

Installation Instructions

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GENERAL

1. Inspect the compressor for shipping damage and file a claim with the shipping company if damaged or incomplete.
2. Check compressor nameplate for correct model and voltage designation.
3. Before installation, review all Carlyle compressor application literature to assure yourself that the proper compressor has been selected and is being applied in a proper manner. The required application literature is available on the Carlyle website, www.carlylecompressor.com/support/literature/



Scan QR Code for link to Carlyle literature website.
<https://bit.ly/3J8liEP>

SAFETY INSTRUCTIONS

DANGER

Failure to follow these instructions will result in severe personal injury or death.

ELECTRIC SHOCK HAZARD. Do not operate compressor or provide electric power to it unless the compressor terminal box is installed and the terminal box cover is in place and secured.

DO NOT provide power to unit or turn on compressor unless suction and discharge service valves are open.

DO NOT remove the compressor terminal box cover until all electrical sources have been disconnected.

NEVER EXCEED specified test pressures. System strength/tightness test pressure may not exceed the compressor maximum test pressure on the nameplate. Close shutoff valves to isolate the compressor if necessary.

DO NOT USE oxygen or other industrial gases for tightness/pressure testing. Use nitrogen or inert gas.

FLAMMABLE REFRIGERANT CAN IGNITE OR EXPLODE. Compressor contains flammable refrigerant. If flammable refrigerant is released, an explosive concentration can be present in the air. A release of flammable refrigerant can result in a fire or explosion if there is an ignition source nearby.



WARNING

Failure to follow these instructions may result in serious injury or death.

CONTENTS UNDER PRESSURE. Compressor contains oil and refrigerant under pressure. Pressure must be relieved before installation, servicing, or opening any connections.

HOT and COLD surface temperatures can occur during operation and can result in severe burns or frostbite.

USE ONLY approved refrigerants and refrigeration oils.

CHECK THE REFRIGERANT TYPE. Charge only with refrigerant that conforms to AHRI Standard 700.

Only qualified, authorized, and appropriately trained HVAC or refrigeration personnel, should install, commission, and maintain this equipment.

Use appropriate personal safety equipment where required. Safety goggles, gloves, protective clothing, safety boots, and hard hats should be worn where necessary.

OPERATING LIMITS

Operating envelopes of the compressor models will differ with each model and refrigerant. These operating envelopes are provided in the CARWIN rating program.



Scan QR code for link to CARWIN website.
<https://bit.ly/3tSLH4n>

GENERAL INSTALLATION PROCEDURE

Holding Charge

The 06M compressor is factory-supplied with a 5 to 15 psig (1.4 to 2 bar) charge of dry air. This internal pressure must be relieved before attempting to remove any compressor fitting or part.

Relieve holding charge by removing the cap on the low pressure connection fitting and depressing the internal disc. See Fig. 1 for applicable low pressure connection fitting location.

System Cleanliness and Dehydration

Clean and dry systems are essential for long compressor and motor life and satisfactory operation. Compressor lubricants require special attention; excessive moisture, when combined with heat and refrigerant, can form damaging acids. The recommended limit for moisture is less than 100 ppm for POE lubricants.

Use only piping which is clean and dry inside, free from rust and process oils.

Suction Screen

All 06M compressors are equipped with a suction strainer located on the compressor side of the suction service valve. Verify that the suction screen is installed. Do not operate the compressor without the suction strainer installed.

Service Valves

Remove valve pads and attach factory-supplied suction and discharge gaskets and service valve to the compressor. Torque applicable service valve mounting bolts as noted in table "Fastener Torque Specifications" on page 8.

When brazing piping to valve, disassemble valve or wrap in a wet cloth to prevent heat damage.

Cylinder Head Unloaders

If equipped with an electric capacity control solenoid valve, perform a functional test on the valves using a permanent magnet or a solenoid coil to activate the solenoid valve. There should be a distinctive "click" when the solenoid valve is energized and de-energized. The valve may have been damaged if there is no sound. Examine the valve stem enclosure tube to determine if it is bent or damaged.

Approved Refrigerants

06MA compressor models may be applied on R-410A only.

NOTE: 06MB models may be applied with R-410A or R-454B. All 06M compressor models are UL (Underwriters' Laboratories) and CSA (Canadian Standards Association) Recognized. 06MA models comply with the Machinery Directive and Low Voltage Directive of the European Community to carry the CE mark for R-410A applications only.

