



**SERIES 85  
PTO AIR COMPRESSOR  
OPERATORS, MAINTENANCE,  
AND PARTS MANUAL**

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### REVISIONS LIST

DATE	LOCATION	DESCRIPTION OF CHANGE
20020121	2-8	ADDED DECAL 70396127 FOR SIGHTGLASS
20030131	7,8	ADDED SUB-ZERO OPERATION INSTRUCTIONS
20070329	COVER	UPDATED OWNERSHIP STATEMENT

## GENERAL ARRANGEMENT

IMT 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. Electrical Components
9. Driveshaft Components
10. Parts, Service, Installation, and Maintenance Manual.

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

## IMT SERIES 85 ROTARY SCREW COMPRESSOR SPECIFICATIONS

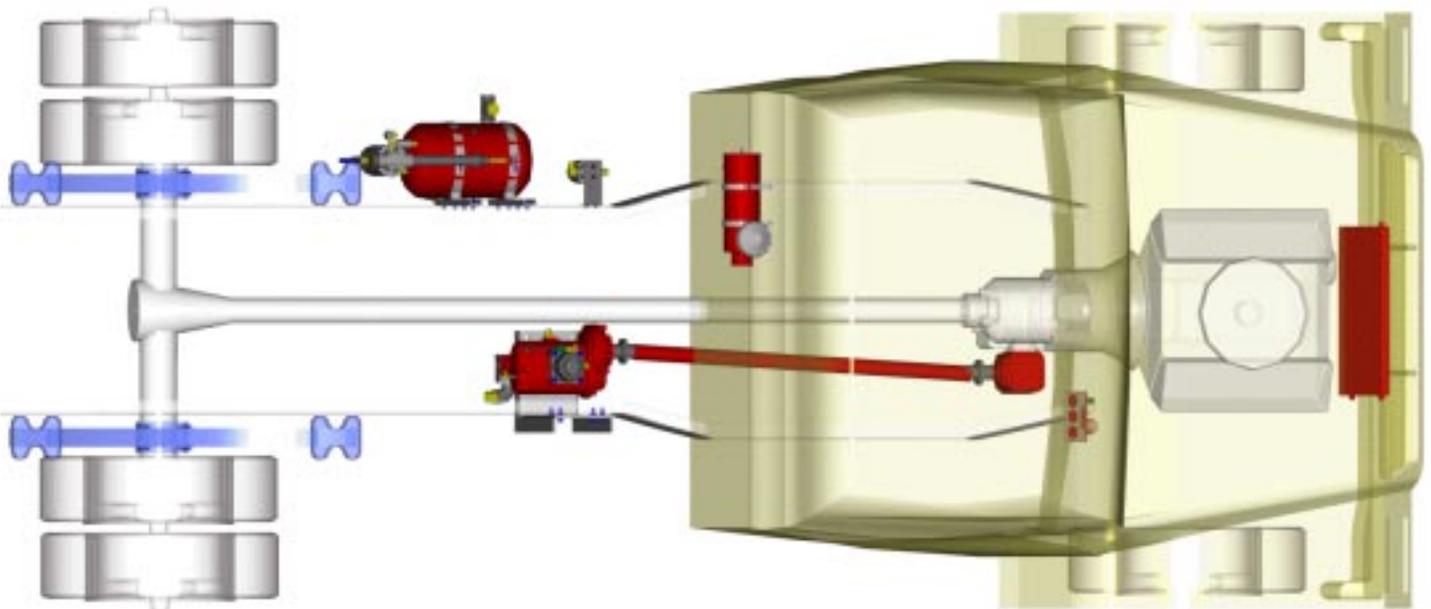
DELIVERY @ 110 PSIG:	85 CFM
INPUT SPEED RPM TO COMPRESSOR:	1010 RPM
FLUID CAPACITY:	4.75 GALLONS

### COMPONENTS - COMPRESSOR SYSTEM (OVERALL DIMENSIONS)

COMPRESSOR / AIR INLET	10" W X 16" H X 18" L
RECEIVER / SUMP	17" DIA. X 22" L
SPIN-ON ELEMENT	5" DIA. X 13" H
COOLER / FAN ASSEMBLY	19" W X 12" H X 22" L

WEIGHT (DRY)	423 LB
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***SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE***



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. Through experience and common sense, you are in the best 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. Keep dirt away from parts by covering parts and exposed openings.

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

### DANGER

DO NOT USE IMT 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.

IMT 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 IMT COMPRESSORS USED TO SUPPLY BREATHING AIR.

## SAFETY

- Do not disconnect or bypass safety circuit system.
- Do not install safety devices other than authorized IMT 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.

IMT 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.

## SUB-ZERO TEMPERATURE OPERATION INSTRUCTIONS

### CAUTION

READ AND UNDERSTAND THE SUB-ZERO TEMPERATURE OPERATION INSTRUCTIONS BELOW. DO NOT OPERATE COMPRESSOR WITH THE OIL TEMPERATURE BELOW 0° F.

### Sub-Zero Operation

For IMT rotary screw compressors (both shaft driven and hydraulically driven) sub-zero temperature operation is defined as operation of the compressor when the oil temperature is below 0° F. It is possible to operate an IMT rotary screw compressor when the **ambient** temperature is below 0° F, but only by adhering to the following guidelines:

### Maintenance Requirements

If the IMT rotary screw compressor is expected to operate at temperatures below 0° F, the oil filter, coalescer, air filter, and oil should be changed before the compressor is ran in sub-zero temperatures (ex: late fall, but this may vary by location and environment). Performing this maintenance will improve the performance of the system during sub-zero temperature operation. Use only IMT approved rotary screw compressor oils and filters.

### Storage Requirements

The IMT rotary screw compressor should be stored at or above 0° F. If the ambient temperature is below 0° F the vehicle should be stored inside, preferably in a heated environment. After moving the vehicle from the heated environment, the compressor system should be operated for 15 minutes before proceeding to a job site. During this time, the service valve must be slightly ajar, such that the pressure gauge reads between 100 and 140 psi. This ensures that the oil temperature has had adequate time to come up to operating temperature, and that most of the water in the system has been removed. This will allow for approximately one hour of travel time before the oil cools to ambient temperature. If an extended driving time is expected, the operator may need to stop driving and run the system for 15 minutes every hour to ensure that the oil temperature does not cool to below 0° F. The operator should use his/her judgment when deciding what interval is needed between running the compressor to warm the oil. Lower ambient temperature will require more frequent warming of the compressor oil.

**Failure to Follow Maintenance & Storage Requirements**

At temperatures below 0° F, failure to follow the above guidelines may result overheating of the compressor due to the oil’s inability to circulate through the compressor system. The lack of circulation leads to rapid warming of the compressor air end, and eventually the compressor air end will exceed the maximum operating temperature. If the system shuts down due to high temperature during sub-zero temperature operation, the oil will need to be warmed before restarting. This may require moving the vehicle to a heated location or waiting for the ambient temperature (and therefore the oil temperature) to exceed 0° F.

**CAUTION**

FAILURE TO ADHERE TO THESE GUIDELINES, AND REPEATED RUNNING OF THE COMPRESSOR TO HIGH TEMPERATURE SHUTDOWN, MAY RESULT IN PERMANENT DAMAGE TO THE AIR END.

**SAFETY**

A compliment of warning decals are supplied with each unit. These decals must be affixed to the vehicle after it has been painted, trimmed, and undercoated, etc. and prior to being put into service. The decal placement should ensure decals are clearly visible to the user and service personnel.

**COMPRESSOR FLUID**

USE IMT ROTARY SCREW COMPRESSOR FLUID ONLY.

1. CHECK FLUID LEVEL WITH TRUCK OFF AND PARKED ON LEVEL GROUND BEFORE STARTING COMPRESSOR.
2. ADD FLUID IF NONE IS SHOWING IN SIGHTGLASS.

301475

Compressor Fluid:  
Placed on body near oil sump filler cap

**FILL OIL TO THIS LEVEL IN SIGHTGLASS**



70396127

Sightglass:  
Placed on body near oil sump filler cap

**THIS TRUCK IS EQUIPPED WITH A**



**PTO COMPRESSOR PACKAGE**

**START UP PROCEDURE**

1. SET BRAKES PER COMPANY PROCEDURE AND CHOCK WHEELS.
2. CHECK COMPRESSOR OIL LEVEL. ADD IF LOW.
3. DEPRESS CLUTCH. ENGAGE P.T.O.
4. PUT TRANSMISSION IN NEUTRAL.
5. LET OUT CLUTCH AND DEPRESS FUEL PEDAL MOMENTARILY.

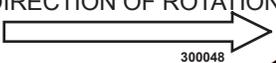
**SHUTDOWN PROCEDURE**

1. CLOSE SERVICE VALVE.
2. DEPRESS CLUTCH AND HOLD FOR COMPRESSOR BLOWDOWN.
3. DISENGAGE P.T.O.

301476

Truck Equipped with PTO:  
Placed on visor

DIRECTION OF ROTATION



300048

Direction of Rotation:  
Placed on air compressor

**⚠ WARNING**

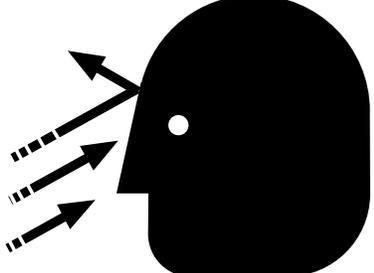


**Read the operators manual before starting this unit. Failure to adhere to instructions can result in severe personal injury. Replacement manuals can be purchased from: Iowa Mold Tooling Co., Inc. 500 Hwy 18 West Garner, IA 50438**

300039001

Read Operator's Manual:  
Placed on visor.

**⚠ DANGER**



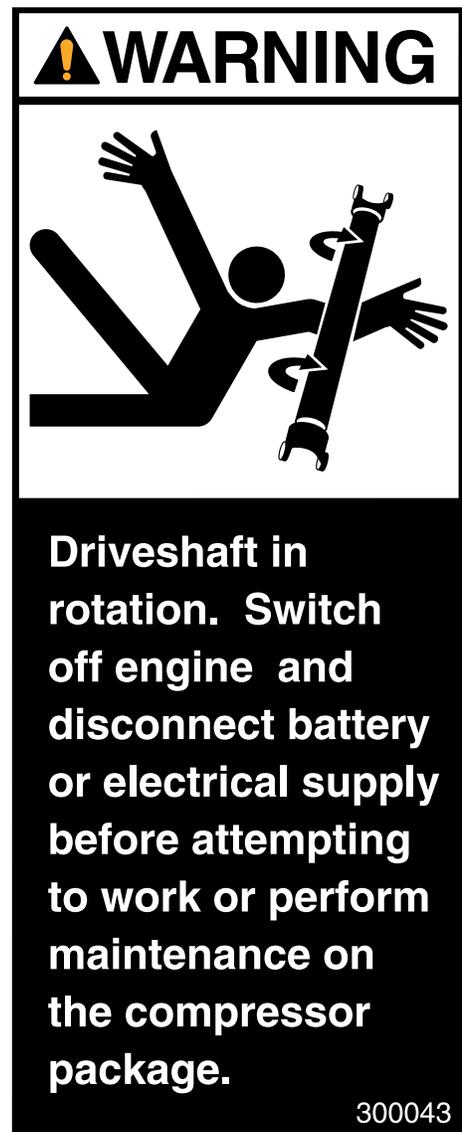
**HOT OIL UNDER PRESSURE!  
Will cause SEVERE PERSONAL INJURY OR DEATH. Do not remove valves, caps, plugs or piping when compressor is running or pressurized. Shut down compressor and relieve system of all pressure before removing valves, caps, plugs or piping**

300038

Hot Oil Under Pressure:  
Placed on body near oil sump filler cap.



Discharge Air:  
Placed on body near air  
service valve.



Driveshaft in Rotation:  
Placed on body near compressor  
mounting foot.

## SAFETY



### Air Compressor Operating Instructions

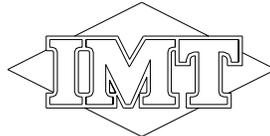
- Check oil level prior to engaging the pto.
- Set the parking brake.
- Engage the PTO.
- Close air tank drain.
- Operate the air compressor at least 15 minutes each time the compressor is started. This will reduce moisture build-up and winter freeze.

plete operating instructions.

P.N. 302214

Operating Instructions:  
Placed on visor

THIS TRUCK IS EQUIPPED WITH A



### PTO COMPRESSOR PACKAGE START UP PROCEDURE

1. STOP VEHICLE AND ENGAGE PARKING BRAKES.
2. SHIFT TRANSMISSION TO NEUTRAL.
3. DEPRESS PTO ON/OFF SWITCH TO ON POSITION. ENGAGEMENT WILL BE COMPLETE WHEN RED INDICATOR LIGHT COMES ON.

### SHUTDOWN PROCEDURE

1. CLOSE SERVICE VALVE.
2. DEPRESS PTO ON/OFF SWITCH TO OFF POSITION.

301661

PTO Compressor Package:  
Placed on visor.

## 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.

**CFM** - Refers to the volume of compressed air being 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.

**SHUTDOWN SWITCH** - Works in conjunction with a temperature and pressure switchgauges, sending a signal to stop the compressor power source in cases of high temperature or pressure.

**SIDE MOUNT PTO** - Power take off gearbox that bolts to the side of the transmission. The PTO input gear 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, driving the compressor.

