

**BOSS 80100  
PTO AIR COMPRESSOR  
OPERATORS, INSTALLATIONS, AND  
PARTS MANUAL**



# OPERATORS AND PARTS MANUAL

## TABLE OF CONTENTS

### Operation & Maintenance Section

General Arrangement .....	6
Specifications .....	7
Safety .....	10
Compressor Terminology .....	16
Description of Components .....	17
Inspection, Lubrication, and Maintenance .....	21
Troubleshooting .....	29
Compressor Operation .....	32
Parts and Illustration Section .....	35
Recommended Spare Parts List .....	46
Service Questionnaire .....	47

### Installation Section

Instructional Procedures .....	49
Installation Illustrations .....	57

### Warranty Section

Warranty Information .....	66
----------------------------	----



## GENERAL ARRANGEMENT

BOSS Underdeck PTO Compressors are shipped in kit form for field installation. These kits include:

1. Rotary Screw Compressor and Mounting Bracket.
2. Oil Sump with Mounting Brackets.
3. Spin-on Coalescer/Air Manifold Assembly.
4. Compressor Oil Cooler.
5. Air Inlet Filtration System.
6. Hoses and Fittings.
7. All Necessary Safety and Informational Decals.
8. Wiring Harness.
9. Driveshaft Components
10. Parts, Service, Installation, and Maintenance Manual.

BOSS offers factory installation by qualified technicians, as well as a nationwide network of authorized distributors for field installations, parts and service.

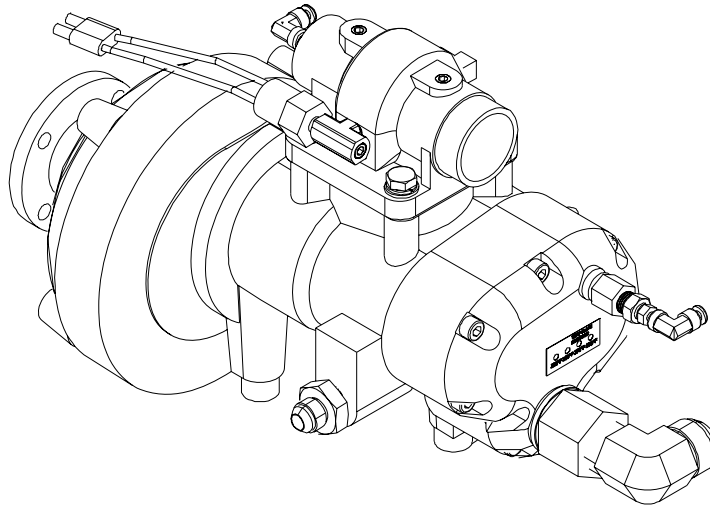
## SPECIFICATIONS

### BOSS INDUSTRIES 80100-8G UBI COMPRESSOR

<b>DELIVERY @ 110 PSIG</b>	<b>CFM</b>	<b>35</b>	<b>45</b>	<b>55</b>	<b>65</b>	<b>75</b>	<b>85</b>	<b>95*</b>	<b>100*</b>
Input Speed RPM to Compressor	RPM	1110	1395	1685	1945	2250	2500	2750*	2900*
Hydraulic flow (UHBI Models only)*	GPM	7.8	9.8	11.8	13.6	15.8	17.5	19.2	20.3
<b>Components - Compressor System</b>	(Overall Dimensions)								
Compressor/Air Inlet Assembly	10" W x 11" H x 14" L								
Receiver/Sump (TYP.)	10" Diameter x 20" L								
Spin - On Element (TYP.)	5" Diameter x 13" L								
Remote Cooler/Fan Assembly (TYP.)	18" W x 10" H x 23" L								
Weight (dry) (TYP.)	300 pounds								
Fluid Capacity (SYS.) (TYP.)	2.50 Gallons								

**\*Average hydraulic operating pressure over the cfm range is 2400psig. Motor displ. 1.62 cir**

**PTO Drive Requirements:** Engine rotation on PTO. Clockwise rotation looking at compressor shaft.



W8GISO

R.R.M. 9/6/02

**Typical Applications:**

- Allison automatic transmission using hot shift PTO's with engine rotation.
- Manual transmissions using Chelsea 442 series PTO's with adapter gear assemblies to get the required engine rotation.

Typical Installation

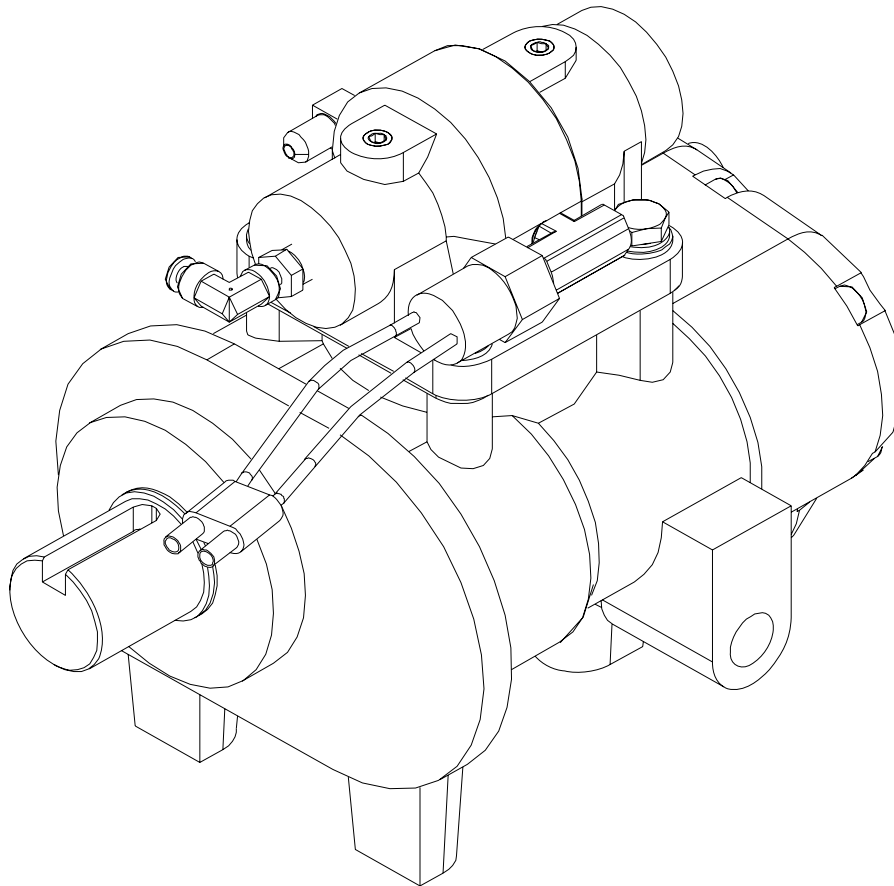
# SPECIFICATIONS

## BOSS INDUSTRIES 80100-9D UBI COMPRESSOR

<b>DELIVERY @ 110 PSIG</b>	CFM	30	35	40	45	50	55	60	65
Input Speed RPM to Compressor	RPM	1700	1950	2200	2450	2650*	2950*	3200*	3425*
Hydraulic flow (UHBI Models only)*	GPM	7.4	8.5	9.6	10.7	11.6	12.9	14	15
<b>Components - Compressor System</b>	(Overall Dimensions)								
Compressor/Air Inlet Assembly	11" W x 11" H x 14" L								

\*Average hydraulic operating pressure over the cfm range is 2100 psig. Motor displ. 1.01 cir.

**PTO Drive Requirements:** Opposite engine rotation on PTO. Counter-clockwise rotation looking at the compressor shaft.



301702 VIEW

R.R.M. 9/6/02

**Typical Applications:**

- Ford 5R110w automatic transmissions using Chelsea 246 series hot shift PTO.
- Manual transmissions using Chelsea 442 series PTO's to get the required opposite engine rotation.

Typical Installation

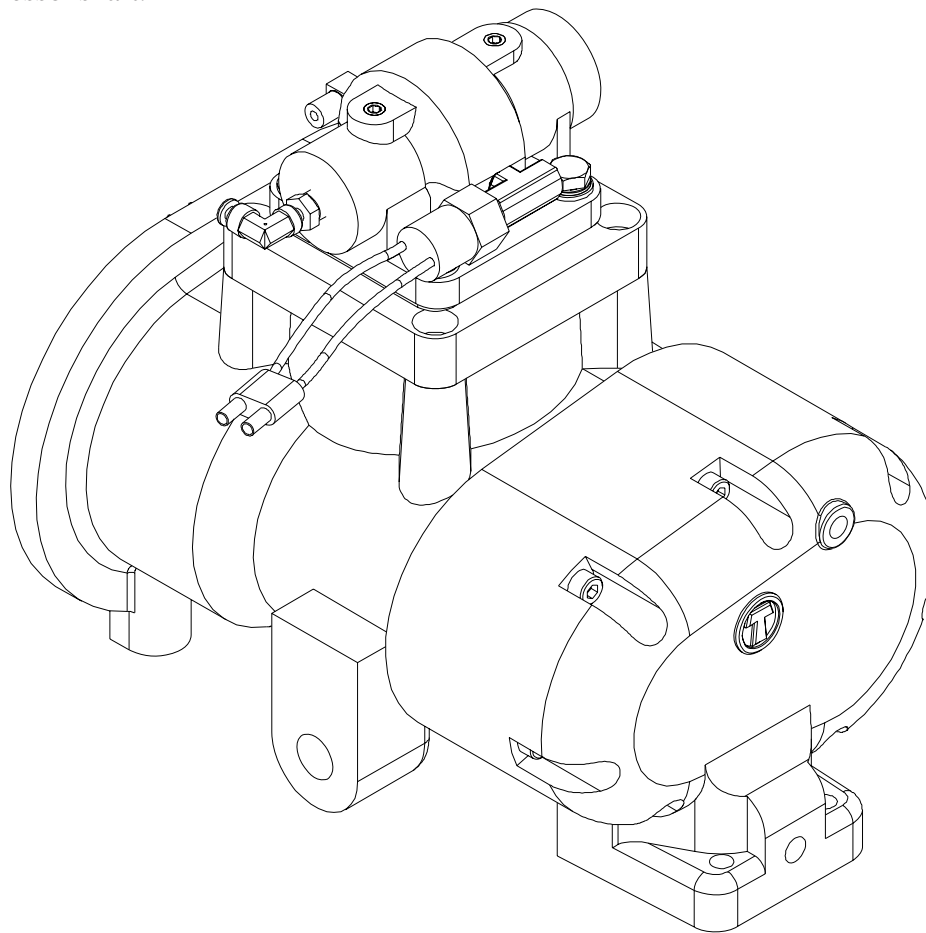
# SPECIFICATIONS

## BOSS INDUSTRIES 80100-10D UBI COMPRESSOR

<b>DELIVERY @ 110 PSIG</b>	CFM	50	55	60	65	70	75	80	85	90	95	100
Input Speed RPM to Compressor	RPM	1825	2000	2190	2370	2500	2685*	2850*	3025*	3180*	3350*	3525*
Hydraulic flow (UHBI Models only)*	GPM	12.8	14	15.3	16.6	17.5	18.9	20.2	21.4	22.4	23.7	24.9
<b>Components - Compressor System</b>	(Overall Dimensions)											
Compressor/ Air Inlet Assembly	11" W x 12" H x 16" L											

**\*Average hydraulic operating pressure over the cfm range is 1900. Motor displ. 1.62 cir**

**PTO Drive Requirements:** Opposite engine rotation on PTO. Counter-clockwise rotation looking at the compressor shaft.



W10DISO

CRH 9/6/02

**Typical Applications:**

- Ford 5R110 wautomatic transmissions using Chelsea 246 series hot shift PTO.
- Manual transmissions using Chelsea 442 series PTO's to get the required opposite engine rotation.

Typical Installation



## **SAFETY**

### **WARNING**

**ALL UNITS ARE SHIPPED WITH A DETAILED OPERATORS AND PARTS MANUAL. THIS MANUAL CONTAINS VITAL INFORMATION FOR THE SAFE USE AND EFFICIENT OPERATION OF THIS UNIT. CAREFULLY READ THE OPERATORS MANUAL BEFORE STARTING THE UNIT. FAILURE TO ADHERE TO THE INSTRUCTIONS COULD RESULT IN SERIOUS BODILY INJURY OR PROPERTY DAMAGE.**

### **AIR COMPRESSOR SAFETY PRECAUTIONS**

Safety is basically common sense. While there are standard safety rules, each situation has its own peculiarities that cannot always be covered by rules. Therefore with your experience and common sense, you are in a position to ensure your safety. Lack of attention to safety can result in: accidents, personal injury, reduction of efficiency and worst of all - Loss of Life. Watch for safety hazards. Correct them promptly. Use the following safety precautions as a general guide to safe operation:

Do not attempt to remove any compressor parts without first relieving the entire system of pressure.

Do not attempt to service any part while machine is operating.

### **DANGER**

**CHECK THE COMPRESSOR SUMP OIL LEVEL ONLY WHEN THE COMPRESSOR IS NOT OPERATING AND SYSTEM IS COMPLETELY RELIEVED OF PRESSURE. OPEN SERVICE VALVE TO ENSURE RELIEF OF SYSTEM AIR PRESSURE WHEN PERFORMING MAINTENANCE ON COMPRESSOR AIR/OIL SYSTEM. FAILURE TO COMPLY WITH THIS WARNING MAY CAUSE DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

Do not operate the compressor at pressure or speed in excess of its rating as indicated in "Compressor Specifications".

Periodically check all safety devices for proper operation.

Do not play with compressed air. Pressurized air can cause serious injury to personnel.

Exercise cleanliness during maintenance and when making repairs by covering parts and exposed openings.

## SAFETY

Do not install a shut-off valve between the compressor and compressor oil sump.

### DANGER

**DO NOT USE BOSS INDUSTRIES COMPRESSOR SYSTEMS TO PROVIDE BREATHING AIR. SUCH USAGE, WHETHER SUPPLIED IMMEDIATELY FROM THE COMPRESSOR SOURCE, OR SUPPLIED TO BREATHING TANKS FOR SUBSEQUENT USE, CAN CAUSE SERIOUS BODILY INJURY.**

**BOSS INDUSTRIES DISCLAIMS ANY AND ALL LIABILITIES FOR DAMAGE FOR LOSS DUE TO PERSONAL INJURIES, INCLUDING DEATH, AND/OR PROPERTY DAMAGE INCLUDING CONSEQUENTIAL DAMAGES ARISING OUT OF ANY BOSS INDUSTRIES COMPRESSORS USED TO SUPPLY BREATHING AIR.**

Do not disconnect or bypass safety circuit system.

Do not install safety devices other than authorized BOSS INDUSTRIES replacement devices.

Close all openings and replace all covers and guards before operating compressor unit.

Tools, rags, or loose parts must not be left on the compressor or drive parts.

Do not use flammable solvents for cleaning parts.

Keep combustibles out of and away from the Compressor and any associated enclosures.

The owner, lessor, or operator of the Compressor are hereby notified and forewarned that any failure to observe these safety precautions may result in damage or injury.

BOSS INDUSTRIES expressly disclaims responsibility or liability for any injury or damage caused by failure to observe these specified precautions or by failure to exercise that ordinary caution and due care required when operating or handling the Compressor, even though not expressly specified above.

## SAFETY

A compliment of warning decals is supplied with each unit. These decals must be affixed to the vehicle after it has been painted, trimmed, and undercoat, etc. and prior to being put into service. The decals shall be placed so as to be clearly visible to the user and service personnel. (Figures 1 through 6.)

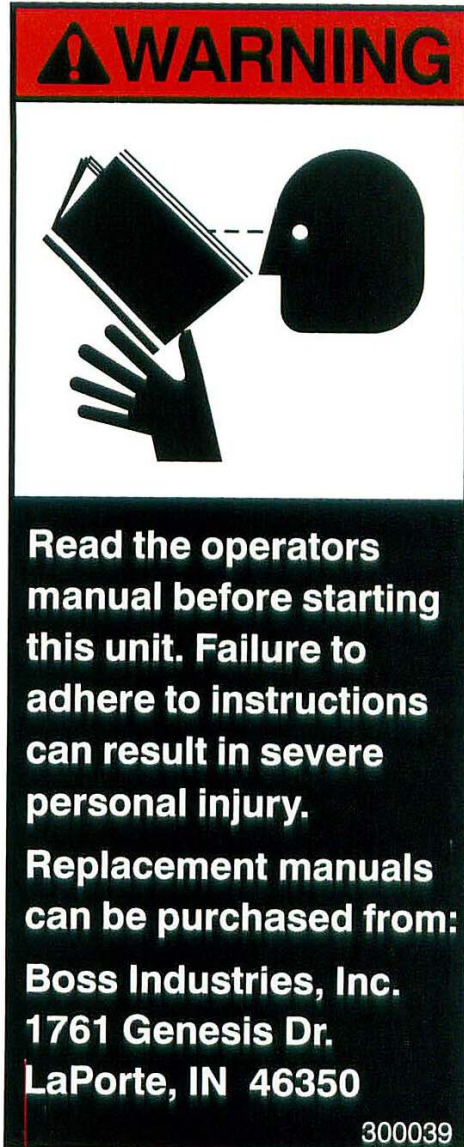


Figure 1. To be placed on visor or dash near start-up procedure decal.  
P/N: 300039

