

SAFETY PRECAUTIONS ENCLOSED

DO NOT DESTROY

This manual contains important safety information and should be made available to all personnel who operate and/or maintain this product. Carefully read this manual before attempting to operate or perform maintenance.

PRECAUCIONES DE SEGURIDAD

NO DESTRUIR

Este manual contiene Información Importante y debe estar al alcance de todo el personal que opera y/o mantiene este producto. Lea cuidadosamente este manual antes de intentar operar o efectuar cualquier mantenimiento a este producto.

INSTRUCTION MANUAL

Model V23A

Model V235

Model V235T

Model V244

Model V244T

Model V255

Model V255T

Model 7V

Model 7VT

Model 15V

Model 15VT

Model 20V

Model 20VT

Vacuum Pumps

INGERSOLL-RAND®

AIR COMPRESSORS

NOTICE

THE USE OF REPAIR PARTS OTHER THAN THOSE INCLUDED WITHIN THE INGERSOLL-RAND COMPANY APPROVED PARTS LIST MAY CREATE UNSAFE CONDITIONS OR MECHANICAL FAILURES OVER WHICH INGERSOLL-RAND COMPANY HAS NO CONTROL. INGERSOLL-RAND COMPANY SHALL BEAR NO RESPONSIBILITY FOR EQUIPMENT ON WHICH NON-APPROVED REPAIRS PARTS ARE INSTALLED.

The manufacturer reserves the right to make changes or add improvements without notice and without incurring any obligation to make such changes or add such improvements to products previously sold.

GLOSSARY

Group Assembly Parts List

Parts are listed in disassembly sequence, where applicable. Each assembly is broken down into subassemblies and detail parts which are identified with "bullet" (•) symbols in the DESCRIPTION column to indicate the relationship to the next higher assembly:

Assemblies and Detail Parts

- Attaching Parts for Assemblies and Detail Parts
- • Subassemblies
- • • Detail Parts for Subassemblies, etc.

Reference Number Column

The reference number is the number assigned to the part in the listing. The reference number corresponds to the item on the associated illustration. Where applicable, the following abbreviations might appear in this column:

- NI Not Illustrated.
- REF Reference Only. Refer to the figure and page noted in the description column.

Part Number Column

All numbers listed in this column are INGERSOLL-RAND part numbers, and must be specified when ordering replacement parts. The following abbreviations appear in this column:

- NA Not Applicable. This abbreviation indicates items which are not used on particular models or packages.
- NSS Not Sold Separately. These items must be ordered under the next higher assembly, or, where applicable, as part of a Step Saver Kit.
- Consumable Materials (lubricants, sealants, etc.). Purchase directly from your local INGERSOLL-RAND Air Center or Full Service Distributor.
- ** Part Number Varies. Specify the compressor bare speed and complete nameplate data when ordering.

Description Column

The description column indicates the item by standard name followed by modifiers. The modifiers identify specific characteristics (i.e. dimensions, capacity, pressure setting, etc.), and/or the particular location or function on the compressor. Always include the description when ordering replacement parts or kits.

Quantity Per Assembly Column

Quantities listed in this column reflect the number used in the next higher assembly, and are not necessarily the total quantity of the part used in the complete package. Specify the desired quantity when ordering replacement parts.

Recommended Spares Column

Quantities listed in this column reflect the number of each item which we recommend be kept on hand for maintenance or repair.

- CLASS 1 MINIMUM. Recommended quantity for Domestic Service where interruptions in service are not important.
- CLASS 2 AVERAGE. Recommended quantity for Domestic Service where interruptions in continuity of service are not objectionable.
- CLASS 3 MAXIMUM. Recommended quantity for International or Domestic Service where interruptions in service are not acceptable.

Step Saver Kits

Step Saver Kits are available for all compressor models. These kits are designed to provide all of the parts you will need to perform routine maintenance and repair tasks. A list of available Step Saver Kits is included in the Parts List manual which came with your compressor. When ordering Step Saver Kits, please follow the instructions set out below for ordering replacement parts.

ORDERING INSTRUCTIONS

All parts listed in the Part List manual for your compressor are available through your local INGERSOLL-RAND Air Center or Full Service Distributor. Consult the Directory of Distributors included with your compressor to locate the distributor in your area.

When ordering replacement parts or Step Saver Kits, please specify:

1. The MODEL and SERIAL NUMBER as stamped on the compressor nameplate.
2. The FORM NUMBER of the Parts List manual.
3. The QUANTITY, DESCRIPTION and PART NUMBER exactly as listed.

EXAMPLE

Send the following parts for model	7100
Serial Number	T30000000
Literature Form Number	SCD-478A
1 Switch, Pressure - NEMA 1	37005907
2 Element, Filter	32012957
1 Gauge, Pressure	32013872

NOTA

EL USO DE PARTES PARA REPARACION DIFERENTES A LAS INCLUIDAS EN LA LISTA DE PARTES APROBADA DE INGERSOLL-RAND PUEDE CREAR CONDICIONES INSEGURAS O FALLAS MECANICAS SOBRE LAS CUALES INGERSOLL-RAND NO TIENE CONTROL. POR LO TANTO INGERSOLL-RAND NO PUEDE SER RESPONSABLE POR EQUIPOS EN LOS QUE SE HAN USADO PARTES NO APROBADAS.

El fabricante se reserva el derecho a hacer cambios o adicionar mejoras sin notificación y sin incurrir en la obligación de hacer dichos cambios o adicionar tales mejoras a productos vendidos previamente.

GLOSARIO

Lista de Partes de Conjuntos de Ensamble

Las partes están listadas en secuencia de desarme en donde sea aplicable. La relación de un artículo con su más alto e inmediato ensamble está indicado por una indentación (•). Por ejemplo en la columna de DESCRIPCIÓN:

Ensamblajes y partes detalladas

- Partes para ensamblajes y partes detalladas
- • Subensamblajes
- • • Partes detalladas para sub-ensamblajes etc.

Columna de Ítems

El número de ítem es el asignado a la parte en el listado. Este número de ítem identifica la parte en la ilustración asociada. Las abreviaturas siguientes podrían aparecer en esta columna:

- NI No ilustra.
- REF Para la referencia. Refiera a la página e ilustración apropiada.

Columna de Número de Parte

Todos los números son números de parte INGERSOLL-RAND los cuales deben ser especificados cuando se ordenen los repuestos. Las abreviaturas siguientes podrían aparecer en esta columna:

- NA Significan que la parte no es aplicable a determinados modelos.
- NSS Indican que la parte no se vende por separado para determinados modelos. Las letras
- Los Materiales Consumibles (lubricantes, adhesivos, etc.). Comprad directamente desde un INGERSOLL-RAND Distribuidor de Servicio o Air Center.
- ** El Número de Parte Varía. Especifique los datos completos de compresor cuando ordena.

Columna de Descripción

Esta columna de descripción contiene el nombre del artículo estándar con modificadores. La relación de un artículo con su próximo ensamble más alto se muestra en esta columna por una indentación. Siempre incluir la descripción cuando ordena conjuntos o partes de reemplazo.

Columna de Cantidad Por Ensamble

Las cantidades especificadas en esta columna son el número de partes usadas por cada ensamble superior y no necesariamente son el número total de partes del modelo en general. Especifique la cantidad deseada cuando partes ordenadoras de reemplazo.

Como Seleccionar Repuestos Recomendados

Este catálogo contiene una lista de partes que está incluidas en cada una de las siguientes clases de repuestos recomendados:

- CLASE 1 MINIMA. Sugerida para uso doméstico donde interrupciones en la continuidad del servicio no son importantes.
- CLASE 2 PROMEDIO. Sugerida para servicio doméstico donde algunas interrupciones en la continuidad del servicio no son objetables.
- CLASE 3 MAXIMA. Sugerida para exportación o para servicio doméstico donde la interrupción en el servicio es objetable.

Conjuntos de Partes

Los conjuntos de Partes son disponibles para todos los compresores. Estos conjuntos se diseñan para proveer todas las partes que usted necesitará desempeñar el mantenimiento de rutina y reparar tareas. Una lista de Conjuntos disponibles se incluye en el lista de partes que vino con su compresor. Cuando se ordenen repuestos recomendados o kits prácticos, siga el procedimiento descrito para partes del compresor.

INSTRUCCIONES DE ORDEN DE COMPRA

Todas las partes enumeraron en el Lista de Partes para su compresor son disponibles mediante su Air Center o Distribuidor de Servicio de INGERSOLL-RAND. Consulte el Directorio de Distribuidores incluyó con su compresor para ubicar el distribuidor en su área.

Cuando se ordenen repuestos, por favor especifique:

1. El MODELO y NUMERO DE SERIE como está impreso en la placa del compresor
2. El NUMERO DE FORMATO de la lista de partes.
3. La CANTIDAD, DESCRIPCION y NUMERO DE PARTE exactamente como fue listado.

EJEMPLO

Envíe las siguientes partes para un modelo	7100
Número de Serie	T30000000
Número de formato de la literatura	SCD-478A
1 Interruptor, Presión	37005907
2 Elemento, Filtro	32012957
1 Manómetro	32013872

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SECTION I GENERAL DESCRIPTION

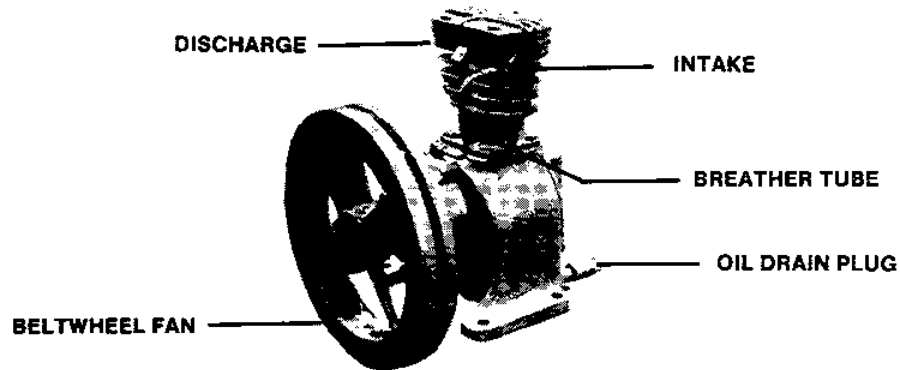


Figure 1-1. Model V23A Single-Stage Single Cylinder Vacuum Pump.

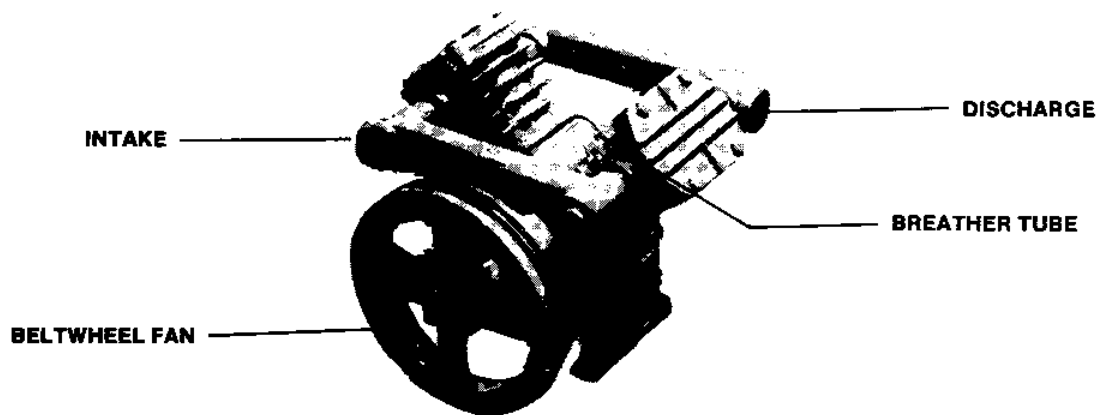


Figure 1-2. Models V235, V244, V255 Single-Stage, Two Cylinder Vacuum Pump.

GENERAL DESCRIPTION

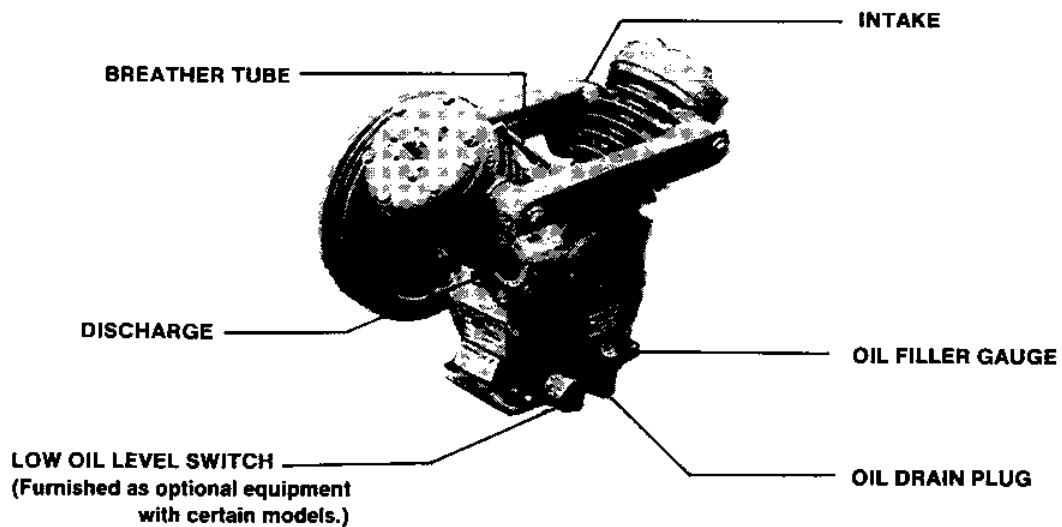


Figure 1-3. Model 7V Single-Stage, Two Cylinder Vacuum Pump.

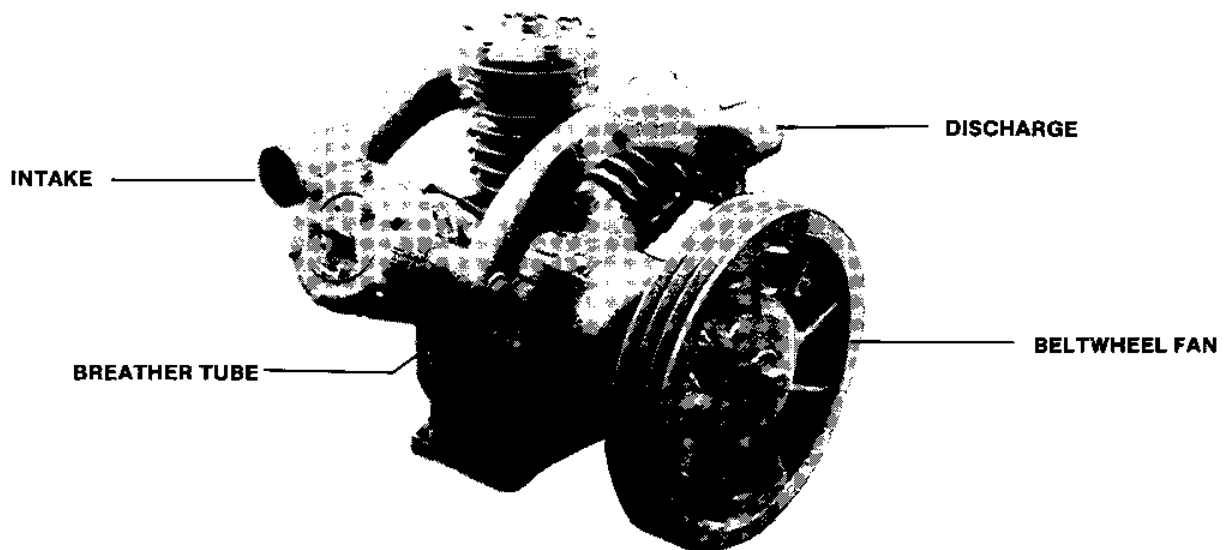


Figure 1-4. Model 15V Single-Stage, Three Cylinder Vacuum Pump.

GENERAL DESCRIPTION

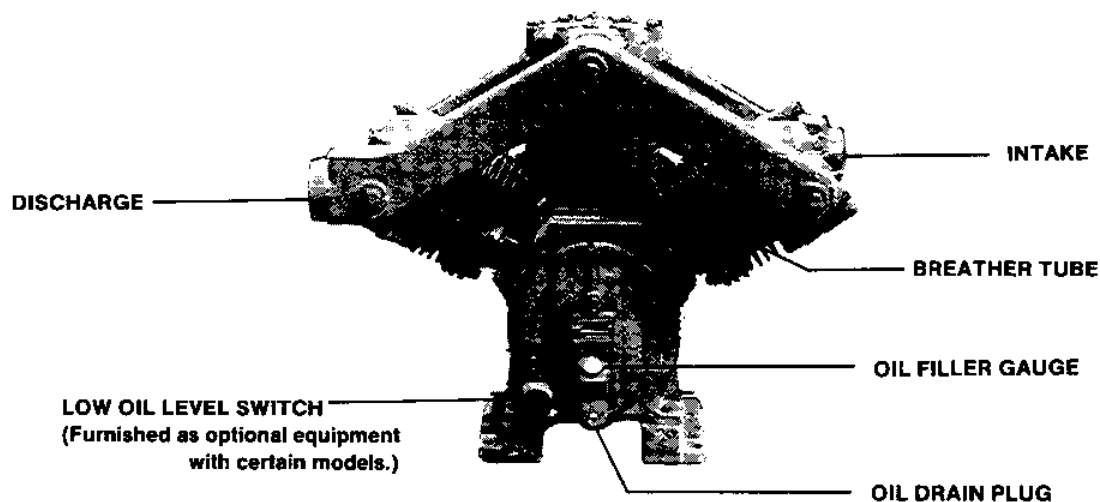


Figure 1-5. Model 20V Single-Stage, Three Cylinder Channel Valve Vacuum Pump.

APPLICATION

Ingersoll-Rand's $\frac{3}{4}$ Horsepower (.5 KW) through 20 Horsepower (14.9 KW) units are either single or two-stage, single-acting, air-cooled vacuum pumps that do not require installation on a special foundation. All models can be furnished as compact, self-contained, receiver-mounted units, automatically regulated and driven by an electric motor. The models are also sold as bare or baseplate-mounted compressors.

They can be furnished as either single-stage or two-stage compound machines. Single-stage units are rated to pull a vacuum to 29 inches (0.98 bar) of mercury. Compound units are rated to pull vacuums to 29.65 In. Hg. (1.004 bar.). Compound units are preferred above 28 inches (0.948 bar.) of mercury.

The piston displacement range is 8.0 to 294 CFM (.23 to 8.33 m³/min.) for single-stage units and 9.0 to 196 CFM (.255 to 5.55 m³/min.) for two-stage units.

SINGLE-STAGE OPERATION

Any vacuum pump with cylinders of the same bore size (regardless of the number of cylinders) are a single-stage machine. See Figure 1-6. Single-stage vacuum pumps are either single-cylinder machines or multiple cylinder machines with the inlet side of each cylinder connected to a common manifold. See Figure 1-6. The basic principle of operation of a single-stage

vacuum pump follows: On the suction stroke of the piston(s), air or gas is drawn from the chamber being evacuated into the cylinder(s) through the inlet manifold and inlet valve(s) located in the air head(s). On the upward stroke of the piston(s), the inlet valve(s) closes and the discharge valve(s) opens, permitting the air that was evacuated from the chamber to be exhausted through the discharge valve(s) either to atmosphere or to a recovery system. A silencer (optional) may be installed in the discharge of units discharging to atmosphere.

Efficient oil control is established by a direct connection between the intake (vacuum) side of the system and the interior of the crankcase through a breather tube. As a result, a pressure balance is created between both sides of the pistons which minimizes loss of oil past the piston rings. In addition, the crankcase vacuum tends to keep the oil dry by flashing off condensable vapors that may be pulled over from the system.

For maintaining the vacuum within predetermined limits, the pump may be manually controlled, relief valve controlled, or regulated by automatic start and stop control. With this latter type of regulation, a vacuum switch is tapped into the system under vacuum and wired back to the driving motor. Changes in vacuum will make and break the electrical circuit, automatically starting and stopping the driving motor, thereby maintaining the vacuum within the prescribed limits.

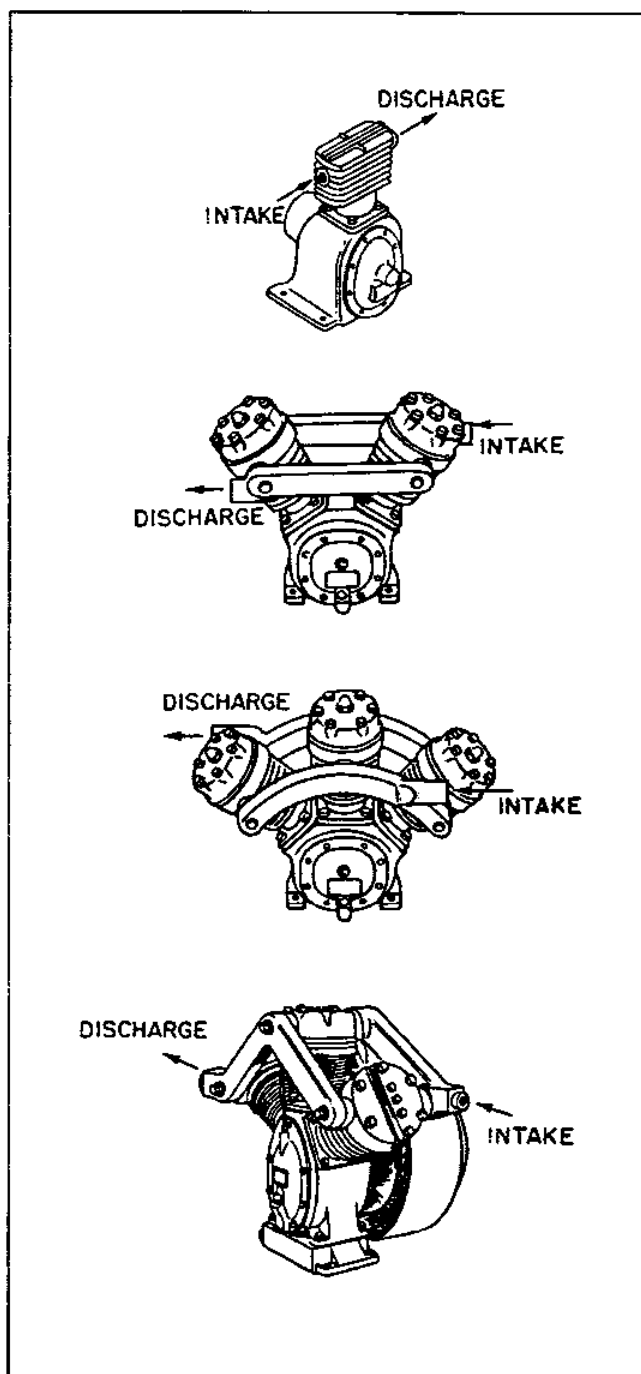


Figure 1-6. Single-Stage Vacuum Pumps.

