

Instruction Manual and Replacement Parts List

TCOM LITE

High Pressure Breathing Air Trailer

TCom Lite 25H



June 22, 2022

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WARNING

This Instruction Manual and Replacement Parts List contains safety information and instructions for the TCom Lite 25H, High Pressure Breathing Air Trailer.
 You must read, understand and follow all safety precautions and instructions.

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TABLE OF CONTENTS

Forward	xv
How To Use This Manual.	xv
How to Use the Replacement Parts List	xv
How to Use the Appendix.	xvi

CHAPTER 1: - - - - - INTRODUCTION

1.1 REPORTING SAFETY DEFECTS	1
1.2 SAFETY ALERTS AND SIGNAL WORDS.....	1
1.3 MAJOR HAZARDS	2
1.3.1 Driving Too Fast	2
1.3.2 Failure to Adjust Handling While Towing a Trailer.....	2
1.3.3 Trailer Not Properly Coupled to the Hitch.....	2
1.3.4 Incorrect Use of Safety Chains.....	3
1.3.5 Incorrect Use of Breakaway Brake	3
1.3.6 Mismatch of Trailer and Hitch	4
1.3.7 Unsafe Tires, Lug Nuts or Wheels.....	4
1.3.8 Loading the Trailer and Securing the Cargo	5
1.3.9 Inappropriate Cargo.....	6
1.3.10 Inoperable Brakes, Lights or Mirrors.....	6
1.3.11 Hazards From Modifying Your Trailer.....	6
1.4 SAFETY WARNING LABELS ON YOUR TRAILER.....	7
1.5 DESCRIPTION AND SPECIFICATIONS.....	9
1.5.1 Unit Description	9
1.5.2 Other Standard Features	9
1.5.3 Options	10
1.5.3.1 Option Package A	10
1.5.3.2 Option Package B	10
1.5.3.3 Option Package C	10
1.5.3.4 Option Package D.....	10
1.5.4 Specifications: TCom Lite 25H.....	11
1.5.5 Compressor Block, K18.1 II	11
1.5.6 Compressor Drive	12
1.5.6.1 Diesel Engine.....	12
1.5.7 Purification System Applicability	12
1.5.8 Trailer Dimensions.....	12
1.6 COMPONENT LOCATOR	13
1.6.1 Trailer Components.....	13
1.6.2 Compressor Module	18
1.7 TRAILER TOWING GUIDE	19
1.8 SAFE TRAILER TOWING GUIDELINES.....	19
1.9 COUPLING TO THE TOW VEHICLE	20
1.9.1 Use an Adequate Tow Vehicle and Hitch	20
1.9.2 Trailer VIN Information.....	20
1.9.3 Tow Vehicle	21
1.9.4 Coupling and Uncoupling the Trailer.....	22
1.9.4.1 Various Coupler Designs.....	23
1.9.4.2 Trailer with Ball Hitch Coupler.....	24
1.9.4.3 Before coupling the trailer to the tow vehicle	24

1.9.4.4	Prepare the coupler and hitch.....	25
1.9.4.5	Couple the trailer to the tow vehicle	25
1.9.4.6	Rig the safety chains	26
1.9.4.7	Attach and test breakaway brake system	26
1.9.4.8	Electrical Connection.....	27
1.9.4.9	Uncoupling the Ball Hitch Trailer with Tongue Jack.....	27
1.9.4.10	Trailer with Pintle Hook and Lunette Ring Coupler.....	28
1.9.4.11	Before Coupling the Trailer to the Tow Vehicle	28
1.9.4.12	Prepare the Coupler and Hitch.....	28
1.9.4.13	Couple the trailer to the tow vehicle	29
1.9.4.14	Rig the safety chains	29
1.9.4.15	Attach and test breakaway brake system	30
1.9.4.16	Connect the Electrical Cables.	30
1.9.4.17	Uncoupling the Pintle Hitch Trailer with Tongue Jack	31
1.9.5	Loading the Trailer.....	31
1.9.6	Checking the Trailer Before and During Each Tow.....	32
1.9.6.1	Pre-tow Checklist.....	32
1.9.6.2	Make Regular Stops.....	32
1.10	BREAKING-IN A NEW TRAILER	32
1.10.1	Retighten Lug Nuts at First 10, 25 & 50 Miles	32
1.10.2	Adjust Brake Shoes at First 200 Miles	33
1.10.3	Synchronizing the Brake Systems	33
1.11	ACCESSORIES	33

CHAPTER 2:- - - - -TIRE SAFETY INFORMATION

2.1	STEPS FOR DETERMINING CORRECT LOAD LIMIT - TRAILERS	34
2.1.1	Trailers 10,000 pounds GVWR or less.....	35
2.1.2	Trailers over 10,000 pounds GVWR.....	35
2.2	STEPS FOR DETERMINING CORRECT LOAD LIMIT - TOW VEHICLE.....	35
2.3	GLOSSARY OF TIRE TERMINOLOGY.....	36
2.4	TIRE SAFETY - EVERYTHING RIDES ON IT	40
2.5	SAFETY FIRST – BASIC TIRE MAINTENANCE.....	41
2.5.1	Finding Your Vehicle’s Recommended Tire Pressure and Load Limits	41
2.5.2	Understanding Tire Pressure and Load Limits.....	41
2.5.3	Checking Tire Pressure.....	41
2.5.4	Steps for Maintaining Proper Tire Pressure	42
2.5.5	Tire Size.....	42
2.5.6	Tire Tread	42
2.5.7	Tire Balance and Wheel Alignment	42
2.5.8	Tire Repair.....	43
2.5.9	Tire Fundamentals	43
2.5.9.1	Information on Passenger Vehicle Tires.....	43
2.5.9.2	UTQGS Information	45
2.5.9.3	Additional Information on Light Truck Tires	45
2.6	TIRE SAFETY TIPS	46
2.6.1	Preventing Tire Damage.....	46
2.6.2	Tire Safety Checklist	46

CHAPTER 3:- - - DIESEL ENGINE OPERATING INSTRUCTIONS

3.1	PREOPERATIONAL CHECKS.....	47
------------	-----------------------------------	-----------

3.2	START-UP	48
3.3	SHUTDOWN	48
3.4	COMPONENTS	48
3.4.1	Emergency Stop Switch	48
3.4.1.1	PLC Warning and Alarm Lamps	48
3.4.1.1.1	Warning Lamp - Amber	48
3.4.1.1.2	Alarm Lamp - Red	49
3.4.2	Hour meter	49
3.4.3	PLC Control	49
3.5	WARNINGS	49
3.5.1	One Flash - Final Separator Warning	49
3.5.2	Two Flashes - Securus Monitor	49
3.6	ALARMS	49
3.6.1	One Flash - Compressor High Temperature	50
3.6.2	Two Flashes - Compressor Low Oil Pressure	50
3.6.3	Three Flashes - Compressor Overtime	50
3.6.4	Four Flashes - Securus Monitor	50
3.6.5	Six Flashes - Final Separator Shutdown	50
3.6.6	Seven Flashes - Condensate Fault	50
3.6.7	Eight Flashes - Engine Fault High Temp / Low Oil Pressure	51

CHAPTER 4: - - - - - IK 18.1 II COMPRESSOR BLOCK

4.1	DESCRIPTION	52
4.1.1	Component Location	52
4.1.2	Air Flow Diagram	53
4.1.3	Lubrication System	53
4.1.3.1	Description	53
4.1.3.2	Oil Level Check	54
4.1.3.3	Oil Change Interval	54
4.1.3.4	Oil Capacity	54
4.1.3.5	Oil Change	54
4.1.3.6	Venting the Oil Pump	56
4.1.4	Intake Filter	56
4.1.4.1	Description	56
4.1.4.2	Maintenance	56
4.1.5	Interstage Separators	57
4.1.5.1	Description	57
4.1.5.2	Maintenance	58
4.1.6	Compressor Valves and Valve Heads	59
4.1.6.1	Functional Description	59
4.1.6.2	Initial Operational Check of the Valves	59
4.1.6.3	General Instructions for Changing the Valves	59
4.1.6.4	Changing the 1st Stage Valves	60
4.1.6.4.1	Removal Procedure	60
4.1.6.4.2	Installation Procedure	61
4.1.6.5	Changing the 2nd Stage Valves	61
4.1.6.5.1	Removal Procedure	61
4.1.6.5.2	Installation Procedure	61
4.1.6.6	Changing the 3rd Stage Valves	62
4.1.6.6.1	Removal Procedure	62
4.1.6.6.2	Installation Procedure	62
4.1.6.7	Changing the 4th/5th Stage Valves	63

CHAPTER 5:- - SCHEDULING MAINTENANCE AND SPARE PARTS

CHAPTER 6:- - - - - PURIFICATION SYSTEM

1st Edition, Rev. 0 Chg. 13

6.1.4.1	Compressor Data Plate	121
6.1.4.2	Purification System Data Plate	122
6.1.4.3	Cartridge Installation Data Plate	122
6.1.5	Purification System Configurations	122
6.1.6	Industrial Purification System Configurations	123
6.1.7	Cartridge Operating Life	123
6.1.7.1	Calculating the Maximum Cartridge Operating Hours	124
6.1.7.2	Calculating the Adjusted Cartridge Operating Hours	124
6.1.8	Chambers	124
6.1.8.1	Purification Cartridge Operating Hours Form	126
6.1	P5S PURIFICATION SYSTEM MAJOR COMPONENTS	1
6.2	COMPONENTS DESCRIPTION	2
6.2.1	Oil and Water Separator.	2
6.2.2	Pressure Chambers	2
6.2.3	Cartridge	3
6.2.3.1	Cartridge Construction	3
6.2.3.2	Cartridge Handling	3
6.2.4	Condensate Drain Valve	3
6.2.5	Check Valves	3
6.2.6	Bleed Valve	3
6.2.7	Pressure Maintaining Valve	3
6.2.8	Safety Valve	3
6.2.9	Securus® Electronic Moisture Monitor System	3
6.2.9.1	Securus® Cartridge	4
6.2.9.1.1	Securus® Indicator	4
6.3	MAINTENANCE	5
6.3.1	Oil and Water Separator	5
6.3.2	Cartridge Replacement	5
6.3.2.1	Leaking at the Safety Bore	7
6.4	REPLACEMENT PARTS LIST	8

CHAPTER 7: - - - - - COMPRESSOR DRIVE SYSTEM

7.1	DESCRIPTION	13
7.1.1	Maintenance of the V-belts and Sheaves	13
7.1.1.1	Check the Sheaves	13
7.1.1.2	Check the V-belt	13
7.1.1.3	Check the Sheave Alignment	13
7.1.2	Replacing the V-belts	14
7.2	DIESEL ENGINE FUEL FILTER	15
7.2.1	Draining the Fuel Filter	15
7.2.2	Filter Element Replacement	15
7.3	ENGINE STUB SHAFT MAINTENANCE	16
7.4	REPLACEMENT PARTS LIST	17
7.5	CLUTCH ASSEMBLY	18
7.5.1	General	18
7.5.2	Theory of Operation	18
7.5.2.1	Electric	18
7.5.2.2	Centrifugal	18
7.5.3	Component Description	19
7.5.3.1	Electronic Connector (electric clutch only)	19
7.5.3.2	Installation Bracket (electric clutch only)	19

7.5.3.3	Key Slot	19
7.5.3.4	Sheave Bolt Holes.....	19
7.5.4	Maintenance	20
7.5.4.1	Engine Stub Shaft Maintenance.....	20
7.5.4.2	Clutch.....	21
7.5.5	Replacement Procedures	22
7.6	ELECTRICAL CONNECTIONS TO ENGINE	24
7.6.1	Glow Plug Relay.....	24
7.6.2	Starter Solenoid	24
7.6.3	Fuel Filter/Pump	25
7.6.4	Alternator.....	25
7.6.5	Coolant Temperature Switch	25
7.6.6	Oil Pressure Switch	25
7.6.7	Engine Electrical Component Parts List.....	26

CHAPTER 8:- - - - - ELECTRICAL PANEL ASSEMBLY

8.1	OVERVIEW	27
8.2	OPTIONS.....	27
8.3	POWER REQUIREMENTS.....	28
8.3.1	Fuses	28
8.3.2	Emergency Stop Switch.	28
8.3.3	Compressor Control Switch	28
8.3.4	Indicator Lamps.....	29
8.3.4.1	PLC Warning and Alarm Lamps	29
8.3.4.1.1	Warning Lamp - Amber.....	29
8.3.4.1.2	Alarm Lamp - Red	29
8.3.5	Hourmeter	29
8.3.6	Voltmeter.....	29
8.3.7	Cold Weather Option.....	30
8.3.7.1	Compressor Block Heater (See Figure 8-4).....	30
8.3.8	PLC Control.....	30
8.3.8.1	PLC LEDs.....	30
8.3.9	PLC Inputs and Outputs	31
8.4	INSTALLING A NEW PROGRAM USING AN EEPROM CARTRIDGE	31
8.5	WIRE HARNESS CONNECTIONS	32
8.6	REPLACEMENT PARTS LIST	33
8.7	TROUBLE SHOOTING GUIDE	34
8.7.1	Compressor Will Not Start	34
8.7.2	Compressor Is Shutdown, Alarm Code Flashing Sequence.	34
8.7.2.1	One Flash - Compressor High Temperature	34
8.7.2.2	Two Flashes - Compressor Low Oil Pressure	34
8.7.2.3	Three Flashes - Compressor Overtime	34
8.7.2.4	Four Flashes - Securus® Alarm.....	35
8.7.2.5	Five Flashes - Carbon Monoxide Monitor Alarm	35
8.7.2.6	Six Flashes - Final Separator Shutdown	35
8.7.2.7	Seven Flashes -Condensate Fault	35
8.7.2.8	On Steady - Motor Over load Trip.....	36
8.7.2.9	Eight Flashes - High Inlet Pressure (Gas Compressors Only).....	36
8.7.2.10	Nine Flashes - Low Inlet Vacuum (Gas Compressors Only)	36

CHAPTER 9: - - - - - CARBON MONOXIDE MONITOR

9.1 DESCRIPTION	37
9.1.1 Component Description	37
9.1.1.1 Isolation Valve	38
9.1.1.2 High Pressure to Low Pressure Regulator	38
9.1.1.3 Relief Valve	38
9.1.1.4 Solenoid Valve	38
9.1.1.5 Inlet Regulator	38
9.1.1.6 Carbon Monoxide Monitor	38
9.1.1.6.1 Carbon Monoxide Sensor Cell	38
9.1.1.7 Test Gas Storage	38
9.2 CARBON MONOXIDE MONITOR SETUP	38
9.3 OPERATION	38
9.4 MAINTENANCE	39
9.4.1 Calibrating Carbon Monoxide Monitor	39
9.4.2 Troubleshooting a Calibration Failure	40
9.4.3 Carbon Monoxide Sensor Cell Replacement	40
9.4.4 Calibration Initialization	41
9.4.5 Carbon Monoxide Monitor Test Mode Buttons	43
9.5 REPLACEMENT PARTS LIST	45

CHAPTER 10: - - - - - CFS 5.5 OPERATION AND MAINTENANCE

10.1 DESCRIPTION	47
10.2 OPERATION	47
10.2.1 Connecting an Air Bottle	49
10.2.2 Filling the Air Bottle	49
10.2.3 Removing the Air Bottle	49
10.2.4 Operating the Cascade Panel (Optional)	49
10.3 FILL STATION AIR FLOW	50
10.3.1 Containment Fill Stations CFSII-2S and CFSII-3S	50
10.3.2 Containment Fill Stations CFSII-2M and CFSII-3M	50
10.4 MAINTENANCE	51
10.4.1 General Maintenance	51
10.4.2 Nonadjustable Valves	51
10.4.3 Pressure Gauges	51
10.4.4 Safety Valves	51
10.5 PNEUMATIC CONNECTIONS	52
10.6 BEARINGS FOR BOTTLE DOOR PIVOT	52
10.7 PRESSURE HOSES	52
10.8 DOOR GAS SPRING	52
10.9 STANDARD FILL PANEL REMOVAL	53
10.9.1 To remove the Fill Panel from the front	53
10.9.2 To remove the Fill Panel from the rear	53
10.9.3 Replacement Parts List CFS 5.5 Assemblies	54
10.10 FILL HOSE ASSEMBLIES	62

CHAPTER 11: - - - - - HP AIR STORAGE

11.1 STORAGE CYLINDERS	65
11.2 MAINTENANCE	65
11.2.1 Storage Bottles.....	65
11.2.2 Pressure Gauges.....	65
11.2.3 Tube Connections.....	66
11.2.3.1 Safety Valve	66
11.2.3.2 Pressure Hoses	66

CHAPTER 12: - - - - - OPTION PACKAGES

12.1 OPTION PACKAGE A - SPARE TIRE AND WHEEL COVER	67
12.1.1 Spare Tire and Cover.....	67
12.1.2 Part Numbers.....	67
12.2 OPTION PACKAGE B - REMOTE FILL CONNECTION AND INTERIOR LIGHTS	68
12.2.1 Remote Fill Connection.....	68
12.2.1.1 Connecting an Air Bottle	68
12.2.1.2 Filling the Air Bottle.....	68
12.2.1.3 Removing the Air Bottle.....	68
12.2.2 Interior Lights.....	68
12.2.2.1 Part Numbers	68
12.2.2.2 Remote Fill Parts	69
12.3 OPTION PACKAGE C -LUNETTE EYE HITCH	70
12.4 OPTION PACKAGE D - TWO (2) ADDITIONAL 6,000 PSI DOT CYLINDERS	70
12.5 NONADJUSTABLE VALVES	71
12.6 PRESSURE MAINTAINING VALVE	71
12.7 SAFETY VALVES	72

CHAPTER 13: - - - - - -APPENDIX

13.1 SAFETY	73
13.1.1 General Safety Precautions.....	73
13.1.2 Safety Warning Labels	75
13.2 UNPACKING, HANDLING AND INSTALLATION	76
13.2.1 Unpacking and Handling.....	76
13.2.2 Installation of the Compressor Unit	77
13.2.2.1 General.....	77
13.2.2.2 Ventilation	78
13.2.2.2.1 Outdoor Installation	78
13.2.2.2.2 Indoor Installation.....	78
13.2.2.2.3 Natural Ventilation	79
13.2.2.2.4 Forced Ventilation	80
13.2.3 Intake Gas.....	80
13.2.3.1 Inside Gas Source	80
13.2.3.2 Outside Gas Source.....	81
13.2.4 Compressor Intake Piping	81
13.2.5 Installation Procedures	82
13.2.6 Electrical Installation.....	82
13.2.6.1 Electric Drive.....	82

13.2.6.2	Electrical Supply.....	82
13.2.7	Pneumatic Leaks	85
13.3	LONG TERM STORAGE	85
13.3.1	General	85
13.3.2	Preparations	85
13.3.2.1	Units Equipped with a Filter System	85
13.3.3	Preserving the Compressor.....	85
13.3.4	Preventive Maintenance During Storage.....	86
13.3.5	Lubrication Oils for Preservation.....	86
13.3.6	Reactivating the Compressor Unit	86
13.4	REPRODUCIBLE FORMS	87
13.4.1	Scheduled Maintenance Form.....	87
13.4.2	Cartridge Operating Hours	90
13.4.3	Record of Operating Hours	91
13.5	REFERENCE DATA	92
13.5.1	Tightening Torque Values.....	92
13.5.2	Torque Sequence Diagrams	92
13.5.3	Conversion Formulas	92
13.5.4	Approved Lubricants Chart.....	93
13.5.5	Glossary of Abbreviations and Acronyms	93
13.6	ADDITIONAL DOCUMENTS	94
13.6.1	Diagrams and Drawings	94
13.6.2	Other Documents.....	94

List of Figures

CHAPTER 1:- - - - - INTRODUCTION

Figure 1-1	Warning Labels and Locations	7
Figure 1-2	Towing Components Standard 2" Ball Hitch	13
Figure 1-3	Towing Components Optional Lunette Ring Hitch.....	14
Figure 1-4	Trailer, View from Streetside	15
Figure 1-5	Trailer, View from Curbside.....	16
Figure 1-6	Trailer, Rear View	17
Figure 1-7	Compressor Block (Front View)	18
Figure 1-8	VIN Tag	21
Figure 1-9	Ball Hitch Coupler	23
Figure 1-10	Lunette Ring Coupler	23
Figure 1-11	Trailer to Tow Vehicle Electrical Connections	27
Figure 1-12	Pintle Hook Coupler Mechanism.....	29

CHAPTER 2:- - - - - TIRE SAFETY INFORMATION

Figure 2-1	Tire and Loading Information Placard	35
Figure 2-2	Information on Passenger Vehicle Tires.....	43
Figure 2-3	Additional Information on Light Truck Tires.....	46

CHAPTER 3:- - - DIESEL ENGINE OPERATING INSTRUCTIONS

Figure 3-1	Engine Control Panel.....	47
------------	---------------------------	----

CHAPTER 4:- - - - - IK 18.1 II COMPRESSOR BLOCK

Figure 4-1	Compressor Block (Front View)	52
Figure 4-2	Five Stage Compressor Air Flow	53
Figure 4-3	Lubrication Oil System.....	54
Figure 4-4	Oil Sight Gauge	54
Figure 4-5	Oil Sight Gauge & Drain	55
Figure 4-6	Removing the Oil Filter Cover	55
Figure 4-7	Replacing the Oil Filter	55
Figure 4-8	Intake Filter.....	56
Figure 4-9	2nd Stage Interstage Separator	58
Figure 4-10	3rd & 4th Stage Interstage Separator.....	58
Figure 4-11	1st Stage Valve Function	59
Figure 4-12	Valve Function.....	59
Figure 4-13	1st Stage Valve and Head	60
Figure 4-14	2nd Valve Head and Valves	61
Figure 4-15	3rd Stage Valve Head and Valves	62
Figure 4-16	4th/5th Stage Valve and Head	63
Figure 4-17	Discharge Valve Removal	64
Figure 4-18	Assembly Tool.....	65

Figure 4-19	Using Special Tool	65
Figure 4-20	Crankcase Assembly	67
Figure 4-21	Complete Crankshaft Assembly	69
Figure 4-22	1st Stage Piston and Cylinder	70
Figure 4-23	2nd & 4th Stage Piston and Cylinder	71
Figure 4-24	3rd Stage Piston and Cylinder	73
Figure 4-25	5th Stage Cylinder and Piston	74
Figure 4-26	1st Stage Valve Head	75
Figure 4-27	2nd Stage Valve Head	76
Figure 4-28	3rd Stage Valve Head	77
Figure 4-29	4th Stage Valve Head	78
Figure 4-30	5th Stage Valve Head	79
Figure 4-31	Flywheel Drive Assembly	80
Figure 4-32	Intake Filter Assembly	81
Figure 4-33	1st Stage Interfilter (Optional)	83
Figure 4-34	2nd Stage Interstage Separator	85
Figure 4-35	3rd Stage Interstage Separator	86
Figure 4-36	4th Stage Interstage Separator	87
Figure 4-37	Cooling System Assembly	89
Figure 4-38	Lubricating System Assembly	91
Figure 4-39	Lubricating System	92
Figure 4-40	Crankcase Venting	93
Figure 4-41	5 Stage Automatic Condensate Drain System	94
Figure 4-42	ACD Operation	96
Figure 4-43	Condensate Collector	97
Figure 4-44	Automatic Condensate Drain System	99
Figure 4-45	2nd Stage Condensate Drain Valve	101
Figure 4-46	3rd and 4th Stage Condensate Drain Valves	103
Figure 4-47	Final Separator Condensate Drain Valve	105
Figure 4-48	Alternate Final Separator Condensate Drain Valve	107
Figure 4-49	Manual Condensate Drain Valve	109
Figure 4-50	Condensate Collector	110

CHAPTER 5: - -SCHEDULING MAINTENANCE AND SPARE PARTS

Figure 5-1	Lug nut sequence of tightening	119
------------	--------------------------------------	-----

CHAPTER 6: - - - - - PURIFICATION SYSTEM

Figure 6-1	Cartridge Safety Venting	121
Figure 6-2	P0 & P31 Safety Venting	121
Figure 6-3	Purification System Data Plates (typical)	121
Figure 6-4	Correction Factor for Cartridge Operating Hours	125
Figure 6-5	Example Record of Adjusted Operating Hours	125
Figure 6-1	P5S Purification System	1
Figure 6-2	Oil and Water Separator & Labels	2
Figure 6-3	Securus Indicator	4

Figure 6-4	Oil and Water Separator	6
Figure 6-5	Sintered Metal Filter Assembly	6
Figure 6-6	Cartridge Replacement	6
Figure 6-7	P5 Purification System Parts List	8
Figure 6-8	Oil and Water Separator Parts List	9
Figure 6-9	27" Chamber Assembly Parts List.....	10
Figure 6-10	Securus® Electronic Moisture Monitor System Parts List.....	11

CHAPTER 7:- - - - - COMPRESSOR DRIVE SYSTEM

Figure 7-1	Horizontal Motor Mount (typical)	13
Figure 7-2	Checking the Sheave Alignment	14
Figure 7-3	Replacing the V-belt	14
Figure 7-4	Engine Fuel Filter	15
Figure 7-5	Engine Stub Shaft	16
Figure 7-6	TCom Lite Drive Assembly.....	17
Figure 7-7	Electric Clutch & Sheave Assembly (typical)	18
Figure 7-8	Centrifugal Clutch Assembly (typical).....	18
Figure 7-9	Electric Clutch Assembly (typical).....	19
Figure 7-10	Clutch & Sheave Assembly	20
Figure 7-11	Engine Stub Shaft	20
Figure 7-12	Drive Shaft, Key stock & Clutch	22
Figure 7-13	Starter Solenoid & Glow Plug Relay.....	24
Figure 7-14	Fuel Filter and Pump	24
Figure 7-15	Alternator & Temp. Switch	24
Figure 7-16	Oil Pressure Switch.....	25
Figure 7-17	Electrical Component Replacement Parts	26

CHAPTER 8:- - - - - ELECTRICAL PANEL ASSEMBLY

Figure 8-1	Electrical Panel Assembly	27
Figure 8-2	Electrical Panel Label	28
Figure 8-3	Electrical Panel Front	29
Figure 8-4	Compressor Block Heater.....	30
Figure 8-5	Electrical Panel	33

CHAPTER 9:- - - - - CARBON MONOXIDE MONITOR

Figure 9-1	Carbon Monoxide Monitor, MNR-0029.....	37
Figure 9-2	Carbon Monoxide Monitor Flow Diagram.....	37
Figure 9-3	Basic Calibration Kit & Test Gas Cylinders.....	40
Figure 9-4	Carbon Monoxide Monitor Internal Components	42
Figure 9-5	Carbon Monoxide Sensor Cell Removal	43
Figure 9-6	Mode Buttons Close-up	44
Figure 9-7	Carbon Monoxide Monitor Assembly - TCom Trailer.....	45
Figure 9-8	Carbon Monoxide Monitor Schematic	46

CHAPTER 10: - - - - -CFS 5.5 OPERATION AND MAINTENANCE

Figure 10-1	Bottle Riser.....	47
Figure 10-2	Bottle Valve Sequences.....	48
Figure 10-3	Safety Valves.....	51
Figure 10-4	Special Tool, TOO-103	52
Figure 10-5	Containment Fill Station.....	54
Figure 10-6	CFS 5.5 Assembly.....	55
Figure 10-7	Fill Whips & Brackets.....	56
Figure 10-8	CFS5.5 Door Lock Assembly.....	57
Figure 10-9	Door Handle, Pivot and Bracket.....	58
Figure 10-10	CFS5.5 Door Interlock	59
Figure 10-11	CFSIII Fill Control Panel (CFSII-2S shown).....	60
Figure 10-12	Cascade Panel.....	61
Figure 10-13	Standard Fill Hose Assemblies.....	62
Figure 10-14	Fill Whips with Options	63

CHAPTER 11: - - - - - HP AIR STORAGE

Figure 11-1	High Pressure Storage System.....	65
Figure 11-2	Safety Valve	66

CHAPTER 12: - - - - - OPTION PACKAGES

Figure 12-1	Spare Tire	67
Figure 12-2	Spare Tire Cover.....	67
Figure 12-3	Interior Light	68
Figure 12-4	Remote Fill Parts (Optional)	69
Figure 12-5	Lunette Eye Hitch.....	70
Figure 12-6	6,000 psi DOT Cylinders.....	70
Figure 12-7	Check Valve	71
Figure 12-8	Pressure Maintaining Valves (PMV).....	71
Figure 12-9	Safety Valves.....	72

CHAPTER 13: - - - - - APPENDIX

Figure 13-1	Lifting Devices.....	76
Figure 13-2	Leveling Feet.....	77
Figure 13-3	Example of Gas Intake Piping.....	82
Figure 13-4	Incoming Power Wiring Label.....	83
Figure 13-5	6 Bolt and 4 Bolt Torque Sequence.....	92

FORWARD

How To Use This Manual

This manual contains the operating and maintenance instructions for the Bauer Compressors, Inc. products listed on the front cover.

All instructions in this manual should be observed and carried out as written to prevent damage or premature wear to the product or the equipment served by it.

If your unit is equipped with nonstandard accessories and/or options, supplemental information is normally included in other documentation; i.e. OEM Manuals or additional Bauer Manuals.

While every effort is made to ensure the accuracy of the information contained in this manual, Bauer Compressors, Inc. will not, under any circumstances be held accountable for any inaccuracies or the consequences thereof.

How to Use the Replacement Parts List

- A lozenge ♦ in the Item Number column indicates the part number for a complete assembly.
- a dagger (†) in the Qty column with or without an ellipse (...) in the Part Number column means the part is illustrated for assembly purposes only and is not available for sale as an individual component. This part can be obtained by ordering the complete assembly.
- AR in the Qty column means that the item is cut or manufactured to the size which the customer specifies.
- A dash (—) in the Item Number column indicates that there is more than one part number applicable to the preceding Item Number.

When placing an order for spare parts, please provide the following information to ensure delivery of the correct parts. The model number, date of manufacture and serial number can be found of the compressor unit identification plate on the compressor unit frame.

Information	Example
Model Number	TCom 25
Serial Number	149291
Date of Manufacture	4/2013
Quantity required	2
Part Number	N04860
Part Description	Valve

**WARNING**

The use of repair parts other than those included in the Bauer Replacement Parts Lists may create unsafe conditions over which Bauer has no control. Such unsafe conditions can lead to accidents that may be life-threatening, cause substantial bodily injury, and/or result in damage to the equipment. Therefore, Bauer Compressors, Inc. can bear no responsibility for equipment in which non-approved repair parts are installed.

How to Use the Appendix

Information contained in the Appendix to this manual includes the following.

- The instructions for long term storage (over 90 days) of this product.
- A set of forms which may be reproduced as needed to record operating hours, purification cartridge adjusted operating hours, and scheduled maintenance actions.

CHAPTER 1: INTRODUCTION

1.1 Reporting Safety Defects

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Bauer Compressors, Inc.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer or Bauer Compressors, Inc.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in the Washington, DC area) or write to: NHTSA, U.S. Department of Transportation, 400 7th Street SW NSA-11, Washington, DC 20590. You can also obtain other information about motor vehicle safety from the Hotline.

1.2 Safety Alerts and Signal Words

Important instructions concerning the endangerment of personnel, technical safety or operator safety will be specially emphasized in this manual by placing the information in the following types of safety notices.



DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This is limited to the most extreme situations.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or injury.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

NOTE advise of technical requirements that require particular attention by the operator or the maintenance technician for proper maintenance and utilization of the equipment.

1.3 Major Hazards

1.3.1 Driving Too Fast

With ideal road conditions, the maximum speed when safely towing a trailer is 60 m.p.h. If you drive too fast, the trailer tires will overheat and possibly blowout. As your speed increases, you are more likely to suddenly lose control. Never exceed 60 m.p.h. while towing the trailer.



WARNING

Driving too fast for conditions can result in loss of control and cause death or serious injury. Decrease your speed as road, weather and lighting conditions deteriorate.

1.3.2 Failure to Adjust Handling While Towing a Trailer

When towing a trailer, you will have decreased acceleration, increased stopping distance, and increased turning radius (which means you must make wider turns to keep from hitting curbs, vehicles, and anything else that is on the inside corner). In addition, you will need a longer distance to pass, due to slower acceleration and increased length.

- Be alert for slippery conditions. You are more likely to be affected by slippery road surfaces when driving a tow vehicle with a trailer, than driving a tow vehicle without a trailer.
- Anticipate the trailer “swaying.” Swaying is the trailer reaction to the air pressure wave caused by passing vehicles. Continued pulling of the trailer provides a stabilizing force to correct swaying. Do not apply the brakes to correct trailer swaying.
- Check rearview mirrors frequently to observe the trailer and traffic.
- Use lower gear when driving down steep or long grades. Use the engine and transmission as a brake. Do not ride the brakes, as they can overheat and become ineffective.
- Be aware of your trailer height, especially when approaching roofed areas and around trees.

1.3.3 Trailer Not Properly Coupled to the Hitch

It is critical that the trailer be securely coupled to the hitch, and that the safety chains are correctly attached. Uncoupling may result in death or serious injury.



WARNING

Proper selection and condition of the coupler and hitch are essential to safely towing your trailer. A loss of coupling may result in death or serious injury.

- Be sure the hitch load rating is equal to or greater than the load rating of the coupler.
- Be sure the hitch size matches the coupler size
- Observe the hitch for wear, corrosion and cracks before coupling.
- Replace worn, corroded or cracked hitch components before coupling trailer to tow vehicle.
- Be sure the hitch components are tight before coupling the trailer to the tow vehicle.

**WARNING**

An improperly coupled trailer can result in death or serious injury.

Do not move the trailer until:

- The coupler is secured and locked to hitch
- The safety chains are secured to the tow vehicle
- The trailer jack is fully retracted.
- Tiedowns removed, if necessary.
- Wheel Chocks removed and stored, if necessary

Do not tow the trailer on the road until:

- Tires and wheels are checked;
- The trailer brakes are checked;
- The breakaway actuator is connected to the tow vehicle;
- The load is secured to the trailer
- The trailer lights are connected and checked.

1.3.4 Incorrect Use of Safety Chains

If your trailer comes loose from the hitch for any reason, we have provided safety chains so that control of the trailer can still be maintained.

**WARNING**

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

1.3.5 Incorrect Use of Breakaway Brake

Your trailer is equipped with a breakaway brake system that can apply the brakes on your trailer, if your trailer comes loose from the hitch for any reason. The safety chains and breakaway brake system must be in good condition and properly rigged to be effective

**WARNING**

An ineffective or inoperative breakaway brake system can result in a runaway trailer, leading to death or serious injury, if the coupler or hitch fails.

The breakaway chain must be connected to the tow vehicle; and NOT to any part of the hitch.

Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer; have it serviced or repaired.

1.3.6 Mismatch of Trailer and Hitch**DANGER**

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

Be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

1.3.7 Unsafe Tires, Lug Nuts or Wheels

Trailer tires and wheels are more likely to fail than car tires and wheels because they carry a heavier load. Therefore, it is essential to inspect the trailer tires before each tow.

If a tire has a bald spot, bulge, cuts, is showing any cords, or is cracked, replace the tire before towing. If a tire has uneven tread wear, take the trailer to a dealer service center for diagnosis. Uneven tread wear can be caused by tire imbalance, axle misalignment or incorrect inflation.

Tires with too little tread will not provide adequate tracking on wet roadways and can result in loss of control, leading to death or serious injury.

Improper tire pressure causes an unstable trailer and can result in a tire blowout and loss of control. Therefore, before each tow you must also check the tire pressure. Tire pressure must be checked when tires are cold. Allow 3 hours cool-down after driving as much as 1 mile at 40 m.p.h. before checking tire pressure. NOTE: Trailer tires will be inflated to higher pressures than passenger vehicle tires.

**WARNING**

Improper tire pressure can result in a blowout and loss of control, which can lead to death or serious injury. Be sure tires are inflated to pressure indicated on side wall before towing trailer.

Since trailer wheels and lug nuts are subjected to greater side loads than automobile wheels, they are more prone to loosen. Before each tow, check to make sure they are tight.

**WARNING**

Metal creep between the wheel rim and lug nuts will cause rim to loosen and could result in a wheel coming off, leading to death or serious injury. Tighten lug nuts before each tow.

The proper tightness (torque) for lug nuts is listed in Chapter 4. Use a torque wrench to tighten the lug nuts. If you do not have a torque wrench, use a lug wrench and tighten the nuts as much as you can. Then have a service garage or trailer dealer tighten the lug nuts to the proper torque.

Lug nuts are also prone to loosen after first being assembled. When driving a new trailer (or after wheels have been remounted), check to make sure they are tight after the first 10, 25 and 50 miles of driving and before each tow thereafter. Failure to perform this check can result in a wheel parting from the trailer and a crash, leading to death or serious injury.

**WARNING**

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury. Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving

**WARNING**

Improper lug nut torque can cause a wheel parting from the trailer, leading to death or serious injury. Be sure lug nuts are tight before each tow.

1.3.8 Loading the Trailer and Securing the Cargo

The TCom Lite trailer is a specific use trailer and is not designed to carry any additional cargo. Those items which are removable or consumable must be placed in the appropriate containers or racks and properly secured before the trailer is moved.

Since the trailer ride can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.

**WARNING**

Shifting cargo can result in loss of control of the trailer, and can lead to death or serious injury. Tie down all loads with proper sized fasteners, ropes, straps, etc.

1.3.9 Inappropriate Cargo

The TCom Lite trailer must not be used to carry certain items, such as people, containers of hazardous substances or containers of flammable substances.



WARNING

Do not transport people inside the trailer, even if it has living quarters. The transport of people puts their lives at risk and may be illegal.



WARNING

Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer. The exception is fuel in the tank for the on-board diesel engine.

1.3.10 Inoperable Brakes, Lights or Mirrors

Be sure that the brakes and all of the lights on your trailer are functioning properly before towing your trailer. Lights on a trailer are controlled via a connection to the tow vehicle through a flat four prong electrical connector. Check the trailer tail lights by turning on your tow vehicle headlights. Check the trailer brake lights by having someone step on the tow vehicle brake pedal while you look at trailer lights. Do the same thing to check the turn signal lights.

While towing the trailer at less than 5 m.p.h., operate the tow vehicle brakes. You should feel the operation of the trailer brakes.



WARNING

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and can lead to collision. Before each tow:

- Check that the taillights, brake lights and turn signals work
- Check that the trailer surge brakes work by applying the tow vehicle brakes.

Standard mirrors usually do not provide adequate visibility for viewing traffic to the sides and rear of a towed trailer. You must provide mirrors that allow you to safely observe approaching traffic.

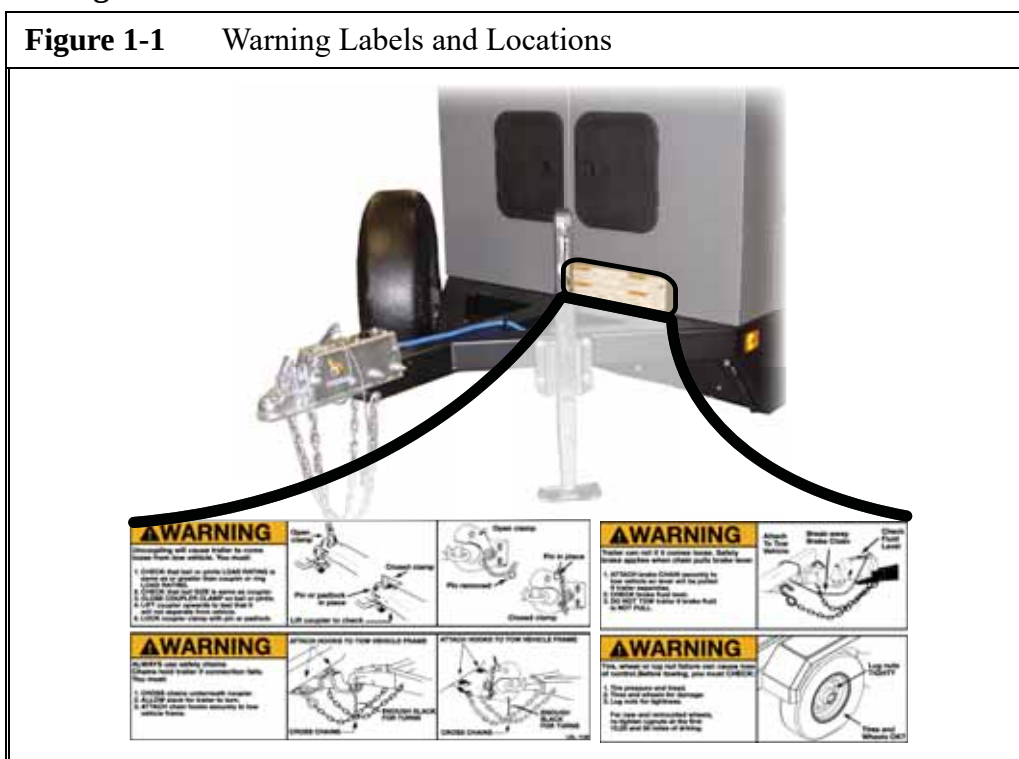
1.3.11 Hazards From Modifying Your Trailer

Essential safety items can be damaged by altering your trailer. Even simply drilling a hole to hang something can damage an electrical circuit or other feature of the trailer.

Before making any alteration to your trailer, contact your dealer or Bauer Compressors, Inc. and describe the alteration you are contemplating. Alteration of the trailer structure or modification of mechanical, electrical, plumbing or other systems on your trailer must be performed only by qualified technicians who are familiar with the system as installed on your trailer.