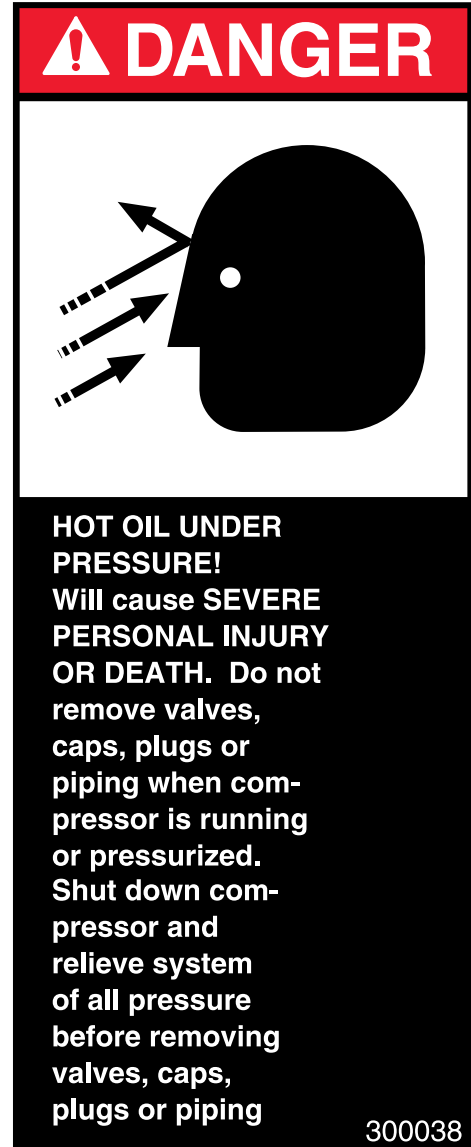


Figure 2. To be placed on body near oil sump filter cap.  
P/N: 300038

## SAFETY



Figure 3. To be placed on body near air service valve.  
P/N: 300040

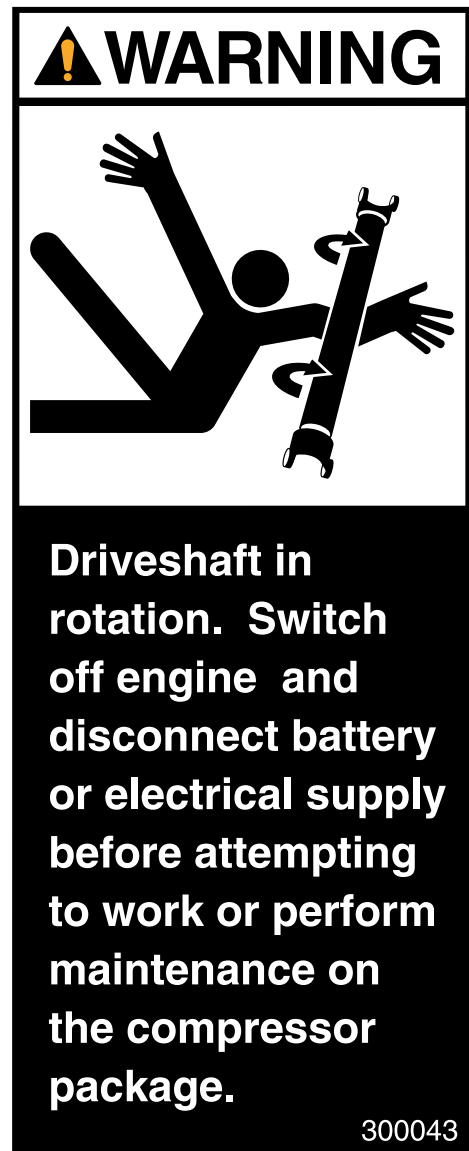


Figure 4. To be placed on body near compressor mounting foot.  
P/N: 300043

## SAFETY



Figure 5. To be placed near oil cooling fan.  
P/N: 300041

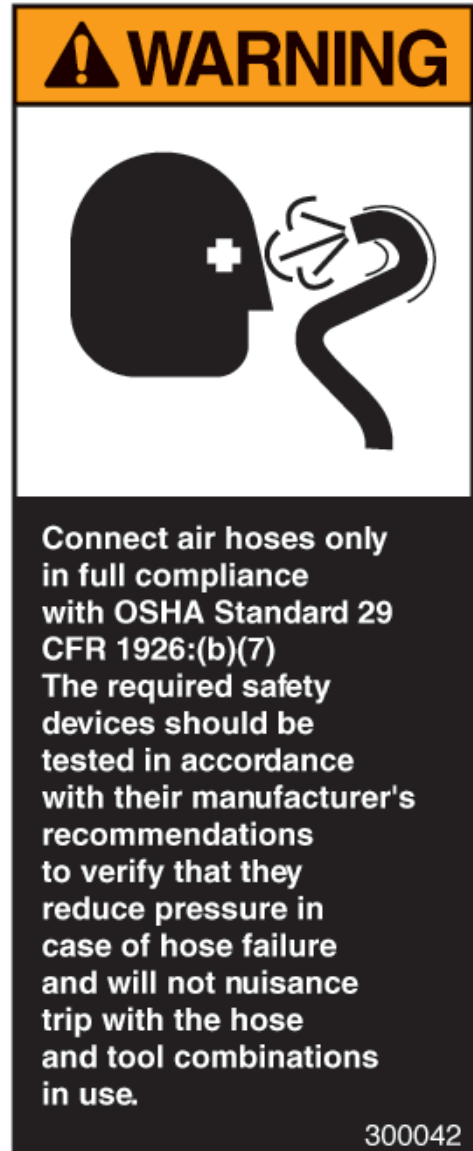


Figure 6. To be placed on body air service valve.  
P/N: 300042



**SAFETY**

**COMPRESSOR FLUID**

**USE AUTOMATIC TRANSMISSION FLUID  
DEXRON III OR EQUIVALENT**

- 1. CHECK FLUID LEVEL WITH TRUCK OFF AND PARKED ON LEVEL GROUND BEFORE STARTING COMPRESSOR.**
- 2. ADD FLUID IF NONE IS SHOWING IN SIGHT GLASS.**
- 3. DO NOT FILL ABOVE LINE ON SIGHTGLASS.**

300047

**|||||BOSS**

**BOSS INDUSTRIES, INC.**

**1761 GENESIS DR. LA PORTE, IN 46350**

**1-800-635-6587**

**WWW.BOSSAIR.COM**

**SERIAL NO.**

305761

## COMPRESSOR TERMINOLOGY

**ATF** - Automatic transmission fluid.

**AIR/OIL COALESCER** - Performs second stage separation of oil from compressed air feeding air tools. Sometimes referred to as the separator element.

**AOM** - Air Oil Manifold. Consists of coalescer and oil filters. Along with most electrical senders.

**BCU** - Boss Control Unit. The digital gauge panel that shows system levels and store information.

**BIM** - Boss Interface Module. Combination of relays, timers, and terminal strips used as the central wiring point that is chassis specific for ease of installation.

**CFM** - The volume of compressed air produced expressed as cubic feet of air per minute.

**LOAD CONTROLLER** - Sometimes referred to as the engine speed control.

**OIL SUMP** - The first stage of oil separation from compressed air. Also serves as reservoir area for compressor lubricant and sometimes referred to as the receiver tank.

**PSI** - Refers to the operating pressure the system is set up at, expressed as pounds per square inch.

**SAFETY VALVE** - A valve located on the oil sump which opens in case of excessive pressure. Sometimes referred to as the pop-off or pressure relief valve.

**SIDE MOUNT PTO** - Power take off gearbox that bolts to the side of the transmission. The PTO input gear meshes with one of the gears in the vehicle's transmission. The rotation developed by the engine drives the transmission which turns the PTO gear box and rotates the PTO output shaft. Special care during PTO selection should be taken to ensure proper compressor rotation and PTO % is achieved for specific compressor kit.

**ADAPTER GEAR ASSEMBLY: SIDE MOUNT PTO** - The adapter gear assembly is to be used on the 80100-8G model when installed on manual transmissions that require the PTO rotation to be changed from "Opposite Engine" rotation to "Engine" rotation.

## DESCRIPTION OF COMPONENTS

### COMPRESSOR ASSEMBLY

The BOSS INDUSTRIES 80100-8G compressor assembly is a positive displacement, oil flooded, rotary screw type unit employing one stage of compression to achieve the desired pressure. Components include a housing (stator), two screws (rotors), bearings, and bearing supports. Power from the engine is transferred to the male rotor through a drive shaft and gears in the gear housing. The female rotor is driven by the male rotor. There are five lobes on the male rotor while the female rotor has six roots. The 80100-9D and 80100-10D compressor assemblies are direct drive and do not incorporate the gear housing. Your compressor model is selected based on your air flow required and type of transmission mounted PTO that is used.

### PRINCIPLES OF OPERATION

In operation, two helical grooved rotors mesh to compress air. Inlet air is trapped as the male lobes roll down the female grooves, pushing trapped air along, compressing it until it reaches the discharge port in the end of the stator and delivers smooth-flowing, pulse-free air to the receiver.

During the compression cycle, oil is injected into the compressor and serves these purposes:

1. Lubricates the rotating parts and bearings.
2. Serves as a cooling agent for the compressed air.
3. Seals the running clearances.

### LUBRICATION SYSTEM

Oil from the compressor oil sump, at compressor discharge pressure, is directed through the oil filter, cooling system, and to the side of the compressor stator, where it is injected into the compressor. At the same time oil is directed internally to the bearings and shaft seal of the compressor. The oil-laden air is then discharged back into the sump.

### OIL SUMP

Compressed, oil-laden air enters the sump from the compressor. As the oil-laden air enters the sump, most of the oil is separated from the air as it passes through a series of baffles and de-fusion plates. The oil accumulates at the bottom of the sump for recirculation. However, some small droplets of oil remain suspended in the air and are passed on to the coalescer.

### SAFETY VALVE

The pop safety valve is set at 175 PSI and is located at the top of the air/oil sump. This valve acts as a backup to protect the system from excessive pressure that might result from a malfunction.

### AIR/OIL COALESCER

The coalescer is self-contained within a spin-on housing and is independent of the sump. When air is demanded at the service line, it passes through the coalescer which efficiently provides the final stage of oil separation.

### OIL RETURN LINE

The oil that is removed by the coalescer accumulates at the bottom of the can and is returned through an oil return line leading to the compressor. The oil return line is 1/4" and goes to elbow hose fitting which is located at the compressor.



## DESCRIPTION OF COMPONENTS

### MINIMUM PRESSURE ORIFICE

The minimum pressure orifice is located at the outlet of the coalescer head and serves to maintain a minimum discharge pressure of 65 PSIG in operation, which is required to assure adequate compressor lubrication pressure.

### OIL FILTER

The compressor oil filter is the full-flow replaceable element type and has a safety bypass built into it.

### COMPRESSOR COOLING SYSTEM (STANDARD)

The compressor cooling system consists of an oil cooler remote mounted aerodynamically designed cooling package or a cooler mounted in front of the truck's radiator. Oil temperature is controlled by a thermal switch on the remote mount cooler package. A thermal valve located down stream of the oil filter is used on the front mount oil cooler package. The switch or valve maintains compressor oil temperatures in the range of 160° - 200° F.

## **DESCRIPTION OF COMPONENTS**

### **INSTRUMENTATION**

The BOSS PTO unit incorporates a gauge panel that monitors temperature, hours of operation, oil level, and pressure. It is designed to be mounted inside the cab or in a protected area outside of the cab.

### **COMPRESSOR DISCHARGE PRESSURE SENDER**

This sender indicates the discharge air/oil pressure. Operate compressor within the discharge pressure limits as indicated in specifications section. The sender ensures high pressure safety shutdown before the safety relief valve on the sump is discharged, preventing hot pressurized oil spray on the vehicle and/or compressor components.

### **HOURMETER**

The hourmeter records the total number of operating hours. It serves as a guide in following the recommended inspection and maintenance schedule. The hourmeter will only run when there is pressure in the system.

### **COMPRESSOR DISCHARGE AIR/OIL TEMPERATURE SENDER**

This sender indicates compressor air discharge temperature. The gauge ensures safety shutdown in case of excessive operating temperatures, preventing compressor damage.

### **ELECTRICAL AND SAFETY SYSTEM**

The BOSS compressor's standard electrical system consists of a gauge panel; a remote mount 12 VDC fan package with fan switch and relay assembly (for standard cooling system only); and Boss Interface Modules (BIM). These components are integrated together to provide a safety shutdown system that is activated when extreme high temperature or pressure conditions are present. When the temperature or pressure exceeds the maximum set parameter of the BCU sends a signal to "trip" the shutdown relay from normally closed to open. This signal will then shut off the engine in vehicles equipped with a CABLE PTO or disengage the PTO in "HOT SHIFT" PTO applications.

### **ELECTRONIC ENGINE INTERFACE**

Electronic engine interface for the compressor speed control incorporates several BOSS supplied electrical components that are chassis specific. A chassis specific wiring diagram and BIM is supplied per the information application data sheet at the time of the order. Most electronic engines will require programming by your dealer for the truck chassis.

### **AUTOMATIC BLOW DOWN VALVE**

There is one blow down valve in the compressor system. It is located at the downstream side of the coalescer head and will automatically bleed the sump to zero pressure when the compressor is disengaged. Blow down time interval takes between 30 to 60 seconds.

### **CONTROL SYSTEM**

The prime component of the compressor control system is the compressor inlet valve. The control system is designed to match air supply to air demand and to prevent excessive discharge pressure when compressor is at idle. Control of air delivery is accomplished by the inlet valve regulation and modulation as directed by the discharge pressure regulator.

## DESCRIPTION OF COMPONENTS

### DISCHARGE PRESSURE REGULATOR VALVE

This valve, located on the coalescer head is used to set the desired discharge pressure within the operating pressure range. Turning the regulator screw clockwise increases the working pressure, a counterclockwise movement of the screw reduces the working pressure. This system has a maximum operating pressure of 175 psi.

***NOTE: Most air tools operating pressure range is between 90 and 125 psi. Operating above the tools recommended pressures will decrease the life of the tool. Higher operating pressure can also over torque nut and bolts fatiguing the fastener and mating parts. Strictly adhere to tool operating pressures and torque standards set forth by the tool manufacturer and the specifications of the equipment that work is being performed on.***

### INLET VALVE

The compressor inlet valve is a piston operated disc valve that regulates the inlet opening to control capacity and serving as a check valve at shutdown.

### CONTROL SYSTEM OPERATION (ELECTRONIC ENGINES)

The following discussion explains the operation of the control system from a condition of “no load” to a condition of “full capacity” at working pressure. For the working pressure range of your machine, refer to applicable data in “Specifications”.

The pressure regulator, mounted on the coalescer head, operates as follows:

1. As the demand for air decreases, the receiver pressure rises. When this pressure exceeds the set point of the pressure regulator, the regulator opens sending a secondary pressure signal to the inlet valve, and in case of two speed, engine speed controls, a timer is activated to slow the engine down to compressor idle. The poppet valve moves towards the valve inlet seat against the force of the modulating spring inside the valve. This regulates the opening area of the inlet valve.
2. If the air demand goes to zero, (service valve closed or air dead headed at tool) the inlet valve will close completely.
3. As the demand for air increases, the secondary pressure signal to the inlet valve is removed and the inlet valve poppet modulates to full open, and the engine returns to the programmed compressor high RPM.

## INSPECTION, LUBRICATION, AND MAINTENANCE

This section contains instructions for performing the inspection, lubrication, and maintenance procedures required to maintain the compressor in proper operating condition. The importance of performing the maintenance described herein cannot be over emphasized.

The periodic maintenance procedures to be performed on the equipment covered by this manual are listed below. It should be understood that the intervals between inspections specified are maximum interval. More frequent inspections should be made if the unit is operating in a dusty environment, in high ambient temperature, or in other unusual conditions. A planned program of periodic inspection and maintenance will help avoid premature failure and costly repairs. Daily visual inspections should become a routine.

The LUBRICATION AND MAINTENANCE CHART lists serviceable items on this compressor package. The items are listed according to their frequency of maintenance, followed by those items which need only "As Required" maintenance.

The maintenance time intervals are expressed in hours. The hourmeter shows the total number of hours your compressor has run. Use the hourmeter readings for determining your maintenance schedules. Perform the maintenance at multiple intervals of the hours shown. For example, when the hourmeter shows "100.00," all items listed under "EVERY 10 HOURS" should be serviced for the tenth time, and all items under "EVERY 25 HOURS" should be serviced for the fourth time, and the items under "EVERY 100 HOURS" for the first time.

### DANGER

**COMPRESSOR MUST BE SHUT DOWN AND COMPLETELY RELIEVED OF PRESSURE PRIOR TO CHECKING FLUID LEVELS. OPEN SERVICE VALVE TO ENSURE RELIEF OF SYSTEM AIR PRESSURE. FAILURE TO COMPLY WITH THIS WARNING MAY CAUSE DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

## LUBRICATION AND MAINTENANCE CHART

INTERVAL	ACTION
PERIODICALLY DURING OPERATION	1. Observe all gauge reading. Note any change from the normal reading and determine the cause. Have necessary repairs made. (NOTE: "NORMAL" is the usual gauge reading when operating at similar conditions on a day to day operation.)
EVERY 10 HOURS OR DAILY	1. Check the compressor oil level. 2. Check air filter. 3. Check for oil and air leaks. 4. Check safety circuit switches.
EVERY 25 HOURS OR MONTHLY	1. Drain water from compressor oil.
EVERY 100 HOURS	1. Grease compressor drive shaft.
EVERY 500 HOURS OR 6 MONTHS	1. Change compressor oil and oil filter. 2. Check compressor shaft seal for leakage. 3. Check air filter piping, fittings and clamps. 4. Check compressor supports. 5. Install new air filter element. (Shorter interval may be necessary under dusty conditions.) 6. Check sump safety valve.
EVERY 1000 HOURS	1. Change coalescing element.
PERIODICALLY OR AS REQUIRED	1. Inspect and clean air filter element. 2. Inspect and replace spin-on coalescer element if necessary. 3. Inspect and clean oil cooler fins.

NOTE: Compressor oil and filter is to be changed after the first 50 hours of operation. After this, normal intervals are to be followed.

## LUBRICANT RECOMMENDATIONS

### WARNING

**IT IS IMPORTANT THAT THE COMPRESSOR OIL BE OF A RECOMMENDED TYPE AND THAT THIS OIL AS WELL AS THE AIR FILTER, OIL FILTER, AND COALESCER ELEMENTS BE INSPECTED AND REPLACED AS STATED IN THIS MANUAL.**

**THE COMBINATION OF A COALESCER ELEMENT LOADED WITH DIRT AND OXIDIZED OIL PRODUCTS TOGETHER WITH INCREASED AIR VELOCITY AS A RESULT OF THIS CLOGGED CONDITION MAY PRODUCE A CRITICAL POINT WHILE THE MACHINE IS IN OPERATION WHERE IGNITION CAN TAKE PLACE AND COULD CAUSE A FIRE IN THE OIL SUMP.**

**FAILURE TO COMPLY WITH THIS WARNING MAY CAUSE DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

The following are general characteristics for a rotary screw lubricant. Due to the impossibility of establishing limits on all physical and chemical properties of lubricants which can affect their performance in the compressor over a broad range of environmental influences, the responsibility for recommending and consistently furnishing a suitable heavy duty lubricant must rest with the individual supplier if they choose not to use the recommended BOSS INDUSTRIES rotary screw lubricant. The lubricant supplier's recommendation must, therefore, be based upon not only the following general characteristics, but also upon his own knowledge of the suitability of the recommended lubricant in PTO helical screw type air compressors operating in the particular environment involved.

### CAUTION

**MIXING DIFFERENT TYPES OR BRANDS OF LUBRICANTS IS NOT RECOMMENDED DUE TO THE POSSIBILITY OF A DILUTION OF THE ADDITIVES OR A REACTION BETWEEN ADDITIVES OF DIFFERENT TYPES.**

## LUBRICANT RECOMMENDATIONS

### LUBRICANT CHARACTERISTICS

1. Flash point 400°F minimum.
2. Pour point -40°F.
3. Contains rust and corrosion inhibitors.
4. Contains foam suppressors.
5. Contains oxidation stabilizer.

### NOTE

**DUE TO ENVIRONMENTAL FACTORS THE USEFUL LIFE OF ALL “EXTENDED LIFE” LUBRICANTS MAY BE SHORTER THAN QUOTED BY THE LUBRICANT SUPPLIER. BOSS INDUSTRIES ENCOURAGES THE USER TO CLOSELY MONITOR THE LUBRICANT CONDITION AND TO PARTICIPATE IN AN OIL ANALYSIS PROGRAM WITH THE SUPPLIER.**

### NOTE

**NO LUBRICANT, HOWEVER GOOD AND/OR EXPENSIVE, CAN REPLACE PROPER MAINTENANCE AND ATTENTION. SELECT AND USE IT WISELY.**

## MAINTENANCE

If some of the maintenance intervals in the schedule outlined in this manual seem to be rather short, it should be considered that one hour's operation of a compressor is equal to about 40 road miles on an engine. Thus, eight hours operation is equal to 320 road miles, 250 hours is equal to 10,000 road miles, etc.