TWO-STAGE OPERATION

The Vacuum Models with "T" designations are two-stage machines consisting of one or two first-stage cylinders with the same bore size and one second-stage cylinder with a smaller bore size.

Any unit with more than one cylinder and the manifold arrangements shown in Figure 1-7 is a two-stage vacuum pump. Two-stage vacuum pumps pull higher vacuums than single-stage units and operate as follows: On the suction stroke of the first stage piston(s), air or gas is drawn from the chamber being evacuated and enters the first-stage cylinder(s) through the inlet valve(s) located in the air head(s). The discharge stroke of the first-stage piston(s) occurs partly during the suction stroke of the second-stage piston and since these two stages are connected through the interstage manifold, the first-stage cylinder(s) are put under a vacuum by the second-stage. This action increases volumetric efficiency and contributes to a higher final vacuum.

The discharge stroke of the second-stage piston then discharges the air either to atmosphere or to a recovery system. A silencer (optional) may be installed in the discharge of units discharging to atmosphere.

Efficient oil control is established by a direct connection between the interstage manifold and the interior of the crankcase through a breather tube. As a result, a nearly equal pressure balance is created between both sides of the low-stage piston(s) which minimizes loss of oil past the piston rings. In addition, the crankcase vacuum tends to keep the oil dry by flashing off condensable vapors that may be pulled over from the system.

For maintaining the vacuum within predetermined limits the pump may be manually controlled, relief valve controlled or regulated by automatic start-and-stop control. With this latter type of regulation, a vacuum switch is tapped into the system under vacuum and wired back to the driving motor. Changes in vacuum will make and break the electrical circuit, automatically starting and stopping the driving motor, thereby maintaining the vacuum within the prescribed limits.

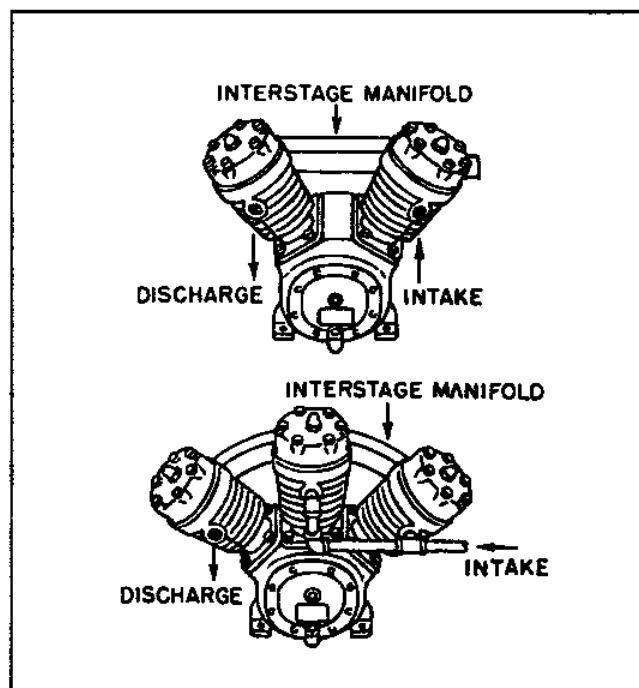


Figure 1-7. Two-Stage Vacuum Pumps.

SECTION II

INSTALLATION AND START-UP RECOMMENDATIONS

Step 1.

Unload the vacuum pump from delivering vehicle — the purchaser must arrange for adequate lifting equipment at the job site.

IMPORTANT NOTE: The purchaser assumes title to the pump equipment at the manufacturers shipping dock. Immediately upon receipt of the equipment, it should be inspected for any damage that may have occurred during shipment. If damage is present, demand an inspection immediately by an inspector from the carrier. Ask him how to file a claim for damages.

Step 2.

Check vacuum pump nameplate to be sure the unit is the model and size ordered. Do this before uncrating. Check Receiver Nameplate to be sure the tank is adequate for pressure at which you intend to operate. (If receiver mounted).

Step 3.

Check motor nameplate to be sure motor is suitable for your electrical conditions (Volts-Phase-Hertz).

IMPORTANT NOTE: Do Not Use Triple Voltage 3 Phase Motor For 200-208 Voltage 3 Phase Application. Must Use 200 Volt Motor Only.

Step 4.

LOCATION & FOUNDATION

RECEIVER MOUNTED PUMPS

NOTE: Ideal ambient temperature is (70°F) (21°C).

In cold climates, it is desirable to install the vacuum pump within a heated building. Choose a clean, relatively cool location, and provide ample space around the unit for cooling and general accessibility. Place the beltwheel side toward the wall, leaving at least 15" (380mm) for air circulation to the beltwheel fan.

Select a well ventilated area and locate the pump so that the inlet piping will drain away from the cylinders. This precaution eliminates the possibility of liquid and condensibles draining into the pump and causing oil dilution and sludging which results in rapid wear of running parts.

The unit may be placed on any substantial floor or base; however, a foundation made of concrete is recommended. It is very important that the unit sets level and is supported evenly. Shim or grout up the receiver feet to provide equal support and to prevent placing a strain on the receiver when the foundation bolts

are tightened. Foundation bolts should project above their nuts by at least 1/2" to allow for leveling. After the foundation bolts are tightened, recheck to make certain the unit sets level.

The unit must be levelled and bolted in a manner which avoids pre-stressing the receiver in order to prevent vibration and insure proper operation. The following technique is recommended for anchoring this unit:

- Tighten evenly, and to a moderate torque, the nuts of any three of the four receiver feet. Check the unit for level. If the unit is not level, insert metal shims, as shown in Figure 2-2, under one or two of the feet to obtain level, and retighten the nuts.
- Note the distance the unanchored foot is elevated above the base and insert a metal shim of equal thickness under this foot to provide firm support. Shims must be at minimum the same dimension as bottom of foot.
- After all shims are inserted and the unit is level, pull up the nuts on all receiver feet to a moderate (not excessively tight) torque.
- Check for receiver stress by loosening nuts (one at a time), and note any upward movement of the mounting foot. Any noticeable movement indicates that step B must be repeated.

Severe vibration will result when nuts are pulled down tightly and feet are not level. This can lead to welds cracking or fatigue failure of receiver. This is a very important part of installation.

BASE-PLATE MOUNTED PUMPS

The baseplate may be bolted to any substantial, relatively level floor or base. If such a surface is not available, an adequate base must be constructed. Should a concrete base be necessary, make certain the foundation bolts are positioned correctly to accept the baseplate feet, and that these bolts project at least 1" (25.4 mm) above the surface of the foundation.

The baseplate must be levelled and bolted in a manner which avoids pre-stressing the baseplate in order to prevent vibration and insure proper operation. The following technique is recommended for anchoring the base-plate to the foundation.

- Tighten evenly, and to a moderate torque, the nuts of any three of the four baseplate feet, and check for level. If the baseplate is not level, insert metal shims under one or two of the feet to obtain level, and retighten the nuts.
- Note-the distance the unanchored foot is elevated above the base and insert a metal shim of equal thickness under this foot to provide firm support. Shims must be at minimum the same dimension as bottom of foot.
- After all shims are inserted and the baseplate is level, tighten the nuts on all baseplate feet to a moderate (not excessively tight) torque.
- Check for baseplate stress by loosening nuts (one at a time), and note any upward movement of the mounting foot. Any noticeable movement indicates step B must be repeated.

Severe vibrations will result when nuts are pulled down tightly and feet are not level. This can lead to welds cracking or fatigue failure of baseplate. This is a very important part of installation.

THE PUMP SHOULD NEVER BE OPERATED WHILE MOUNTED TO THE SHIPPING CRATE SKID.

If the pump is to operate in an explosive atmosphere or if it is exposed to appreciable quantities of water, oil dirt, acid or

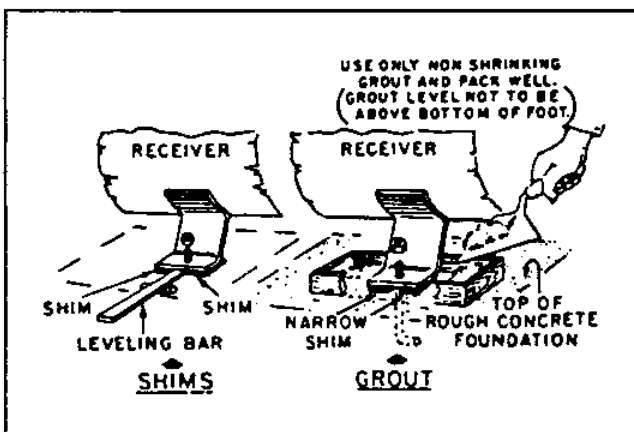


Figure 2-1. Methods of Leveling Unit.

alkaline fumes, the motor must be specially constructed. Special equipment is available from your local Ingersoll-Rand Distributor.

Step 5.

ELECTRICAL WIRING

(See Electrical Diagrams on Page 20 and 21.)

To avoid invalidating your fire insurance, it is advisable to have the electrical work done by a licensed electrician who is familiar with the regulations of the National Electrical Code and the requirements of the local code.

The wire sizes recommended in the following tables are suitable for the vacuum pump unit. If other electrical equipment is connected to the same circuit, the total electrical load must be considered in selecting the proper wire sizes. A burned out motor due to low voltage may result unless it is properly protected.

Before wiring the vacuum pump to the power supply, the electrical rating of the motor, as shown on the motor nameplate, must be checked against the electrical supply. If they are not the same, do not connect the motor.

It is important that the wire used be the proper size and all connections secured mechanically and electrically. The size of the wire shown in the table below is a safe guide.

**Sizes of copper wire to use for distances
up to 50 feet (15.3 m) from the feeder—60 Hertz.**

MOTOR HORSEPOWER	VOLTAGE—AWG-(75°C)					
	SINGLE PHASE		THREE PHASE			
	115	230	200	230	460	575
¾	12	14	14	14	14	14
1	12	14	14	14	14	14
1½	10	14	14	14	14	14
2	10	14	14	14	14	14
3	6	10	14	14	14	14
5	4	8	10	12	14	14
7½	1	6	8	10	14	14
10	—	—	8	8	12	14
15	—	—	4	6	10	10
20	—	—	3	4	8	10

**Sizes of copper wire to use for distances
up to 50 feet (15.3 m) from the feeder—50 Hertz**

MOTOR HORSEPOWER	VOLTAGE—AWG-(75°C)					
	SINGLE PHASE		THREE PHASE			
	110	220	190	220	380	440
¾	12	14	14	14	14	14
1	10	14	14	14	14	14
1½	10	14	14	14	14	14
2	6	10	12	14	14	14
3	4	8	10	12	14	14
5	1	6	8	10	12	14
7½	—	4	8	8	12	14
10	—	—	4	6	8	10
15	—	—	3	4	6	8
20	—	—	1	2	4	6

If the distance is more than 50 feet (15.3 m), larger wire will probably be necessary and your electrical contractor or local electric company should be consulted for recommendations. The use of too small wire results in sluggish operation, unnecessary tripping of the overload relays or blown fuses.

Step 6.

FUSES

Fuse failure usually results from the use of fuses of insufficient capacity. If fuses are the correct size and still fail, check for conditions that cause local heating, such as bent, weak or corroded fuse clips. Refer to the table below for recommendations on the proper fuse size to be used. Also refer to the regulations of the National Electrical Code and requirements of the local code.

**DUAL ELEMENT FUSE SIZE—60 HERTZ
UL CLASS RK-5 600V**

MOTOR HORSEPOWER	VOLTAGE					
	SINGLE PHASE		THREE PHASE			
	115	230	200	230	460	575
¾	20	10	6.25	5.6	2.8	2.0
1	25	12	7	6.25	3.2	2.5
1½	35	17.5	10	8	4	3.2
2	40	20	12	10	5.6	4.5
3	60	30	17.5	15	8	6.25
5	80	40	30	25	12	10
7½	—	60	40	30	17.5	15
10	—	—	50	45	25	17.5
15	—	—	80	70	35	25
20	—	—	100	90	45	35

**DUAL ELEMENT FUSE SIZE—50 HERTZ
UL CLASS RK-5 600V**

MOTOR HORSEPOWER	VOLTAGE					
	SINGLE PHASE		THREE PHASE			
	110	220	190	220	380	440
¾	25	12	7	6.25	3.2	2.5
1	35	17.5	10	8	4	3.2
1½	40	20	12	10	5.6	4.5
2	60	30	17.5	15	8	6.25
3	80	40	30	25	12	10
5	100	60	40	30	17.5	15
7½	—	70	50	45	25	17.5
10	—	—	80	70	35	25
15	—	—	100	90	45	35
20	—	—	125	100	50	45

Step 7.

MAGNETIC STARTER/ALTERNATOR

(See Electrical Diagrams on Pages 20 and 21.)

The electrical wiring between the power supply and the electric motor varies according to the type of regulation used and the horsepower of the motor.

Vacuum pumps regulated by automatic start and stop control may use a manual starter if the motor does not exceed 1½ H.P. on 115 volts, single-phase; 3 H.P. on 230 volts, single-phase; or 3 H.P. on 230 or 460 volts, three-phase. Note: that these ratings permit the vacuum switch to be wired in series with the motor leads, since the motor current does not exceed the rating of the switch.

Vacuum pumps using motors with higher horsepower ratings than those listed above, must be equipped with a magnetic starter. Note that the Vacuum Switch, the Oil Level Switch and the On-Off Switch are wired to the operating coil of the magnetic starter and serves to interrupt current flow to the motor.

All starters must include thermal overload protection to prevent possible motor damage from overloading. These starters are furnished with the manufacturer's instructions for installation. Ingersoll-Rand cannot accept responsibility for damages arising from failure to provide adequate motor protection.

Duplex Models may be equipped with alternating control circuits for equalizing operation of both vacuum pumps.

Step 8 LOW OIL LEVEL SWITCH

(Furnished as optional equipment with certain models.)

A float activated switch may be installed to protect your vacuum pump against damage due to insufficient oil level. The switch operates on a fail-safe principle and is mechanically actuated for sealed, friction-less operation. Low oil level in the frames causes the switch contacts to open, thus shutting the unit down until the proper oil level has been restored.

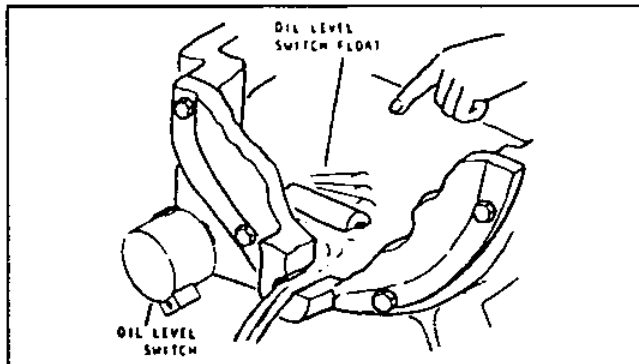


Figure 2-2. Typical Low Oil Level Switch.

The Low Oil Level Switch is a single pole, double throw snap switch, available with an optional NEMA 1 or NEMA 7 enclosure. (See Wiring Diagram on Page 20 and 21 for connection of the Low Oil Level Switch.)

NEMA 1 ENCLOSURE: This switch has a maximum rating of 5 amps at 125, 250 or 480 volt operation and uses a 3/8" nominal size flexible steel conduit, of a length as required, over the switch lead wires. The switch is not acceptable for greater than 480 volts.

NEMA 7 ENCLOSURE: This switch has a maximum rating of 4 amps at 250 volt operation and is equipped with a 1/2" NPT non-removable fitting.

WARNING

Hazardous voltage.

Connecting vacuum switch or low oil level switch directly to motor can cause severe injury or death.

Always insure the vacuum switch or low oil level switch is connected through the control circuit of a magnetic starter.

This is a "float" type switch. Sometimes gets cocked in shipping. If cocked or stuck, disconnect switch, drain remaining oil, remove crankcase cover and then free the float. Reassemble and then reuse the same oil.

IF FLOAT IS COCKED IN THE LOW POSITION, COMPRESSOR CANNOT START.

Proper protection against low oil levels depends on proper adjustment of the low oil level switch.

During the initial run, stop unit and drain one quart of oil from crankcase into clean can, and listen for switch to click or check with continuity tester.

Step 9. VACUUM PUMP START UP

Do not connect the vacuum pump piping to your system at this time.

- Fill the crankcase to the proper level with the correct grade of lubricating oil. Use a petroleum based oil for the initial start-up. (See Page 13 for Lubrication Specifications.) Tighten the oil plug. **HAND TIGHTEN ONLY.**
- Check vacuum pump rotation by flicking "Start-Stop" switch. Rotation is shown by arrow on belt guard back. If rotation is incorrect, interchange two of the three leads on three phase motors. On single phase motors, refer to reverse wiring diagram on motor name plate.

Your vacuum pump should now be ready for the initial startup and checks. Close the service valve and start the pump.

IF YOUR PUMP DOES NOT OPERATE PROPERLY, SHUT-DOWN IMMEDIATELY, AND CALL YOUR LOCAL INGERSOLL-RAND DISTRIBUTOR.

Allow the air receiver to build to the vacuum for which you ordered the machine. At this vacuum, the vacuum switch should cause the unit to stop. If the unit does not Start and Stop at the correct pressure, you may need to adjust the Vacuum Switch. (See Section III, Regulation, if adjustments are necessary).

Run the Vacuum Pump for about 10 minutes by closing the service valve on the receiver to let the unit warm up and observe for excess vibration or any unusual noise. Retorque all head bolts to 75 Ft. Lbs. (102 Nm.). Dry Torque.

Step 10. VACUUM PUMP PIPING

The location of the intake and discharge connection for the various type vacuum pumps is shown in Section I. For efficient, trouble free operation, the following recommendations are to be observed when connecting the vacuum pump to the chamber being evacuated. The general arrangement drawing shown in Figure 2-3, is applicable to all vacuum pump types and may be used as a guide during installation.

All pipe and fittings must be certified safe for the pressure involved. Pipe thread sealant is to be used on all threads, and all joints are to be made up tightly, since small leaks in the system are the largest single cause of high operating costs. If your pump runs more than you believe it should, the most likely cause is a leaky pipe line.

- All piping should drain away from the cylinders. (Locate the pump above the chamber being evacuated).
- Piping from the chamber being evacuated to the pump must be as short and straight as possible. The connection to the chamber should be near the top and all changes in pipe direction are to be gradual to reduce friction losses. Pipe diameter must correspond to the pump intake opening diameter. Increase the diameter at least one size for every 20 feet of length. If the total length of piping is between 20 and 40 feet, we recommend that the increase in pipe diameter is made at the midpoint in length, i.e., for a 30 foot length, increase the pipe diameter at the 15 foot point.
- The interior of the intake pipe is to be clean and special care is to be taken in the threading of pipes and the selection of fittings. All joints must be absolutely tight.
- It is very important that the inlet air to the pump be kept clean at all times. Dirty, contaminated air not only reduces the capacity of the pump but also causes premature wear of working parts. All vacuum pumps must be positively protected against water vapor, dirt, entrained moisture or corrosive gas. The use of a pipe line

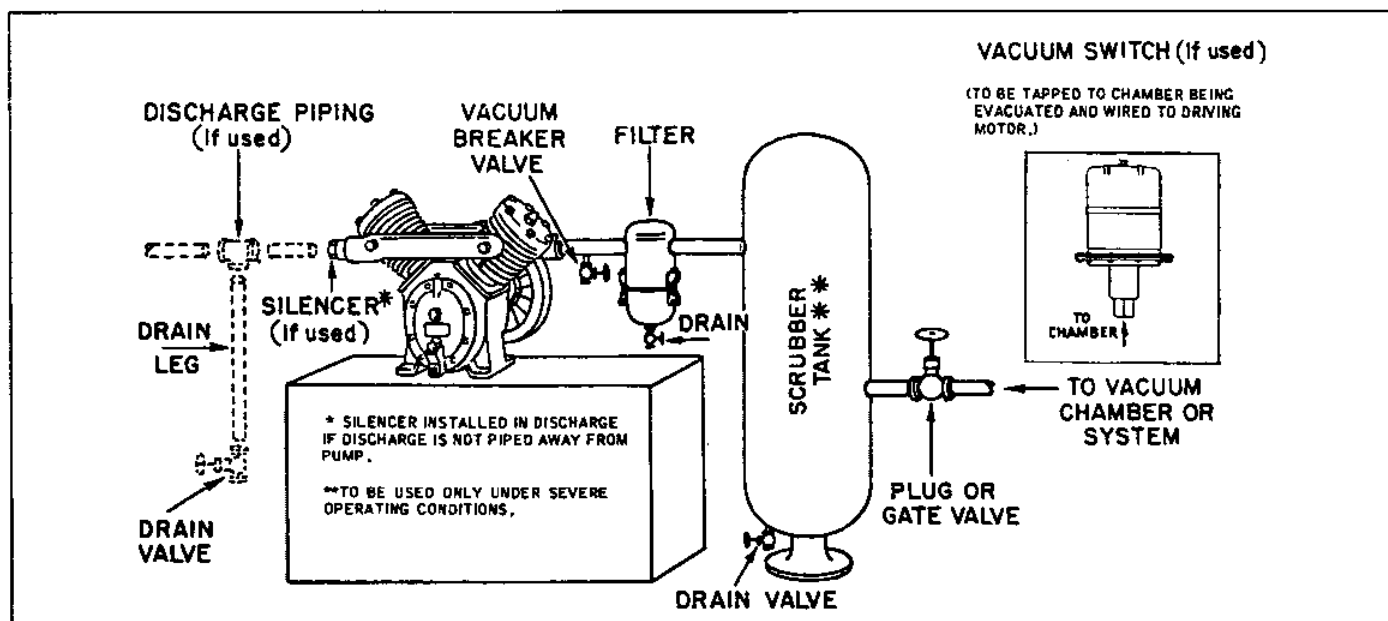


Figure 2-3. General piping arrangement for vacuum pumps (Note: The pump shown above is a single-stage model. See Section I for intake and discharge location.

filter designed for this purpose will protect the pump against these elements under average service conditions. The filter selected should combine extra large filtering area and capacity with low flow resistance. Install the filter close to the pump intake as shown in Figure 2-3, and make certain the air flow through it is in the direction indicated by the arrow on the filter housing. Note: If the pump is required to evacuate a moist or liquid filled chamber and there is a possibility of an abnormal quantity of liquid being drawn into the cylinders, a scrubber tank should be installed next to and ahead of the filter. The scrubber tank is merely a large volume chamber that traps and collects liquid as air passes through it. Always install a drain valve in the bottom of the tank. See Figure 2-3, for general installation recommendations covering the scrubber tank.