1.4 Safety Warning Labels on Your Trailer

Figure 1-1 Warning Labels and Locations



WARNING

To protect you and others against death or serious injury, all of the labels shown above must be on the trailer and must be legible.

If any of these labels are missing or cannot be read, call Bauer Compressors, Inc. at (757) 855-6006 for free replacement labels.

You will need to provide us with the number shown at the bottom of the label(s) in order for us to send the correct one(s)

Compressor Safety Precautions

- Read the operating manual before operating the compressor unit. Follow appropriate handling, operation and maintenance procedures from the very beginning.
- This compressor unit must be installed, operated, maintained and repaired only by authorized, trained and qualified personnel.
- Consult and follow all OSHA, NEMA, NFPA, ASME and local regulations, laws and codes covering the operation of this compressor and accessories before operating the unit.
- Do not operate this unit in excess of it's rated capacity, speed, pressure, temperature, or otherwise than in accordance with the instructions contained in this manual. Operation of this unit in excess of the conditions set forth in this manual will subject the unit to limits which it may not be designed to withstand.
- Do not wear loose clothing around machinery. Loose clothing, neckties, rings, wrists watches, bracelets, hand rags, etc. are potential hazards.

- Provide adequate fire protection. Make sure fire extinguishers are accessible.
- Make sure you are equipped with all required safety equipment; hearing protection, safety glasses, hard hats, safety shoes and fire extinguisher.
- Visually inspect the unit before starting. Remove and /or replace any loose or broken components, tools, valves, missing equipment, etc.
- Keep safety guards in place.
- Do not modify the compressor or its systems.
- Do not tamper with, modify, or bypass safety and shutdown equipment.
- Do not tighten or adjust fitting or connections under pressure.
- The use of plastic pipe or rubber hose in place of steel tube or iron pipe, soldered joints or failure to insure system compatibility of flex joints and flexible hose can result in mechanical failure, property damage, and serious injury or death.
- Replace damaged fan blades promptly. Fan assemblies must remain in proper balance. An unbalanced fan can fly apart and create an extremely dangerous condition.
- Allow the compressor to cool before servicing. Whenever the compressor is shut down and overheating is suspected, a minimum period of 15 minutes must elapse before opening the crankcase. Premature opening of the crankcase of an overheated unit can result in an explosion.
- Incorrect placement of the inlet and pressure valves in a compressor cylinder head can cause an extremely dangerous condition. Refer to the appropriate section of this manual before installing or replacing valves.
- Before doing any work involving maintenance or adjustment, be sure the electrical supply has been disconnected, and the complete compressor system has been vented of all internal pressure. Failure to follow these warnings may result in an accident causing personal injury and/or property damage.
- Before working on the electrical system, be sure to disconnect the negative battery terminal from the battery. Do not rely on the ON/OFF switch to disconnect the electrical supply.
- Do not use gasoline, diesel fuel or other flammable products as a cleaning solution.
- The use of repair parts other than those listed in this manual or purchased from BAUER Compressors, Inc. may create unsafe conditions over which BAUER has no control. Such unsafe conditions can lead to accidents that may be life-threatening, cause substantial bodily injury, and/or result in damage to the equipment. Therefore, BAUER Compressors, Inc. can bear no responsibility for equipment in which non-approved repair parts are installed.
- The maintenance schedule contains measures required to keep this compressor unit in good condition. Maintenance is simple, but must be executed regularly to achieve safe operation, maximum efficiency and long service life.
- We recommend that all maintenance work be recorded in a service book, showing the date and details of the work carried out. This will help to avoid expensive repairs caused by missed maintenance work. If it is necessary to make a claim against the warranty, it will help to have proof that regular maintenance has been carried out and that the damage has not been caused by insufficient maintenance.

1.5 Description and Specifications

1.5.1 Unit Description

The BAUER TCom Lite 25H has an IK18.1 II compressor, a containment fill station, on board high pressure air storage and a diesel engine drive as a prime mover.

1.5.2 Other Standard Features

- 6,000 psig maximum output pressure
- BAUER Breathing Air Purification System with Securus® Electronic Moisture Monitoring System
- PLC Control for Diesel Engine and Compressor
- Air-cooled Interstage Coolers and Aftercooler
- Automatic Condensate Drain System
- Interstage and Final Separator
- Interstage and Final Relief Valves
- Inlet Filter
- High Temperature Switch
- Hour Meter
- Low Oil Pressure Switch
- Oil Pressure Gauge
- Final Pressure Switch
- Final Pressure Gauge and Locally Mounted Interstage Pressure Gauges
- Alarms for Safety Shutdowns
- 2 Position Containment Fill Station
- 2 DOT Rated High Pressure Storage Cylinders
- Carbon Monoxide Monitor
- Integrated Enclosure
- A 5200 lbs Rated Axle
- Hydraulic Surge Brakes with Break Away Actuator

1.5.3 Options

1.5.3.1 Option Package A

- Spare Tire with Cover

1.5.3.2 Option Package B

- 75 ft Hose Reel
- Interior Lights

1.5.3.3 Option Package C

- Lunnette Eye Hitch

1.5.3.4 Option Package D

- Two Additional 6,000 psi DOT rated storage cylinders

1.5.4 Specifications: TCom Lite 25H

All specifications are subject to change without prior notice.

Medium	air
Charging Rate	25.2 scfm (714 l/min) ¹
Free Air Delivery	21.0 scfm (595 l/min) ²
Inlet pressure	atmospheric
Operating pressure, max.	6,000 psig (420 bar)
Ambient temperature range	40 - 115 °F (5 - 45 °C)

1.5.5 Compressor Block, K18.1 II

IK18.1 II	Mod. 9
No. of stages	5
No. of cylinders	4
Cylinder bore, 1st stage	5.92 in. (130 mm)
Cylinder bore, 2nd stage	3.465/2.367 in. (88/60 mm)
Cylinder bore, 3rd stage	1.26 in. (32 mm)
Cylinder bore, 4th stage	0.709 in. (18 mm)
Cylinder bore, 5th stage	0.394 in. (10 mm)
Piston Stroke	1.969 in. (50 mm)
Intermediate pressure, 1st stage	45 - 60 psig (3 - 4 bar)
Safety valve setting, 1st stage	87 psig (6 bar)
Intermediate pressure, 2nd stage	196 - 225 psig (13.5 - 15 .5 bar)
Safety valve setting, 2nd stage	350 psig (24 bar)
Intermediate pressure, 3rd stage	625 - 640 psig (43 - 44 bar)
Safety valve setting, 3rd stage	1,160 psig (80 bar)
Intermediate pressure, 4th stage	1,930 - 2,145 psig (133 - 148 bar)
Safety valve setting, 4th stage	2,610 psig (180 bar)
Direction of rotation when facing flywheel	CCW
Oil capacity	6 1/3 qts. (6 liters)
Oil Pressure	60 - 85 psig (4 - 6 bar)
Recommended oil (Synthetic)	BAUER OIL-0024
Maximum Inclination	15° in all directions

1. Based on recharging an 80 cubic foot tank from 500 to 3000 PSIG

2. Referenced to standard inlet conditions of 68°F and 36% humidity at 14.70 psia.

1.5.6 Compressor Drive

1.5.6.1 Diesel Engine

For complete diesel engine specifications see the OEM manual.

Fuel	Cylinders	Power	BAUER PN
Diesel	3	16.6 Hp	ENG-0121

Recommended Fuel

Diesel Fuel

Fuel Capacity

8 Gals

Recommended Engine Oil

Bauer OIL-0025

1.5.7 Purification System Applicability

The TCom Lite 25H is equipped with the Bauer P5 Purification System with Securus® Electronic Moisture Monitoring System.

1.5.8 Trailer Dimensions

Length

138 inches

Width

76 inches

Height

72 inches

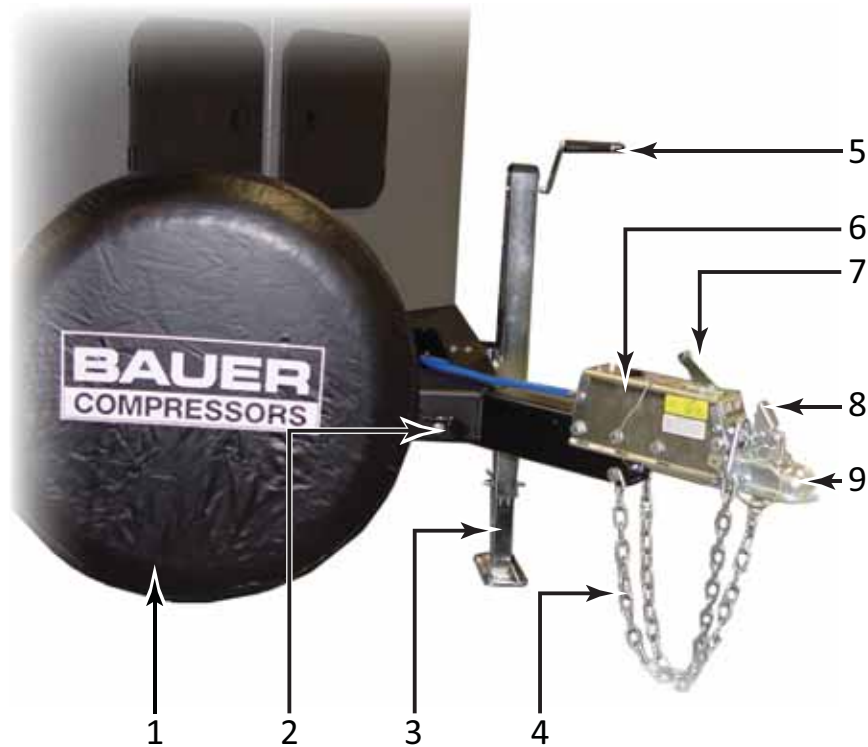
Weight

3,900 lbs

1.6 Component Locator

1.6.1 Trailer Components

Figure 1-2 Towing Components Standard 2" Ball Hitch



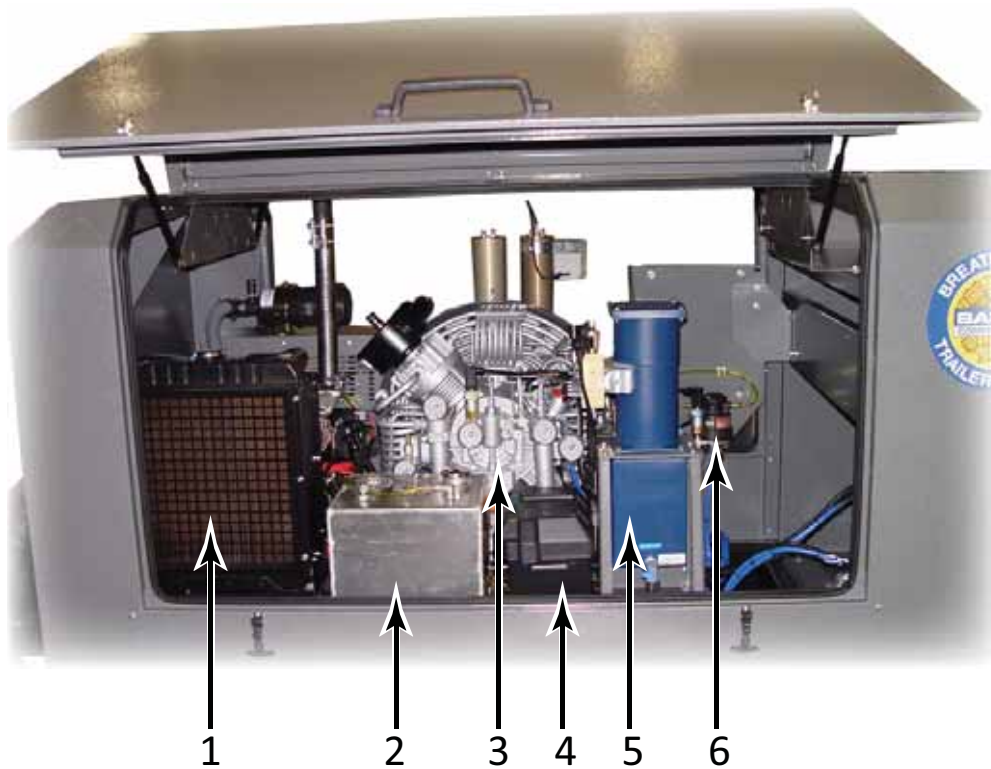
1. Spare Tire
2. Electrical Connector
3. Tongue Jack
4. Safety Chains
5. Tongue Jack Crank Handle

6. Hydraulic Surge Coupling
7. Breakaway Brake Actuator
8. Ball Hitch Locking Mechanism
9. 2" Ball Hitch (standard)

Figure 1-3 Towing Components Optional Lunette Ring Hitch

1. Breakaway Brake Actuator
2. Lunette Ring (optional)
3. Safety Chains

4. Hydraulic Surge Coupling
5. Tongue Jack Crank Handle
6. Tongue Jack

Figure 1-4 Trailer, View from Streetside

- | | |
|------------------|-------------------------------|
| 1. Diesel Engine | 4. Battery Compartment |
| 2. Fuel Tank | 5. ACD Condensate Tank |
| 3. Compressor | 6. Fuel Filter with Fuel Pump |

Figure 1-5 Trailer, View from Curbside

- 1. Control Panel
- 2. P5S Purification System

- 3. Air Filter (over engine)

Figure 1-6 Trailer, Rear View

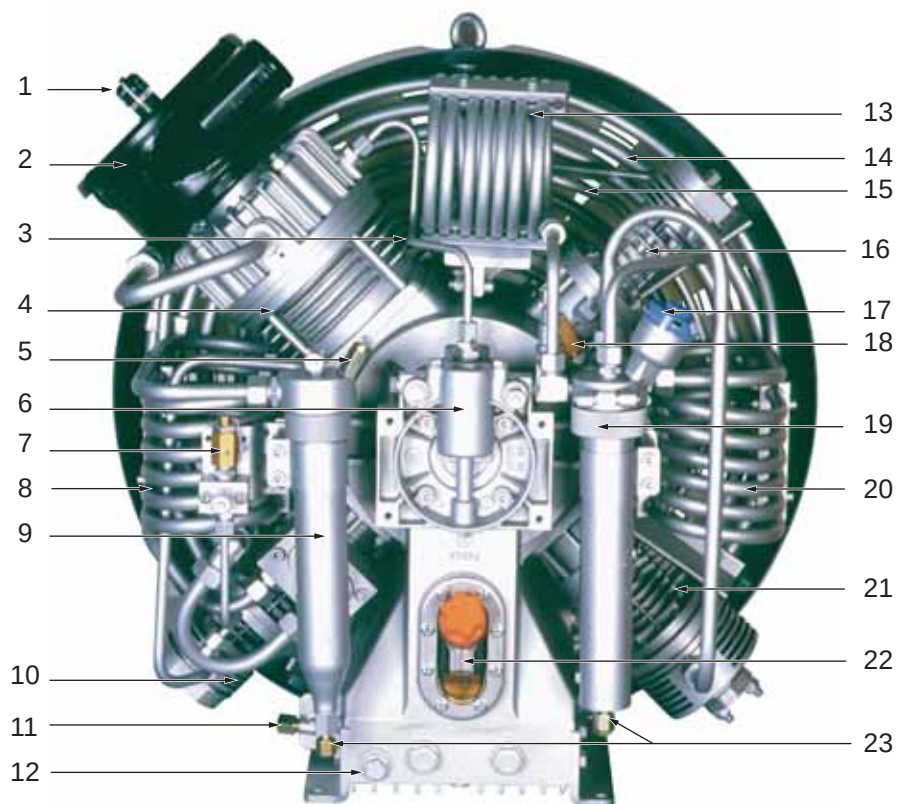


1. CFS Cover, Twist Lock Fastener
2. Remote Hose Reel Controls
3. Containment Fill Station (CFS)
4. Remote Hose Reel
5. Trailer CFS Cover

6. Air Source Control
7. CFS Controls
8. Storage Cylinder Controls
9. Remote Fill Control

1.6.2 Compressor Module

Figure 1-7 Compressor Block (Front View)



1. Service Indicator (Breathing Air Only)	9. 3rd Stage Separator	17. 4th Stage Safety Valve
2. Intake Filter (Breathing Air Only)	10. 3rd Stage Cylinder	18. 3rd Stage Safety Valve
3. Crankcase Oil Feedback Vent Line	11. Air Outlet Connection	19. 4th Stage Separator
4. 1st Stage Cylinder	12. Oil Drain Plug	20. 2nd Stage Intercooler
5. 3rd Stage Safety Valve	13. 4th Stage Intercooler	21. 3rd Stage Cylinder
6. Oil Pump Housing	14. 1st Stage Intercooler	22. Oil Filler with Sight Glass
7. 1st Stage Safety Valve	15. 5th Stage Aftercooler	23. Condensate Drain Connections
8. 3rd Stage Intercooler	16. 5th Stage Cylinder	

1.7 Trailer Towing Guide

Driving a vehicle with a trailer in tow is vastly different from driving the same vehicle without a trailer in tow. Acceleration, maneuverability and braking are all diminished with a trailer in tow. It takes longer to get up to speed, you need more room to turn and pass, and more distance to stop when towing a trailer. You will need to spend time adjusting to the different feel and maneuverability of the tow vehicle with a loaded trailer. Because of the significant differences in all aspects of maneuverability when towing a trailer, the hazards and risks of injury are also much greater than when driving without a trailer. You are responsible for keeping your vehicle and trailer in control, and for all the damage that is caused if you lose control of your vehicle and trailer.

As you did when learning to drive an automobile, find an open area with little or no traffic for your first practice trailering. Of course, before you start towing the trailer, you must follow all of the instructions for inspection, testing, loading and coupling. Also, before you start towing, adjust the mirrors so you can see the trailer as well as the area to the rear of it.

Drive slowly at first, 5 m.p.h. or so, and turn the wheel to get the feel of how the tow vehicle and trailer combination responds. Next, make some right and left hand turns. Watch in your side mirrors to see how the trailer follows the tow vehicle. Turning with a trailer attached requires more room.

Stop the rig a few times from speeds no greater than 10 m.p.h and note the effect that the trailer brakes have when they are applied.

It will take practice to learn how to back up a tow vehicle with a trailer attached. Take it slow. Before backing up, get out of the tow vehicle and look behind the trailer to make sure that there are no obstacles. Some drivers place their hands at the bottom of the steering wheel, and while the tow vehicle is in reverse, “think” of the hands as being on the top of the wheel. When the hands move to the right (counter-clockwise, as you would do to turn the tow vehicle to the left when moving forward), the rear of the trailer moves to the right. Conversely, rotating the steering wheel clockwise with your hands at the bottom of the wheel will move the rear of the trailer to the left, while backing up. If you are towing a bumper hitch rig, be careful not to allow the trailer to turn too much, because it will hit the rear of the tow vehicle. To straighten the rig, either pull forward, or turn the steering wheel in the opposite direction.

1.8 Safe Trailer Towing Guidelines

- Recheck the tiedowns to make sure the load will not shift during towing.
- Before towing, check coupling, safety chain, safety brake, tires, wheels and lights.
- Check the lug nuts or bolts for tightness.
- Check coupler tightness after towing 50 miles.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance.
- Allow plenty of stopping space for your trailer and tow vehicle.
- Do not drive so fast that the trailer begins to sway due to speed. Never drive faster than 60 m.p.h.
- Allow plenty of room for passing. A rule of thumb is that the passing distance with a trailer is 4 times the passing distance without a trailer.
- Shift your automatic transmission into a lower gear for city driving.
- Use lower gears for climbing and descending grades.

- Do not ride the brakes while descending grades, they may get so hot that they stop working. Then you will potentially have a runaway tow vehicle and trailer.
- To conserve fuel, don't use full throttle to climb a hill. Instead, build speed on the approach.
- Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
- Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve and power through the curve. This way, the towing vehicle remains “in charge.”
- Do not apply the brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, will provide a stabilizing force.
- Make regular stops, about once each hour. Confirm that
 - The coupler is secure to the hitch and is locked.
 - Electrical connectors are made.
 - There is appropriate slack in the safety chains.
 - There is appropriate slack in the breakaway actuator chain.
 - The tires are not visibly low on pressure.
 - The cargo is secure and in good condition.

1.9 Coupling to the Tow Vehicle

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, cargo, and satisfactory life of the trailer.

1.9.1 Use an Adequate Tow Vehicle and Hitch

If the vehicle or hitch is not properly selected and matched to the Gross Vehicle Weight Rating (GVWR) of your trailer, you can cause an accident that could lead to death or serious injury. If you already have a tow vehicle, know your vehicle tow rating and make certain the trailer's rated capacity is less than or equal to the tow vehicle's rated towing capacity. If you already have (or plan to buy) a trailer, make certain that the tow rating of the tow vehicle is equal to or greater than that of the trailer.



DANGER

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

Be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

1.9.2 Trailer VIN Information

The Trailer VIN Tag is located on the street side of the trailer tongue.

Figure 1-8 VIN Tag

MANUFACTURED BY		DATE:		RIMS	
GVWR				FRONT	
				KG	REAR
				LB	S/O #
GAWR			TIRES		COLD TIRE INFO
FRONT	KG	LB			kPa
REAR	KG	LB			PSI
THIS TRAILER CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.					
VIN #			TYPE: TRAILER		

LBL-1147

The trailer VIN tag contains the following critical safety information for the use of your trailer.

S/O #: This is the Manufacturers Serial Number of your TCom Lite Trailer and must be used in any communications with Bauer Compressors, Inc.

GAWR: The maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating. Usually, the tire or wheel rating is lower than the axle rating, and determines GAWR.

GVWR: The maximum allowable gross weight of the trailer and its contents. The gross weight of the trailer includes the weight of the trailer and all of the replaceable and consumable items within it. GVWR is sometimes referred to as GTWR (Gross Trailer Weight Rating), or MGTW (Maximum Gross Trailer Weight). GVWR, GTWR and MGTW are all the same rating.

The sum total of the GAWR for all trailer axles may be less than the GVWR for the trailer, because some of the trailer load is to be carried by the tow vehicle, rather than by the trailer axle(s). The total weight of the cargo and trailer must not exceed the GVWR, and the load on an axle must not exceed its GAWR.

PSIC: The tire pressure (Pounds per Square Inch) measured when Cold.

VIN: The Vehicle Identification Number.

EMPTY WEIGHT: Some information that comes with the trailer (such as the Manufacturer's Statement of Origin) is not a reliable source for "empty" or "net" weight. The shipping documents list average or standard weights and your trailer may be equipped with options. To determine the "empty" or "net" weight of your trailer, weigh it on an axle scale. To find the weight of the trailer using an axle scale, you must know the axle weights of your tow vehicle without the trailer coupled. Some of the trailer weight will be transferred from the trailer to the tow vehicle axles, and an axle scale weighs all axles, including the tow vehicle axles.

1.9.3 Tow Vehicle

When equipping a new vehicle or an older vehicle to tow your trailer, ask the vehicle dealer for advice on how to outfit the towing vehicle. Discuss the following information and equipment with the vehicle dealer.

1. Overall Carrying and Towing Capacity of Vehicle - Vehicle manufacturers will provide you with the maximum capacities of their various models. No amount of reinforcement will give a 100 horsepower, 2,500 pound truck the towing capacity that a 300 horsepower, 5,000 pound truck has.

2. Towing Hitch - The towing hitch attached to your tow vehicle must have a capacity equal to or greater than the load rating of the trailer you intend to tow. The hitch capacity must also be matched to the tow vehicle capacity. Only your vehicle dealer can provide and install the proper hitch on your tow vehicle.
3. Suspension System - Sway bars, shock absorbers, heavy duty springs, heavy duty tires and other suspension components must be able to sufficiently serve the size and weight of the trailer that is going to be towed.
4. Side View Mirrors - The size of the trailer that is being towed and your state law regulations determine the size of the mirrors. However, some states prohibit extended mirrors on a tow vehicle, except while a trailer is actually being towed. In this situation, detachable extended mirrors are necessary. Check with your dealer or the appropriate state agency for mirror requirements.
5. Heavy Duty Flasher - A Heavy Duty Flasher is an electrical component that may be required when your trailer turn signal lights are attached to the tow vehicle flasher circuit.
6. Electrical Connector - An Electrical Connector connects the light on the trailer to the light controls on the towing vehicle.
7. Heavy Duty Engine Oil Cooling System - The tow vehicle engine works harder when a trailer is being towed. Depending on the size of the trailer, you may need to install a separate engine oil cooler. Inadequate cooling may result in sudden engine failure. Ask the tow vehicle dealer if it is necessary to install a heavy duty cooling system.
8. Automatic Transmission Oil Cooler - The automatic transmission of a towing vehicle handles more power when a trailer is being towed. Inadequate cooling will shorten transmission life, and may result in sudden transmission failure. Ask the tow vehicle dealer if it is necessary to install a separate oil cooler for the automatic transmission.
9. Fire Extinguisher - It is sensible to have a fire extinguisher in the tow vehicle.
10. Emergency Flares and Emergency Triangle Reflectors - It is wise to carry these warning devices even if you are not towing a trailer. It is particularly important to have these when towing a trailer because the hazard flashers of your towing vehicle will not operate for as long a period of time when the battery is running both the trailer lights and tow vehicle lights.

1.9.4 Coupling and Uncoupling the Trailer

A secure coupling of the trailer to the tow vehicle is essential. A loss of coupling may result in death or serious injury. Therefore, you must understand and follow all of the instructions for coupling. The following parts are involved in making a secure coupling between the trailer and tow vehicle:

- Coupler: A device on the tongue of the trailer that connects to the hitch on the tow vehicle.
- Hitch: A device on the tow vehicle that supports the weight of the trailer tongue and pulls the trailer. The coupler attaches to the hitch.
- Safety chains: If the coupler connection comes loose, the safety chains can keep the trailer attached to the tow vehicle. With properly rigged safety chains, it is possible to keep the tongue of the trailer from digging into the road pavement, even if the coupler-to-hitch connection comes apart.
- Trailer lighting connector: A device that connects electrical power from the tow vehicle to the trailer. Electricity is used to turn on brake lights, running lights, and turn signals as required.

- Breakaway actuator: If the coupler connection comes loose, the breakaway actuator can actuate emergency hydraulic brakes on the trailer. The breakaway actuator must be rigged to the tow vehicle with appropriate slack that will activate the switch if the coupler connection comes loose.
- Jack: A device on the trailer that is used to raise and lower the coupler.

	DANGER
An improperly coupled trailer can result in death or serious injury. Do not move the trailer until: • The coupler is secured and locked to hitch. • The safety chains are secured to the tow vehicle. • The trailer jack is fully retracted. Do not tow the trailer on the road until: • Tires and wheels are checked • The trailer brakes are checked. • The breakaway actuator is connected to the tow vehicle. • The load is secured to the trailer. The trailer lights are connected and checked.	

1.9.4.1 Various Coupler Designs.

TCOM Lite trailer comes standard with a ball hitch coupler. A Lunette ring coupler may be ordered as Option C. One of the sections below will pertain to your trailer.

Figure 1-9 Ball Hitch Coupler

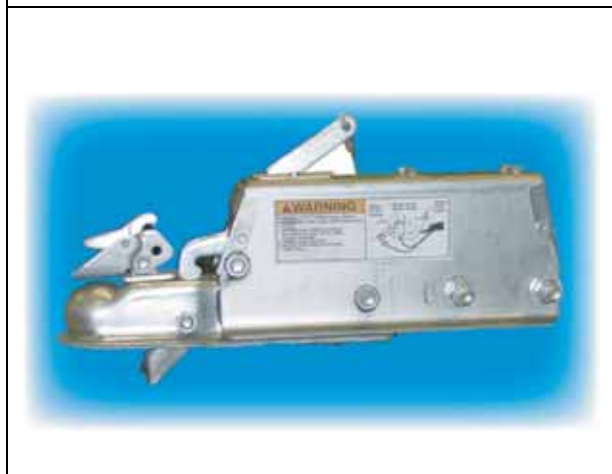


Figure 1-10 Lunette Ring Coupler



If the coupler on your trailer does not resemble one of the couplers shown in the figures, see the separate coupler instructions. If you do not have separate coupler instructions, call BAUER at (757) 855-6006 to obtain a copy.

1.9.4.2 Trailer with Ball Hitch Coupler

A 2 inch diameter ball hitch coupler connects to a ball that is located on or under the rear bumper of tow vehicle.

The TCom Lite trailer is fitted with a tongue jack that can raise and lower the coupler. The tongue jack is mounted to the A-frame of the trailer. The jack leg can be lowered by removing the pin and letting the leg extend to the ground. Lift the leg until the pin can be re-inserted. Then by rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer. You must provide a hitch for your tow vehicle, where the load rating of the hitch is equal to or greater than that of your trailer. Also, the ball size must be the same as the coupler size. If the hitch ball is too small, too large, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may cause death or serious injury.

The tow vehicle, hitch and ball must have a rated towing capacity equal to or greater than the trailer gross vehicle weight rating (GVWR). It is essential that the hitch ball be of the same size as the coupler. The ball size and load rating (capacity) are marked on the ball; hitch capacity is marked on the hitch.

1.9.4.3 Before coupling the trailer to the tow vehicle

1. Be sure the size and rating of hitch ball match the size and rating of the coupler. Hitch balls and couplers are marked with their size and rating.
2. Wipe the hitch ball clean and inspect it visually and by feel for flat spots, cracks and pits

**WARNING**

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.
Be sure the **LOAD RATING** of the hitch ball is equal or greater than the load rating of the coupler.
Be sure the **SIZE** of the hitch ball matches the size of the coupler.

**WARNING**

A worn, cracked or corroded hitch ball can fail while towing, and may result in death or serious injury.
Before coupling trailer, inspect the hitch ball for wear, corrosion and cracks.
Replace worn or damaged hitch ball.

3. Rock the ball to make sure it is tight to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.
4. Wipe the inside and outside of the coupler clean and inspect it visually for cracks and deformations; feel the inside of the coupler for worn spots and pits.
5. Be sure the coupler is tight to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.

**WARNING**

A loose hitch ball nut can result in uncoupling, leading to death or serious injury. Be sure the hitch ball is tight to the hitch before coupling the trailer.

6. Use the jack to raise the bottom surface of the coupler to be above the top of the hitch ball.

1.9.4.4 Prepare the coupler and hitch

1. Lubricate the hitch ball and the inside of the coupler with a thin layer of automotive bearing grease. If your trailer is equipped with a jack, raise the coupler above the ball height.
2. Open the coupler locking mechanism. Ball couplers have a locking mechanism with an internal moving piece and an outside handle.
3. In the open position, the coupler is able to drop fully onto the hitch ball.
4. See the coupler instructions for details of placing the coupler in the “open” position.
5. Slowly back up the tow vehicle so that the hitch ball is near or aligned under the coupler.

1.9.4.5 Couple the trailer to the tow vehicle

1. If the coupler does not line up with the hitch ball, adjust the position of the tow vehicle or you may lift the coupler and place it over the ball.
2. Using the jack, lower the trailer until the coupler fully engages the hitch ball.
3. Engage the coupler locking mechanism. In the engaged position, the locking mechanism securely holds the coupler to the hitch ball.
4. Insert a pin or lock through the hole in the locking mechanism.
5. Be sure the coupler is all the way on the hitch ball and the locking mechanism is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch, after the coupler is locked to the hitch.

NOTICE

Overloading can damage the tongue jack. Do not use the tongue jack to raise the tow vehicle more than 1 inch..

6. If the coupler cannot be secured to the hitch ball, do not tow the trailer. Call BAUER at (757) 855-6006 or your dealer for assistance.
7. Lower the trailer so that its entire tongue weight is held by the hitch, and continue retracting the jack to its fully retraced position.

1.9.4.6 Rig the safety chains

1. Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
2. Rig the safety chains so that if the trailer uncouples, the safety chains can hold the tongue up above the road.
 - a. Cross the chains underneath the coupler
 - b. Loop them around a frame member of the tow vehicle or to holes provided in the hitch system but do not attach them to an interchangeable part of the hitch assembly
 - c. Have enough slack to permit tight turns, but not so much that they are too close to the road.

**WARNING**

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.

Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

1.9.4.7 Attach and test breakaway brake system

If the coupler or hitch fails, a properly connected and working breakaway brake system will apply brakes on the trailer. The safety chains will keep the tow vehicle attached and as the brakes are applied at the trailer's axles, the trailer/tow vehicle combination will come to a controlled stop.

The breakaway brake system includes a breakaway brake chain and actuator. Read and follow the instructions here as well as the instructions that have been prepared by the breakaway brake manufacturer.

1. Connect the brake chain to the tow vehicle so that the brake chain will be pulled before all of the slack in the safety chains is taken up. Do not connect the brake chain to a safety chain or to the hitch ball or hitch ball assembly. This would keep the breakaway brake system from operating when it is needed.
2. Do not tow the trailer with the breakaway brake system ON because the brakes will overheat which can result in permanent brake failure.

**WARNING**

An ineffective breakaway brake system can result in a runaway trailer, leading to death or serious injury, if the coupler or ball hitch fails.

Connect the breakaway chain to the tow vehicle; and NOT to the hitch, ball or support.

Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer. Have it serviced or repaired.

1.9.4.8 Electrical Connection

Connect the trailer lights to the tow vehicle's electrical system using the electrical connectors.

Figure 1-11 Trailer to Tow Vehicle Electrical Connections



1. Check all lights for proper operation.
 - a. Running Lights (Turn on tow vehicle headlights).
 - b. Brake Lights (Step on tow vehicle brake pedal).
 - c. Turn Signals (Operate tow vehicle directional signal lever).
 - d. Before towing the trailer on the road, you must operate the tow vehicle brake while trying to pull the trailer in order to confirm that the surge brakes operate. You should feel the operation of the trailer surge brakes.

**WARNING**

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and can lead to collision.

Before each tow:

Check that the taillights, brake lights and turn signals work.

Check that the surge brakes work by applying the tow vehicle brakes.

1.9.4.9 Uncoupling the Ball Hitch Trailer with Tongue Jack

Follow these steps to uncouple your ball hitch trailer from the tow vehicle:

1. Chock the tires to prevent the trailer from rolling, before uncoupling the trailer.
2. Disconnect the electrical connector.
3. Disconnect the breakaway brake chain.
4. Disconnect the safety chains from the tow vehicle.
5. Unlock the coupler and open it.
6. Before extending jack drop leg, make certain the ground surface below the jack wheel will support the tongue load.
7. Remove the locking pin from the jack leg extension. Position the extension close to ground level and insert the locking pin. Rotate the jack handle (or crank) clockwise. This will slowly extend the jack drop leg and transfer the weight of the trailer tongue to the jack.

1.9.4.10 Trailer with Pintle Hook and Lunette Ring Coupler

A Lunette Ring Coupler connects to a Pintle Hook that is located under the rear bumper of tow vehicle. The TCom Lite Trailer is fitted with a tongue jack that can raise and lower the coupler. The tongue jack drop leg is mounted to the A-frame of the trailer. The jack has an adjustable leg extension. By extending the jack leg and rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer.

We have utilized a Lunette Ring Coupler that is suitable for the size and weight of the trailer. The load rating of the coupler and the necessary pintle hook size are listed on the trailer tongue. You must provide a hitch and pintle hook for your tow vehicle, where the load rating of the hitch and pintle hook is equal to or greater than that of your trailer. The tow vehicle, hitch and coupler must have a rated towing capacity equal to or greater than the trailer gross vehicle weight rating (GVWR).

1.9.4.11 Before Coupling the Trailer to the Tow Vehicle

1. Be sure the size and rating of pintle hook matches the size and rating of the ring coupler. Pintle Hooks and ring couplers are marked with their size and rating.

**WARNING**

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.
Be sure the LOAD RATING of the hitch is equal or greater than the load rating of the coupler.

**WARNING**

A worn, cracked or corroded hitch or coupler can fail while towing, and may result in death or serious injury.

Before coupling trailer, inspect the hitch and coupler for wear, corrosion and cracks.

Replace worn or damaged hitch or coupler.

2. Wipe the pintle hook clean and inspect it visually and by feel for flat spots, cracks and pits
3. Wipe the inside and outside of the ring coupler clean and inspect it visually for cracks and deformations; feel the inside of the coupler for worn spots and pits.
4. Be sure the coupler is tight to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.

1.9.4.12 Prepare the Coupler and Hitch

1. Your trailer is equipped with a jack to raise the coupler above the lower pintle hook height.
2. Open the hitch locking mechanism. Pintle Hook hitches have a locking mechanism with an internal moving piece and an outside handle.
3. In the open position, the coupler is able to drop fully into the pintle hook.
4. See the coupler instructions for details of placing the coupler in the “open” position.

5. Slowly back up the tow vehicle so that the pintle hook is near or aligned under the coupler.

Figure 1-12 Pintle Hook Coupler Mechanism**1.9.4.13** Couple the trailer to the tow vehicle

1. For minor misalignment, you may lift the coupler and place it into the pintle hook.
2. Engage the hitch locking mechanism. In the engaged position, the locking mechanism securely holds the ring coupler in the pintle hook.
3. Use the jack to lower the trailer until the coupler fully engages the hitch.
4. Insert a pin or lock through the hole in the locking mechanism.
5. Be sure the hitch is completely closed and the locking mechanism is engaged.
6. If the coupler cannot be secured to the hitch, do not tow the trailer. Call BAUER at (757) 855-6006 or your dealer for assistance.
7. Lower the trailer so that its entire tongue weight is held by the hitch. Adjust the jack leg extension to the highest position and secure with the locking pin. Continue retracting the jack to its fully retracted position.

1.9.4.14 Rig the safety chains

1. Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
2. Rig the safety chains so that if the trailer uncouples, the safety chains can hold the tongue up above the road.
 - a. Cross the chains underneath the coupler
 - b. Loop them around a frame member of the tow vehicle or to holes provided in the hitch system but do not attach them to an interchangeable part of the hitch assembly
 - c. Have enough slack to permit tight turns, but not so much that they are too close to the road.

**WARNING**

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.

Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

1.9.4.15 Attach and test breakaway brake system

If the coupler or hitch fails, a properly connected and working breakaway brake system will apply brakes on the trailer. The safety chains will keep the tow vehicle attached and as the brakes are applied at the trailer's axles, the trailer/tow vehicle combination will come to a controlled stop.

The breakaway brake system includes a breakaway brake chain and actuator. Read and follow the instructions here as well as the instructions that have been prepared by the breakaway brake manufacturer.

1. Connect the brake chain to the tow vehicle so that the brake chain will be pulled before all of the slack in the safety chains is taken up. Do not connect the brake chain to a safety chain or to the hitch assembly. This would keep the breakaway brake system from operating when it is needed.

**WARNING**

An ineffective breakaway brake system can result in a runaway trailer, leading to death or serious injury, if the coupler or hitch fails.

Connect the breakaway chain to the tow vehicle; and NOT to the hitch, ball or support.

If the breakaway brake system is not working, do not tow the trailer. Have it serviced or repaired.

2. Do not tow the trailer with the breakaway brake system ON because the brakes will overheat which can result in permanent brake failure.

1.9.4.16 Connect the Electrical Cables.

See Figure 1-11.

1. Connect the trailer to the tow vehicle's electrical system using the electrical connectors.
2. Check all lights for proper operation.
 - a. Running Lights (Turn on tow vehicle headlights).
 - b. Brake Lights (Step on tow vehicle brake pedal).
 - c. Turn Signals (Operate tow vehicle directional signal lever).

**WARNING**

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and can lead to collision.

Before each tow:

Check that the taillights, brake lights and turn signals work.

1.9.4.17 Uncoupling the Pintle Hitch Trailer with Tongue Jack

Follow these steps to uncouple your ball hitch trailer from the tow vehicle:

1. Chock the tires to prevent the trailer from rolling, before jacking the trailer up.
2. Disconnect the electrical connector.
3. Disconnect the breakaway brake chain.
4. Disconnect the safety chains from the tow vehicle.
5. Before extending jack, make certain the ground surface below the jack pad will support the tongue load.
6. Unlock the pintle hook and open it.
7. Lower the jack leg extension and secure in place with the locking pin. Rotate the jack handle (or crank) clockwise. This will slowly extend the jack and transfer the weight of the trailer tongue to the jack.

1.9.5 Loading the Trailer

The TCom Lite trailer is a specific use trailer and is not designed to carry any additional cargo. Those items which are removable or consumable must be placed in the appropriate containers or racks and properly secured before the trailer is moved.

**WARNING**

Shifting cargo can result in loss of control of the trailer, and can lead to death or serious injury. Tie down all loads with proper sized fasteners, ropes, straps, etc.

**WARNING**

Do not transport people inside the trailer, even if it has living quarters. The transport of people puts their lives at risk and may be illegal.

**WARNING**

Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer, with the exception of the fuel stored in the tank for the diesel engine.

1.9.6 Checking the Trailer Before and During Each Tow**1.9.6.1 Pre-tow Checklist**

Before towing, double-check all of these items:

1. Tires, wheels and lug nuts.
2. Coupler secured and locked.
3. Safety chains properly rigged to tow vehicle, not to hitch or ball.
4. Test of lights: Tail, Stop, and Turn.
5. Breakaway Brake Chain fastened to tow vehicle, not to safety chains.
6. Cargo properly tied down.
7. Doors latched and secured
8. Wheel Chocks Stored

1.9.6.2 Make Regular Stops

After each 50 miles, or one hour of towing, stop and check the following items:

1. Coupler secured
2. Safety chains are fastened and not dragging
3. Contents secured
4. Doors latched and secured

1.10 Breaking-in a New Trailer**1.10.1 Retighten Lug Nuts at First 10, 25 & 50 Miles**

Wheel lug nuts can shift and settle quickly after being first assembled, and must be checked after the first 10, 25 and 50 miles of driving. Failure to perform this check may result in a wheel coming loose from the trailer, causing a crash leading to death or serious injury.