### COMPRESSOR OIL SUMP FILL, LEVEL, AND DRAIN

Before adding or changing compressor oil make sure that the sump is completely relieved of pressure. Oil is added at the fill cap on the side of the receiver/sump. A drain plug is provided at the bottom of the sump. The proper oil level, when unit is shut down and has had time to settle, is at the midpoint of the oil sightglass. The truck must be level when checking the oil. **DO NOT OVERFILL.** The oil sump capacity is given in "Compressor Specifications".

### DANGER

**DO NOT ATTEMPT TO DRAIN CONDENSATE, REMOVE THE OIL LEVEL FILL PLUG, OR BREAK ANY CONNECTION IN THE AIR OR OIL SYSTEM WITHOUT SHUTTING OFF COMPRESSOR AND MANUALLY RELIEVING PRESSURE FROM THE SUMP. FAILURE TO COMPLY WITH THIS WARNING MAY CAUSE DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

### GREASE

Lubricate the compressor drive shaft every time the truck is lubricated or every 100 hours of compressor operation, whichever comes first.

### AIR INTAKE FILTER

The air intake filter is a heavy-duty two-stage dry type high efficiency filter designed to protect the compressor from dust and foreign objects.

The filter is equipped with an evacuator cup for continuous dust ejection while operating and when stopped.

Frequency of maintenance of the filter depends on dust conditions at the operating site. The filter element must be serviced when clogged (maximum pressure drop for proper operation is 15" H<sub>2</sub>O).



## MAINTENANCE

### AIR/OIL COALESCER

The air/oil coalescer employs an element permanently housed within a spin-on canister. This is a single piece unit that requires replacement when it fails to remove the oil from the discharge air, or pressure drop across it exceeds 15 PSI. Dirty oil clogs the element and increases the pressure drop across it.

To replace element proceed as follows:

1. Shutdown compressor and wait for complete blow down (zero pressure).
2. Turn element counterclockwise for removal (viewing element from bottom).
3. Install new rubber seal in head and supply a film of fluid directly to seal.
4. Rotate element clockwise by hand until element contacts seal (viewing element from bottom).
5. Rotate element approximately one more turn clockwise with band wrench near the top of element.
7. Run system and check for leaks.

### WARNING

**DO NOT SUBSTITUTE ELEMENT. USE ONLY A GENUINE BOSS INDUSTRIES REPLACEMENT ELEMENT. THIS ELEMENT IS RATED AT 195 CFM @ 295 PSI WORKING PRESSURE. USE OF ANY OTHER ELEMENT MAY BE HAZARDOUS AND COULD IMPAIR THE PERFORMANCE AND RELIABILITY OF THE COMPRESSOR, POSSIBLY VOIDING THE WARRANTY AND/OR RESULTING IN DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

### OIL RETURN LINE

This line originates at the top of the air/oil coalescer head and flows through a clear 1/4" nylon tube to an elbow located at the air-end. This elbow incorporates an oil return line check valve stopping the flow of oil into the coalescer at shutdown.

# MAINTENANCE

## OIL FILTER

The compressor oil filter is a spin-on, throw away type.

To replace filter proceed as follows:

1. Make sure system pressure is relieved.
2. Remove filter by unscrewing from filter head (turn counterclockwise by hand viewing from bottom) and discard.
3. Install a new filter by applying a little oil to the seal and then screw the filter on by hand (turning it clockwise until hand tight, plus one - third turn viewing from bottom).
4. Check for leaks in operation.

## WARNING

**DO NOT SUBSTITUTE ELEMENT. USE ONLY A GENUINE BOSS INDUSTRIES REPLACEMENT ELEMENT. THIS ELEMENT IS RATED AT 200 PSI WORKING PRESSURE. USE OF ANY OTHER ELEMENT MAY BE HAZARDOUS AND COULD IMPAIR THE PERFORMANCE AND RELIABILITY OF THE COMPRESSOR, POSSIBLY VOIDING THE WARRANTY AND/OR RESULTING IN DAMAGE TO PROPERTY AND SERIOUS BODILY HARM.**

## OIL COOLER

The interior of the oil cooler should be cleaned when the pressure drop across it at full flow exceeds 25 PSI. The following procedure has been recommended by the vendor who supplies the cooler:

1. Remove cooler.
2. Circulate a suitable solvent to dissolve and remove varnish and sludge.
3. Flush generously with BOSS INDUSTRIES compressor lubricant.
4. After cooler is reinstalled and compressor is filled with fresh oil, change compressor oil after 50 hours of normal operation.

# MAINTENANCE

## SHAFT SEAL

### SHAFT SEAL INSTALLATION INSTRUCTIONS:

1. Remove PTO drive shaft, companion flange and key.
2. Remove (5) socket head retaining bolts on cover and slide cover off shaft. Cover has the seal and snap ring assembled in it.
3. Press old snap ring and seal off the cover for assembly of new seal.
4. Pull seal wear sleeve off shaft with puller, adding heat to one area only on wear sleeve will help enlarge and aid in it's removal.
5. Clean shaft and surface of bearing removing all burrs from shaft where the wear sleeve gets installed.
6. Press new wear sleeve on to shaft. Oil heating new wear sleeve to 212°F approximately aids in the installation of this ring.
7. Clean seal cover and snap ring with solvent before installation.
8. Press new seal into cover (included in repair kit) and insert snap ring.
9. Place the assembly tool on the drive shaft until it sits on the end of the wear sleeve. Slightly lubricate the assembly tool on the external surface and add Loctite 573 to seal cover.
10. Install cover, seal and snap ring assembly, over shaft and assembly tool. Note: Assembly tool is slip fit on shaft and allows new seal in cover to slide on to wear sleeve without cutting the lip of shaft seal. Reinstall the dirt ring retainer once the new seal and cover assembly is in place.
11. Place seal cover against rotor casting paying attention not to damage the seal and slide off assembly tool.
12. Screw down the socket head retaining bolts on the cover with a torque of 25Nm.
13. Reinstall companion flange, key and drive shaft assembly.

## PTO

The PTO should be serviced in accordance with the PTO manual. The SAE side-mount type of PTO is lubricated by the transmission oil and thus requires little maintenance. It is strongly recommended that you periodically torque the fasteners in accordance with the PTO manual.

# TROUBLESHOOTING

This section contains instructions for troubleshooting the equipment following a malfunction.

The troubleshooting procedures to be performed on the equipment are listed below. Each symptom of trouble for a component or system is followed by a list of probable causes of the trouble and suggested procedures to be followed to identify the cause.

In general, the procedures listed should be performed in the order in which they are listed, although the order may be varied if the need is indicated by conditions under which the trouble occurred. In any event, the procedures which can be performed in the least amount of time and with the least amount of removal or disassembly of parts, should be performed first.

## TRUCK ENGINE WILL NOT START

Most problems in this area will not be connected with the compressor, and should therefore be checked out with the engine manual.

Manual transmissions require our safety shutdown to shut off the engine in cases of high temperature or pressure. If this occurs the truck can be restarted by waiting 5 seconds for the shutdown relay to release. If the truck still will not restart hold reset button for 5 seconds. If the compressor temperature, pressure, or low oil safety has shut off the engine, the truck should be taken in for service/troubleshooting.

Trucks that have automatic transmissions that use hot shift PTO's should be wired so the PTO disengages in the event of a safety shutdown instead of shutting off the truck engine.

## UNPLANNED SHUTDOWN

When the operation of the machine has been interrupted by an unexplained shutdown, take the following steps:

1. Disengage PTO immediately.
2. Check the fuel level and truck dash gauges and indications for possible engine problems.
3. Check the BCU panel to see if there is an indication for the reason of shutdown. If a light is on solid, there was a safety shutdown for the corresponding reason. If a light is flashing, there corresponding sender is wired incorrectly. Fix the identified problem.
4. Check oil cooler for dirt, slush, ice on the fins, or any other obstructions to the cooling air flow.
5. If problem is fixed, hold reset button on panel for 5 seconds.

# TROUBLESHOOTING

## IMPROPER DISCHARGE PRESSURE

1. If discharge pressure is too low, check the following:
  - A. Too much air demand. (Air tools require more air than what the compressor can produce, air tools are free wheeling without resistance.)
  - B. Service valve wide open to atmosphere.
  - C. Leaks in service line.
  - D. Restricted compressor inlet air filter.
  - E. Faulty control system operation (i.e. regulator is sending a signal to close inlet valve at all times.)
2. If discharge pressure is too high, safety valve blows, or system shuts down on high pressure, check the following:
  - A. Faulty discharge pressure sender.
  - B. Coalescer plugged up.
  - C. Faulty safety valve.
  - D. Faulty regulator (regulator air pressure signal is not getting to inlet valve)
3. High pressure shutdown at compressor idle:
  - A. Inlet valve leaking or open
  - B. Faulty regulator

## SUMP PRESSURE DOES NOT BLOW DOWN

If after the compressor is shutdown, pressure does not automatically blow down, check for:

1. Automatic blow down valve may be inoperative at coalescer head.
2. Blockage in air line from side of inlet valve to blow down valve.
3. Muffler at blow down clogged.

## OIL CONSUMPTION

Abnormal oil consumption or oil in service line, check for the following:

1. Over filling of oil sump.
2. Leaking oil lines or oil cooler.
3. Plugged oil return line: check entire line, to the compressor.
4. Defective coalescer element.
5. Compressor shaft seal leakage.
6. Discharge pressure below 65 PSI or above 175 PSI.

# TROUBLESHOOTING

## ENGINE LUGGING

If engine does not accelerate or will not maintain full load speed, check the following:

1. Engine problem (refer to engine manual).
2. Compressor discharge pressure too high.
3. Improper compressor speed. (Compressor running at truck idle.)
4. Operating above maximum altitude rating of compressor and truck.

## COALESCER PLUGGING

If the coalescer element has to be replaced frequently because it is plugging up, it is an indication that foreign material may be entering the compressor inlet or the compressor oil is breaking down.

Compressor oil can break down prematurely for a number of reasons.

(1) Extreme operating temperature, (2) negligence in draining condensate from oil sump, (3) using the improper type of oil, (4) dirty oil, (5) oil return line plugged.

The complete air inlet system should be checked for leaks.

## HIGH COMPRESSOR DISCHARGE TEMPERATURE

1. Check compressor oil level. Add oil if required (see Section for oil specifications).
2. Check thermal valve operation. (Front mounting coolers only).
3. Clean outside of oil cooler.
4. Check if fan is operational.
5. Clean oil system (cooler) internally.

# COMPRESSOR OPERATION


## STARTING/STOPPING

An operating procedure decal is furnished with every PTO Compressor. The decal should be attached to the dashboard or visor of the truck where it will be visible to the driver.

The following decal is a sample.

## Start-Up Procedure

1. Set vehicle parking brake and chock wheels.
2. Close air service valves. Engine speed control will not engage unless 20 PSI is built up.
3. Check compressor oil level; add if low.
4. Place transmission in Neutral.
5. Engage PTO and depress fuel pedal momentarily until engine speed control takes over.



**BOSS**<sup>®</sup>  
AIR COMPRESSORS

## Shutdown Procedure

1. Close air service valves.
2. Disengage PTO.

Phone: (219) 324-7776

PN:305647B

## COMPRESSOR OPERATION

Before starting the PTO/compressor, read this section thoroughly. Familiarize yourself with the controls and indicators, their purpose, location, and use.

CONTROL OR INDICATOR	PURPOSE
TEMPERATURE SENDER	Monitors the temperature of the air/fluid mixture leaving the compressor. The normal reading should be approximately 175 to 200 degrees F. Sends signal to BCU when the compressor reaches 245 degrees F. The compressor system will shut down.
PRESSURE SENDER	Monitors the pressure inside the sump tank. When the pressure reaches 180 PSI the compressor system will shut down.
OIL LEVEL SENDER	Monitors the oil level inside the sump tank. When the level reaches 5 quarts low, the compressor system will shut down.
HOURMETER	Indicator accumulated hours of actual compressor operation.
FLUID LEVEL SIGHTGLASS	Indicates fluid level in the sump. Proper level should be 2/3 full on the glass. Check this level when the compressor is disengaged and the vehicle is parked on level ground.
PRESSURE RELIEF VALVE	Vents sump pressure to the atmosphere if the pressure inside the sump exceeds 175 PSI.
COMPRESSOR INLET CONTROL VALVE	Regulates the amount of air intake in accordance with the amount of compressed air being used. Isolates fluid in compressor unit on shutdown.
PRESSURE REGULATING VALVE	Senses air pressure from sump to provide automatic regulation of the compressor inlet control valve and load controller.
BLOW DOWN VALVE	Coalescer head blow down valve vents the sump pressure to the atmosphere at shut down.
MINIMUM PRESSURE ORIFICE	Resticts air flow to balance sump and service air pressure. Assures a minimum of 65 PSI to maintain compressor lubrication.
RETURN LINE CHECK VALVE	Ensures thst the back flow to coalescer element does not occur during shut down.



# COMPRESSOR OPERATION

## OPERATING CONDITIONS

The following conditions should exist for maximum performance of the PTO/compressor. The truck should be as close to level as possible when operating. The compressor will operate on a 15 degree sideward and lengthwise tilt without any adverse problems. Fluid carry over and/or oil starvation may occur if operated beyond this tilt.

### NOTE

**IF THE COMPRESSOR IS BEING USED TO POWER SANDBLASTING EQUIPMENT, OR AN AIR STORAGE TANK, USE A CHECK VALVE DIRECTLY AFTER THE MINIMUM PRESSURE ORIFICE TO PREVENT BACKFLOW INTO THE SUMP. THIS CHECK VALVE SHOULD HAVE A MAXIMUM PRESSURE DROP RATING OF 2 PSIG (13.78kPa) OPERATING AND A CAPACITY RATING EQUAL TO THE COMPRESSOR.**

### NOTE

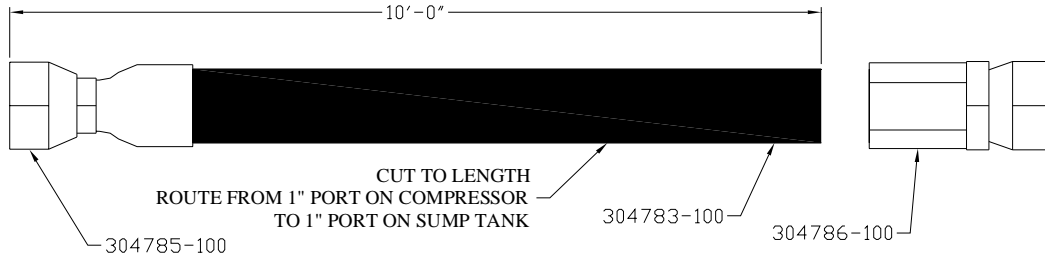
**THE COMPRESSOR SERVICE VALVE SHOULD BE RELOCATED TO THE HOSE REEL INLET OR BE THE CUSTOMERS AIR CONNECTION PORT WHEN A HOSE REEL IS NOT USED. TYPICAL PLUMBING FROM MINIMUM PRESSURE ORIFICE SHOULD FLOW IN THE FOLLOWING ORDER:**

- 1. MINIMUM PRESSURE ORIFICE.**
- 2. CHECK VALVE.**
- 3. AIR TANK (WHEN USED).**
- 4. OSHA VALVE**
- 5. SERVICE VALVE.**
- 6. MOISTURE TRAP/GAUGE/OILER COMBINATION (WHEN USED).**

## **PARTS AND ILLUSTRATION SECTION**

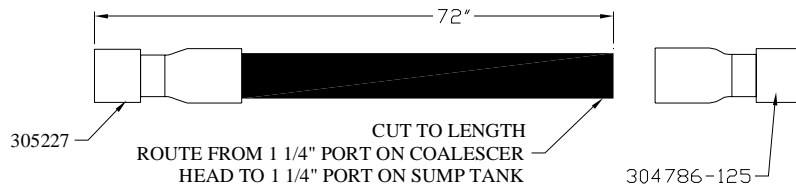
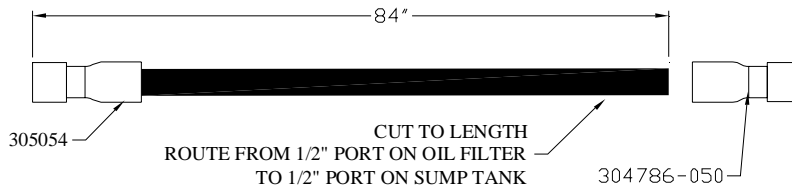
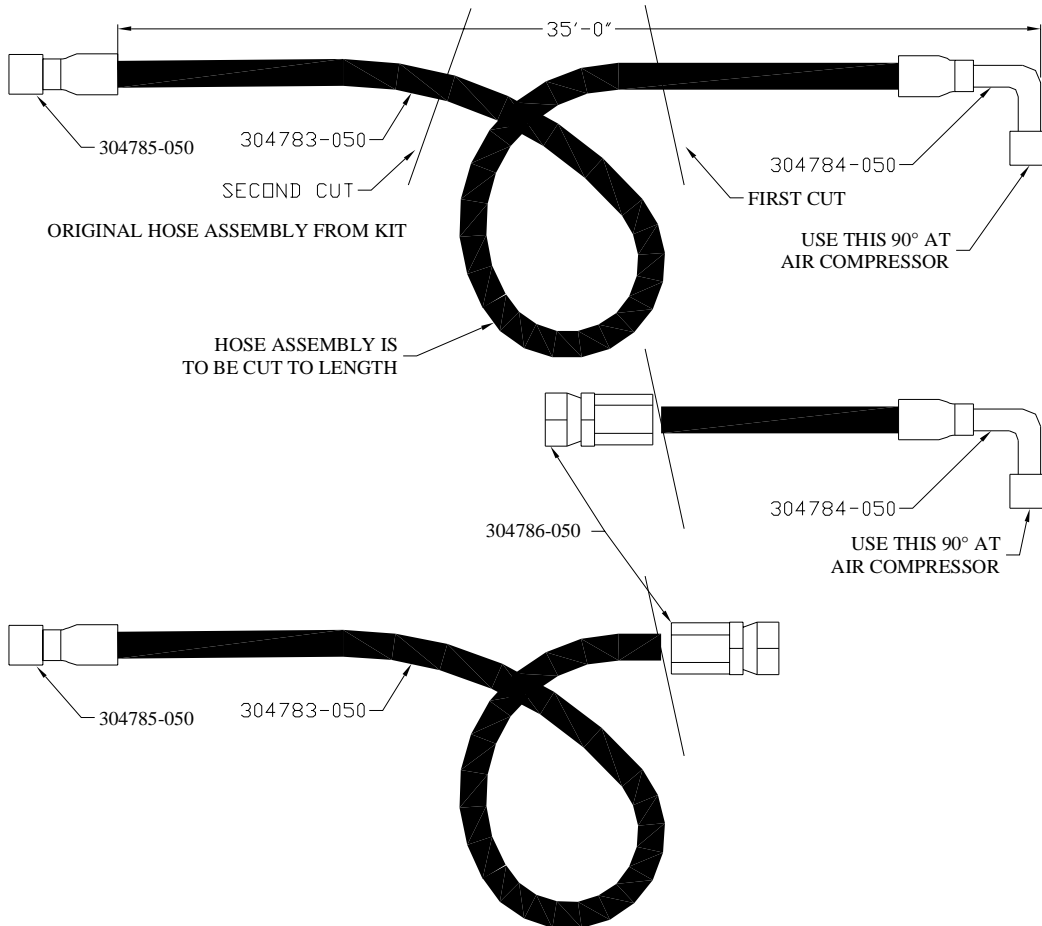
# HOSE SYSTEM

60815



NOTE: TWO HOSE ASSEMBLIES ARE REQUIRED WITH REMOTE MOUNTED OIL COOLER SYSTEMS.