(5.) To facilitate servicing and maintenance, a full size plug or gate valve is to be installed on the vacuum system side of the filter. If a scrubber tank is used, install the valve on the vacuum system side of the tank. In addition, a small vacuum breaker valve is to be installed between the larger plug or gate valve and the vacuum pump intake. See Figure 2-3.

(6.) If the discharge is to be piped away from the pump, use the same diameter pipe as the discharge connection and make provision for draining condensate from this line by either sloping the piping down from the pump or installing a suitable condensate trap in the line. Note: the silencer (if used) may be removed from the pump discharge and installed in the end of the discharge pipe.

VACUUM SWITCH & GAUGE: (See Regulation Section on Page 12.) A vacuum switch and/or gauge are factory installed only if so indicated on your order. If the customer intends to install these items in the system, observe the following instructions.

(1.) Install the vacuum switch and/or gauge at a point in the system that registers the actual vacuum being pulled, such as the vacuum chamber. Do not install these items in a position or locations that will permit condensate to drain into them and keep the connecting tubing as short and direct as possible.

(2.) The vacuum switch may be mounted in any position and supported by the connecting piping or its mounting bracket. Wire the switch to the motor or magnetic starter according to the schematic diagram on Page 20 or Page 21. Also see schematic diagram accompanying the switch.

Step. 11

COMPLETE WARRANTY REGISTRATION

Completion of the registration form indicates satisfactory installation and performance of start-up operations. If any defects are apparent in the equipment; contact the nearest I-R Distributor or Ingersoll-Rand District office. The I-R service literature included with the unit has instructions for minor adjustments. Minor adjustments are not considered warranty.

SECTION III REGULATION

TYPES OF REGULATION

(See Wiring Diagrams on Page 20 and 21.)

For maintaining the vacuum within predetermined limits, the pump may be manually controlled, relief valve controlled, or regulated by automatic start and stop control.

MANUAL CONTROL

This is an economical type of control which is used when the operator desires the pump to deliver a steady one rate vacuum.

Manual Control is obtained by means of a manual control valve on the inlet of the vacuum pump, the air receiver, or scrubber tank. This valve can be throttled to any desired vacuum (Such as 23 or 25 inches HG.), and the vacuum will continue to run and pull this vacuum.

RELIEF VALVE CONTROL

This type of regulation is used when the demand for the vacuum is practically constant at the capacity of the vacuum pump.

Relief Valve Control is obtained by means of a vacuum relief valve that controls the operation of the vacuum pump. The

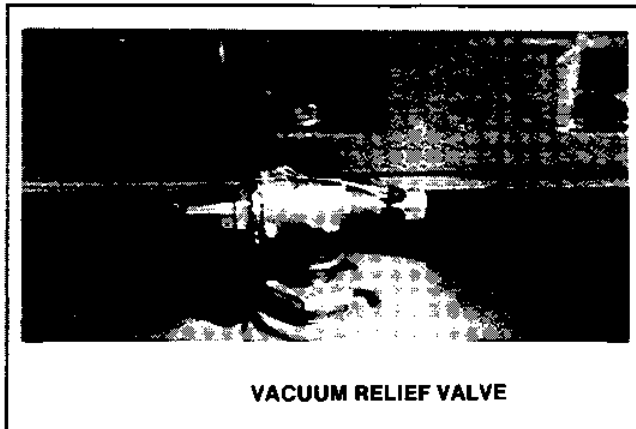


Figure 3-1. Typical Vacuum Relief Valve.

vacuum relief valve allows controlled atmospheric pressure to enter the receiver, therefore, automatically holding the receiver or system at the desired vacuum. This action maintains the receiver within definite limits while the vacuum pump continues to operate. The vacuum relief valve is piped directly to the receiver. When the receiver pressure reaches the pre-set unload pressure, the valve is actuated.

AUTOMATIC START AND STOP CONTROL

This type of regulation is used when the demand for air is small or intermittent, but where pressure must be continuously maintained.

Automatic Start and Stop Control is obtained by means of a vacuum switch which makes or breaks an electrical circuit, starting and stopping the driving motor, thereby maintaining the air receiver pressure within definite limits. The vacuum switch is piped to the receiver and is actuated by changes in air receiver pressure.

Automatic Start and Stop should only be used when motor starts no more than 6-8 times per hour.

VACUUM SWITCH

(Furnished as optional equipment with certain models.)

(See Wiring Diagrams on Page 20 and 21).

The vacuum switch automatically regulates the vacuum pump, starting and stopping the driving motor at predetermined settings. To adjust the switch, refer to Figure 3-2.

MOUNTING — Under conditions of moderate vibration and if connected to a short length of rigid steel pressure pipe, this switch may be mounted and supported by its pressure connector.

RANGE ADJUSTMENT — Always adjust the range adjustment nut first until the desired higher vacuum operating point is obtained. Keep in mind this adjustment changes both the high and low operating points but should always be used to set the higher vacuum operating point. Turning the range adjustment nut clockwise will decrease (lower vacuum) both operating points.

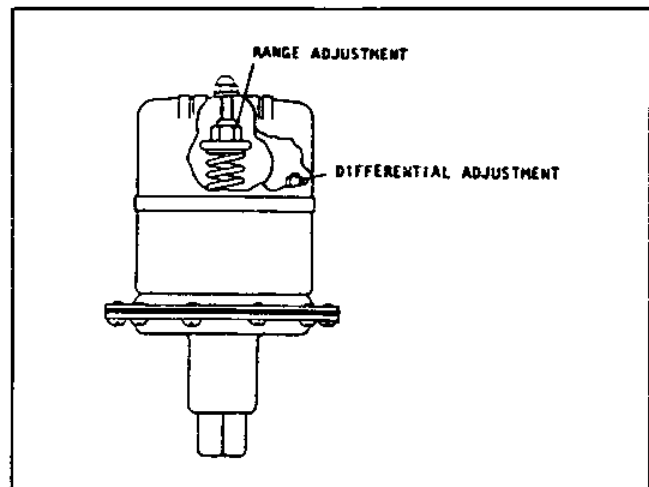


Figure 3-2. Typical vacuum switch cut-in and cut-out adjustment.

DIFFERENTIAL ADJUSTMENT — Then set the lower vacuum operating point by adjusting the differential adjustment nut. Turning the differential adjustment nut clockwise increases the vacuum difference between the high and low operating points by decreasing the lower vacuum point only.

SECTION IV OPERATION

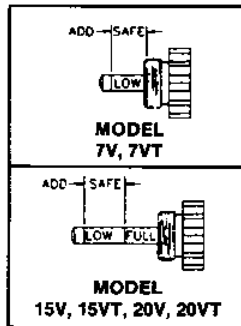
OPERATING CHECKS

Satisfactory operation of any piece of mechanical equipment depends, to a large degree, upon adherence to a preventive maintenance schedule.

To obtain optimum performance at minimum cost, observe the "Maintenance" guide on page 15.

COMPRESSOR LUBRICATION

Check the oil level in the bare compressor before each use by removing the oil filler plug and wiping clean. For Models V23A, V235, V235T, V244, V244T, V255, and V255T the oil should be level with the top thread of the oil filler hole. For Models 7V, 7VT, 15T, 15VT, 20V, 20VT, place the oil gauge with the writing up into the filler hole until the threads touch (DO NOT ENGAGE THE THREADS.) Remove the gauge and read the oil level. If oil level drops below the safe point, add oil to bring level back to the FULL mark. Do not over fill. Replace oil plug HAND TIGHTEN ONLY.



FRAME OIL CHANGE

Oil changes should be made every 500 hours of operation or every 90 days, whichever occurs first. Important: For maximum removal of impurities, drain only when frame oil is hot. After the operator has observed the condition of the oil from a number of changes, the length of time between changes may be extended if so warranted.

Frame oil capacities are as follows:

Models V23A, V235, and V235T 7/8 quart (0.83 liters).
Models V244, and V244T 1-3/4 quarts (1.66 liters).
Models V255, and V255T 2-1/2 quarts (2.37 liters).
Models 7V, and 7VT 2-1/2 quarts (2.37 liters).
Models 15V, 15VT, 20V, and 20VT 5 quarts (4.73 liters)

WARNING



Flushing vacuum pump frame with gasoline, kerosene or flammable fluid. Can cause severe injury or death.

Use a regular flushing oil to flush out vacuum pump frame.

LUBRICATING OIL RECOMMENDATIONS

Ingersoll-Rand does not recommend any particular brand of oil, but a petroleum lubricating oil is preferred in this particular type of vacuum pump. The petroleum lubricating oil should be a non-detergent, containing only rust, oxidation, and anti-foaming inhibitors with either a naphthenic or paraffinic base.

The viscosity should be selected for the temperature immediately surrounding the unit when it is in operation.

The viscosities given in the following table are intended as a general guide only. Heavy-duty operating conditions require

heavier viscosities, and where borderline temperature conditions are encountered the viscosity index of the oil should be considered. Always refer your specific operating conditions to your industrial lubricant supplier for recommendations.

OIL VISCOSITY TABLE

Temperature Range	Viscosity at 100°F (37.8°C)		Viscosity Grade
	SUS	Centistokes	
40°F & Below (4.4°C & Below)	150	32	32
40°F & 80°F (4.4°C to 26.7°C)	500	110	100
80°F to 125°F (26.7° to 51.7°C)	750	165	150

BREATHER TUBE

The breather tube connects the interior of the frame to the inboard side of the vacuum pump. This connection permits pulsations, created by the reciprocating action of the pistons, to be vented to intake, thus preventing any vacuum build up within the frame.

MOTOR LUBRICATION & CARE

Depending upon the type of electric motor driving your unit, the following lubricating schedule should be observed.

BALL BEARING MOTORS WITH GREASE FITTINGS - Ball bearing motors that have grease fittings and plugs near the bearings are to be repacked with grease once a year. Use a very good grade of ball bearing grease.

BALL BEARING MOTORS PRELUBRICATED FOR LIFE - These motors have no grease fitting or plugs near the bearing and do not require lubrication.

Several major points contributing to proper motor operation and care are given in the following paragraphs. For more detailed instructions, refer to the manufacturers' specific recommendations.

It is also a good practice to monthly blow off the motor windings with a jet of air to prevent an accumulation of dirt. An occasional revarnishing of the windings will greatly prolong the life of the motor.

If the motor is located in an atmosphere where it is exposed to appreciable quantities of water, oil, dirt or fumes, it must be specially constructed.

OIL CONSUMPTION CHECK

A rule of thumb for determining a "passing grade" for oil consumption is to consider consumption at or above 25 horsepower-hours per ounce to be acceptable.

To apply this rule, consider the size of machine; say a 5 hp unit uses 2 ounces of oil every 10 hours of operation. Five (5) hp x 10 hours equals 50 horsepower hours, divided by 2, equals 25 horsepower hours per ounce.

$$\frac{\text{Motor Horsepower} \times \text{Hours of Operation}}{\text{Ounces of Oil Used}} = \text{Horsepower Hours per Ounce}$$

Machines using more than one (1) ounce of oil per 25 horsepower-hours would be classed as not meeting commercial standards, and further corrective action is recommended.

SECTION V

TROUBLE GUIDE

TROUBLE	CHECK POINT NUMBERS
Oil pumping Knocks or rattles Failure to pull required vacuum Failure to come up to speed Excessively hot running Light flicker when vacuum pump runs Motor overload tripping or excessive current Abnormal piston, ring or cylinder wear Water in crankcase or rusting in cylinders Excessive starting & stopping (Automatic stop & start units)	1 - 4 - 17 - 18 14 - 15 - 16 - 18 - 19 12 - 13 - 14 - 17 - 18 7 3 - 11 - 14 - 18 7 - 8 10 - 14 - 15 - 18 2 - 3 - 5 - 10 - 17 5 - 6 12 - 13 - 14
CHECK POINT NUMBERS/TROUBLE CAUSE	
1. Oil viscosity too low. 2. Oil viscosity too high. 3. Oil level too low. 4. Oil level too high. 5. Detergent type oil being used. Change to non-detergent type with rust and oxidation inhibitor. 6. Extremely light duty or unit located in a damp or humid location. (Vacuum pumps should pump only dry gas). 7. Check line voltage, motor terminals and starter connections for good contact, proper starter heaters. 8. Poor power regulation (unbalanced line). 9. V-Belts pulled excessively tight. 10. Dirt and grit entering intake. 11. Air to fan wheel blocked off. 12. Air leak in intake piping. 13. Air leak in vacuum pump due to faulty gaskets, loose flanges, loose intake manifold. 14. Leaking, broken, dirty, worn, or loose valves. 15. Worn or scored connecting rod, piston pin or crankpin bearings. 16. Defective ball bearing on crankshaft or on motor shaft. Loose motor fan. 17. Piston rings broken or not seated in, end gaps not staggered, stuck in grooves, rough, scratched or have excessive end gap or side clearance. 18. Cylinder or piston scratched, worn or scored. 19. Loose belt wheel or motor pulley or motor with excessive end play in shaft.	

SECTION VI MAINTENANCE

⚠ WARNING



**This machine contains high vacuum.
Can cause injury or death from
collapsing parts.**

Always relieve the vacuum from pump and vacuum receiver before removing caps, plugs, fittings, covers; etc.

⚠ WARNING



**Hazardous voltage.
Can cause severe injury or death.**

Disconnect main power before servicing vacuum pump.

MAINTENANCE OPERATION	SERVICE INTERVAL				
	Operating Hours/Months - whichever comes first				
	500/3	1000/6	1500/9	2000/12	2500/15
VACUUM PUMP					
Frame Oil Level - Check	Daily				
Inspect Oil for Contamination —Change if necessary	Monthly				
Frame Oil—Change Petroleum Lube	X	X	X	X	X
Compressor Valves - Inspect, Clean or Replace				X	
Low Oil Level Switch - Check Operation	X	X	X	X	X
Clean Cylinder Cooling Fins	Monthly				
V-BELT DRIVE					
Belt Tension - Check	Monthly				
MOTOR					
Motor Bearings - Check and Lubricate				X	
Clean	Monthly—(Weekly in Dusty Locations)				
SYSTEM					
Drain Line Filter, Scrubber Tank, Etc.	Daily				
PIPE LINE FILTER					
Inspect And Clean Element (If Necessary)		X		X	
RECEIVER					
Drain Condensate - Manual	Daily				
GENERAL					
Tighten or check all bolts (retorque)	Monthly				
Check for Unusual Noise and Vibration	Daily				
Inspect for Leaks	Monthly				

GENERAL

The maintenance section of this book covers only those operations with which maintenance personnel may not be too familiar. It is expected that the average mechanic's training and experience will permit him to perform the more common maintenance functions without the need for detailed instructions.

AIR VALVE CLEANING

(Models V23A, V235, V235T, V244, V244T, V255, V255T)

Ingersoll-Rand stainless steel finger valves are quick-acting, durable, reliable and easily serviced. Valves are readily accessible and may be removed without disturbing piping. See Figure 6-1.

To clean the valves, take out the air head cap screws and remove the head and valve plate from the cylinder. Remove the valves from the valve plate and clean both the valve and seat by brushing with a stiff bristle brush (not wire). If necessary, use a non-flammable safety solvent to loosen dirt, oil or carbon deposits. Should it be necessary to scrape, do so lightly to prevent marring the valve or seating surface.

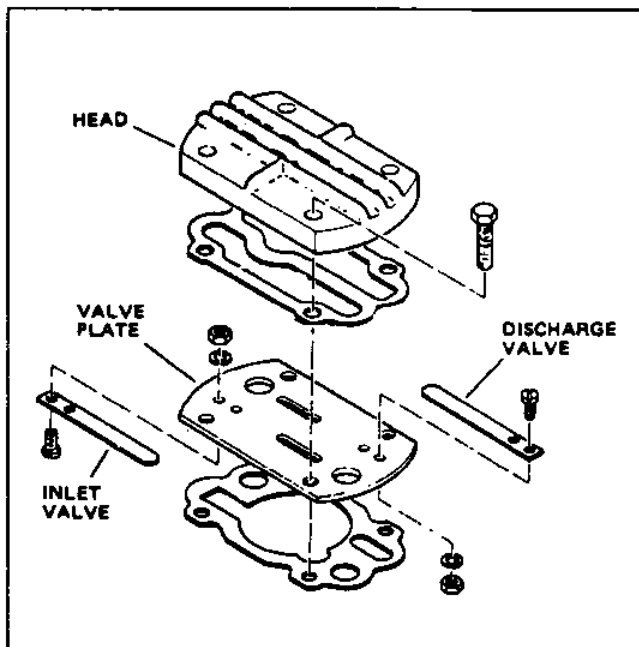


Figure 6-1. Finger Valves.

Handle the valves with care and be careful not to nick or scratch them. When replacing a valve, make certain it will lie flat against the seating surface surround the port hole; otherwise, the valves will leak, resulting in carbonization and reduced vacuum pump efficiency.

AIR VALVE CLEANING

(Models 7V, 7VT, 15V, 15VT)

To remove and clean a concentric ring valve, observe the following step-by-step procedure:

1. Loosen the valve acorn nuts, then take out the air head cap screws and remove the air head from the cylinder.
2. The valve itself may now be disassembled. To facilitate the valve disassembly, screw two bolts part way into the two threaded ports located in the valve seat. Clamp these bolts firmly in a vise and remove the locknut and hex nut. Note the manner in which the valve parts are assembled and replace them in the same order and position.

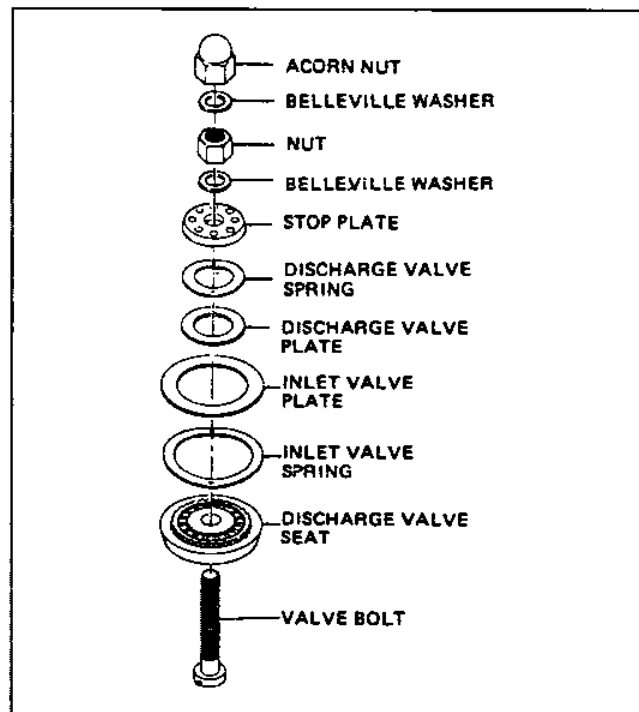


Figure 6-2. Concentric Ring-Type Valve.

NOTE: Handle the valve parts with care. Do not nick, scratch or bend them.

3. The valve parts may be cleaned by light scraping or stiff brushing (do not use a wire brush.) If necessary, use a non-flammable safety solvent to loosen dirt, oil or carbon deposits.
4. Reassemble the valve parts in their proper sequence and position. Make absolutely certain that the stop-plate is centered properly on its guide; otherwise, the valve will be damaged when it is pulled up tight in the air head. Replace the valve hex nut and washer on the valve bolt. Tighten the valve hex nuts to the following torque:
High pressure valve assembly - 65 ft. lbs.
(88 Nm.) dry torque
Low pressure valve assembly - 110 ft. lbs.
(149 Nm.) dry torque
5. Before replacing the valve in the air head, scrape the old shellac off the valve bolt steel washer and coat it with new shellac to prevent air from leaking under the washer. Replace the acorn nut and tighten it to the lower limit of the torque valve, recommended below. Do not overtighten this nut, since this will distort the springs and plates, causing the valve to leak. After the valve has been replaced in the air head, make certain that the valve operates freely by lifting at its edges with a knife blade.
6. Replace the air head gasket on the cylinder; then replace the air head. Tighten the air head cap screws to the torque recommended below and replace the unloader if the unit is so equipped.

AIR VALVE CLEANING

(Models 20V, 20VT)

To remove and clean a channel valve, observe the following step-by-step procedure:

1. Remove the air head from the cylinder. Separate the valve assembly from the air head by removing the nuts from the center studs and pull the valve out of the head.

2. Lay each valve assembly on a clean surface with the studs pointing upward. Remove the flat head assembling screws that hold the valve plates together. Use a thin blade to pry the head plate off the cylinder plate, thus uncovering the springs and channels. (For identification purposes, note that the channels are beneath springs on the discharge side; and the springs are beneath channels on the inlet side).

3. Lay each channel, wear strip and spring carefully to one side. Keep them in order and be careful not to turn them end for end. If they are to be used again, they must be replaced exactly as they were before removal in order to return them to the same seating surface. If turned end for end, the valve channels will not seat tightly. Also, the inlet and discharge springs must not be interchanged.

4. Clean each channel and spring carefully by brushing or scraping lightly, use a non-flammable safety solvent to help loosen the carbon. Do not change the shape of the valve spring by bending.

5. Remove the valve guide and clean all valve seating surfaces on both plates. Do not cut or scratch the seating surfaces of the plates.