**ADAPTER GEAR ASSEMBLY: SIDE MOUNT PTO** - The adapter gear assembly and the side mount PTO are assembled to the side of the transmission. Typically a PTO box installed on a **manual** transmission will require an adapter gear assembly in order to obtain the proper engine rotation required by the compressor. Most automatic transmissions utilize engine rotation PTO's. Consult IMT for assistance in PTO sizing and selection if needed.

## DESCRIPTION OF COMPONENTS

### COMPRESSOR ASSEMBLY

The IMT PTO 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 four lobes on the male rotor while the female rotor has five roots.

### 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.

## DESCRIPTION OF COMPONENTS

### 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.

### 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 OIL COOLING/AFTER COOLER SYSTEM

The compressor cooling system consists of an oil cooler remote mounted, aerodynamically designed cooling assembly. Oil temperature is controlled by a thermal valve located down stream of the oil filter. The valve maintains compressor oil temperatures in the range of 175° - 200° F. The assembly should be mounted such that the fan motor shaft is in the vertical position. When ever possible the assembly should be mounted so the air across the fan when driving down the road dose not rotate the fan blade in excess of it's normal operating rpm. The assembly should move only ambient air across it's core and not recirculated any truck heat or hot air from the assembly.

## DESCRIPTION OF COMPONENTS

### INSTRUMENTATION

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

### COMPRESSOR DISCHARGE PRESSURE SWITCHGAUGE

This switchgauge indicates the discharge air/oil pressure. Operate compressor within the discharge pressure limits as indicated in specifications section. The switchgauge 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.

### HOURLY METER

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 SWITCHGAUGE

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

### ELECTRICAL AND SAFETY SYSTEM

The IMT compressor's standard electrical system consists of a gauge panel; a remote mount 12 VDC fan package with fan relay assembly (for standard cooling system only); and a resettable normally closed shutdown switch. 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 respective switchgauge a signal is sent to "trip" the shutdown switch from normally closed to open. This signal will then shut off the engine in vehicles equipped with a CABLE PTO or "HOT SHIFT" PTO applications.

### ELECTRONIC ENGINE INTERFACE

Electronic engine interface for the compressor speed control incorporates several IMT supplied electrical components that are chassis specific. A chassis specific wiring diagram and electrical components are supplied per the vehicle application data 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.

## 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 150 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.

## DESCRIPTION OF COMPONENTS

### 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: (2-speed system only)

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.

The pressure regulator, mounted on the coalescer head, operates as follows: (1-speed system only)

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. 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.

## 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 avoided 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" on the dial, all items listed under "EVERY 10 HOURS" should be serviced for the tenth time, and all items under "EVERY 50 HOURS" should be serviced for the second time, and so on.

### **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. Pressure drop indicator while compressor is operating. 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 IMT 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 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. IMT 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). The filter is equipped with a pressure drop indicator, and the element should be changed based on it's reading first and then by the maintenance intervals outlined.

### 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.

## MAINTENANCE

To replace element proceed as follows:

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

NOTE: When connecting drain line care must be taken to hold onto canister nut securely when tightening the hose fitting.

### WARNING

DO NOT SUBSTITUTE ELEMENT. USE ONLY A GENUINE IMT 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 RETURN LINE

This line originates at the bottom of the air/oil coalescer and flows through a special 1/4 hose 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.

### 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). Do not use tools to tighten the filter.
4. Check for leaks in operation.

### WARNING

DO NOT SUBSTITUTE ELEMENT. USE ONLY A GENUINE IMT 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.

## MAINTENANCE

### 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 IMT compressor lubricant.
4. After cooler is reinstalled and compressor is filled with fresh oil, change compressor oil after 50 hours of normal operation.

### 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 switch to shut off the engine in cases of high temperature or pressure. If this occurs the truck can be restarted by pushing in the reset button on the shutdown switch. In most cases this switch is located in the discharge block of the compressor. If the compressor hi-temperature gauge on the pressure switchgauge has shut off the engine the compressor truck should be taken in for service/troubleshooting.

Trucks with automatic transmissions that use hot shift PTO's should be wired the same way as a manual transmission.

### UNPLANNED SHUTDOWN

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

1. Check the fuel level and truck dash gauges and indications for possible engine problems.
2. Check the compressor discharge temperature/pressure shutdown switch; it is normally closed. If it is popped out, it had opened the circuit and will need to be reset. Push the button in to reset it. You will then hear the button click if it was tripped by the switchgauges.
3. Check that the compressor oil is at proper level.
4. Check oil cooler for dirt, slush, ice on the fins, or any other obstructions to the cooling air flow.
5. Make a thorough external check for any cause of shutdown such as broken hose, broken oil lines, loose or broken wire, etc.

## 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 switch.
  - B. Coalescer plugged up.
  - C. Faulty safety valve.
  - D. Faulty regulator (regulator air pressure signal is not getting to inlet valve)
3. Hi 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 shut down, 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

If the oil consumption is abnormal, or there is oil in the 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.

### ENGINE PLUGGING

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.

## TROUBLESHOOTING

### 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. Clean oil system (cooler) internally.
5. Check fan switch/relay harness.

## 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. Cable shift PTO's require the use of decal 300045.

See safety section for decals.

## COMPRESSOR OPERATION

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

<b>CONTROL OR INDICATOR</b>	<b>PURPOSE</b>
<b>TEMPERATURE SWITCH GAUGES</b>	Monitors the temperature of the air/fluid mixture leaving the compressor. The normal reading should be approximately 175 to 200° F. Sends signal to high temperature pressure switch when the compressor reaches 240° and the compressor will shut down.
<b>HOURLMETER</b>	Indicator of accumulated hours of actual compressor operation.
<b>FLUID LEVEL SIGHTGLASS</b>	Indicates fluid level in the sump. Proper level should fill half the glass. Check this level when the compressor is disengaged and the vehicle is parked on level ground.
<b>PRESSURE RELIEF VALVE</b>	Vents sump pressure to the atmosphere if the pressure inside the sump exceeds 175 PSI.
<b>COMPRESSOR INLET CONTROL VALVE</b>	Regulates the amount of air intake in accordance with the amount of compressed air being used. Isolated fluid in compressor unit on shutdown.
<b>PRESSURE REGULATING VALVE</b>	Senses air pressure from sump to provide automatic regulation of the compressor inlet control valve and load controller.
<b>BLOW DOWN VALVE</b>	Coalescer had blow down valve vents the sump pressure to the atmosphere at shut down.
<b>MINIMUM PRESSURE ORIFICE</b>	Restricts air flow to balance sump and service air pressure. Assures a minimum of 65 PSI to maintain compressor lubrication.
<b>RETURN LINE CHECK VALVE</b>	Ensures that 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.**

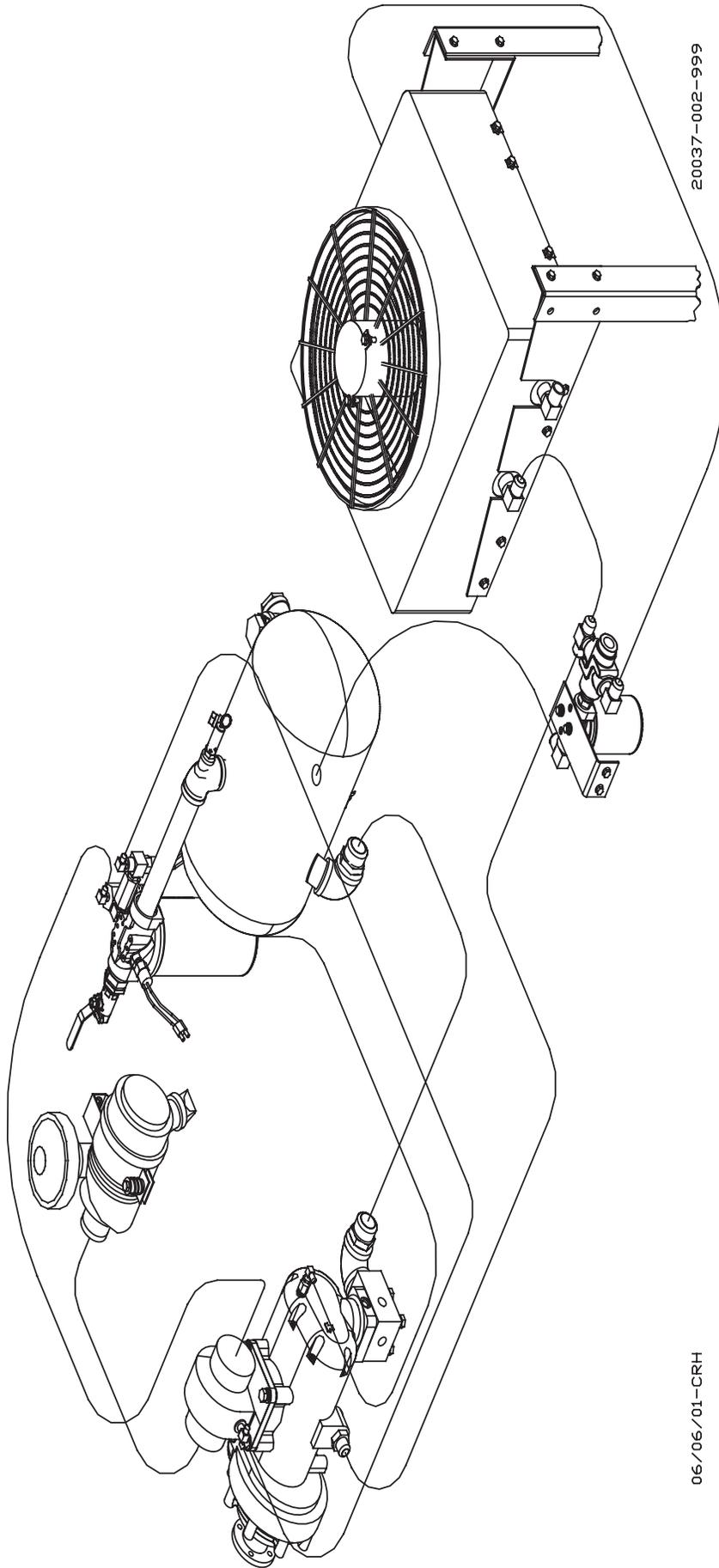
#### NOTE

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.
2. CHECK VALVE.
3. AIR TANK (WHEN USED).
4. SERVICE VALVE.
5. MOISTURE TRAP/GAUGE/OILER COMBINATION (WHEN USED).
6. HOSE REEL (WHEN USED).

## **PARTS AND ILLUSTRATION SECTION**

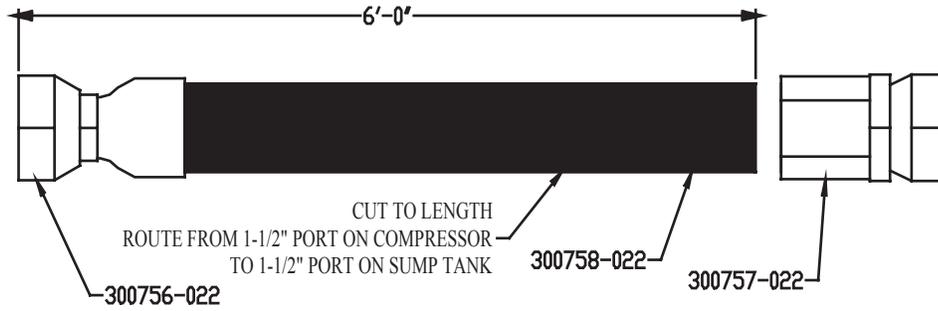
**AIR/OIL SCHEMATIC**



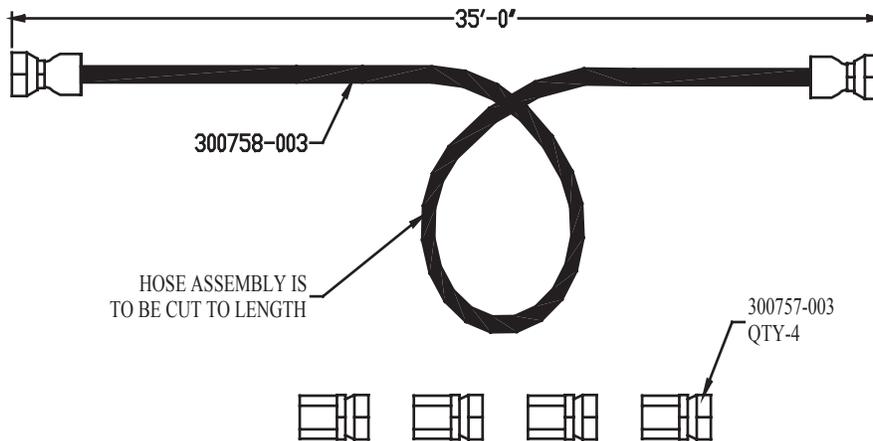
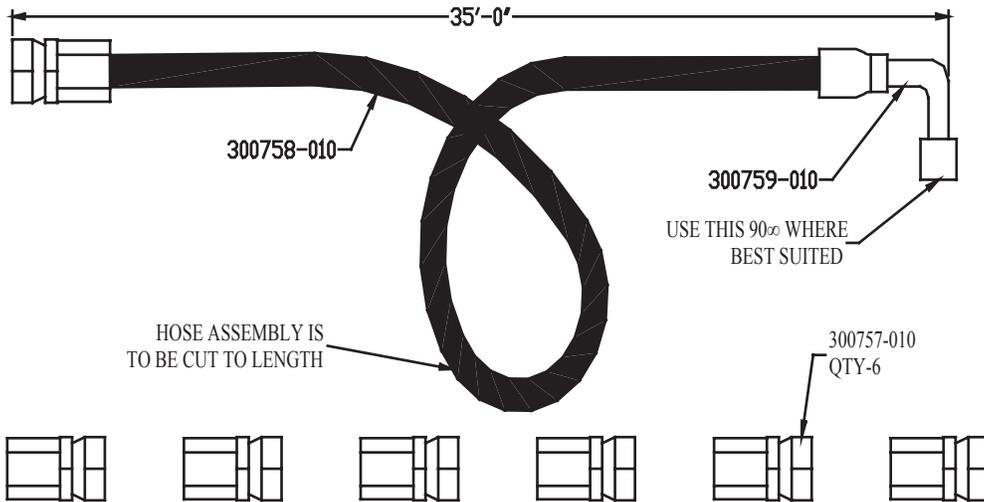
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### HOSE SYSTEM (100078)