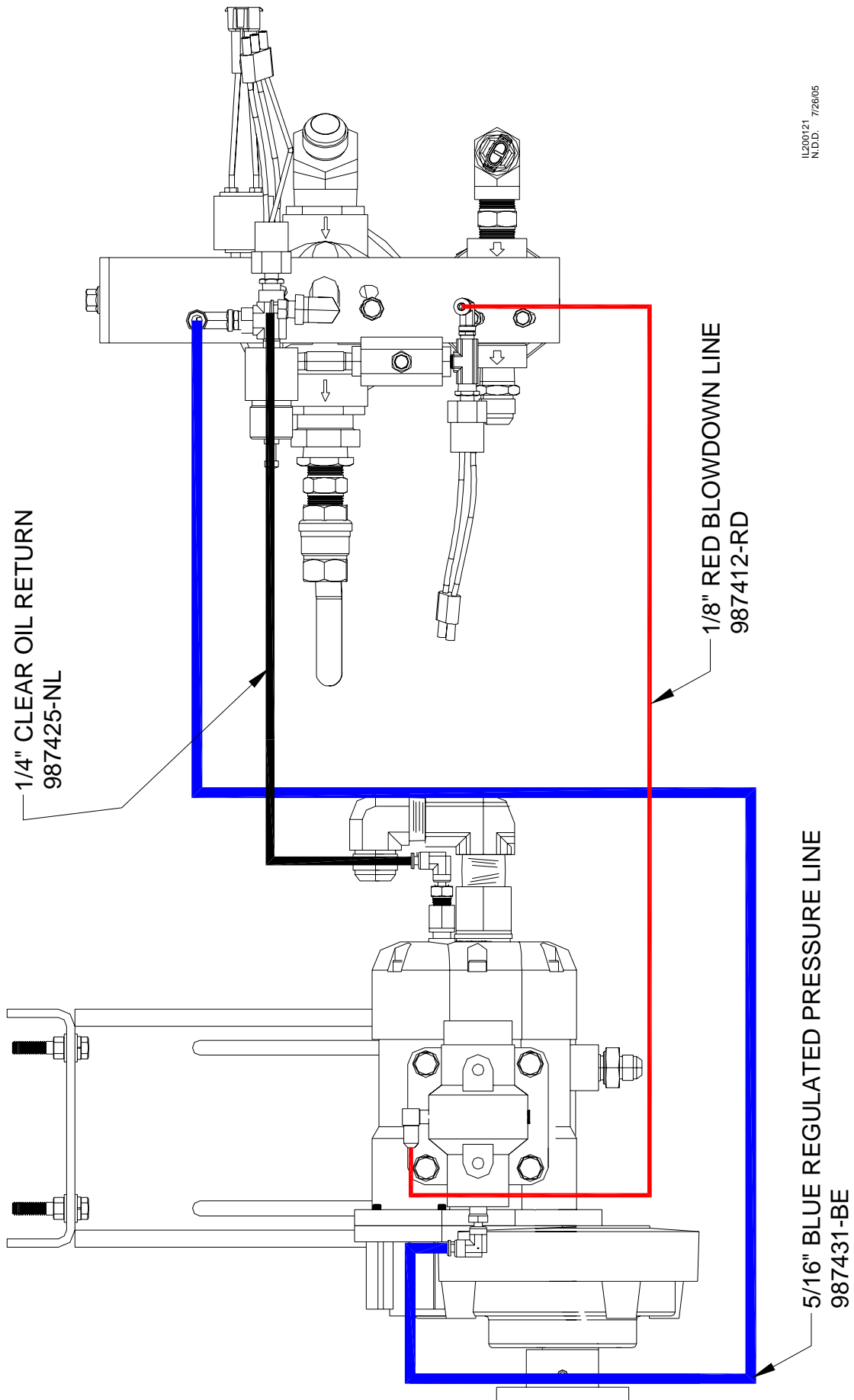
1. CUT HOSE SO ONE ASSEMBLY HAS THE 90° CRIMP FITTING AND ASSEMBLE A REUSABLE FITTING TO THE OTHER END. USE THIS ASSEMBLY WITH THE 90 DEG CRIMP AT THE COMPRESSOR PORT AND THE STRAIGHT REUSABLE AT THE COOLER OUTLET PORT.
2. CUT REMAINING HOSE TO LENGTH FOR THE HOSE RUN FROM THE COOLER INLET TO THE OIL FILTER OUTLET. THIS ASSEMBLY WILL USE THE OTHER CRIMP FITTING THAT WAS ATTACHED ON THE ORIGINAL 35' HOSE ASSEMBLY ALONG WITH ONE REUSABLE FITTING.



7/26/05  
N.D.D.

(60815-999)

# CONTROL HOSE PORT CALL OUTS



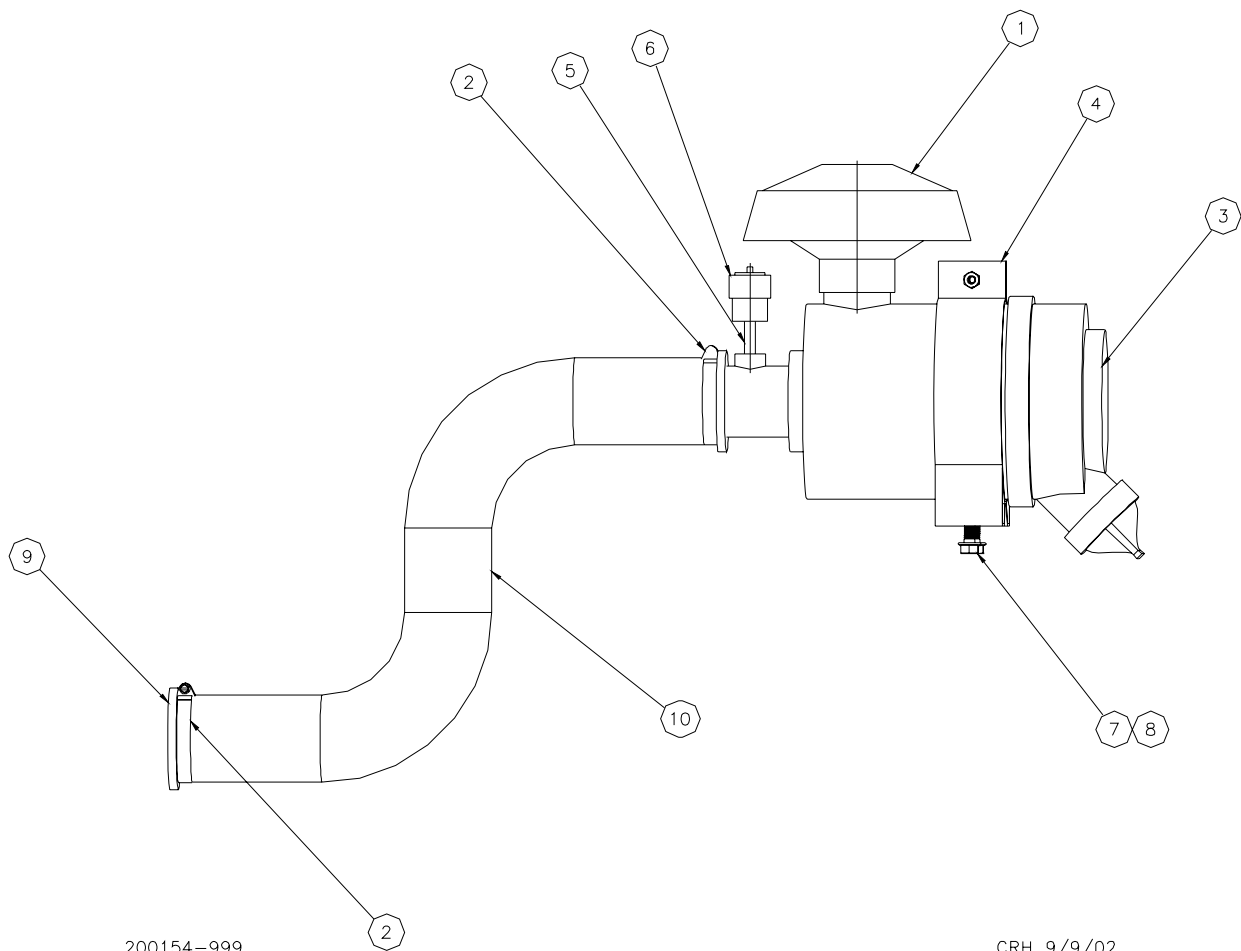
IL200121  
N.D.D. 7/26/05

# AIR INLET SYSTEM

200154

PART NUMBER	QTY	DESCRIPTION	ITEM
302204	1 EACH	CAP, AIR FILTER 5.75 2	1
301786-250	2 EACH	CLAMP, AIR INLET 2.500 IN KFLEX	2
302205	1 EACH	ASSY, AIR FILTER - 5.75	3
302207	1 EACH	BAND, AIR FILTER MTG. 5.75	4
922102-015	1 EACH	NIPPLE, PIPE 1/8 X 1 1/2 GAL SCH40	5
300853	1 EACH	INDICATOR, AIR FILTER ELEMENT	6
929705-100	2 EACH	BOLT, WHIZLOCK GR5 .3125-18 X 1.000	7
925305-283	2 EACH	NUT, WHIZ LOCK .3125-18	8
301588	2 EACH	INSERT, RUBBER 2.500 X 2.000	9
301785-250	10 FOOT	HOSE, AIR INLET 2.500 ID KFLEX	10

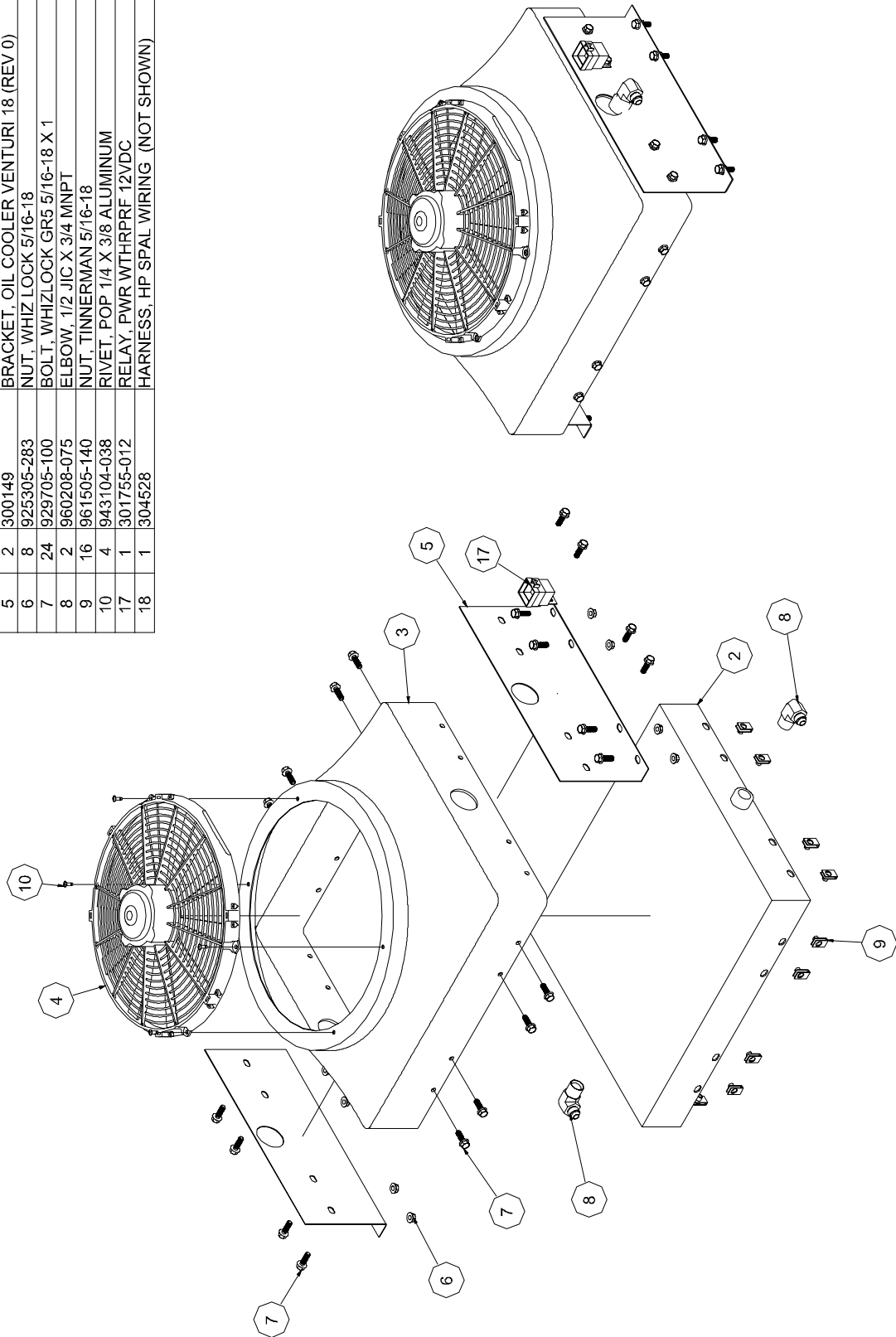
**\* REPLACEMENT AIR FILTER ELEMENT P/N 300854**



# OIL COOLING SYSTEM (REMOTE MOUNT)

200313

Parts List		
ITEM	QTY	PART NUMBER DESCRIPTION
1	1	300014 COOLER, OIL 18.62
2	1	304454 VENTURI, FAN 9 INCH
3	1	304468 FAN ASSY, W MOTOR & GRILL 16
4	2	300149 BRACKET, OIL COOLER VENTURI 18 (REV 0)
5	8	925305-283 NUT, WHIZ LOCK 5/16-18
6	24	929705-100 BOLT, WHIZLOCK GR5 5/16-18 X 1
7	2	960208-075 ELBOW, 1/2 JIC X 3/4 MNPT
8	16	961505-140 NUT, TINNERMAN 5/16-18
9	4	943104-038 RIVET, POP 1/4 X 3/8 ALUMINUM
10	1	301755-012 RELAY, PWR WTHRPRF 12VDC
17	1	304528 HARNESS, HP SPAL WIRING (NOT SHOWN)



# 80100-8G COMPRESSOR MOUNTING OPTION

200252

ITEM	QTY	DESCRIPTION
1	1	301709-369 COMPRESSOR, AIR SCABG 3.69-1 RATIO (REV 0)
2	1	301724 FLANGE, COMPANION, 25MM (REVISION 1)
3	1	932206-050 SCREW, SET .375 X .500
4	1	970804-025 ADAPTER, .250 MBSPP X .250 FNPT
5	1	307588 CAP, 2" INLET VALVE
6	1	987302-012 ELBOW, .125 TUBE SWVL X .125MNPT
7		
8	3	301881 SPACER, DIA. .44 ID X .875 OD X .62 LG (REVISION 1)
9	1	301594 DECAL, COMP. - 250 F
10	1	301725 FOOT, COMP MTC SCAB (REV 1)
11	4	928606-200 BOLT, HEX GR8 .375-16 X 2.000
12	4	937806-094 WASHER, LOC GR8 .375
13	4	929210-250 BOLT, HEX T0MM X 25MM GR10.9
14	1	302467 GASKET, INLET VLV 1875 TO ADAPTER 3D
15	8	938206-071 WASHER, FLAT GR8 .375
16	4	926006-337 NUT, HEX GR8 .375-16
17	1	973108-050 CONNECTOR, .500 JIC X .500 BSPP FS
18	1	302203 VALVE, INLET 30-90 AC 2.090
19	4	938810-220 WASHER, LOC M10
20	4	938910-200 WASHER, FLAT M10
21	3	929208-450 BOLT, HEX 8MM X 45MM GR 10.9
22	3	938908-180 WASHER, FLAT M8
23	3	938608-200 WASHER, LOC M8
24	1	960216-100 ELBOW, 1.000 JIC X 1.000 MNPT
25		
26	1	987305-025M ELBOW, .312 TUBE SWVL X .250 MNPT WITH HOLE
27	1	304720 VALVE, CHECK ELBOW 1/4 TUBE X 1/4 NPT
28	1	902915-005 PLUG, PIPE 1.25 RECESSED ZINC
29	1	970816-100 ADAPTER, 1.000 MBSPP M X 1.000 FNPT
30		
31	1	302607 THREADLOCKER, .5ml CAPSULE 242 LOCTITE P/N 24205 (NOT SHOWN)
32	1	60307-1ST DWG. SERV-KIT T10G/8G MTC SYS (NOT SHOWN)
33	1	922216-000 NIPPLE, PIPE 1 X CLOSE GAL
34	1	971616-100 ELBOW, 1" FPT X 1" FPT
35	3	938205-071 WASHER, FLAT 5/16"

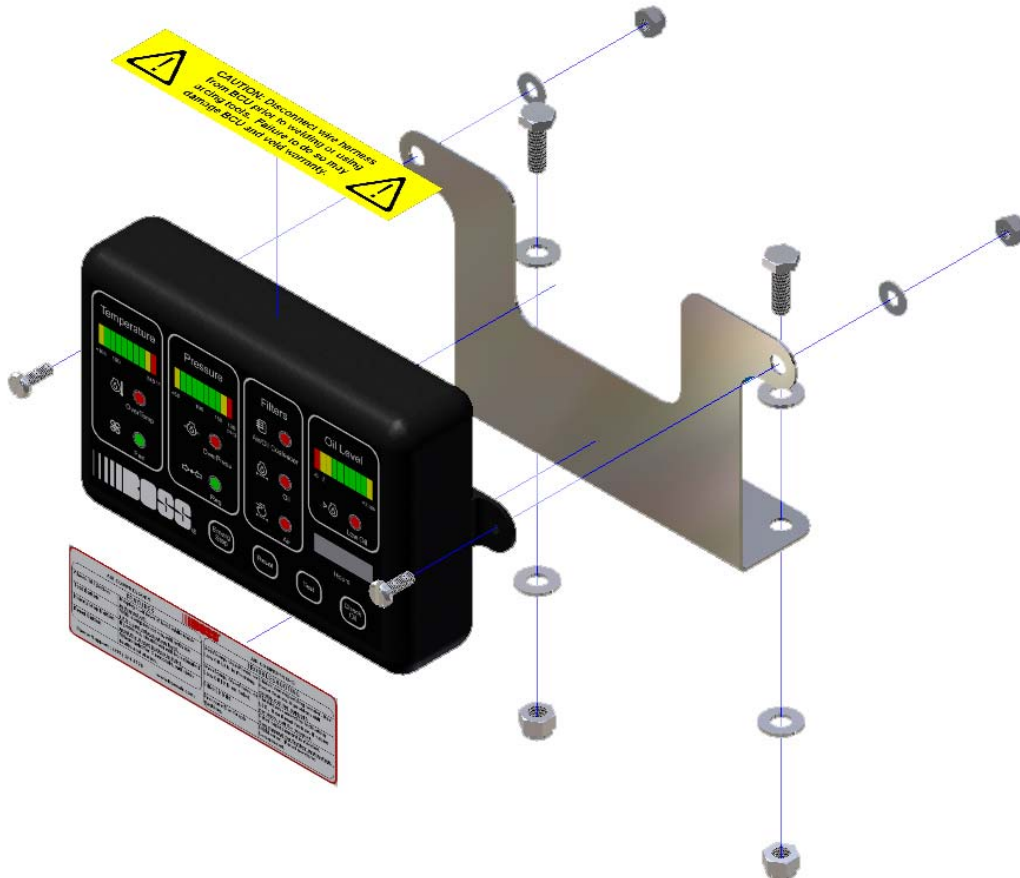
200252-999  
6/29/05

DO NOT SCALE THIS DRAWING AND ALL DIMENSIONS UNLESS INDICATED OTHERWISE. DIMENSIONS ARE GIVEN IN INCHES UNLESS OTHERWISE SPECIFIED. IT IS THE BUYER'S RESPONSIBILITY TO VERIFY DIMENSIONS AND TOLERANCES. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE TO BE TAKEN FROM THE CENTER OF GRAVITY OF THE PART. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE TO BE TAKEN FROM THE CENTER OF GRAVITY OF THE PART.