06MB models (applied with R-410A or R-454B) do not have the certifications to carry CE mark. 06MB models are only UL and CSA Recognized.

Oil

1. Check to see that the oil level is 1/4 to 3/4 way up on compressor sight glass before starting and after 15 to 20 minutes of operation. Refer to table "06M Sight Glass" on page 3.) Compressors are shipped without oil. All compressors must contain the specified oil charge prior to start up as a condition of warranty.
2. To add oil:
Relieve internal crankcase pressure, isolate crankcase, and add oil through the oil fill connection (see Fig. 1).
To remove excess oil:
Reduce internal crankcase pressure to 2 psig (1.15 bar), isolate crankcase then loosen the oil drain plug allowing oil to seep out past the threads of the plug.

⚠ CAUTION

With the compressor crankcase under slight pressure, do not remove the oil drain plug, as the entire oil charge could be lost. Do not reuse drained oil or oil that has been exposed to the atmosphere.

3. When additional oil or a complete oil change is required, use only the listed Carlyle approved oils as shown in Table 1.

Mufflers

Discharge line mufflers are recommended for all 06M compressors. The installer is responsible to ensure that the muffler is properly rated for refrigerant used.

Pressure Relief Valves

A sufficient number of pressure relieving devices and/or pressure relief valves, having capacity deemed adequate for the system, may need to be provided. They must be located such that no stop valve is located between the relief valve and the section of the system being protected. The Maximum Allowable Pressure for the high side of the 06M compressors is 800 psig (maximum) and for the low side is 365 psig (maximum).

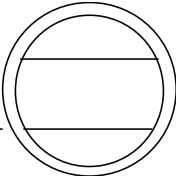
Table 1 — Recommended Oils

COMPRESSOR MODEL	REFRIGERANT	OIL		
		TYPE	MANUFACTURER	BRAND NAME
06MA*****	R-410A	POE	Totaline	P903-1701
			CPI	Emkarate RL68H
			CPI	Solest 60
			Mobile	Arctic EAL 68
06MB*****	R-410A, R-454B	POE	Totaline	P903-1701
	R-410A, R-454B		CPI	Emkarate RL68H
	R-410A, R-454B		CPI	Solest 60
	R-410A		Mobile	Arctic EAL 68