**WARNING**

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury. Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving.

1.10.2 Adjust Brake Shoes at First 200 Miles

Brake shoes and drums experience a rapid initial wear. The brakes must be adjusted after the first 200 miles of use, and each 3,000 miles thereafter. Some axles are fitted with a mechanism that will automatically adjust the brake shoes when the trailer is “hard braked” from a forward direction. Read your axle and brake manual to see if your brakes adjust automatically. If you do not have the axle and brake manual, call Bauer Compressors, Inc. at (757) 855-6006 for a copy.

A hard stop is used to:

- confirm that the brakes work;
- confirm that the trailer brakes are properly synchronized with the tow vehicle brakes
- automatically adjust the brake shoes.

1.10.3 Synchronizing the Brake Systems

Trailer brakes are designed to work in synchronization with the brakes on the tow vehicle. Do not use either brake system alone to stop the combined tow vehicle and trailer.

When the tow vehicle and trailer braking systems are synchronized, both braking systems contribute to slowing, and the tongue of the trailer will neither dive nor rise sharply.



WARNING

If trailer and tow vehicle brakes do not work properly together, death or serious injury can occur. Road test the brakes in a safe area at no more than 30 m.p.h. before each tow.

To insure safe brake performance, read and follow the axle/brake manufacturers' instructions. If you do not have these instructions, call Bauer Compressors, Inc. at (757) 855-6006 for a copy..

1.11 Accessories

For many accessories, the manufacturer of the accessory has also provided instructions. You must read and follow these instructions before using the accessory. If you are uncertain whether you have all of the instructions, call Bauer Compressors, Inc. at (757) 855-6006 before operating the accessory.

CHAPTER 2: TIRE SAFETY INFORMATION

This portion of the manual contains tire safety information as required by 49 CFR 575.6 provide by the National Association of Trailer Manufacturers.

2.1 Steps for Determining Correct Load Limit - Trailers

Determining the load limits of a trailer includes more than understanding the load limits of the tires alone. On all trailers there is a Federal Certification/VIN label that is located on the forward half of the left (road) side of the unit. This Certification/VIN label will indicate the trailer's Gross Vehicle Weight Rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the Gross Axle Weight Rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

If your trailer GVWR of 10,000 pounds or less, there is a vehicle placard located in the same location as the certification label described above. This placard provides tire and loading information. In addition, this placard will show a statement regarding the maximum cargo capacity. Cargo can be added to the trailer, up to the maximum weight specified on the placard. The combined weight of the cargo is provided as a single number. In any case, remember: the total weight of the fully loaded trailer can not exceed the stated GVWR.

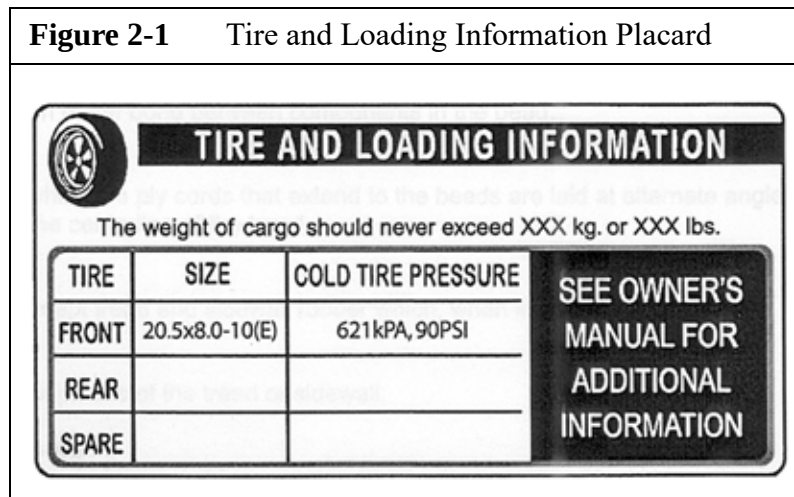
For trailers with living quarters installed, the weight of water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the trailer before it is loaded with cargo and is not considered part of the disposable cargo load. Water however, is a disposable cargo weight and is treated as such. If there is a fresh water storage of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle position as reasonable. Too many items in one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your dealer to discuss the weighing methods needed to capture the various weights related to the trailer. This would include the weight empty or unloaded, weights per axle, wheel, hitch or king-pin and total weight.

Excessive loads and/or underinflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. The proper air pressure may be found on the Certification/VIN label and/or on the Tire Placard. This value should never exceed the maximum cold inflation pressure stamped on the tire.

2.1.1 Trailers 10,000 pounds GVWR or less

Figure 2-1 Tire and Loading Information Placard



1. Locate the statement, “The weight of cargo should never exceed XXX kg or XXX lbs.,” on your vehicles placard. See Figure 2-1.
2. This figure equals the available amount of cargo and luggage load capacity.
3. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

The trailer’s placard refers to the Tire Information Placard attached adjacent to or near the trailers VIN (Certification) label at the front of the trailer.

2.1.2 Trailers over 10,000 pounds GVWR

NOTICE
These trailers are not required to have a tire information placard on the vehicle.

1. Determine the empty weight of your trailer by weighing the trailer using a public scale or other means. This step does not have to be repeated.
2. Locate the GVWR (Gross Vehicle Weight Rating) of the trailer on your trailers VIN (Certification) label.
3. Subtract the empty weight of your trailer from the GVWR stated on the VIN label. The weight is the maximum available cargo capacity of the trailer and may not be safely exceeded.

2.2 Steps for Determining Correct Load Limit - Tow Vehicle

1. Locate the statement, “The combined weight of the occupants and cargo should never exceed XXX lbs.,” on your vehicle’s placard.
2. Determine the combined weight on the driver and passengers who will be riding in you vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.

4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the “XXX” amount equals 1400 lbs and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. $(1400 - 750 (5 \times 150) = 650 \text{ lbs.})$.
5. Determine the combined weight of luggage and cargo being loaded in the vehicle. The weight may not safely exceed the available cargo and luggage capacity calculated in Step 4.

If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicles manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

2.3 Glossary of Tire Terminology

- **Accessory Weight**

The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

- **Bead**

The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

- **Bead Separation**

This is the breakdown of the bond between components in the bead.

- **Bias Ply Tire**

A pneumatic tire which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

- **Carcass**

the tire structure, except tread and sidewall rubber which, when inflated, bears the load.

- **Chunking**

The breaking away of pieces of the tread or sidewall.

- **Cold Inflation Pressure**

The pressure in the tire before you drive.

- **Cord**

The strands forming the plies in the tire.

- **Cord Separation**

The parting of the cords from the adjacent rubber compounds.

- **Cracking**

Any parting within the tread, sidewall, or inner wall of the tire extending to the cord material.

- **CT**

A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with the rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

- Curb weight

The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

- Extra Load Tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

- Groove

The space between two adjacent tread ribs.

- Gross Axle Weight Rating

The maximum weight that any axle can support, as published on the Certification/VIN label on the front left side of the trailer. Actual weight determined by weighing each axle on a public scale, with the trailer attached to the towing vehicle.

- Gross Vehicle Weight Rating

The maximum weight of the fully loaded trailer, as published on the Certification/VIN label. Actual weight determined by weighing the trailer on a public scale, without being attached to the towing vehicle.

- Hitch Weight

The downward force exerted on the hitch ball by the trailer coupler.

- Innerliner

The layers forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

- Inner Separation

The parting of the innerliner from the cord material in the carcass.

- Intended Outboard Sidewall

The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

- Light Truck (LT) Tire

A tire designated by its manufacturer as primarily intended for use on lightweight or multipurpose passenger vehicles.

- Load Rating

The maximum load that a tire is rated to carry for a given inflation pressure.

- Maximum Load Rating

The load rating for a tire at the maximum inflation pressure for that tire.

- Maximum Permissible Inflation Pressure

The maximum cold pressure to which a tire may be inflated.

- Maximum Loaded Vehicle Weight

The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

- Measuring Rim

The rim on which a tire is fitted for physical dimension requirements.

- Pin Weight

The downward force applied to the 5th wheel or gooseneck ball, by the trailer kingpin or gooseneck coupler.

- Non-pneumatic Rim

A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

- Non-pneumatic Spare Tire Assembly

A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

- Non-pneumatic Tire Assembly

A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

- Normal Occupant Weight

This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

- Occupant Distribution

The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

- Open Splice

Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

- Outer Diameter

The overall diameter of an inflated new tire.

- Overall Width

The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

- Ply

A layer of rubber-coated parallel cords.

- Ply Separation

A parting of rubber compound between adjacent plies.

- Pneumatic Tire

A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

- Production Options Weight

The combined weight of those installed regular production items weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

- Radial Ply Tire

A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

- Recommended Inflation Pressure

This is the inflation pressure provided by the vehicle manufacturer on the Tire Information Label and on the Certification/VIN tag.

- Reinforced Tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

- Rim

A metal support for a tire or a tire and tube assembly upon which the beads are seated.

- Rim Diameter

This means the nominal diameter of the bead seat.

- Rim Size Designation

This means the rim diameter and width.

- Rim Type Designation

This means the industry of manufacturer's designation for a rim by style or code.

- Rim Width

This means the nominal distance between the rim flanges.

- Section Width

The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration or protective bands.

- Sidewall

That portion of the tire between the tread and bead.

- Sidewall Separation

The parting of the rubber compound from the cord material in the sidewall.

- Special Trailer (ST) Tire

The "ST" is an indication the tire is for trailer use only.

- Test Rim

The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

- Tread

That portion of the tire that comes in contact with the road.

- Tread Rib

A tread section running circumferentially around a tire.

- Tread Separation

Pulling away of the tread from the tire carcass.

- Treadwear Indicators (TWI)

The projections within the principal grooves designed to give a visual indication of the wear of the tread.

- Vehicle Capacity Weight

The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicles designated seating capacity.

- Vehicle Maximum Load on the Tire

The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded weight and dividing by two.

- Vehicle Normal Load on the Tire

The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of 49 CFR 571.110) and dividing by two.

- Weather Side

The surface area of the rim not covered by the inflated tire.

- Wheel Center Member

In the case of non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and vehicle.

- Wheel-holding Fixture

The fixture used to hold the wheel and tire assembly securely during testing.

2.4 Tire Safety - Everything Rides On It

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site: http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This section presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

2.5 Safety First – Basic Tire Maintenance

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Underinflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

2.5.1 Finding Your Vehicle's Recommended Tire Pressure and Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW – the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR - the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer near the left front.

2.5.2 Understanding Tire Pressure and Load Limits

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and effects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure – measured in pounds per square inch (psi) – a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilo pascals (kPa), which is the metric measure used internationally.)

Manufacturers of passenger vehicles and light trucks determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.) Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

2.5.3 Checking Tire Pressure

- It is important to check your vehicle's tire pressure at least once a month for the following reasons:
Most tires may naturally lose air over time
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine underinflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets. The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to

the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

2.5.4 Steps for Maintaining Proper Tire Pressure

Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owners manual.

Step 2: Record the tire pressure of all tires.

Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.

Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.

Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.

Step 6: Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure). If you have been driving your vehicle and think that a tire is under inflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly under inflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly under inflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

2.5.5 Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owners manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

2.5.6 Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

2.5.7 Tire Balance and Wheel Alignment

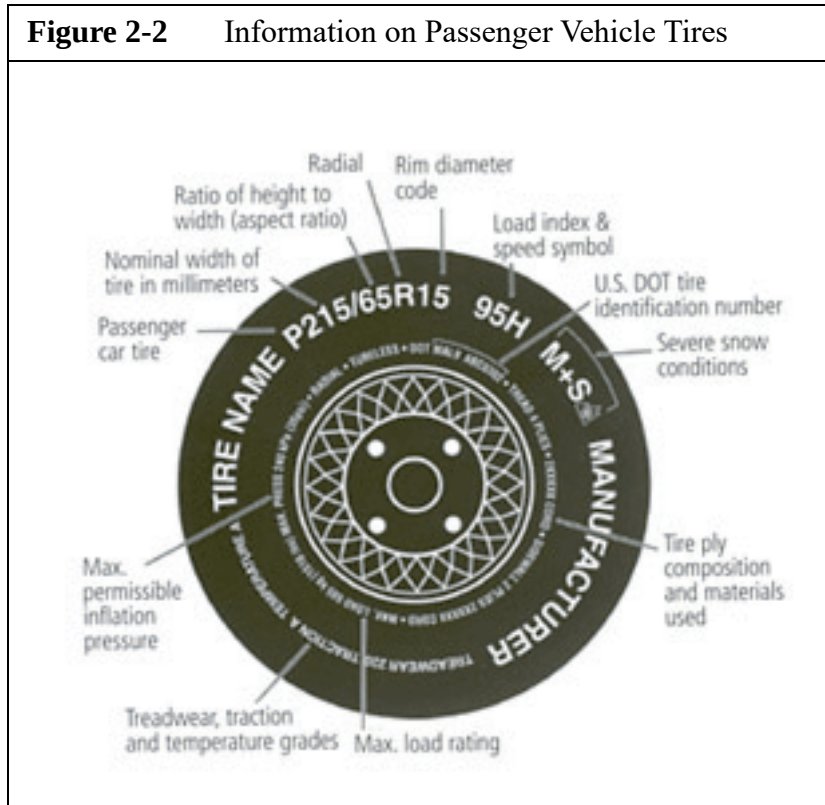
To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

2.5.8 Tire Repair

The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

2.5.9 Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.



2.5.9.1 Information on Passenger Vehicle Tires

Please refer to Figure 2-2 below.

- P

The “P” indicates the tire is for passenger vehicles.

- Next number

This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

- Next number

This two-digit number, known as the aspect ratio, gives the tire’s ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

- R

The “R” stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

- Next number

This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

- Next number

This two- or three-digit number is the tire’s load index. It is a measurement of how much weight each tire can support. You may find this information in your owners manual. If not, contact a local tire dealer.

NOTICE

You may not find this information on all tires because it is not required by law

- M+S

The “M+S” or “M/S” indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

- Speed Rating

The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below.

Letter Rating	Speed Rating
Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168 mph
Y	186 mph

For those tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

NOTICE

You may not find this information on all tires because it is not required by law.

- U.S. DOT Tire Identification Number

This begins with the letters “DOT” and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer’s discretion. This information is used to contact consumers if a tire defect requires a recall.

- Tire Ply Composition and Materials Used

The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

- Maximum Load Rating

This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

- Maximum Permissible Inflation Pressure

This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

2.5.9.2 UTQGS Information

- Tread Wear Number

This number indicates the tire’s wear rate. The higher the tread wear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

- Traction Letter

This letter indicates a tire’s ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as “AA”, “A”, “B”, and “C”.

- Temperature Letter

This letter indicates a tire’s resistance to heat. The temperature grade is for a tire that is inflated properly and not overloaded. Excessive speed, under inflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire’s resistance to heat is graded as “A”, “B”, or “C”.

2.5.9.3 Additional Information on Light Truck Tires

Please refer to Figure 2-3.

Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

- LT

The “LT” indicates the tire is for light trucks or trailers.

- ST

An “ST” is an indication the tire is for trailer use only.

- Max. Load Dual kg (lbs) at kPa (psi) Cold

This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

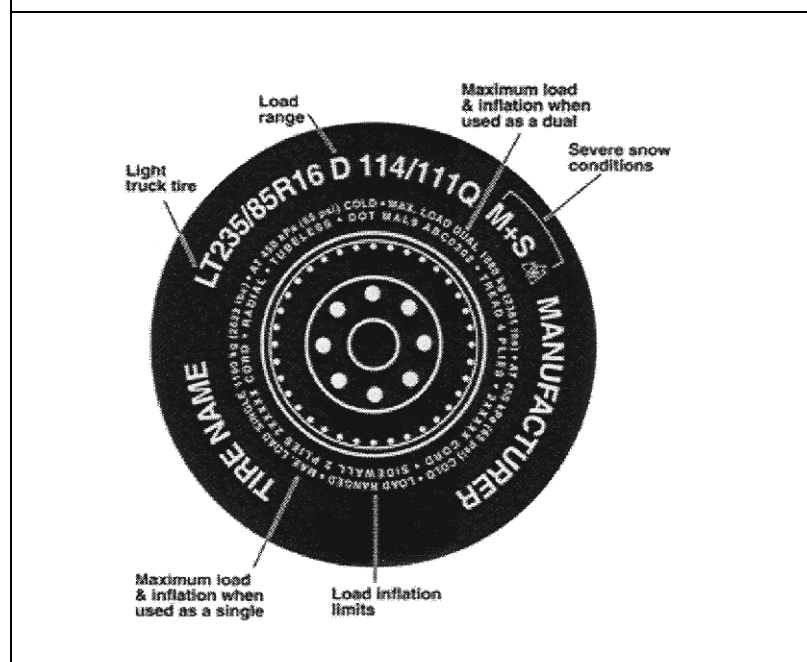
- Max. Load Single kg (lbs) at kPa (psi) Cold

This information indicates the maximum load and tire pressure when the tire is used as a single.

- Load Range

This information identifies the tire's load-carrying capabilities and its inflation limits.

Figure 2-3 Additional Information on Light Truck Tires



2.6 Tire Safety Tips

2.6.1 Preventing Tire Damage

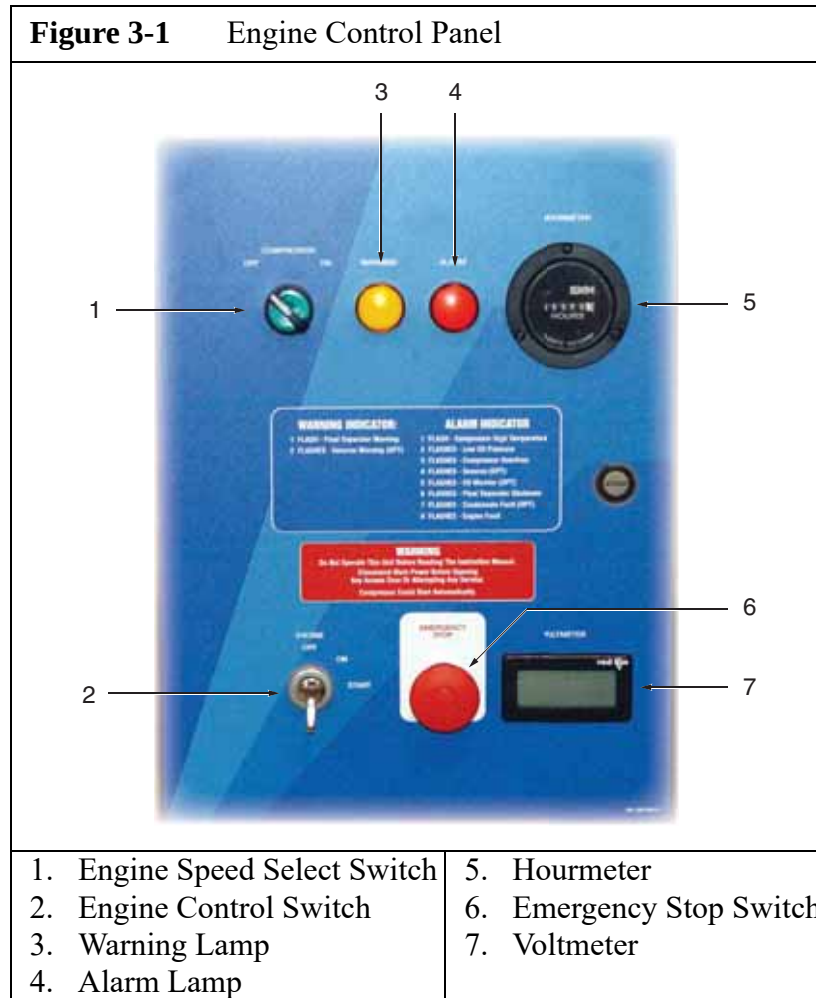
- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

2.6.2 Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.

CHAPTER 3: DIESEL ENGINE OPERATING INSTRUCTIONS

Figure 3-1 Engine Control Panel



3.1 Preoperational Checks

1. Inspect the oil level in the compressor. The oil level should be between the high and low marks on the compressor sight-glass. Add oil as needed.
2. Drain the Condensate Collection Tank. Compressor condensate consists of primarily water, and some oil in an emulsion. Drain into a container and dispose of in accordance with government regulations. Close the drain valve.
3. Inspect Drive Belts. Visually inspect drive belts for wear or fraying. The belt is tensioned by moving the diesel engine and should not need frequent adjustment.
4. Inspect the oil level in the Diesel Engine. The engine oil level should be between the high and low marks on the engine oil dip stick. Add oil as needed.
5. Inspect engine for leaks. Inspect the engine fuel and coolant systems to look for evidence of any leakage from these systems. Correct any deficiencies prior to running the equipment.
6. Inspect the level in the fuel tank. Add fuel if needed.
7. Inspect the engine coolant overflow tank level. Add coolant if needed.

8. Inspect the battery and cable connections. Visually inspect the battery and battery cable connections for looseness and evidence of corrosion. Correct any discrepancies.

3.2 Start-Up

1. Pull out the Emergency Stop Button.
2. Place Engine Control Switch in the RUN (Center) position.
 - a. If the ambient air temperature is less than 70°F (21°C) then wait for six seconds before proceeding.
 - b. If the ambient air temperature is greater than 70°F (21°C) then you do not have to wait for the six seconds.
3. Turn the Engine Control Switch to the START (full CW) position. Hold the switch until the engine starts.
4. Do not hold the Engine Control Switch in the START position for more than 10 seconds.
5. When the engine starts return the Engine Control Switch to the RUN position.
6. If possible allow the Diesel Engine to idle for five minutes to warm-up.
7. After the engine is warm turn the Compressor Switch to HIGH (CW). The Warning Lamp and the Alarm Lamp should illuminate for 5 seconds as a bulb test. If one or both of the lamps do not illuminate, then replace the bulb with LIT-0105. It is also possible the lamps will not light if the main battery has become discharged.
8. If the air system has a pressure of approximately 5500 psi or less, the engine will increase speed and then the compressor will start. The compressor will stop and the engine will return to idle when the air system pressure reaches approximately 5000 psi.

3.3 Shutdown

1. Allow the diesel to run at idle for 10 to 15 minutes to cool-down.
2. Place the Engine Control Switch to the OFF (full CCW) position.
3. Push the Emergency Stop Switch in.

3.4 Components

3.4.1 Emergency Stop Switch.

The Emergency Stop Switch is a switch with a mushroom head located on the Electrical Panel. The button must be pulled out for the unit to operate. In an emergency, depress the push button, which will shutdown the engine and all other periphery devices. Do not use the Emergency Stop Switch for securing the equipment under normal operation, use the Engine Control Switch.

3.4.1.1 PLC Warning and Alarm Lamps

3.4.1.1.1 Warning Lamp - Amber

The lamp (Bauer P/N LIT-0105) is an incandescent lamp for long trouble free life. This lamp will flash a code IAW the logic of the PLC. See Paragraph 3.5.

3.4.1.1.2 Alarm Lamp - Red

The lamp (Bauer P/N LIT-0105) is an incandescent lamp for long trouble free life. This lamp will flash a code IAW the logic of the PLC. See Paragraph 3.6.

3.4.2 Hour meter

The panel is supplied with an hour meter (HMR-0029). The hour meter is not resettable and used to monitor the run hours of the compressor. It is powered with a 12 VDC signal supplied from the battery.

3.4.3 PLC Control

This will be controlled with a Mitsubishi Programmable Logic Controller located in the electrical panel. This unit will provide logical operations to the overall system that includes the high pressure compressor, purification systems, and other accessories.

3.5 Warnings

The amber Warning Light located on the control panel flashes warning codes with a 0.5 second on, 0.5 second off sequence with a distinct pause between sequences. In addition the light will illuminate on initial start up for a period of 5 seconds, to serve as a lamp test function. The lamp is a LED lamp for long trouble free life.

3.5.1 One Flash - Final Separator Warning

The compressor unit is equipped with a final separator. To prevent fatigue failure of this pressure vessel, the PLC program monitors the pressurization, de-pressurization cycles of the separator and will first issue a Warning, and then an Alarm. The program is set up to provide the warning at 90% of the maximum recommended number of cycles. The program is configured to reflect these values when it is built. When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the Final Separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the Final Separator. Once the Final Separator is replaced, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions on this procedure.

**3.5.2 Two Flashes - Securus Monitor**

The compressor purification system is equipped with a Securus® Electronic Moisture Monitor. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridges have reached the point where they retain a set level of moisture, the Securus® monitor will issue a warning via the amber Warning Light. On a Securus® Warning condition, the compressor will run normally, the PLC X7 lamp will illuminate, and the warning code will flash. This warning is meant to prompt the operator to schedule replacement of the purification cartridge.

3.6 Alarms

The red Warning Light located on the control panel flashes warning codes with a 0.5 second on, 0.5 second off sequence with a distinct pause between sequences. In addition the light will illuminate on initial

start up for a period of 5 seconds, to serve as a lamp test function. The lamp is a LED lamp for long trouble free life.

3.6.1 One Flash - Compressor High Temperature

The compressor high temperature switch is located on the compressor block, third, fourth or fifth stage head, depending on model. Under normal operating conditions, the switch is closed and the X1 lamp on the PLC is illuminated. On a high temperature condition, the compressor will shutdown, the X1 lamp will extinguish, and the alarm code will flash.

3.6.2 Two Flashes - Compressor Low Oil Pressure

The compressor oil pressure switch is located on the back of the compressor block, mounted with the oil pressure gauge. The switch is N.O., Normally Open, and is connected to the PLC on terminal X2. During startup of the compressor, the oil pressure switch is bypassed for a period of 45 seconds to allow the oil pressure to stabilize, then the switch will close. Then should the compressor lose oil pressure, the compressor will shutdown, the X2 lamp will extinguish, and the alarm code will flash.

3.6.3 Three Flashes - Compressor Overtime

The compressor has an overtime function, where if the compressor runs continuously for 4 hours, then the compressor will shutdown, and the alarm code will flash. This is done to secure the equipment if it were to be started and left unattended.

3.6.4 Four Flashes - Securus Monitor

The compressor purification system is equipped with a Securus® Electronic Moisture Monitor. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridge has reached the point where it retains a set level of moisture, the Securus® monitor will issue an alarm via the red Alarm Light. On a Securus® ALARM condition, the compressor will shutdown, the PLC X5 lamp will be illuminated, and the alarm code will flash.

3.6.5 Six Flashes - Final Separator Shutdown



WARNING

Do not attempt to override the Final Separator Shutdown. This feature is provided to protect operating personnel from injury or death.

The high pressure-breathing compressor is equipped with a final separator. To prevent fatigue failure of this vessel, the PLC program monitors the pressurization, de-pressurization cycles of the separator and will issue a Warning, and then later an Alarm. The program is set up to provide a warning at 90% of the maximum recommended number of cycles. The program is configured to reflect these values when it is built. When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the separator. Once this is accomplished, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions

3.6.6 Seven Flashes - Condensate Fault

The compressor condensate level float switch is located in the condensate collection tank. Under normal operating conditions, the switch is open and the X6 lamp on the PLC is off. On a high condensate

level the float switch will close, the compressor will shutdown, the PLC X6 lamp will illuminate, and the alarm code will flash. The operator should drain the condensate from the tank and resume operation of the equipment.

NOTICE

The compressor condensate contains some oil, and accordingly, should be disposed of in accordance with state and local regulations.

3.6.7 Eight Flashes - Engine Fault High Temp / Low Oil Pressure

The diesel engine is equipped with both a Temperature Switch and an Oil Pressure Switch. These switches are wired in series providing a common diesel alarm function to the PLC. The switches provide a connection to ground which engages the relay that controls the signal going to PLC terminal X12. The Temperature Switch is N.O. and the Oil Pressure Switch is N.C. The Oil Pressure Switch is bypassed for 5 seconds at startup until normal oil pressure is reached. When normal oil pressure is reached the Oil Pressure Switch opens. Under normal operating conditions with the engine running, the switches are open and the X12 lamp on the PLC is off. On a high temperature or low oil pressure condition, the X12 lamp will illuminate, the alarm code will flash and the system will shutdown.

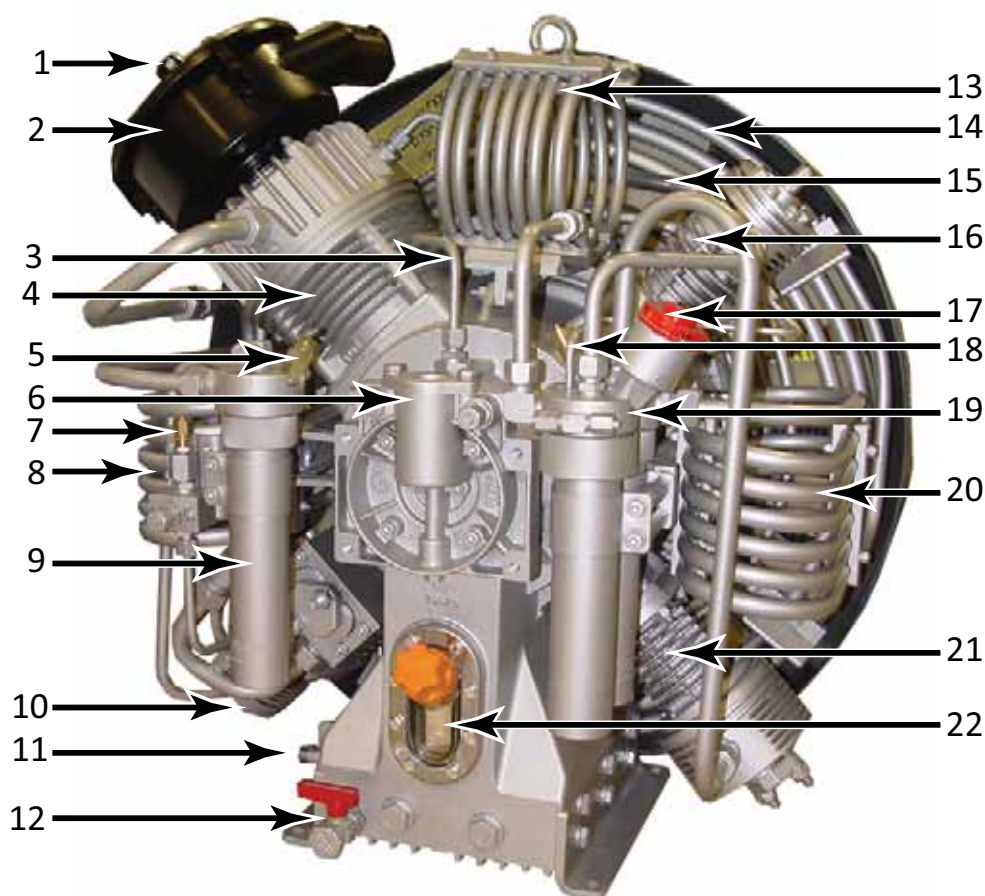
CHAPTER 4: IK 18.1 II COMPRESSOR BLOCK

4.1 Description

The IK18.1 II compressor is used to compress air up to 6,000 psi. This compressor is a four cylinder, five stage air cooled, oil lubricated reciprocating compressor. The 4th stage cylinder is lubricated by means of the forced feed lubrication system, while the other cylinders are splash lubricated. The cylinders are arranged 90° apart, with the 1st and 2nd stage, and the 3rd and 4th stage opposite each other. This compressor block is particularly suitable for continuous operation because of their rugged design and corrosion resistant interstage filter and cooler assemblies.

4.1.1 Component Location

Figure 4-1 Compressor Block (Front View)

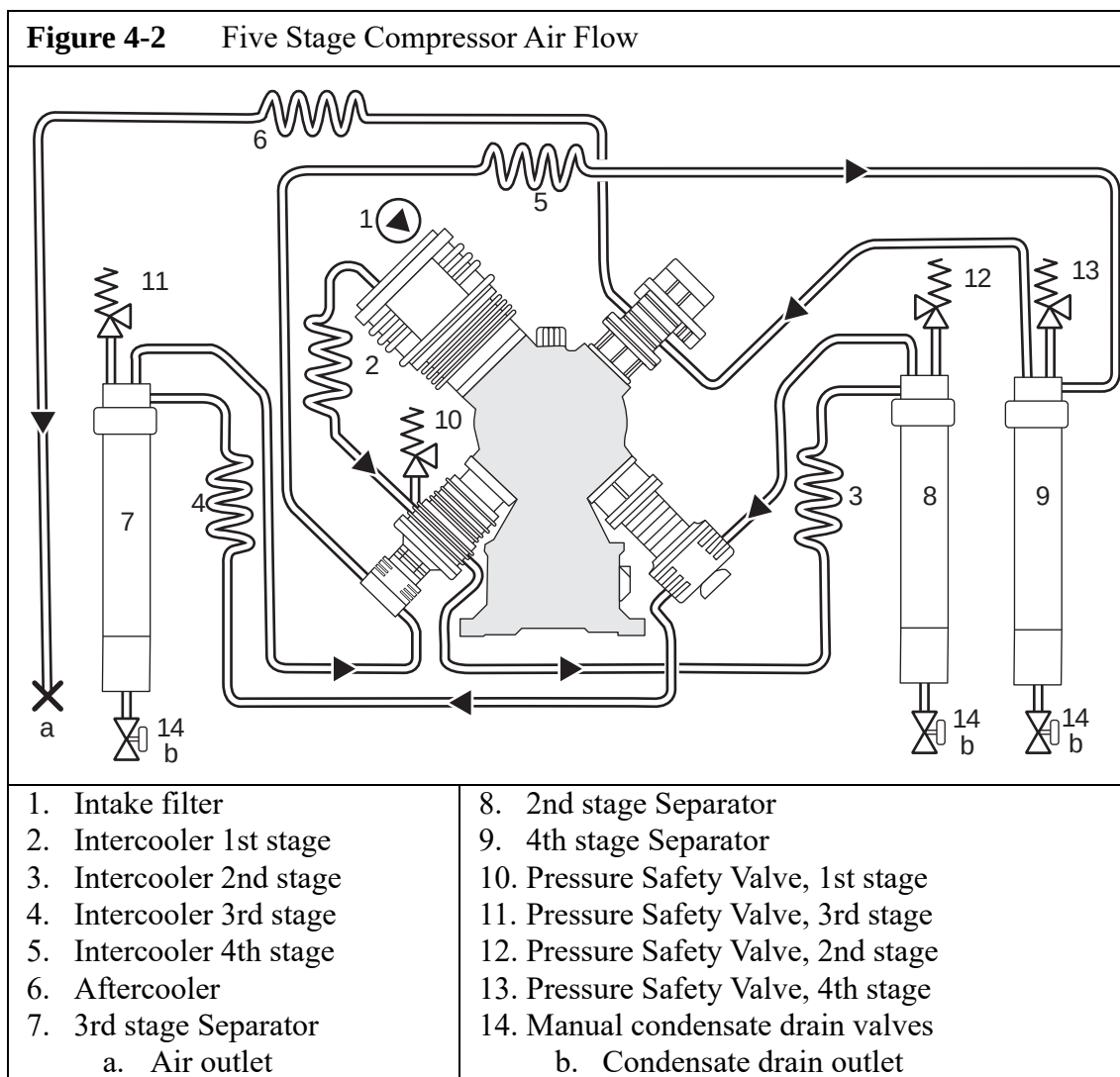


1. Service Indicator
 2. Intake Filter
 3. Crankcase Vent
 4. 1st Stage Cylinder
 5. 3rd Stage Safety Valve
 6. Oil Pump Housing
 7. 1st Stage Safety Valve
 8. 3rd Stage Intercooler

9. 3rd Stage Separator
 10. 2nd/4th Stage Cylinder
 11. Compressed Air Outlet
 12. Oil Drain
 13. 4th Stage Intercooler
 14. 1st Stage Intercooler
 15. 5th Stage Aftercooler

16. 5th Stage Cylinder
 17. 4th Stage Safety Valve
 18. 2nd Stage Safety Valve
 19. 4th Stage Separator
 20. 2nd Stage Intercooler
 21. 3rd Stage Cylinder
 22. Oil Filler with Sight Glass

4.1.2 Air Flow Diagram



4.1.3 Lubrication System

4.1.3.1 Description.

The compressor is provided with forced-feed lubrication. The oil pressure is produced by a low revving gear pump. The oil pressure is between 44 psi and 87 psi (3 to 6 bar).

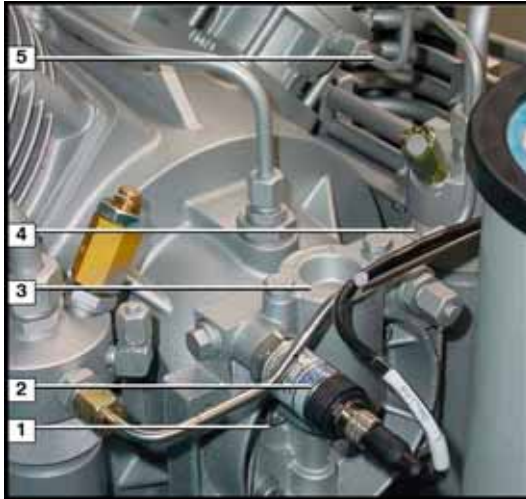
CAUTION

This oil pump must be operated in the correct direction of rotation, other wise no oil pressure will be built up and the compressor may be damaged.

(See Figure 4-3) The oil pump (1) is coupled to and driven by the crankshaft. It pumps oil from the crankcase through an oil filter (3) and the oil pressure regulating valve (4) to the 4th stage cylinder. The oil is then distributed by the guide piston of the 4th stage and lubricates all the moving parts of the com-

pressor block. The oil pressure sensor (2) allows mounting for an optional oil pressure gauge or electronic pressure monitoring.

Figure 4-3 Lubrication Oil System



- | | |
|------------------------|----------------------------------|
| 1. Oil Pump Housing | 4. Oil Pressure Regulating Valve |
| 2. Oil Pressure Sensor | 5. Injection Line to Final Stage |
| 3. Oil Filter Housing | |

Figure 4-4 Oil Sight Gauge



4.1.3.2 Oil Level Check

Check the oil level at the oil filler sight gauge on the compressor block every day before putting the compressor into operation. Oil level must never be below the minimum mark molded into the sight gauge as this will cause severe damage due to lack of lubrication. Overfilling is prevented by the design of the filler neck; i.e. oil should be filled right to the edge of the opening.

4.1.3.3 Oil Change Interval

The synthetic oil should be changed every 2,000 operating hours or biennially, whichever is reached first.

4.1.3.4 Oil Capacity

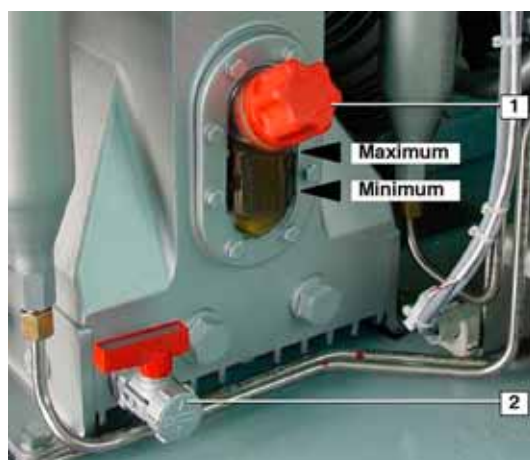
The oil capacity is approximately 6.5 quarts (6.0 liters). The amount of oil between the minimum and maximum marks is approximately 1.7 quarts (1.6 liters).

4.1.3.5 Oil Change

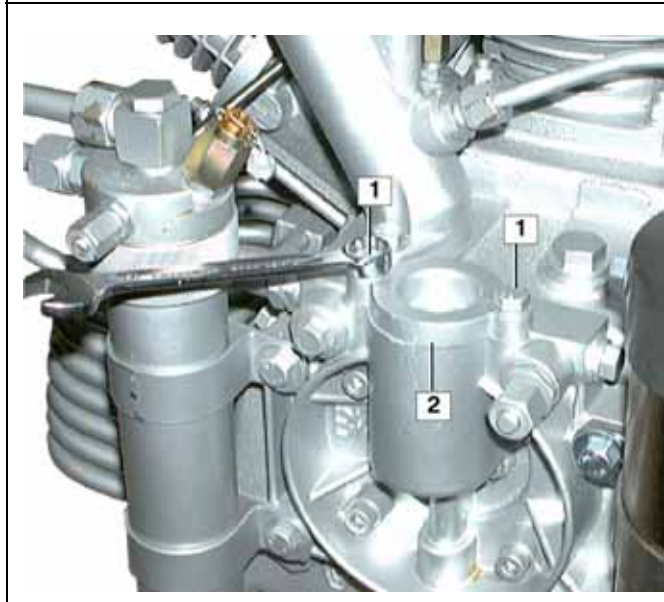
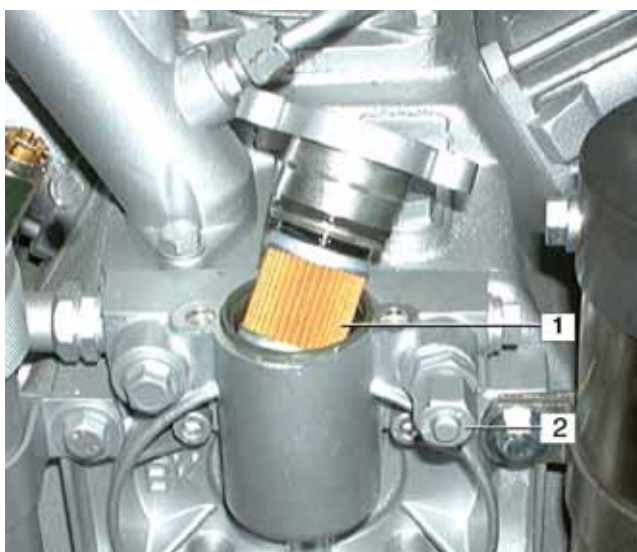


CAUTION

Replace the oil filter at every oil change, otherwise when the filter becomes clogged a bypass valve opens and the oil circulates without being filtered.