6. Replace any broken parts. For identifying new springs; inlet valve springs all have a free height (bow) of 3/64", while discharge valve springs are bowed 5/64". Used springs may vary from these dimensions. Replace the complete valve assembly if the seats on the plates are so badly worn that new channels will not seat properly.

7. Place the valve guide on the cylinder plate and reassemble the clean valves, wear strips and springs as originally found, make certain that none of the valve spring ends extend beyond their channels.

8. Reassemble the head plate over the studs and on the guides, then insert and tighten the assembling screws.

9. Test the valve action of each channel by pushing the channel off its seat to see that it moves freely in the guide and seats properly.

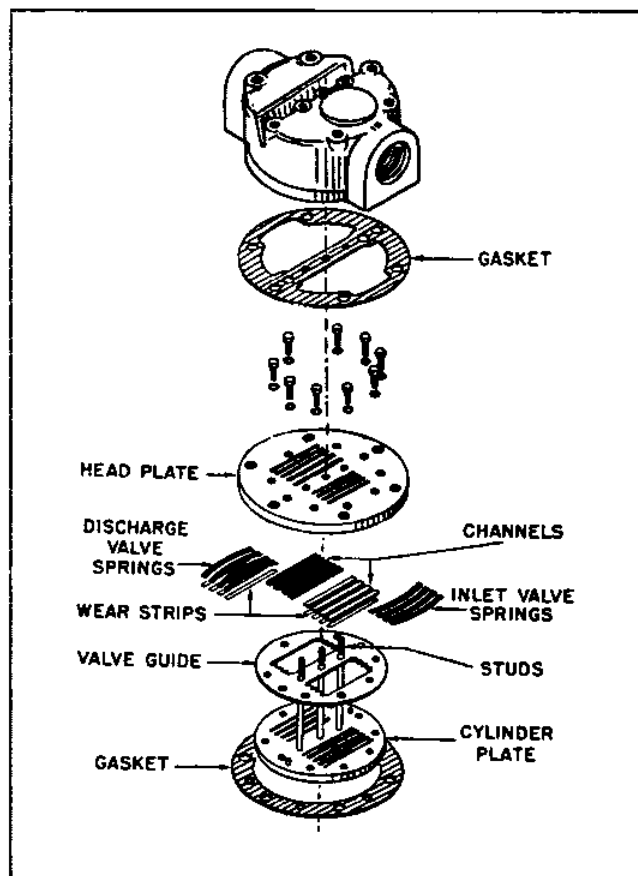


Figure 6-3. Concentric Ring-Type Valve.

10. Reassemble the valve assembly to the cylinder head and the head to the cylinder from which it was removed.

TORQUE VALUE TABLE

NATIONAL COARSE	GRADE 2		GRADE 5		GRADE 8	
Dia. Pitch						
1/4" — 20	48 In. Lb.	5 Nm.	72 In. Lb.	8 Nm.	108 In. Lb.	12 Nm.
5/16" — 18	96 In. Lb.	11 Nm.	144 In. Lb.	16 Nm.	18 Ft. Lb.	24 Nm.
3/8" — 16	15 Ft. Lb.	20 Nm.	23 Ft. Lb.	31 Nm.	31 Ft. Lb.	42 Nm.
7/16" — 14	24 Ft. Lb.	33 Nm.	36 Ft. Lb.	49 Nm.	51 Ft. Lb.	69 Nm.
1/2" — 13	37 Ft. Lb.	50 Nm.	56 Ft. Lb.	76 Nm.	80 Ft. Lb.	108 Nm.
9/16" — 12	53 Ft. Lb.	72 Nm.	81 Ft. Lb.	110 Nm.	116 Ft. Lb.	157 Nm.
5/8" — 11	68 Ft. Lb.	92 Nm.	113 Ft. Lb.	153 Nm.	160 Ft. Lb.	217 Nm.
3/4" — 10	131 Ft. Lb.	177 Nm.	203 Ft. Lb.	275 Nm.	286 Ft. Lb.	388 Nm.

We recommend the use of a torque wrench on all bolts, capscrews, and nuts using the values in the following table. The values given are for threads lubricated with oil or grease. To determine the grade of bolt or capscrew being tightened, use the following information. Grade 2: No markings or vendor identification on the head. Grade 5: Letter "S" or 3 lines and/or vendor identification on the head. Grade 8: Letter "V" or 6 lines and/or vendor identification on the head.

BELT INSTALLATION AND ADJUSTMENT

When installing new belts, do not pry the belts over the pulley grooves. The proper method of removing an installing new belts is to loosen the anchor screws and the belt tightener screw, Figure 6-4, and push the motor toward the vacuum pump. Use the tightener screw to adjust belt tension on new belts.

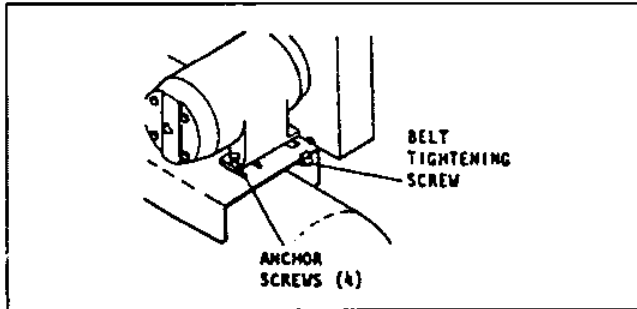


Figure 6-4. Belt Adjustments.

It is important that the belts be properly adjusted. A belt that is too loose will slip and cause heating and wear, and a belt that is too tight may overload the bearings. A quick check to determine if belt adjustment is proper may be made by observing the slack side of the belt for a slight bow when the unit is in operation. See Figure 6-5. If a slight bow is evident, belts are usually adjusted satisfactorily. However, the recommended method of checking belt tension is by the more accurate spring scale measurement method that follows:

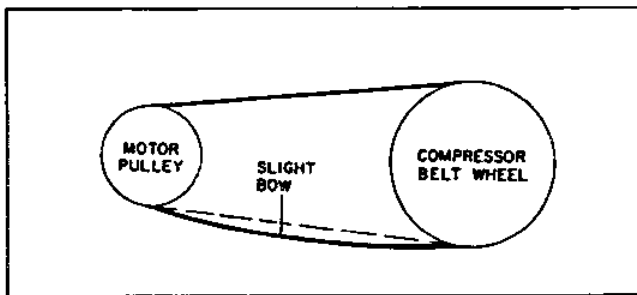


Figure 6-5. Visual Method.

- A. Measure the belt span (t) as shown in Figure 6-6.
- B. At the center of the span (t), apply a force (perpendicular to the span, by attaching a spring scale to the two outside belts. The force applied to the spring scale should be sufficient to deflect the belts $1/64$ " (.396 mm) for every inch of span length (t). For example: The deflection of 100" (2540 mm) span would be $100/64$ " or $1\ 9/16$ " (39.6 mm), thus, the force applied to the spring scale should deflect the belts to $1\ 9/16$ " (39.6 mm).

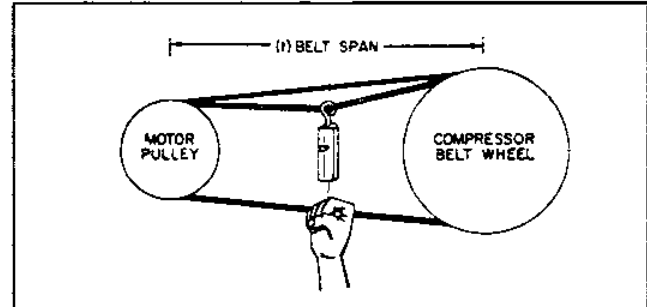


Figure 6-6. Spring Scale Method.

- C. When the belts are deflected the necessary distance, compare the spring scale reading (in lbs. force) with the value given in the following table.

STANDARD BELT TENSION		
Belt Type	Normal Tension	105% Normal Tension
A	1 1/4 lbs. (.565 kg)	1 1/8 lbs. (.85 kg)
B	2 1/4 lbs. (1.25 kg)	4 lbs. (1.81 kg)
C	5 1/2 lbs. (2.5 kg)	8 1/4 lbs. (3.74 kg)

If the reading is between the value for normal tension and 150% normal tension, the belt tension should be satisfactory. A reading below the value for normal tension indicated the belt slack should be reduced, and conversely, a reading exceeding the value for 150% normal tension indicated the belt slack should be increased. Experience has shown that as new drive can be tightened initially to two times normal tension to allow for any drop in tension during run in.

SECTION VII

OPTIONAL EQUIPMENT AND ACCESSORIES

CHECK VALVE

The check valve is located in the discharge and acts to check the flow of air from the discharge to the cylinder when the vacuum pump is stopped.

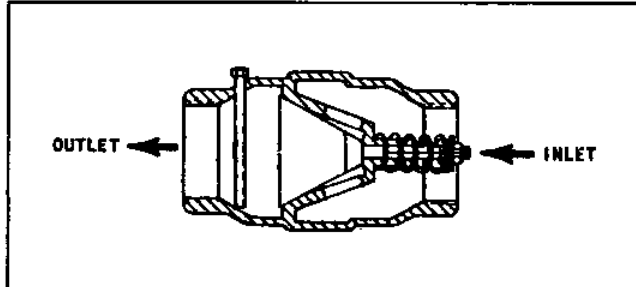


Figure 7-1. Typical Check Valve.

The check valve is not adjustable. Leaky valves can sometimes be corrected by disassembling the valve and cleaning the seating surface. If cleaning does not stop the leaking, the valve should be replaced.

INLET PIPELINE FILTER

Figure 7-2 shows a typical dry-type filter. Do not clean the dry-type filter more often than is absolutely necessary. Under the worst conditions, cleaning should not be required more often than every 1000 hours of operation.

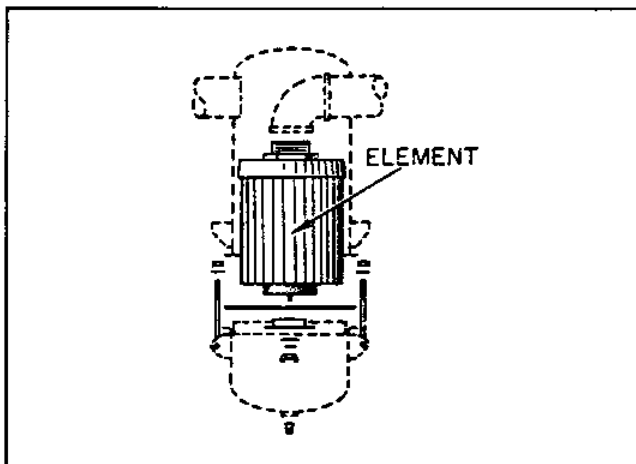


Figure 7-2. Typical Dry-type filter.

Compressed air should not be used to clean a dry-type filter since damage to the filtering element may result. The filter may be cleaned with a commercial type vacuum cleaner. Use a nozzle that fits the contour of the filtering element.

Replace the filtering element when its condition has deteriorated to the point where it cannot be effectively cleaned. Keep a spare element in stock at all times for replacement purposes.

VACUUM RECEIVER

If the vacuum system connected to the pump inlet does not have sufficient volume, the pump will cycle too frequently. In this case, a vacuum receiver must be used to provide enough volume to operate the regulation system of the pump.

WARNING



This machine contains a high degree of vacuum.
Can cause injury or death from flying parts.

Never operate the vacuum pump above the maximum working pressure of the vacuum receiver.

Vacuum receivers must meet the safety requirement of the state in which they are used.

THE VACUUM RECEIVER MUST BE MANUFACTURED TO MEET THE REQUIREMENTS OF THE ASME BOILER AND PRESSURE VESSEL CODE.

VACUUM GAUGE

A 2½ inch dial size vacuum gauge with a 0-30 In. HG, vacuum range is available. This gauge should be mounted in the vacuum receiver, snubber tank, or in the vacuum system on the inlet side of the vacuum pump.

DISCHARGE FILTER/SILENCER

A discharge filter silencer is available to reduce the discharge noise produced by the vacuum pump.

It is very important that the discharge filter/silencer be kept clean at all times. A dirty discharge filter/silencer reduces the capacity of the vacuum pump.

WARNING



Cleaning discharge filter/silencer with gasoline, kerosene or flammable fluid.
Can cause an explosion or fire which can result in severe injury or death.

Use warm soapy water for cleaning the discharge filter/silencer.

The filtering element should be taken out at least once a month and cleaned by vacuuming or washing in mild detergent and water. Allow to dry and then reinstall.

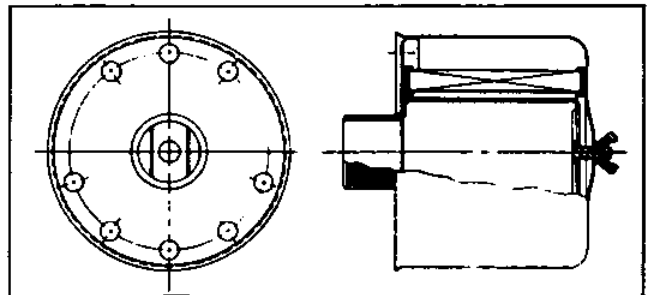


Figure 7-3. Typical Discharge Filter/Silencer.

SECTION VIII

TYPICAL WIRING DIAGRAM

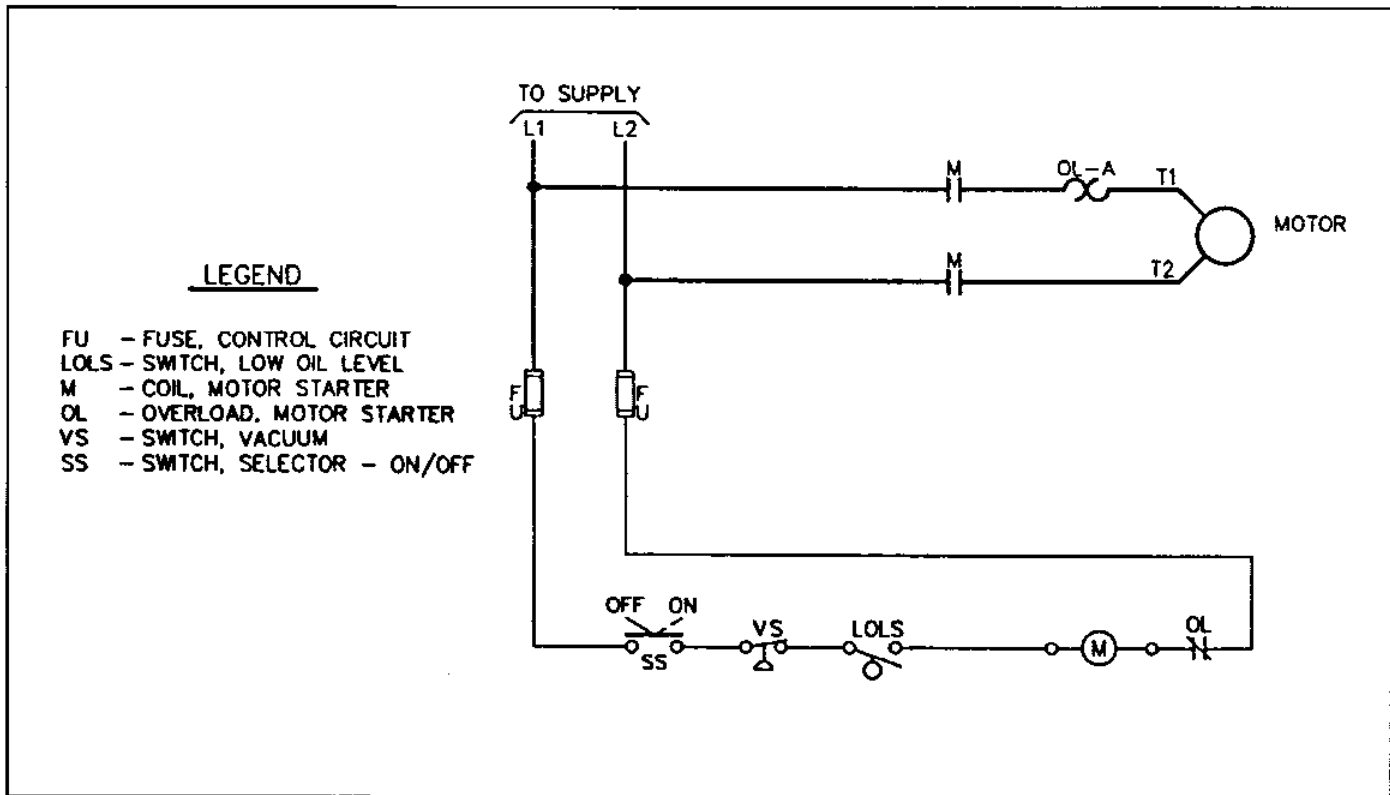


Figure 8-1. Schematic Wiring Diagram for Single Phase Automatic Start and Stop Control with Optional Equipment. (Also see Wiring Diagram Furnished with Equipment.)

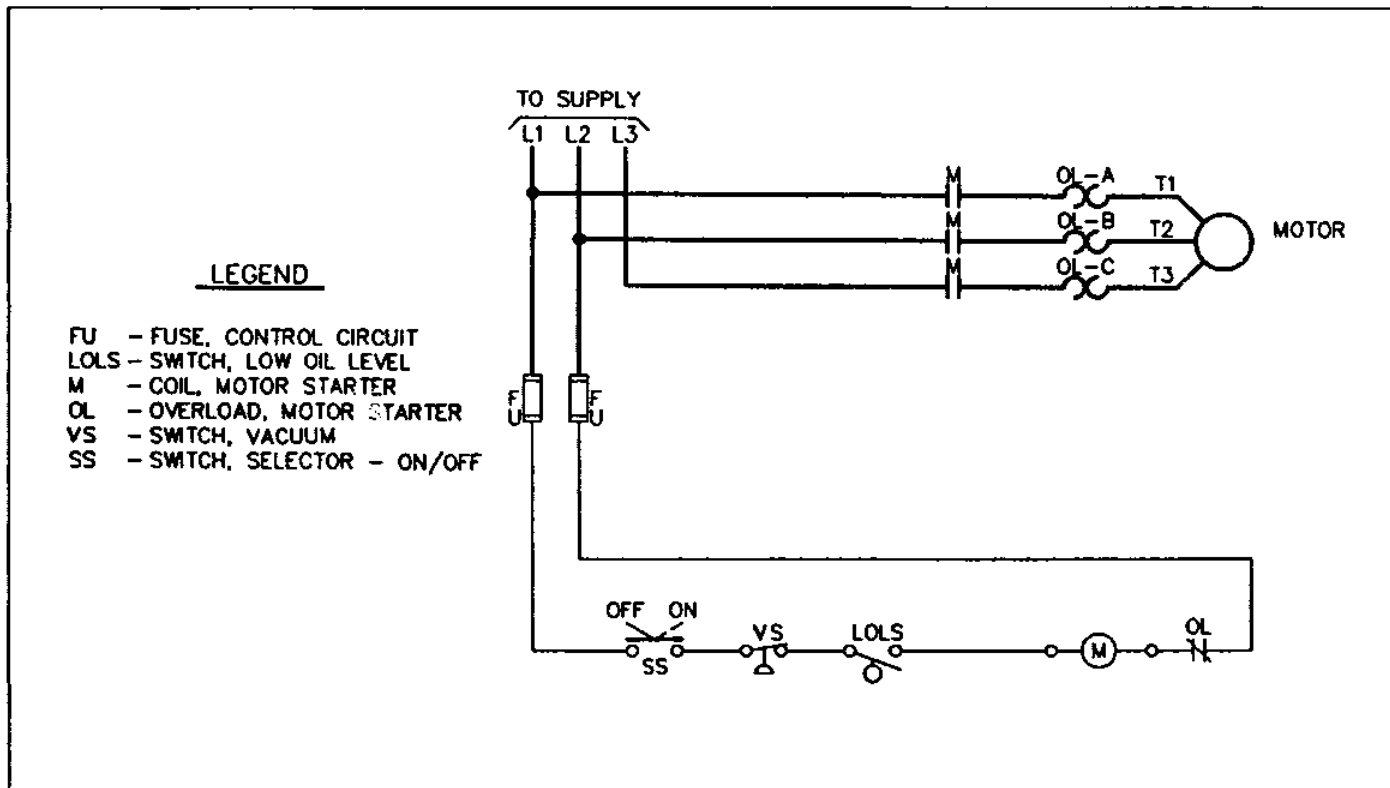


Figure 8-2. Schematic Wiring Diagram for Three Phase Automatic Start and Stop Control with Optional Equipment. (Also see Wiring Diagram Furnished with Equipment.)