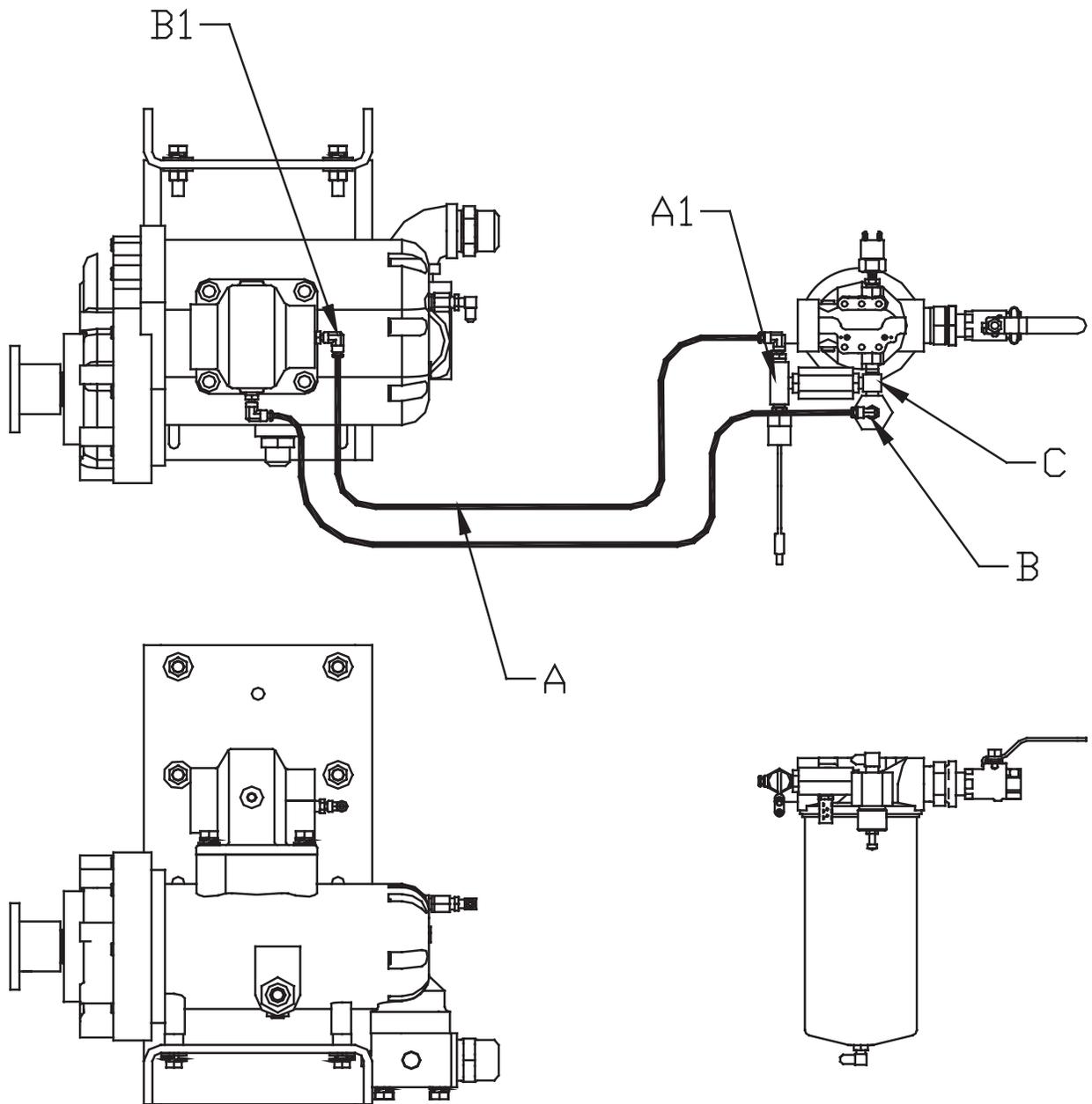


NOTE: THREE HOSE ASSEMBLIES ARE REQUIRED  
CUT HOSE SO ONE ASSEMBLY HAS ONE 90° CRIMP  
FITTING AND ONE REUSABLE FITTING, THE OTHER  
TWO ASSEMBLIES WILL HAVE TWO REUSABLE  
FITTING ON EACH END



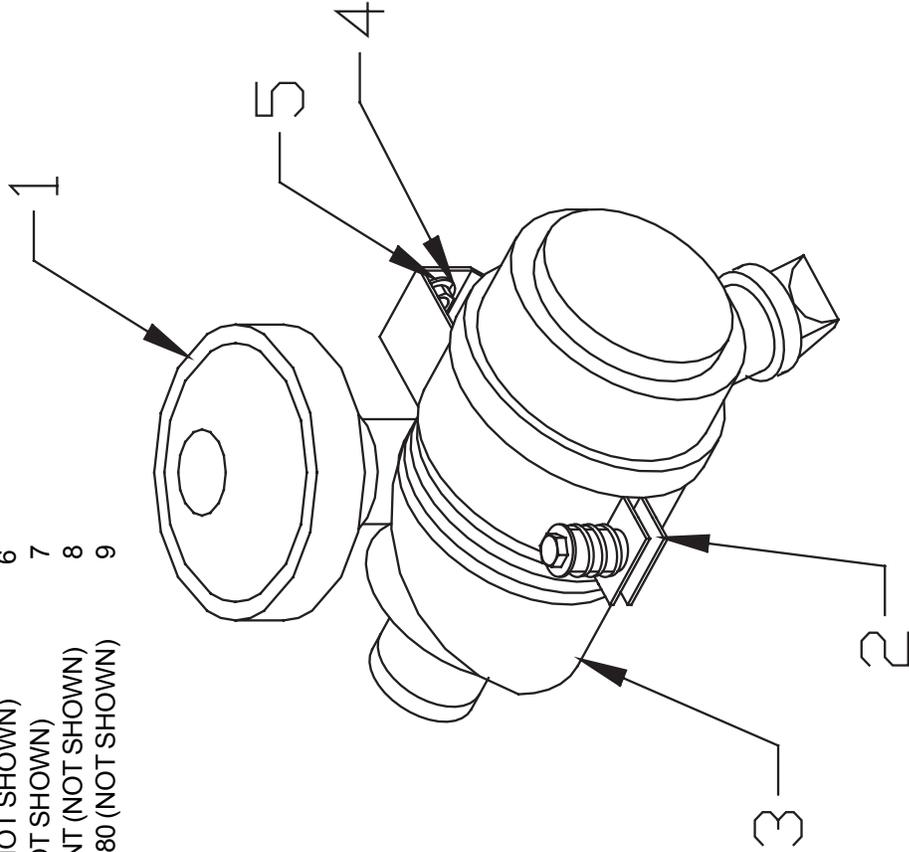
### CONTROL HOSE PORT CALL OUTS

PORT	DESCRIPTION
A	AIR SIGNAL SUPPLY, AT SHUTDOWN ONLY TO A1
A1	SIGNAL FROM "A" AT SHUTDOWN TO EXHAUST AIR FROM COMPRESSOR SYSTEM
B	OUTLET REGULATED AIR PRESSURE SIGNAL, PRESENT ONLY WHEN THERE IS NO DEMAND FOR AIR. I.E. CLOSED SERVICE VALVE OR AIR PRESSURE DEAD HEADED INTO TOOL THAT IS NOT BEING USED. MAXIMUM PRESSURE IN THIS LINE IS 50 PSIG.
B1	AIR SIGNAL FROM "B" REGULATOR OUTLET TO COMPRESSOR INLET VALVE REGULATING PORT. AIR SIGNAL MODULATES AIR OPENING FROM OPEN TO CLOSED WHEN THERE IS NO DEMAND FOR AIR.
C	SYSTEM AIR PRESSURE SIGNAL PORT TO AIR PRESSURE REGULATOR INLET. AIR PRESSURE IS PRESENT ANYTIME THERE IS AIR PRESSURE IN THE SYSTEM.



**AIR INLET SYSTEM (100081)**

PART NUMBER	QTY	DESCRIPTION	ITEM
300031	1	EACH CAP, AIR FILTER 6.5	1
302015	1	EACH BAND, AIR FILTER MTG. 7.18	2
302013	1	EACH ASSY, AIR FILTER - 7.18 185	3
925305-283	2	EACH NUT, WHIZ LOCK 5/16-18	4
929705-075	2	EACH BOLT, WHIZLOCK GR5/16-18 X 3	5
301785-300	10	FOOT HOSE, AIR INLET 3" ID KFLEX (NOT SHOWN)	6
301786-300	2	EACH CLAMP, AIR INLET 3" KFLEX (NOT SHOWN)	7
300853	1	EACH INDICATOR, AIR FILTER ELEMENT (NOT SHOWN)	8
922202-000	1	EACH NIPPLE, PIPE 1/8 X CLOSE SCH80 (NOT SHOWN)	9

