exhaust elbow	1	

4593100 Pump Explosion – Rev C



4593100 Pump Parts List – Rev C

Ref#	Part#	Description	Qty	Kit #
1	N/A	Cylinder head	1	Kit # 1
2	N/A	Allen bolt set	4	
3	N/A	Allen bolt set	1	
4	789375	Air filter *	1	N/A
5	789376	Filter element	1	N/A
6	N/A	Cylinder head gasket	1	Kit # 2
7	N/A	In.& ex. valve assembly	1	Kit # 3
8	N/A	Valve seat gasket	1	Kit # 2
9	N/A	Double head screw set	8	Kit # 4
10	N/A	Cylinder	1	Kit # 5
11	N/A	Cylinder gasket	2	Kit # 2, 5, 7
12	N/A	Piston ring	1	Kit # 5, 7
13	N/A	Piston	1	Kit # 5
14	N/A	Rod	1	Kit # 6
15	789383	Rod bush	2	N/A
16	N/A	Crankcase	1	N/A
17	789384	Oil draining plug	1	N/A
18	N/A	Front bearing seat gasket	1	Kit # 2
19	N/A	Oil mesh	1	N/A
20	N/A	Front bearing seat	1	N/A
21	N/A	Bolt M8 x 25	10	N/A
22	788880	Oil sight gauge	1	N/A
23	789386	Oil filling plug	1	N/A
24	789387	Bearing	2	N/A
25	N/A	Crankshaft and balancer	1	N/A
26	789388	Pulley key	1	N/A
27	N/A	Rear bearing seat gasket	1	Kit # 2
28	N/A	Rear bearing seat	1	N/A
29	788882	Breathing cover	1	N/A
30	N/A	Oil seal	1	Kit # 2
31	791527	Pulley	1	N/A
32	N/A	Plate washer	1	Kit # 8
33	N/A	Bolt M12 x 50	1	
34	N/A	Cylinder head	1	Kit # 9
35	N/A	Allen bolt set	4	
36	N/A	Cylinder head gasket	1	Kit # 2
37	N/A	In.& ex. valve assembly	1	Kit # 3
38	N/A	Valve seat gasket	1	Kit # 2
39	N/A	Cylinder	1	Kit # 10
40	N/A	Piston ring	1	Kit # 7, 10
41	N/A	Piston	1	Kit # 10
42	N/A	Rod	1	Kit # 6
43	N/A	Exhaust elbow	1	Kit # 11
44	N/A	Intercooler	1	
45	789396	Pressure relief valve	1	N/A
46	N/A	Exhaust elbow	2	Kit # 11
47	789397	Exhaust tube	1	N/A
*	789524	Wing nut, air filter	1	N/A

4593100 Pump Kits – Rev C

Kit # 1 - Cylinder and Bolt Kit – Part # 789374

Ref#	Description	Qty	Kit Qty
1	Cylinder head	1	1
2	Allen bolt set	4	
3	Allen bolt set	1	

Kit # 2 – Gasket Kit– Part # 789377

Ref#	Description	Qty	Kit Qty
6	Cylinder head gasket	1	1
36	Cylinder head gasket	1	
8	valve seat gasket	1	
38	valve seat gasket	1	
11	cylinder gasket	2	
18	front cover gasket	1	
27	rear bearing seat gasket	1	
30	oil seal	1	

Kit # 3 – Valve Kit– Part # 789378

Ref#	Description	Qty	Kit Qty
7	In.& ex. valve assembly	1	1
37	In.& ex. valve assembly	1	

Kit # 4 – Screw Kit– Part # 789379

Ref#	Description	Qty	Kit Qty
9	Double head screw set	4	2

Kit # 5 – Cylinder and Piston Kit– Part # 789380

Ref#	Description	Qty	Kit Qty
10	Cylinder	1	1
11	Cylinder gasket	1	
12	Piston ring	1	
13	Piston	1	

Kit # 6 – Rod Kit– Part # 789382

Ref#	Description	Qty	Kit Qty
14	Rod	1	1
42	Rod	1	

Kit # 7 – Piston Ring Kit– Part # 789381

Ref#	Description	Qty	Kit Qty
11	Cylinder gasket	2	1
12	Piston ring	1	
40	Piston ring	1	