TYPICAL WIRING DIAGRAM

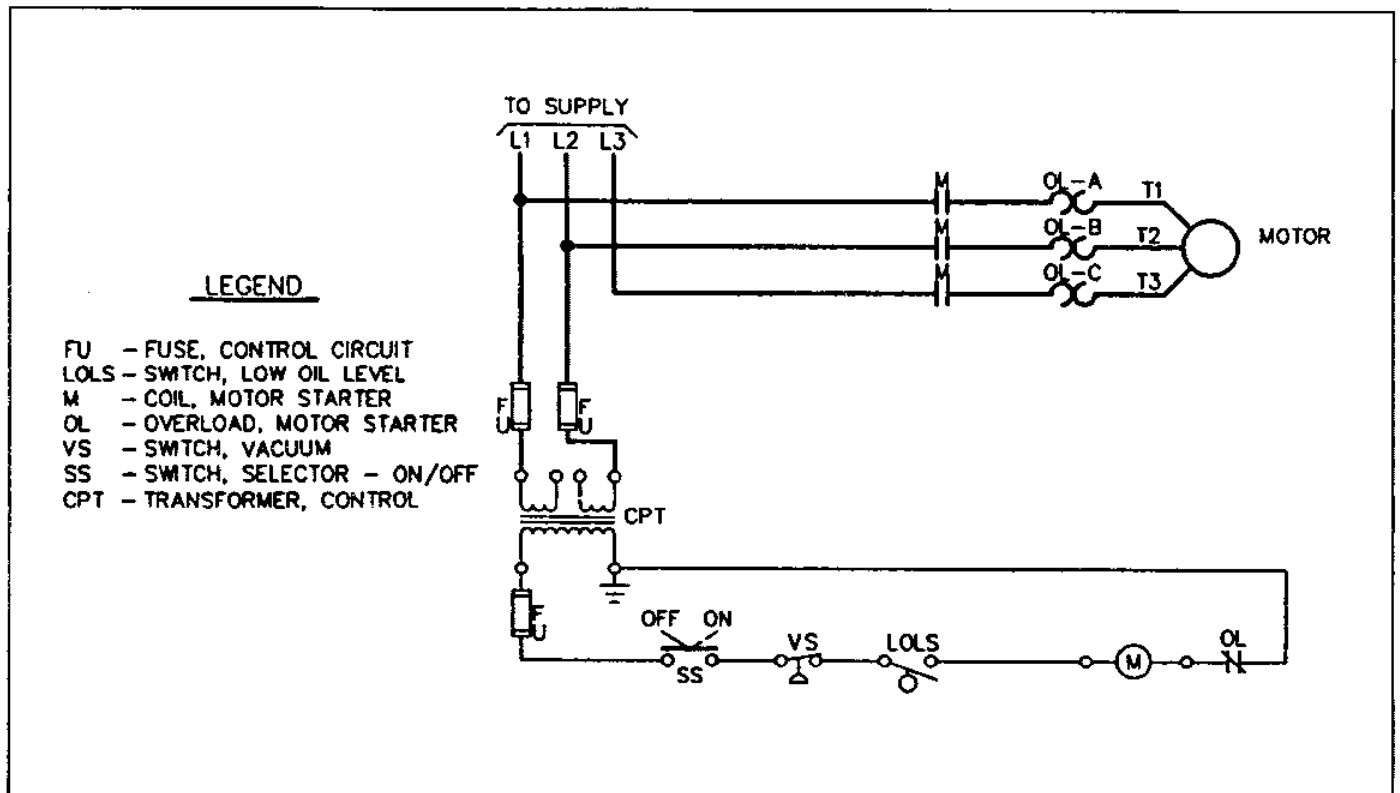


Figure 8-3. Schematic Wiring Diagram for Three Phase Automatic Start and Stop Control with Optional Equipment. (Also see Wiring Diagram Furnished with Equipment.)

NOTES

⚠ WARNING

STATEMENT CONCERNING THE USE OF THIS EQUIPMENT FOR BREATHING AIR AND/OR AQUA LUNG SERVICE.

If the model number on a compressor contains the letters "BAP", the air compressor is suitable for breathing air services. Compressors that DO NOT bear this designation are NOT capable of producing air of breathing quality. For use in breathing air applications, an air compressor must be fitted with additional specialized equipment to properly filter and/or purify the air to meet all applicable federal, state and local laws, rules, regulations and codes, such as, but not limited to, OSHA 29 CFR 1910.34, Compressed Gas Association Commodity Specifications G-7.1-1966, Grade D Breathing Air, and/or Canadian Standards Association. Should the Purchaser and/or User fail to add such specialized equipment, and proceed to use the air compressor for breathing air service, the Purchaser/User assumes all liability resulting therefrom without any responsibility or liability being assumed by Ingersoll-Rand Company.

The purchaser is urged to include the above provisions in any agreement for any resale of this compressor.

Hazardous vapors. Can cause severe nausea, fainting or death.

Compressed air or gas from this compressor may contain poisonous vapors or gases.

Certain sprayed material such as paints, insecticides, weed killer, sand, etc., may be harmful if inhaled or used in a closed area.

Never directly inhale the compressed air or gas produced by this compressor.

Always read container labels when spraying paints or poisons.

Always use the compressor in a well-ventilated area.

Use a respirator or mask whenever there is a chance that you might inhale any sprayed material. If a mask is used, read all instructions provided with the mask to ensure it will protect you from the materials you are spraying.

Hazardous voltage. Can cause severe injury or death.

Always disconnect the power supply cord before performing any maintenance or repair work.

Always connect the power supply cord to a grounded electrical receptacle with the specified voltage and fuse protection.

Never use the compressor in rain, in a wet area, or near an explosive environment.

Flammable vapors. Can cause a fire or explosion, and result in severe injury or death.

Sparks from the motor's electrical contacts can ignite flammable vapors from gasoline, natural gas or solvents.

Do not operate the compressor in any areas where explosive or flammable vapors or liquids may exist.

Never smoke or use open flame in the vicinity of the compressor or any gas bottle or source.

Compressed air/gas has great force.

Over-pressurizing the bottle, tank or receiver, or using a receiver which does not meet the design limits for this compressor, can cause them to rupture or explode, and result in severe injury or death.

Changes to the bottle, tank or receiver structure will cause it to weaken and can cause it to rupture or explode, and result in severe injury or death.

Internal rusting in the bottle, tank or receiver will cause it to weaken and can cause it to rupture or explode, and result in severe injury or death.

Pressure beyond design limits can cause the bottle, tank or receiver to rupture or explode, and result in severe injury or death.

Improper use of air tools or attachments can cause an explosion, and result in severe injury or death.

The bottle, tank or receiver is equipped with a relief valve to protect against over-pressurization. DO NOT REMOVE, ADJUST OR MAKE SUBSTITUTIONS FOR THE RELIEF VALVE. Periodically pull the ring on the relief valve to ensure it operates freely. If the valve is stuck or does not operate freely, it must be replaced.

Never drill into, weld to, or alter the bottle, tank or receiver in any manner.

Drain water/condensate from the air receiver daily or before each use.

Pressure switch and unloader valve operation is related to motor/engine horsepower, air receiver rating, and relief valve setting. DO NOT ATTEMPT TO ADJUST, REMOVE OR BYPASS THE PRESSURE SWITCH, OR CHANGE OR MODIFY ANY PRESSURE CONTROL RELATED DEVICE.

Do not use any air tools or air attachments without first determining the maximum air pressure recommended for that particular piece of equipment.

Compressed natural gas compressors are equipped with explosion-proof electrical systems. Ensure any additional electrical equipment is also explosion-proof.

Gas leaks can occur in compressed natural gas compressors or associated piping. Even small leaks pose a potential hazard and should be corrected before the compressor is operated. If a maintenance function involves breaking a gas-tight joint, always recheck for gas leaks after reassembling by using a commercial gas leak detector.

Rotating compressor. Can propel dirt, sand, metal shavings, etc., and result in severe injury.

Never point an air nozzle or air sprayer toward any part of the body, or toward another person.

Always wear safety glasses or goggles when servicing.

Moving parts. Can cause severe injury.

Always disconnect the power supply before attempting to perform any maintenance or repair work. Always ensure the pressure is released from the compressor, bottles, tanks, receiver and air attachments before performing any maintenance or repair work.

Always disconnect the power supply on electric motor models if the compressor is to be left unattended.

Never operate compressor with the fan shroud removed, or if the shroud is damaged or broken.

Hot parts. Compressors get hot while running, and can cause severe burns if touched.

Never touch the compressor, motor/engine, or tubing during or shortly after compressor operation.

⚠ ADVERTENCIA

DOCUMENTO CONCERNIENTE AL USO DE ESTE EQUIPO PARA EL SERVICIO DE AIRE RESPIRABLE Y/O SERVICIO DE BUCEO.

Si el número del modelo en un compresor de aire contiene las letras BAP, el compresor está diseñado para el uso en servicios de aire respirable. En la ausencia de tal designación, el compresor no puede ser considerado adecuado para producir aire respirable. Para que un compresor sea adecuado para ser usado en aplicaciones de aire respirable, debe estar acondicionado con equipo especializado para filtrar y/o purificar apropiadamente el aire y así cumplir con las leyes, reglas y regulaciones federales, locales y estatales, no limitadas a OSHA 29 CFR 1910.34, las Especificaciones de la Asociación de Gas Comprimido G-7.1-1966 Aire respirable Grado D, y/o Asociación de Estándares Canadienses. Si el comprador y/o el usuario no añaden este equipo especializado y procede a usar el compresor para servicio de aire respirable, el Comprador/Usuario asume toda la responsabilidad resultante de esto sin que ninguna responsabilidad u obligación sea asumida por la compañía Ingersoll-Rand.

Se sugiere al comprador que incluya la anterior provisión en cualquier acuerdo por cualquier re-venta de este compresor.

Vapores peligrosos. Pueden causar náusea, desmayo o muerte.

El aire comprimido de este compresor puede contener monóxido de carbono venenoso.

Ciertos materiales propulsados por aire tales como pinturas, insecticidas, arena etc. pueden ser peligrosos si se inhalan o utilizan en un área cerrada.

Nunca inhale directamente el aire comprimido producido por este compresor.

Lea siempre las etiquetas de los contenedores cuando esté rociando pintura o venenos.

Siempre utilice el compresor en un área bien ventilada.

Utilice el respirador o máscara cuando haya riesgo de inhalar cualquier material que esté rociando. Si utiliza máscara, lea muy bien las instrucciones para que usted pueda saber de qué lo va a proteger mientras rocía.

Voltaje peligroso. Puede causar heridas severas o muerte.

Siempre desconecte el suministro eléctrico antes de hacer cualquier mantenimiento o reparación.

Siempre conecte el suministro eléctrico a un circuito adecuado y con el voltaje especificado.

Nunca utilice el compresor en la lluvia, o en un área cerca de una atmósfera explosiva.

Vapores inflamables. Pueden causar fuego o una explosión, y el resultado puede ser herida severa o muerte.

Chispas del motor eléctrico pueden encender vapores inflamables de gasolina, gas natural o solventes.

No operen el compresor en ninguna áreas donde vapores o los líquidos explosivos o combustibles pueden existir.

Nunca fumar o el uso abre llama en la vecindad del compresor, botella de gas o fuente de gas.

El aire comprimido tiene gran fuerza.

El tanque de aire sobre-presurizado puede causar que el tanque de aire explote o se rompa, y puede resultar en heridas severas o muerte.

Cambios en la estructura del tanque de aire pueden causar que el tanque de aire se debilita causando la ruptura o explosión de este, resultando en herida severa o muerte.

El debilitamiento de la estructura del tanque de aire debido a oxidación interna puede causar rupturas o explosión del tanque y puede resultar en heridas severas o muerte.

La presión de aire fuera de sus límites puede causar que el tanque explote o se rompa, y esto causaría heridas severas o muerte.

El uso impropio de las herramientas neumáticas o sus accesorios pueden causar explosión, y resultar en heridas severas.

El tanque de aire está protegido de sobrepresurización por una válvula de seguridad. NOQuite, haga ajustes, o sustituciones en esta válvula. Ocasionalmente hable el anillo en la válvula de seguridad para asegurarse de que la válvula funcione libremente. Si la válvula está atascada o no funciona, debe ser reemplazada.

Nunca perforo, suelte o cambie el tanque de aire en ninguna forma.

Drene el agua/condensado del tanque de aire diariamente o antes de cada uso.

NO trate de ajustar, remover, o derivar el botón del interruptor de presión, o cambie y modifique cualquier estructura relacionada con el control de presión.

No utilice ninguna herramienta neumática o accesorio sin determinar la presión máxima de aire comprimido que se recomienda para esa herramienta en particular.

Los compresores comprimidos de gas natural se equipan con sistemas eléctricos que no estallarán. Asegure cualquier equipo eléctrico adicional es también incapaz de estallar.

Los escapes de gas pueden ocurrir en los compresores naturales de gas o asociados tubos. Cualquier escape es un peligro potencial y debería corregirse antes de el compresor se opera. Si una función de mantenimiento involucra quitando un sujetador, siempre detecta cualquier gas escapa después de amarrar nuevamente por usar un detector de escape de gas.

Aire comprimido. Puede expulsar polvo, metal o arena etc. y puede resultar en heridas.

Nunca apunte la boquilla hacia alguna parte del cuerpo o hacia otra persona.

Use siempre gafas protectoras.

Las partes en movimiento pueden causar heridas severas.

Desconecte siempre el suministro eléctrico antes de cualquier mantenimiento ó reparación.

Desconecte siempre el suministro eléctrico si el compresor no va ser usado.

Asegúrese que el aire a presión es liberado del compresor, del tanque de aire, y demás accesorios de aire antes de hacer cualquier mantenimiento o reparación.

Nunca opere el compresor sin el guarda poleas. Nunca opere el compresor con una polea dañada o rota.

Partes calientes. Los compresores de aire se calientan en operación y pueden causar quemaduras severas.

Nunca toque el compresor, el motor, o la tubería de descarga durante o poco después de operar el compresor.



Look What **INGERSOLL-RAND Can Do For YOU. . .**

EFFICIENT FIELD SERVICE

We maintain a highly trained staff of technicians to service your equipment for preventive maintenance, or to assist you should emergencies ever occur.



EFICIENTE SERVICIO EN EL CAMPO

Mantenemos un grupo de mecánicos entrenados para suministrarle mantenimiento preventivo o atender cualquier emergencia que puede tener.

COMPLETE REPAIR SERVICE

Our trained technicians will repair or overhaul your equipment to factory specifications, using only genuine I-R parts.



COMPLETO SERVICIO DE REPARACION

Mecánicos entrenados repararán su compresor según los métodos recomendados por fábrica usando solamente partes genuinas Ingersoll-Rand.

SPECIAL ENGINEERING SERVICE

We can help you identify and solve your compressed air problems by evaluating your needs and recommending the proper compressor and air piping system to give you maximum efficiency.



SERVICIO DE INGENIERIA ESPECIAL

Nosotros podemos ayudarlo con sus problemas de aire comprimido investigando sus necesidades y recomendando el compresor y el sistema de aire adecuados para lograr máxima eficiencia.

SPARE PARTS

By stocking genuine I-R spare parts, we can help you avoid costly delays, or substituting inferior parts. Using genuine I-R parts on your I-R equipment will help to keep even older machines running in good-as-new condition.



PARTES DE REPUESTO

Mantenemos partes genuinas Ingersoll-Rand, evitando posibles sobrecostos debido a demoras en la sustitución de partes menores. Como resultado, los equipos antiguos son mantenidos como nuevos.

COMPLETE STOCK OF EQUIPMENT

We carry a complete line of I-R equipment and accessories designed to meet any compressed air application. We are backed by Ingersoll-Rand's prompt factory shipment to ensure you on-time delivery.



STOCK COMPLETO DE EQUIPOS

Nuestro stock de máquinas completas que pueden encargarse usualmente de cualquier necesidad, está soportado por un eficiente sistema de despachos de fábrica de Ingersoll-Rand para asegurarle entrega a tiempo.

A SUBSTITUTE IS NOT A REPLACEMENT

Ensure you get peak performance and longevity out of your Ingersoll-Rand compressor by insisting on genuine Ingersoll-Rand replacement parts and maintenance kits. Not only are the replacement parts made to precise dimensions and OEM-specified metallurgy, but each part is backed by the Ingersoll-Rand warranty. Your local Air Center, Full-Service distributor or direct Ingersoll-Rand salesperson will work with you to ensure you get the parts you need to do the job right. Equip your machines with only the best - Ingersoll-Rand Genuine Parts.

**DISTRIBUTED BY:
DISTRIBUIDO POR:**

UN SUSTITUTO NO ES UN REEMPLAZO

Asegúrese que obtiene máximo desempeño y duración de su compresor insistiendo en usar solamente partes de reemplazo genuinas y kits de mantenimiento Ingersoll-Rand. No solamente están construidas con dimensiones precisas y especificaciones exactas de metalurgia, sino que cada parte está respaldada por la garantía Ingersoll-Rand. Su Air Center, su Distribuidor de Servicio o el personal de ventas directo de Ingersoll-Rand trabajarán con Usted para asegurarle que recibe las partes para efectuar el trabajo correcto. Equipe sus máquinas sólo con lo mejor - Partes Genuinas Ingersoll-Rand.

**Ingersoll-Rand Company
Reciprocating Compressor Division
Small Compressor Business Unit
Campbellsville, KY 42718**



Supplement Sheet FOR VACUUM PUMP INSTRUCTION MANUAL (FORM SCD-454)

This supplement sheet contains a revised maintenance schedule for all vacuum pump models covered in instruction manual form SCD-454. The information below supercedes the information given on page 15 of the manual.

MAINTENANCE OPERATION	SERVICE INTERVAL				
	Operating Hours/Months - whichever comes first				
	500/3	1000/6	1500/9	2000/12	2500/15
VACUUM PUMP					
Frame Oil Level - Check	Daily				
Inspect Oil for Contamination —Change if necessary	Monthly				
Frame Oil—Change Petroleum Lube	X	X	X	X	X
Compressor Valves - Inspect, Clean or Replace	X	X	X	X	X
Low Oil Level Switch - Check Operation	X	X	X	X	X
Clean Cylinder Cooling Fins	Monthly				
V-BELT DRIVE					
Belt Tension - Check	Monthly				
MOTOR					
Motor Bearings - Check and Lubricate				X	
Clean	Monthly—(Weekly in Dusty Locations)				
SYSTEM					
Drain Line Filter, Scrubber Tank, Etc.	Daily				
PIPE LINE FILTER					
Inspect And Clean Element (If Necessary)		X		X	
RECEIVER					
Drain Condensate - Manual	Daily				
GENERAL					
Tighten or check all bolts (retorque)	Monthly				
Check for Unusual Noise and Vibration	Daily				
Inspect for Leaks	Monthly				



**TECHNICAL
MANUAL
SUPPLEMENT**

T30

Small Compressor Division
INGERSOLL-RAND COMPANY
Campbellsville, KY 42718

T-30 TECHNICAL MANUAL SUPPLEMENT

This Publication Applies to Models:

242

244

V244

253

255

V255

PURPOSE.

The purpose of this publication is to provide the latest maintenance and parts list information regarding your Ingersoll-Rand air compressor. The information contained herein has not yet been incorporated in the instruction and parts list manuals provided with your compressor.

SCOPE.

The Low Pressure Head gaskets furnished with your compressor (or Step Saver Kit) provide superior sealing characteristics, thus allowing a reduction in the clamping force applied to the gasket. A flat washer has added under each capscrew to evenly distribute loading. This publication lists:

- Parts list information for the new Low Pressure (First Stage) Head capscrews provided with your compressor.
- New torque requirements for the Low Pressure Head capscrews.
- Parts list information for inclusion of the one flat washer to be installed with each capscrew on the low pressure head.

PRECEDENCE.

The information contained herein supersedes the torque values for the Low Pressure Head capscrews stated in the instruction manual and all applicable Step Saver Kit instructions for your air compressor. The washer listed below is in addition to the parts reflected in your parts list manual and all applicable Step Saver Kit parts lists.

TORQUE VALUES.

The new dry torque value for the Low Pressure Head capscrews on the models referenced above is 50-55 Ft. Lb. Torque the capscrews in a cross pattern at increments of 25, 40 and 50-55 Ft. Lb.

PARTS LIST DATA.

PART NUMBER	DESCRIPTION
95104196	CAPSCREW, HEX - 1/2-13 x 2"
32279408	WASHER, FLAT - 1/2"

SAFETY PRECAUTIONS ENCLOSED

DO NOT DESTROY

This manual contains important safety information and should be made available to all personnel who operate and/or maintain this product. Carefully read this manual before attempting to operate or perform maintenance.

PRECAUCIONES DE SEGURIDAD

NO DESTRUIR

Este manual contiene información importante y debe estar al alcance de todo el personal que opera y/o mantiene este producto. Lea cuidadosamente este manual antes de intentar operar o efectuar cualquier mantenimiento a este producto.

PARTS LIST

Model V234

Model V235

Model 235T

Model V244

Model V244T

Model V255

Model V255T

Vacuum Pumps

INGERSOLL-RAND®

AIR COMPRESSORS

NOTICE

THE USE OF REPAIR PARTS OTHER THAN THOSE INCLUDED WITHIN THE INGERSOLL-RAND COMPANY APPROVED PARTS LIST MAY CREATE UNSAFE CONDITIONS OR MECHANICAL FAILURES OVER WHICH INGERSOLL-RAND COMPANY HAS NO CONTROL. INGERSOLL-RAND COMPANY SHALL BEAR NO RESPONSIBILITY FOR EQUIPMENT ON WHICH NON-APPROVED REPAIRS PARTS ARE INSTALLED.

The manufacturer reserves the right to make changes or add improvements without notice and without incurring any obligation to make such changes or add such improvements to products previously sold.

GLOSSARY

Group Assembly Parts List

Parts are listed in disassembly sequence, where applicable. Each assembly is broken down into subassemblies and detail parts which are identified with "bullet" (•) symbols in the DESCRIPTION column to indicate the relationship to the next higher assembly:

Assemblies and Detail Parts

- Attaching Parts for Assemblies and Detail Parts
- • Subassemblies
- • • Detail Parts for Subassemblies, etc.

Reference Number Column

The reference number is the number assigned to the part in the listing. The reference number corresponds to the item on the associated illustration. Where applicable, the following abbreviations might appear in this column:

- NI Not Illustrated.
- REF Reference Only. Refer to the figure and page noted in the description column.

Part Number Column

All numbers listed in this column are INGERSOLL-RAND part numbers, and must be specified when ordering replacement parts. The following abbreviations appear in this column:

- NA Not Applicable. This abbreviation indicates items which are not used on particular models or packages.
- NSS Not Sold Separately. These items must be ordered under the next higher assembly, or, where applicable, as part of a Step Saver Kit.
- Consumable Materials (lubricants, sealants, etc.). Purchase directly from your local INGERSOLL-RAND Air Center or Full Service Distributor.
- ** Part Number Varies. Specify the compressor bare speed and complete nameplate data when ordering.

Description Column

The description column indicates the item by standard name followed by modifiers. The modifiers identify specific characteristics (i.e. dimensions, capacity, pressure setting, etc.), and/or the particular location or function on the compressor. Always include the description when ordering replacement parts or kits.

Quantity Per Assembly Column

Quantities listed in this column reflect the number used in the next higher assembly, and are not necessarily the total quantity of the part used in the complete package. Specify the desired quantity when ordering replacement parts.

Recommended Spares Column

Quantities listed in this column reflect the number of each item which we recommend be kept on hand for maintenance or repair.

- CLASS 1 MINIMUM. Recommended quantity for Domestic Service where interruptions in service are not important.
- CLASS 2 AVERAGE. Recommended quantity for Domestic Service where interruptions in continuity of service are not objectionable.
- CLASS 3 MAXIMUM. Recommended quantity for International or Domestic Service where interruptions in service are not acceptable.