Figure 4-5 Oil Sight Gauge & Drain

1. Oil Fill Cap
2. Oil Drain Valve

Figure 4-6 Removing the Oil Filter Cover**Figure 4-7** Replacing the Oil Filter

1. Run the compressor until it is warm.
2. Remove cap from Oil Filler Sight Gauge.
3. (See Figure 4-5) Drain the Oil into a suitable container by opening the Oil Drain Valve (2)
4. After oil has stopped draining, close Oil Drain Valve.
5. (See Figure 4-6) Remove two bolts (1) with a 13 mm wrench. Remove cover (2).
6. (See Figure 4-7) Remove the Oil Filter (1) from the rubber gasket at the cover.
7. Mount a new filter element and replace and fasten cover.

8. Fill new oil through filler neck to the Maximum mark on the Oil Fill Sight Gauge.
9. Pour oil in slowly, wait until the level settles then replace cap in the Oil Fill Sight Gauge.
10. Return the unit to operation.

4.1.3.6 Venting the Oil Pump



CAUTION

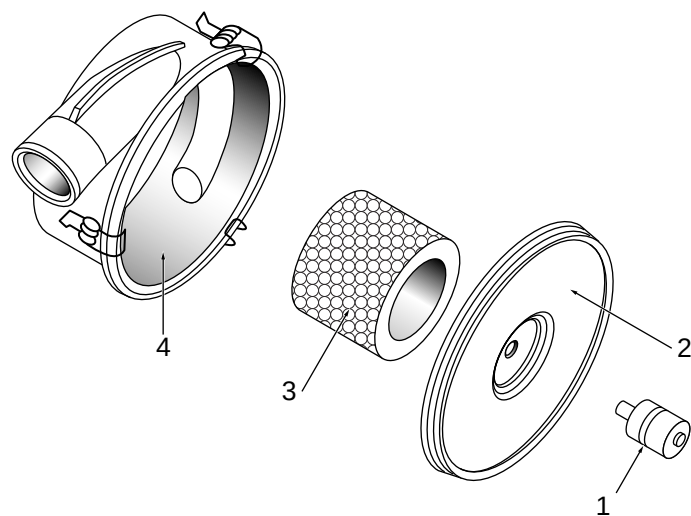
To avoid damage after maintenance the following measures should be strictly adhered to.

(See Figure 4-7). If after the start of the compressor no oil pressure builds up, venting the oil pump may be necessary, especially after maintenance and repair work. It may also be necessary if the unit has been operated in the wrong direction of rotation.

1. With the unit running, open the condensate drain valves.
2. Open Oil Pump Vent Plug (2) and wait until oil comes out bubble free.
3. Replace Oil Vent Plug.

4.1.4 Intake Filter

Figure 4-8 Intake Filter



1. Service Indicator
2. Cover

3. Filter Element
4. Filter Housing

4.1.4.1 Description

(See Figure 4-8). A dry micronic filter is used to filter intake air in breathing air units. Nitrogen compressors use a separate inlet regulation system.

4.1.4.2 Maintenance

The vacuum in the intake filter is monitored by the Service Indicator (1). When the preset vacuum pressure is reached the indicator changes to red and the Filter Element (3) should be replaced as follows.

1. Open clips on Filter Housing (4) and remove Cover (2).
2. Remove the Filter Element (3).
3. Clean the inside of the Filter Housing with a damp cloth. Take care to prevent any dust from entering the intake manifold.
4. Replace the Filter Element (3).
5. Mount the Cover (1) and fasten with the clips.
6. Reset the Service Indicator (1) by pressing the button.

**WARNING**

The rapid de-pressurizing and re-pressurizing of an interstage separator during condensate draining subjects it to metallurgical stresses. To prevent catastrophic failure with the possibility of damage, injury or death the interstage separator must be replaced after 85,000 load cycles. A load cycle equals one de-pressurization- repressurization. The Bauer recommended frequency of condensate draining is every fifteen minutes and is a balance between maximizing the life of the separator chamber and maintaining the quality of the delivered air.

4.1.5 Interstage Separators

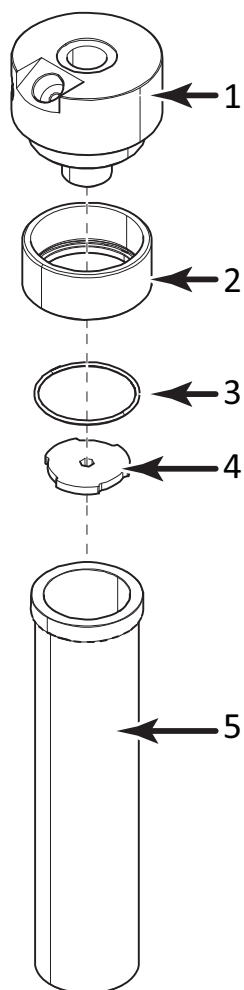
4.1.5.1 Description

Three interstage separators are mounted on the compressor, one after the 2nd stage and another after 3rd stage and the last after the 4th stage. These separators are designed to remove oil and water which accumulates due to the cooling of the air after the compression process. Separation is achieved by means of centrifugal action. In the 2nd stage separator the design of the filter head provides this action. In the 3rd and 4th stage separators the centrifugal action is provided by a vortex plate additionally a sintered metal filter is provided to remove dirt contamination.

4.1.5.2 Maintenance

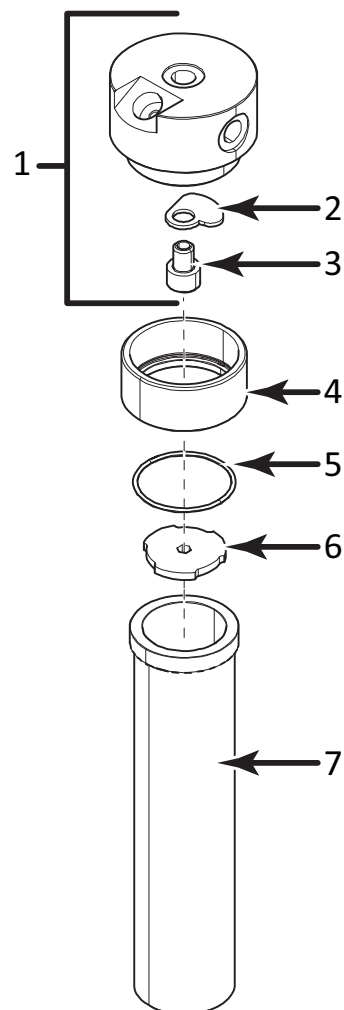
The interstage Separators require no maintenance.

Figure 4-9 2nd Stage Interstage Separator



- | | |
|-------------------|-------------------|
| 1. Separator Head | 4. Center Insert |
| 2. Knurled Nut | 5. Separator Body |
| 3. O-ring | |

Figure 4-10 3rd & 4th Stage Interstage Separator



- | | |
|-------------------|-------------------|
| 1. Separator Head | 5. O-ring |
| 2. Plate | 6. Center Insert |
| 3. Hollow Screw | 7. Separator Body |
| 4. Knurled Nut | |

4.1.6 Compressor Valves and Valve Heads

4.1.6.1 Functional Description

The valve heads of the individual stages form the upper part of the cylinders. The inlet and pressure valves are fitted inside the valve heads.

When the piston moves downwards, the resultant vacuum in the piston cylinder opens the inlet valve. When the piston moves upwards, the inlet valve is closed and the pressure valve opened by the pressure created in the compression process. See Figure 4-12.

The Intake and Pressure Valve of the 1st Stage are combined in a Plate Valve under the Valve Head. See Figure 4-11.

Figure 4-11 1st Stage Valve Function

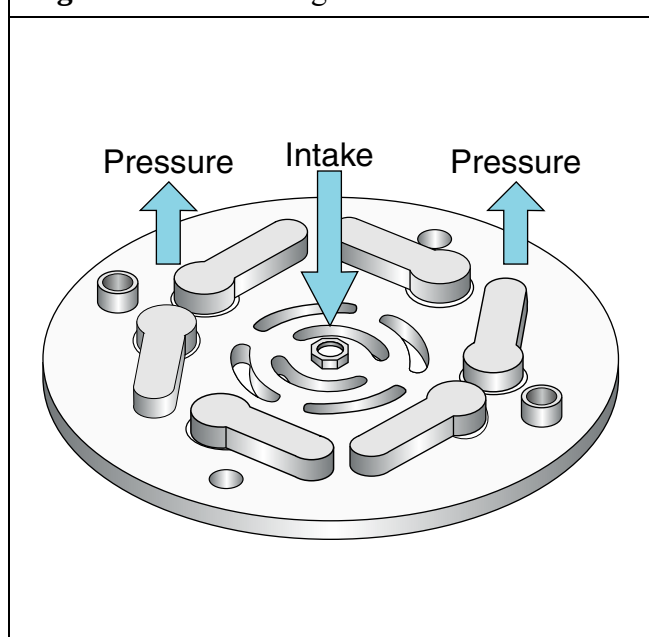
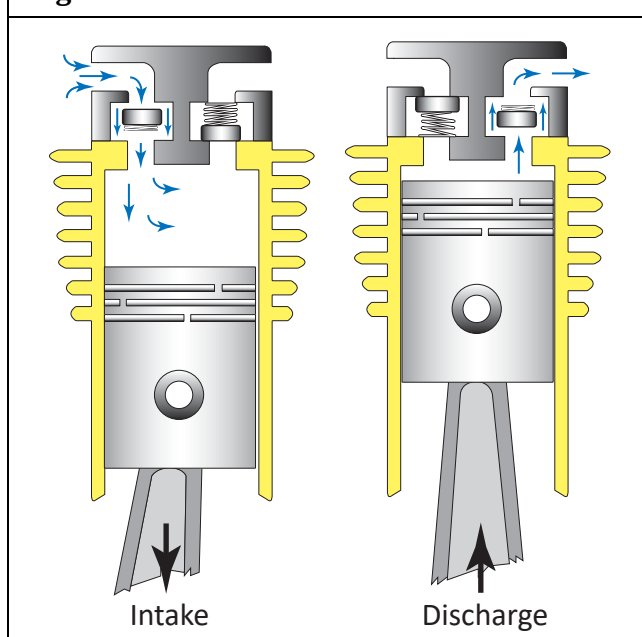


Figure 4-12 Valve Function



4.1.6.2 Initial Operational Check of the Valves

After roughly half an hour of operation, the valves should be checked. The outlet piping should be hot if the valves are operating properly. Note that the inlet line to the valve heads should be warm to the touch.



WARNING

Do not touch the outlet piping with bare hands, use a thermometer.

4.1.6.3 General Instructions for Changing the Valves

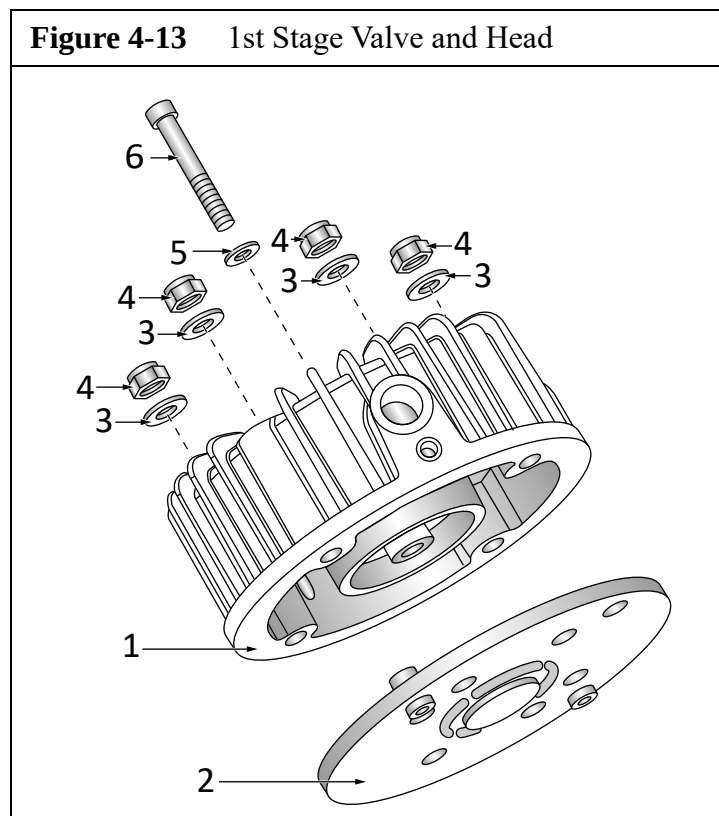
Please observe the following instructions for valve maintenance:

1. Always replace valves as a complete set.
2. Carefully clean dirty valves. Never use a sharp tool for this purpose. Soak the valves in Varsol and clean with a soft brush.

3. Check the individual components for excessive wear. If the valve seat or valve discs are dented, replace the valves.
4. Check the valve space in the valve heads for dirt, and clean if necessary.
5. Use only satisfactory gaskets and O-rings during reassembly.
6. Observe the correct sequence when reassembling.
7. After finishing all maintenance work on the valves, turn the compressor manually using the fly-wheel and check whether all items have been correctly installed.
8. 30 minutes after restarting the compressor, stop the unit, let it cool down to ambient temperature, and re-tighten valve studs and cap nuts. Otherwise the gasket set may cause a leak.
9. Remove and check the valves every 1000 operating hours.
10. Replace the valves every 2000 operating hours to avoid fatigue failure.
11. Use an assembly tool (Bauer P/N: 011365) for all work on valve heads (See Figure 4-18).

4.1.6.4 Changing the 1st Stage Valves.

See Figure 4-13



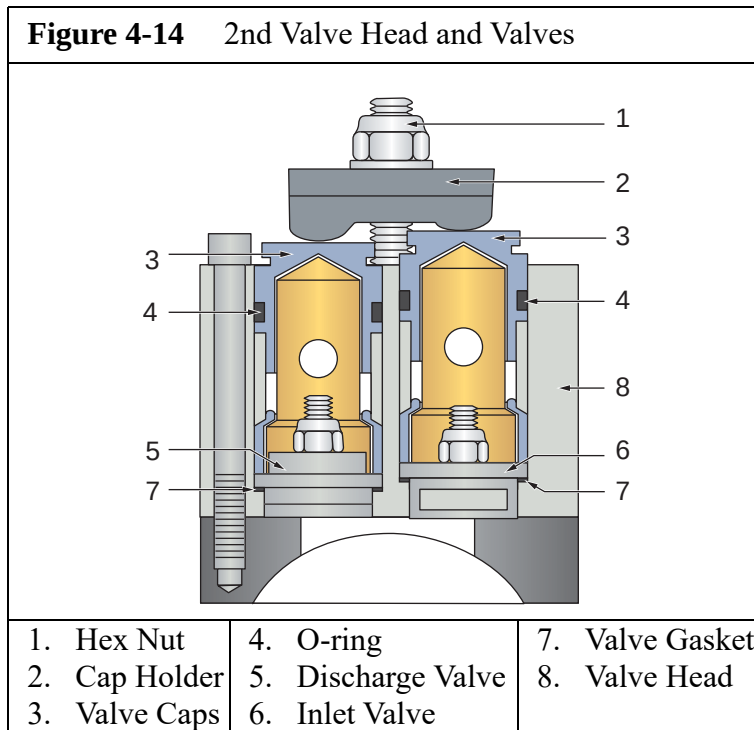
4.1.6.4.1 Removal Procedure.

1. Unscrew and remove cap nuts (4) and washers (3).
2. Remove Valve Head Assembly (1) from studs in cylinder.
3. Remove Valve (2) and unscrew and remove center screw (6) and washer (5).

4.1.6.4.2 Installation Procedure

1. Fasten new Valve (2) with center screw (6) and washer (5).
2. Place assembled Valve Head (1) on studs in the cylinder.
3. Install washers (3) and cap nuts (4) and tighten to the torque value listed in the Appendix.

4.1.6.5 Changing the 2nd Stage Valves



4.1.6.5.1 Removal Procedure

See Figure 4-14

1. Unscrew and remove Hex Nut (1).
2. Remove Cap Holder (2).
3. Insert two screwdrivers into the Extraction Grooves of the Valve Caps (3) and lift out the Valve Caps with O-Rings (5).
4. Check and replace O-Rings if required.
5. Take out Valves (6 & 9).
6. Check the Valve Gaskets (7) and replace if required.

4.1.6.5.2 Installation Procedure

1. Fit valves(6 & 9) with gaskets (7) and replace.
2. Fit valve caps (3) with O-Rings (5) and replace.
3. Replace cap holder (2) in the proper position.



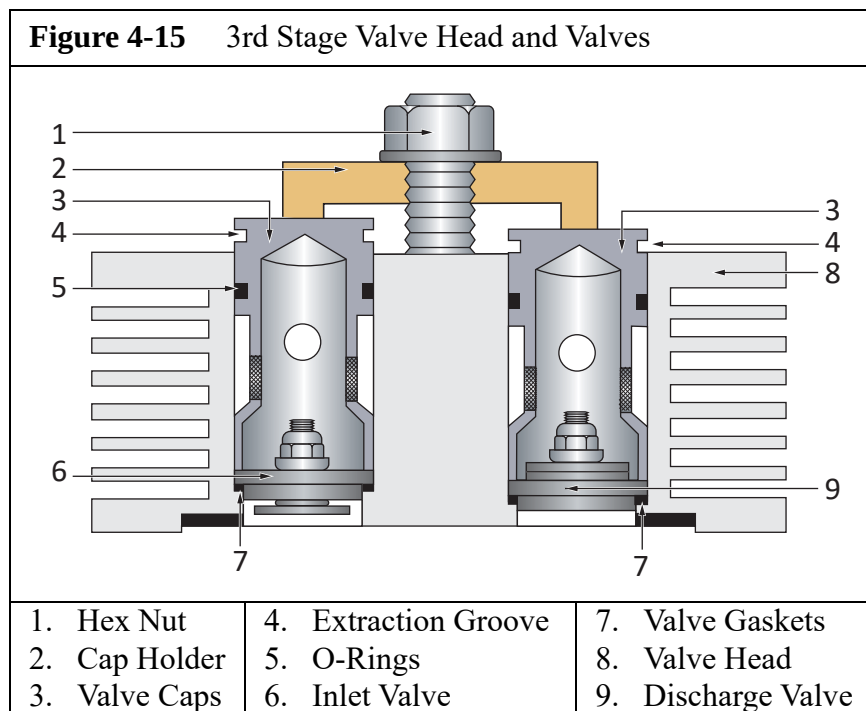
CAUTION

The valve cap for the inlet valve protrudes 0.98 in (2.5 mm) out of the valve head more than the valve cap for the discharge valve. The cap holder is designed accordingly.

4. Screw on hex nut (1) and tighten with a torque wrench to the torque value listed in the Appendix.

4.1.6.6 Changing the 3rd Stage Valves

See Figure 4-14



4.1.6.6.1 Removal Procedure

1. Unscrew and remove hex nut (1).
2. Remove cap holder (2).
3. Insert two screwdrivers into the extraction grooves (4) of the valve caps (3) and lift out the valve caps with O-Rings (5).
4. Check and replace O-Rings if required.
5. Take out valves (6 & 9).
6. Check the valve gaskets (7) and replace if required.

4.1.6.6.2 Installation Procedure

1. Fit valves (6 & 9) with gaskets (7) and replace.
2. Fit valve caps (3) with O-Rings (5) and replace.

3. Replace cap holder (2) in the proper position.



CAUTION

The valve cap for the inlet valve protrudes 0.98 in (2.5 mm) out of the valve head more than the valve cap for the discharge valve. The cap holder is designed accordingly.

4. Screw on hex nut (1) and tighten with a torque wrench to the torque value listed in the Appendix.

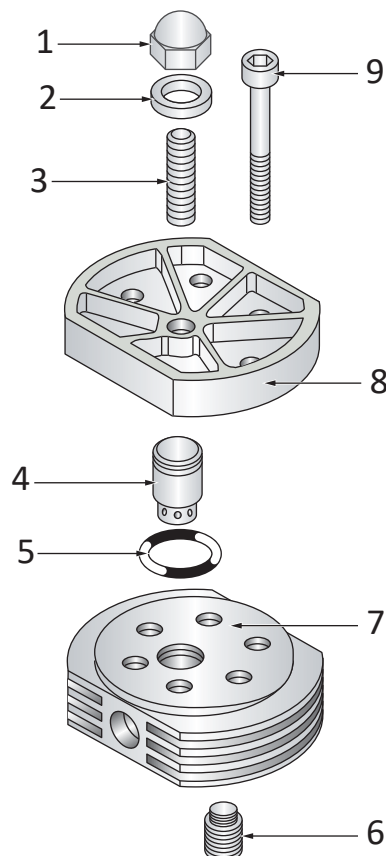
4.1.6.7 Changing the 4th/5th Stage Valves.



CAUTION

Always change the intake and discharge valves of the 4th stage at the same time.

Figure 4-16 4th/5th Stage Valve and Head

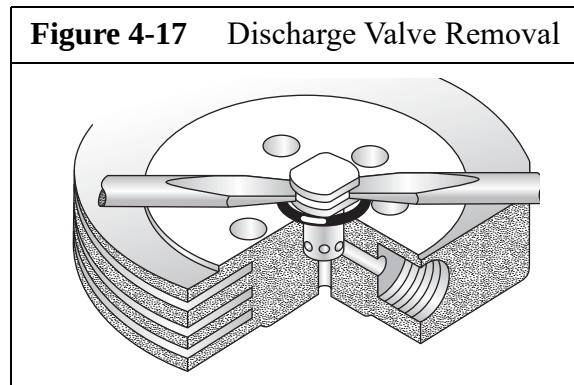


1. Acorn Nut	4. Discharge Valve	7. Valve Head
2. Gasket	5. O-ring	8. Valve Cover
3. Stud	6. Inlet Valve	9. Allen Screw

4.1.6.7.1 Discharge Valve Removal Procedure

See Figure 4-16

1. Remove piping connected to the Valve Head.
2. Remove Acorn Nut (1) and unscrew Stud (3) three or four turns.
3. Remove the Socket Head Screws (9) and remove the Valve Cover (8).
4. Loosen the Discharge Valve (5) first by turning it with a 13 mm wrench on the flat surfaces.
5. Put two screwdrivers into the groove of the Discharge Valve body. See Figure 4-17.
6. Lift out Discharge Valve together with the O-ring (4).

**4.1.6.7.2 Discharge Valve Installation Procedure**

1. Check condition of O-ring (4) and replace if necessary
2. Put O-ring (4) into Valve Head (7).
3. Insert Discharge Valve (5) into Valve Head (7).
4. Put on Valve Cover (8).
5. Screw in Socket Head Screws (9) and tighten with a torque wrench.
6. Tighten Stud (3) and replace Gasket (2).
7. Tighten Acorn Nut (1) with a torque wrench to the value listed in the Appendix.

4.1.6.7.3 Inlet Valve Removal and Installation

Figure 4-18 Assembly Tool

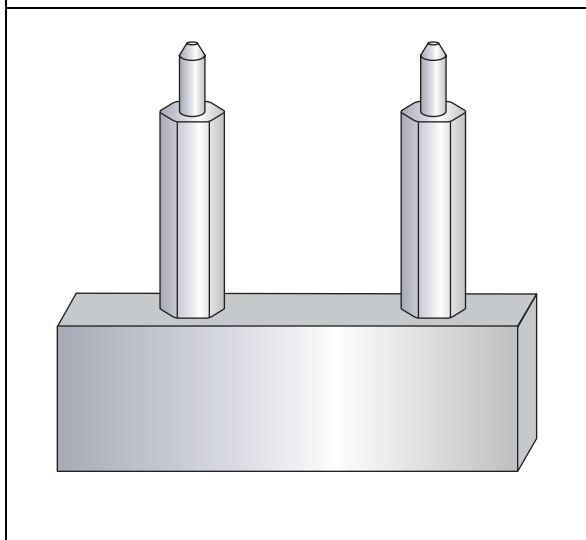
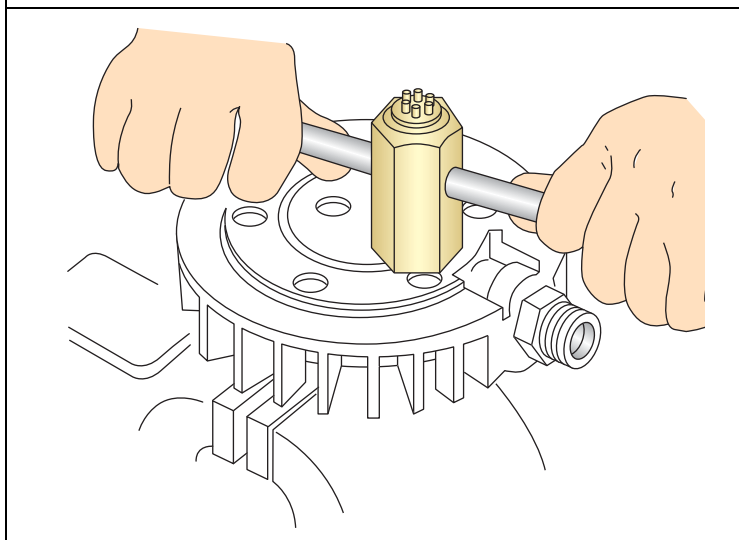


Figure 4-19 Using Special Tool



1. If the assembly tool shown in Figure 4-18 is unavailable, place two 8 mm diameter metal pins of any length in the holes of the Valve Head (7) and secure them in a vise with the Inlet Valve (6) facing up.
2. Unscrew the Inlet Valve (6) from the Valve Head (7) using the special valve tool. See Figure 4-19.



CAUTION

Avoid damaging the special tool or the valve when using the tool, ensure that it is pushed firmly and properly into the sockets in the valve so that it will not tilt when it is turned.

4.1.7 Repair and Troubleshooting

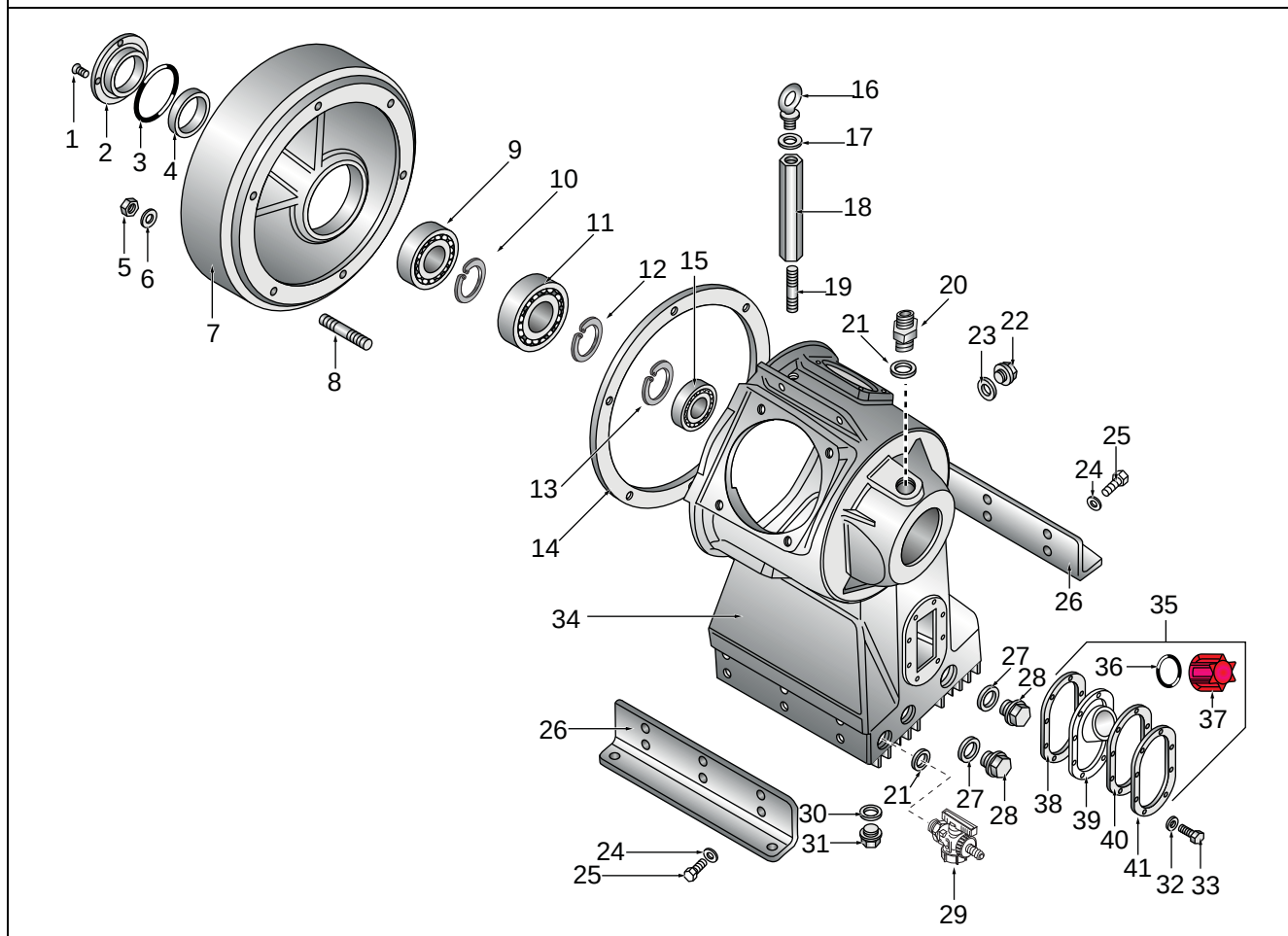
4.1.7.1 Repair

Repair work can be carried out on the compressor block to a certain extent but a certain level of experience and skill is necessary. It should be noted however that no repair should be carried out on the crankshaft nor on the bearings and safety valves are not repaired but always replaced.

4.1.7.2 Troubleshooting

Trouble	Cause	Remedy
No oil pressure	1. Low oil level 2. Air trapped in oil pump. 3. Compressor rotates in the wrong direction	1. Check oil level 2. Vent Oil Pump 3. Reverse two of the three phase leads at the switch box.
Oil foam in crankcase	1. Last stage piston worn 2. Last stage pressure valve defective	1. Operate compressor with final stage valve head removed. If oil flows continuously out of cylinder, replace piston and sleeve. 2. Replace last stage valves.
Compressor output insufficient	1. Condensate drain valves or fittings leaking. 2. Premature opening of final safety valve. 3. Piston rings worn 4. Excessive piston clearance 5. Pipes leaking	1. Tighten and reseal. 2. Clean and adjust final safety valve. 3. Replace 4. Replace 5. Tighten
Safety valves between stages releasing pressure	1. Interstage pressure too high 2. Valves not closing properly	1. Service and clean valves. 2. Service and clean valves.
Compressor running too hot.	1. Insufficient supply of cooling air 2. Intake or outlet valve not closing properly 3. Wrong direction of rotation.	1. Check location for adequate ventilation 2. Check and clean valves, replace as necessary 3. Check arrow on compressor and correct accordingly.
Oil residue in delivered air	1. Improper maintenance of filters, purifier cartridge saturated.	1. Service filters, change purifier cartridge.
Compressor rotates in the wrong direction	Electrical phases not connected properly	Reverse two of the three phase leads at the switch box. Do NOT change the leads at the motor terminal.

4.1.8 Replacement Parts List

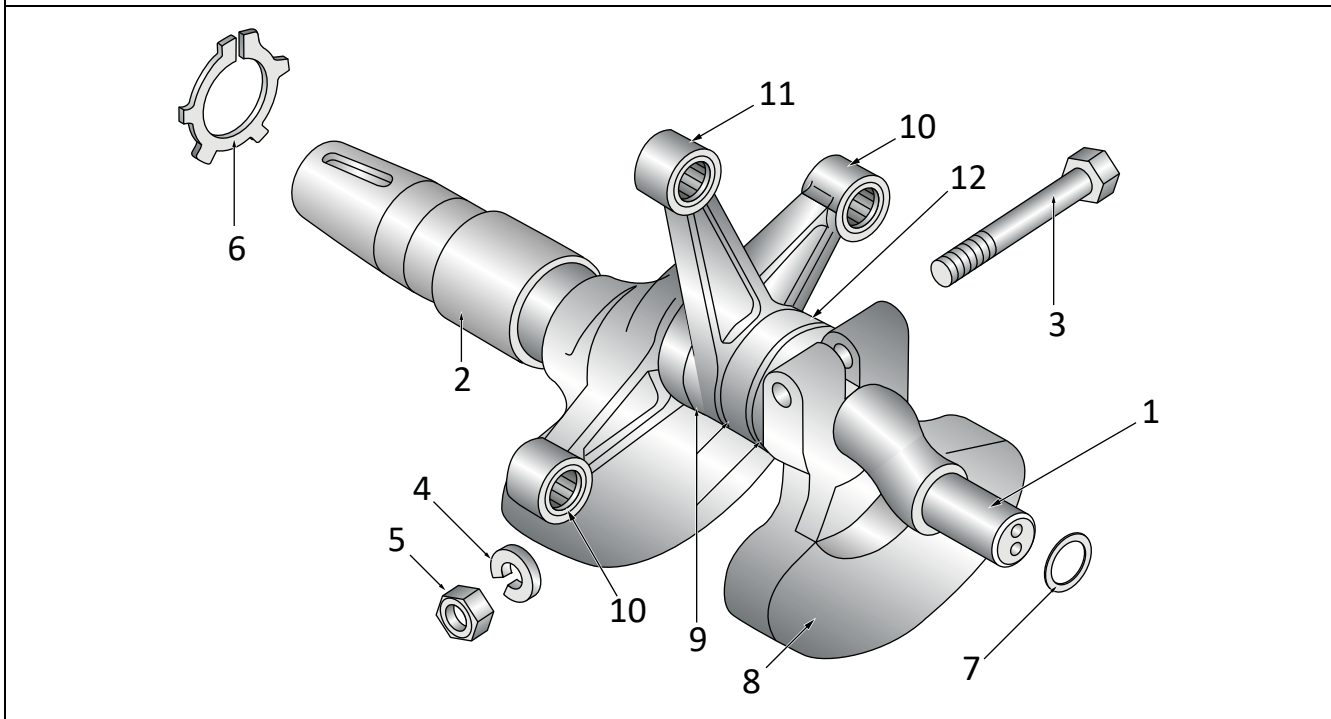
Figure 4-20 Crankcase Assembly


Item	Qty	Part No.	Description	Notes
◆	1	78577	Crankcase Assembly	
1	4	N20649	Screw	
2	1	68586	Cover Plate	
3	1	N15093	O-ring	
4	1	N26281	Shaft Seal	
5	6	N370	Self Locking Hex Nut	
6	6	N58	Washer	
7	1	78897	Bearing Cover	
8	6	N3138	Stud	
9	1	N18303	Roller Bearing	
10	1	N3810	Circlip	
11	1	N18304	Roller Bearing	
12	1	N18432	Circlip	
13	1	N2635	Circlip	

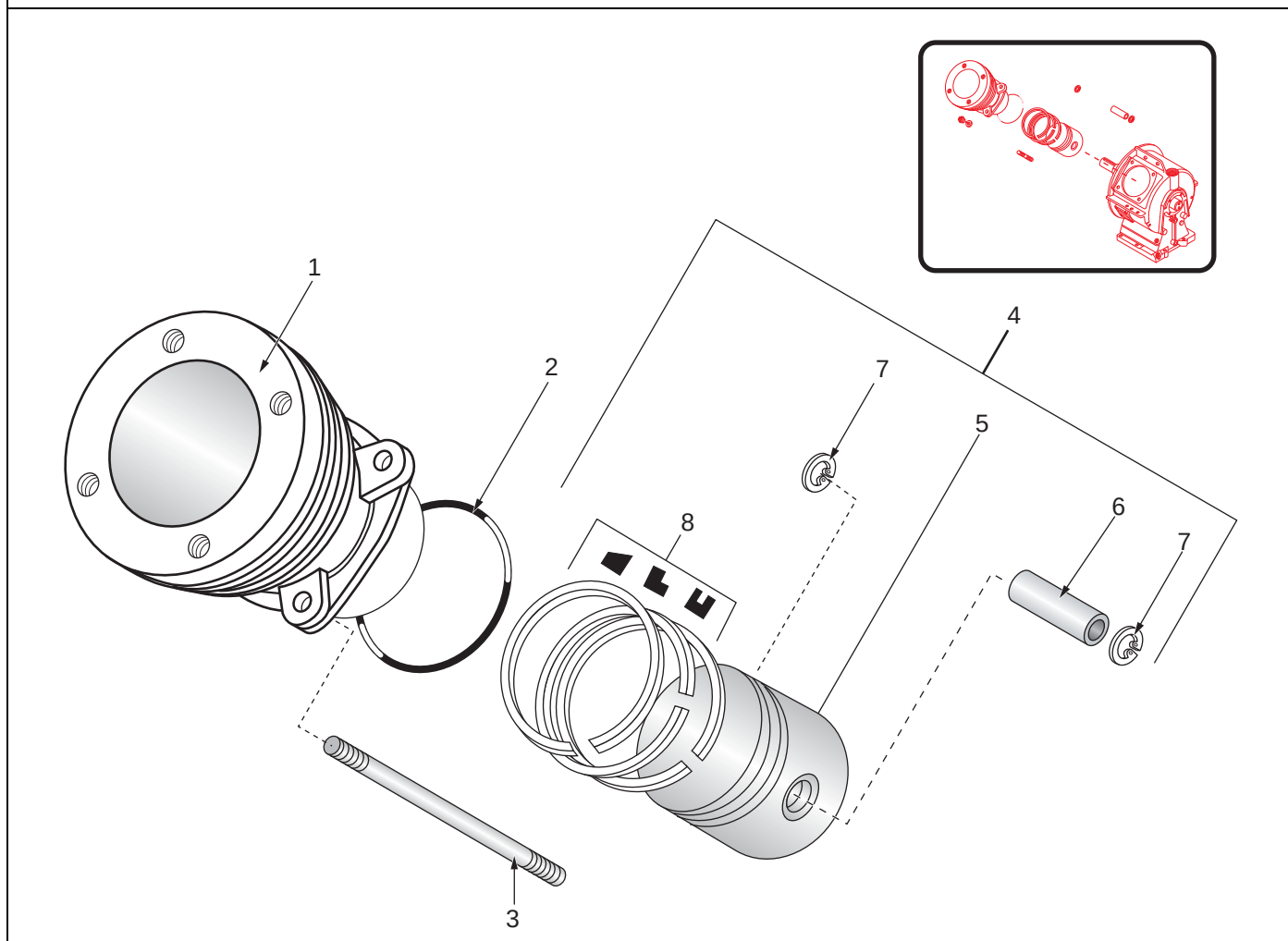
Figure 4-20 (cont.)