DATE: 6/29/05  
DESIGNER: [Signature]  
CHECKER: [Signature]  
PART NO: 200252  
REV: 1  
SHEET 1 OF 1

# GAUGE SYSTEM 100526


Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	303916	PANEL, BOSS CONTROL UNIT
2	1	304540	BRACKET, BCU
3	2	931702-050	SCREW, MACH RD HD #10-32 X 1/2
4	2	924301-130	NUT, NYLOC GR5 #10-32
5	2	938602-049	WASHER, FLAT GR5 #10
6	1	304546	DECAL, BCU
7	2	929104-075	BOLT, HEX GR5 1/4-20 X 3/4
8	4	938604-071	WASHER, FLAT GR5 1/4
9	2	924304-145	NUT, NYLOC GR5 1/4-20
10	1	305672	DECAL, BCU WELDING





# BOSS CONTROL UNIT DECAL

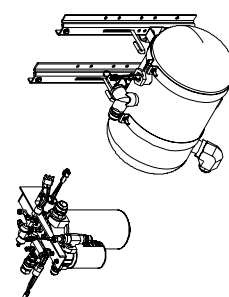
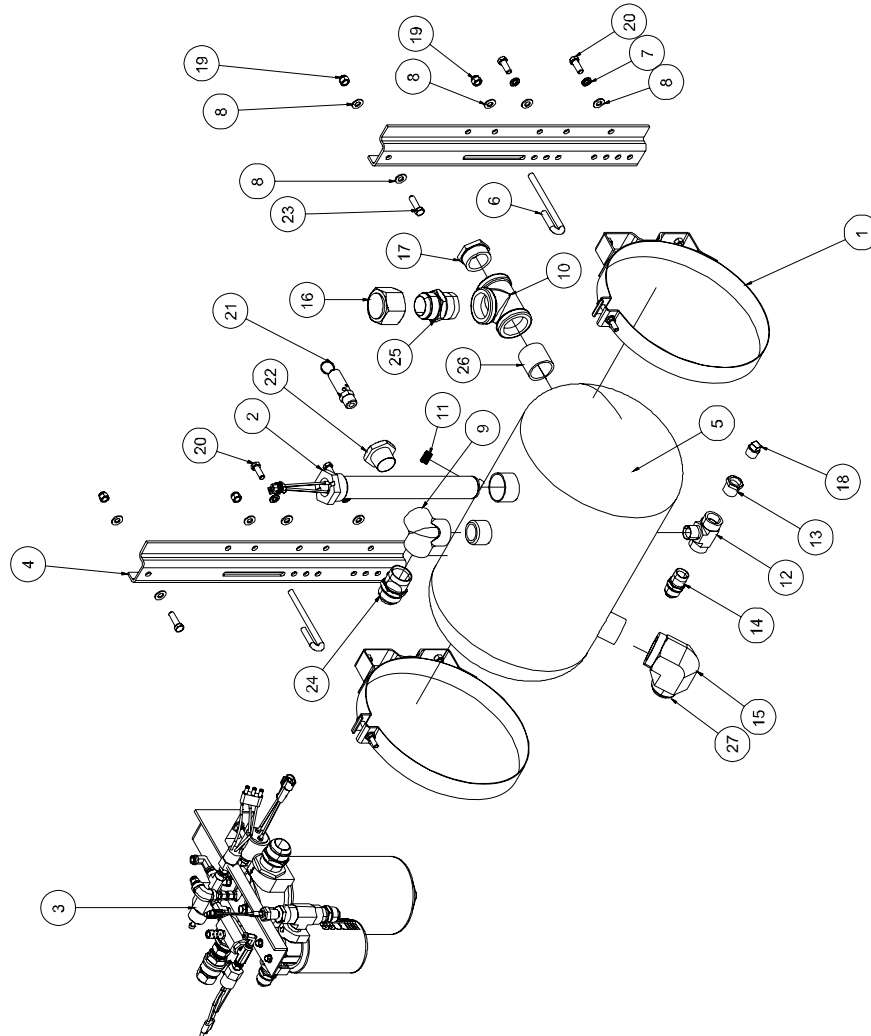
304546

		<b>AIR COMPRESSORS</b>	<b>AIR COMPRESSORS</b>
<b>FEATURES</b>		<b>TROUBLESHOOTING</b>	
Check Oil Button	Displays oil level if held while truck is turned off.	OverTemp, OverPress, or Low Oil LED is Flashing.	Check corresponding sender. Use Reset feature. If problem still exists, call for support
Test Button	With compressor on, will activate LEDs and relays when held.	OverTemp, OverPress, or Low Oil LED on Solid.	Shutdown caused by indicating LED. Use Reset feature. If cause persists, call for support.
Emerg Stop Button	If pressed, shutdown will be activated until the Reset button is held.	Filter LED lit.	Filter replacement is needed.
Reset Button	When held for 5 seconds, will clear faults and alarms.	Pressure Bar Graph flashing.	See manual for further instruction. NVM error. Panel needs to be replaced.
Phone Support : (219) 324-7776 <a href="http://www.bossair.com">www.bossair.com</a>			

# DISCHARGE SYSTEM

200255

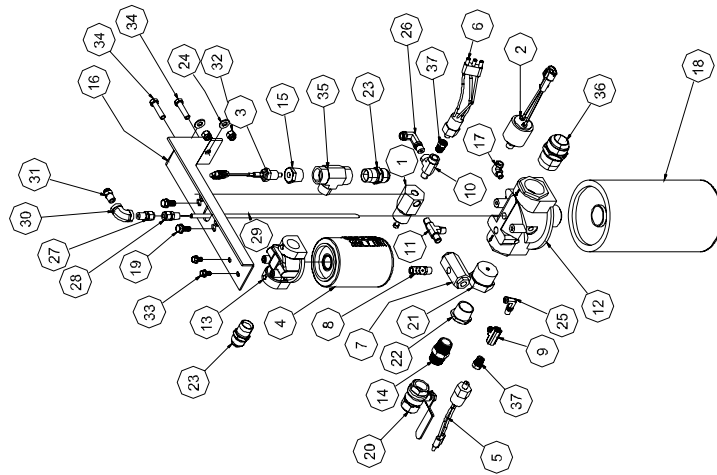
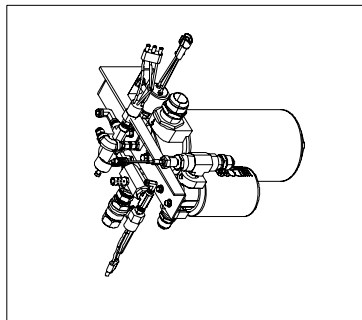
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	300234	BAND, SUMP MTG 12
2	1	304520	SENDER, OIL LEVEL RESISTIVE
3	1	200256-999	MANIFOLD, 80100 AIR OIL
4	2	304619	BRACKET, RECEIVER TANK EZ (REV 1)
5	1	300225	SUMP, 12 in DISCH. WITH PLATE BAFFLE (REV 8)
6	2	304629	J-BOLT, 3/8 X 5 1/2 X 3/8
7	4	937806-094	WASHER, LOC GR8 3/8
8	10	938206-071	WASHER, FLAT GR8 3/8
9	1	902615-050	ELBOW, PIPE SIDE OUT 1 1/4 GAL 150PSI
10	1	902415-060	TEE, PIPE 1 1/2 GAL 150PSI
11	1	902915-020	PLUG, PIPE 1/2 RECESSED ZINC
12	1	961912-075	TEE, MB 3/4 F X 3/4 F X 3/4 M
13	1	907603-020	BUSHING, RED 3/4 X 1/2 GAL
14	1	960108-075	CONNECTOR, 1/2 MJIC X 3/4 MNPT
15	1	977624-150	ELBOW, HYD 1 1/2 FNPT
16	1	301466-150	CAP, JIC 1 1/2 W/ HOLE
17	1	300107	SIGHTGLASS, OIL LEVEL 1 1/2
18	1	300108	PLUG, MAGNETIC 1/2 NPT
19	4	925506-198	NUT, NYLOC GR8 3/8-16
20	4	928806-100	BOLT, HEX GR8 3/8-16 X 1
21	1	300023-175	RELIEF, 1/2 NPT 175 PSI
22	1	907605-020	BUSHING, RED 1 1/4 X 1/2 GAL
23	2	928806-125	BOLT, HEX GR8 3/8-16 X 1 1/4
24	1	960120-125	CONNECTOR, 1 1/4 MJIC X 1 1/4 MNPT
25	1	960124-150	CONNECTOR, 1 1/2 MJIC X 1 1/2 MNPT
26	1	922224-000	NIPPLE, PIPE 1 1/2 X CLOSE GAL SCH80
27	1	960116-150	CONNECTOR, 1" MJIC X 1 1/2 MNPT



# AIR OIL MANIFOLD (AOM)

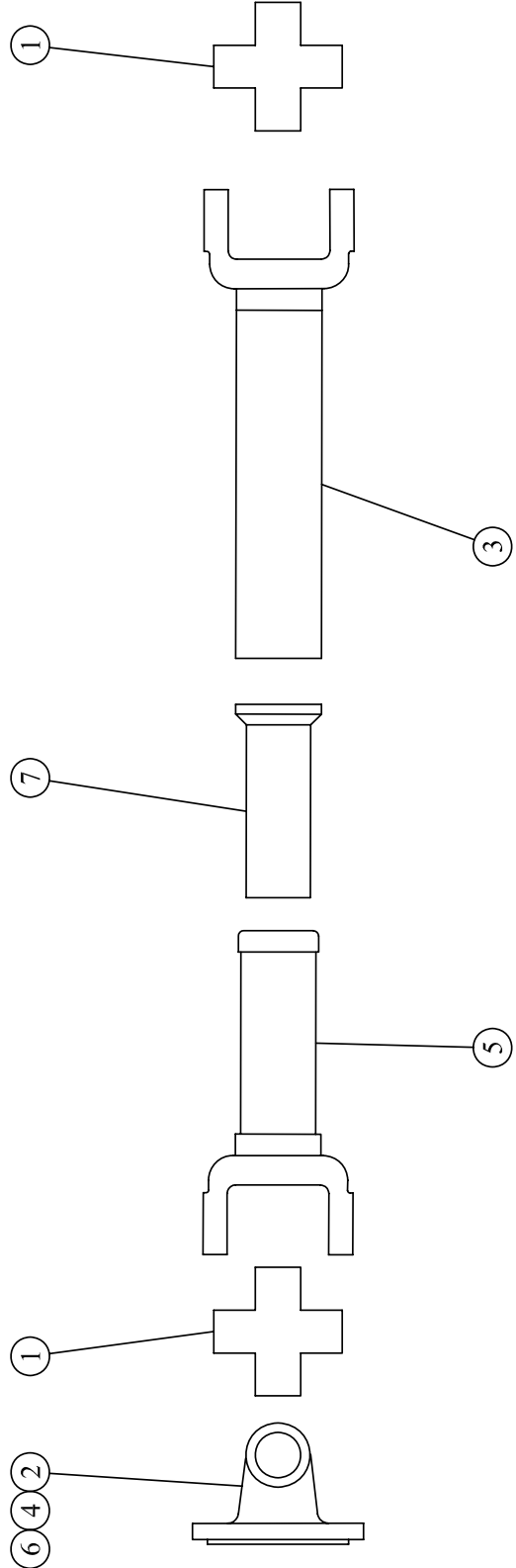
200256

Parts List			DESCRIPTION
ITEM	QTY	PART NUMB	
1	1	300057	VALVE, REGULATOR 1/4
2	1	304180	SENDER, PRESS RESISTIVE
3	1	304179	SENDER, TEMP THERMISTOR
4	1	300005	ELEMENT, OIL FILTER 2060
5	1	301421	SWITCH, PRESSURE N.C.
6	1	304549	SWITCH, PRESS 3-WAY NONC
7	1	301827	VALVE, BLOWDOWN 1/4 N.C. 55502
8	1	300021	MUFFLER, EXHAUST 1/4
9	1	961902-012	TEE, MB 1/8 F X 1/8 F X 1/8 M
10	1	964804-025	TEE, MR 1/4F X 1/4M X 1/4F
11	1	977704-0404	TEE, 1/4 MNPT
12	1	304121	HEAD, COALESCE, MH
13	1	300589	HEAD, OIL FILTER 3/4 FNPT 15-PSI BY PASS
14	1	960412-075	NIPPLE, HYD HEX 3/4
15	1	907603-005	BUSHING, RED 3/4 X 1/8 GAL
16	1	304814	BRACKET, AOM L-SHAPED (REV 2)
17	1	960702-012	ELBOW, HYD 1/8 FNPT X MNPT STREET
18	1	304122	COALESCE, MH 195/295
19	2	929705-075	BOLT, WHIZLOCK GR5 5/16-18 X 3/4
20	1	300022-075	VALVE, SERVICE - 3/4 VENTED
21	1	300605	ORIFICE, MINIPRESS 1 1/4 X 1
22	1	907604-030	BUSHING, RED 1 X 3/4 GAL
23	2	960108-075	CONNECTOR, 1/2 MJIC X 3/4 MNPT
24	2	938206-071	WASHER, FLAT GR8 3/8
25	1	987302-012	ELBOW, 1/8 MNPT X 1/8 TUBE 200PSI 250 DEG
26	1	987305-025	ELBOW, 1/4 MNPT X 5/16 TUBE 200PSI 250 DEG
27	1	987504-025	CONNECTOR, MALE 1/4 T X 1/4 D
28	1	987504-025M	CONNECTOR, MALE 1/4 T X 1/4 MNPT MACH BORE TO .28 DIA
29	1	304210	TUBE, PICK-UP MH 1/4 OD X 15 1/4 L
30	1	977604-025	ELBOW, HYD 1/4 FNPT
31	1	987204-025	CONNECTOR, 1/4 MNPT X 1/4 TUBE 200PSI 250 DEG
32	2	925506-198	NUT, NYLOC GR8 3/8-16
33	2	929704-050	BOLT, WHIZLOCK GR8 1/4-20 X 1/2
34	2	929806-150	BOLT, HEX GR8 3/8-16 X 1 1/2
35	1	961912-075	TEE, MB 3/4 F X 3/4 F X 3/4 M
36	1	960120-125	CONNECTOR, 1 1/4 MJIC X 1 1/4 MNPT
37	2	907600-005	BUSHING, RED .250 X .125 GAL



ITEM	QTY.	PART NO.	DESCRIPTION
1	2	300154-785	U-JOINT
2	1	300196-329	YOKE, FLANGE
3	1	300197-017	TUBE AND YOKE ASSY
4	4	925706-198	NUT, NYLOC GR8 3/8"-24UNF
5	1	300155-8021	YOKE, SLIP 1 3/8-16SPL
6	4	929406-150	BOLT, HX HD GR8 3/8"-24UNF
7	1	300198-8512	SHAFT, SLIP TUBE 1 3/8-16SPL
8	1	973406-050	SCREW, SET 3/8" W/ HOLE N.S.
9	1	301486	WIRE, SET SCREW 10" LONG N.S.

REV	DESCRIPTION	DATE	ENG
1	REPLACED 929406-150 WITH 929406-150	6/11/2008	MCM



2 1/2" DRIVESHAFT WITH OUT PTO END YOKE  
2-2-329 FLANGE YOKE

THIS DRAWING AND ALL INFORMATION HEREIN IS THE PROPERTY OF BOSS INDUSTRIES, INC. IT IS TO BE USED ONLY FOR THE PROJECT AND QUANTITY SPECIFIED HEREON. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF BOSS INDUSTRIES, INC. ANY USE OF THIS DRAWING FOR ANY OTHER PROJECT OR IN ANY MANNER OTHER THAN THAT SPECIFIED HEREON IS STRICTLY PROHIBITED.

**BOSS INDUSTRIES**  
720 BOYD BLVD  
LA PORTE, IN 46350

DATE	11/99	DESCRIPTION	OPT, DRIVELINE KIT 2-SWO
M.B.			
DATE	12/3/99	DESCRIPTION	PTO YOKE2-2-329
R.R.M.			
DATE			
SCALE			
SCALE	1 = 1	SHEET	1 = 1
REV			
REV	60000-001		

## RECOMMENDED SPARE PARTS LIST

<b>PART NUMBER</b>	<b>DESCRIPTION</b>
300005	OIL FILTER ELEMENT
302206	AIR FILTER ELEMENT
304122	SPIN ON COALESCER
307471	REGULATOR REPAIR KIT
307092	SHAFT SEAL REPAIR KIT SCA8G

# SERVICE QUESTIONNAIRE

DATE: \_\_\_\_\_

1. Information given by: \_\_\_\_\_
2. Information received by: \_\_\_\_\_
3. Has anyone helped you:        Yes \_\_\_\_\_        No \_\_\_\_\_
4. Distributor: \_\_\_\_\_
5. End-User: \_\_\_\_\_
6. Phone Number: \_\_\_\_\_
7. Make and Model for PTO: \_\_\_\_\_
8. BOSS INDUSTRIES Serial #: \_\_\_\_\_
9. Make and Model of Engine: \_\_\_\_\_
10. Engine: \_\_\_\_\_
11. Transmission: \_\_\_\_\_
12. Nature of Problem: \_\_\_\_\_

---

---

---

13. Engine RPM: \_\_\_\_\_
14. Compressor RPM: \_\_\_\_\_
15. Action Taken: \_\_\_\_\_

---

---

---

Additional Comments: \_\_\_\_\_

---

---

---

---

---

---

---

---

---

---

## **INSTALLATION SECTION**

# Instructional Procedures for the Installation of

## BOSS INDUSTRIES 80100 Rotary Screw Air Compressor

This air compressor should be installed only by those who have been trained and delegated to do so and who have read and understand both the operators' manual and the installation manual. Failure to follow the instructions, procedures, and safety precautions in this manual may result in accidents and injuries.

Install, use, and operate this air compressor only in full compliance with all pertinent O.S.H.A. requirements and all pertinent Federal, State, and Local codes or requirements and with BOSS Industries, Inc. instructions.

Do not modify this compressor except with written factory approval.

### **GENERAL**

The overall installation of the BOSS PTO air compressor lends itself well to staging. By handling the installation in various stages, the job becomes much easier and efficient. The following sequence should be adhered to when installing a BOSS PTO compressor: All trucks should be road tested prior to installing BOSS equipment to determine if trucks have any prior problems.