Step Saver Kits

Step Saver Kits are available for all compressor models. These kits are designed to provide all of the parts you will need to perform routine maintenance and repair tasks. A list of available Step Saver Kits is included in the Parts List manual which came with your compressor. When ordering Step Saver Kits, please follow the instructions set out below for ordering replacement parts.

ORDERING INSTRUCTIONS

All parts listed in the Part List manual for your compressor are available through your local INGERSOLL-RAND Air Center or Full Service Distributor. Consult the Directory of Distributors included with your compressor to locate the distributor in your area.

When ordering replacement parts or Step Saver Kits, please specify:

1. The MODEL and SERIAL NUMBER as stamped on the compressor nameplate.
2. The FORM NUMBER of the Parts List manual.
3. The QUANTITY, DESCRIPTION and PART NUMBER exactly as listed.

EXAMPLE

Send the following parts for model	7100
Serial Number	T30000000
Literature Form Number	SCD-478A
1 Switch, Pressure - NEMA 1	37005907
2 Element, Filter	32012957
1 Gauge, Pressure	32013872

NOTA

EL USO DE PARTES PARA REPARACION DIFERENTES A LAS INCLUIDAS EN LA LISTA DE PARTES APROBADA DE INGERSOLL-RAND PUEDE CREAR CONDICIONES INSEGURAS O FALLAS MECANICAS SOBRES LAS CUALES INGERSOLL-RAND NO TIENE CONTROL. POR LO TANTO INGERSOLL-RAND NO PUEDE SER RESPONSABLE POR EQUIPOS EN LOS QUE SE HAN USADO PARTES NO APROBADAS.

El fabricante se reserva el derecho a hacer cambios o adicionar mejoras sin notificación y sin incurrir en la obligación de hacer dichos cambios o adicionar tales mejoras a productos vendidos previamente.

GLOSARIO

Lista de Partes de Conjuntos de Ensamble

Las partes están listadas en secuencia de desarme en donde sea aplicable. La relación de un artículo con su más alto e inmediato ensamble está indicado por una indentación (•). Por ejemplo en la columna de DESCRIPCIÓN:

Ensamblajes y partes detalladas

- Partes para ensamblajes y partes detalladas
- • Subensamblajes
- • • Partes detalladas para sub-ensamblajes etc.

Columna de Items

El número de ítem es el asignado a la parte en el listado. Este número de ítem identifica la parte en la ilustración asociada. Las abreviaturas siguientes podrían aparecer en esta columna:

- NI No ilustra.
- REF Para la referencia. Refiera a la página e ilustración apropiada.

Columna de Numero de Parte

Todos los números son números de parte INGERSOLL-RAND los cuales deben ser especificados cuando se ordenen los repuestos. Las abreviaturas siguientes podrían aparecer en esta columna:

- NA Significan que la parte no es aplicable a determinados modelos.
- NSS Indican que la parte no se vende por separado para determinados modelos. Las letras
- Los Materiales Consumibles (lubricantes, adhesivos, etc.). Comprados directamente desde un INGERSOLL-RAND Distribuidor de Servicio o Air Center.
- ** El Número de Parte Varía. Especifique los datos completos de compresor cuando ordenación.

Columna de Descripción

Esta columna de descripción contiene el nombre del artículo estándar con modificadores. La relación de un artículo con su próximo ensamble más alto se muestra en esta columna por una indentación. Siempre incluir la descripción cuando ordenadora conjuntos o partes de reemplazo.

Columna de Cantidad Por Ensamble

Las cantidades especificadas en esta columna son el número de partes usadas por cada ensamble superior y no necesariamente son el número total de partes del modelo en general. Especifique la cantidad deseada cuando partes ordenadoras de reemplazo.

Como Seleccionar Repuestos Recomendados

Este catálogo contiene una lista de partes que está incluidas en cada una de las siguientes clases de repuestos recomendados:

- CLASE 1 MINIMA. Sugerida para uso doméstico donde interrupciones en la continuidad del servicio no son importantes.
- CLASE 2 PROMEDIO. Sugerida para servicio doméstico donde algunas interrupciones en la continuidad del servicio no son objetables.
- CLASE 3 MAXIMA. Sugerida para exportación o para servicio doméstico donde la interrupción en el servicio es objetable.

Conjuntos de Partes

Los conjuntos de Partes son disponibles para todos los compresores. Estos conjuntos se diseñan para proveer todas las partes usted necesitará desempeñar el mantenimiento de rutina y reparar tareas. Una lista de Conjuntos disponibles se incluye en la lista de partes que vino con su compresor. Cuando se ordenen repuestos recomendados o kits prácticos, siga el procedimiento descrito para partes del compresor.

INSTRUCCIONES DE ORDEN DE COMPRA

Todas las partes enumeraron en el Lista de Partes para su compresor son disponibles mediante su Air Center o Distribuidor de Servicio de INGERSOLL-RAND. Consulte el Directorio de Distribuidores incluycon su compresor para ubicar el distribuidor en su área.

Cuando se ordenen repuestos, por favor especifique:

1. El MODELO y NUMERO DE SERIE como está impreso en la placa del compresor
2. El NUMERO DE FORMATO de la lista de partes.
3. La CANTIDAD, DESCRIPCION y NUMERO DE PARTE exactamente como fue listado.

EJEMPLO

Envíe las siguientes partes para un modelo	7100
Número de Serie	T30000000
Número de formato de la literatura	SCD-478A
1 Interruptor, Presión	37005907
2 Elemento, Filtro	32012957
1 Manómetro	32013872

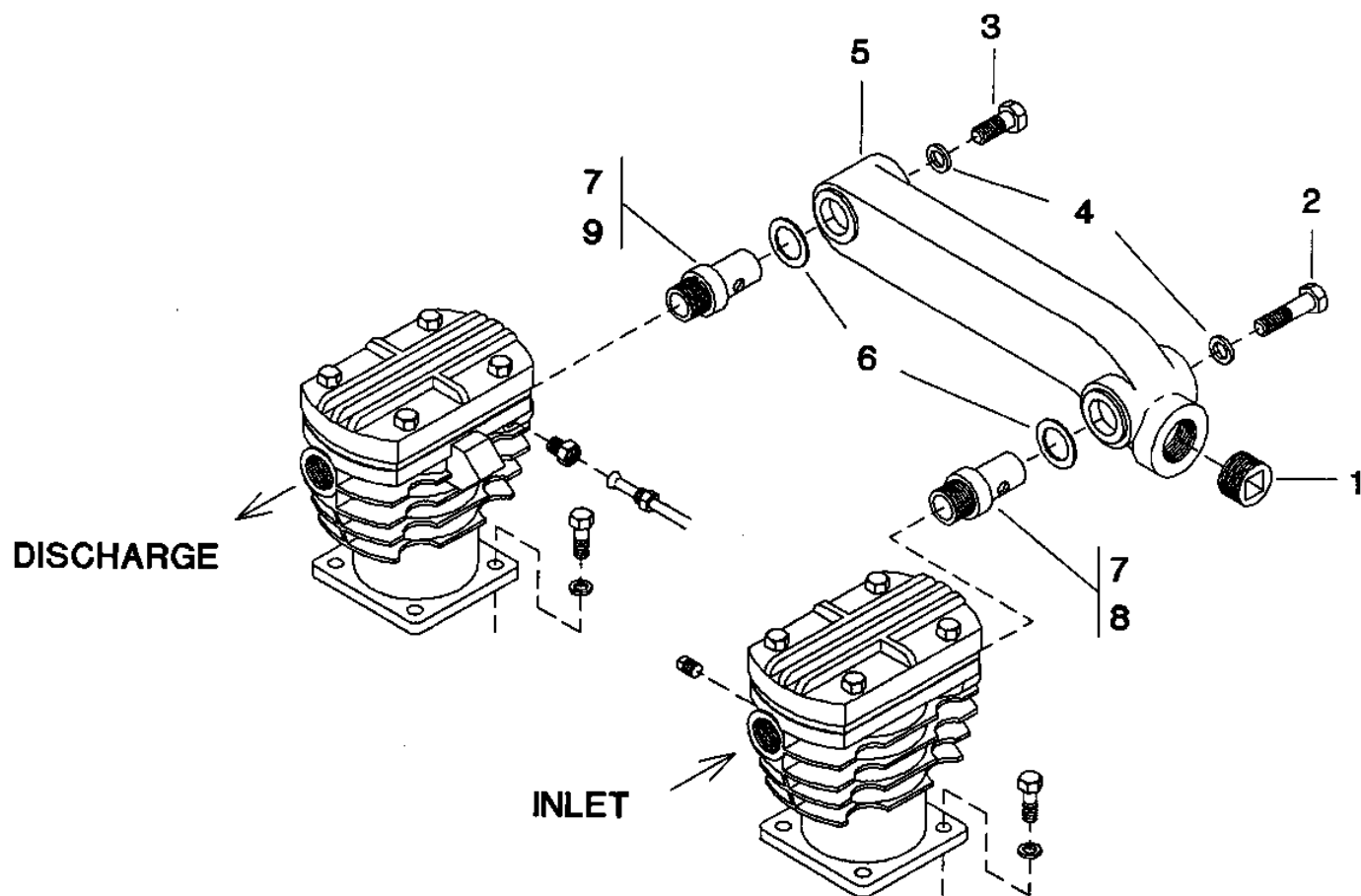


FIGURE 1. TYPICAL TWO-STAGE VACUUM ARRANGEMENT

REF. NBR.	V235T PART NUMBER	V244T PART NUMBER	V255T PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
						1	2	3
1-1	32186413	95033338	95250254	PLUG, PIPE - SQUARE COUNTERSUNK	1			
1-2	95052940	95876975	95054144	CAPSCREW - HEX	1			
1-3	95716882	95002168	95002168	CAPSCREW - HEX	1			
1-4	30345235	30345185	30345185	WASHER, FLAT	2			
1-5	37129210	37129236	37129251	MANIFOLD, INLET/DISCHARGE	1			
1-6	30294912	30294854	30294938	GASKET, MANIFOLD	2	2	2	4
1-7	30284111	30284095	--	CONNECTION, MANIFOLD	2			
1-8	--	--	30284095	CONNECTION, MANIFOLD	1			
1-9	--	--	30284103	CONNECTION, MANIFOLD	1			

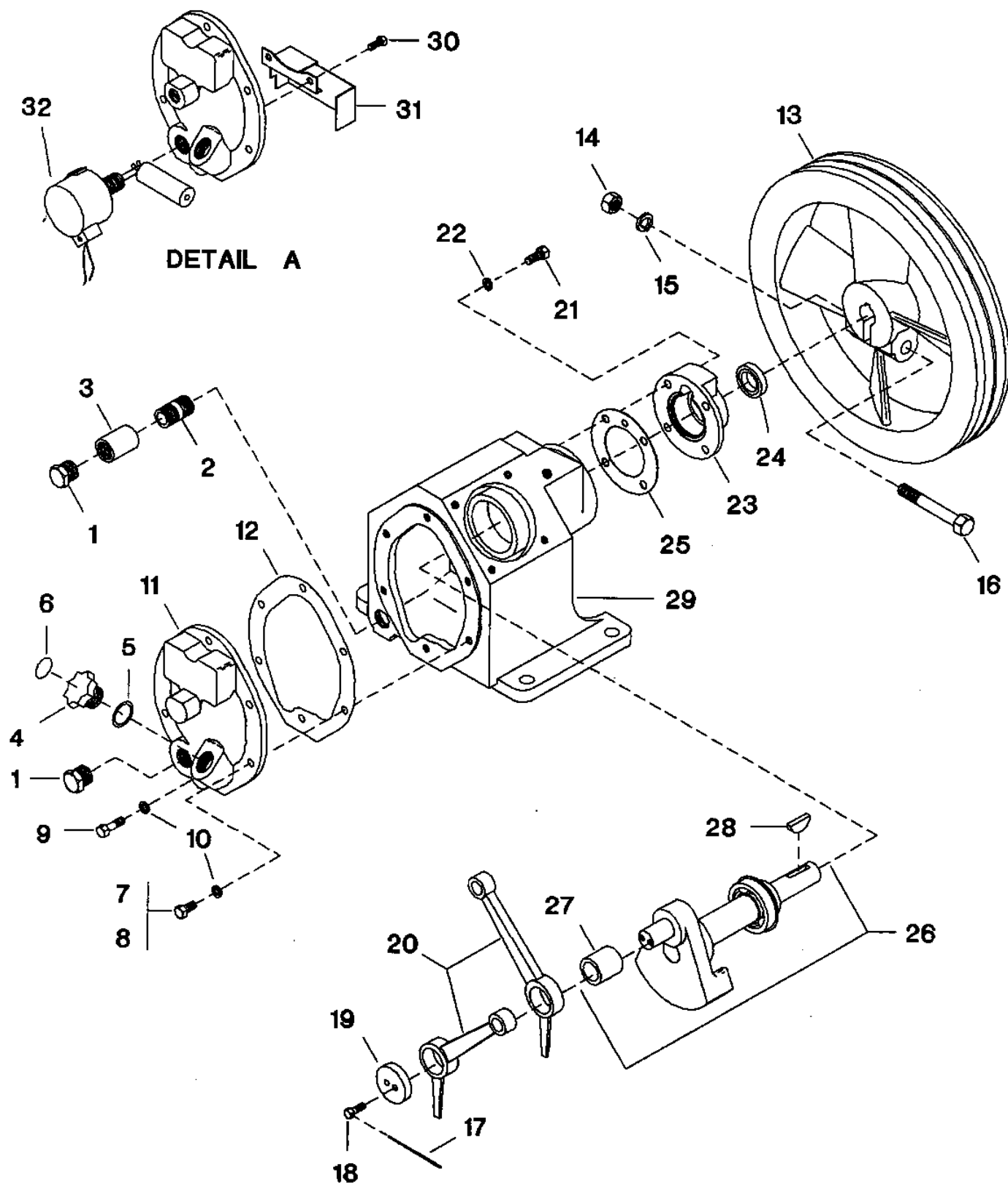


**FIGURE 2. TYPICAL VACUUM FRAME ASSEMBLY
FOR MODELS V235, V235T, V244, V244T, V255 V255T**

REF. NBR.	V235 PART NUMBERS	V244 PART NUMBERS	V255 PART NUMBERS	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
						1	2	3
2-1	95344651	95344651	95344651	PLUG, PIPE 1/2"	2			
2-2	95640009	--	--	NIPPLE, LONG - 1/2 x 2"	1			
2-3	32179061	--	--	COUPLING, PIPE - 1/2"	1			
2-4	30216055	30216055	30216055	PLUG, OIL FILLER - COMPLETE	1			
2-5	95022158	95022158	95022158	● O-RING	1	1	1	2
2-6	32000655	32000655	32000655	DECAL, HAND TIGHT ONLY	1			
2-7	95227302	--	--	CAPSCREW - HEX 5/16-18 x 7/8"	5			
2-8	--	95227302	95227302	CAPSCREW - HEX 5/16-18 x 7/8"	6			
2-9	95079984	--	--	CAPSCREW - HEX 5/16-18 x 1-1/4"	1			
2-10	95674651	95674651	95674651	GASKET, COPPER WASHER - 5/16"	6			
2-11	37127123	37127800	37127990	COVER, FRAME END	1			
2-12	30299226	30439319	30439327	GASKET, FRAME END COVER	1	1	1	2
2-13	30291892	32145146	30212914	WHEEL, V-BELT	1			
2-14	95077798	95077798	95077798	● NUT - HEX 1/2-13	1			
2-15	95716890	95716890	95716890	● LOCKWASHER, SPRING -1/2"	1			
2-16	95053682	95053682	95053708	● CAPSCREW - HEX 1/2-13	1			
2-17	90799289	90799289	90799289	LOCKWIRE, 12 GA x 5"	1			
2-18	95044111	30278667	30278667	CAPSCREW - HEX	2			
2-19	30210314	30210298	30210280	CAP, CRANKPIN	1			
2-20	32004145	32004152	32198160	ROD, CONNECTING	2		2	2
2-21	95227302	95227302	95227302	CAPSCREW - HEX 5/16-18 x 7/8"	4			
2-22	95674651	95674651	95674651	GASKET, COPPER WASHER - 5/16"	4			
2-23	37127032	37127677	37127958	COVER, SHAFT END	1			
2-24	32204521	32204539	32204547	SEAL, OIL	1		1	2
2-25	30295034	30294995	30280531	GASKET, SHAFT END COVER	1	1	1	2
2-26				CRANKSHAFT - COMPLETE	1			
2-27	30289813	30210199	30210165	● BUSHING, CRANKPIN	1			
2-28	95433173	95433173	95433173	● KEY, WOODRUFF	1			
2-29	30222327	32012932	32003709	FRAME, VACUUM PUMP	1			
				OPTIONAL EQUIPMENT DETAIL A				
2-30	95311650	95311650	95311650	CAPSCREW - HEX 1/4-20 x 1/2"	2			
2-31	30285605	30285597	30285589	BAFFLE, LOW OIL LEVEL SWITCH	1			
2-32	32201527	32201527	32201527	SWITCH, LOW OIL LEVEL - NEMA 1	1			
***	--	32217390	32217390	SWITCH, LOW OIL LEVEL - NEMA 7	1			
***	32217697	--	--	SWITCH, LOW OIL LEVEL - NEMA 7	1			
***	95273330	--	--	NIPPLE, PIPE - 1/2 x 1-1/2"				
***	32179061	--	--	COUPLING, PIPE - 1/2"				
				IF BEARING AND CONNECTING ROD REPLACEMENT IS DESIRED, WE RECOMMEND AN ECONOMICAL BEARING/CONNECTING ROD KIT. SEE PAGE 14.				

*** NOT SHOWN IN ILLUSTRATION

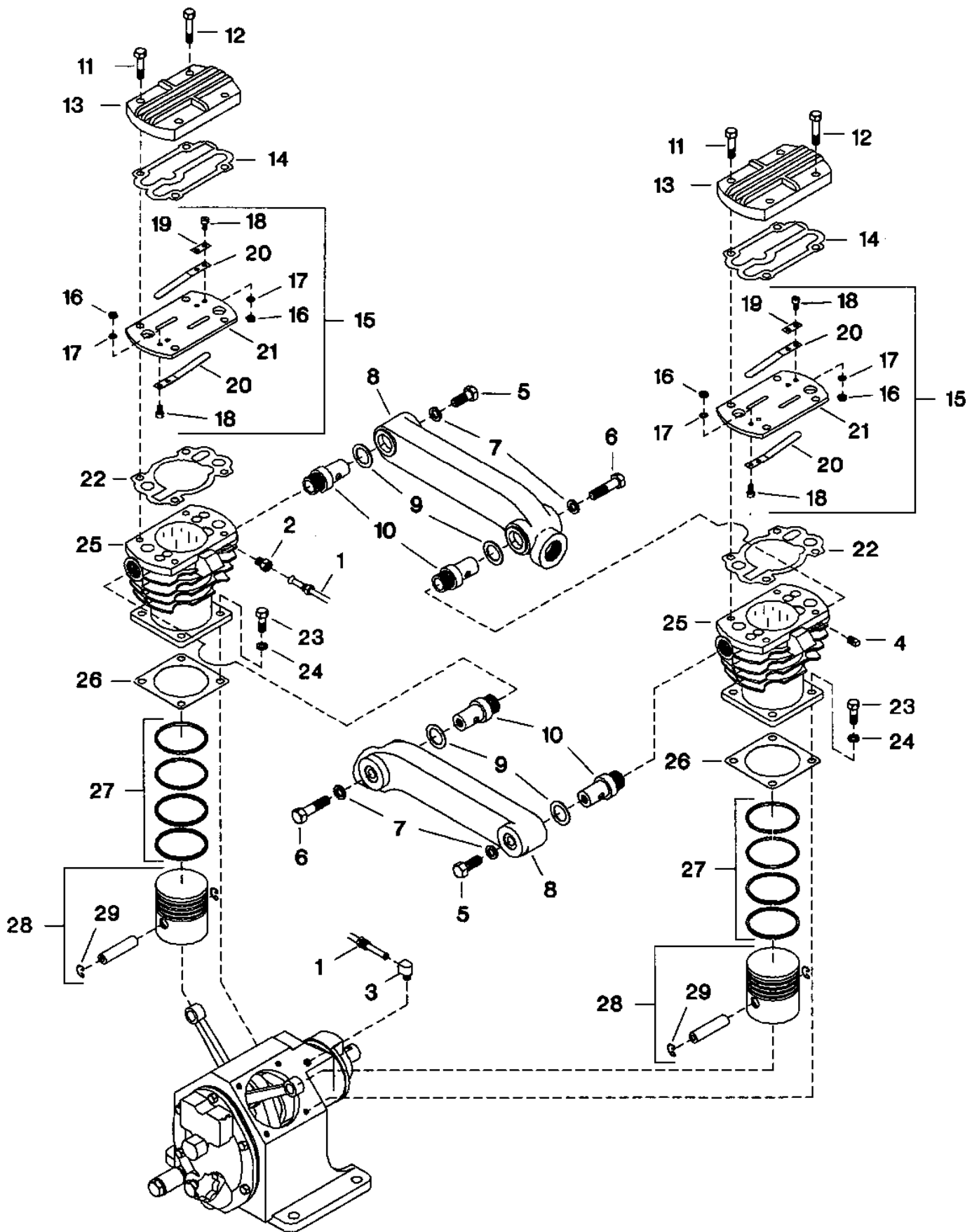


FIGURE 3. MODEL V235 BARE VACUUM

REF. NBR.	PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
				1	2	3
3-1	37131117	TUBE ASSEMBLY, BREATHER - 5/16" DIA.	1			
3-2	95082483	CONNECTOR, TUBE - 5/16 x 1/8"	1			
3-3	95031860	ELBOW, TUBE - 5/16 x 1/8"	1			
3-4	95033585	PLUG, PIPE - SOLID SQUARE HEAD 1/8"	1			
3-5	95053567	CAPSCREW - HEX 1/2-13 x 1-1/4"	2			
3-6	95052940	CAPSCREW - HEX 1/2-13 x 2"	2			
3-7	30345235	WASHER, FLAT - 1/2"	4			
3-8	37129210	MANIFOLD, INLET/DISCHARGE	2			
3-9	30294912	GASKET, MANIFOLD	4	4	4	8
3-10	30284111	CONNECTION, MANIFOLD	4			
3-11	95103792	CAPSCREW - HEX 3/8-16 x 1-1/2"	6			
3-12	95103800	CAPSCREW - HEX 3/8-16 x 1-3/4"	2			
3-13	37127354	AIRHEAD	2			
3-14	30280507	GASKET, AIRHEAD	2	2	2	4
3-15	32141194	SPACER/VALVE ASSEMBLY	2	2	2	4
3-16	95416335	• NUT - HEX 1/4-20	4			
3-17	32035479	• LOCKWASHER, SPRING - 1/4"	4			
3-18	32035461	• SCREW, FILLISTER HEAD 1/4-20 x 1/2"	4			
3-19	32139891	• SHIM, FINGER VALVE	1			
3-20	30221170	• VALVE, FINGER	2	2	2	4
3-21	37127248	• SPACER	1			
3-22	30280499	GASKET, SPACER	2	2	2	4
3-23	95053146	CAPSCREW - HEX 3/8-16 x 7/8"	8			
3-24	95674677	GASKET, COPPER - 3/8"	8			
3-25	37130630	CYLINDER - 3"	2			
3-26	30294227	GASKET, CYLINDER FLANGE	2	2	2	4
3-27	32194276	SET, RING - 3"	2	2	2	4
3-28	30292429	PISTON, AIR - COMPLETE - 3"	2		2	2
3-29	35151067	• RING, LOCK	2			
IF PISTON RING REPLACEMENT IS DESIRED, WE RECOMMEND AN ECONOMICAL RING/GASKET KIT. SEE PAGE 14.						
IF VALVE REPLACEMENT IS DESIRED, WE RECOMMEND AN ECONOMICAL VALVE/GASKET KIT. SEE PAGE 14.						