Crankcase Assembly

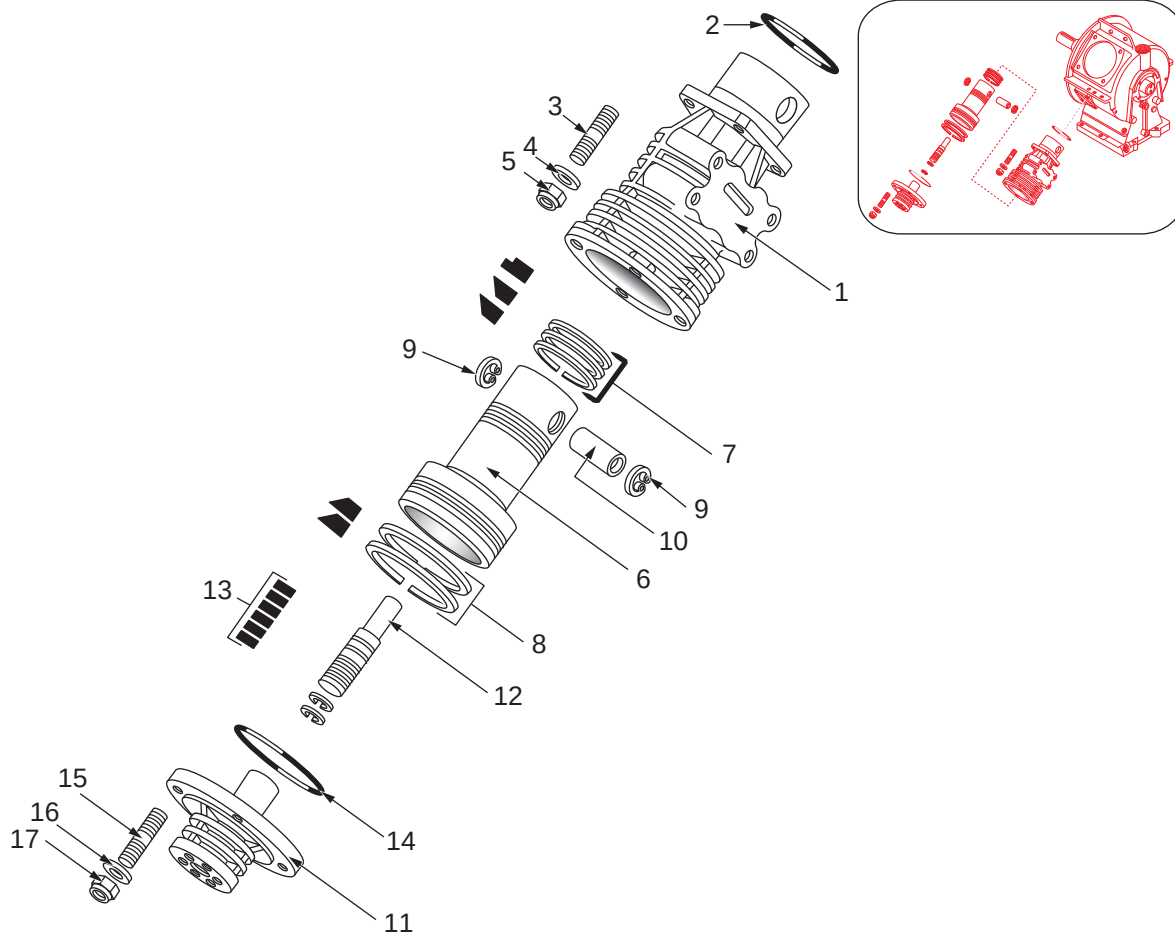
Item	Qty	Part No.	Description	Notes
14	1	3177	Gasket	
15	1	N2638	Roller Bearing	
16	1	N4467	Eye Bolt	
17	1	1492	Washer	
18	1	79225	Hexagonal Spacer	
19	1	N4150	Stud	
20	1	80197	Reducer	
21	2	N293	Gasket	
22	1	N204	Plug	
23	1	N1314	Gasket	
24	12	N16	Washer	
25	12	N312	Hex Head Screw	
26	2	78571	Bracket	
27	2	N4261	Gasket	
28	2	N2796	Plug	
29	1	N25638	Ball Valve	oil drain
30	1	N1316	Gasket	
31	1	N4570	Plug	
32	8	N102	Washer	
33	8	N19497	Hex Screw	
34	1	78578	Crankcase	
35	1	78810	Oil Sight Gauge Assembly	Items 36 - 41
36	1	N15412	O-ring	
37	1	80225	Plug	
38	1	78808	Gasket	
39	1	78569	Oil Fill	
40	1	80647	Steel Plate	
41	1	78570	Steel Plate	

Figure 4-21 Complete Crankshaft Assembly


Item	Qty	Part No.	Description	Notes
◆	1	161929	Crankshaft Assembly	
1	1	78936	Crankshaft	
2	1	68587	Bushing	
3	1	N4366	Dowel Screw	
4	1	N108	Spring Washer	
5	1	N2765	Hex Nut	
6	1	N18310	Circlip	
7	1	N423	Circlip	
8	†	...	Counterweight	Available only with 161929
9	3	4220	Spacers	
10	†	...	Piston Rod Assembly	Available only with 161929
11	†	...	Piston Rod Assembly	Available only with 161929
12	†	...	Piston Rod Assembly	Available only with 161929

Figure 4-22 1st Stage Piston and Cylinder


Item	Qty	Part No.	Description	Notes
◆	1	79420	1st Stage Piston and Cylinder Assembly	
1	1	79017	Cylinder	
2	1	N2621	O-ring	
3	4	N26036	Stud	
4	1	79720	Piston Assembly	#5 - 8
5	1	79719	Piston	130 mm
6	1	N2930	Piston Pin	
7	2	N484	Circlip	
8	1	N2963	Piston Ring Set	

Figure 4-23 2nd & 4th Stage Piston and Cylinder


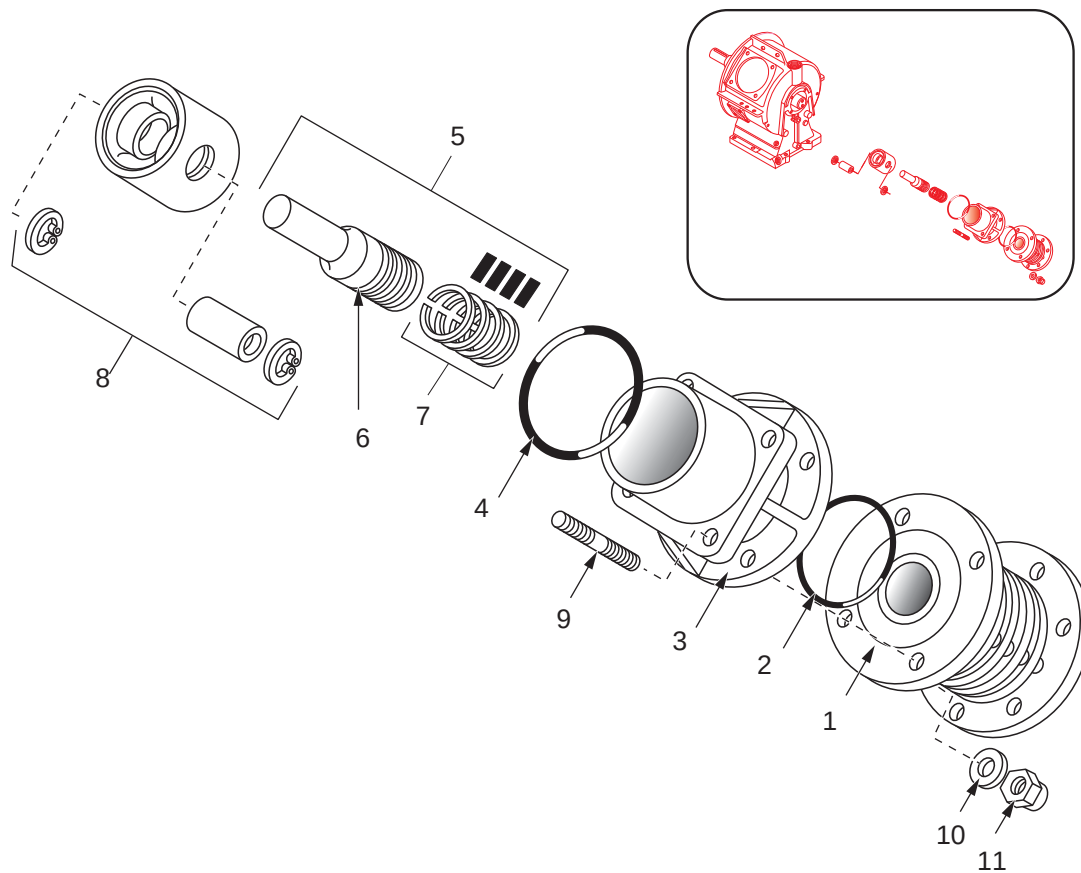
Item	Qty	Part No.	Description	Notes
◆	1	127813	2nd Stage Cylinder Assembly	Items 1 - 10
1	1	127812	Cylinder	
2	1	N3731	O-ring	
3	4	N215	Stud	
4	4	N58	Washer	
5	4	N370	Self Locking Hex Nut	
◆	1	127779	Stepped Piston Assembly	Items 6 - 10
6	1	127778	Stepped Piston	88/66 mm
7	1	N3162	Piston Ring Set	
8	1	N34414	Piston Ring Set	
9	2	N1665	Circlip	
10	1	N15409	Piston Pin	
◆	1	161335	4th Stage Cylinder Assembly	Items 11 - 17
11	1	161316	Cylinder	
◆	1	078338	4th Stage Piston Assembly	Items 12 & 13

Figure 4-23 (cont.)

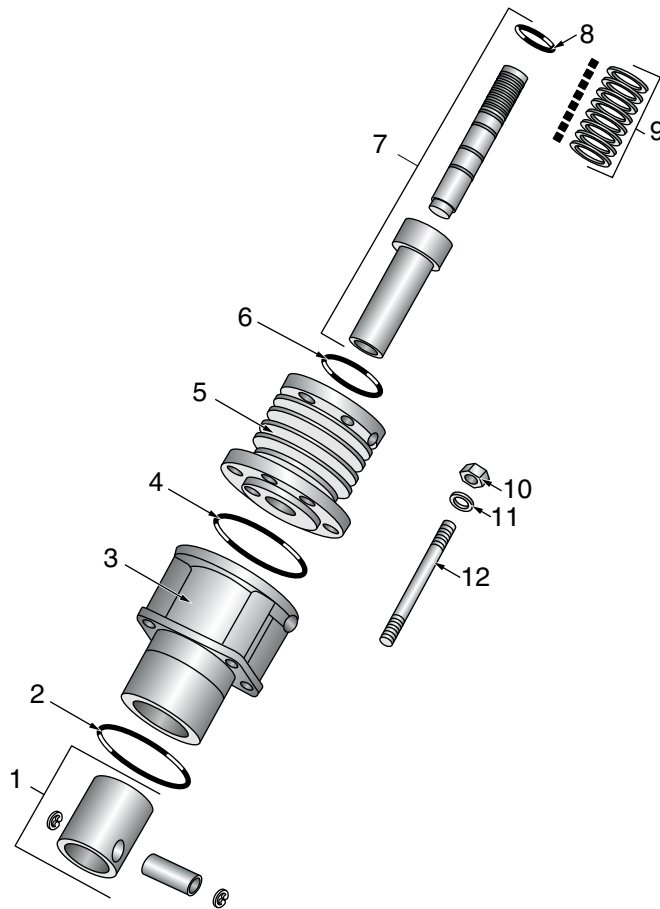
2nd and 4th Stage Piston and Cylinder

Item	Qty	Part No.	Description	Notes
12	1	78337	Piston	
13	1	N35556	Piston Ring Set	
14	1	N29082	O-ring	
15	4	N215	Stud	
16	4	N58	Washer	
17	4	N370	Self Locking Hex Nut	

Figure 4-24 3rd Stage Piston and Cylinder

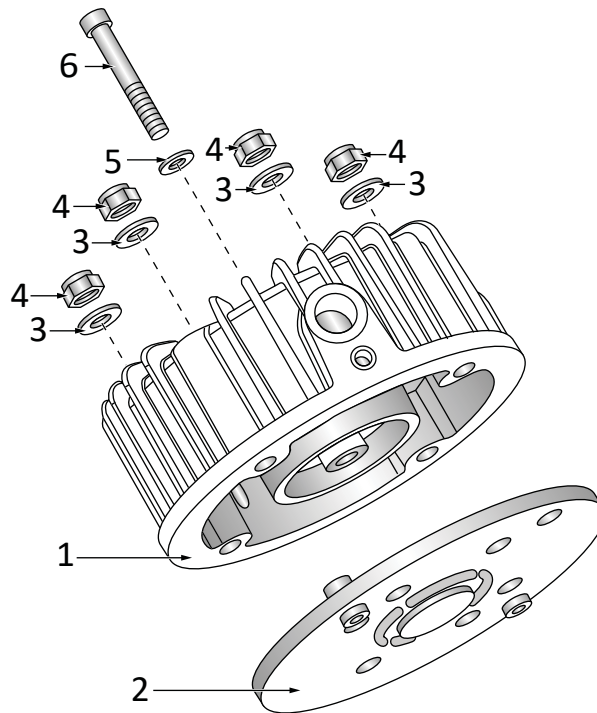


Item	Qty	Part No.	Description	Notes
◆	1	068595	3rd Stage Piston and Cylinder Assembly	
1	1	67061	Cylinder	
2	1	N7063	O-ring	
3	1	82295	Guide Cylinder	
4	1	N3731	O-ring	
5	1	070013	Piston Assembly	Items 6 and 7
6	1	N4378	Piston	
7	1	N16313	Piston Ring Set	
8	1	070070	Guide Piston Assembly	
9	4	N17462	Stud	
10	4	N58	Washer	
11	4	N370	Self Locking Hex Nut	

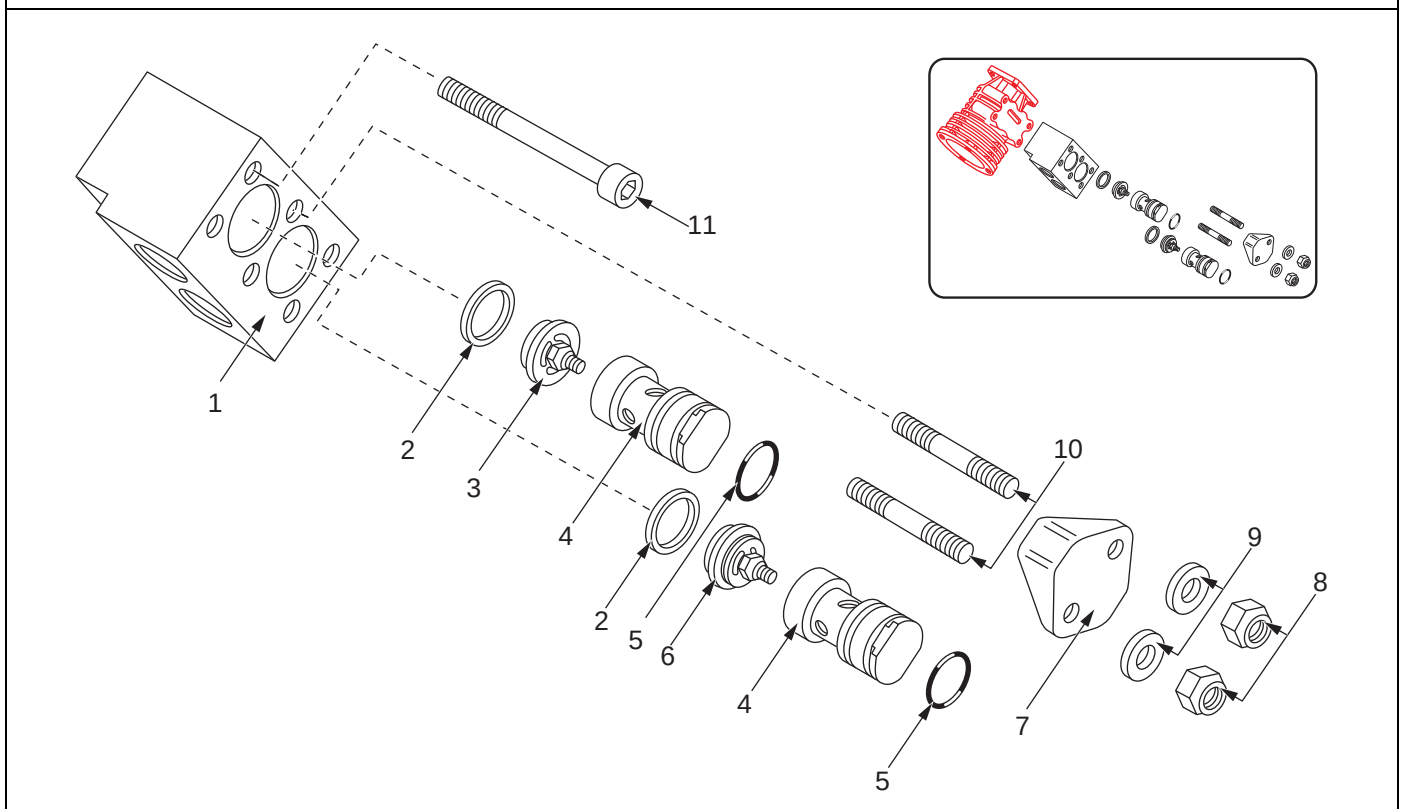
Figure 4-25 5th Stage Cylinder and Piston

Item	Qty	Part No.	Description	Notes
◆	1	161926	5th Stage Piston & Cylinder Assembly	
1	1	070070	Guide Piston Assembly	
2	1	N3731	O-ring	
3	1	82295	Guide Cylinder	
4	1	N7063	O-ring	
5	1	82480	Cylinder	
6	1	N4868	O-ring	
7	1	79185	Piston And Sleeve Assembly	Items 8 & 9
8	1	N23755	O-ring	
9	1	N26412	Piston Ring Set	
10	4	N370	Self Locking Hex Nut	
11	4	N58	Washer	
12	4	N17462	Stud	

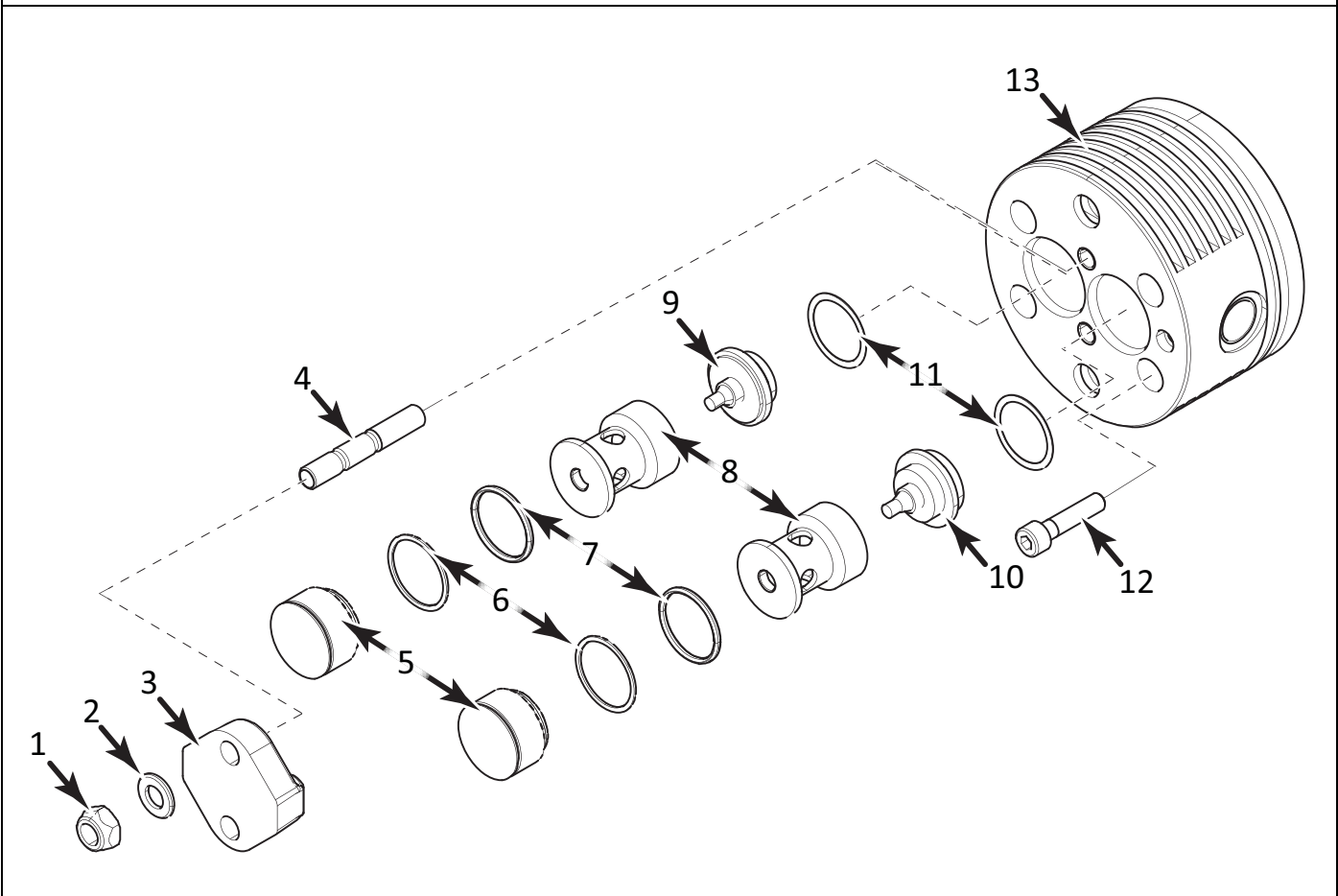
Figure 4-26 1st Stage Valve Head



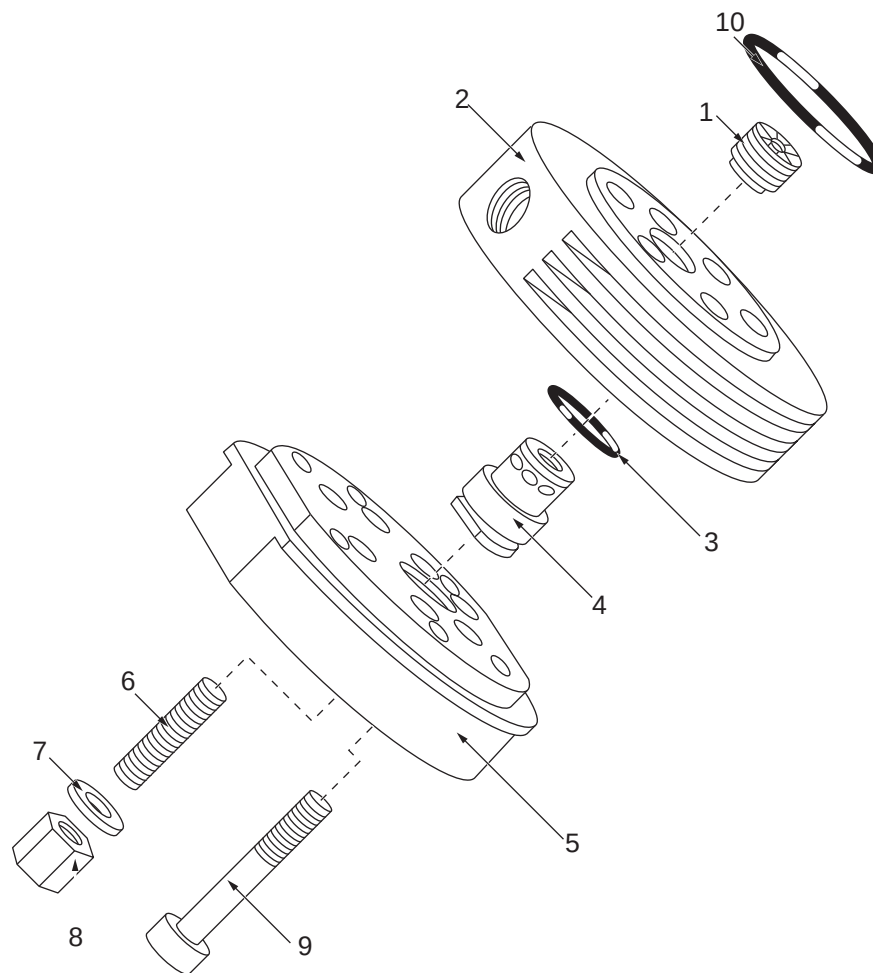
Item	Qty	Part No.	Description	Notes
◆	1	79680	1st Stage Valve Head Assembly	
1	†	...	1st Stage Valve Head	
2	1	N26029	Plate Valve	
3	4	N16	Washer	
4	4	N644	Self Locking Hex Nut	
5	1	N58	Washer	
6	1	N150	Allen Screw	

Figure 4-27 2nd Stage Valve Head

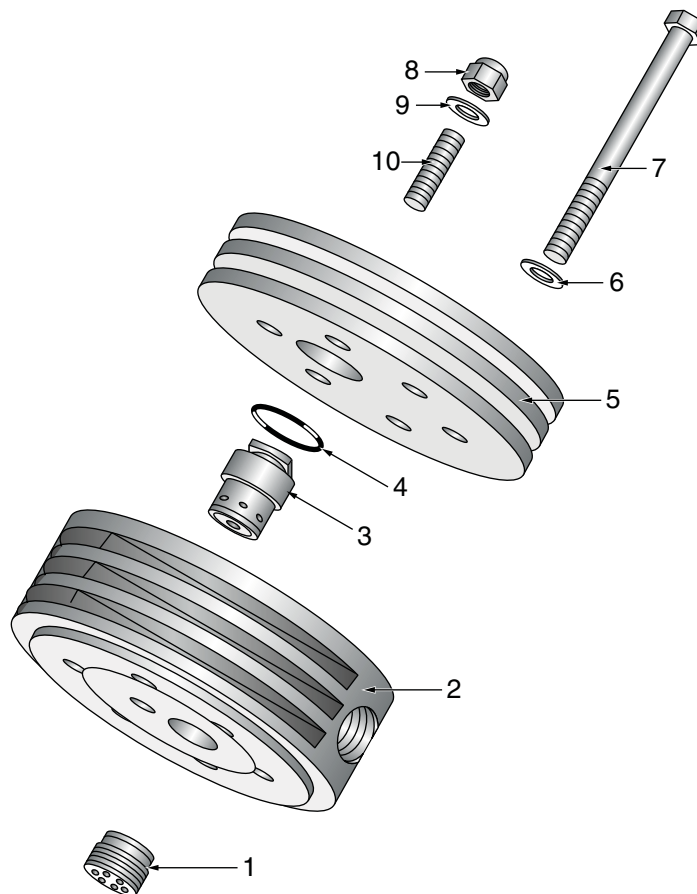
Item	Qty	Part No.	Description	Notes
◆	1	068601	2nd Stage Valve Head Assembly	
1	1	68491	Valve Head	
2	2	56668	Gasket	
3	1	N45336	Intake Valve	
4	2	56183	Valve Cap	
5	2	N3997	O-ring	
6	1	N45357	Pressure Valve	
7	1	62924	Press Pad	
8	2	N3474	Self Locking Hex Nut	
9	2	N16	Washer	
10	2	N4190	Stud	
11	4	N354	Allen Screw	

Figure 4-28 3rd Stage Valve Head


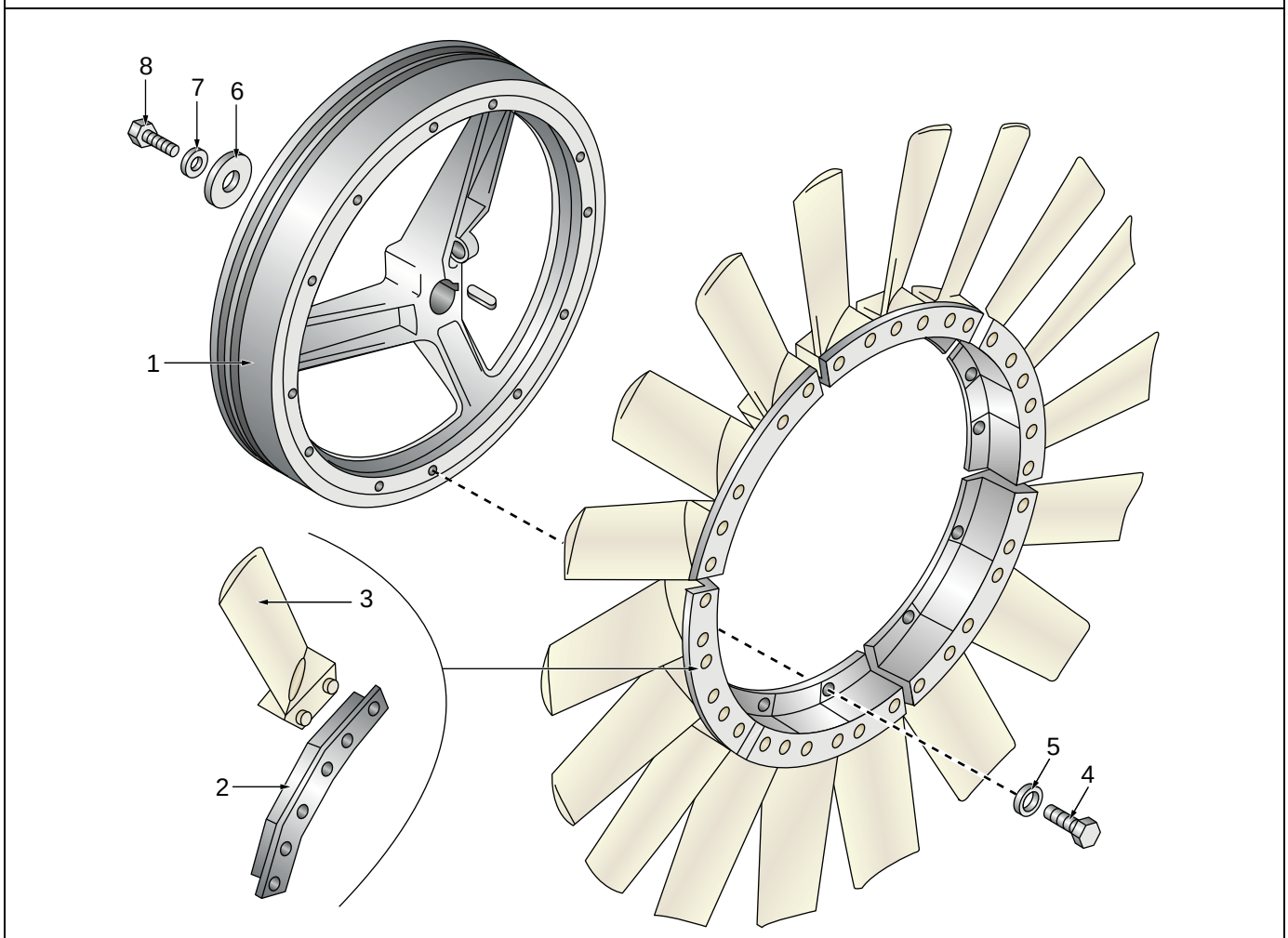
Item	Qty	Part No.	Description	Notes
◆	1	068602	3rd Stage Valve Head Assembly	
1	2	N3474	Self Locking Hex Nut	
2	2	N16	Washer	
3	1	62924	Pressure Pad	
4	2	N4190	Stud	
5	2	127366	Valve Cap Upper	
6	2	N34134	O-ring	
7	2	N34135	Back-up Ring	
8	2	56183	Valve Cap Lower	
9	1	N45323	Intake Valve	
10	1	N45340	Pressure Valve	
11	2	56668	Gasket	
12	1	60583	Valve Head	
13	6	N503	Allen Screw	

Figure 4-29 4th Stage Valve Head


Item	Qty	Part No.	Description	Notes
♦	1	071621	4th Stage Valve Head Assembly	Items 1-10
♦	1	073629	Valve Head Assembly	Items 1-8
1	1	07790	Intake Valve	
2	1	65191	Valve Head	
3	1	N2789	O-ring	
4	1	014121	Pressure Valve	
5	1	14118	Valve Head Cover	
6	1	71065	Stud	
7	1	N3625	Gasket	
8	1	N3623	Nut	
9	6	N19554	Allen Screw	
10	1	N3860	O-ring	

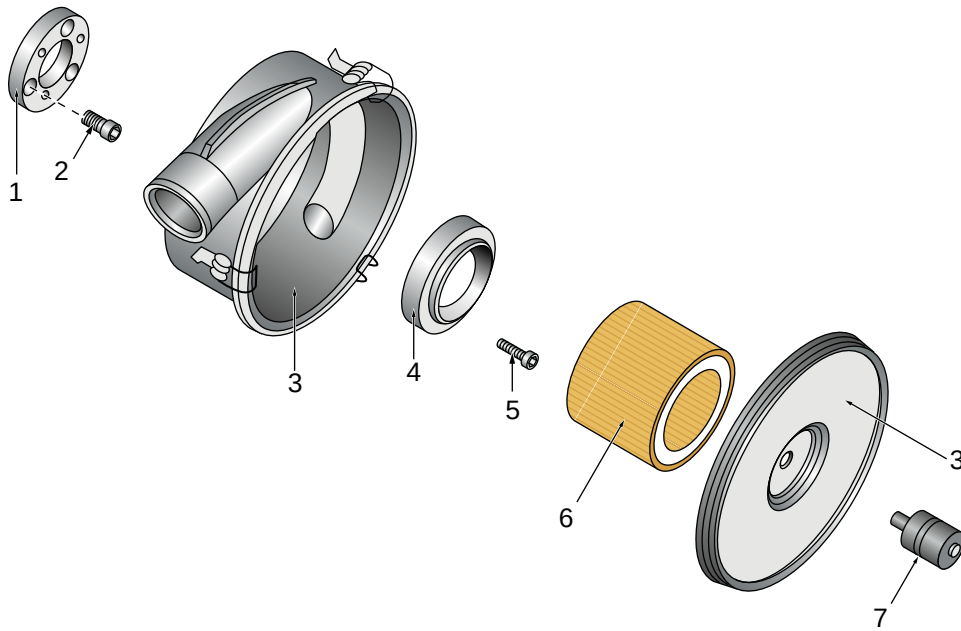
Figure 4-30 5th Stage Valve Head


Item	Qty	Part No.	Description	Notes
♦	1	082096	5th Stage Valve Head Assembly	
1	1	187287	Intake Valve	air & nitrogen units
or	1	184660	Intake Valve	helium units
2	1	082087	Valve Head	
3	1	014121	Discharge Valve	Includes Item 4
4	1	N2789	O-ring	
5	1	082086	Valve Head Cover	
6	6	N58	Washer	
7	6	N17730	Hex Head Bolt	
8	1	88609	Acorn Nut	
9	1	N3625	Gasket	
10	1	N124608	Stud	

Figure 4-31 Flywheel Drive Assembly


Item	Qty	Part No.	Description	Notes
◆	1	161475	Flywheel Drive Assembly	Banded
1	1	129360-RA	L9010V-belt Pulley	
2	6	128837	Fan Blade Support	
3	18	79239	Blade, Fan CCW	
4	36	N19508	Hex Head Screw	M6 x 16
5	36	WAS-0029	Washer, Split Lock	6 mm
6	1	68646	Washer	
7	1	WAS-0002	Washer, Split Lock	
8	1	N19523	Hex Head Cap Screw	

Figure 4-32 Intake Filter Assembly



Item	Qty	Part No.	Description	Notes
◆	1	079706	Intake Filter Assembly	
1	1	79679	Manifold, Air Intake	
2	3	N171	Socket Head Cap Screw	
3	1	88797	Housing, Intake Filter	
4	1	79464	Flange	
5	3	N19535	Allen Screw	
6	1	N25886	Element, Intake Filter	
7	1	N2221	Indicator, Maintenance	

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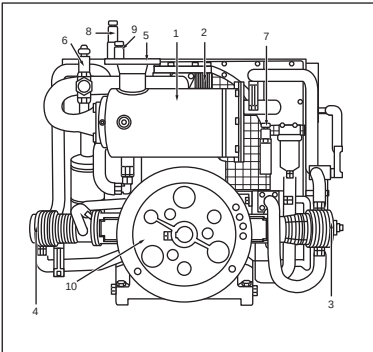
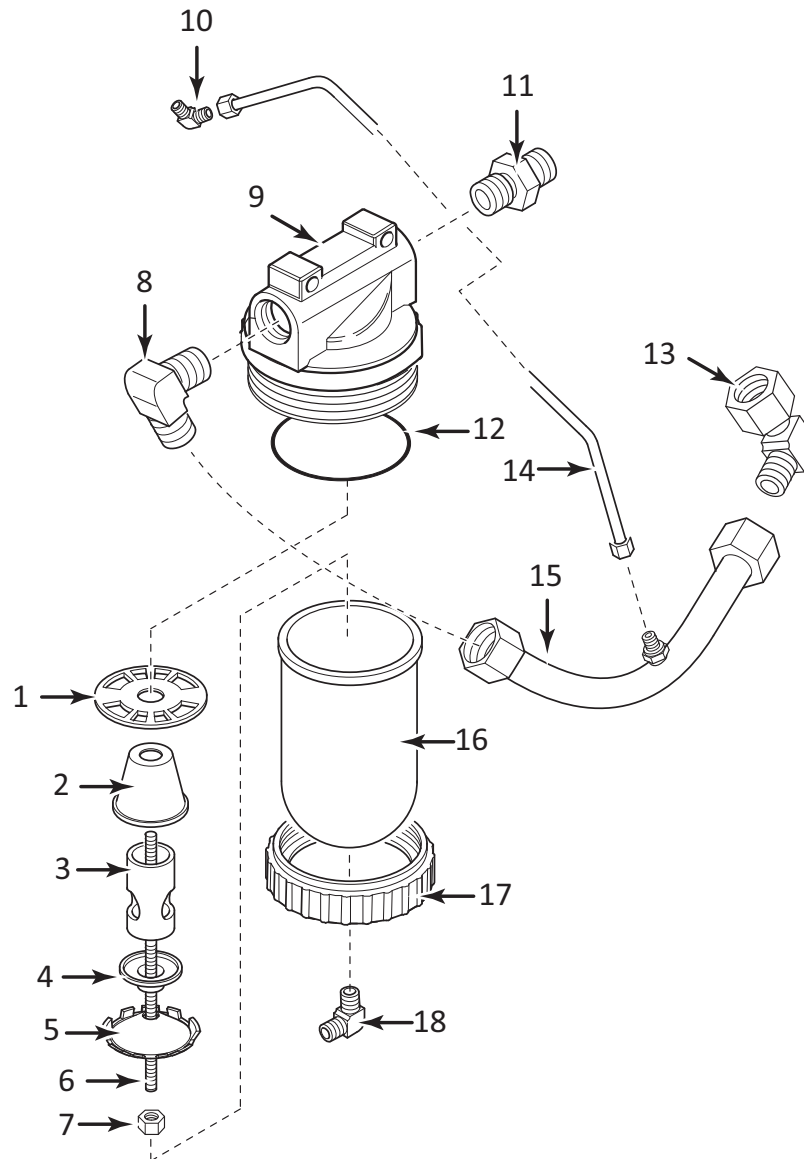


Figure 4-33 1st Stage Interfilter (Optional)

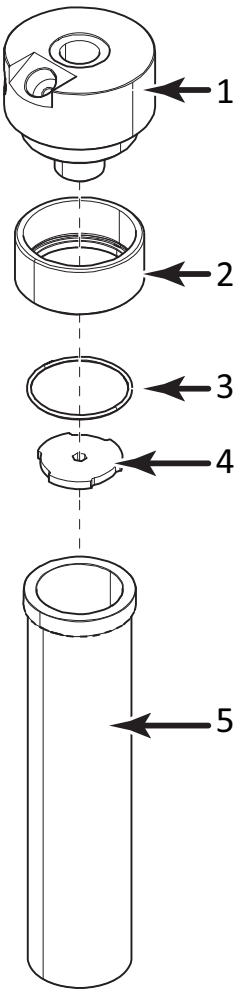


Item	Qty	Part No.	Description	Notes
◆	1	160918	1st Stage Interfilter Assembly	
1	1	N2484	Distributing Plate	
2	1	N2483	Baffle Funnel	
3	1	61751	Tube	
4	1	N2480	Baffle Plate	
5	1	N2479	Baffle Washer	
6	1	N3677	Stud	
7	1	N1042	Hex Nut, Self Locking	
8	1	N20304	Screwed Socket, Elbow	

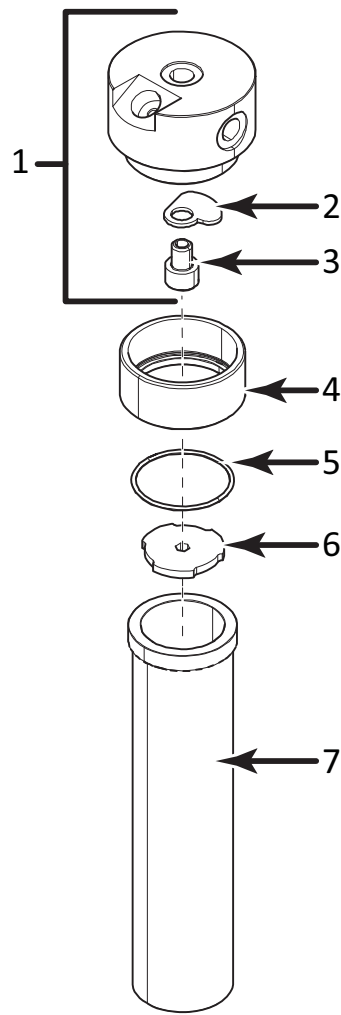
Figure 4-33 (cont.)1st Stage Interfilter (*Optional*)

Item	Qty	Part No.	Description	Notes
9	1	80261	Interfilter	includes #1-7, 12, 16 & 17
10	1	N20058	Screwed Socket, Elbow	
11	1	N20075	Straight Male Socket	
12	1	N19122	O-ring	
13	1	N20485	Adjustable Screwed Socket	
14	1	83505	Connecting Tube Assembly	
15	1	83503	Connecting Tube Assembly	
16	1	N22966	Separator	
17	1	N3511	Screw Cap	
18	1	N20207	Screwed Socket, Elbow	

Figure 4-34 2nd Stage Interstage Separator

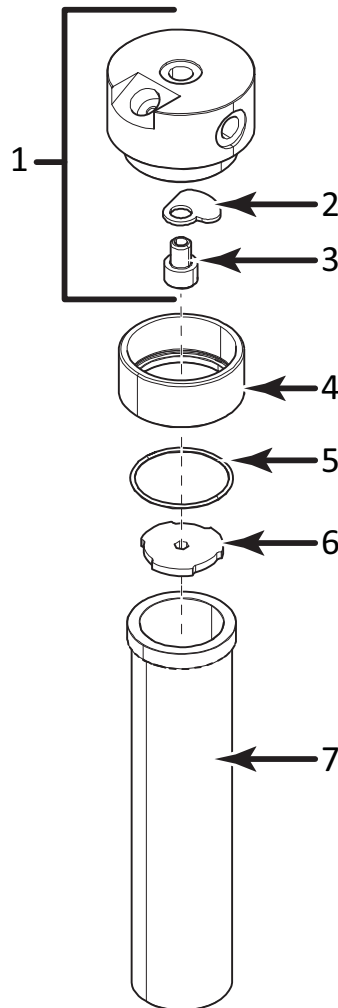


Item	Qty	Part No.	Description	Notes
♦	1	172775	2nd Stage Interstage Separator	
1	...	1 060601	Filter Head	
2	...	1 13937	Collar, Threaded Knurled	
3	...	1 N3556	O-ring	
4	...	1 161781	Insert	
5	...	1 —	Filter Housing	
NS	...	1 81810	Safety Valve	24 bar