1. Install the PTO
2. Install the compressor and the mounting bracket
3. Install the drive shaft
4. Install the oil cooler
5. Install the oil sump
6. Install the Air Oil Manifold
7. Install the air cleaner
8. Prepare and install the hoses
9. Prepare and install the electrical components
10. Pre-start up inspection tests
11. Initial startup and test

The chassis should be scrutinized for the best location of the compressor and its components with the least amount of relocating equipment previously mounted on the chassis. In most applications, the driver's side is the preferred side, due to the exhaust tubing typically located on the right side. However, if there is only one PTO opening on the transmission, there is no choice. The compressor and mounting bracket is designed for 80100 application of either side. In order to ensure long, trouble-free service of the drive line to the compressor, the compressor must be located such that the angle requirements of the driveshaft are met. Direct drive air compressor requires opposite engine rotation on the output shaft of the PTO (counterclockwise looking at the compressor shaft) and typically a low shaft PTO is most suitable, offering better clearances when installing on the (s6-650) zed-f 6-speed manual transmission. Relocate any equipment that will cause interference with mounting the compressor and driveline. Geared air compressor requires rotation on the output shaft of the PTO (clockwise looking at the compressor shaft) and typically a low shaft PTO is most suitable. Most manual transmissions will require an adapter gear assembly to get the proper rotation to the compressor. When installing on Allison automatic transmissions the Chelsea Hot Switch PTO is recommended. Relocate any equipment that will cause interference with mounting the compressor and driveline.



# Installation

## 1. INSTALL THE PTO

The manual supplied with each PTO gives clear installation instructions. Because of the high level of engine vibration encountered by the PTO, particular attention must be given to proper tightening of all studs, nuts, and cap screws. Tighten to PTO manual specifications. The following are 80100 requirements for mounting PTO's:

1. Drain the transmission into a clean container.
2. Remove the container from the work area and cover to avoid contamination.
3. Remove the PTO port access cover from transmission.
4. Install PTO mounting studs.
5. Temporarily mount PTO gaskets to check backlash and shim accordingly.
6. Once backlash has been determined torque all fasteners to their recommended torque specified in PTO manual.
7. Fill transmission and check for leaks. Shift PTO by hand into PTO mode. Run briefly to check rotation.
8. Check continuity of PTO switch with PTO engaged, but not running. Verify that the light comes on.
9. Install the PTO cable. The engaging cable must be routed such that it is not in the close proximity to the engine exhaust pipes, muffler, or sharp edges. Do not kink cable, no bends smaller than 6" radius. The total bends in the cable should not exceed 360°. The shift lever must be installed so it completes 100% of it's required travel. The cable must be mounted very rigidly to the PTO. If a PTO has a forward and reverse gear a mechanical block must be added to the outside or inside of the PTO to prevent shifting into the wrong gear. **The air compressor requires opposite engine rotation on the output shaft of PTO for direct drive units** (clockwise looking at PTO shaft). **The air compressor requires engine rotation on the output shaft of PTO for geared units** (counterclockwise looking at PTO shaft). Failure to run the compressor in the proper rotation will damage the compressor and void the warranty.

## 2. INSTALL COMPRESSOR AND MOUNTING BRACKET

The location on the frame rail is determined by the following factors:

1. Does the drive shaft reach the compressor when the drive shaft is assembled using the supplied components. The maximum length is a function of shaft speed and the true operating angles.
2. Can the proper operating angles (see chart) be obtained and are there any obstructions between the compressor and PTO, i.e. cross-members, transmission bulges, etc.
3. Is there clearance to route the compressor intake hose and do you have acceptable ground clearance in your final compressor location.

The BOSS PTO compressor/mounting bracket can be handled and installed as an assembly. Clamp the compressor-mounting bracket to the chassis frame. Using an angle finder, angle the compressor such that the compressor-input shaft is parallel to the PTO output shaft. Comparing the PTO output shaft to the compressor input shaft the compressor must be located such that the true operating angles of the driveline are met. The angle of the PTO output shaft can be measured before the end yoke is on the PTO shaft. The shorter the driveline the smaller the allowable side and top offsets of the two shaft centerlines.

Excessive driveline vibration will occur if operating angles are out of their acceptable range for the speed and overall length.

# Installation

### **3. INSTALL DRIVE SHAFT**

The compressor is furnished with a companion flange mounted to the compressor input shaft, which will accept a 1310 series driveline. The PTO box should have the end yoke installed and the splined slip yoke assembly should attach to the PTO end yoke. A pre-made (welded) tube and tube yoke assembly is supplied in kit. Welding of the slip tube shaft into the tube and yoke assembly is required and should be performed at a qualified Spicer driveshaft distributor. The shaft must meet the minimum balance and run out specifications required by Spicer. Ensure the PTO yoke is engaged onto the PTO shaft so the setscrew in the end yoke lines up with the middle of the undercut on PTO shaft. Install the setscrew so it bottoms out in this groove and secure with the supplied mechanics wire. Bolt the flange yoke to the compressor flange with the four 3/8" x 1 1/4" UNF bolts and lock nuts. After installing the drive shaft, grease the slip yoke assembly with approved driveline grease.

### **4. INSTALL THE OIL COOLER/FAN ASSEMBLY**

The 12 Volt DC motor-driven fan and oil cooler package is suitable for mounting many positions in several locations on the vehicle. The fan is a pull-type, pulling air through the cooler and past the motor. The motor is designed to run in one direction (note direction arrow decal on motor). Be sure to connect the wires for proper rotation. The black and white fan motor wire lead is hot.

### **STAGES OF INSTALLATION**

The best location for the oil cooler package is cantilevered over the top of the truck cab, with the cooling air blowing vertically upwards. The oil cooler will remain clean, and the fan will always work with cool air. A minimum of four inches of clearance between the oil cooler and the top of the cab is required for proper air flow.

Another common location for the oil cooler/fan assembly is under the truck between the frame rails, behind the rear axle, installed so the cooler package will blow the air from the front of the truck toward the rear.

The truck engine muffler may require relocation to keep the exhaust and the heat from entering the oil cooler. It must be recognized that under-the-truck mounting of the oil cooler subjects it to road dirt, mud, slush, and ice. Deflectors, shields, or pans can be installed to protect the oil cooler. The shields must not increase the fans discharge air temperature by more than 5 degrees F.

Recirculation of hot air must also be prevented when shielding. When locating the fan on top of cab or under truck, the motor/fan assembly must be on top.

Mounting in the body wall is common in the walk-in van type body. It is recommended to use louvers on the outside wall to help prevent rain and/or snow from entering the body. Sufficient opening in the truck body (i.e. rear doors open) must be provided for the cooling air. Air flow can be changed in this application to pushing instead of pulling if requested. The fan motor has several drain holes. When mounting the package in a wall or behind the frame rail, fan motor leads should point down. Boss Industries can supply cooler package mounting hardware when requested (i.e. wall, louvers, etc.).

## **Installation**

### **4B. INSTALL THE FRONT MOUNTING OIL COOLER**

Depending on the chassis, removal of the grill or hood may be required to gain access. Install the oil cooler in front of the radiator. Mount the oil cooler in such a manner that the oil cooler does not rub on the radiator or any other component. The cooler must be mounted to the existing truck's cooler support so that it can move as one unit or such that when the truck's existing radiator moves it does not make contact with the compressor cooler. 80100 brackets are supplied but in some installations these brackets will need to be modified or new mounting hardware will need to be fabricated in house. Some chassis will not have the necessary room to install the cooler in front of the truck's radiator and a remote mount style oil cooler will need to be exchanged for the front mount and it's related components.

### **5. INSTALL THE OIL SUMP**

When beginning the sump mount you will want to consider the following before permanently installing;

1. The PTO oil sump is designed for horizontal mounting only.
2. The sump can be mounted on the inside of the frame rails, or on the outside the frame.
3. The final location must allow for easy access to the oil fill and sight glass. Answer the following questions and the sump mounting will fall into place, How can I plumb the oil fill port so that it is accessible and will remain level? Where is the body in relationship to the fill and sight glass? Will the sight glass be visible with the body on? If the oil fill piping is extended, it is better to have the piping slope down hill towards the sump Vs up hill. Up hill the piping will always show a false reading at the sight glass. If mounting to the outside of the frame rail will the body interfere with the tank? The vessel is 12 inched in diameter and approximately 22 inches long. Move the tank assembly around to various locations to see what best fits on your specific chassis and body. Locate a position on the chassis frame rail that will allow the oil sump tank to be mounted as close to the compressor as possible. The sump tank comes equipped with EZ-mounting brackets for bolting to the chassis frame. The EZ-mounting bands are mounted to the frame rail by drilling the top whole for each band, and then securing the bracket into place with a J-Bolt through the slot. Once both bands are mounted, the sump is then lifted into place. The sump bands are mounted to the EZ-mounting brackets using the highest possible set of holes that do not cause interference with the frame rail. It is important to be sure that the sightglass is level on the centerline of the tank from end to end and side to side. Not centering the sightglass can cause possible over or under filling of the tank, and give an inaccurate reading on the oil level display.

### **6. INSTALL AIR OIL MANIFOLD**

The Air Oil Manifold (AOM) is next to be installed. This system contains most of your senders and switches, along with coalescer and oil filter. There is a 20" hose in the hose kit that is used for connecting the head of the coalescer to the sump tank.. There is also a 31" hose supplied to go from the head of the oil filter to the receiver tank.

The AOM should be located in an area that allows for easy access to the two canisters for replacement. The AOM must also be mounted so that the canisters are vertical when in place.

**THE COALESCER HEAD IS DESIGNED FOR AIRFLOW IN ONE DIRECTION ONLY. PROPER DIRECTION IS INSIDE OUT FLOW THROUGH THE HEAD AND ELEMENT.**

A service valve is installed directly after the minimum pressure orifice. The service valve should be relocated to an easy access area that allows the operator to control the flow of air. If a hose reel compartment in on the body the valve should be located before the reel inlet. The automatic blowdown valve and the air pressure regulator are located on the down stream side (outlet side) of the coalescer head.

## Installation

### **7. INSTALL THE AIR CLEANER**

The air cleaner kit consists of a heavy-duty, 2-stage, dry type air cleaner, suitable for horizontal mounting, Two clamps, and ten feet of 2 ½" id air intake hose is supplied with each kit. Locate the air cleaner at a point where it can draw in cool, clean air and that it will reach to the final compressor location. Stay away from areas where the filter can pull in flammable vapors. A preferred location is above the cab. When mounting air intake hose try to have minimum number of bends. The intake hose is extremely flexible for ease of installation. Be sure to check that all clamps are installed properly and that outside unfiltered air can not enter without going through the filter. Failure to do so could result in dirty air bypassing the filter and entering into the compressor system.

### **8. PREPARE AND INSTALL HOSES**

The hose kit consists of a generous amount of bulk hose in various sizes and fittings. The fittings were selected for their ease of assembly in the field, without special tools. A simple five-step procedure is used to make up the hoses:

- Step 1. Determine the hose length.
- Step 2. Put hose in vise just tight enough to prevent it from turning. Cut hose square with fine tooth hacksaw or cut-off wheel. Clean hose with compressed air.
- Step 3. Screw socket counterclockwise onto hose until it bottoms. Back off ½ turn.
- Step 4. Oil nipple threads and screw clockwise into socket and hose, leaving 1/32 to 1 1/16" clearance between nipple box and socket.
- Step 5. Clean assembly by blowing with compressed air.

Be sure to route all hoses so that they do not bind or kink.

Avoid hose contact to exhaust piping, muffler, engine manifold, or any other hot surfaces. Secure hoses with tie downs or clamps. Inspect hose for possible areas where chaffing may occur. It may be necessary to use a protective sleeve on the hose(s) in these areas or to re-route hose. Check that all fittings are tight and secure.

**KEEP THE CONTROL AIR LINE HOSES AS SHORT AS POSSIBLE AND RUN THEM SO THEY SLOPE DOWN TOWARD THE AIR COMPRESSOR IN ORDER TO PROMOTE MOISTURE DRAINAGE AT SHUTDOWN, WHICH WILL HELP TO PREVENT ICING IN COLD WEATHER. DO NOT USE OR SUBSTITUTE A DIFFERENT MANUFACTURERS HOSE WITH DIFFERENT MANUFACTURED ENDS/FITTING. IF ADDITIONAL HOSE IS REQUIRED CONTACT THE FACTORY FOR BOSS SPECIFICATIONS.**

The 1" discharge line runs from the compressor discharge fitting to the oil sump tank inlet fitting. This is the only 1" hose assembly required in the basic kit so there should be no confusion as to what ports to hook the hose assembly up to. There are two hoses made when using a remote mount cooler with the 1/2" hose. One hose runs from the oil injection port on the air compressor to one side of the cooler. The other runs from the oil filter head outlet to the other side of the remote mount cooler.

## **Installation**

### **9. INSTALLING THE ELECTRICAL WIRING**

1. Install Sender Connector Harness. This runs from the senders on the Air Oil Manifold to the location of the Boss Control Unit.
2. Install Boss Interface Module (BIM)/prewired relay board in a dry location. Hook up the six pin connectors from the Sender Harness to the BIM harness.
3. Install The Boss Control Unit in weatherproof location. (ex. Rear toolbox, beneath passenger seat). Install 35-pin connector from BIM harness to back of Boss Control Unit.
4. Install the wiring to the PTO as shown in included drawings.
5. Install necessary engine and transmission wiring per included drawings.
6. Install battery power, ground, and switched ignition to the BIM.

# Installation

## **10. PRE-START-UP INSPECTION CHECKS**

This inspection should be done prior to removing truck from bay. Final testing of the system, including checking for leaks, is to be done outside.

### **ALL TRUCKS SHOULD BE ROAD TESTED PRIOR TO STARTING INSTALLATION TO ISOLATE ANY PREVIOUS TRUCK PROBLEMS.**

- I. Check sales order to verify that all compressor related items originally ordered have been installed or are ready to ship with the truck. This would include any special filters, oils, hoses, etc.
- II. Vacuum inside of truck and all areas (including frame and underhood) that have metal or plastic shavings. Wipe all fingerprints off truck.
- III. Apply decals to proper location. Make sure that the area is cleaned prior to applying decals. All decals should have a professional appearance upon application. Additional decals that need to be applied by the body company should be placed inside the BOSS manual and left in the cab of the truck.
- IV. Check all assemblies, clamps, fittings, drivelines, angles, nuts, and bolts to ensure they are properly tied and secured to the vehicle. This is a very critical area of inspection. The vehicle should not be moved until this inspection has been completed.
- V. Record all serial numbers for this installation.
  - A. Truck V.I.N.
  - B. PTO Model no#
  - C. Air-End Serial Number
  - D. BOSS Serial Number
  - E. Receiver Tank Serial Number
  - F. Note any special applications relating to specific installations.
  - G. Driveshaft should have an identification no# if supplied by a qualified Spicer distributor.
  - H. Record the slopes of the PTO, drive line and the air compressor in the side plane when the truck is on level ground. Record the total offset in the top plane of the PTO shaft to the compressor drive shaft. Record the center to center distance of the drive shaft installed.
- VI. Check all fluid levels (position the truck on a level surface so that proper amount of fluids can be added).
  - A. Fuel - enough for three hours of operation.
  - B. Transmission fluid and PTO box.
  - C. Compressor. Fill the compressor oil sump with blue lube. 1) Capacity is approximately 2.5 gallons. Add one quart of blue lube down through the compressor inlet valve. Be careful not to damage the teflon o-ring in the inlet valve when holding open and adding the one quart of blue lube. 2) Additional oil may need to be added after test. 3) Top off oil level to half the sightglass when finished with the test.
  - D. Lube for driveline slip yoke assembly. The u-joint are lube for life bearings and do not require any lube.
  - E. Brake fluid.
  - F. Anti-freeze – coolant.
  - G. Any other applicable fluids.

The vehicle should be ready for removal from bay at this point. Road test all vehicles after compressor testing.

## Installation

### **11. INITIAL START-UP AND TEST**

- A. Start truck engine and allow for warm-up.
- B. Read the operation section in the operator and parts manual carefully before proceeding onto the initial start-up.
- C. Check indicator lights on the gauge panel. Flashing lights indicate a problem and should be fixed prior to PTO engagement. Refer to troubleshooting or BCU decal.
- D. Engage PTO as per the start-up /shutdown decal supplied with the unit. A direction of rotation arrow is attached to the compressor package above the flange. The shaft must be rotating in the direction the arrow is pointing. If for any reason this arrow has been removed the correct compressor rotation is opposite engine rotation of output shaft on PTO for direct drive units or clockwise when looking at the PTO shaft. The correct compressor rotation is engine rotation of output shaft on PTO for geared units or counterclockwise when looking at the PTO shaft. Check the direction of rotation by quickly engaging and then disengaging the compressor.