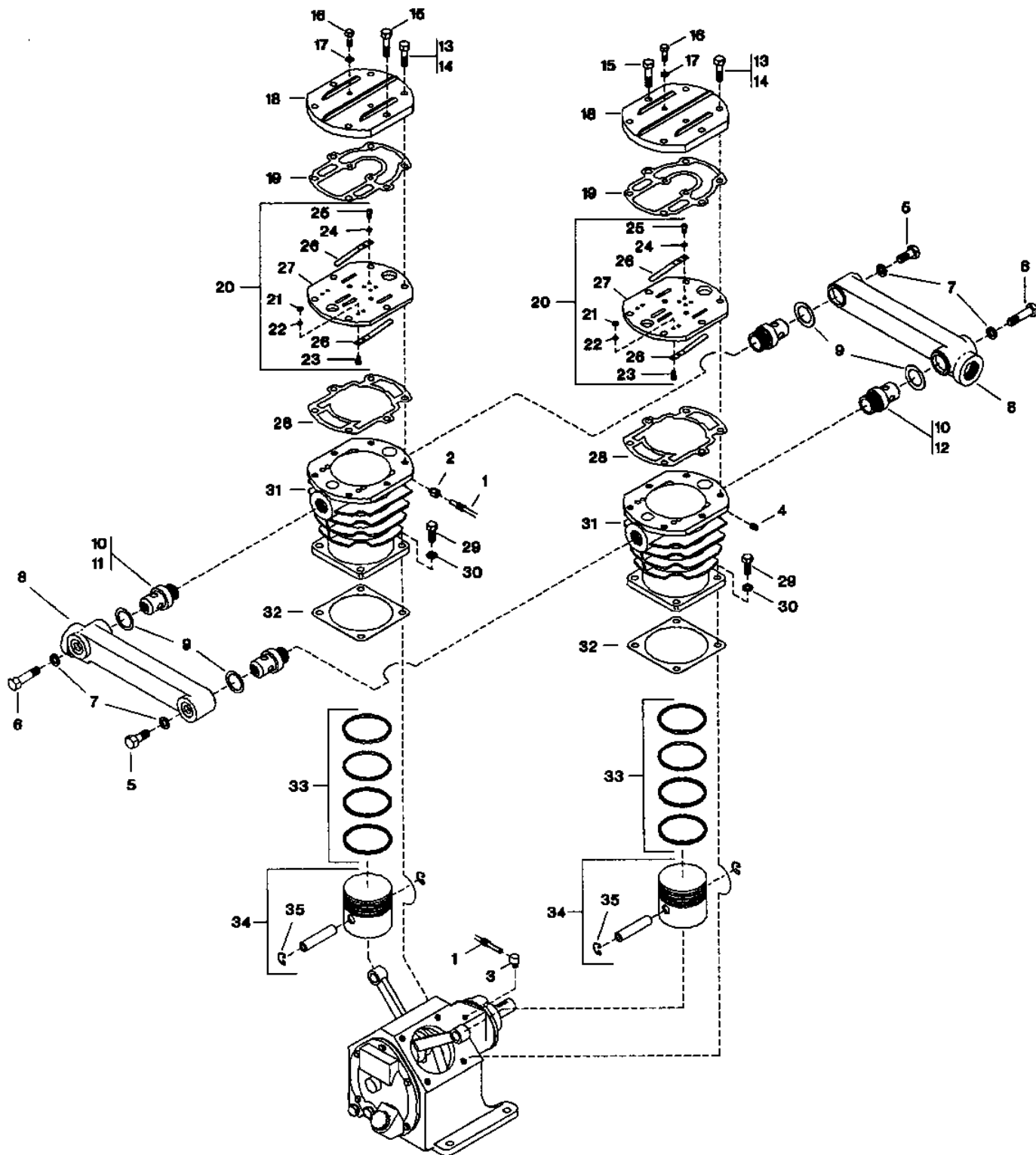


FIGURE 4. TYPICAL BARE VACUUM FOR MODELS V244, V255

REF. NBR.	V244 PART NUMBER	V255 PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
					1	2	3
4-1	37004066	37131273	TUBE ASSEMBLY, BREATHER - 5/16" DIA.	1			
4-2	95082483	95082483	CONNECTOR, TUBE - 5/16 x 1/8"	1			
4-3	95031860	95031860	ELBOW, TUBE - 5/16 x 1/8"	1			
4-4	95033585	95033585	PLUG, PIPE - SOLID SQUARE HEAD 1/8"	1			
4-5	95002168	95002168	CAPSCREW - HEX 5/8-11	2			
4-6	95876975	95054144	CAPSCREW - HEX 5/8-11	2			
4-7	30345185	30345185	WASHER, FLAT - 5/8"	4			
4-8	37129236	37129251	MANIFOLD, INLET/DISCHARGE	2			
4-9	30294854	30294938	GASKET, MANIFOLD	4	4	4	8
4-10	30284095	--	CONNECTION, MANIFOLD	4			
4-11	--	30284095	CONNECTION, MANIFOLD	2			
4-12	--	30284103	CONNECTION, MANIFOLD	2			
4-13	95104188	--	CAPSCREW - HEX 1/2-13 x 1-3/4"	8			
4-14	--	95104188	CAPSCREW - HEX 1/2-13 x 1-3/4"	10			
4-15	--	95104196	CAPSCREW - HEX 1/2-13 x 2"	2			
4-16	--	95468443	CAPSCREW - HEX 3/8-16 x 1-1/8"	4			
4-17	--	30345227	WASHER, FLAT	4			
4-18	37127362	37127370	AIRHEAD	2			
4-19	30279038	30280358	GASKET, AIRHEAD	2	2	2	4
4-20	32024283	32027740	SPACER/VALVE ASSEMBLY	2	2	2	4
4-21	95416335	95416335	• NUT - HEX 1/4-20	4			
4-22	32035479	32035479	• LOCKWASHER, SPRING - 1/4"	4			
4-23	32035461	32035503	• SCREW, FILLISTER HEAD 1/4-20	4			
4-24	32217382	32217382	• WASHER, BELLEVILLE - 1/4"	4			
4-25	32035495	32035511	• SCREW, FILLISTER HEAD 1/4-20	4			
4-26	30221170	30221170	• VALVE, FINGER	4	4	4	8
4-27	37127289	37127297	• SPACER	1			
4-28	30280515	30280366	GASKET, SPACER	2	2	2	4
4-29	95053567	95053567	CAPSCREW - HEX 1/2-13 x 1-1/4"	8			
4-30	95674701	95674701	GASKET, COPPER - 1/2"	8			
4-31	37128535	37128576	CYLINDER	2			
4-32	30288870	30294201	GASKET, CYLINDER FLANGE	2	2	2	4
4-33	32194151	32198376	SET, RING	2	2	2	4
4-34	30215263	30287825	PISTON, AIR - COMPLETE	2		2	4
4-35	30298020	30287791	• RING, LOCK	2			
IF PISTON RING REPLACEMENT IS DESIRED, WE RECOMMEND AN ECONOMICAL RING/GASKET KIT. SEE PAGE 14.							
IF VALVE REPLACEMENT IS DESIRED, WE RECOMMEND AN ECONOMICAL VALVE/GASKET KIT. SEE PAGE 14.							

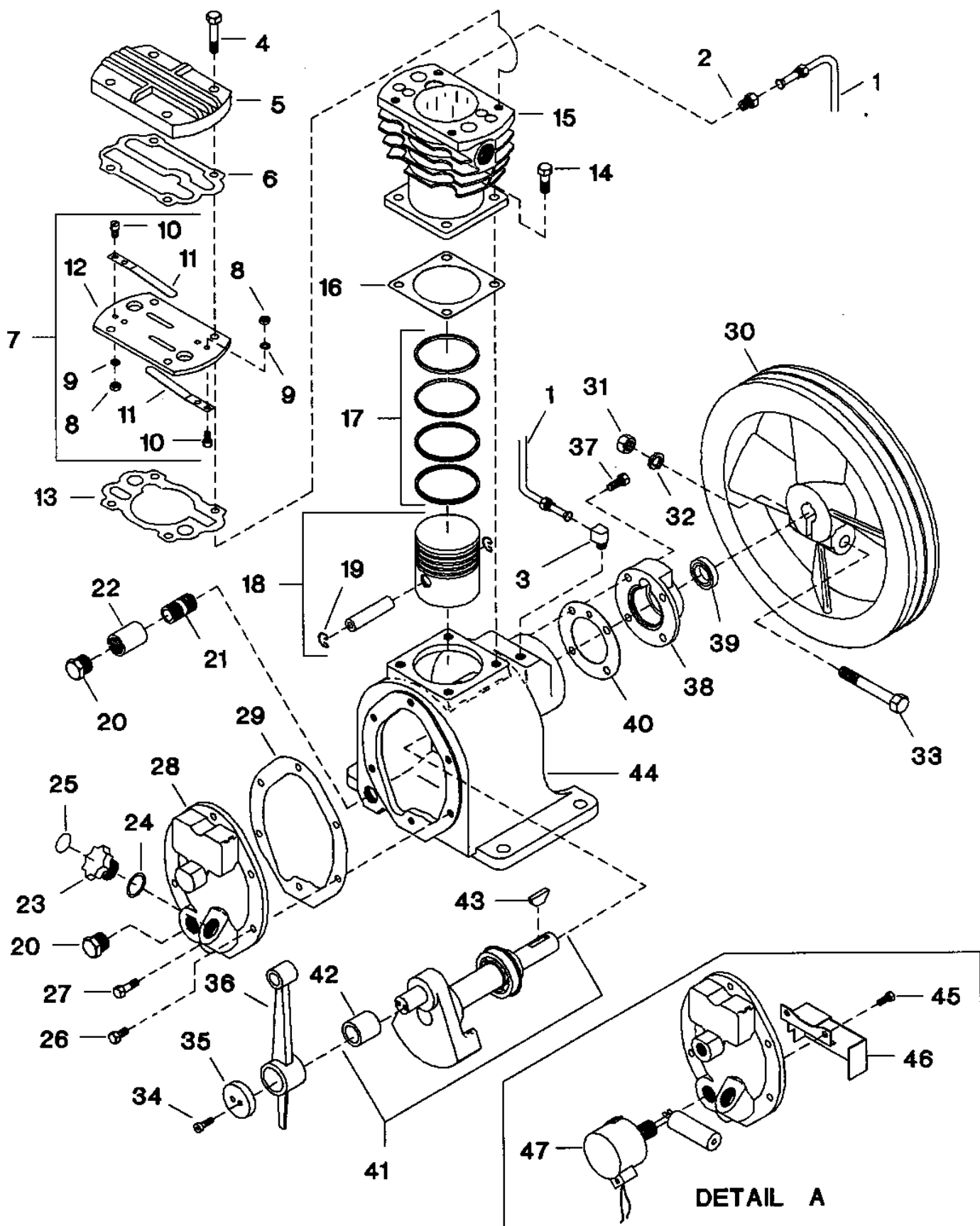


FIGURE 4. MODEL V23A BARE VACUUM AND FRAME ASSEMBLY

REF. NBR.	PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
				1	2	3
5-1	32060410	TUBE ASSEMBLY, BREATHER - 5/16" DIA.	1			
5-2	95082483	CONNECTOR, TUBE - 5/16 x 1/8"	1			
5-3	95031860	ELBOW, TUBE - 5/16 x 1/8"	1			
5-4	95103792	CAPSCREW - HEX 3/8-16 x 1-1/2"	4			
5-5	37127354	AIRHEAD	1			
5-6	30280507	GASKET, AIRHEAD	1	1	1	2
5-7	32024291	SPACER/VALVE ASSEMBLY	1	1	1	2
5-8	95416335	● NUT - HEX 1/4-20	4			
5-9	32035479	● LOCKWASHER, SPRING - 1/4"	4			
5-10	32035461	● SCREW, FILLISTER HEAD 1/4-20 x 1/2"	4			
5-11	30221170	● VALVE, FINGER	2	2	2	4
5-12	37127248	● SPACER	1			
5-13	30280499	GASKET, SPACER	1	1	1	2
5-14	95251013	CAPSCREW - HEX 3/8-16 x 7/8"	4			
5-15	37130630	CYLINDER - 3"	1			
5-16	30294227	GASKET, CYLINDER FLANGE	1	1	1	2
5-17	32194276	SET, RING - 3"	1	1	1	2
5-18	30292429	PISTON, AIR - COMPLETE - 3"	1		1	1
5-19	35151067	● RING, LOCK	2			
5-20	95344651	PLUG, PIPE 1/2"	2			
5-21	95640009	NIPPLE, LONG - 1/2 x 2"	1			
5-22	32179061	COUPLING, PIPE - 1/2"	1			
5-23	30216055	PLUG, OIL FILLER - COMPLETE	1			
5-24	95022158	● O-RING	1	1	1	2
5-25	32000655	DECAL, HAND TIGHT ONLY	1			
5-26	95166849	CAPSCREW - HEX 5/16-18 x 7/8"	5			
5-27	95079976	CAPSCREW - HEX 5/16-18 x 1-1/4"	1			
5-28	37127123	COVER, FRAME END	1			
5-29	30299226	GASKET, FRAME END COVER	1	1	1	2
5-30	30291892	WHEEL, V-BELT	1			
5-31	95077798	● NUT - HEX 1/2-13 x 3-1/2"	1			
5-32	95716890	● LOCKWASHER, SPRING - 1/2"	1			
5-33	95053682	● CAPSCREW - HEX 1/2-13	1			
5-34	95200523	CAPSCREW - SKT 1/4-20 x 3/4"	2			
5-35	30210314	CAP, CRANKPIN	1			
5-36	32004137	ROD, CONNECTING	1		1	1
5-37	95166849	CAPSCREW - HEX 5/16-18 x 7/8"	4			
5-38	37127032	COVER, SHAFT END	1			
5-39	32204521	SEAL, OIL	1		1	2
5-40	30295043	GASKET, SHAFT END COVER	1	1	1	2
5-41	30211577	CRANKSHAFT - COMPLETE	1			
5-42	30289813	● BUSHING, CRANKPIN	1			
5-43	95433173	● KEY, WOODRUFF	1			
5-44	37155587	FRAME, VACUUM PUMP	1			
		OPTIONAL EQUIPMENT				
		DETAIL A				
5-45	95311650	CAPSCREW - HEX 1/4-20 x 1/2"	2			
5-46	30285605	BAFFLE, LOW OIL LEVEL SWITCH	1			
5-47	32201527	SWITCH, LOW OIL LEVEL - NEMA 1	1			
***	32217697	SWITCH, LOW OIL LEVEL - NEMA 7	1			
***	95273330	NIPPLE, PIPE - 1/2 x 1-1/2"	1			
***	32179061	COUPLING, PIPE - 1/2"	1			
		IF PISTON RING, FINGER VALVE OR BEARING AND CONNECTING ROD REPLACEMENT IS DESIRED, WE RECOMMEND ECONOMICAL STEP SAVER KITS. SEE PAGE 14.				

*** NOT SHOWN IN ILLUSTRATION

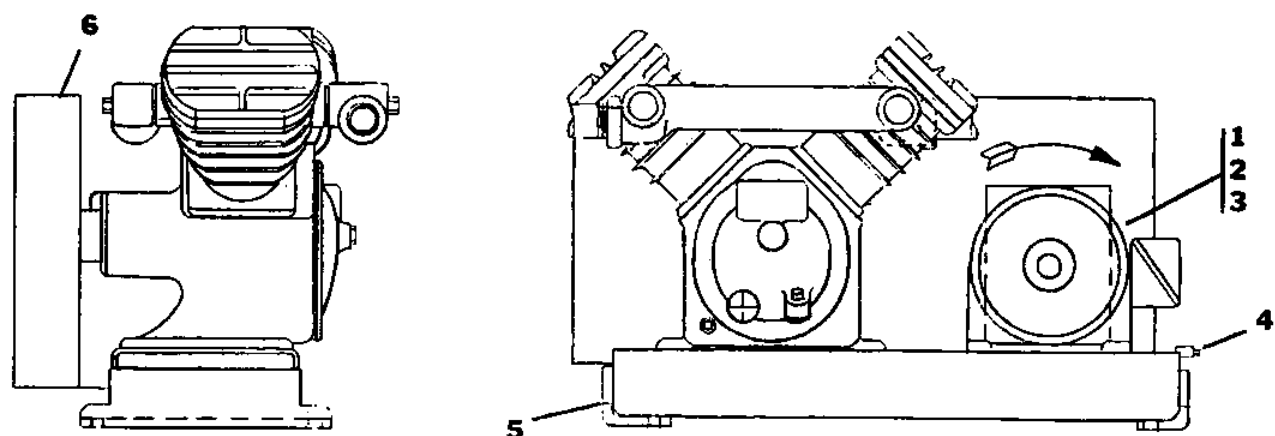


FIGURE 6. VACUUM PUMP DRIVE, SUBBASE AND ACCESSORIES.

REF. NBR.	PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
				1	2	3
6-1	*	MOTOR, ELECTRIC	1			
6-2	*	PULLEY, MOTOR	1			
6-3	95099495	BELT, "V" (V23A, V244 - 1.5 HP)	1			1
6-3	95099503	BELT, "V" (V235, V244 - 2 HP)	1			1
6-3	32166662	BELT, "V" (V255)	2			2
6-4	32192171	TIGHTENER, BELT - COMPLETE (V23A, V235, V244)	1			
6-4	32192197	TIGHTENER, BELT - COMPLETE (V255)	1			
6-5	32001042	SUBBASE ASSEMBLY (V23A, V235, V244)	1			
6-5	37199783	SUBBASE ASSEMBLY (V255)	1			
6-6	32002602	BELTGUARD - COMPLETE (V23A)	1			
6-6	32002685	BELTGUARD - COMPLETE (V235)	1			
6-6	32002693	BELTGUARD - COMPLETE (V244)	1			
6-6	32002701	BELTGUARD - COMPLETE (V255)	1			
***	32212649	KIT, DECAL	1			
OPTIONAL EQUIPMENT						
***	32040065	SWITCH, VACUUM - NEMA 1 - STANDARD	1			
***	37113917	SWITCH, VACUUM - NEMA 1 - 0 TO 30 HG	1			
***	32071284	FILTER, INLET PIPELINE (V23A)	1			
***	32170417	● ELEMENT, FILTER (V23A)	1			
***	32063224	FILTER, INLET PIPELINE (V235, V244)	1			
***	32147035	● ELEMENT, FILTER (V235, V244)	1			
***	32061210	FILTER, INLET PIPELINE (V255)	1			
***	32061335	● ELEMENT, FILTER (V255)	1			
***	32170946	SILENCER, DISCHARGE FILTER (V23A)	1			
***	37170834	SILENCER, DISCHARGE FILTER (V235)	1			
***	37146016	SILENCER, DISCHARGE FILTER (V244)	1			
***	37161577	SILENCER, DISCHARGE FILTER (V255)	1			

* Specify vacuum pump speed and complete motor nameplate data.

** Purchase from your local Ingersoll-Rand Distributor.

*** Not shown in illustration.

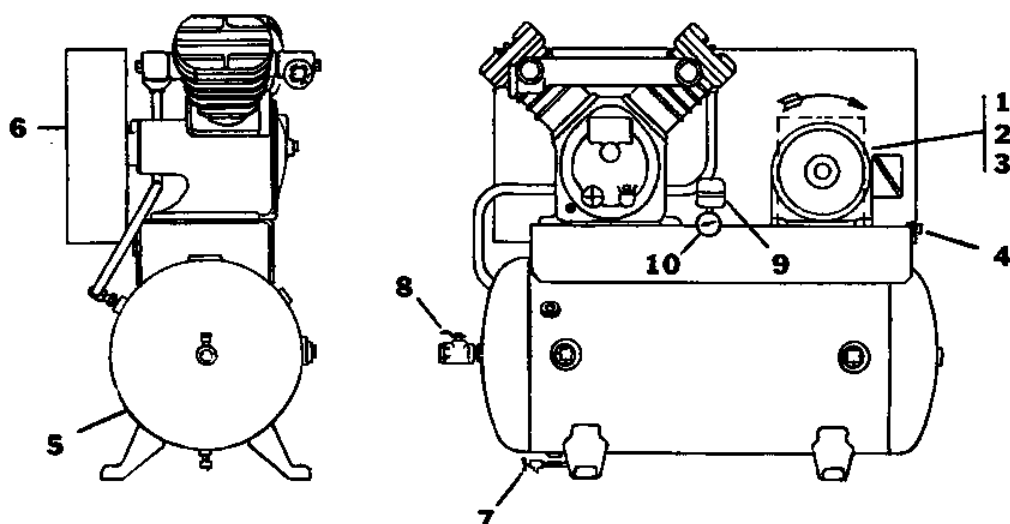


FIGURE 7. VACUUM PUMP DRIVE, VACUUM RECEIVER AND ACCESSORIES.