LEGEND

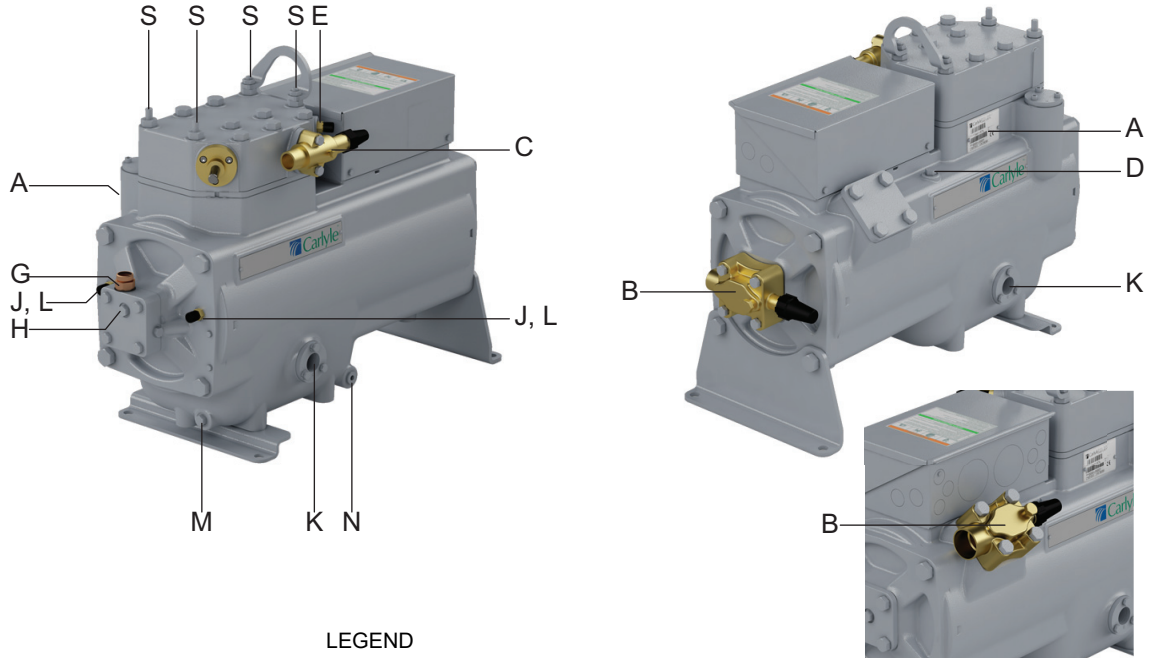
POE — Polyolester-Based Oil

Table 2 — 06M Sight Glass

06M OIL SIGHT GLASS LEVEL	NOMINAL OIL CHARGE		
	NEW SYSTEM (DRY PIPING) PINTS (LITERS)	COMPRESSOR	EXISTING SYSTEM (WET PIPING) PINTS (LITERS)
<div> <div>3/4 (Max) —</div> <div>1/4 (Min) —</div>  </div>	5.8 (2.7)	15, 18, 21, 24 cfm	5.0 (2.4)

Connection Points

06M, 3-Cylinder, 15-24 cfm



LEGEND

- A — Nameplate Locations
- B — Suction Service Valve
- C — Discharge Service Valve
- D — Low Pressure Connection
- E — High Pressure Connection
- G — Oil Pressure Mechanical Sensor
- H — Oil Pressure Connection
- J — Low Side Oil Pressure Difference
- K — Oil Level Sight glass
- L — Oil Sump Fill Port
- M — Oil Sump Drain Port
- N — Crankcase Heater
- S — Cylinder Head Fan Studs

Fig. 1 — 06M Compressor

ELECTRICAL

Consult the wiring diagram located inside the compressor terminal box cover and Fig. 2 or 3 for the correct terminal plate and overloads with proper wiring connections.

Terminal Plate Arrangement

The compressor will have 5-pin terminal plate assembly but the overcurrent and thermal protection systems will differ based on the compressor model.

ELECTRICAL WIRING FOR FIXED SPEED 06M MODELS

See Fig. 2.

1. Connect the control circuit leads to connections 11, 14, and 12 located on top of the module. Connections 11 and 14 are a normally open relay to be used to close the compressor contactor and start the compressor. Connections 11 and 12 are a normally closed relay that will open upon a fault condition which is to be used as an optional alarm indicator. Use a fork terminal or stripped and tinned wire to prevent fraying. Torque module connections to 12 lb-in. (1.35 N-m) maximum.
2. The overload module requires control power, the supply voltage is 120/240 vac. Connect module control power leads to module connections L and N using a fork terminal or stripped and tinned wire to prevent fraying. Torque module connections to 12 lb-in. (1.35 N-m) maximum.

3. Make motor power connections from the contactor to the terminal plate as shown in Fig. 2. See “Terminal Plate Wiring” on page 6 for connection details.

ELECTRICAL WIRING FOR ALL 06M MODELS IN VARIABLE SPEED

See Fig. 3.

1. Variable speed 06M compressors may use the overcurrent protection features of the variable speed drive providing that the drive is listed with UL for this purpose. In variable speed applications, the factory-installed electronic overcurrent protection device should be disconnected entirely and removed from the compressor terminal box.
2. The overcurrent setting of the drive must be consistent with the MCC value as defined in the 06M Application Guide available on the Carlyle website, www.carlylecompressor.com.
3. Make motor power connections from the variable speed drive to the terminal plate as shown in Fig. 3. See “Terminal Plate Wiring” on page 6 section for connection details.

⚠ WARNING

Systems with VFD bypass contactors must include appropriate overcurrent protection when operating in bypass mode.