Figure 4-35 3rd Stage Interstage Separator


Item	Qty	Part No.	Description	Notes
◆	1	172778	3rd Stage interstage Separator	
1	...	1	81150	Separator Head Assembly
2	...	1	81148	Plate
3	...	1	81643	Hollow Screw
4	...	1	13937	Knurled Ring
5	a..	1	N3556	O-ring
6	...	1	161781	Inset Assembly
7	...	1	—	Separator Housing
NS	...	1	12886	Safety Valve
				80 bar

Figure 4-36 4th Stage Interstage Separator



Item	Qty	Part No.	Description	Notes
◆	1	172781	3rd Stage interstage Separator	
1	...	1	81776	Separator Head Assembly
2	...	1	81148	Plate
3	...	1	81643	Hollow Screw
4	...	1	69173	Knurled Ring
5	a..	1	N3556	O-ring
6	...	1	166062	Inset Assembly
7	...	1	—	Separator Housing
NS	...	1	65410-180	Safety Valve
				180 bar

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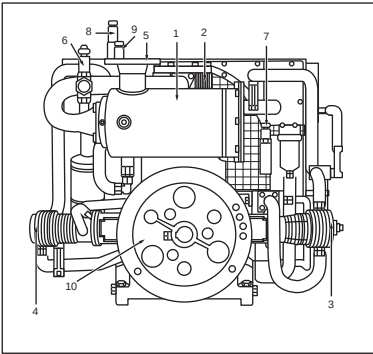
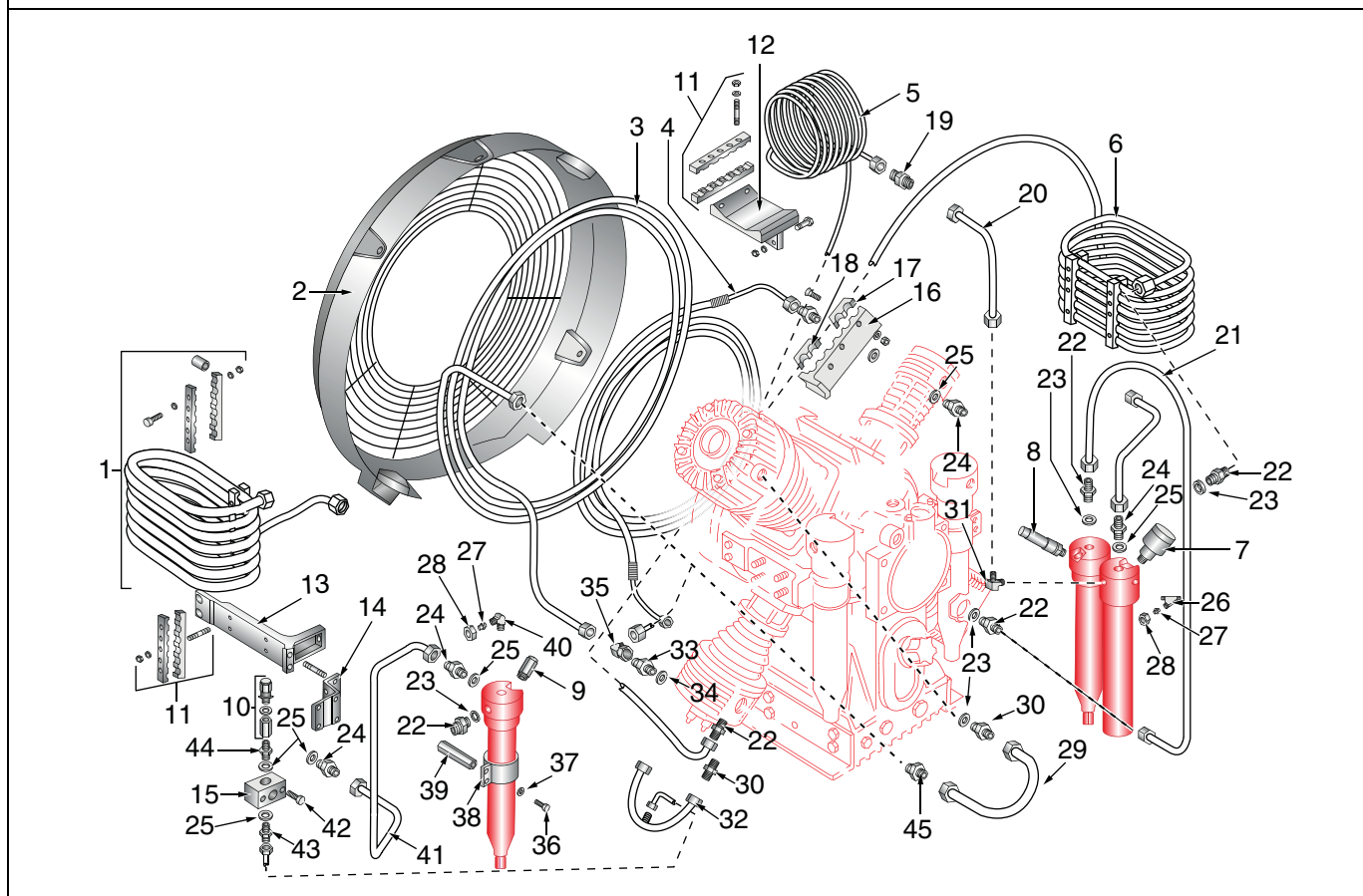


Figure 4-37 Cooling System Assembly


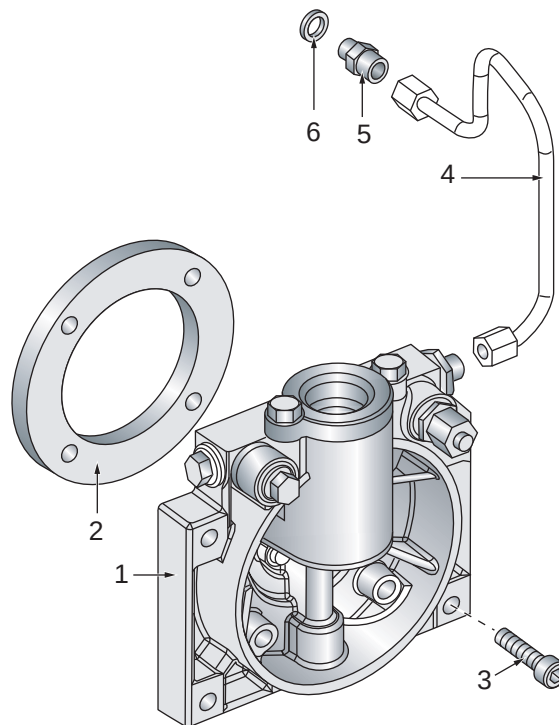
Item	Qty	Part No.	Description	Notes
◆	1	79916	Cooling System Assembly	
1	1	79961	3rd Stage Intercooler	
2	1	060709	Fan Screen	
3	1	79967	1st stage Intercooler	
4	1	79936	Aftercooler	
5	1	79963	4th Stage Intercooler	
6	1	79957	2nd Stage Intercooler	
7	1	065410-180	Safety Valve, 4th Stage	180 bar
8	1	081810	Safety Valve, 2nd Stage	24 bar
9	1	012886	Safety Valve, 3rd Stage	80 bar
10	1	083274	Safety Valve, 1st Stage	9.9 bar
11	4	...	Bracket Assembly	each consisting of:
—	2	62773	Bracket	
—	2	N3494	Stud	
—	2	N102	Washer	
—	2	N1042	Self Locking Hex Nut	
12	1	68889	Bracket	

Figure 4-37 (cont.)

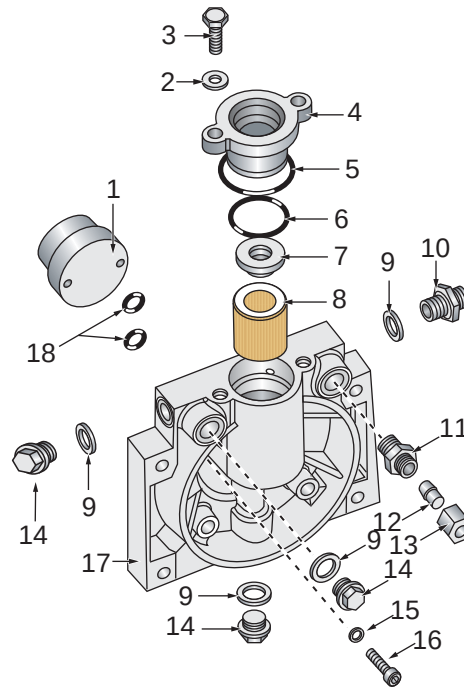
Cooling System Assembly

Item	Qty	Part No.	Description	Notes
13	2	60751	Mounting	
14	1	60716	Mounting	
15	1	60717	Support	
16	4	79637	Bracket	
17	3	71195-M	Clamp	
18	9	60694-M	Clamp	
19	1	N20310	Connector	
20	1	81240	Connecting Tube	
21	1	070079	Connecting Tube	
22	5	N20231	Straight Male Coupling	
23	5	N293	Gasket	
24	4	N20059	Fitting	
25	6	N1316	Gasket	
26	1	N20008	Tee Coupling	
27	2	N4530	Plug	
28	2	N7430	Screw Cap	
29	1	79919	Connecting Tube	
30	1	N20060	Connector	
31	1	N22719	Elbow	
32	1	070043	Connecting Tube	
33	1	71598	Connector	
34	1	56983	Gasket	
35	1	N20200	Elbow	
36	4	N171	Allen Screw	
37	8	N58	Washer	
38	3	57070	Tube Clamp	
39	4	69046	Hex Stud	
40	1	N20003	Elbow	
41	1	070080	Connecting Tube	
42	2	N724	Allen Screw	
43	1	N20014	Connector	
44	1	N20201	Connector	
45	1	N20312	Straight Male Connector	

Figure 4-38 Lubricating System Assembly

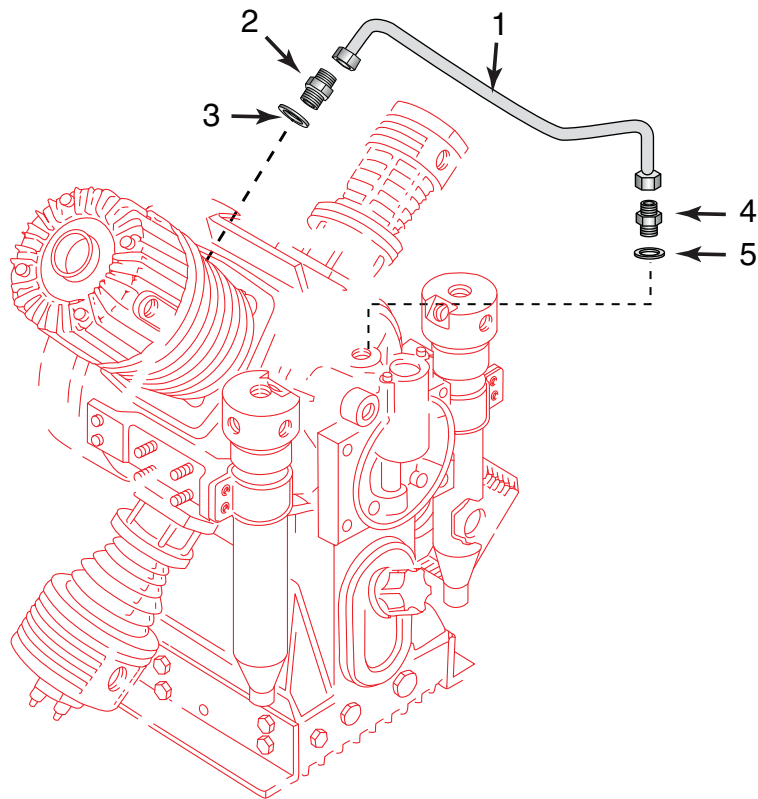


Item	Qty	Part No.	Description	Notes
◆	1	84381	Lubricating System Assembly	
1	1	080345	Lubricating System	See next Figure
2	1	78421	Gasket	
3	4	N123	Socket Head Screw	
4	1	84382	Connecting Tube Assembly	
5	1	N20002	Connector	
6	1	N4501	Gasket	

Figure 4-39 Lubricating System


Item	Qty	Part No.	Description	Notes
♦	1	080345	Lubricating System	
1	1	N24585	Gear Pump	
2	2	N58	Washer	
3	2	N19506	Hex Head Screw	
4	1	77885	Oil Filter Cover	
5	1	N04058	O-ring	
6	1	N25327	O-ring	
7	1	77774	Rubber Gasket	
8	1	N25326	Filter Element	
9	4	N1316	Gasket	
10	1	81050	Regulating Valve	
11	1	N20065	Straight Male Connector	
12	1	N16309	Plug	
13	1	N1049	Screw Cap	
14	3	N52	Plug	
15	2	N2889	Gasket	
16	2	N634	Socket Head Screw	
17	1	077878	Oil Pump Case	
18	2	N3489	O-ring	

Figure 4-40 Crankcase Venting



Item	Qty	Part No.	Description	Notes
◆	1	128426-KD	Crankcase Vent Assembly	
1	1	078918	Connecting Tube Assembly	
2	1	N20188	Male Connector	
3	1	N842	Gasket	
4	1	N20014	Male Connector	
5	1	N1316	Gasket	

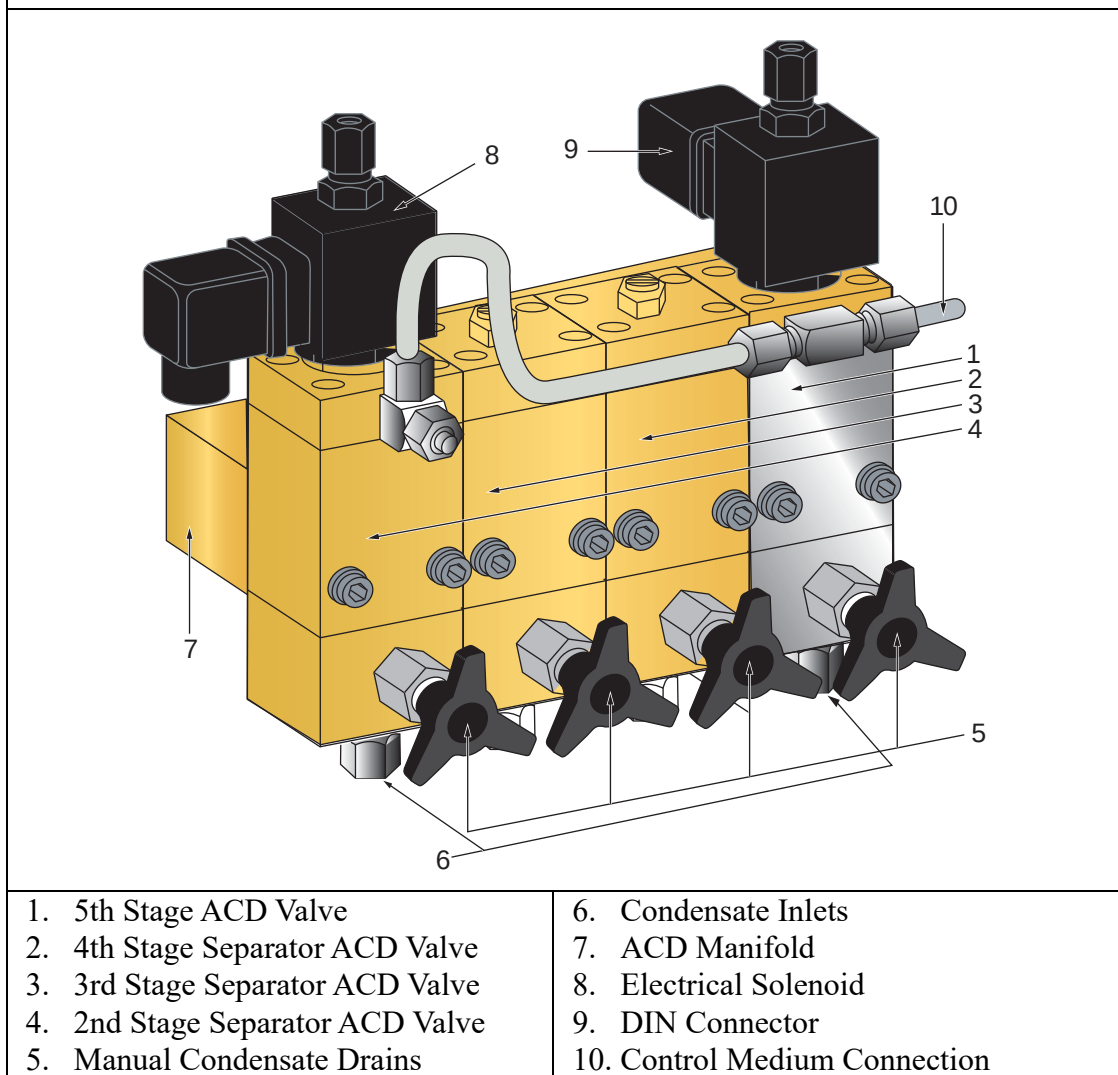
4.2 Five Stage Automatic Condensate Drain System

4.2.1 Purpose

This automatic condensate drain system drains the intermediate separators after the 2nd, 3rd, and 4th stages and the oil and water separator after the 5th stage every fifteen minutes during operation.

In addition the automatic condensate drain is designed to drain these filters after shutdown of the compressor unit, and to unload the compressor during the starting phase.

Figure 4-41 5 Stage Automatic Condensate Drain System



4.2.2 Description

The automatic condensate drain system (See Figure 4-41) operates electropneumatically and is comprised of the following main items:

1. Four pneumatically operated ACD valves, one for each of the intermediate separators after the 2nd, 3rd, and 4th stages, and one for the oil and water separator after the 5th stage. The ACD valves for the intermediate separators after the 2nd, 3rd and 4th stages are of the normally open type, the other one is normally closed, i.e. closed without control medium being applied.

2. Two normally closed electrical solenoids mounted on the top of the condensate drain valves for the 2nd and 5th stage drain valves.
3. A condensate manifold. This collects the condensate from each condensate drain valve as well as serving as a mount for all the condensate drain valves.
4. Two 15 minute electrical time signals are generated by the PLC in the electrical panel to energize the electrical solenoids. The time signals do not operate simultaneously. The electrical solenoid for the 2nd, 3rd and 4th stages is energized to drain them for the same length of time. The electrical solenoid for the 5th stage is energized at a different time for a different length of time.

4.2.3 Operation

(See Figure 4-42) The condensate drain valves are operated pneumatically via a normally closed electrical solenoid which is energized by an electrical time signal from the PLC. The required control medium applied to the electrical solenoid is taken from the intermediate separator after the 2nd stage.

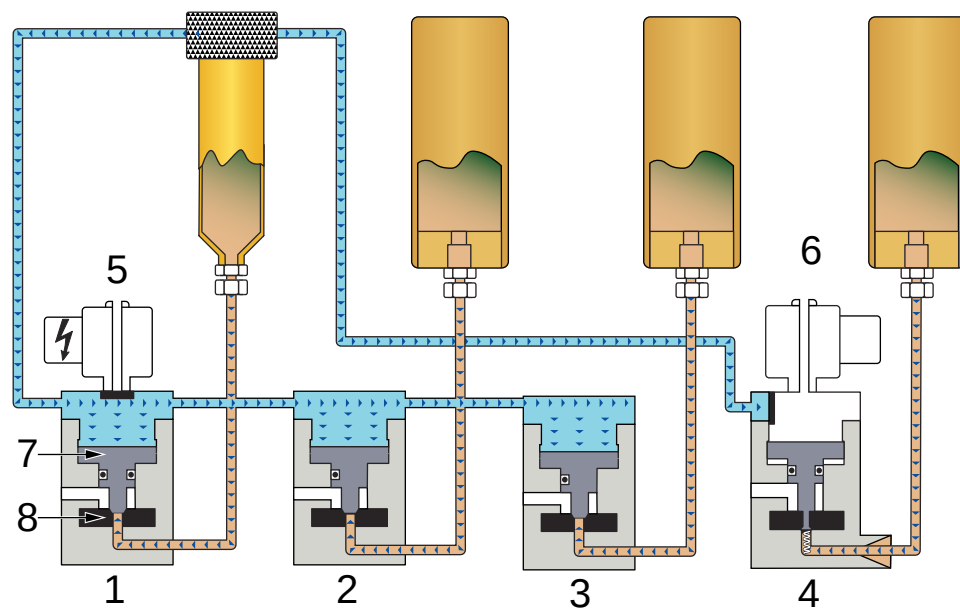
At compressor start-up, condensate drains valves (1), (2) and (3) are open, and (4) is closed by spring pressure. After start-up of the compressor, the electrical solenoid (5) is energized and opens, electrical solenoid (6) is not energized and remains closed. So the control medium is applied to condensate drain valves (1), (2) and (3). The servo-pistons (7) are pressed onto the valve seats (8) and the condensate drain valves close. The condensate drain valve (4) is not pressurized by the control medium. It remains closed by spring pressure and due to the pressure buildup of the compressor. The compressor then delivers compressed air to the connected systems.

4.2.3.1 Condensate Drain

Every 15 minutes the electrical solenoid (5) is de-energized for approximately 6 seconds by the PLC time signal and closes. The control pressure is barred from the valve piston (7) of the condensate drain valves (1), (2) and (3) and the valve pistons (7) are unloaded, the remaining control medium is vented through the relief port of the electrical solenoid. The valve pistons of the condensate drain valves are raised from the valve seats (8) by the pressure from the intermediate separators, the valves (1), (2) and (3) open and condensate from the intermediate separators after the 2nd, 3rd and 4th stages is drained.

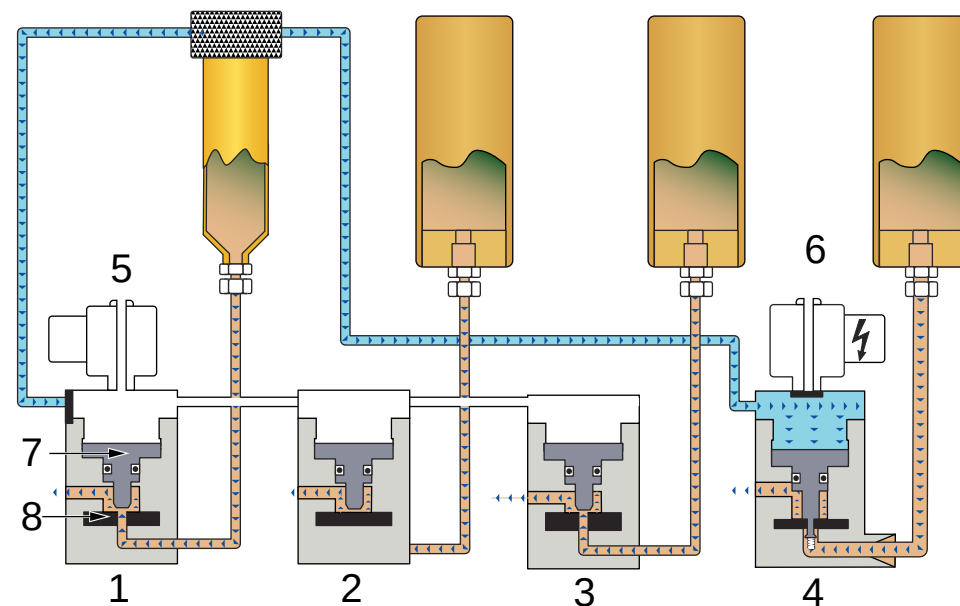
Also every 15 minutes but independently from electrical solenoid (5) the electrical solenoid (6) is energized for approximately 3 seconds by PLC time signal and opens. The control pressure is then applied to the condensate drain valve (4) and the valve piston (7) is pushed down and unseated and the condensate from the oil and water separator is drained.

After 3 seconds, the electrical solenoid closes and shuts off the control medium. The valve pistons (7) are unloaded and the control medium pressure is vented through the relief port of the electrical solenoid. The pistons are raised by pressure from the last compression stage and the valve closes. A restrictor nozzle is mounted at the condensate inlet port of the condensate drain valve (4) to minimize pressure loss during the condensate drain period.

Figure 4-42 ACD Operation


Control Pressure ———
 Condensate ———

Normal Operation



Control Pressure ———
 Condensate ———

Condensate Draining

1. 2nd Stage ACD Valve
2. 3rd Stage ACD Valve
3. 4th Stage ACD Valve
4. 5th Stage ACD Valve

5. 2nd, 3rd and 4th Stage Electrical Solenoid
6. 5th Stage Electrical Solenoid
7. Valve Piston
8. Valve Seat

4.2.3.2 Standstill Drainage

At compressor shutdown, electrical solenoid (5) is de-energized, opens and vents condensate drain valves (1), (2) and (3). the valve pistons are raised by residual pressure within the separators. The valves open and the condensate is drained as the compressor stops.

NOTICE

Ensure that the condensate is collected and disposed of in accordance with local regulations.

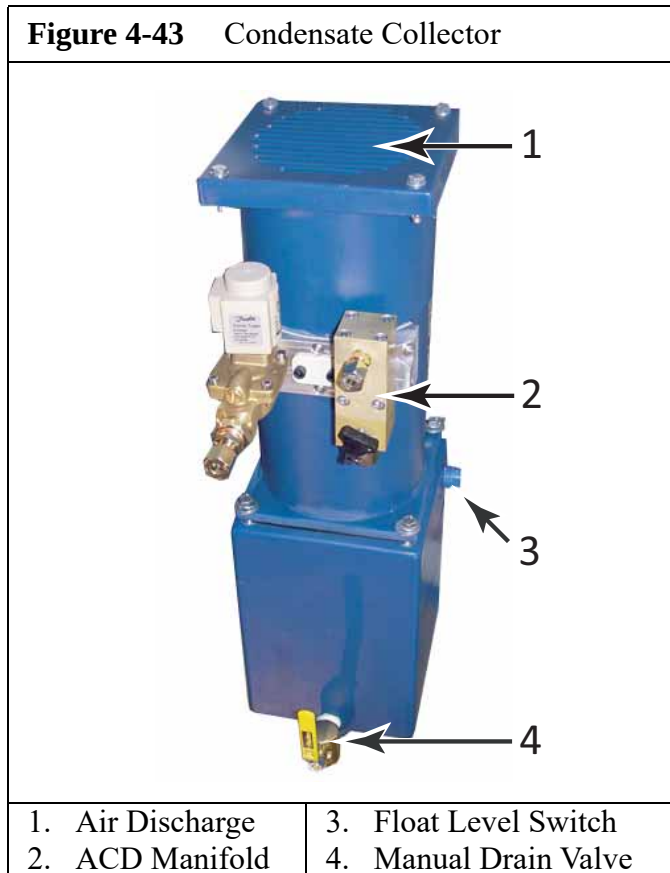
4.3 Condensate Collector

During compression the water content of the air is also compressed. The resulting water is removed after each compression stage and is collected through the automatic condensate drain system.

This water, additionally, has a small oil content. The separation of oil and water is not possible through simple methods; therefore the condensate has to be completely removed. It is most practical to collect this condensate in special containers and dispose of it entirely.

For these compressor units a metal housing and tank assembly is used. A float level switch is also included. The condensate is drained from the tank assembly by the manual drain valve into a separate container for proper disposal.

Figure 4-43 Condensate Collector



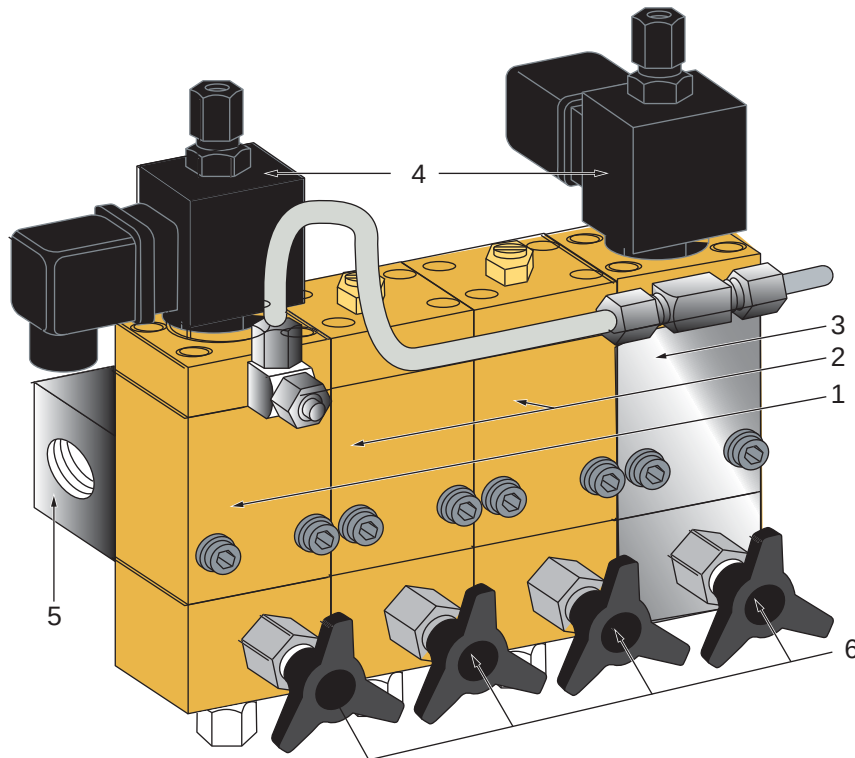
4.3.1 Maintenance

See Figure 4-41. Each condensate drain valve is provided with a manual drain tap to check the correct operation of the automatic condensate drain system. The automatic condensate drain system must be serviced as follows:

1. Once a week open all manual condensate drain taps. This must be carried out immediately after the ACD system has drained the condensate.
2. Observe the amount of condensate drained from the manual condensate drain taps.
 - a. If hardly any condensate emerges, the ACD system is operating properly.
 - b. A large amount of condensate drainage from the manual condensate drain tap is a sign that the corresponding condensate drain valve or the ACD system is malfunctioning.

4.3.2 Replacement Parts List

Figure 4-44 Automatic Condensate Drain System



Item	Qty	Part No.	Description	Notes
◆	1	79504	Automatic Condensate Drain System	5 Stage Breathing Air
1	1	060410	Condensate Drain Valve	(See Figure 4-45)
2	2	061010	Condensate Drain Valve	(See Figure 4-46)
3	1	060412	Condensate Drain Valve	(See Figure 4-47)
or	1	066004	Condensate Drain Valve	Steel Version (See Figure 4-48)
4	2	N04182	Solenoid	115 VAC
or	2	N04185	Solenoid	12 VDC
or	2	N04186	Solenoid	24 VDC
5	1	MFD-0036	Condensate Manifold	
6	4	011430	Drain Valve	

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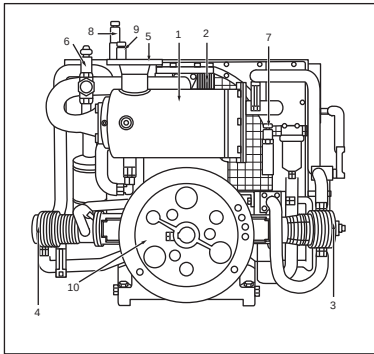
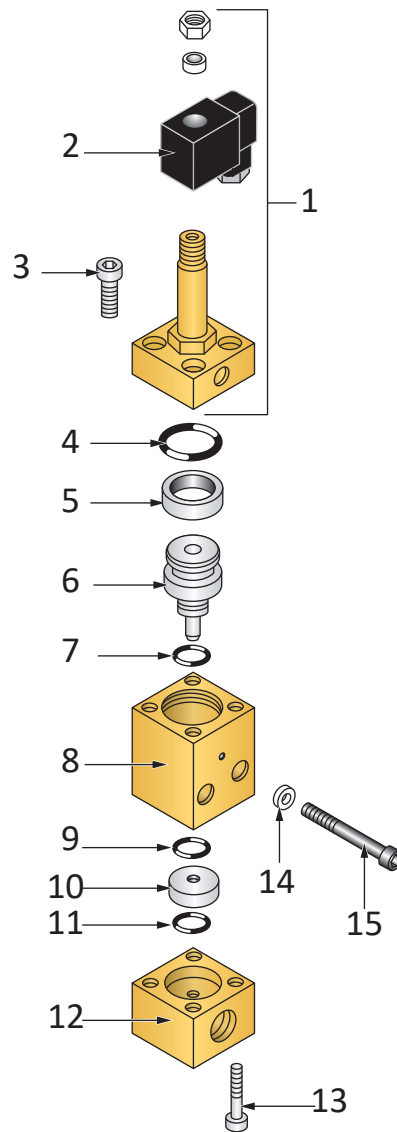


Figure 4-45 2nd Stage Condensate Drain Valve


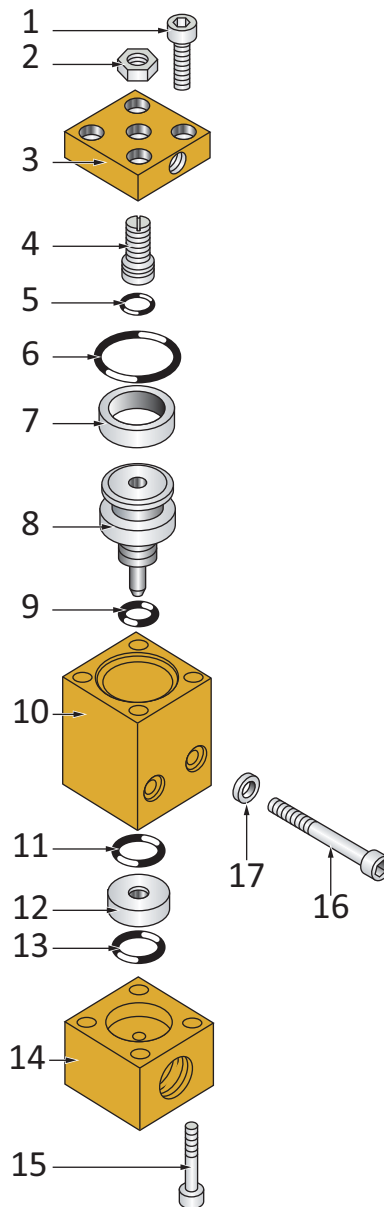
Item	Qty	Part No.	Description	Notes
◆	1	060410	Condensate Drain Valve Assembly	2nd stage
1	1	058053	Solenoid Valve without Coil	
2	1	N04182	High Temperature Coil	115 VAC, 50-60Hz
or	1	N04185	High Temperature Coil	12 VDC
3	4	SCR-0145	Socket Head Cap Screw	
4	1	N02720	O-ring	
5	1	N04177	Sealing Ring	
6	1	057628	Valve Piston	
7	1	N03489	O-ring	
8	1	060414	Valve Body	

Figure 4-45 (cont.)

2nd Stage Condensate Drain Valve

Item	Qty	Part No.	Description	Notes
9	1	N02507	O-ring	
10	1	056687	Valve Seat	
11	1	N04178	O-ring	
12	1	060416	Base Flange	
13	4	SCR-0132	Socket Head Cap Screw	
14	2	WAS-0024	Flat Washer	
15	2	SCR-0177	Socket Head Cap Screw	

Figure 4-46 3rd and 4th Stage Condensate Drain Valves



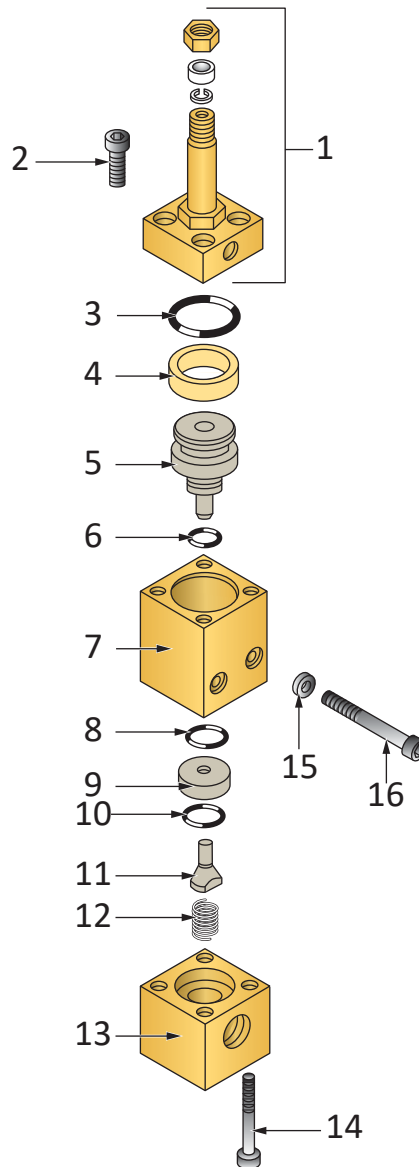
Item	Qty	Part No.	Description	Notes
◆	1	061010	Condensate Drain Valve Assembly	3rd and 4th stage
1	4	N796	Socket Head Cap Screw	
2	1	N3764	Hex Nut	
3	1	61007	Top Flange	
4	1	57353	Adjusting Screw	
5	1	N7091	O-ring	
6	1	N2720	O-ring	
7	1	N04177	Sealing Ring	

Figure 4-46 (cont.)

3rd and 4th Stages Condensate Drain Valves

Item	Qty	Part No.	Description	Notes
8	1	057629	Valve Piston	
9	1	N03489	O-ring	
10	†	...	Valve Body, ACD	Available only with 061010
11	1	N02507	O-ring	
12	1	056691	Valve Seat	
13	1	N04178	O-ring	
14	1	060416	Base Flange	
15	4	N1511	Allen Screw	
16	2	N781	Allen Screw	
17	2	N102	Washer	

Figure 4-47 Final Separator Condensate Drain Valve

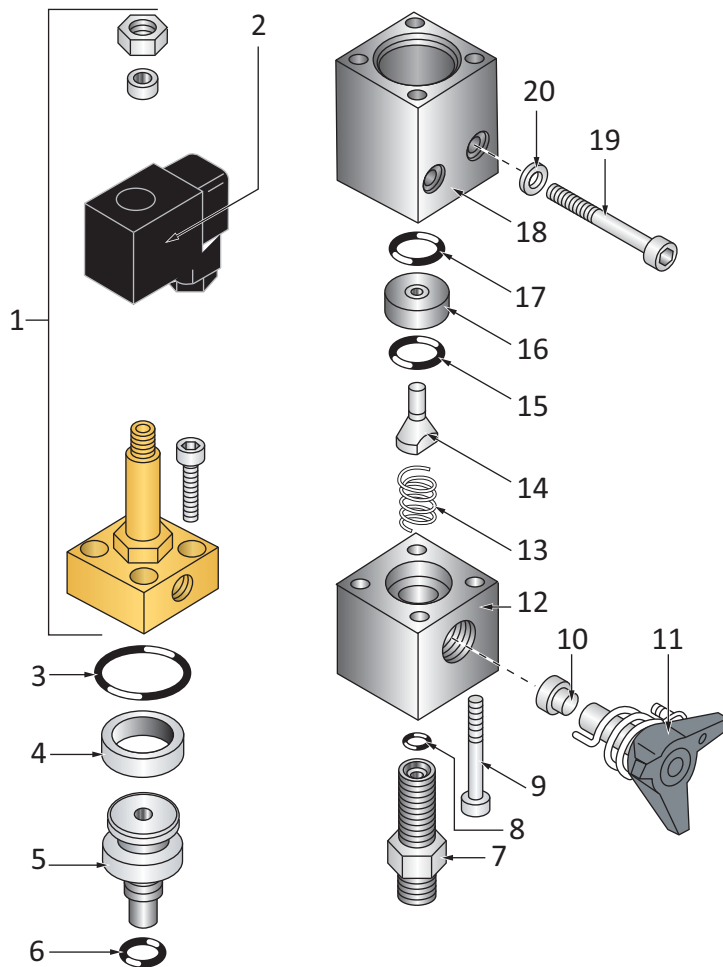


Item	Qty	Part No.	Description	Notes
◆	1	060412	Condensate Drain Valve	
1	1	058053	Solenoid Valve	
2	4	N19534	Allen Screw	M6 x 20
3	1	N2720	O-ring	
4	1	N4177	Grooved Ring	
5	1	060417	Valve Piston	
6	1	N3489	O-ring	
7	†	...	Valve Body	Available only with 060412
8	1	N2507	O-ring	

Figure 4-47 (cont.)

Final Separator Condensate Drain Valve

Item	Qty	Part No.	Description	Notes
9	1	60419	Valve Seat	
10	1	N4178	O-ring	
11	1	60418	Sealing Cone	
12	1	60600	Spring	
13	1	60415	Valve End	
14	4	N1511	Allen Screw	M6 x 60
15	2	N102	Washer	
16	2	N781	Allen Screw	M6 x 35
N.S.	1	N04182	High Temperature Coil	115 VAC, 50-60Hz
or	1	N04185	High Temperature Coil	12 VDC

Figure 4-48 Alternate Final Separator Condensate Drain Valve


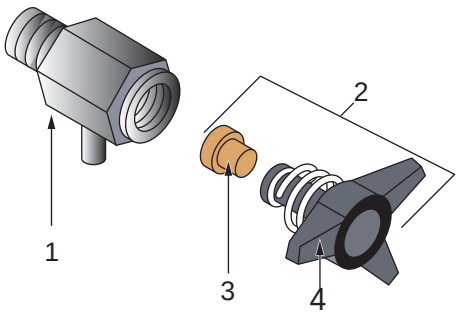
Item	Qty	Part No.	Description	Notes
◆	1	066004	Condensate Drain Valve	Steel Version
1	1	058053	Solenoid Valve without Coil	
2	1	N04182	High Temperature Coil	115 VAC, 50-60Hz
or	1	N04185	High Temperature Coil	12 VDC
3	1	N2720	O-ring	
4	1	N4177	Grooved Ring	
5	1	060417	Valve Piston	
6	1	N3489	O-ring	
7	1	068323	Nozzle	
8	1	N4600	O-ring	
9	4	N19542	Allen Screw	
10	1	013283	Seal	
11	1	073793	Drain Tap Kit	
12	†	...	Intermediate Valve Body	Available only with 066004

Figure 4-48 (cont.)