REF. NBR.	PART NUMBER	DESCRIPTION	UNITS PER ASSY.	REC. SPARES		
				1	2	3
7-1	*	MOTOR, ELECTRIC	1			
7-2	*	PULLEY, MOTOR	1			
7-3	95099495	BELT, "V" (V23A, V244 - 1.5 HP)	1			1
7-3	95099503	BELT, "V" (V235, V244 - 2 HP)	1			1
7-3	32166662	BELT, "V" (V255)	2			2
7-4	32192171	TIGHTENER, BELT - COMPLETE (V23A, V235, V244)	1			
7-4	32192197	TIGHTENER, BELT - COMPLETE (V255)	1			
7-5	32054843	RECEIVER ASSEMBLY - 30 GAL. HORIZONTAL	1			
7-5	32162182	RECEIVER ASSEMBLY - 60 GAL. HORIZONTAL	1			
7-6	32002602	BELTGUARD - COMPLETE (V23A)	1			
7-6	32002685	BELTGUARD - COMPLETE (V235)	1			
7-6	32002693	BELTGUARD - COMPLETE (V244)	1			
7-6	32002701	BELTGUARD - COMPLETE (V255)	1			
7-7	32027120	VALVE, MANUAL DRAIN	1			
7-8	32223588	BALL VALVE ASSEMBLY - 1/2" (SERVICE VALVE)	1			
7-9	32040065	SWITCH, VACUUM - NEMA 1 - STANDARD	1			
7-9	37113917	SWITCH, VACUUM - NEMA 1 - 0 TO 30 HG	1			
7-10	32013849	GAUGE, VACUUM	1			
***	32141558	VALVE, CHECK (V23A, V235)	1			
***	32014649	VALVE, CHECK (V244, V255)	1			
***	32212649	KIT, DECAL	1			
OPTIONAL EQUIPMENT						
***	32170946	SILENCER, DISCHARGE FILTER (V23A)	1			
***	37170834	SILENCER, DISCHARGE FILTER (V235)	1			
***	37146016	SILENCER, DISCHARGE FILTER (V244)	1			
***	37161577	SILENCER, DISCHARGE FILTER (V255)	1			

* Specify vacuum pump speed and complete motor nameplate data.

** Purchase from your local Ingersoll-Rand Distributor.

*** Not shown in illustration.

STEP SAVER KITS

For your convenience, the following parts and/or spare parts for your compressor are available in parts kits. When ordering the kits below, use kit names as Description and the Part No. as shown.

MODEL	PART NUMBER	DESCRIPTION
V23A	32132854 32213597 32153892 30420319	KIT, VALVE/GASKET KIT, RING/GASKET KIT, BEARING/CON ROD SET, GASKET
V235, V235T	32132896 32202418 32127359 30420335	KIT, VALVE/GASKET KIT, RING/GASKET KIT, BEARING/CON ROD SET, GASKET
V244, V244T	32133001 32202426 32127391 30420392	KIT, VALVE/GASKET KIT, RING/GASKET KIT, BEARING/CON ROD SET, GASKET
V255, V255T	32133084 32202434 32127433 30420442	KIT, VALVE/GASKET KIT, RING/GASKET KIT, BEARING/CON ROD SET, GASKET

⚠ WARNING

STATEMENT CONCERNING THE USE OF THIS EQUIPMENT FOR BREATHING AIR AND/OR AQUA LUNG SERVICE.

If the model number on a compressor contains the letters "BAP", the air compressor is suitable for breathing air services. Compressors that DO NOT bear this designation are NOT capable of producing air of breathing quality. For use in breathing air applications, an air compressor must be fitted with additional specialized equipment to properly filter and/or purify the air to meet all applicable federal, state and local laws, rules, regulations and codes, such as, but not limited to, OSHA 29 CFR 1910.34, Compressed Gas Association Commodity Specifications G-7.1-1986, Grade D Breathing Air, and/or Canadian Standards Association. Should the Purchaser and/or User fail to add such specialized equipment, and proceed to use the air compressor for breathing air service, the Purchaser/User assumes all liability resulting therefrom without any responsibility or liability being assumed by Ingersoll-Rand Company.

The purchaser is urged to include the above provisions in any agreement for any resale of this compressor.

Hazardous vapors. Can cause severe nausea, fainting or death.

Compressed air or gas from this compressor may contain poisonous vapors or gases.

Certain sprayed material such as paints, insecticides, weed killer, sand, etc., may be harmful if inhaled or used in a closed area.

Never directly inhale the compressed air or gas produced by this compressor.

Always read container labels when spraying paints or poisons.

Always use the compressor in a well-ventilated area.

Use a respirator or mask whenever there is a chance that you might inhale any sprayed material. If a mask is used, read all instructions provided with the mask to ensure it will protect you from the materials you are spraying.

Hazardous voltage. Can cause severe injury or death.

Always disconnect the power supply cord before performing any maintenance or repair work.

Always connect the power supply cord to a grounded electrical receptacle with the specified voltage and fuse protection.

Never use the compressor in rain, in a wet area, or near an explosive environment.

Flammable vapors. Can cause a fire or explosion, and result in severe injury or death.

Sparks from the motor's electrical contacts can ignite flammable vapors from gasoline, natural gas or solvents.

Do not operate the compressor in any areas where explosive or flammable vapors or liquids may exist.

Never smoke or use open flame in the vicinity of the compressor or any gas bottle or source.

Compressed air/gas has great force.

Over-pressurizing the bottle, tank or receiver, or using a receiver which does not meet the design limits for this compressor, can cause them to rupture or explode, and result in severe injury or death.

Changes to the bottle, tank or receiver structure will cause it to weaken and can cause it to rupture or explode, and result in severe injury or death.

Internal rusting in the bottle, tank or receiver will cause it to weaken and can cause it to rupture or explode, and result in severe injury or death.

Pressure beyond design limits can cause the bottle, tank or receiver to rupture or explode, and result in severe injury or death.

Improper use of air tools or attachments can cause an explosion, and result in severe injury or death.

The bottle, tank or receiver is equipped with a relief valve to protect against over-pressurization. DO NOT REMOVE, ADJUST OR MAKE SUBSTITUTIONS FOR THE RELIEF VALVE. Periodically pull the ring on the relief valve to ensure it operates freely. If the valve is stuck or does not operate freely, it must be replaced.

Never drill into, weld to, or alter the bottle, tank or receiver in any manner.

Drain water/condensate from the air receiver daily or before each use.

Pressure switch and unloader valve operation is related to motor/engine horsepower, air receiver rating, and relief valve setting. DO NOT ATTEMPT TO ADJUST, REMOVE OR BYPASS THE PRESSURE SWITCH, OR CHANGE OR MODIFY ANY PRESSURE CONTROL RELATED DEVICE.

Do not use any air tools or air attachments without first determining the maximum air pressure recommended for that particular piece of equipment.

Compressed natural gas compressors are equipped with explosion-proof electrical systems. Ensure any additional electrical equipment is also explosion-proof.

Gas leaks can occur in compressed natural gas compressors or associated piping. Even small leaks pose a potential hazard and should be corrected before the compressor is operated. If a maintenance function involves breaking a gas-tight joint, always recheck for gas leaks after reassembling by using a commercial gas leak detector.

Rotating compressor. Can propel dirt, sand, metal shavings, etc., and result in severe injury.

Never point an air nozzle or air sprayer toward any part of the body, or toward another person.

Always wear safety glasses or goggles when servicing.

Moving parts. Can cause severe injury.

Always disconnect the power supply before attempting to perform any maintenance or repair work. Always ensure the pressure is released from the compressor, bottles, tanks, receiver and air attachments before performing any maintenance or repair work.

Always disconnect the power supply on electric motor models if the compressor is to be left unattended.

Never operate compressor with the fan shroud removed, or if the shroud is damaged or broken.

Hot parts. Compressors get hot while running, and can cause severe burns if touched.

Never touch the compressor, motor/engine, or tubing during or shortly after compressor operation.

⚠ ADVERTENCIA

DOCUMENTO CONCERNIENTE AL USO DE ESTE EQUIPO PARA EL SERVICIO DE AIRE RESPIRABLE Y/O SERVICIO DE BUCEO.

Si el número del modelo en un compresor de aire contiene las letras BAP, el compresor está diseñado para el uso en servicios de aire respirable. En la ausencia de tal designación, el compresor no puede ser considerado adecuado para producir aire respirable. Para que un compresor sea adecuado para ser usado en aplicaciones de aire respirable, debe estar acondicionado con equipo especializado para filtrar y/o purificar apropiadamente el aire y así cumplir con las leyes, reglas y regulaciones federales, locales y estatales, no limitadas a OSHA 29 CFR 1910.34, las Especificaciones de la Asociación de Gas Comprimido G-7.1-1986 Aire respirable Grado D, y/o Asociación de Estándares Canadienses. Si el comprador y/o el usuario no añaden este equipo especializado y procede a usar el compresor para servicio de aire respirable, el Comprador/Usuario asume toda la responsabilidad resultante de esto sin que ninguna responsabilidad u obligación sea asumida por la compañía Ingersoll-Rand.

Se sugiere al comprador que incluya la anterior provisión en cualquier acuerdo por cualquier re-venta de este compresor.

Vapores peligrosos. Pueden causar náuseas, desmayo o muerte.

El aire comprimido de este compresor puede contener monóxido de carbono venenoso.

Ciertos materiales propulsados por aire tales como pinturas, insecticidas, arena etc. pueden ser peligrosos si se inhalan o utilizan en un área cerrada.

Nunca inhale directamente el aire comprimido producido por este compresor.

Lee siempre las etiquetas de los contenedores cuando estás rociando pintura o venenos.

Siempre utiliza el compresor en un área bien ventilada.

Utilice el respirador o máscara cuando haya riesgo de inhalar cualquier material que esté rociando. Si utiliza máscara, lee muy bien las instrucciones para que usted pueda saber de qué lo va a proteger mientras rocía.

Voltaje peligroso. Puede causar heridas severas o muerte.

Siempre desconecte el suministro eléctrico antes de hacer cualquier mantenimiento o reparación.

Siempre conecte el suministro eléctrico a un circuito adecuado y con el voltaje especificado.

Nunca utilice el compresor en la lluvia, o en un área cerca de una atmósfera explosiva.

Vapores inflamables. Pueden causar fuego o una explosión, y el resultado puede ser heridas severas o muerte.

Chispas del motor eléctrico pueden encender vapores inflamables de gasolina, gas natural o solventes.

No operen el compresor en ninguna área donde vapores o los líquidos explosivos o combustibles pueden existir.

Nunca fumar o el uso abre llama en la vecindad del compresor, botella de gas o fuente de gas.

El aire comprimido tiene gran fuerza.

El tanque de aire sobre-pressurizado puede causar que el tanque de aire explote o se rompa, y puede resultar en heridas severas o muerte.

Cambios en la estructura del tanque de aire pueden causar que el tanque de aire se debilita causando la ruptura o explosión de este, resultando en herida severa o muerte.

El debilitamiento de la estructura del tanque de aire debido a oxidación interna puede causar rupturas o explosión del tanque y puede resultar en heridas severas o muerte.

La presión de aire fuera de sus límites puede causar que el tanque explote o se rompa, y esto causaría heridas severas o muerte.

El uso impropio de las herramientas neumáticas o sus accesorios pueden causar explosión, y resultar en heridas severas.

El tanque de aire está protegido de sobrepresurización por una válvula de seguridad. NO QUITE, HAGA AJUSTES, O SUSTITUCIONES EN ESTA VALVULA. Ocasionamente hale el anillo en la válvula de seguridad para asegurarse de que la válvula funcione libremente. Si la válvula está atascada o no funciona, debe ser reemplazada.

Nunca perforo, suelde o cambie el tanque de aire en ninguna forma.

Drene el agua/condensado del tanque de aire diariamente o antes de cada uso.

NO TRATE DE AJUSTAR, REMOVER, O DERIVAR EL BOTON DEL INTERRUPTOR DE PRESION, O CAMBIE Y MODIFIQUE CUALQUIER ESTRUCTURA RELACIONADA CON EL CONTROL DE PRESION.

No utilice ninguna herramienta neumática o accesorio sin determinar la presión máxima de aire comprimido que se recomienda para esa herramienta en particular.

Los compresores comprimidos de gas natural se equipan con sistemas eléctricos que no estallarán. Asegure cualquier equipo eléctrico adicional es también incapaz de estallar.

Los escapes de gas pueden ocurrir en los compresores naturales de gas o asociados tubos. Cualquier escape es un peligro potencial y debería corregirse antes de el compresor se opera. Si una función de mantenimiento involucra quitando un sujetador, siempre detecta cualquier gas escapa después de amarr nuevamente por usar un detector de escape de gas.

Aire comprimido. Puede expulsar polvo, metal o arena etc. y puede resultar en heridas.

Nunca apunte la boquilla hacia alguna parte del cuerpo o hacia otra persona.

Use siempre gafas protectoras.

Las partes en movimiento pueden causar heridas severas.

Desconecte siempre el suministro eléctrico antes de cualquier mantenimiento ó reparación.

Desconecte siempre el suministro eléctrico si el compresor no va ser usado.

Asegúrese que el aire a presión es liberado del compresor, del tanque de aire, y demás accesorios de aire antes de hacer cualquier mantenimiento o reparación.

Nunca opere el compresor sin el guarda poleas. Nunca opere el compresor con una polea dañada o rota.

Partes calientes. Los compresores de aire se calientan en operación y pueden causar quemaduras severas.

Nunca toque el compresor, el motor, o la tubería de descarga durante o poco después de operar el compresor.



Look What **INGERSOLL-RAND Can Do For YOU. . .**

EFFICIENT FIELD SERVICE

We maintain a highly trained staff of technicians to service your equipment for preventive maintenance, or to assist you should emergencies ever occur.



EFICIENTE SERVICIO EN EL CAMPO

Mantenemos un grupo de mecánicos entrenados para suministrarle mantenimiento preventivo o atender cualquier emergencia que puede tener.

COMPLETE REPAIR SERVICE

Our trained technicians will repair or overhaul your equipment to factory specifications, using only genuine I-R parts.



COMPLETO SERVICIO DE REPARACION

Mecánicos entrenados repararán su compresor según los métodos recomendados por fábrica usando solamente partes genuinas Ingersoll-Rand.

SPECIAL ENGINEERING SERVICE

We can help you identify and solve your compressed air problems by evaluating your needs and recommending the proper compressor and air piping system to give you maximum efficiency.



SERVICIO DE INGENIERIA ESPECIAL

Nosotros podemos ayudarlo con sus problemas de aire comprimido investigando sus necesidades y recomendando el compresor y el sistema de aire adecuados para lograr máxima eficiencia.

SPARE PARTS

By stocking genuine I-R spare parts, we can help you avoid costly delays, or substituting inferior parts. Using genuine I-R parts on your I-R equipment will help to keep even older machines running in good-as-new condition.



PARTES DE REPUESTO

Mantenemos partes genuinas Ingersoll-Rand, evitando posibles sobrecostos debido a demoras en la sustitución de partes menores. Como resultado, los equipos antiguos son mantenidos como nuevos.

COMPLETE STOCK OF EQUIPMENT

We carry a complete line of I-R equipment and accessories designed to meet any compressed air application. We are backed by Ingersoll-Rand's prompt factory shipment to ensure you on-time delivery.



STOCK COMPLETO DE EQUIPOS

Nuestro stock de máquinas completas que pueden encargarse usualmente de cualquier necesidad, está soportado por un eficiente sistema de despachos de fábrica de Ingersoll-Rand para asegurarle entrega a tiempo.

A SUBSTITUTE IS NOT A REPLACEMENT

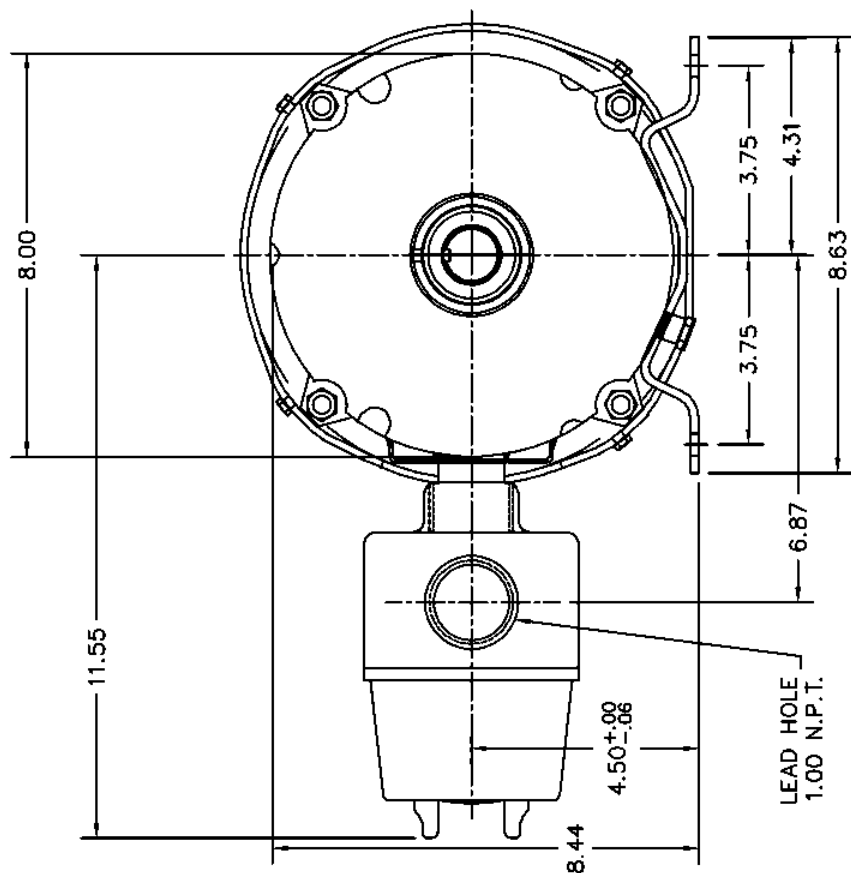
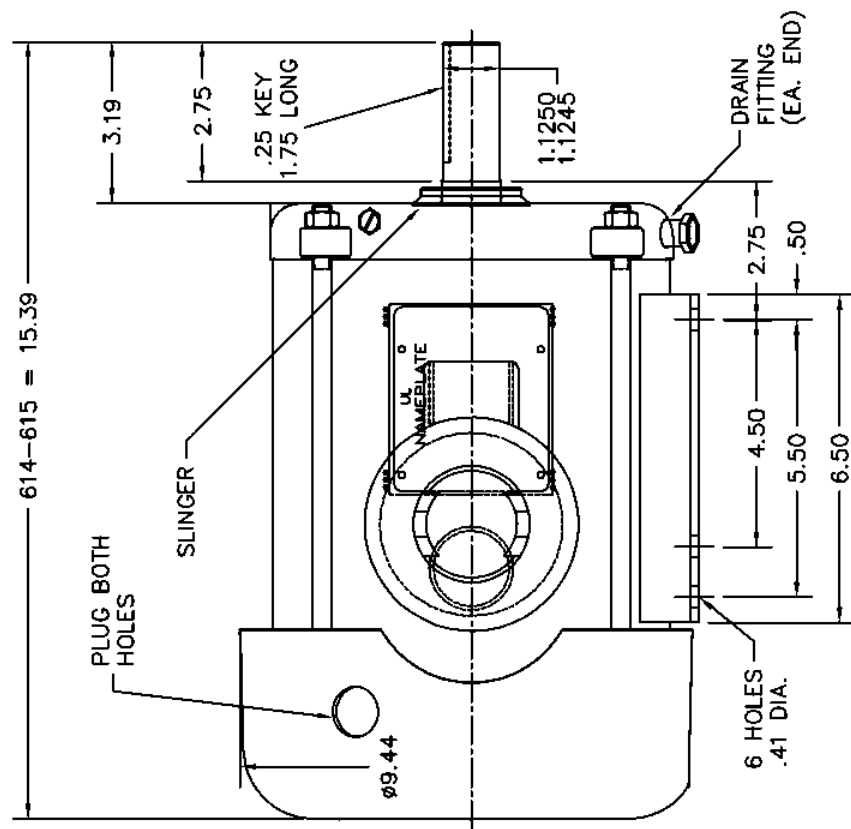
Ensure you get peak performance and longevity out of your Ingersoll-Rand compressor by insisting on genuine Ingersoll-Rand replacement parts and maintenance kits. Not only are the replacement parts made to precise dimensions and OEM-specified metallurgy, but each part is backed by the Ingersoll-Rand warranty. Your local Air Center, Full-Service distributor or direct Ingersoll-Rand salesperson will work with you to ensure you get the parts you need to do the job right. Equip your machines with only the best - Ingersoll-Rand Genuine Parts.

**DISTRIBUTED BY:
DISTRIBUIDO POR:**

UN SUSTITUTO NO ES UN REEMPLAZO

Asegúrese que obtiene máximo desempeño y duración de su compresor insistiendo en usar solamente partes de reemplazo genuinas y kits de mantenimiento Ingersoll-Rand. No solamente están construidas con dimensiones precisas y especificaciones exactas de metalurgia, sino que cada parte está respaldada por la garantía Ingersoll-Rand. Su Air Center, su Distribuidor de Servicio o el personal de ventas directo de Ingersoll-Rand trabajarán con Usted para asegurarle que recibe las partes para efectuar el trabajo correcto. Equipe sus máquinas sólo con lo mejor - Partes Genuinas Ingersoll-Rand.

**Ingersoll-Rand Company
Reciprocating Compressor Division
Small Compressor Business Unit
Campbellsville, KY 42718**



36LYJ694

CUST. NAME		CUST. P.O.		CERTIFIED BY		MODEL	INSUL	AMB
H.P.	MTG	TYPE	R.P.M.	VOLTS		ENCL	PHASE	FREQ
BALDOR ELECTRIC Co.								
REV. DESC: NEW		REVISED: 06/09/00 1:35		TDR: 0211430				
REV. LTR: -		BY: SB	FILE: AAA00076220	MDL: -				
4699A79C		MTL: -						
HOR 182-4T XPFC 36M CLI GP C&D DRILL RIG W/CROUSE-HINDS KOBX								