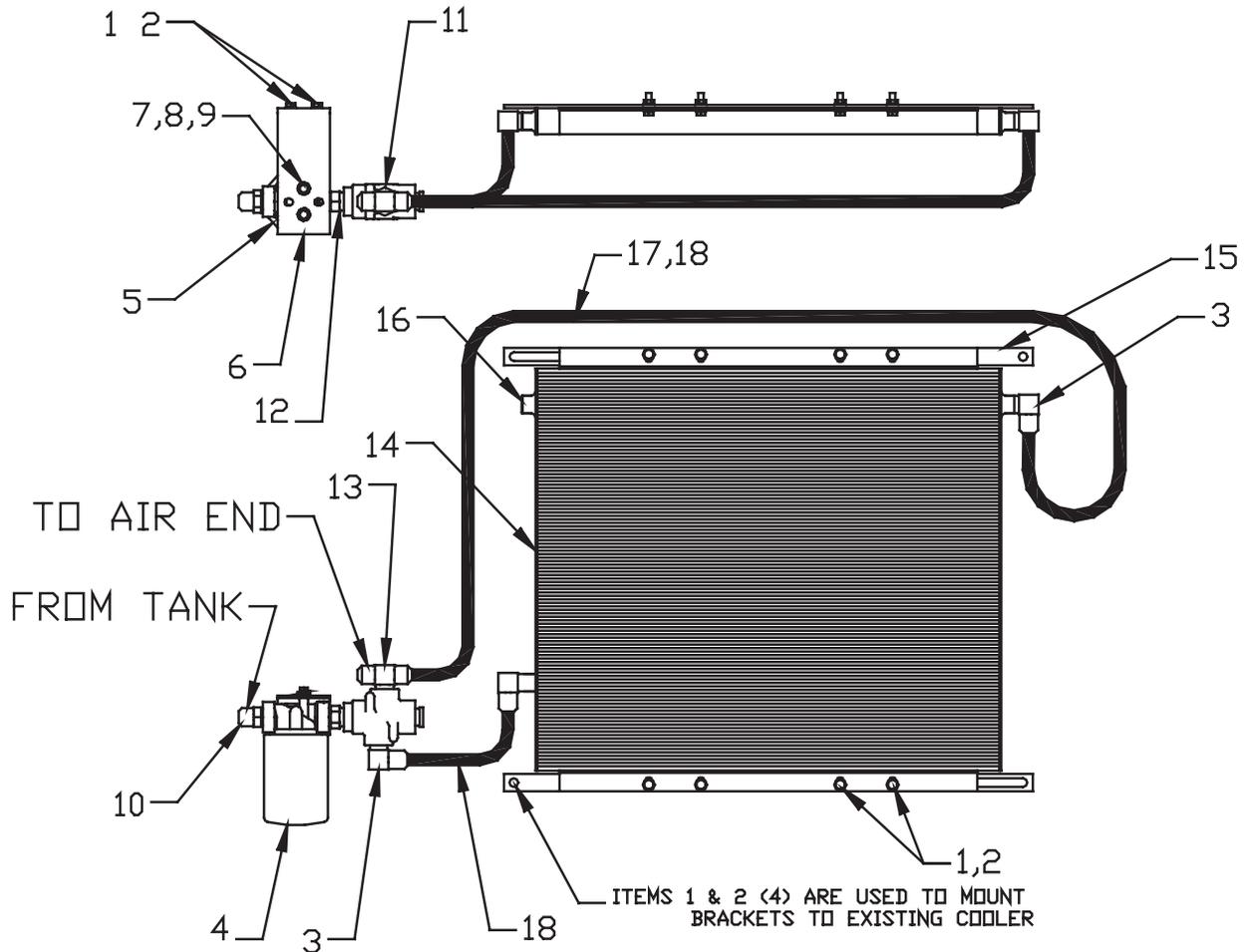


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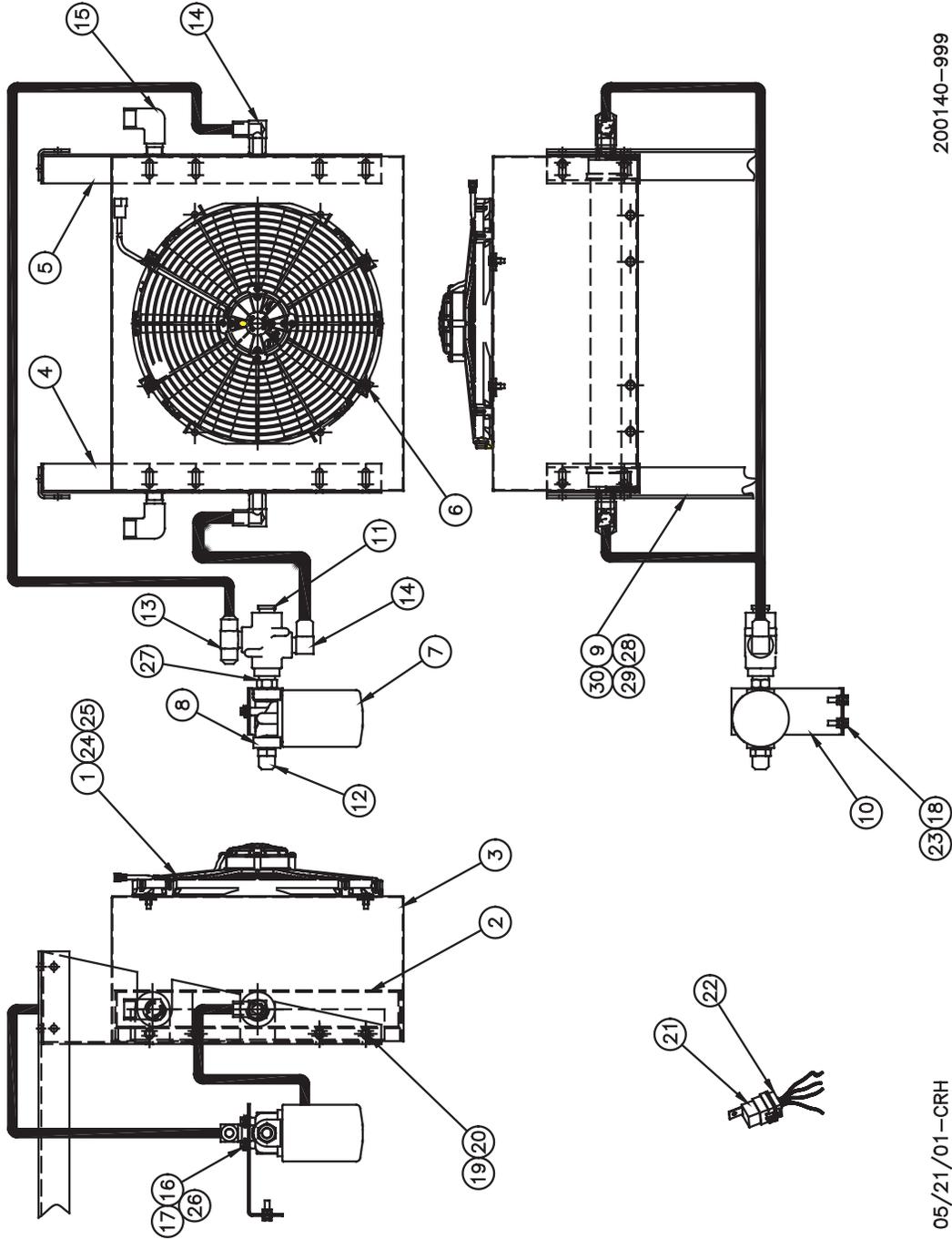
## FRONT MOUNT OIL COOLER SYSTEM (60023K)

925305-283	14	EACH NUT, WHIZ LOCK 5/16-18	1
929705-100	14	EACH BOLT, WHIZLOCK GR5 5/16-18 X 1	2
960212-075	2	EACH ELBOW, 3/4 JIC X 3/4 MNPT 90°	3
300005	1	EACH ELEMENT, OIL FILTER	4
300599	1	EACH HEAD, OIL FILTER	5
300625	1	EACH BRACKET, COALESCER/OIL	6
938204-071	2	EACH WASHER, FLAT 1/4	7
929104-075	2	EACH BOLT, .HEX GR5 1/4-20 X 3/4	8
938004-062	2	EACH WASHER, .LOC 1/4	9
960112-075	1	EACH CONNECTOR, .3/4 JIC X 3/4 MNPT	10
301662	1	EACH VALVE, THRML 3/4 3-PORT	11
960412-075	1	EACH NIPPLE, .HEX 3/4 MPT X 3/4 MPT	12
961712-075	1	EACH TEE, M BR 3/4 X 3/4 X3/4 37ø FL	13
300345	1	EACH COOLER, OIL FRONT MOUNT	14
301867	2	EACH BRACKET, FR MTG	15
902915-030	1	EACH PLUG, PIPE 3/4 RECESSED ZINC	16
300756-010	1	EACH FITTING, CRIMP 5/8 X 3/4	17
300757-010	1	EACH FTTNG, .RESBL 5/8" ID X 3/4" JIC	18
300758-010	15	FOOT HOSE, REUSABLE/CRIMP 5/8	19



# OIL COOLING SYSTEM (200140)

PARTS LIST ON NEXT PAGE



200140-999

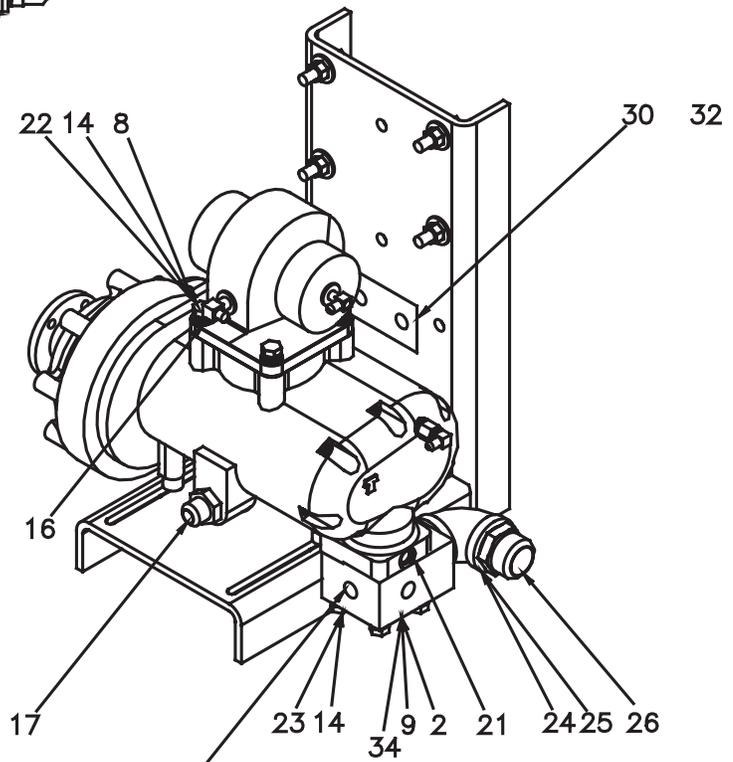
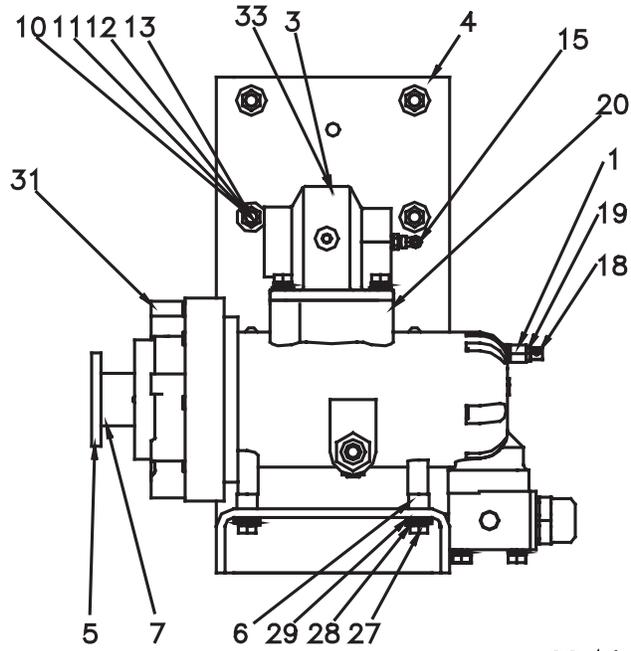
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**OIL COOLING SYSTEM (200140)**

1.	301921	FAN, ASSY W/MTR & GRILL 14.09 PULLER	1
2.	301804	COOLER, OIL/AIR 18.6 (REV. #0)	1
	301813	SHROUD, OIL/AIR COOLER 6"	1
	300149	BRACKET, OIL COOLER	2
6.	961504-090	NUT, TINNERMAN - 1/4-20 .025-.150PNL	4
7.	300005-001	ELEMENT, OIL FILTER 8060	1
8.	300599	HEAD, OIL FILTER	1
9.	302209	BRACKET, ANGLE 2" x 2" x 3/16" x 40"	2
10.	300625	BRACKET, COALESCER/OIL (REV. #1)	1
11.	301662	VALVE, THRML 3/4 3-PORT	1
12.	960112-075	CONNECTOR, 3/4 JIC X 3/4 MNPT	1
13.	961712-075	TEE, MBR 3/4JICx3/4JICx3/4MNPT	1
14.	960212-075	ELBOW, 3/4 JIC X 3/4 MNPT DEG.	3
15.	960712-075	ELBOW, PIPE STREET 3/4" HYD.	2
16.	929104-075	BOLT, .HEX GR5 1/4-20 X 3/4	2
17.	938004-062	WASHER, .LOC 1/4	2
18.	929705-100	BOLT, WHIZLOCK GR5 5/16-18 X 1	2
19.	961505-140	NUT, TINNERMAN - 5/16-18	16
20.	929705-075	BOLT, WHIZLOCK GR5 5/16-18 X 3/4	16
21.	301755-012	RELAY, PWR WTHRPRF 12VDC	1
22.	301740	KIT, WEATHERPROOF RELAY SOCKET	1
23.	925305-283	NUT, WHIZLOCK 5/16-18	2
24.	300444	TAPE, 1/16 x 1/2 CLOSED CELLO	4 FT
25.	302120	KIT, WIRE MATES TO 301502	1
26.	938204-071	WASHER, FLAT 1/4	2
27.	960412-075	NIPPLE, HEX 3/4 x 3/4	1
28.	929806-100	BOLT, HEX GR8 3/8-16 x 1	8
29.	938206-071	WASHER, FLAT 3/8 - GR8	16
30.	925506-198	NUT, NYLOC - 3/8-16 GR8	8

# COMPRESSOR AND MOUNTING SYSTEM (100076)

PARTS LIST ON NEXT PAGE

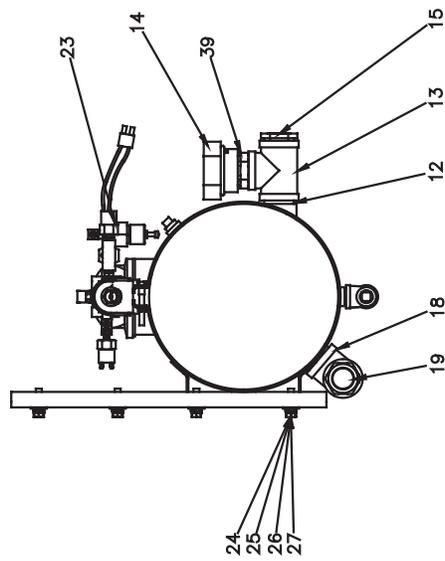
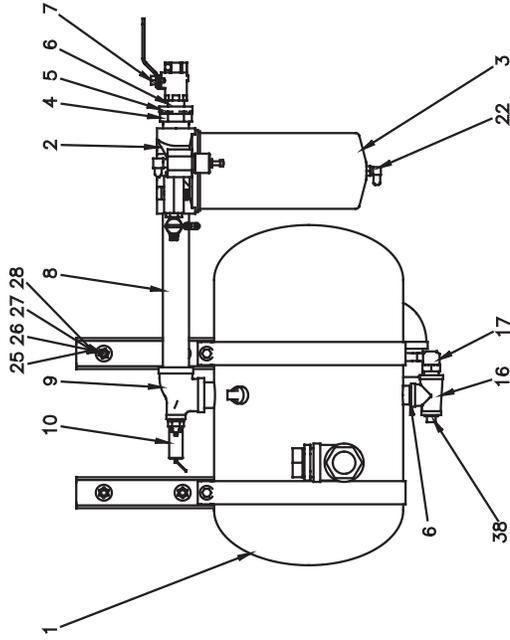
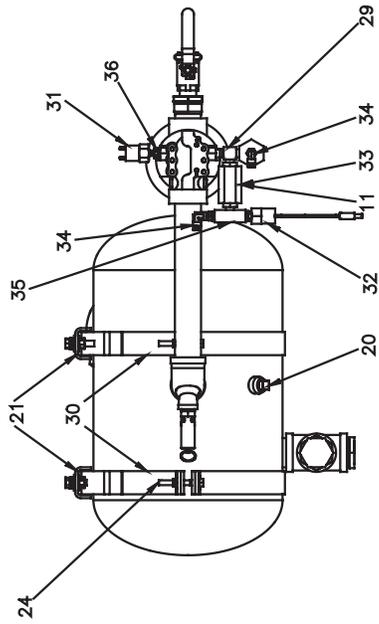