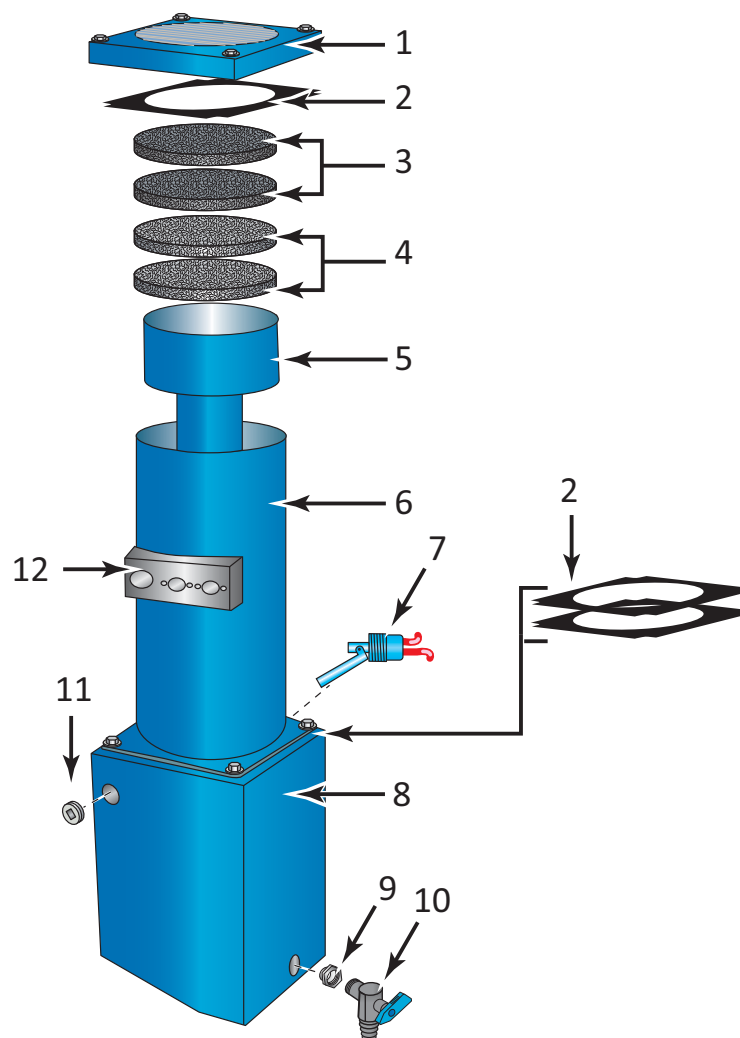
Alternate Final Separator Condensate Drain Valve

Item	Qty	Part No.	Description	Notes
13	1	060600	Pressure Spring	
14	1	077202	Sealing Cone	
15	1	N17079	O-ring	
16	1	077203	Valve Seat	
17	1	N2507	O-ring	
18	†	...	ACD Valve Body	Available only with 066004
19	2	N19541	Allen Screw	
20	2	N102	Washer	

Figure 4-49 Manual Condensate Drain Valve



Item	Qty	Part No.	Description	Notes
◆	1	011430	Condensate Drain Tap	
1	1	068410	Drain Valve Body	
2	1	073793	Drain Valve Kit	Items 3 and 4
3	1	013283	Seal	
4	1	055888	Handle with Spring	

Figure 4-50 Condensate Collector


Item	Qty	Part No.	Description	Notes
1	1	CAP-0056	Condensate Collector Cover	
2	3	GKT-0065	Gasket	1/16" Black Neoprene
3	2	ELM-0160	Fine Filter Element	
4	2	ELM-0161	Coarse Filter Element	
5	1	HUS-0050	Housing, Condensate Filter	
6	1	HUS-0060	Housing, Condensate Collector	
7	1	SWT-0265	Float Switch	
8	1	TNK-0092	Condensate Collection Tank	
9	1	RED-0067	Reducer	
10	1	VAL-0386	Manual Drain Valve	
11	1	PLU-0011	Plug	
12	1	MFD-0035	ACD Manifold	

CHAPTER 5: SCHEDULING MAINTENANCE AND SPARE PARTS

5.1 Preventive Maintenance Tasks

Tasks Compressor Block	Calendar Periods				Operating Hours					Special
	Daily	Weekly	Annually	Biennially	500	1000	2000	3000	4000	1/2 ^a
Check Oil Level										
Operate unit to final pressure and check final pressure switch										
Check automatic condensate drain										
Check V-belt										
Service air intake filter										
Check all connections for leakage										
Test Valves										
Change Synthetic Oil										
Change Oil Filter										
Replace Valves										
Check opening pressure of final safety valve										
Replace oil and water separator, if required										
Change Synthetic Oil and Oil Filter, if operated for less than 2,000 hours										
Check fasteners for tightness										

a. 1/2 Hour after maintenance

5.2 Trailer Maintenance Schedule

Service Item	Interval
Lights	Check prior to towing
Wheel Lugs	Check prior to towing
Pneumatic Tires	Inspect Monthly
Axle Bearings	Inspect Annually
Brakes	Inspect Annually

5.3 Diesel Engine Maintenance Schedule

Service Item	Interval							
	Daily	First 50 hrs	100 hrs	250 hrs	500 hrs	1000 hrs	After long term Storage	Notes
Diesel Engine								
Looseness damage and leakage	I	T						N
Abnormal fumes, sound and vibration	I							
Retighten nuts and bolts		I			I			S
Engine valve clearance					I			S
Engine running speed						I		S
Compression pressure						I		S
Lubrication								
Engine oil	I	D,R	D,R				D	
Oil Filter		R	R				R	
Fuel System								
Fuel	I						D	
Fuel tank					I,C		I,C	
Fuel filter				R			R	F
Water sedimenter	I	C						
Injection pump						C		S
Injector nozzle					I			S
Intake System								
Air filter element			C	R			C	
Electric System								
Indicators	I							
Coolant	I					R		
Radiator Cooling Fins				C				
Stub Shaft Bearing				G				
Overhaul	10,000 Hrs.							
Fan/Alternator Belt					I,A	I,A		
A=Adjust voltage and current, C=Clean, D=Drain, F=Replace more frequently in severe dusty conditions								
I=Inspect, N=Nuts and bolts, R=Replace, S=Service by diesel mechanic, T=Check for tightness, G = Grease								

5.4 Maintenance Records

We recommend that all maintenance work be recorded in a service book, showing the date and details of the work carried out. This will help to avoid expensive repairs caused by missed maintenance work.

If it is necessary to make a claim against the warranty, it will help to have proof that regular maintenance has been carried out and that the damage has not been caused by insufficient maintenance.

To assist in this process the following maintenance control sheet is provided and may be copied as required. The shaded boxes indicate when each maintenance task is due. Enter the number of operating hours in these blocks and date and sign it at the bottom

5.4.1 Maintenance Record Form

A recommend compressor block maintenance record form is included in the Appendix and below.

Operating Hours → Maintenance Task ↓	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	Annually	Biennially
Check drive V-belts														
Service intake filter														
Check connections for leaks														
Check valves														
Oil change														
Replace valves														
Check pistons and rings														
Check final pressure safety valve														
Check and record hourmeter														
Date\ Signature														

5.5 Trailer Inspection Service & Maintenance

5.5.1 Inspection, Service & Maintenance Summary Charts

You must inspect, maintain and service your trailer regularly to insure safe and reliable operation. In addition to this manual, also check the relevant OEM manual.

Inspection and Service before Each Use	
Item	Inspection/Service
Breakaway Brakes Hydraulic	Check operation Check fluid level
Shoes and Drums	Adjust
Coupler and Hitch Ball	Check for cracks, pits, and flats. Grease. Check locking device.
Safety Chains & Hooks	Check for wear and damage Rig the safety chains
Tires	Check tire pressure when cold.
Lug Nuts	Check for tightness Check torque after first 10, 25 & 50 miles of driving and after any impact

Inspection and Service each 3 Months or 3,000 Miles	
Item	Inspection / Service
Structure Hinges, Doors and dividers	Inspect. Repair or replace damaged, worn or broken parts

Inspection and Service each 6 Months or 6,000 Miles	
Item	Inspection / Service
Structure	Clean dirt buildup, lubricate hinges and slides
Tires	Inspect tread and sidewalls thoroughly. Replace tire when treads are worn, when sidewall has a bulge, or sidewall is worn

Inspection and Service Each Year or 12,000 Miles	
Item	Inspection / Service
Brakes, Shoes and Drums	Check for scoring and wear. Replace per manufacturer's specifications
Structure, Frame Members and Welds	Inspect all frame members, bolts, rivets & welds. Repair or replace damaged, worn or broken parts. Clean dirt build-up. Lubricate slides, shafts and gears
Wheels Unsealed Bearings Rims	Check and confirm free running. Disassemble / inspect / assemble and repack. Replace promptly if immersed in water Inspect for cracks & dents. Replace as needed.

5.5.2 Inspection and Service Instructions

5.5.2.1 Axle Bolts, Frame, Suspension, & Structure



WARNING

Worn or broken suspension parts can cause loss of control and injury may result.
Have trailer professionally inspected after any impact.

To perform many of the inspection and maintenance activities, you must jack up the trailer. When jacking and using jack stands, place them so as to clear wiring, brake lines, and suspension parts (springs, torsion bars, etc.). Place jacks and jack stands inside of the perimeter strip on the supporting structure to which the axles are attached.



WARNING

Never crawl under your trailer unless it is on firm and level ground and resting on properly placed and secured jack stands.

5.5.3 Trailer Structure

5.5.3.1 Fasteners and Frame Members

Inspect all of the fasteners and structural frame members for bending and other damage, cracks, or failure. Repair or replace any damaged fastener and repair the frame member. If you have any questions about the condition or method of repair of fasteners or frame members, get the recommendation of, or have the repair done by, your dealer.



WARNING

Broken or damaged fasteners or welds can cause injury or damage to trailer and contents.
Inspect for, and repair all damaged parts at least once a year.

5.5.3.2 Welds

All welds can crack or fail when subjected to heavy loads or movement of cargo that was not properly tied to prevent movement. Any time that you know or suspect that the trailer has been subjected to heavy loads or movement of cargo, immediately inspect the welds and fasteners for damage. To prevent severe damage to your trailer, inspect all of the welds for cracks or failure at least once a year.



WARNING

Improper weld repair will lead to early failure of the trailer structure and can cause serious injury or death. Do not repair cracked or broken welds unless you have the skills and equipment to make a proper repair. If not, have the welds repaired by your dealer.

5.5.4 Trailer Brakes

5.5.4.1 Brake Shoes and Drums

Properly functioning brake shoes and drums are essential to ensure safety. You must inspect these components at least once per year, or each 12,000 miles.

The brake shoes must be adjusted after the first 200 miles of use, and each 3,000 miles thereafter. Most axles are fitted with a brake mechanism that will adjust the brakes during a hard stop.

5.5.4.1.1 Manually Adjusting Brake Shoes

The following steps apply to adjust most manually adjustable brakes. Read your axle and brake manual to see how to adjust your brakes. If you do not have this manual, call Bauer Compressors, Inc. at (757)855-6006 for a copy.

1. Jack up the trailer and secure it on adequate capacity jack stands.
2. Be sure the wheel and brake drum rotate freely.
3. Remove the adjusting-hole cover from the adjusting slot on the bottom of the brake backing plate.
4. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn. Note: Your trailer maybe equipped with drop spindle axles. See axle manual for your axle type. You will need a modified adjusting tool for adjusting the brakes in these axles. With drop spindle axles, a modified adjusting tool with about an 80 degree angle should be used.
5. Rotate the starwheel in the opposite direction until the wheel turns freely with a slight drag.
6. Replace the adjusting-hole cover.
7. Repeat the above procedure on all brakes.
8. Lower the trailer to the ground.

5.5.4.2 Brakes, Hydraulic

The hydraulic braking system must be inspected, at least as often as the brakes on the tow vehicle, but no less than once per year. This inspection includes an assessment of the condition and proper operation of the wheel cylinders, brake shoes, brake drums and hubs.

You must check the fluid level in the master cylinder reservoir at least every three months. If you tow your trailer an average of 1,000 miles per month in a hot and dry environment, you must check the brake fluid level once a month. The brake fluid reservoir is located on the tongue of the trailer. Fill with DOT-4 brake fluid.

5.5.4.3 Trailer Connection to Tow Vehicle

5.5.4.3.1 Coupler and Ball

The coupler on the trailer connects to the 2 inch ball attached to the hitch on the tow vehicle. The coupler, ball and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the coupler to the ball for proper operation.

See the coupler manufacturer's manual for other inspection and maintenance activities. If you do not have this manual, call Bauer Compressors, Inc. at (757) 855-6006 for a copy.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ball or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and coupler system. All bent or broken coupler parts must be replaced before towing the trailer.

The coupler handle lever must be able to rotate freely and automatically snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the ball pocket and latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

When replacing a ball, the load rating must match or exceed the GVWR of the trailer.

5.5.4.4 Pintle Hook and Lunette Ring

See the coupler manufacturer's manual for other inspection and maintenance activities. If you do not have this manual, call Bauer Compressors, Inc. at (757) 855-6006 for a copy.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ring or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the Pintle Hook and Lunette Ring system. All bent or broken parts must be replaced before towing the trailer.

The coupler handle lever must be able to rotate freely and automatically snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

When replacing a Pintle Hook and Lunette Ring the load rating must match or exceed the GVWR of the trailer.

5.5.4.5 Jack

If a grease fitting is present, you must use a grease gun to lubricate the jack mechanism. Grease the gears in the top of hand-cranked jacks once a year, by removing the top of the jack and pumping or hand packing grease into the gears.

5.5.4.6 Lights and Signals

Before each tow, check the trailer tail lights, stoplights, turn signals and any clearance lights for proper operation.



WARNING

Improper operating taillights, stoplights and turn signals can cause collisions.
Check all lights before each tow.

5.5.4.7 Tires

Before each tow, be sure the tire pressure is at the value indicated on the side wall. Tire pressure must be checked while the tire is cold. Do not check the tire pressure immediately after towing the trailer. Allow at least three hours for a tire to cool, if the trailer has been towed for as much as one mile. Replace the tire before towing the trailer if the tire treads have less than 1/16 inch depth or the telltale bands are visible. A bubble, cut or bulge in a side wall can result in a tire blowout. Inspect both side walls of each tire for any bubble, cut or bulge; and replace a damaged tire before towing the trailer.

**WARNING**

Worn, damaged or under-inflated tires can cause loss of control, resulting in damage, serious injury and possibly death. Inspect tires before each tow.

5.5.4.8 Wheel Rims

If the trailer has been struck, or impacted, on or near the wheels, or if the trailer has struck a curb, inspect the rims for damage (i.e. being out of round); and replace any damaged wheel. Inspect the wheels for damage every year, even if no obvious impact has occurred.

5.5.4.9 Wheels, Bearings and Lug Nuts

A loose, worn or damaged wheel bearing is the most common cause of brakes that grab.

To check your bearings, jack trailer and check wheels for side-to-side looseness. If the wheels are loose, or spin with a wobble, the bearings must be serviced or replaced.

5.5.4.10 Lug Nuts

Lug nuts are prone to loosen right after a wheel is mounted to a hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 10, 25 and 50 miles of driving and before each tow thereafter.

**WARNING**

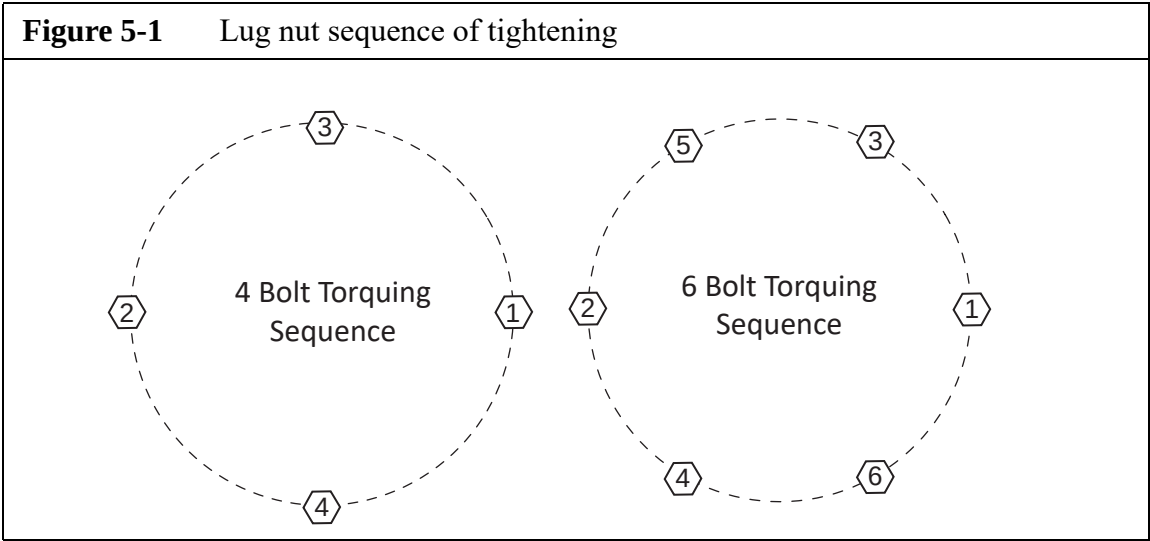
Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury. Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving.

**WARNING**

Metal creep between the wheel rim and lug nuts will cause rim to loosen and could result in a wheel coming off, leading to death or serious injury. Tighten lug nuts before each tow.

Tighten the lug nuts to the proper torque for the axle size on your trailer, to prevent wheels from coming loose. Use a torque wrench to tighten the fasteners. If you do not have a torque wrench, tighten the fasteners with a lug wrench as much as you can, then have a service garage or dealer tighten the lug nuts to the proper torque. Over-tightening will result in breaking the studs or permanently deforming the mounting stud holes in the wheels.

Lug Nut Torque - Steel Wheels		
Axle Rating, Pounds	Stud Size	Torque, Foot-pounds
5,200	9/16	120—140



CHAPTER 6: PURIFICATION SYSTEM

6.1 Introduction

The purpose of all Bauer breathing air purification systems is to remove carbon monoxide, oil, water, taste and odor from the compressed air stream before final delivery.

The purpose of all Bauer industrial gas purification systems is to remove oil and water from the compressed gas stream before final delivery.



WARNING

Industrial Gas Purification System cartridges do not remove Carbon Monoxide and must not be used in breathing air applications.

The quality of gas produced by the compressor is directly related to the quality and temperature of the gas taken in by the unit. Intake gas should as close as possible to 50 °F (10 °C) and cleanest available and as dry as possible. Bauer compressors normally add approximately 18 °F (10 °C) to the intake gas temperature. The purification cartridges perform their best at approximately 68 °F (20 °C). Adequate ventilation enhances the quality and life of the purification cartridges.

6.1.1 General Purification System Procedures

1. Keep an accurate record of operating hours to ensure exact attention to maintenance intervals
2. Change all cartridges before reactivating a compressor unit that has been out of service more than three months. Leave cartridges in the unit as long as it is out of service.
3. While out of service keep all condensate drain valves closed. Maintain a pressure of 700 - 1,100 psi (50 to 80 bar) within the system to prevent moisture from entering the compressor and purification system.

6.1.2 Chamber Safety Bore

The chambers in all Bauer purification systems are designed to prevent pressurization if the cartridge is missing, not seated properly or damaged (Figure 6-1 & Figure 6-2). Without a cartridge properly in place the safety bore is not sealed, the gas escapes into the atmosphere, no pressure can be built up and thus it is ensured that unfiltered gas is not supplied to the consuming device. If gas is escaping from the safety bore remove and check cartridge. If necessary replace the cartridge or O-rings.

Figure 6-1 Cartridge Safety Venting

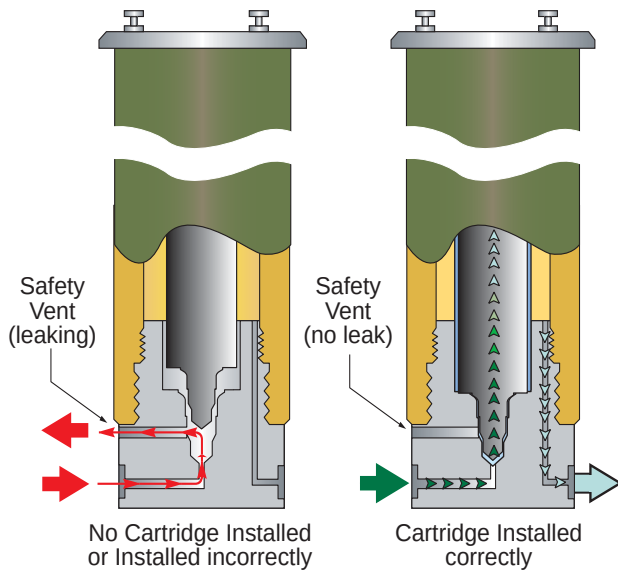
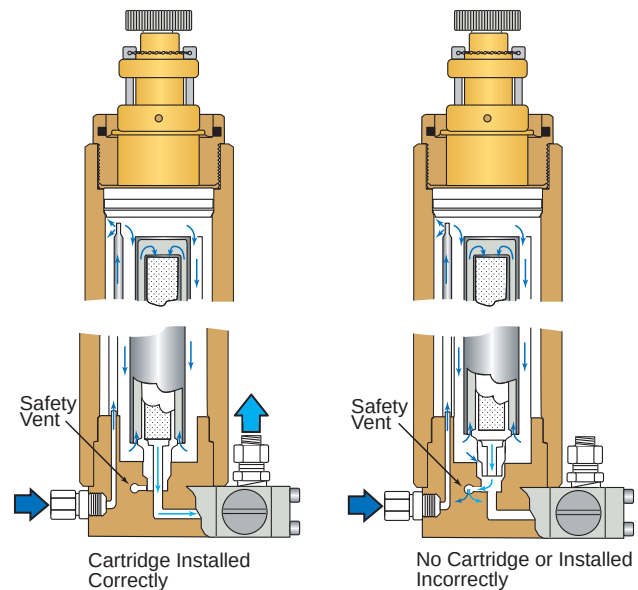


Figure 6-2 P0 & P31 Safety Venting



6.1.3 Manual Condensate Drainage

The condensate must be drained from the oil and water separator (final separator) before changing any cartridge, before beginning each filling procedure and in the absence of an Automatic Condensate Drain (ACD) system, every fifteen minutes during the operating procedure. This is done by slowly opening the manual condensate drain valves. They are opened approximately 1/3 of a turn to the left and held open until the condensate is completely drained. The condensate drain valves close by spring pressure but if necessary may be tightened by hand to ensure they are completely tightened.

6.1.4 Model, Serial Number and Part Number Identification

6.1.4.1 Compressor Data Plate

The model number, date of manufacture and serial number can be found on the compressor unit identification plate in the main electrical enclosure and frame.

Figure 6-3 Purification System Data Plates (typical)

Purification System	Cartridge Installation
PURIFICATION SYSTEM BAUER COMPRESSORS MODEL NO. MAX. PRESSURE psig AIR PROCESSED cu. ft. O-RING BACK-UP RING LBL-0191	CARTRIDGE TO BE INSTALLED BAUER COMPRESSORS CARTRIDGE FOR CARTRIDGE NO. 1328 Azalea Garden Road - Norfolk Virginia 23502-1944 Phone: (757) 855-6006 Fax: (757) 855-8224 LBL-0044

6.1.4.2 Purification System Data Plate

Refer to the compressor unit purification system data plate (Figure 6-3) on the compressor front to determine your purification system model and specifications.

6.1.4.3 Cartridge Installation Data Plate

The function performed by each chamber in the purification system is determined by the type of cartridge installed in that chamber. Refer to the cartridge installation data plate on the chamber to determine the purpose and part number of the cartridge installed in that chamber. (Figure 6-3).

6.1.5 Purification System Configurations

Purification System	Number and Type of Cartridges			Processing Capacity cubic ft (ft) ³
	Dryer	Purification	Securus®	
P0	Combined			3,200
P1	...	1	...	15,000
P2	...	1	...	40,000
P2 with Securus®	...	...	1	67,000
P4	1	1	...	60,000
P5	1	1	...	90,000
P5 with Securus®	1	...	1	150,000
P10	2	1		140,000
P10 with Securus®	2	...	1	230,000
P12 ^a	1	1		420,000
P14 ^a	2	1		650,000
P31	Combined			11,760
P41	...	1		28,700
P41 with Securus®	...	...	1	47,000
P42	1	1	...	64,000
P42 with Securus®	1	...	1	107,000
P43	2	1	...	100,000
P43 with Securus®	2	...	1	164,000
P81	1	1		124,000
P81 with Securus®	1	...	1	198,000

a. P12 and P14 have the Securus® Electronic Moisture Monitor System as standard equipment.

6.1.6 Industrial Purification System Configurations

Purification System	Number and Type of Cartridges			Processing Capacity cubic ft (ft) ^{See Chapter 63}
	Dryer	Purification	Securus®	
P0	Combined			3,200
P1	...	1	...	15,000
P2	...	1	...	40,000
IP2 with Securus®	...	...	1	67,000
P4	1	1	...	60,000
P5	1	1	...	90,000
IP5 with Securus®	1	...	1	150,000
P10	2	1		140,000
IP10 with Securus®	2	...	1	230,000
P31	Combined			11,760
IP41 with Securus®	...	...	1	47,000
IP42 with Securus®	1	...	1	107,000
IP43 with Securus®	2	...	1	164,000

6.1.7 Cartridge Operating Life

NOTICE

Cartridge life is dependent on temperature and humidity variables. Heat and humidity lessen the cartridge life, requiring more frequent replacements.

Every Bauer purification system is designed to process a certain volume of air/gas before the cartridges require replacement. By using special test equipment that measures the quality of air/gas at the outlet any quality reduction may be detected. However as most compressor owners do not have this test equipment the recommended method of determining cartridge operating life is to maintain a written record of the volume of air/gas processed by the purification system.

Each Bauer compressor block is rated to produce a standard volume of gas per minute and by using this number and the gas processing capability of the purification system it is possible to calculate the maximum operating hours before the cartridges need to be replaced. See Paragraph 6.1.7.1 for the method of determining this figure.

The ambient gas temperature and its ability to cool the compressor will effect the operating life of the cartridge. See Paragraph 6.1.7.2 for the method of calculating this adjustment factor.

The optimum place to measure the temperature is at the inlet to the final separator as this best reflects the temperature of the gas as it enters the chambers. Experience has shown that this temperature is approximately 18 °F (10 °C) above the ambient temperature. Therefore for the purpose of calculating cartridge operating life use the Ambient Air Temperature plus 18 °F.

A form titled Air Purification Cartridge Operating Hours is found in Paragraph 6.1.8.1 and in the Appendices. It is used for recording the ambient temperature, operating time and adjustment factor. It is suggested that it be copied, placed in a protective folder and kept with the unit to record the adjusted operating hours. An example of how this form is used is shown in Figure 6-5.

6.1.7.1 Calculating the Maximum Cartridge Operating Hours

1. From the purification system data plate (See Figure 6-3) on the purification chamber determine the gas Processed (cu.ft.)
2. From the paragraph titled Compressor Specifications in the instruction manual for your compressor unit determine the Charging Rate in SCFM of your compressor.
3. Divide the gas Processed by the Charging Rate to obtain the Maximum Operating Time in minutes
4. Divide the Maximum Operating Time in minutes by 60 to obtain the Maximum Operating Hours.
5. Record the answer on the Air Purification Cartridge Operating Hours form.

6.1.7.2 Calculating the Adjusted Cartridge Operating Hours

1. Using the Air Purification Cartridge Operating Hours form record the Date, Operating Hours and Ambient air Temperature plus 18 °F.
2. Using either the graph or the chart in Figure 6-4 determine the Correction Factor.
3. Divide the Operating Hours by the Correction Factor and record it under the column labeled Today.
4. Add the hours recorded in Today to the previous Total and record it as the current Total.
5. When the Total approaches the Maximum Operating Hours replace the Cartridges.

6.1.8 Chambers

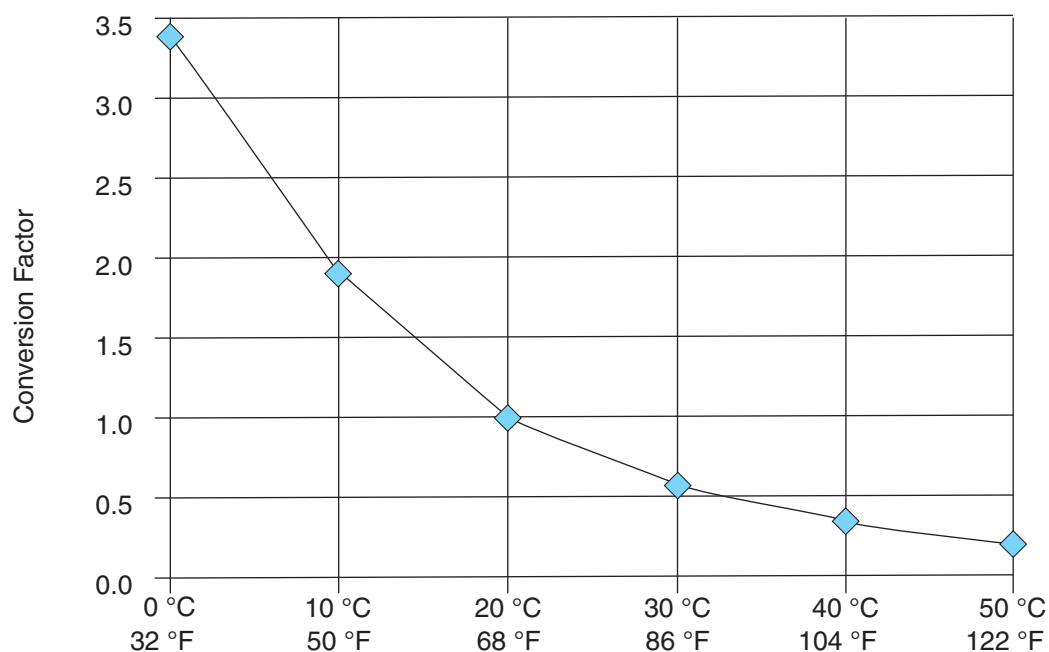
If consistent evidence shows that the maximum admissible number of load cycles has not yet been reached after five (5) years, BAUER Compressors recommends a visual inspection of the inner and outer sides of the pressure vessel.

If consistent evidence shows the maximum admissible number of load cycles has not yet been reached after ten (10) years A hydrostatic pressure test shall be executed. If the test is passed the chamber can be placed back in use for five (5) years. At the maximum number of load cycles or at fifteen (15) years the chambers must be replaced.



WARNING

All aluminum purification chambers, separators, check valves and pressure maintaining valves must be replaced after 15 years of use.

Figure 6-4 Correction Factor for Cartridge Operating Hours


°C [(°F - 32) x 5/9]	°F [°C x 9/5 + 32]	Correction Factor
50	122	0.21
40	104	0.34
30	86	0.58
20	68	1.00
10	50	1.81
0	32	3.44

Figure 6-5 Example Record of Adjusted Operating Hours

Date	Operating Hours	Ambient Temp. during Compression +18 °F	Correction Factor	Adjusted Cartridge Hours	
				Today	Total
10/19/04	8	92°F (33 °C)	0.5	16.00 $\left(\frac{\text{Op hrs}}{\text{Corr. factor}} \right)$	16.00
11/01/04	4	45°F (7.2 °C)	2.25	1.78	$\left(\frac{\text{Total hrs} + \text{Today hrs}}{\text{Corr. factor}} \right)$ 17.78

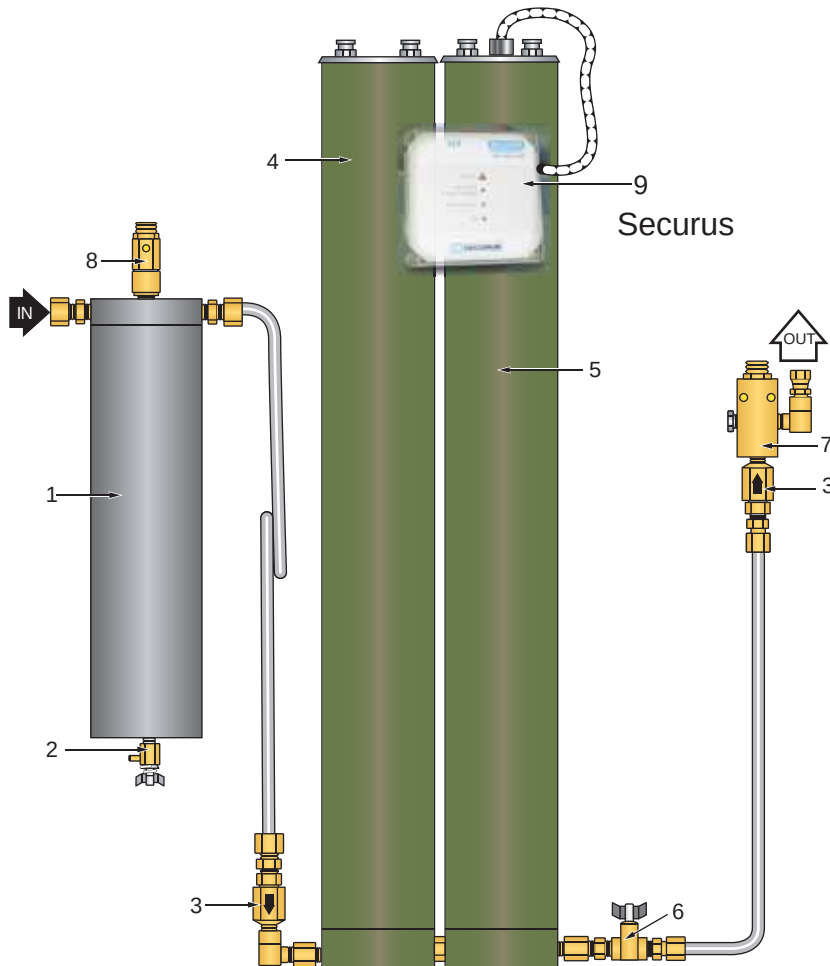
6.1.8.1 Purification Cartridge Operating Hours Form

[illegible]

6.1 P5S Purification System Major Components

The P5S Purification System major components are an Oil and Water Separator, a Dryer Chamber and a Purification Chamber. Figure 6-1 shows the functional interconnection of all the components.

Figure 6-1 P5S Purification System

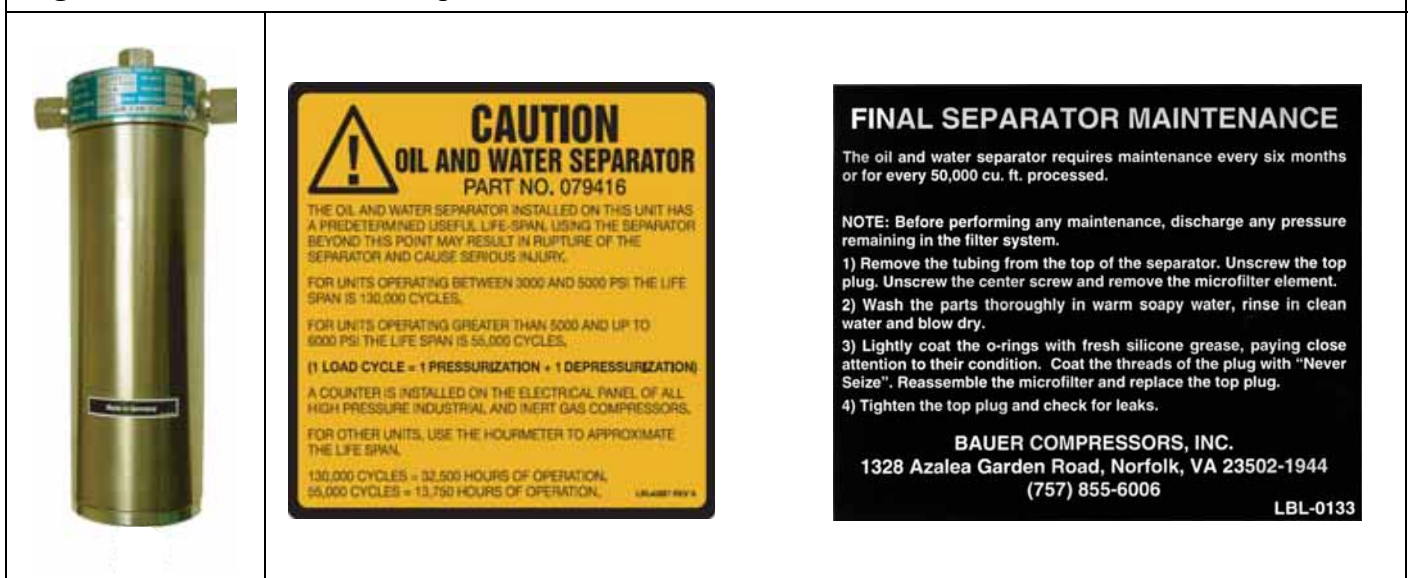


1. Oil and Water Separator	4. Dryer Chamber	7. Pressure Maintaining Valve
2. Condensate Drain Valve	5. Securus® Chamber	8. Safety Valve
3. Check Valves	6. Bleed Valve	9. Securus® Indicator

6.2 Components Description

6.2.1 Oil and Water Separator.

Figure 6-2 Oil and Water Separator & Labels



WARNING

The rapid de-pressurizing and re-pressurizing of the oil and water separator during condensate draining subjects it to metallurgical stresses. To prevent catastrophic failure with the possibility of damage, injury or death the oil and water separator (P/N 079416) must be replaced after a predetermined number of cycles.

One load cycle equals one pressurization plus one de-pressurization.

Units operating between 3,000 and 5,000 psi = 130,000 load cycles (32,500 hours of operation)

Units operating between 5,000 and 6,000 psi = 55,000 load cycles (13,750 hours of operation)

The Bauer recommended frequency of condensate draining is every fifteen minutes and is a balance between maximizing the life of the separator chamber and maintaining the quality of the delivered air.

The air leaving the final stage is cooled in the aftercooler to approximately 18 - 27 °F (10 -15 °C) above ambient temperature and then enters the oil and water separator. The oil and water separator works by means of a sintered metal filter which separates liquid oil and water particles from the compressed air.

6.2.2 Pressure Chambers

Each chamber is made up of an anodized aluminum housing and a cartridge. There are two general types of cartridges, drying or purifying. The cartridge type is determined by the ingredients packed in the cartridge. The pressure chamber is named after the type of cartridge it contains, i.e. dryer chamber or purification chamber.

6.2.3 Cartridge

6.2.3.1 Cartridge Construction

The cartridge casing, top and bottom are aluminum and are packed with one or more of the following.

1. A catalyst to convert carbon monoxide to carbon dioxide.
2. Activated carbon which absorbs oil vapors effecting taste and odor.
3. Molecular sieve to absorb oil and water
4. sensor components of the Securus® Electronic Moisture Monitor System

6.2.3.2 Cartridge Handling

1. Never open the protective packaging a cartridge comes in prior to its actual use. The highly sensitive filter materials will absorb moisture from the atmosphere becoming saturated and useless.
2. Used cartridges must be disposed of in accordance with local regulations.



6.2.4 Condensate Drain Valve

A manually operated valve used for maintenance and before start-up to drain the condensed liquids from the coalescing oil and water separator.

6.2.5 Check Valves

Valves allowing compressed air to flow in only one direction. One is used to maintain pressure in the chamber when the compressor is not operating. The other check valve prevents back-flow from filled storage cylinders or tanks.

6.2.6 Bleed Valve

A manually operated valve used to release the pressure in the chamber before maintenance.

6.2.7 Pressure Maintaining Valve

The pressure maintaining valve ensures that pressure is built up in the system from the start of delivery, thus achieving constant optimum purification. It also assures proper working conditions for the final stage of compression.

6.2.8 Safety Valve

The safety valve is located on the coalescing oil and water separator and acts as the safety valve for the final stage of the compressor.

6.2.9 Securus® Electronic Moisture Monitor System

The Securus® Electronic Moisture Monitor System warns the operator in advance of expiration of the life of the cartridges. The Securus® Indicator receives signals concerning the condition of the drying agent inside the Securus® cartridge from the attached sensors and supplies the appropriate control signals whenever the preset threshold values have been reached.

6.2.9.1 Securus® Cartridge

The Securus® Cartridge is packed with a catalyst which converts carbon monoxide to carbon dioxide, activated carbon which absorbs oil vapors, molecular sieve which absorbs oil and water and the sensor components of the Securus® Electronic Moisture Monitor System.

6.2.9.1.1 Securus® Indicator

The operating condition of the Securus® Electronic Moisture Monitor System is indicated by the color and state of four LEDs on the front of the Securus® Indicator and is shown in the following table.

NOTICE

After applying power it will take about ½ second for the appropriate LED to illuminate. During this time the status of the Securus® Electronic Moisture Monitor System is tested.