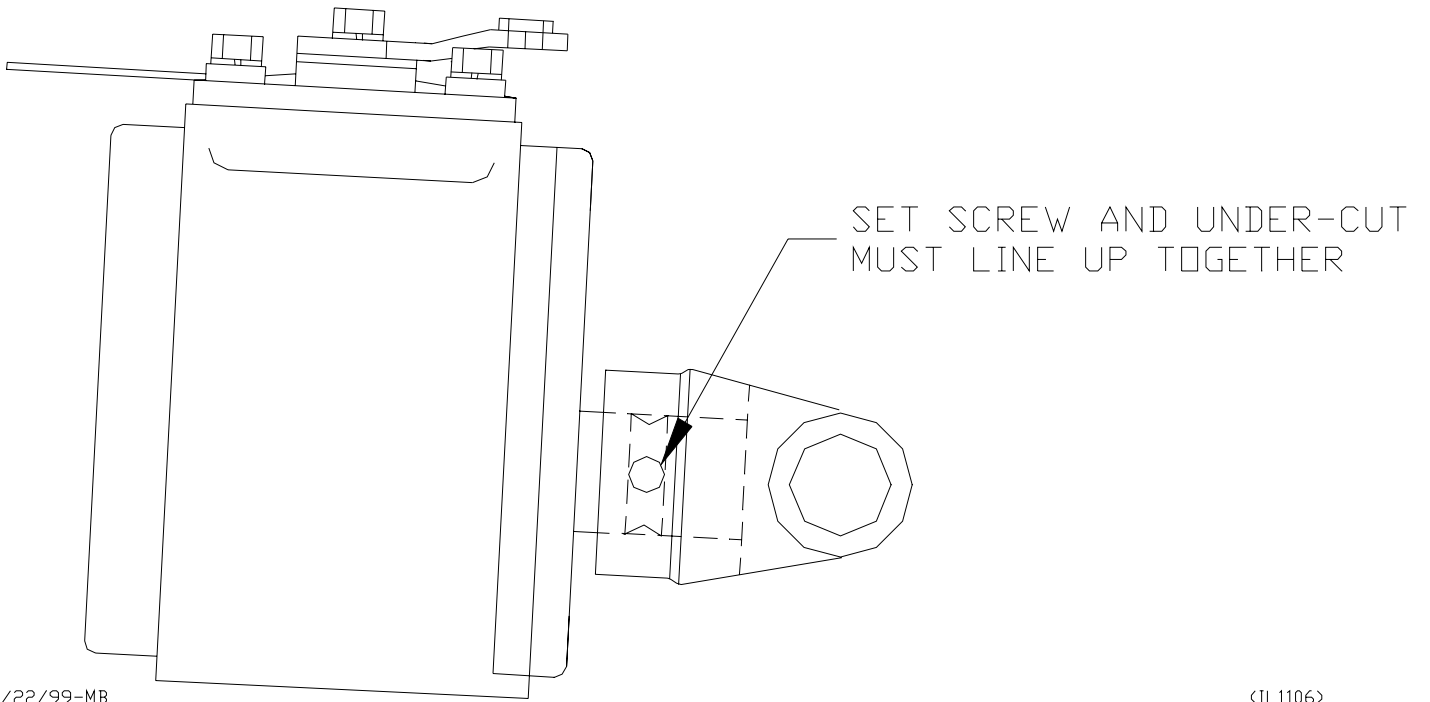
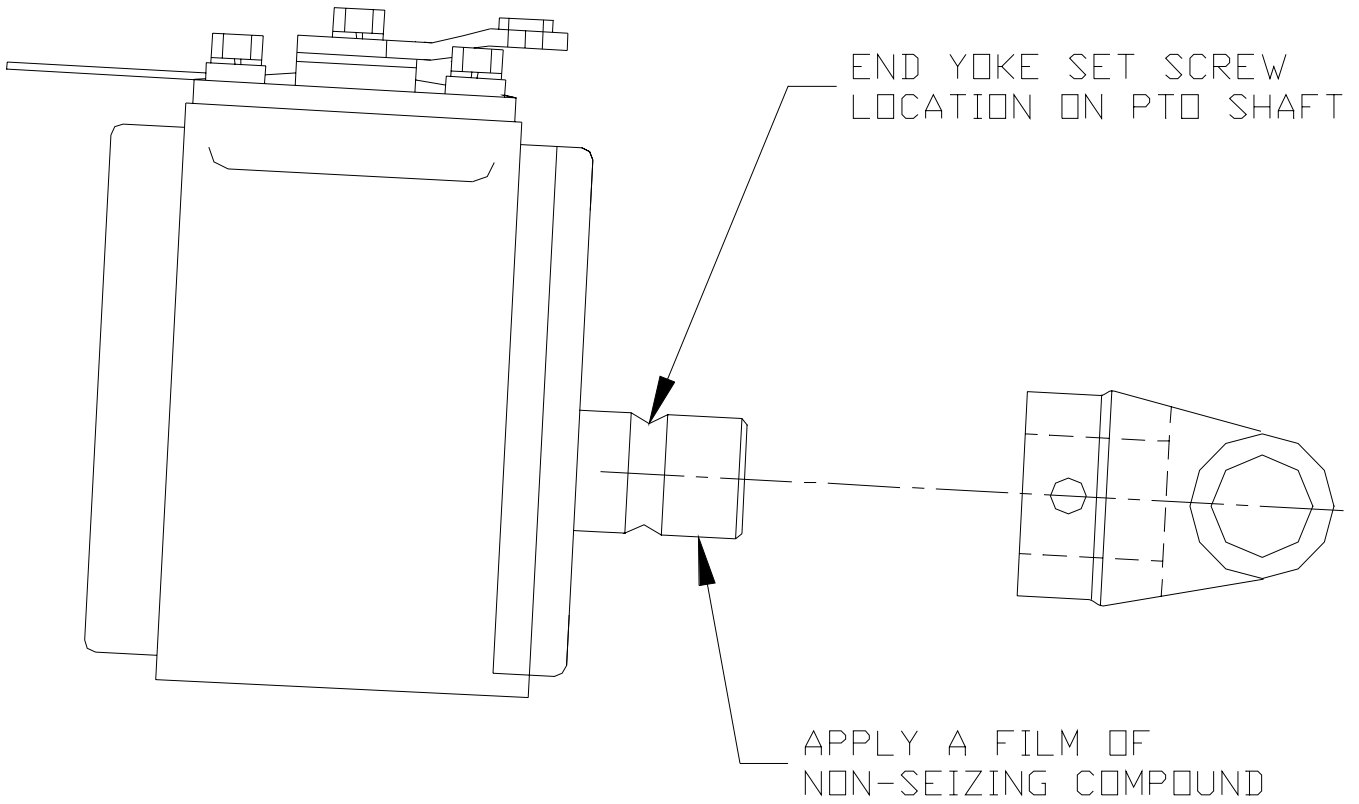
**DO NOT RUN THE COMPRESSOR IN A REVERSE ROTATION FOR PERIODS LONGER THAN 5 SECONDS. CONTINUED OPERATION IN THIS MANNER WILL RESULT IN EXTENSIVE COMPRESSOR UNIT DAMAGE.**

- E. **SAFETY CIRCUIT TESTING FOR 80100 COMPRESSOR PACKAGE** To test the safety circuit for units using the Boss Control Unit, engage the compressor PTO. Once the truck has gone up to speed, press the Emerg Stop button on the BCU. For an automatic transmission, the pto should disengage. If the truck has a manual transmission, the engine should be killed. If this does not occur, immediately shut off the truck and check wiring.

# **INSTALLATION ILLUSTRATIONS**



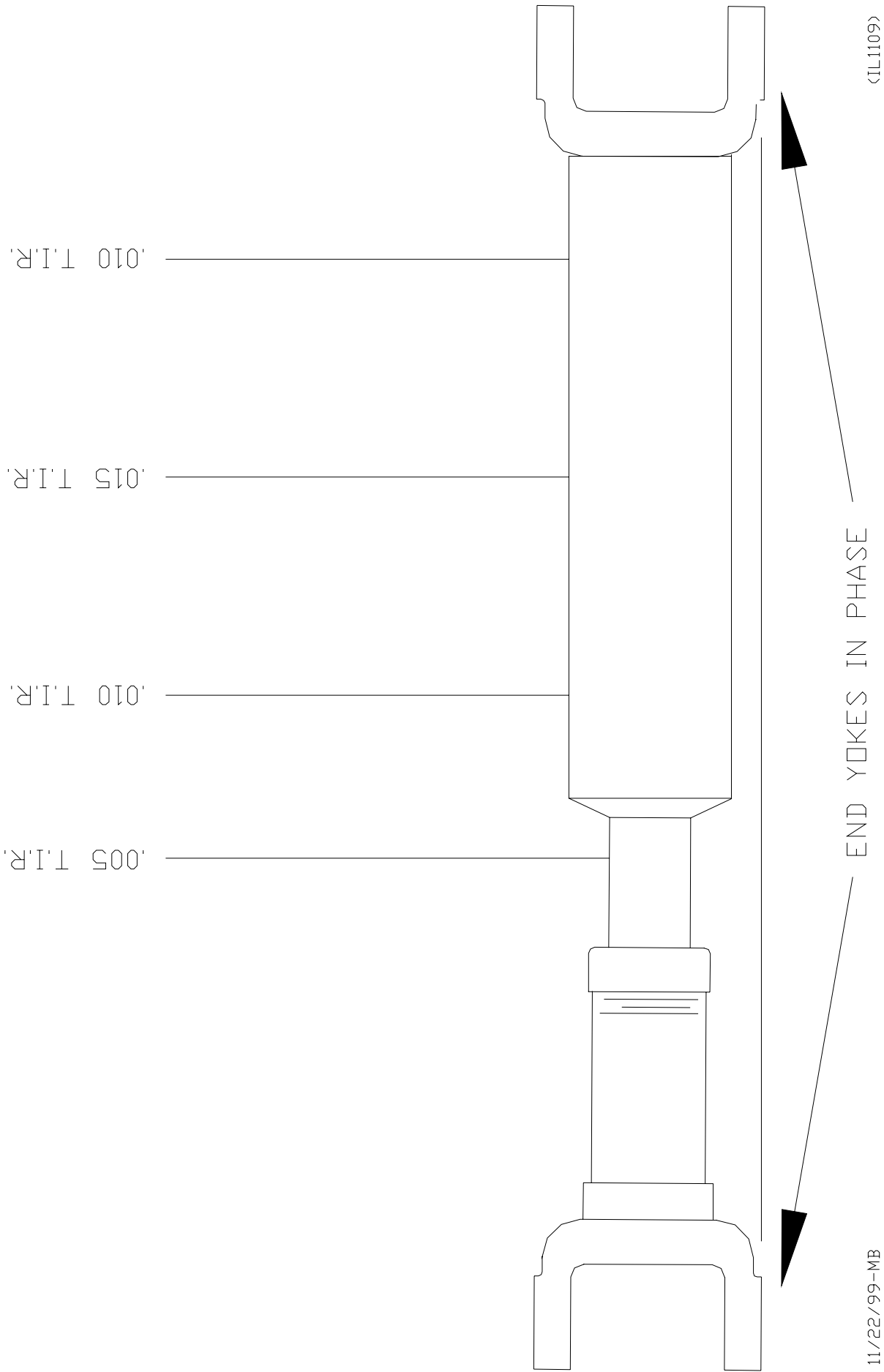
# PTO End Yoke Installation



11/22/99-MB

(IL1106)

# Driveline Runout Specifications



# Driveline Installation Techniques

## 1. U-JOINT OPERATING ANGLES

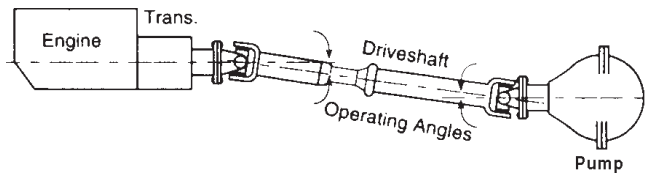
Every U-joint that operates at an angle creates vibration.

U-joint operating angles are probably the most common cause for driveline vibration in vehicles that have been reworked or that have had auxiliary equipment installed.

When reworking a chassis or installing a new driveshaft in a vehicle, make sure that you follow the basic rules that apply to u-joint operating angles, as follows:

1. U-joint operating angles at each end of a shaft should always be at least  $1^\circ$ .
2. U-joint operating angles on each end of a driveshaft should always be equal within  $1^\circ$  of each other.
3. U-joint operating angles should not be larger than  $3^\circ$ . If more than  $3^\circ$ , make sure they do not exceed the maximum recommended angles for the RPM at which they will be operating.

A u-joint operating angle is the angle that occurs at each end of a driveshaft when the output shaft of the transmission and the input shaft of the pump are not in line. See figure.

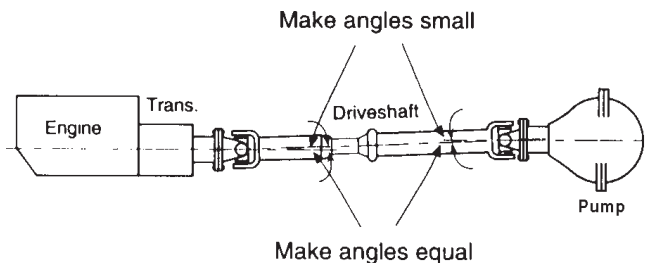


The connecting driveshaft operates with an angle at each u-joint. It is that angle that creates a vibration.

### REDUCING AND CANCELING VIBRATION

A key point to remember about u-joint operating angles: To reduce the amount of vibration, the angles on each end of a driveshaft should always be **SMALL**.

To cancel an angle vibration, the u-joint operating angles need to be **EQUAL** within  $1^\circ$  at each end of a shaft. See figure.



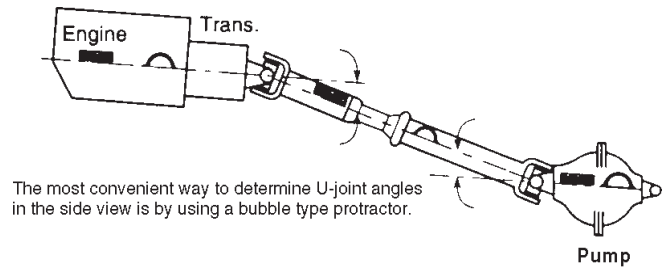
## 2. SINGLE PLANE AND COMPOUND U-JOINT OPERATING ANGLES

There are two types of u-joint operating angles, single plane and compound.

### SINGLE PLANE

Single plane angles occur when the transmission and pump components are in line when viewed from either the top or side, but not both.

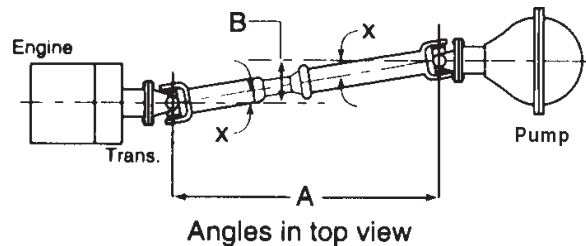
Determine the u-joint operating angle in an application where the components are in line when viewed from the top, but not in line when viewed from the side, is as simple as measuring the slope of the components in the side view, and adding or subtracting those slopes to determine the angle. See figure.



Angles in side view

These angles should be **SMALL** and equal within  $1^\circ$ .

Determine the u-joint operating angles on a shaft that is straight when viewed from the side and offset when viewed from the top requires the use of a special chart (See accompanying chart). In this type of application, the centerlines of the connected components must be parallel when viewed from the top, as shown. These angles should also be **SMALL** and equal within  $1^\circ$ . See figure.



Angles in top view

Look at the angle chart and note that the smaller the offset, the smaller the resultant angle.

To reduce the possibility of vibration, keep any offset between connected points to a minimum.

# Driveline Installation Techniques

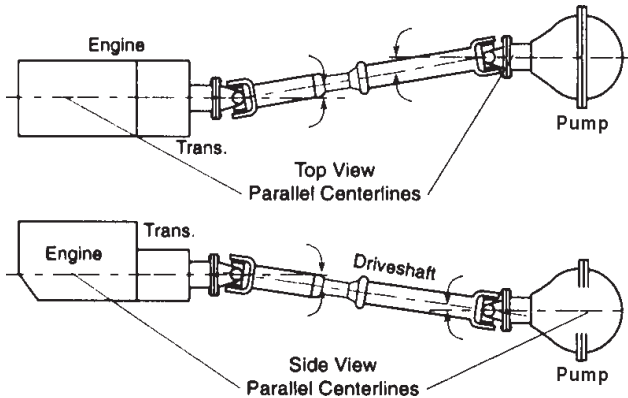
There are two things which can be done to make certain single plane angles are SMALL and EQUAL:

Make sure that the transmission and pump are mounted so that their centerlines are parallel when viewed from both the side and the top.

Make sure the offset between them is small in both views.

## COMPOUND ANGLES

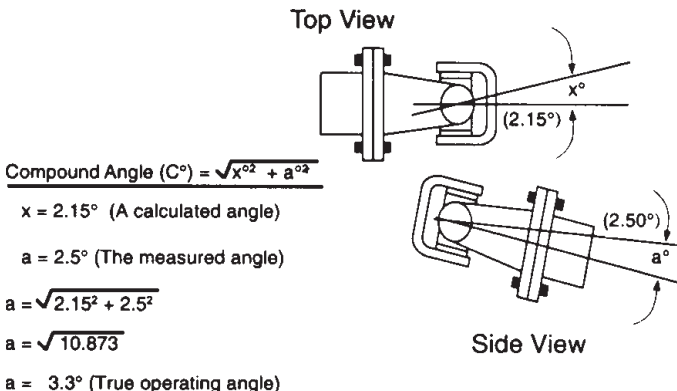
Compound u-joint operating angles occur when the transmission and pump are not in line when viewed from both, the top and side. Their centerlines, however, are parallel in both views. See figure.



## TRUE U-JOINT OPERATING ANGLE

The true u-joint operating angle, which must be calculated for each end of the shaft with compound angles, is a combination of the u-joint operating angle in the top view, as determined from the chart, and the measured u-joint operating angle in the side view.

To determine the true u-joint operating angle for one end of a shaft, (compound angle  $C^\circ$  in the formula shown in figure below) insert the u-joint operating angle measurement obtained in the side view and the u-joint operating angle obtained from the chart into the formula.



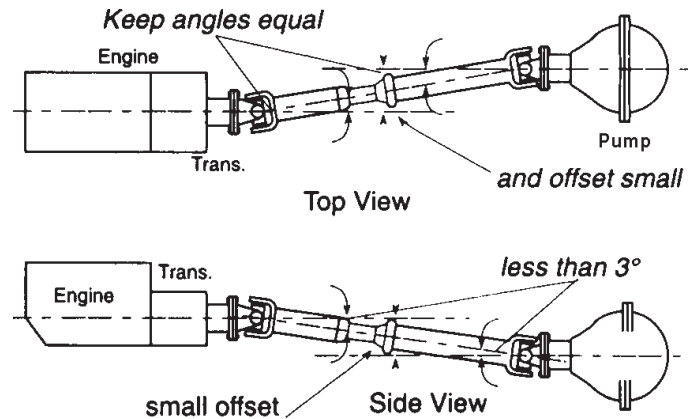
Do the same for the other end of the shaft. Compare the resultant calculated u-joint operating angle for each end. They should be EQUAL within  $1^\circ$ . If they are not, the driveshaft will vibrate.

## 3. ELIMINATING COMPOUND ANGLE INDUCED VIBRATIONS

Compound u-joint operating angles are one of the most common causes for driveline vibration. To avoid these problems, remember these important considerations:

When setting up an application that requires compound u-joint operating angles, always keep the centerlines of the transmission and pump parallel in both views.

Always keep the offset between their horizontal and vertical centerlines small.



### NOTE

CENTERLINES OF TRANSMISSION AND AXLE MUST BE PARALLEL IN BOTH TOP AND SIDE VIEWS TO USE THIS METHOD OF DETERMINING TRUE U-JOINT OPERATING ANGLE. CONTACT BOSS TECHNICAL SUPPORT IF YOU HAVE AN APPLICATION WHICH CANNOT BE INSTALLED WITH THEIR CENTERLINES PARALLEL.

# Driveline Installation Techniques

## 4. ANGLE SIZE

The magnitude of a vibration created by a u-joint operating angle is proportional to the size of the u-joint operating angle. BOSS recommends true u-joint operating angles of 3° or less.