SHUTDOWN BULB WELL FROM  
TEMPERATURE SWITCH GAUGE LOCATED  
IN BLOCK

**COMPRESSOR AND MOUNTING SYSTEM (100076)**

PART NUMBER	DESCRIPTION	QTY
1. 970804-025	ADAPTER, 1/4 BSPP X 1/4 FNPT	1
2. 301703	FLANGE, DISCHARGE T10G	1
3. 300629	VALVE, INLET ELEBOW 90 DEG.	1
4. 301704	FOOT, COMP MTG T10G	1
5. 301917	FLANGE, CMPNN 40MM T10G BGPWRM	1
6. 301881	SPACER, DIA. .44 X .85 LG	3
7. 932206-050	SCREW, SET 3/8 X 1/2	1
8. 938912-200	WASHER, FLAT M12	4
9. 902915-020	PLUG, .PIPE 1/2 RECESSED ZINC	2
10. 929808-200	BOLT, HEX GR8 1/2-13 X 2	4
11. 926008-448	NUT, HEX GR8 1/2-13	4
12. 937808-125	WASHER, LOC 1/2	4
13. 938208-112	WASHER, PLAIN 1/2 PLATED GR 8	8
14. 938812-250	WASHER, LOC M12	8
15. 960204-025	MELBOW, 1/4 JIC X 1/4 MNPT 90° W/HOLE	1
16. 960204-012	ELBOW, 1/4 JIC X 1/8 MNPT 90°	1
17. 973112-075	CONNECTOR, 3/4 JIC X 3/4 BSPP	1
18. 300721	VALVE, CHCK ELBW 1/8 NPTx1/4 JIC	1
19. 907600-005	BUSHING, REDUCING 1/4 X 1/8	1
20. 301694	GASKET, INLT VLV .062 301097	1
21. 926102-145	O-RING, DSCHRG BLCK 8060 T10G	1
22. 929212-350	BOLT, HEX HD 12MM X 35MM GR10.9	4
23. 929212-800	BOLT, HEX HD 12MM X 80MM GR10.9	4
24. 922224-000	NIPPLE, PIPE 1 1/2 X CLOSE SCH	1
25. 901515-060	ELBOW, PIPE 1 1/2	1
26. 960124-150	CONNECTOR, 1 1/2 JIC X 1 1/2 MNPT	1
27. 929210-450	BOLT, HEX 10MM X 45MM GR10.9	3
28. 938810-220	WASHER, LOC M10	3
29. 938910-200	WASHER, FLAT 10MM	3
30. 301480	PLATE, SERIAL NO# - IMT SERIES	1
31. 301677-305	COMPRESSOR, AIR SCA10G 3.05:1	1
32. 943102-038	RIVET, 1/8 X GRPRNG 3/8 TO 5/16	2
33. 902915-005	PLUG, PIPE 1/8 RECESSED ZINC	1
34. 301594	DECAL, TEMP. COMPR. - 250 F	1

**DISCHARGE SYSTEM (100074)**



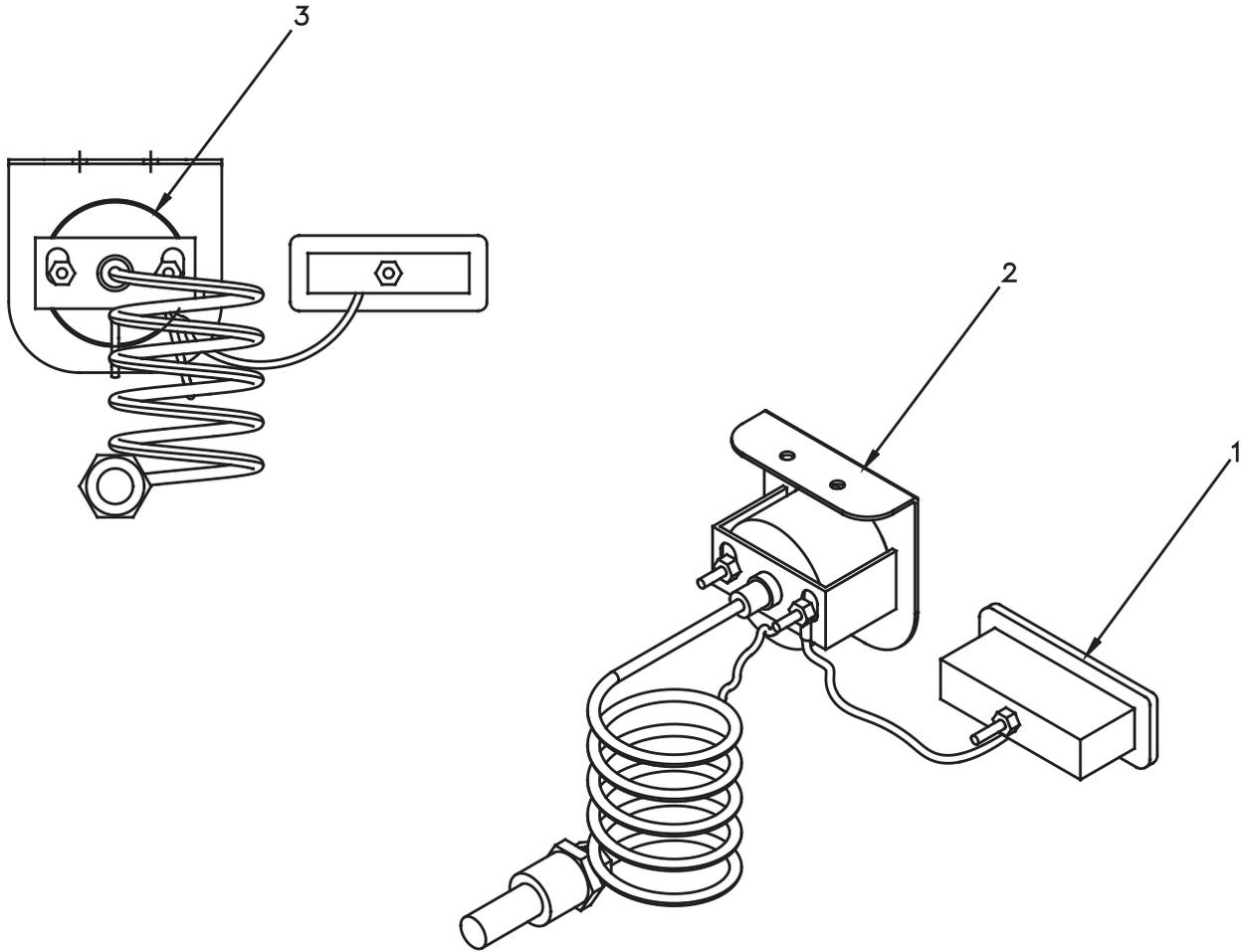
(100074-999)

06/06/01-CRH

**DISCHARGE SYSTEM (100074)**

PART NUMBER	QTY	DESCRIPTION
1. 300225	1	SUMP, 12" DISCH. W/PLATE BAFF
2. 300331	1	HEAD, COALESCER
3. 301669	1	COALESCER, SPIN-ON LONG IMT
4. 300605	1	ORIFICE, MIN PRESS 1 1/4 X 1
5. 907604-030	1	BUSHING, REDUCING 1 X 3/4
6. 960412-075	2	NIPPLE, HEX 3/4 x 3/4
7. 300022-075	1	VALVE, SERVICE - 3/4" VENTED
8. 922120-110	1	NIPPLE, PIPE 1 1/4 X 11
9. 902205-025	1	TEE, PIPE RED 1 1/4 X 1/2 X 1
10. 300023-175	1	VALVE, RELIEF - 1/2 NPT (175#)
11. 301827	1	VALVE, BLOWDOWN 1/4 N.C. 55502
12. 922224-000	1	NIPPLE, PIPE 1 1/2 X CLOSE SCH
13. 902415-060	1	TEE, PIPE 1 1/2"
14. 300090-020	1	CAP, OIL FILL 1-1/4 SAE W/HOLE
15. 300107	1	SIGHTGLASS, OIL LEVEL 1 1/2
16. 902203-023	1	TEE, PIPE RED 3/4 X 1/2 X 3/4
17. 960112-075	1	CONNECTOR, 3/4 JIC X 3/4 MNPT
18. 901515-060	1	ELBOW, PIPE 1 1/2
19. 960124-150	2	CONNECTOR, 1 1/2 JIC X 1 1/2 MNPT
20. 902915-020	1	PLUG, PIPE 1/2 RECESSED ZINC
21. 300068	2	BRACKET, RECEIVER TANK
22. 960204-012	1	ELBOW, 1/4 JIC X 1/8 MNPT 90°
23. 300057	1	VALVE, REGULATOR 1/4
24. 929806-100	4	BOLT, HEX GR8 3/8-16 X 1
25. 937806-094	8	WASHER LOC 3/8 GRADE 8
26. 938206-071	16	WASHER, FLAT 3/8 - GR8
27. 926006-337	8	NUT, HEX GR8 3/8-16
28. 929806-150	4	BOLT, HEX GR8 3/8-16 X 1 1/2
29. 977704-0404	1	TEE, 1/4 MNPT X 1/4 MNPT X 1/4 MN
30. 300234	2	BAND, SUMP MTG 12
31. 301422	1	SWITCH, PRESSURE N.O. 20 PSI
32. 301421	1	SWITCH, PRESSURE N.C.
33. 301977	1	ORIFICE, BLWDWN 1/4 PLG W/5/64
34. 960204-025	2	ELBOW, 1/4 JIC x 1/4 MNPT 90 DEG.
35. 961904-025	1	TEE, MB 1/4F X 1/4F X 1/4M
36. 907600-005	2	BUSHING, REDUCING 1/4 X 1/8
37. 901415-060	1	ELBOW, PIPE 1 1/2 45 DEG.
38. 301868	1	VALVE, DRAIN COCK 1/2" MPT
39. 300089	1	ADAPTER, 1 1/4 SAE X 1 1/2" NPT

# ELECTRICAL SYSTEM (100077)



05/21/01-CRH

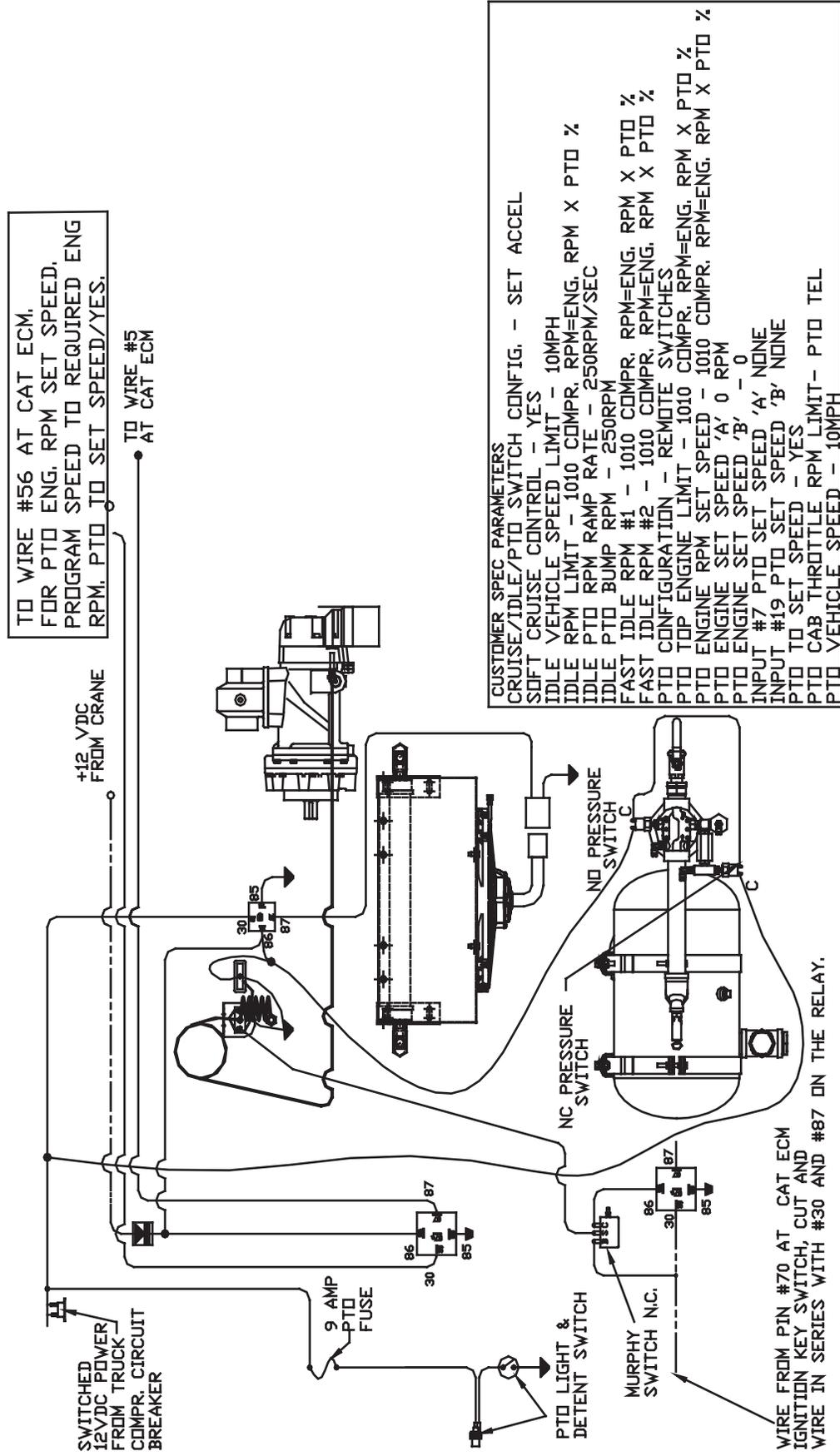
(100077-999)