Kit # 8 – Plate and Bolt Kit– Part # 789392

Ref#	Description	Qty	Kit Qty
32	Plate washer	1	1
33	Hexagon bolt	1	

Kit # 9–Cylinder Head and Bolt Kit–Part # 789393

Ref#	Description	Qty	Kit Qty
34	Cylinder head	1	1
35	Allen Bolt M6 x 40	4	

Kit # 10–Cylinder and Piston Kit– Part # 789394

Ref#	Description	Qty	Kit Qty
39	Cylinder	1	1
40	Piston ring	1	
41	Piston	1	

Kit # 11–Elbow and Intercooler Kit–Part # 789395

Ref#	Description	Qty	Kit Qty
43	Exhaust elbow	1	1
44	Intercooler	1	
46	Exhaust elbow	1	

Appendix A: Lubricants and Compatibility

The following table lists materials that are suitable or not recommended for use with synthetic oil. As some oil escapes into the compressed air, all components that come into contact with the air (i.e., piping, filters, hoses, tools, etc.) must be compatible with synthetic oil.

Northern Tool recommends using synthetic oil after the first 50 hour break in period.

Suitable	Not Recommended
Viton®, Teflon®, Epoxy (Glass Filled), Oil Resistant Alkyd, Fluorosilicone, Flourocarbon, Polysulfide, 2-Component Urethane, Nylon, Delrin®, Celcon®, High Nitrile Rubber (Buna N. NBR more than 36 Acrylonite), Polyurethane, Polyethylene, Epichlorohydrin, Polyacrylate, Melamine, Polypropylene, Baked Phenolics, Epoxy, Modified Alkyds (® indicates trademark of DuPont Corporation)	Neoprene, Natural Rubber, SBR Rubber, Acrylic Paint, Lacquer, Varnish, Polystyrene, PVC, ABS, Polycarbonite, Cellulose Acetate, Latex, EPR, Acrylics, Phenoxy, Polysulfones, Styrene Acrylonitile (San), Butyl

Alternate Lubricants.

You may use a petroleum-based lubricant that is premium quality, does not contain detergents, contains only anti-rust, anti-oxidation, and anti-foam agents as additives, has a flashpoint of 440ºF (227ºC) or higher, and has an auto-ignition point of 650ºF (343ºC) or higher.

See the petroleum lubricant viscosity table below. The table is intended as a general guide only. Heavy-duty operating conditions require heavier viscosities.

Refer specific operating conditions to NorthStar Product Support at 1-800-270-0810.

Temperature around Compressor	Viscosity Grade	
	ISO	SAE
Below 40ºF (4ºC)	60	20
40ºF to 80ºF (4ºC to 27ºC)	100	30
80ºF to 100ºF (27ºC to 38ºC)	150	40

Limited Warranty

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability. Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product. Always contact NorthStar Product Support at 1-800-270-0810 prior to having any service or warranty work performed, as some services performed by parties other than NorthStar approved service centers may void this warranty. This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

Limited Warranty

NorthStar shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of:

NorthStar Warranty		
Item #	**Consumer Warranty Period**	**Commercial Warranty Period**
4592900 4593000 4593100	1 year from date of purchase by user	1 year from date of purchase by user

"Consumer use" means personal residential household use by a consumer. "Commercial use" means all other uses, including use for commercial, income producing or rental purposes or when purchased by a business.

This warranty applies to the original purchaser of the equipment (verification of purchase, in the form of a receipt, is the responsibility of the buyer), is non-transferable, and covers parts and labor. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. If a part is no longer available, the part may be replaced with a similar part of equal function. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar. NorthStar will not provide for replacement of complete products due to defective parts. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. Transportation costs to and from service center is the responsibility of the customer.

In addition to the normal warranty, NorthStar shall warrant any normal wear item from defects in material or workmanship for a period of 90 days from the date of purchase by user. Normal wear items include, but are not limited to, filter elements.

This warranty specifically excludes the following; failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, damage related to rodent and/or insect infestation and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use. Also, Outdoor Power Equipment needs periodic parts and service to perform well, and this warranty does not cover instances when normal use has exhausted the life of a component.

This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part. Repair or replacement of parts does not extend the warranty period.

Please fill in the following information and have it on hand when you call in on a warranty claim.

Customer Number: _____

Date of Purchase: _____

NorthStar Serial Number: _____

Item Number: _____

⚠ **WARNING**: This product can expose you to soots, tars, and mineral oils (untreated and mildly treated oils and used engine oils), which are known to the State of California to cause cancer.

For more information go to www.P65Warnings.ca.gov.

Assembled by
Northern Tool & Equipment Company, Inc.
Burnsville, MN 55306
NorthernTool.com