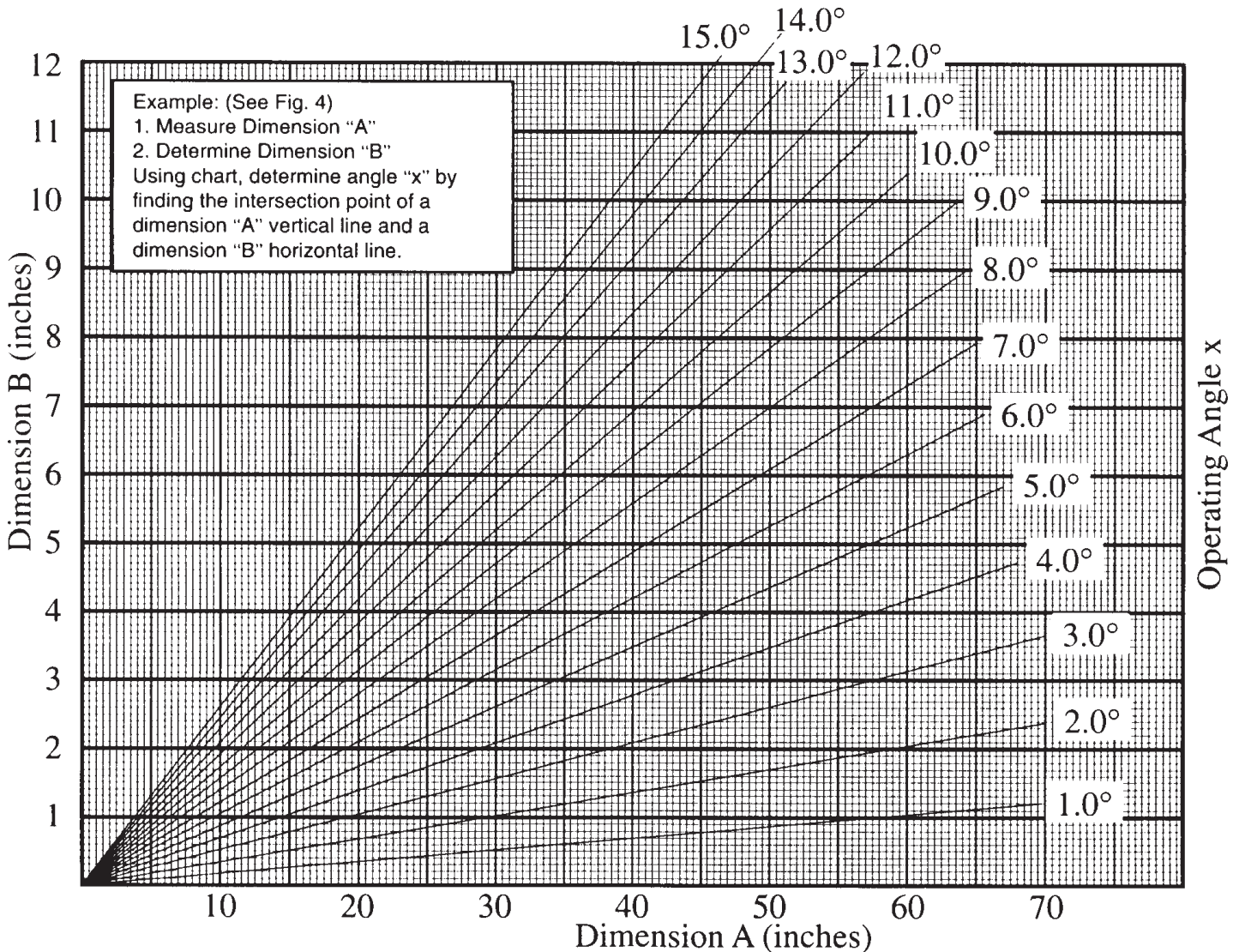
Obtain the true u-joint operating angle, as explained above, and if it is greater than 3°, compare it to the following chart.

DRIVESHAFT	MAXIMUM
5000	3.2°
4500	3.7°
4000	4.2°
3500	5.0°
3000	5.8°
2500	7.0°
2000	8.7°

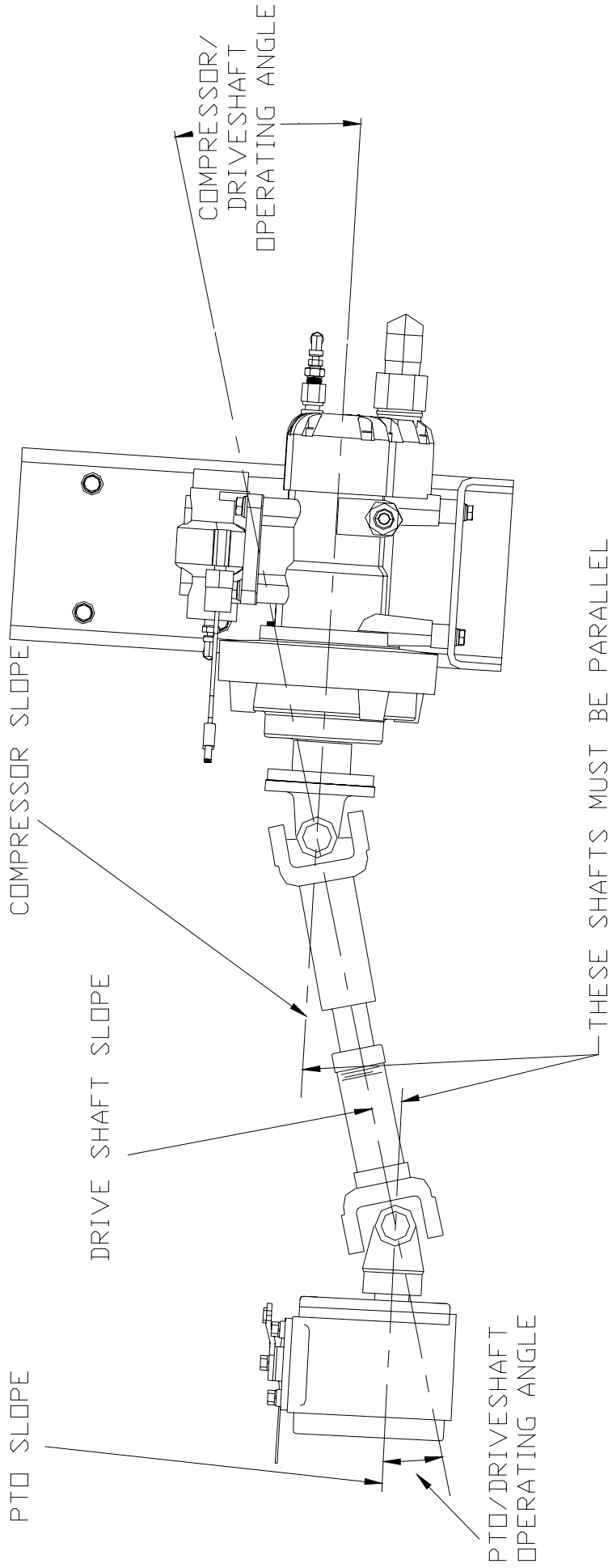
The angles shown on the chart are the MAXIMUM u-joint operating angles recommended by BOSS and are directly related to the speed of the driveshaft. Any u-joint operating angle greater than 3° will lower u-joint life and may cause vibration. Remember to check maximum safe driveshaft RPM as recommended by the driveshaft manufacturer.

### ANGLE CHART

FOR DRIVESHAFTS HAVING AN ANGLE IN THE TOP VIEW



SIDE VIEW OPERATING ANGLE CALCULATIONS WITH UP HILL SHAFT



SIDE VIEW OPERATING ANGLE CALCULATIONS

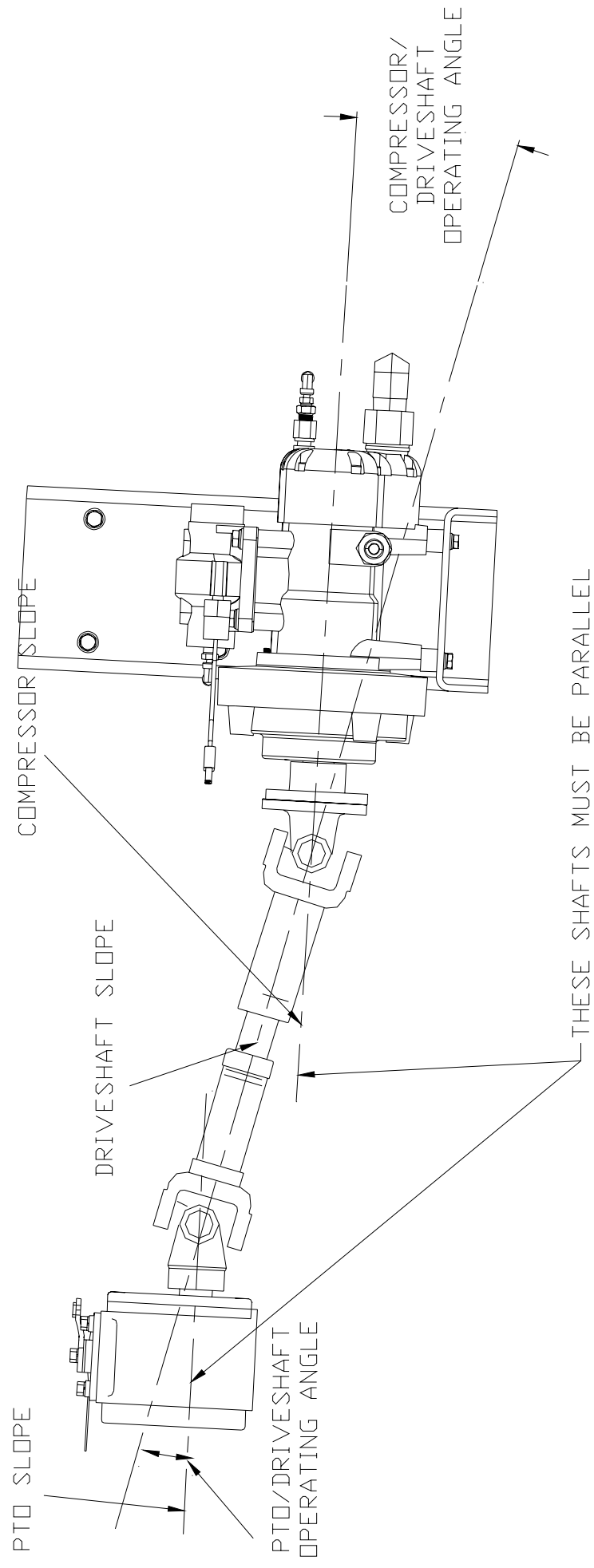
$$\begin{array}{r}
 \text{PTO SLOPE --} \\
 \text{SHAFT SLOPE} \\
 + \\
 \text{DEGREE DOWN} \\
 \text{DEGREE UP} \\
 \text{PTO/DRIVE SHAFT} \\
 \text{OPERATING ANGLE} \\
 = \\
 \text{DEGREE UP} \\
 \text{DEGREE DOWN} \\
 \text{PTO/DRIVE SHAFT} \\
 \text{OPERATING ANGLE}
 \end{array}$$

OPERATING ANGLES MUST BE WITHIN 1 DEGREE OF EACH OTHER

09/11/02-CRH

<LL1107>

SIDE VIEW OPERATING ANGLE CALCULATIONS WITH DOWN HILL SHAFT



SIDE VIEW OPERATING ANGLE CALCULATIONS

$$\begin{array}{r}
 \text{PTO SLOPE} \text{---} \\
 \text{SHAFT SLOPE} \\
 - \text{---} \\
 \text{DEGREE DOWN} \\
 \text{DEGREE DOWN} \\
 \text{PTO/DRIVE SHAFT} \\
 \text{OPERATING ANGLE} \\
 = \\
 \text{SHAFT SLOPE} \text{---} \\
 \text{COMPR. SLOPE} \\
 - \text{---} \\
 \text{DEGREE DOWN} \\
 \text{DEGREE DOWN} \\
 \text{PTO/DRIVE SHAFT} \\
 \text{OPERATING ANGLE} \\
 =
 \end{array}$$

OPERATING ANGLES MUST BE WITHIN 1 DEGREE OF EACH OTHER

## **WARRANTY SECTION**



## WARRANTY INFORMATION

BOSS INDUSTRIES, Inc. warrants that this Rotary Screw Compressor unit conforms to applicable drawings and specifications approved in writing by BOSS. The unit assembly will be free from defects in material and workmanship for a period of two (2) years from the date of initial operation or thirty (30) months from the date of shipment, whichever period first expires. All other components and parts of BOSS manufacture, will be free from defects in material and workmanship for a period of one (1) year from the date of initial operation or eighteen (18) months from the date of shipment, whichever period first expires. If within such period BOSS receives from the Buyer written notice of and alleged defect in or nonconformance of the unit, all other components and parts of BOSS manufacture and if in the judgment of BOSS these items do not conform or are found to be defective in material or workmanship, BOSS will at its option either, (a) furnish a Service Representative to correct defective workmanship, or (b) upon return of the item F.O.B. BOSS original shipping point, repair or replace the item or issue credit for the replacement item ordered by Buyer, (Defective material must be returned within thirty (30) days of return shipping instructions from BOSS. Failure to do so within specified time will result in forfeiture of claim), or (c) refund the full purchase price for the item without interest. Factory installed units will also include warranty on installation for a period of one (1) year. This warranty does not cover damage caused by accident, misuse or negligence. If the compressor unit is disassembled the warranty is void. BOSS's sole responsibility and Buyer's exclusive remedy hereunder is limited to such repair, replacement, or repayment of the purchase price. Parts not of BOSS manufacture are warranted only to the extent that they are warranted by the original manufacture. BOSS shall have no responsibility for any cost or expense incurred by Buyer from inability of BOSS to repair under said warranty when such inability is beyond the control of BOSS or caused solely by Buyer.

**There are no other warranties, express, statutory or implied, including those of merchantability and of fitness of purpose; nor any affirmation of fact or representation which extends beyond the description of the face hereof.**

This warranty shall be void and BOSS shall have no responsibility to repair, replace, or repay the purchase price of defective or damaged parts or components resulting directly or indirectly from the use of repair or replacement parts not of BOSS manufacture or approved by BOSS or from Buyer's failure to store, install, maintain, and operate the compressor according to the recommendations contained in the Operating and Parts Manual and good engineering practice. The total responsibility of BOSS for claims, losses, liabilities or damages, whether in contract or tort, arising out of or related to its products shall not exceed the purchase price. In no event shall BOSS be liable for any special, indirect, incidental or consequential damages of any charter, including, but not limited to, loss of use of productive facilities or equipment, loss of profits, property damage, expenses incurred in reliance on the performance of BOSS, or lost production, whether suffered by Buyer or any third party.

**BOSS INDUSTRIES, INC.  
1761 Genesis Drive  
LAPORTE, IN 46350  
(800)635-6587 TOLL FREE PHONE**

## SUMMARY OF MAIN WARRANTY PROVISIONS

As claims, policies and procedure are governed by the terms of the BOSS INDUSTRIES, Inc. warranty, it is necessary to outline some of the more important provisions.

The BOSS warranty applies only to new and unused products which, after shipment from the factory, have not been altered, changed, repaired or mistreated in any manner whatsoever. Normal maintenance items such as lubricants and filters are not warrantable items.

Parts not of BOSS manufacture are warranted only to the extent they are warranted by the original manufacturer.

Damage resulting from abuse, neglect, misapplication or overloading of a machine, accessory or part is not covered under warranty.

Deterioration or wear occasioned by chemical and/or abrasive action or excessive heat shall not constitute defects.

Parts replacement and/or correction of defective workmanship will normally be handled by BOSS or their authorized distributor.

Failure to file a detailed warranty claim/service report for each occurrence of material defect of defective workmanship will cause warranty claim to be rejected.

Defective material must be returned within 30 days of receipt of shipping instructions. Failure to do so within specified time will result in forfeiture of claim.

The distributor is responsible for the initial investigation and write up of the warranty claim.

Distributor shall be allowed no more than 30 days from date of repair to file a warranty claim/service report.

Warranty for failure of BOSS replacement parts covers the net cost of the party only, not labor and mileage.

The BOSS warranty does not cover diagnostic calls and travel. That is time spent traveling to the machine to analyze the problem and returning with the proper tools and parts to correct the problem.

BOSS will deduct from allowable credits for excess freight caused by sender failing to follow return shipping instructions.

Distributors or end-users automatically deducting the value of a warranty claim from outstanding balances due and payable to BOSS prior to receiving written notification of BOSS approval of the warranty claim may be subject to forfeiture of the entire claim.

## **WARRANTY/RETURN GOODS INSTRUCTIONS**

The warranty/return procedure outlined below is provided to give the claimant the information necessary to file a warranty/return claim, and enable BOSS INDUSTRIES the ability to best serve its' customers.

*Please see the following instructions to initiate a return:*

Contact BOSS INDUSTRIES Returns Department by telephone at 219.324.7776 or via email at [service@bossair.com](mailto:service@bossair.com). You may also send a fax at 219.324.7470.

### **WARRANTY CLAIMS – PREPARATION OF PART RETURN**

Parts returned to the factory must be properly packaged to prevent damage during shipment. Damage to a part as a result of improper handling or packing could be cause for denial. When addressing the package for shipment, the following information must be on the outside of, or tagged clearly, to the package.

1. Return Goods Authorization #.
2. Distributor or end-users return address.
3. Correct factory address.
4. Number of packages pertaining to each claim.

**NOTE:** *Our warranty requires that all defective parts be returned to BOSS INDUSTRIES freight prepaid. Items sent without RGA number will not be accepted. Unauthorized Returns Will Immediately Be Refused At Dock.*

### **RETURN OR WARRANTY CLAIMS – FILING PROCEDURES**

1. Initiate through a purchase order for warranty part or request for credit.
2. RGA will accompany replacement part.
3. BOSS INDUSTRIES will confirm disposition of failed part within 30 days of receipt and or request additional information.
4. Claim denial will result in issuance of a letter of denial.
5. BOSS INDUSTRIES will consider each claim on its' own merit and reserves the right to accept or reject claim request. In case of air-ends, these will be returned to the manufacturer for their analysis/input.
6. Send Warranty Claim to:  
BOSS INDUSTRIES, INC.  
1761 Genesis Drive  
LaPorte, IN 46350  
Attn: Returns Dept.

## **GENERAL**

An approved claim depends on the following provision:

1. An RGA # must be issued by BOSS INDUSTRIES. (See filing procedures.)
2. Failed part must be returned within 30 days of original invoice date, freight prepaid, with RGA #.
3. Part is determined to be defective.
4. Workmanship is determined to be defective.
5. Machine is within warranty period.
6. Machine has been operated within design conditions.

Claims made through distributors must be verified by distributor prior to contacting BOSS INDUSTRIES.

## **DAMAGE IN TRANSIT**

Do not return damaged merchandise to BOSS INDUSTRIES, please follow claim procedure.

1. Loss in transit:  
The merchandise in our kit or provided in our factory installations has been thoroughly inspected or carefully installed and tested before leaving our plant. However, regardless of the care taken at the factory, there is a possibility that damage may occur in shipment. For this reason, it is recommended that the unit be carefully inspected for evidence of possible damage or malfunction during the first few hours of operation. Responsibility for the safe delivery of the kit or factory installed unit was assumed by the carrier at the time of shipment. Therefore, claims for loss or damage to the contents of the kit or factory installed unit should be made upon the carrier.
2. Concealed loss or damage:  
Concealed loss or damage means loss or damage, which does not become apparent until the kit is unpacked or the factory-installed unit is run by the end-user. The contents of the kit or factory installed unit may be damaged due to rough handling while in route to its destination, even though the kit or factory installed unit shows no external damage. When the damage is discovered upon unpacking, make a written request for inspection by the carrier agent within fifteen days of delivery date. Then file a claim with the carrier since such damage is the carrier's responsibility.

By following these instructions carefully, we guarantee our full support of your claims, to protect you against loss from concealed damage.

3. Visible Loss or Damage  
Any external evidence of loss or damage must be noted on the Freight Bill or Express Receipt, and signed by the carrier's agent. Failure to adequately describe such external evidence of loss, or damage may result in the carrier refusing to honor a damage claim. The carrier will supply the form required to file such a claim.

## **SCREW COMPRESSOR AIR-END EXCHANGE PROGRAM**

Replacement air-ends are available from the factory. For current prices and availability, contact BOSS INDUSTRIES, Inc. or an authorized BOSS INDUSTRIES distributor. Prices are F.O.B. shipping point. Prices do not include labor for removal or installation.