**ELECTRICAL SYSTEM (100077)**

PART NUMBER	QTY	DESCRIPTION
1. 300074	1	GAUGE, HOURMETER
2. 300076-016	1	SWITCHGAUGE, TEMP W/THRMWL-16'
3. 300227	1	GAUGE, PANEL
4. 300075	1	SWITCHGAUGE, PRESSURE
5. 960602-012	1	TEE, PIPE 1/8 HYD
6. 980704-012	1	ELBOW, 1/4 TB SW X 1/8 NPT 90°
7. 301834	1	SWITCH, PRESSURE 18#
8. 974216-YW	15 FT	WIRE, 16 GA YELLOW (NOT SHOWN)
9. 979110-014	4	TERMINAL, RING #10 HS 16-14 (NOT SHOWN)
10. 300079	1	SWITCH, SHUTDOWN (NOT SHOWN)
11. 300909-025	1	BREAKER, 25 AMP CIRCUIT (NOT SHOWN)
12. 925801-130	2	NUT, HEX GR5 #10-32 UNF (NOT SHOWN)
13. 974212-RD	10 FT	WIRE, 12 GA RED IMT LOGO (NOT SHOWN)
14. 974216-BE	10 FT	WIRE, 16 GA BLUE IMT LOGO (NOT SHOWN)
15. 979125-010	2	TERMINAL, RING 1/4 HS 12-10 (NOT SHOWN)
16. 979138-014	2	TERMINAL, RING 3/8 X 16-14 (NOT SHOWN)
17. 979315-014	1	TERMINAL, BUTT TYPE 16-14 (NOT SHOWN)
18. 301885	1	HARNESS, GAUGE PNL
19. 979516-2S10R005	1	WIRE ASSY, 16GAX005X25FSPX10RS
20. 979138-010	1	TERMINAL, RING 3/8 X 12-10 (NOT SHOWN)

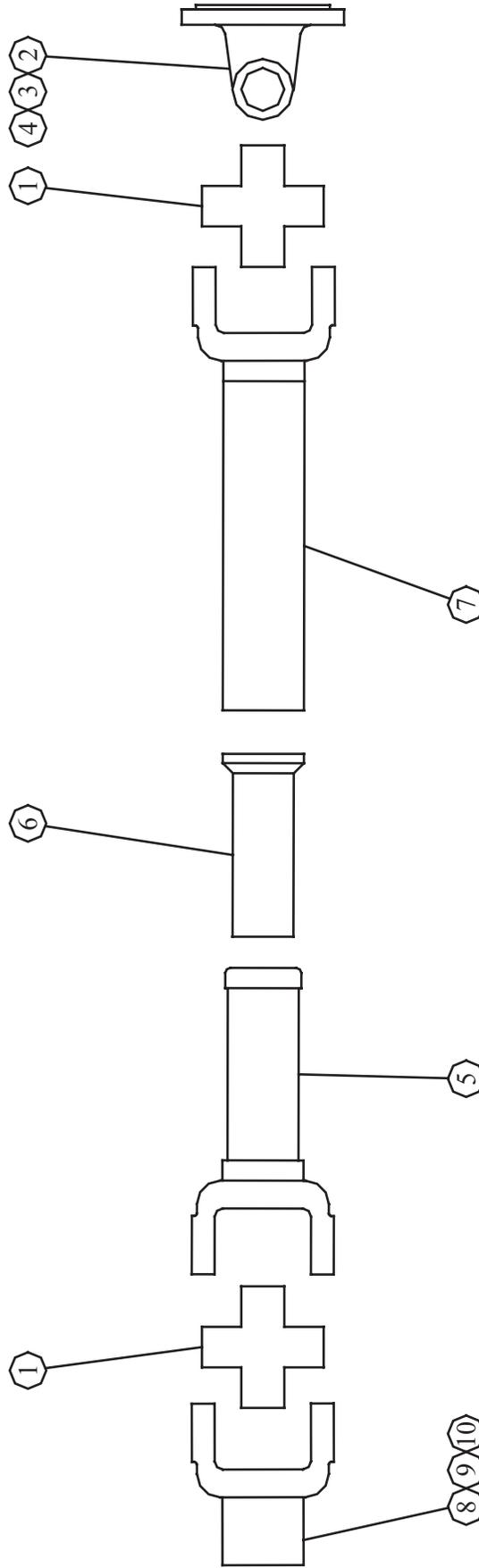
# ELECTRICAL SYSTEM

**NOTE: THIS IS ONLY A BASIC DIAGRAM. REFER TO WIRING DIAGRAM SPECIFIC TO YOUR CHASSIS LOCATED IN THE BACK OF THE MANUAL.**



**PTO AND DRIVELINE SYSTEM (60000)**

PART NUMBER	QTY	DESCRIPTION
1. 300154-625	2	U-JOINT 5-625X
2. 300196-329	1	YOKE, FLANGE 2-2-329
3. 929406-125	4	BOLT, HX HD GRD8 3/8 24 X 1-1/
4. 925706-198	4	NUT, NYLOC GR8 3/8-24 UNF
5. 300155-8021	1	YOKE, SLIP 1 3/8-16 SPLINE X 1
6. 300198-8512	1	SHAFT, SLIP 1 3/8-16 2 1/2 X .
7. 300197-017	1	TUBE & YOKE ASSY, 2 1/2 153
8. 300164-533	1	YOKE, END SR/SB
9. 973406-050	1	SCREW, SET 3/8 WITH HOLE
10. 301486	1	WIRE, SET SCREW



05/21/01-CRH

60000-999

**IMT MISCELLANEOUS PARTS BOX (AIR FILTER BOX)**

QTY	PART	DESCRIPTION	LOCATION
4	925305-283	NUT, HEX WHIZ 5/16-18	AIR INLET SYSTEM - QTY (4) BOLTS
4	929705-100	BOLT, WHIZLOCK GR 5 5/16-18 X 1	& NUTS FOR AIR FILTER BANDS
1	300031	CAP, AIR FILTER 6.5	#9 & 10, (2) BANDS TO SUPPORT AIR
2	300032	BAND, AIR FILTER MTG 6.5	FILTER #2, (1) CAP AND (2) CLAMPS TO
2	301786-300	CLAMP, AIR INLET 3" KFLEX	SUPPORT AIR INLET HOSE

**MISC. PARTS LOCATED IN BOX**

QTY	PART	DESCRIPTION	LOCATION
4	929808-200	BOLT, GR 8 1/2-13 X 2	COMPRESSOR MTG. FOOT TO FRAME
4	937808-125	WASHER, LOCK 1/2	RAIL COMPRESSOR MTG. SYSTEM
8	938208-112	WASHER, PLAIN 1/2 PLATED	#10, 11, 12, 13
4	926008-448	NUT, HEX GR.8 1/2-13	
4	929806-125	BOLT, HEX GR.8 3/8-16 X 1-1/2	RECEIVER TANK MTG. - BRACKETS TO
4	937806-094	WASHER, LOCK 3/8 GR.8	FRAME RAIL, QTY. (4) OF DISCHARGE
8	938206-071	WASHER, FLAT 3/8	SYSTEM #30, 31, 32, 33
4	926006-337	NUT, HEX GR.8 3/8-16	
4	929806-100	BOLT, HEX GR.8 3/8-16 X 1	RECEIVER TANK MTG. - BRACKETS TO
4	937806-094	WASHER, LOCK 3/8 GR.8	TANK, QTY (4) OF DISCHARGE
8	938206-071	WASHER, FLAT 3/8	SYSTEM #29, 30, 31, 32
4	926006-337	NUT, HEX GR.8 3/8-16	
8	300112	CLAMP, HOSE 3/4 ID	CLAMP DOWN HYDRAULIC HOSES AS
2	300111	CLAMP, HOSE 1-1/2 ID	NEEDED. QTY (10) OF OPTION KIT
8	300757-003	FITTING, RESBL 3/16 ID X 1/4	REUSABLE FITTINGS CONNECT TO THE
5	300757-010	FITTING, RESBL 5/8 ID X 3/8	ENDS OF THE HYDRAULIC HOSES
1	300757-022	FITTING, RESBL 1-3/8 ID X 1-1/2	AFTER THEY ARE CUT TO LENGTH.
6	925305-283	NUT, HEX WHIZ 5/16-18	OPTION: FRONT MOUNT COOLER MTG.
6	929705-100	BOLT, WHIZLOCK GR.5 5-16-18 X 1	BRACKET TO EXISTING COOLER QTY (4)
			1 & 2 AND OIL FILTER BRACKET MTG. QTY (2)
3	960212-075	ELBOW, 3/4 JIC X 3/4 MNPT 90°	FITTINGS USED IN PLUMBING THE FRONT
1	960112-075	CONNECTOR, 3/4 JIC X 3/4 MNPT	MOUNT COOLER OPTION #3, 10, 18
1	300575-010	FITTING, RESBL 5/8 ID X 3/4 JIC	
8	925305-283	NUT, HEX WHIZ 5/16-18	OPTION: ABOVE DECK COOLER MTG. TO
8	929705-100	BOLT, WHIZLOCK GR.5 5/16-18 X 1	EXISTING SURFACE QTY (8) #6 & 7
3	960212-075	ELBOW 3/4 JIC X 3/4 MNPT 90°	FITTINGS USED IN PLUMBING THE FRONT
1	960112-075	CONNECTOR, 3/4 JIC X 3/4 MNPT	MOUNT COOLER OPTION # 8 & 19

**RECOMMENDED SPARE PARTS LIST**

PART NO.	DESCRIPTION	QTY
300005-001	OIL FILTER ELEMENT	1
302014	AIR FILTER ELEMENT 7.18	1
301669	SPIN ON COALESCER	1
300187	REGULATOR REPAIR KIT	1
301932	KIT, SHAFT SEAL REPAIR T10G	1
300186	KIT, INLET VALVE REPAIR	1

# 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. IMT 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: \_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

## **INSTALLATION SECTION**

## INSTALLATION OF IMT SERIES 85 GEARED 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 IMT, Inc. instructions.

Do not modify this compressor except with written factory approval.

### GENERAL

The overall installation of the IMT 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 IMT PTO compressor: All trucks should be road tested prior to installing IMT 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 coalescer assembly
7. Install the oil filter
8. Install the air cleaner
9. Prepare and install the hoses
10. Prepare and install the electrical components
11. Pre-start up inspection tests
12. Initial start-up and test

The chassis should be scrutinized for the best location of the compressor and it's 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 8060 UBI 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. The air compressor requires engine 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.

## INSTRUCTIONAL PROCEDURES

### 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 air compressor requires engine rotation on the output shaft of PTO** (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 IMT 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.

### 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 the optional driveline 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 necessary driveshaft components with approved driveline grease.

## INSTRUCTIONAL PROCEDURES

### 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. The plain black wire motor lead is ground.

#### 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. IMT can supply cooler package mounting hardware when requested (i.e. wall, louvers, etc.).

### 5. INSTALL THE OIL COOLER (Front mounting cooler option only)

Depending on the chassis, removal of the grill 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. 8060 UBI brackets are supplied but in some installations these brackets will need to be modified or new mounting hardware will need to be fabricated. 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.

## INSTRUCTIONAL PROCEDURES

### 6. INSTALL THE OIL SUMP

You will want to consider the following before permanently installing the sump.

1. The 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. Longer if the coalescer is mounted directly to the tank. 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 mounting brackets for bolting to the chassis frame. Sump mounting bands are to be bolted on to the sump mounting brackets. There are 4-holes in each of the sump brackets. Two of these holes must go through the frame rail. In some cases the bolts that hold the bands to the sump brackets can also travel through the frame to improve ground height. It is important to be sure that the sightglass is level on the centerline of the tank from end to end. Not centering the sightglass can cause possible over or under filling of the tank. Also, the air outlet leading to the coalescer should be centered on top.

### 7. INSTALL COALESCER ASSEMBLY

The head for the spin-on coalescer canister should be located in an area that allows for easy access to the canister. The head must be mounted so that the canister is vertical when in place. As mentioned above the coalescer can be mounted directly to the tank or remote mounted. When remote mounting, minimize the distance away from the tank while allowing easy access for service. The farther away from the tank, the compressed air can cool and the resulting moisture can cause problems with the control air line off the coalescer head that feeds the air pressure regular.

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

Once the head is in place spin on the coalescer:

1. Put a film of oil on the gasket.
2. Rotate element clockwise by hand until element seal contacts the head. Hand tighten then rotate element one more turn clockwise with band wrench. The fitting on the bottom of the canister is for the oil return line. Care should be taken when connecting this line so damage or over torquing does not take place. Hold the nut on the bottom of the can stationary with wrench while tightening the fitting and hose to the coalescer. A minimum pressure orifice is built into a hex plug located in the outlet port of the coalescer head and will automatically maintain the minimum pressure needed for the unit to function properly. Do not remove this fitting. 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 located on the down stream side (outlet side) of the coalescer head. The blowdown valve and air pressure regulator should remain intact as it was shipped.

## INSTRUCTIONAL PROCEDURES

### 8. INSTALL THE OIL FILTER (Thermal Valve Front Mount Oil Cooling Option Only)

The oil filter assembly includes a filter head and oil filter canister. When mounting, apply a film of oil to gasket. Screw the element on until gasket makes contact then tighten  $\frac{1}{2}$  turn farther. As mentioned earlier the oil filter can be mounted directly off the tank. This offers excellent support for the filter. If space is a concern the element can be remote mounted. Leave the thermal valve plumbed to the oil filter head and the head plumbed to the tank when ever possible. This eliminates the need for two additional hose assemblies.