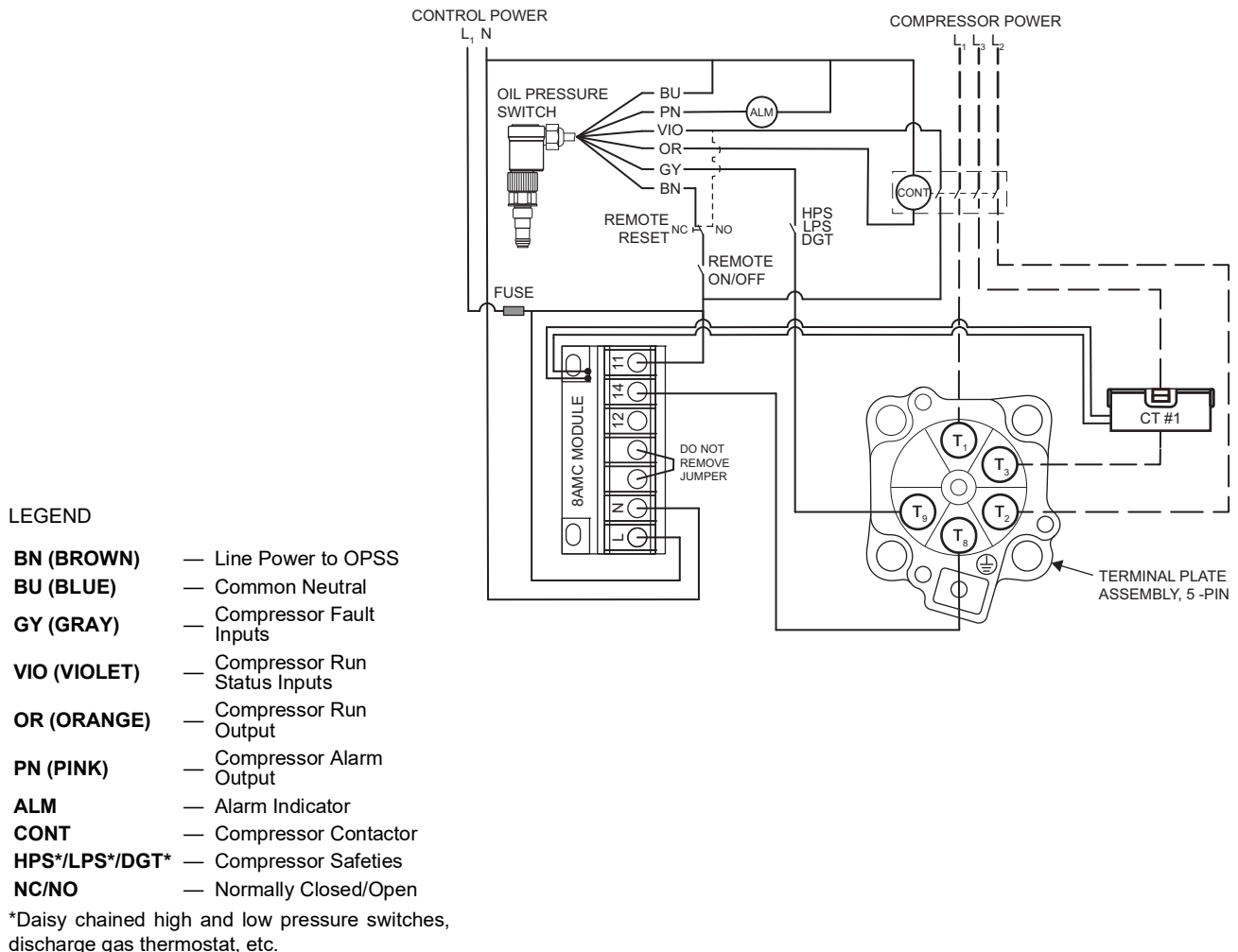


Fig. 2 — Electric Wiring for Fixed Speed 06M Models

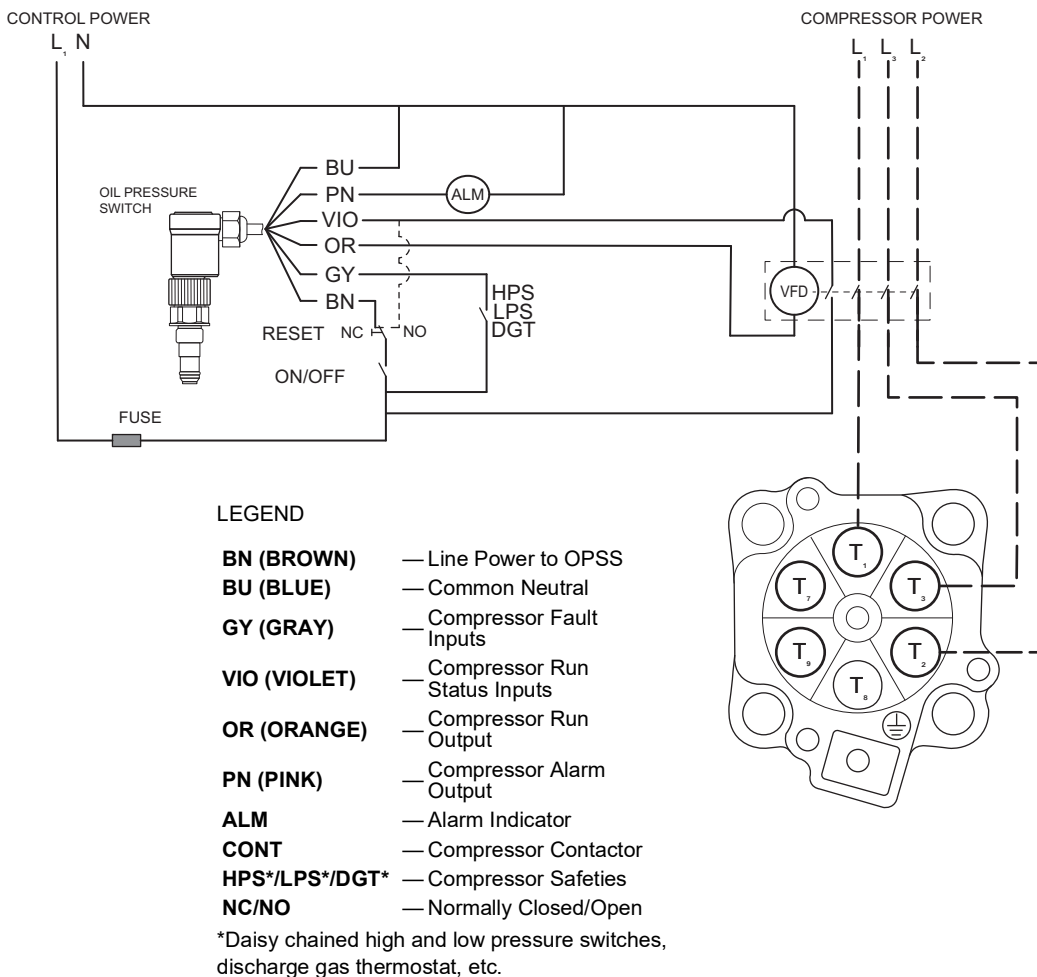


Fig. 3 — Electric Wiring for all 06M models in Variable Speed

Terminal Plate Wiring

1. Field-supplied ring terminals are required to accommodate the 1/4-28 terminal studs.
2. With screwdriver, remove terminal nut and star washer only on terminals needed to make connections applicable to installed overload system. Leave dished retainer in place. (See Fig. 4.)
3. Apply all applicable power and control circuit leads to the terminal studs per associated overload wiring diagram. Reassemble star washers and extended slotted terminal nuts. (See Fig. 4.)
4. Tighten extended terminal nuts to 30 lb-in. (3.4 N-m) maximum.

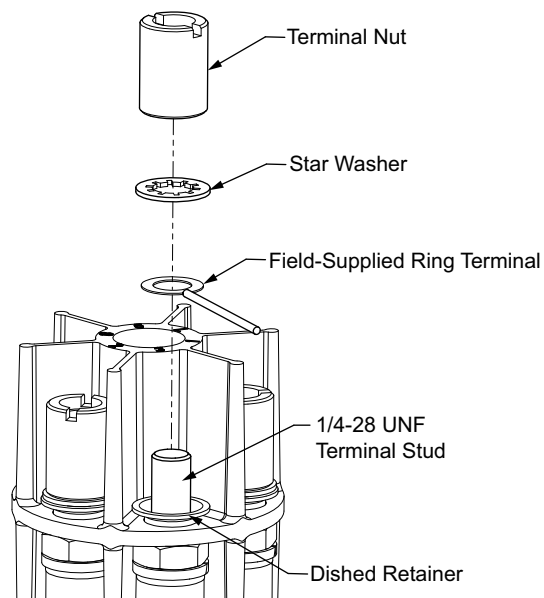


Fig. 4 — Terminal Plate Components

OIL PRESSURE SAFETY SWITCH

Differential oil pressure (oil minus suction pressure) is important to good compressor reliability. Carlyle recommends a 120-second time delay in the oil safety switch. The oil safety switch protects the compressor when lubrication is lost for more than 120 seconds. The switch closes the control circuit at startup, allowing the compressor to run for 120 seconds. Operating oil pressure must reach the minimum required start pressure above suction pressure within 120 seconds for the switch to remain closed, which allows the compressor to run. If the operating oil pressure falls below the minimum stop pressure above suction for longer than 120 seconds, the switch will open the control circuit, shutting down the compressor. Oil pressure protection devices must be manual reset type.