### 9. 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 3" 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.

### 10. 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 cutoff wheel. Clean hose with compressed air.

Step 3. Screw socket counterclockwise onto hose until it bottoms. Back off  $\frac{1}{2}$  turn.

Step 4. Oil nipple threads and screw clockwise into socket and hose, leaving  $\frac{1}{32}$  to  $1 \frac{1}{16}$ " 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 IMT SPECIFICATIONS.**

The 1.5" discharge line runs from the compressor discharge block to the oil sump tank inlet fitting. This is the only 1.5" hose assembly required in the basic kit so there should be no confusion as to what ports to hook the hose assembly up to. When the oil filter and thermal valve are

## INSTRUCTIONAL PROCEDURES

used (front mounting cooler option only), there are three 3/4" oil lines originating from the thermal valve. There are three 1/4" airlines that originate at the coalescer. These lines are also color coded. One of the lines starts at the bottom of the coalescer element and runs to the oil return line port on the end of the compressor opposite the drive shaft. The other two lines start up on top of the coalescer. One line starts at the air pressure regulator and runs to the 1/4" npt elbow at the compressor inlet valve located on top of the compressor. The last line starts at the blow-down valve and runs to the 1/8" npt elbow at the inlet valve.

The 3/4" line from the bottom of the sump feeds the oil filter head/and thermal valve assy. The 3/4" elbow on the thermal valve feeds the lowest port on the front mounting cooler and the cooler return come back to the tee on the thermal valve. The other end of the tee on the thermal valve feed cool oil back to the compressor. The 12vdc fan/cooler assembly is fed after the oil filter and then back to the compressor.

### 11. INSTALLING THE WIRING

Depending on the chassis, engine, transmission and PTO used, the wiring requirements will vary. Each kit is supplied with the necessary wiring components if this information has been supplied prior to the order.

Wiring requirements for the following compressor components will always be required.

- Hourmeter
- 12 vdc fan package (not required on front mount coolers)
- Safety shutdown circuit
- Gauge panel

The compressor wiring for these components and the engine speed control should be wired per the IMT supplied diagram. In most cases engine programming is required and can be done by a local dealer or yourself if you own the appropriate hardware and software.

Engine and transmission program parameters are listed on your custom wiring schematic per your chassis.

A generic wiring diagram is included to illustrate the wiring of the above mentioned compressor components.

### 12. 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, options, 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.
- 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.

## INSTRUCTIONAL PROCEDURES

- V. Record all serial numbers for this installation.
- A. Truck V.I.N.
  - B. PTO Model Number
  - C. Air-End Serial Number
  - D. IMT Serial Number
  - E. Receiver Tank Serial Number
  - F. Note any special applications relating to specific installations.
  - G. Driveshaft should have an identification number 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 (see lubricant section of the operator and parts section for type of lubricant to use). 1. Capacity is approximately 2.5 gallons. 2. Add one quart of oil into the compressor thru the compressor intake valve prior to start-up. 3. Additional oil may need to be added after test. 4. 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. Antifreeze – 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.

### 13. 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. 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 or clockwise when looking at the PTO shaft. Check the direction of rotation by quickly engaging and then disengaging the compressor.

### CAUTION

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.

#### D. 1. SAFETY CIRCUIT TESTING FOR 8060-UBI CABLE OPERATED PTO'S

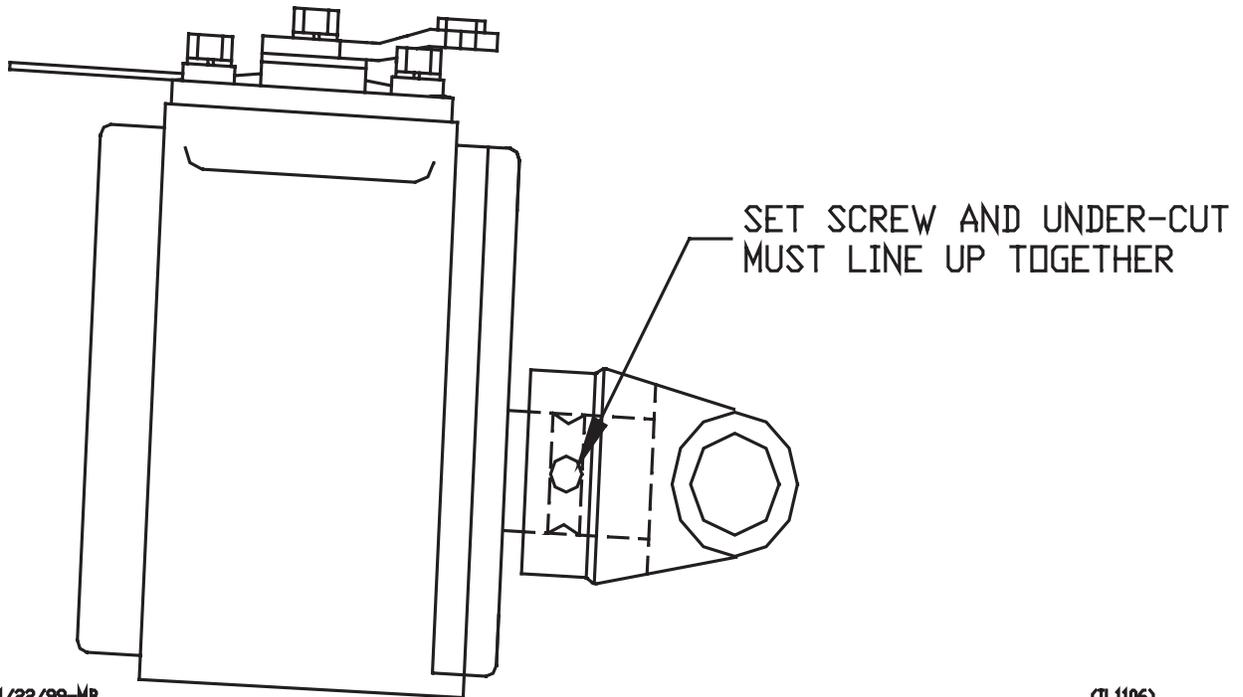
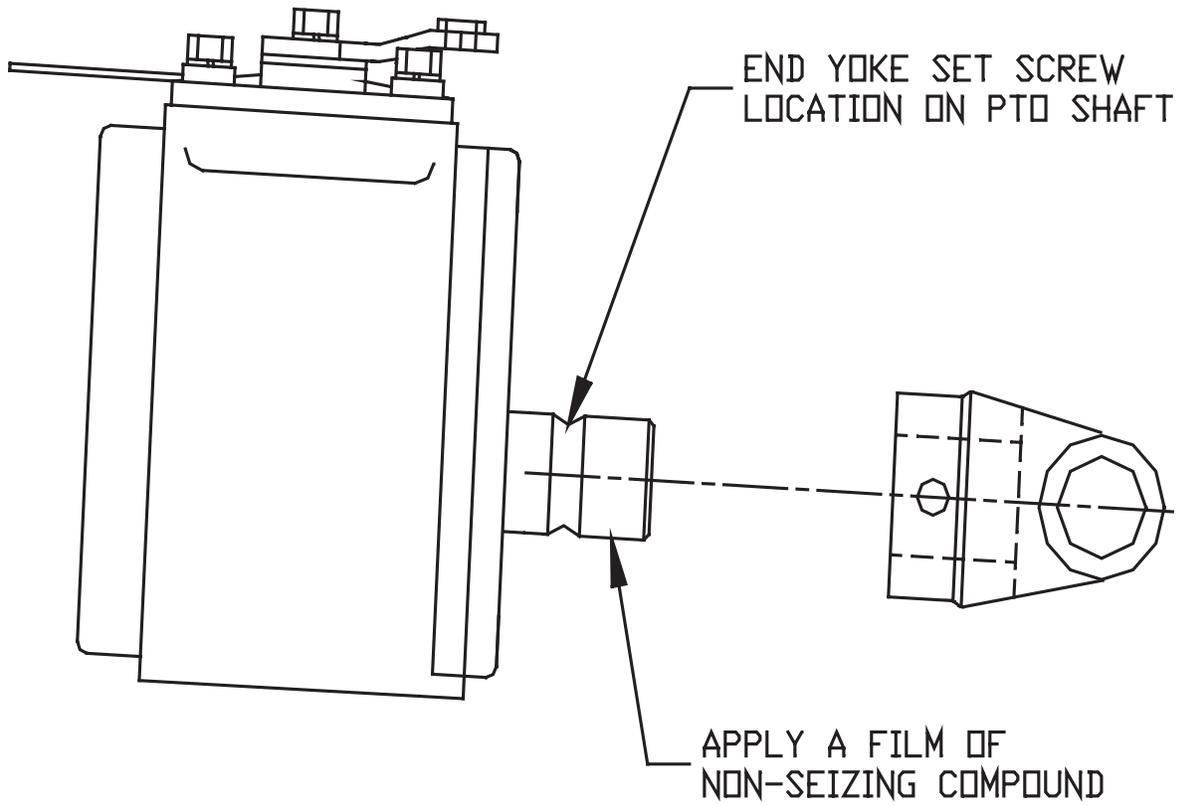
Safety circuit testing can be done before starting the PTO and compressor when using this model. This model requires the shutdown switch to be wired in series with the ignition coil on gas engine vehicles. Using a 1/16" Allen wrench, set the temperature switchgauge shutdown set point at 240 degrees F. This is done on the face of the gauge. The pressure switchgauge will

## **INSTRUCTIONAL PROCEDURES**

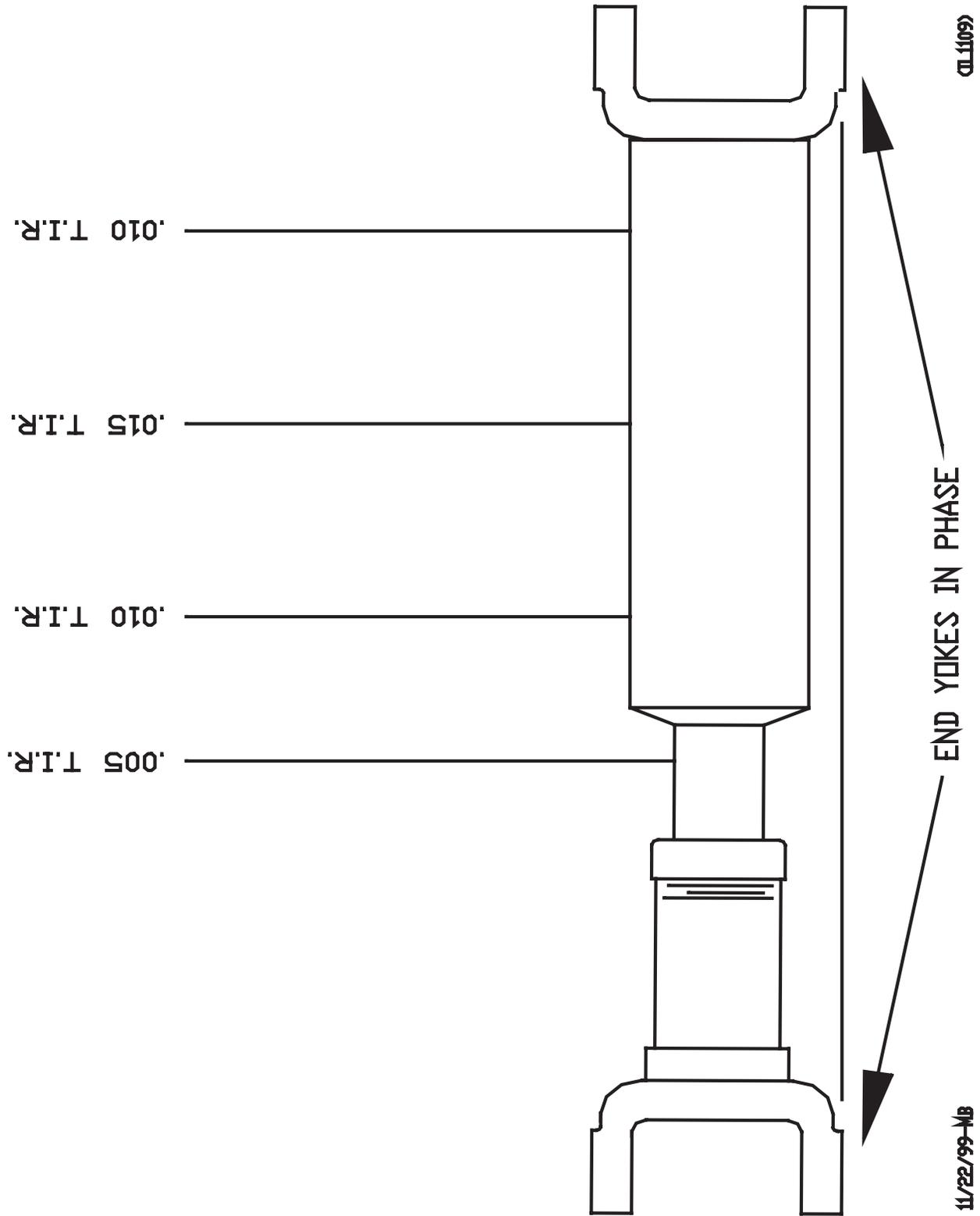
need to be set at 160 PSI and is adjusted at the face of the gauge using a 1/16" Allen wrench also. Start the truck (do not engage the compressor) and take a screw driver and touch the 1/16" Allen head screw on the face of the temperature switchgauge and simultaneously touch the outside ring on the face of the gauge, and this should shut down the engine. Push in the button on the shutdown switch to reset. Repeat the test with the pressure switchgauge. If engine does not shutdown, check compressor wiring.