The 06M compressors are supplied with factory-installed oil pressure protection. Refer to Fig. 1. This factory-installed sensor eliminates the need for any field piping connections. The electronic portion of this oil pressure protection is available as a separate accessory for integrating into the system controls. Table 3 shows the oil pressure differential electronic switch required to integrate the factory-installed sensor into the system controls.

COOLING FANS

Cylinder head cooling fans are required in any application where the discharge gas temperature exceeds 250°F (121°C). Applications where the compressor is located in an airstream with a consistent velocity of 8-10 fps (~3 m/s) do not require cylinder head fans.

MOUNTING

The 06M compressors is approved only for rigid mounts. See Fig. 5. Variable speed applications should be carefully evaluated to ensure that there are no resonances across the entire speed range. See Table 4 for proper torque values.

SERVICE AND TROUBLESHOOTING

Scan QR code below for links to troubleshooting information for the 06M compressors.



574-018 Failure Modes and Troubleshooting Guide
<https://bit.ly/3CBaDkM>

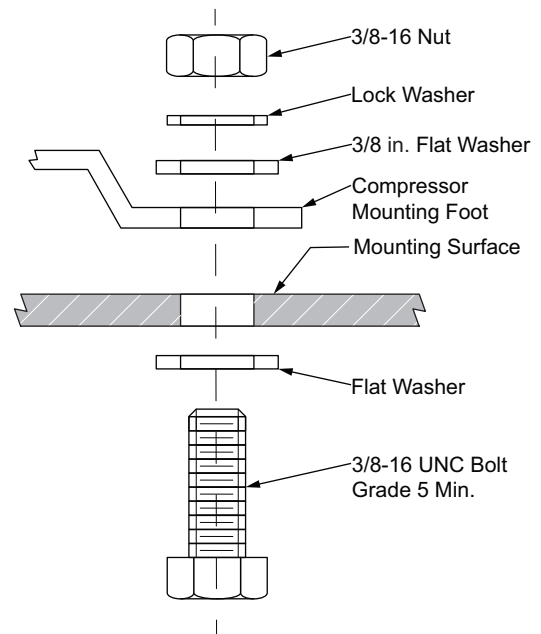


Fig. 5 — Rigid Mounting (Plate Foot with Spacer)

Table 3 — Electronic Oil Pressure Protection

CARLYLE PART NO.	TIME DELAY	USAGE	PRESSURE DIFFERENTIAL SETTING		VOLTS	RESET TYPE	REMOTE ALARM CIRCUIT OPTION
			Cut Out	Cut In			
06DA509570	120 sec	Electronic switch for factory-installed sensor.	4-8 psid (0.28-0.55 bar)	8-11 psid (0.55-0.76 bar)	115/230	Manual	Yes

TORQUE SPECIFICATIONS

Table 4 — Fastener Torque Specifications

THREAD SIZE	TORQUE RANGE	APPLICATION
No. 10-24	20-22 in-lb (2.3-2.5 Nm)	Terminal Box Cover Screws
No. 10-32	3-5 ft-lb (4-7 Nm)	Terminal Box
7/16-20 UNF	11-19 ft-lb (15-26 Nm)	Oil Fill SAE Plug
1/4-28 UNF	3-5 ft-lb (4-7 Nm)	Oil Sight Glass
	8-18 ft-lb (11-24 Nm)	Unloader Valve
	30 in-lb (3.4 Nm)	Terminal Nut
5/16-18 UNC	20-33 ft-lb (27-45 Nm)	Discharge Service Valve (2-bolt)
3/8-16 UNC	30-50 ft-lb (41-68 Nm)	Crankcase Mounting Bolts
1/2-13 UNC	80-90 ft-lb (108-122 Nm)	Suction Service Valve (4-bolt)
9/16-16 UNC	105-115 ft-lb (142-156 Nm)	Cylinder Head Bolts
3/4-16 UNF	44-55 ft-lb (60-75 Nm)	OPSS Sensor