## **INSTALLATION ILLUSTRATIONS**

### PTO END YOKE INSTALLATION



**DRIVELINE RUNOUT SPECIFICATIONS**



## DRIVELINE INSTALLATION TECHNIQUES

### 1. U-JOINT OPERATING ANGLES

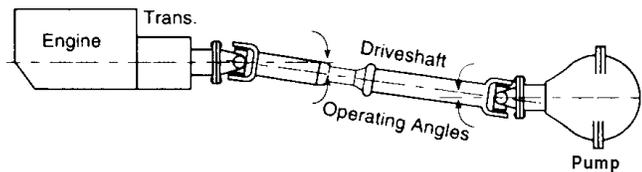
Every U-joint that operates at an angle creates vibration.

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°.
2. U-joint operating angles on each end of a driveshaft should always be equal within 1° of each other.
3. U-joint operating angles should not be larger than 3°. If more than 3°, 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.

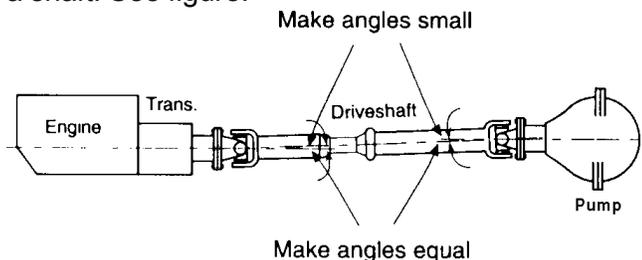


The connecting driveshaft operates with an angle at each u-joint. It is that angle that creates a vibration.

### 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° at each end of a shaft. See figure.



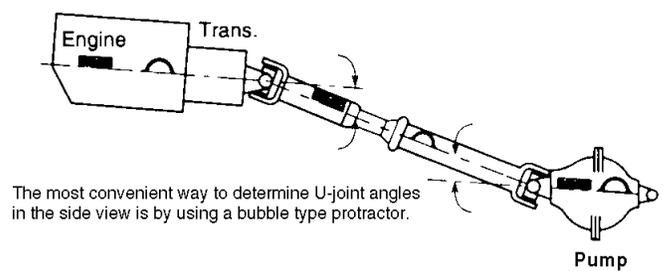
### 2. SINGLE PLANE AND COMPOUND U-JOINT OPERATING ANGLES

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.

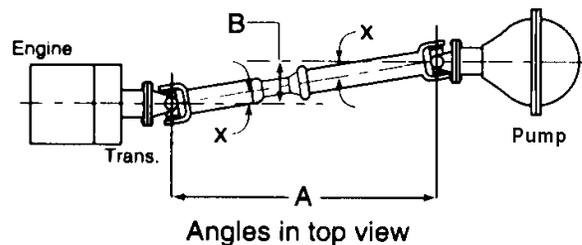
Determine the u-joint operating angle in an application where the components are in line when viewed from the top, but not in line when viewed from the side, is as simple as measuring the slope of the components in the side view, and adding or subtracting those slopes to determine the angle. See figure.



Angles in side view

These angles should be SMALL and equal within 1°.

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°. 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

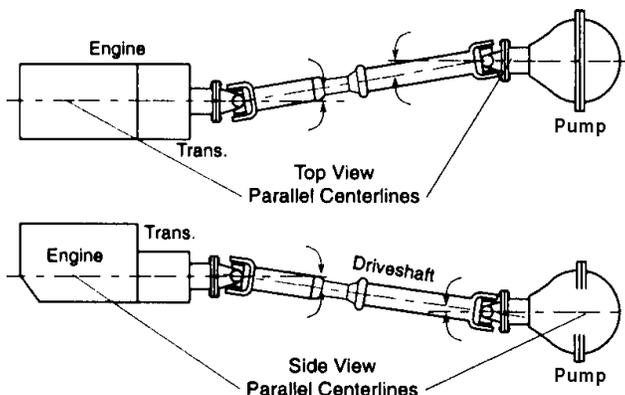
There are two things which can be done to make certain single plane angles are SMALL and EQUAL:

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.

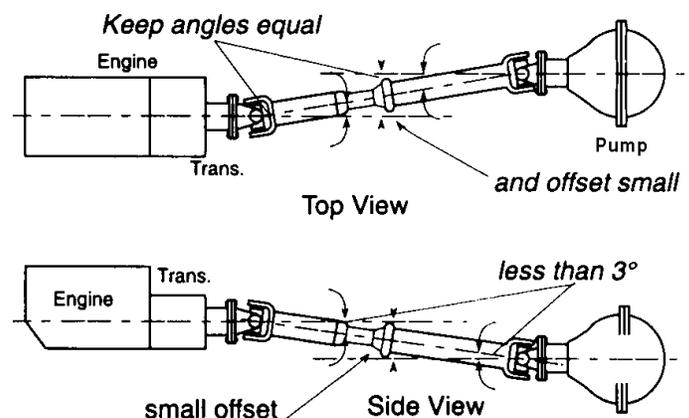
Do the same for the other end of the shaft. Compare the resultant calculated u-joint operating angle for each end. They should be EQUAL within  $1^\circ$ . If they are not, the driveshaft will vibrate.

### 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 IMT 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. IMT recommends true u-joint operating angles of 3° or less.

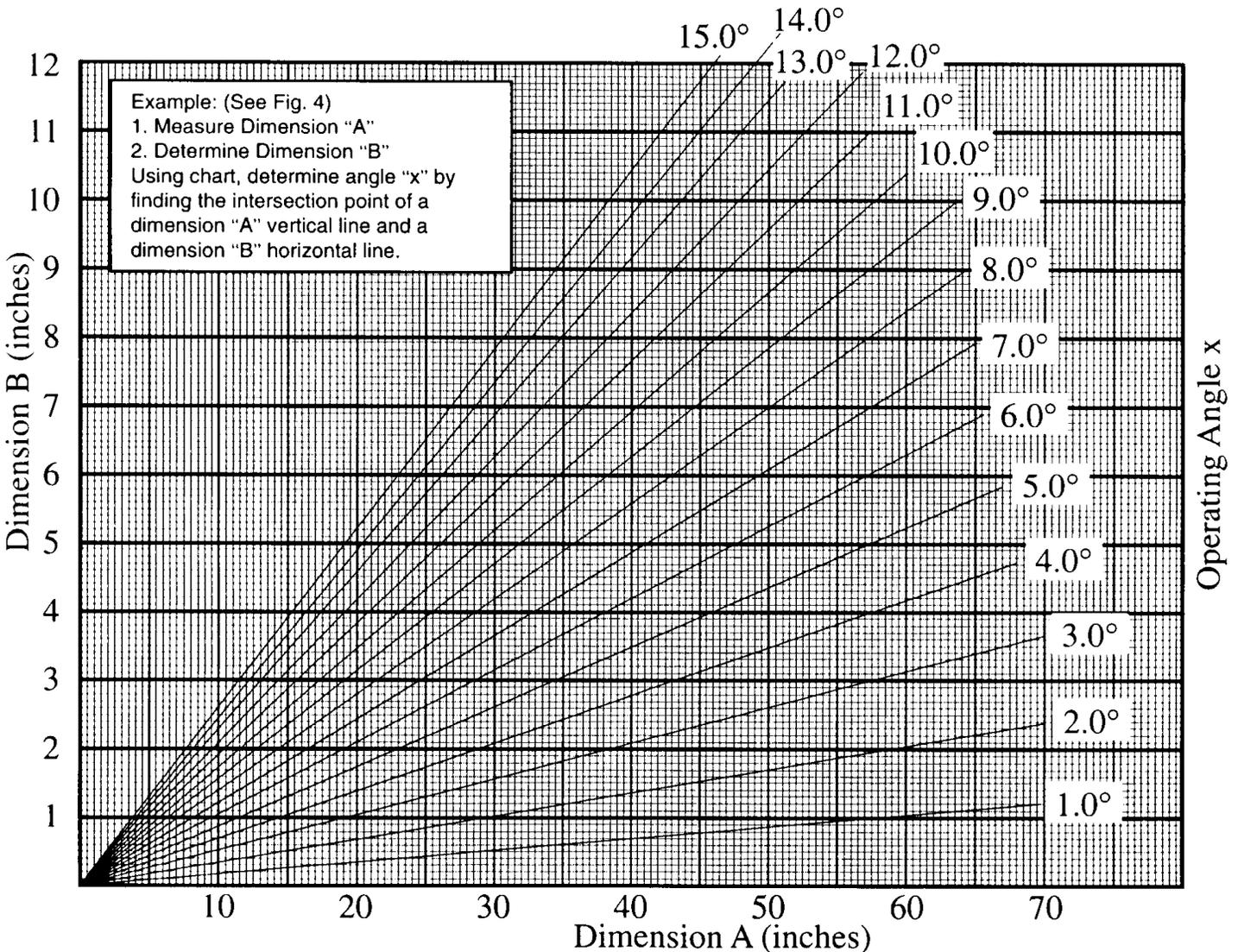
Obtain the true u-joint operating angle, as explained above, and if it is greater than 3°, compare it to the following chart.

The angles shown on the chart are the MAXIMUM u-joint operating angles recommended by IMT 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.

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

### ANGLE CHART

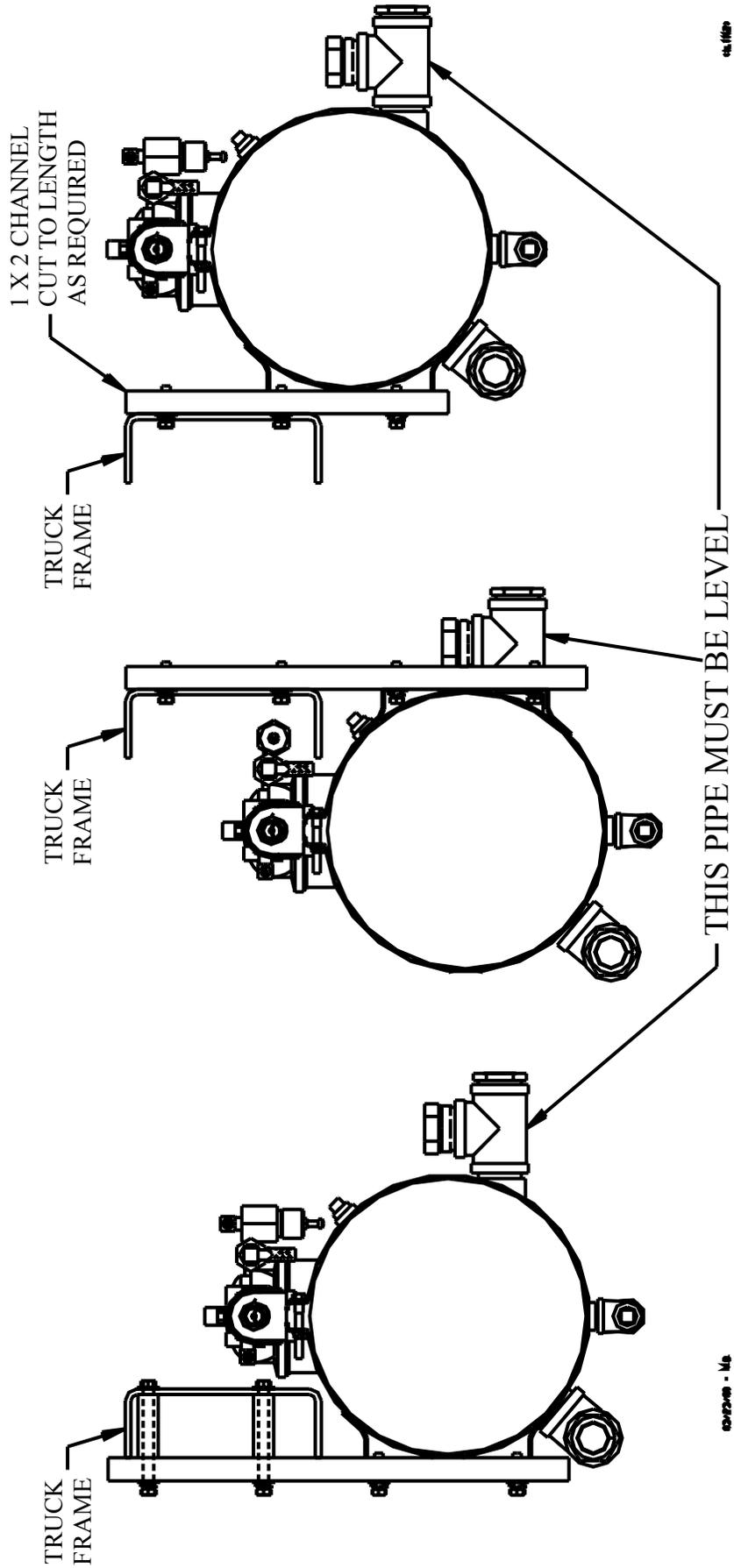
FOR DRIVESHAFTS HAVING AN ANGLE IN THE TOP VIEW







# OIL SUMP MOUNTING CONFIGURATIONS





**IMT SERIES 85  
PTO AIR COMPRESSOR  
OPERATORS, INSTALLATIONS, AND PARTS  
MANUAL**