Figure 6-3 Securus Indicator



Color	State	Indication	Compressor Unit Status
	Flashing	Failure	Compressor shutdown because of missing cartridge or fault in indicator.
	Flashing	Cartridge Saturated, must be changed	Compressor shutdown due to used up cartridge.
	Flashing	Cartridge Nearing Saturation	Compressor working. Cartridge change due soon warning.
	Steady	OK, good	Compressor operating normally.

Color	State	Indication	Compressor Unit Status
No LEDs Illuminate		No operating voltage or electronic failure	The unit is shutdown.

6.3 Maintenance

6.3.1 Oil and Water Separator

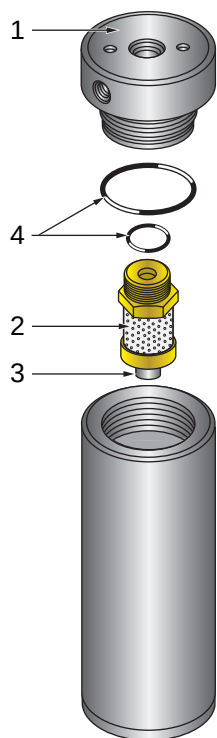
To remove the sintered metal filter proceed as follows: (See Figure 6-4). Disconnect the power and shut off the inlet supply line if applicable.

1. Depressurize the system by means of the bleed valve.
2. Remove the tubes connected to the side of the filter head (1).
3. Unscrew and remove the filter head.
4. Unscrew the sintered metal filter (2) from the filter head.
5. Remove the center screw (3) to remove the sintered metal filter.
6. Clean the sintered metal filter using hot soapy water. Blow dry with compressed air.
7. After cleaning the element, record the number of operating hours to ensure exact attention to the maintenance intervals.
8. Lubricate the threads and O-rings as well as the threaded part of the sintered metal filter with petroleum jelly. Apply sparingly.
9. Dry the inside of the filter housing with a clean cloth and check for corrosion before reinstalling the sintered metal filter.
10. In the event you discover corrosion, replace the corroded parts with new Bauer parts.
11. Reinstall the sintered metal filter assembly and filter head.
12. Replace all removed tubes, close all valves and check for leaks.

6.3.2 Cartridge Replacement

To change the purification cartridge, proceed as follows. (See Figure 6-6)

1. Disconnect the power and shut off the inlet supply line, if applicable.
2. De-pressurize the system by means of the bleed valve.
3. Unscrew the chamber head using the special wrench supplied.
4. Pull out the cartridge using the lifting ring on top of the cartridge.
5. Dry the inside of the chamber with a clean cloth and check for corrosion.

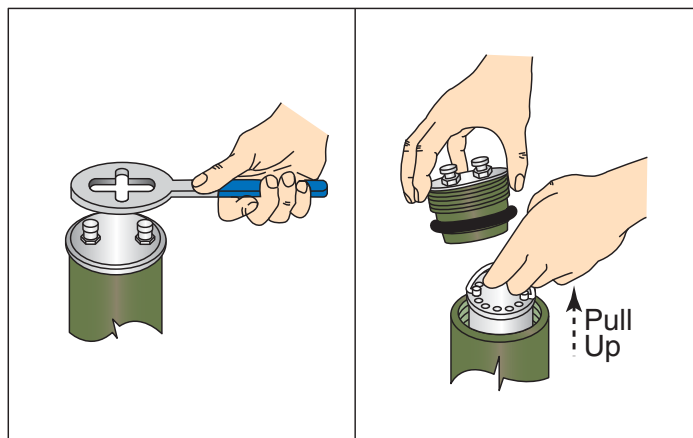
Figure 6-4 Oil and Water Separator

- | | |
|--------------------------|-----------------|
| 1. Filter Head | 3. Center Screw |
| 2. Sintered Metal Filter | 4. O -rings |

Figure 6-5 Sintered Metal Filter Assembly

- | | |
|--------------------|-----------------|
| 1. Threaded Insert | 4. Outer Filter |
| 2. Filter Bottom | 5. Filter Head |
| 3. Inner Filter | |

6. Replace all corroded parts with new Bauer parts.

Figure 6-6 Cartridge Replacement

7. Remove the shipping covering and the protective cap from the bottom of the cartridge.
8. Lubricate the O-rings with white petroleum jelly. Apply sparingly.

9. Install the new cartridge. Be sure the cartridge snaps into place.
10. Reinstall the chamber head.
11. Close the bleed valve, restore the power and reconnect the inlet supply line, if applicable.

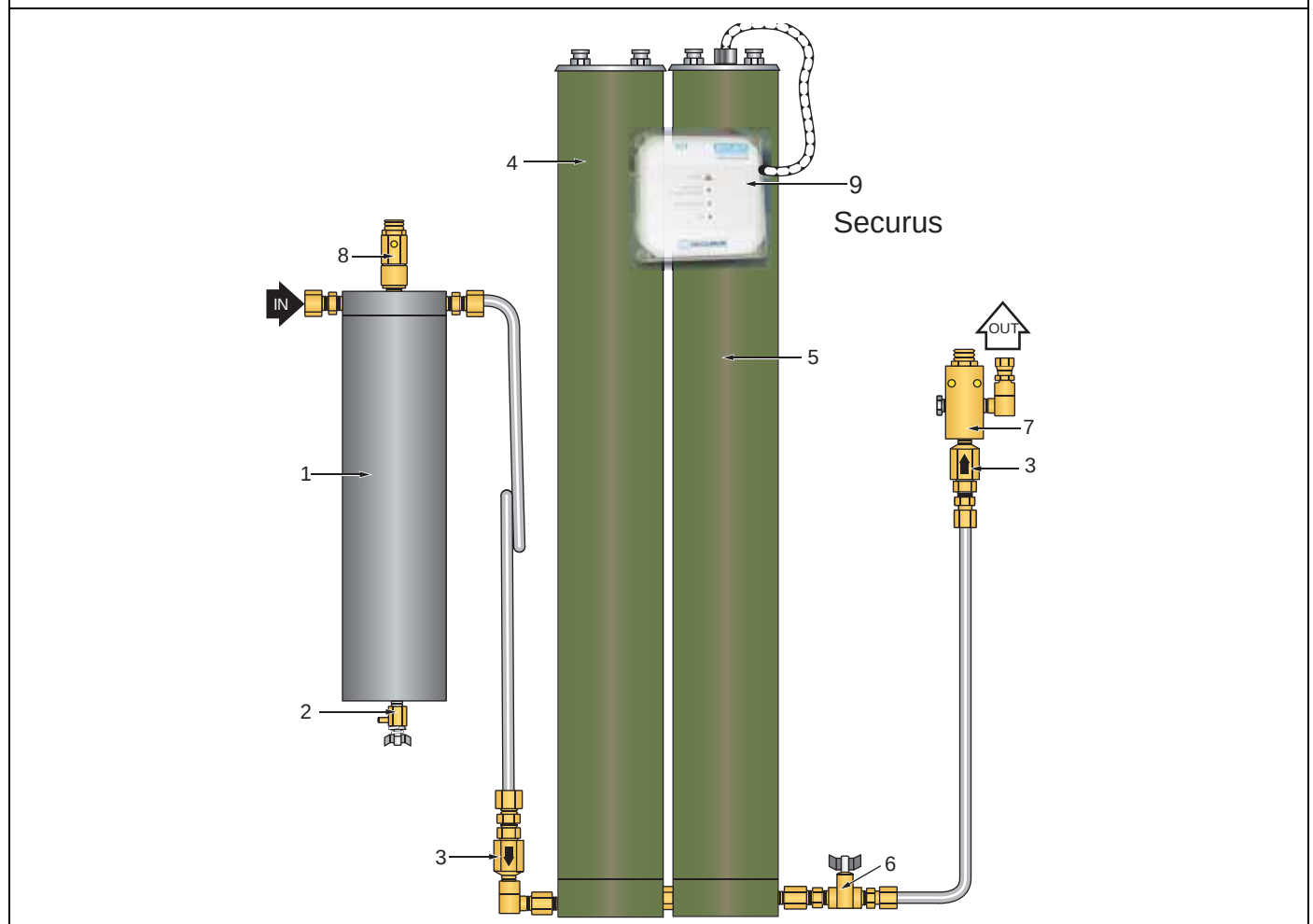
6.3.2.1 Leaking at the Safety Bore

NOTICE

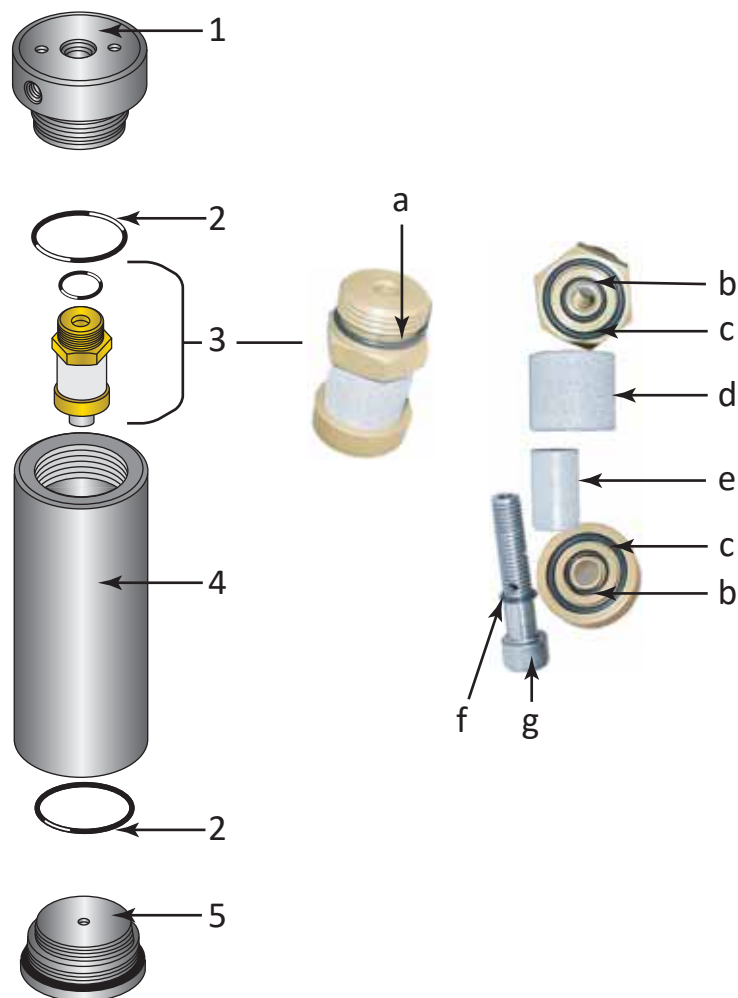
If air is detected bleeding out from the bottom of the chamber, the cartridge has not been installed properly or is missing. Follow the instructions below.

1. Remove the cartridge following the steps in Paragraph 6.3.2.
2. Install cartridge if missing.
3. Remove cartridge and inspect O-rings.
4. Replace O-rings if necessary.
5. Ensure protective caps and devices have all been removed.
6. Replace cartridge following steps 8. to 11. in Paragraph 6.3.2

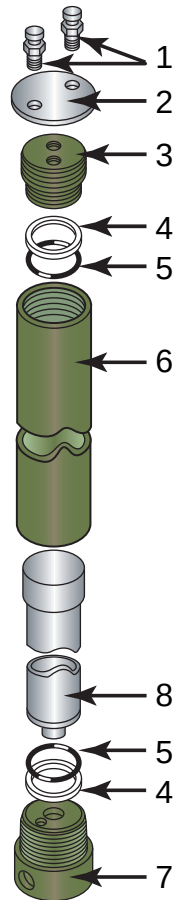
6.4 Replacement Parts List

Figure 6-7 P5 Purification System Parts List


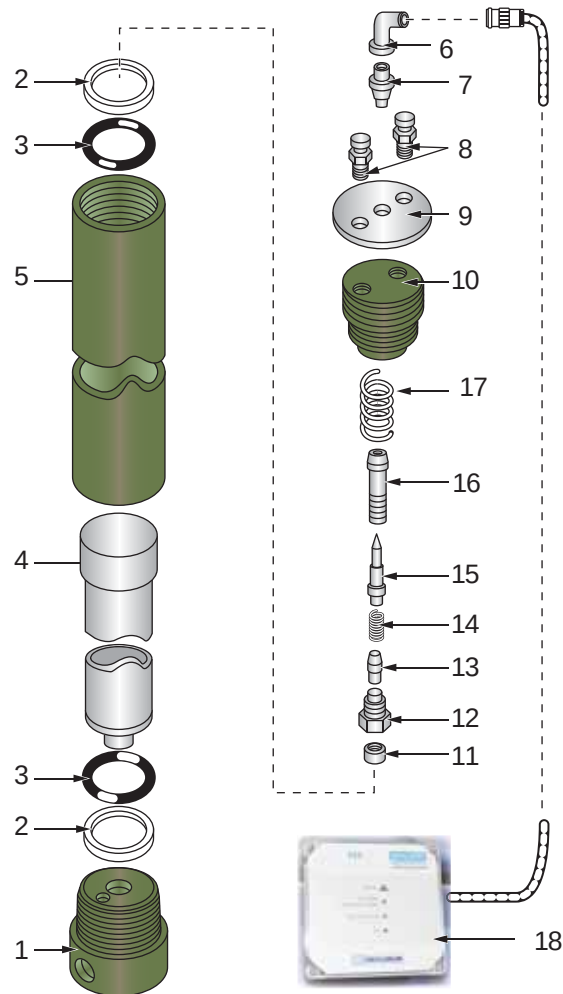
Item	Qty	Part No.	Description	Notes
1	1	079416	Oil and Water Separator	See Figure 6-8
2	1	011430	Condensate Drain Valve	
3	2	VAL-0007	Check Valves	
4	1	080144	27" Dryer Chamber	See Figure 6-9
5	1	080144	27" Purification Chamber	See Figure 6-9
—	1	080145	Securus® Chamber	See Figure 6-10
6	1	VAL-0377	Bleed Valve	
7	1	VAL-0053	Pressure Maintaining Valve	
8	1	VAL-0169	Safety Valve	
9	1	N43880	Securus® Indicator	12 - 24 VDC

Figure 6-8 Oil and Water Separator Parts List


Item	Qty	Part No.	Description	Notes
◆	1	079416	Oil and Water Separator Assembly	
1	†	...	Separator Head	Available only with 079416
2	2	N04586	O-Ring	
3	1	061860	Sintered Metal Filter	
3a	1	N15133	O-Ring	
3b	2	N04496	O-Ring, small	
3c	2	N04385	O-Ring, large	
3d	1	061858	Sleeve Element, large	
3e	1	061859	Sleeve Element, small	
3f	1	N07091	O-Ring	
3g	1	061857	Screw	
4	†	...	Separator Housing	Available only with 079416
5	†	...	Bottom Plug	Available only with 079416

Figure 6-9 27" Chamber Assembly Parts List


Item	Qty	Part No.	Description	Notes
♦	2	80144	Chamber Assembly	27"
1	2	012293	Tool Post Screw	
2	1	061237	Cover Plate	
3	†	...	Filter Head	Available only with 80144
4	2	N04736	Back-up Ring	
5	2	N04735	O-ring	
6	†	...	Filter Housing	Available only with 80144
7	†	...	Filter Bottom	Available only with 80144
8	1	058825A	Dryer Cartridge	MS (See Paragraph 6.1.5 & 6.1.6)
or	1	058827A	Purification Cartridge	MS/AC/MS/HP

Figure 6-10 Securus® Electronic Moisture Monitor System Parts List


Item	Qty	Part No.	Description	Notes
◆	1	80145	Securus® Chamber Assembly	Replaces 1 P/N 80144 in P5S
1	†	...	Bottom Plug	Available only with 80145
2	2	N04736	Backup Ring	
3	2	N04735	O-ring	
4	1	060037A	Securus® Cartridge	
5	†	...	Filter Body	Available only with 80145
6	1	ADP-0204	Adapter, Right Angle	
7	1	059850	Socket, RF type	
8	2	012293	Tool Post Screw	
9	1	06135	Cover Plate	
10	†	...	Filter Head	Available only with 80145
11	1	059855	Nut	
12	1	059852	Drawback Screw	
13	1	059854	Loose Pin	

Figure 6-10 (cont.)

Securus® Electronic Moisture Monitor System Parts List

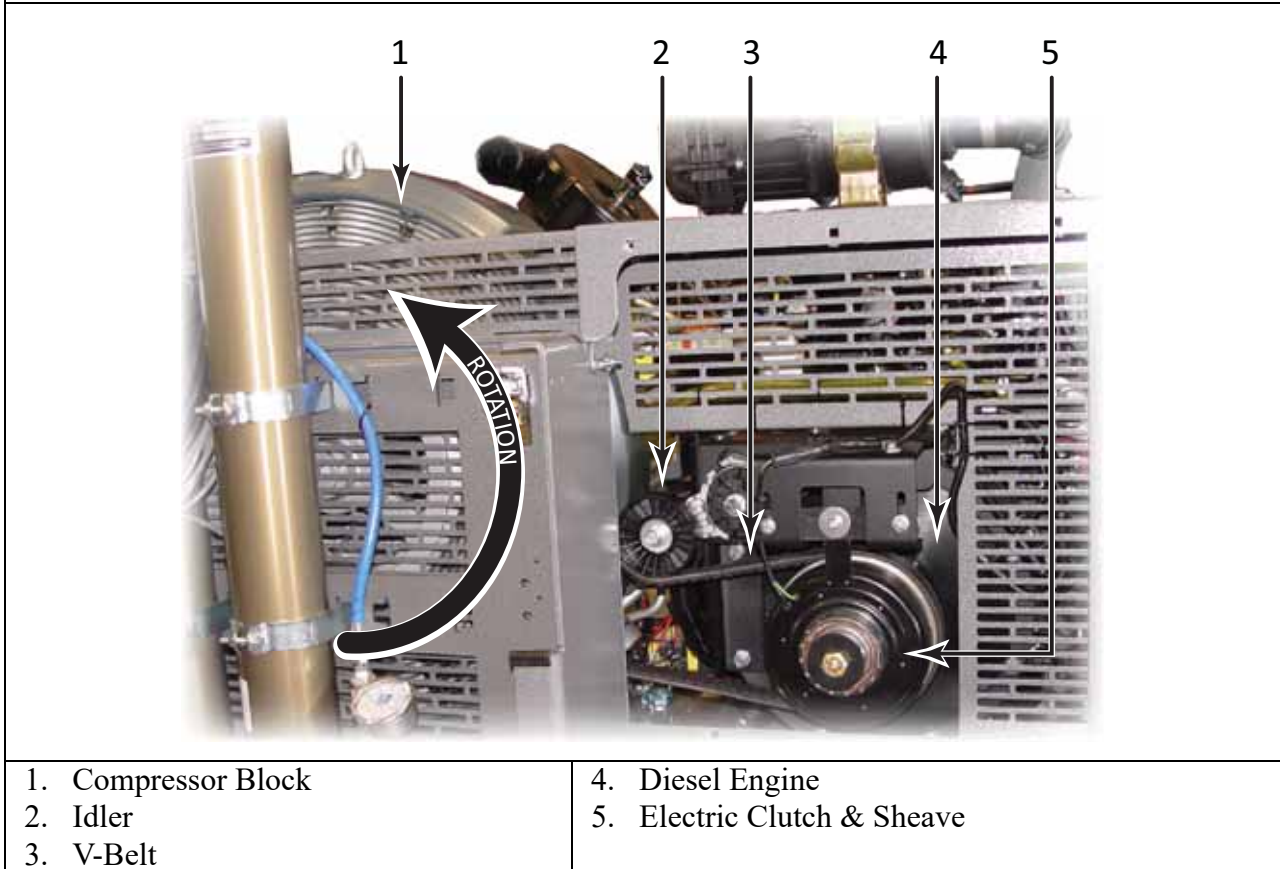
Item	Qty	Part No.	Description	Notes
14	1	060062	Compression Spring	
15	1	059853	Fixed Pin	
16	1	059851	Bolt	
17	1	002181	Compression Spring	
18	1	N43880	Securus® Indicator	12 - 24 VDC

CHAPTER 7: COMPRESSOR DRIVE SYSTEM

7.1 Description

The compressor is driven by the drive motor through a V-belt. The direction of rotation, as seen facing the flywheel, is counterclockwise. Observe the arrow on the compressor block.

Figure 7-1 Horizontal Motor Mount (typical)



7.1.1 Maintenance of the V-belts and Sheaves

7.1.1.1 Check the Sheaves

Before a new set of V-belts are installed, the condition of the sheaves should be checked. Dirty or rusty sheaves impair the drive's efficiency and abrade the cover of the belts, which results in premature failure. Worn sheaves shorten belt life as much as 50%. If the grooves are worn to the point where the belt bottoms, slippage may result and the belts may burn. If the side walls are "dished out," the bottom shoulder ruins the belt prematurely by wearing off the bottom corners.

7.1.1.2 Check the V-belt

Check the V-belt regularly for damage and wear. Replace if necessary. V-belt tension is adjusted automatically by the spring tension idler.

7.1.1.3 Check the Sheave Alignment.

(See Figure 7-2). Sheave adjustment should be checked by placing a straight edge or tight cord across the sheave faces so that it touches all four points of contact. Ordinarily, a misalignment of more than one-half of one degree (one-eighth inch in one foot) will adversely affect belt life. Improper sheave alignment pro-

duces uneven wear on one side of the belt, causes the belt to roll over in the sheave, or throws all the load on one side of the belt, stretching or breaking the cords on that side.

Figure 7-2 Checking the Sheave Alignment

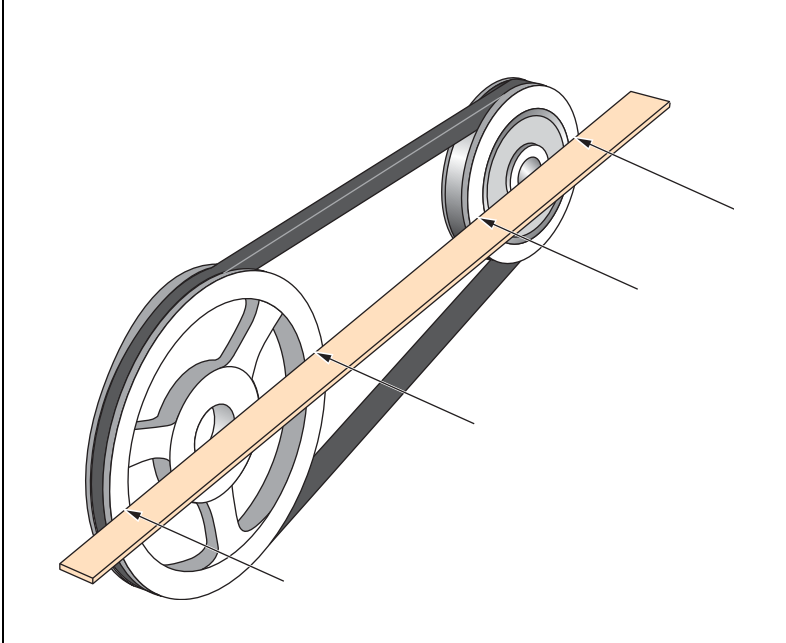
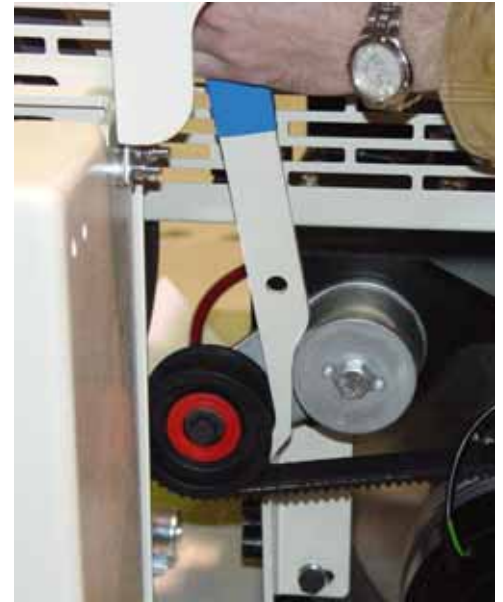


Figure 7-3 Replacing the V-belt

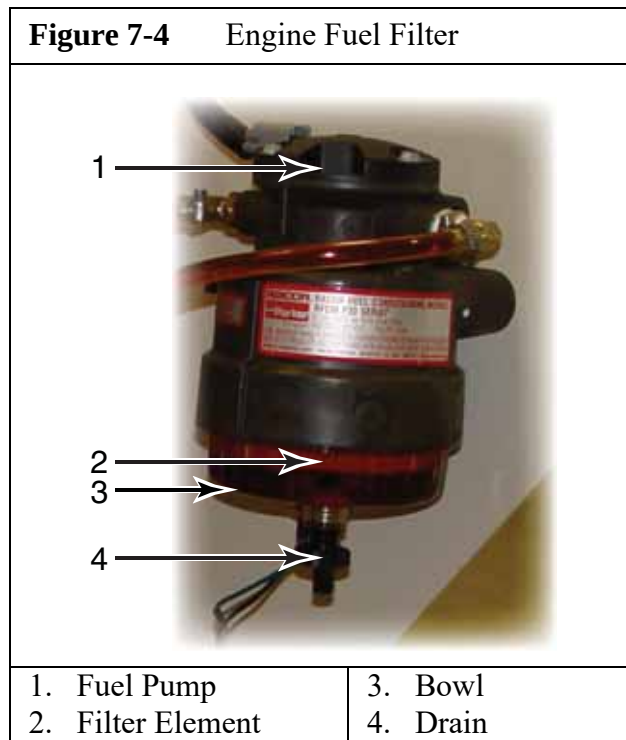


7.1.2 Replacing the V-belts.

(See Figure 7-3)

1. To replace the compressor drive belts, insert tool 51, (T00-0051 supplied with unit) as shown and pull idler away from the belt.
2. Remove the old drive belt.
3. Install the new drive belt
4. Release the tension on the idler.
5. The belt tension is preset at the factory, so there is no need for adjustment.

7.2 Diesel Engine Fuel Filter



The Diesel Engine Fuel Filter is mounted on the back side of the compressor module. (See Figure 7-4). The Engine Primer Pump is integrated into the Fuel Filter.

7.2.1 Draining the Fuel Filter.

Water is heavier than diesel fuel and different in color. Water will settle to the bottom of the bowl and must be drained before it reaches the bottom of the filter element. Open the drain (4) and operate Primer Pump (1) until clean diesel fuel comes from the drain.

7.2.2 Filter Element Replacement.

Filter Element replacement is determined by the amount of contamination present in the diesel fuel. As the Filter Element becomes clogged with contaminants the engine suffers from a noticeable power loss or hard starting. Replace the Filter Element whenever a power loss is noticed or 250 operating hours whichever comes first.



CAUTION

It is recommended that a Filter Element (Bauer P/N ELM-0188) be kept on hand at all times.

1. Drain off the fuel in the bowl by loosening the Vent Plug and opening the Drain (4).
2. Spin the Filter Element and bowl off together. Remove and clean the bowl and O-ring groove.
3. Apply a coating of clean fuel or motor oil to the new O-ring and Filter Element seal. Spin the bowl onto the new element and then spin them both onto the filter head snugly by hand.

**CAUTION**

Do Not Use Tools to Tighten the Filter Bowl

4. With the Vent Plug still loosened, operate the Fuel Pump by turning the key (ignition switch) to the run position. until fuel comes out of the Vent Plug. Close the Vent Plug, start the engine and check for leaks.

**WARNING**

Fix any leaks with the engine off.

7.3 Engine Stub Shaft Maintenance

Figure 7-5 Engine Stub Shaft



Closeup Rotated 90°



The stub shaft bearing is greased every 250 operating hours with NLGI No. 2 Grade Unleaded Extreme Pressure Lithium Grease.

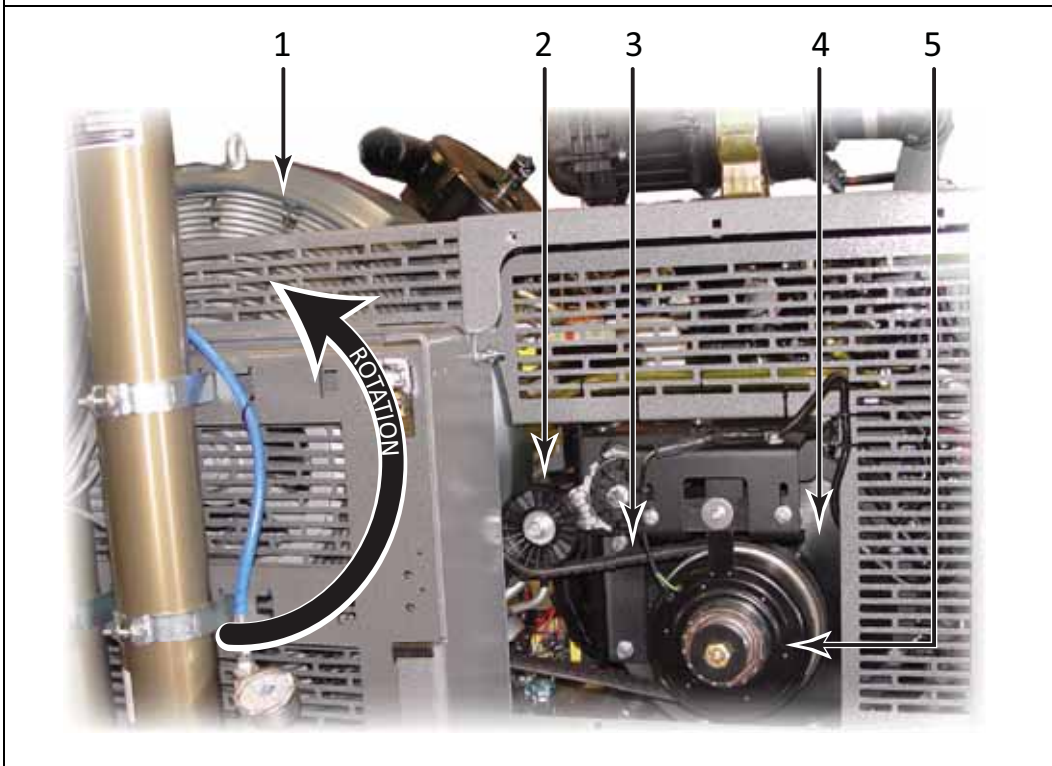
1. At the bearing housing fitting (2) apply grease until the pin in the relief valve (3) extends.
2. At the shaft end fitting (1) apply three or four pumps of the grease gun.

**WARNING**

Do not apply grease while the engine is running

7.4 Replacement Parts List

Figure 7-6 TCom Lite Drive Assembly



Item	Qty	Part No.	Description	Notes
1	1	IK 18.1 II	Compressor Block	
with	1	081709	Flywheel	(replaces stock flywheel)
2	1	IDL-0011	Idler	
3	1	BET-0161	V-belt	
4	1	ENG-0121	Diesel Engine	Mitsubishi, Tier 4
5	1	CLT-0045	Electric Clutch	24 VDC, 250 ft.lbs. torque
with	1	SHE-0283	Sheave	

7.5 Clutch Assembly

7.5.1 General

Several different models of clutch assemblies are used by Bauer Compressors. Electric and Centrifugal powered are the two main types this section will cover. Different models may vary slightly.

The purpose of the clutch assembly is to transfer power from the drive engine to the compressor block on an as needed basis. This lessens the running time and minimizes wear and tear on the compressor block.

Electric clutches are normally black and are bolted onto a separate sheave in order to rotate the V-belt. They also have an plug in connection to the electrical harness and a installation bracket.

Centrifugal clutches are normally blue and the sheave is part of the clutch assembly. There is no electrical connection or installation bracket

Figure 7-7 Electric Clutch & Sheave Assembly (typical)	Figure 7-8 Centrifugal Clutch Assembly (typical)
	

7.5.2 Theory of Operation

7.5.2.1 Electric

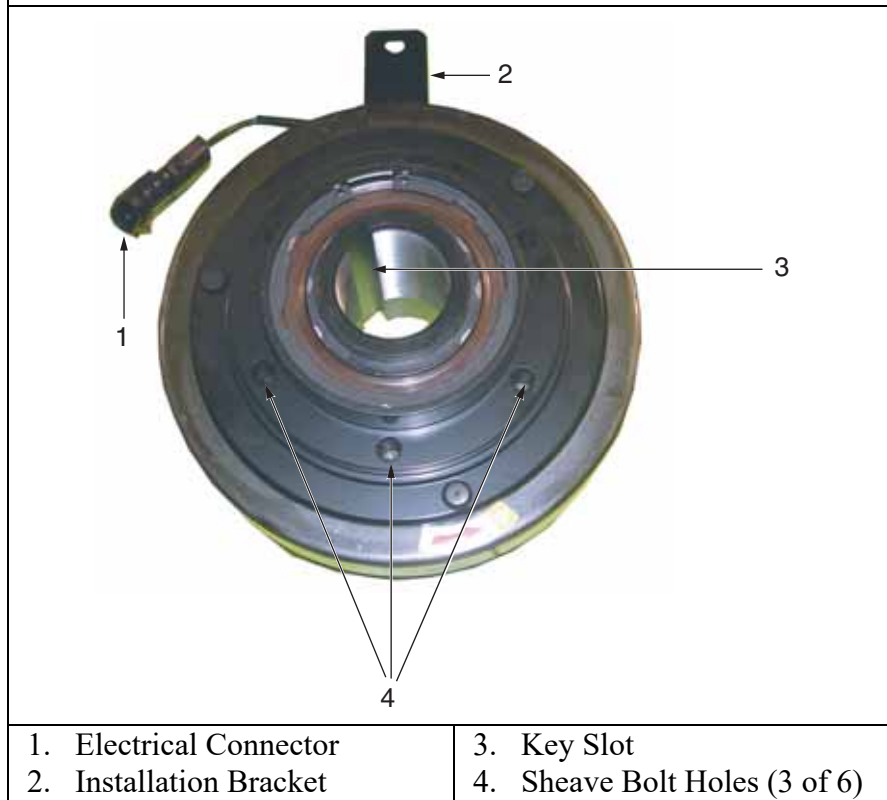
The engine's drive shaft continually rotates while the engine is running. When the final pressure falls below the lower set point of the final pressure switch an electronic signal is sent to the PLC. The PLC sends electrical power to the clutch causing the clutch to engage. The clutch engages the clutch sheave rotating it with the engine's drive shaft. The clutch sheave is connected to the compressor with the V-belt. The V-belt rotates the compressor flywheel thus powering the compressor operation. (Compressor operation is covered in Chapter 3.) Once the final air pressure reaches the upper set point of the final pressure switch another signal is sent to the PLC. The PLC turns off the power to the clutch and the clutch disengages the sheave. The engine continues to run but the compressor is no longer powered.

7.5.2.2 Centrifugal

The engine's drive shaft continually rotates at idle speed. When the throttle is applied increasing the speed of the drive shaft the clutch engages the sheave rotating it with the engine's drive shaft. The clutch sheave rotates the V-belt thus powering the compressor. When the engine's speed is reduced back to idle speed the clutch disengages the sheave and the compressor is no longer powered.

7.5.3 Component Description

Figure 7-9 Electric Clutch Assembly (typical)



7.5.3.1 Electronic Connector (electric clutch only)

The electronic connector is the pathway for power to engage the clutch. It connects to the unit electrical harness and is controlled by the units PLC.

7.5.3.2 Installation Bracket (electric clutch only)

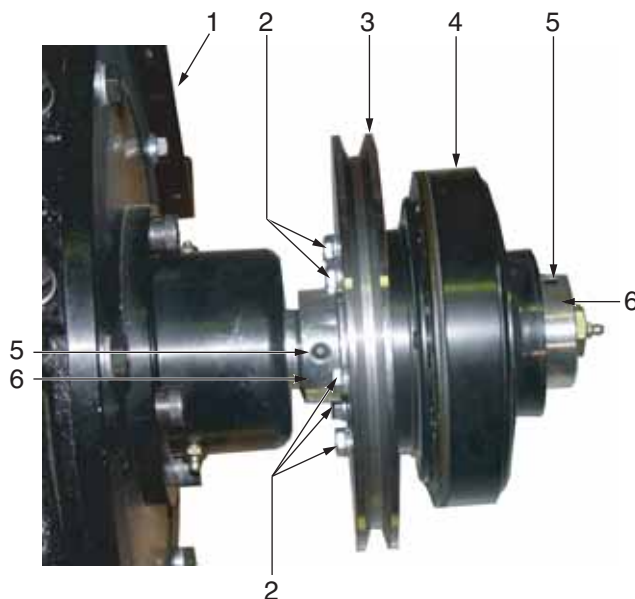
The installation bracket stabilizes the clutch on the drive shaft.

7.5.3.3 Key Slot

The Key Slot is where the engine shaft key connects the engine shaft to the inner spindle of the clutch.

7.5.3.4 Sheave Bolt Holes

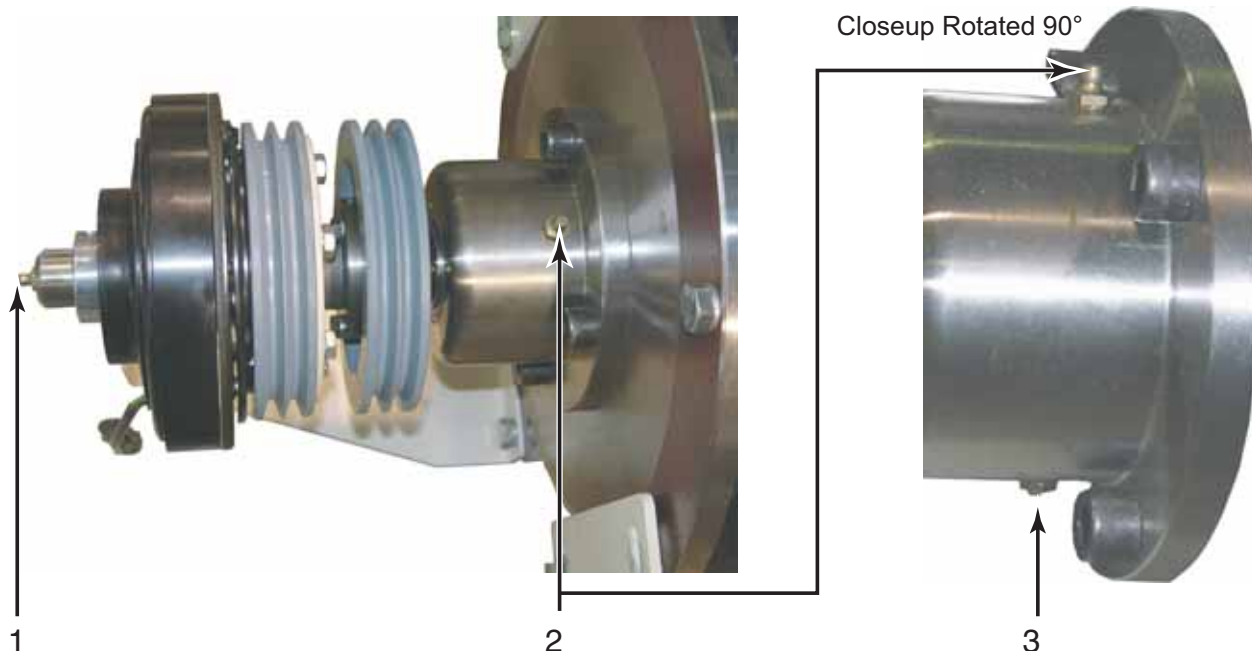
These holes are where sheave bolts connect the clutch sheave to the clutch itself.

Figure 7-10 Clutch & Sheave Assembly


- | | |
|-----------------|---------------|
| 1. Engine Block | 4. Clutch |
| 2. Sheave Bolts | 5. Set Screws |
| 3. Sheave | 6. Collars |

7.5.4 Maintenance

7.5.4.1 Engine Stub Shaft Maintenance

Figure 7-11 Engine Stub Shaft


The stub shaft bearing is greased every 250 operating hours with NLGI No. 2 Grade Unleaded Extreme Pressure Lithium Grease.

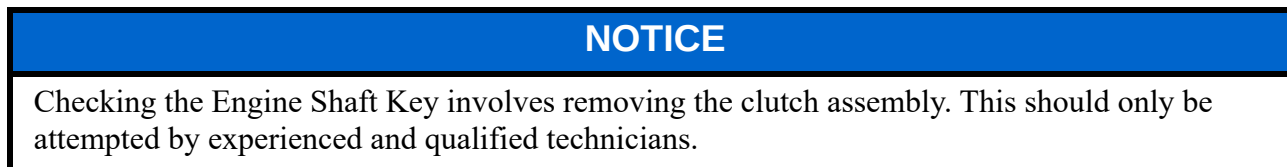
1. At the bearing housing fitting (2) apply grease until the pin in the relief valve (3) extends.
2. At the shaft end fitting (1) apply three or four pumps of the grease gun.



7.5.4.2 Clutch

No maintenance of the clutch is needed. If the clutch fails to engage, Check the following:

- Proper voltage being supplied to clutch.
- Proper condition and adjustment of V-belts.
- If Engine Drive Shaft is turning but the clutch doesn't engage when the proper voltage powers it or increased throttle is applied, check the collar set screws and engine shaft key.



- If the set screws and engine shaft key are tight and properly installed and the clutch still does not engage when proper voltage is supplied, a new clutch may be needed.

Bauer Compressors recommends ordering a new clutch from our parts department to ensure the proper clutch is supplied. Our parts department can be contacted at

Bauer Compressors, Inc.

1328 Azalea Garden Road

Norfolk, VA 23502

Telephone: 757-858-5140, 757-858-5127, or 757-858-5147

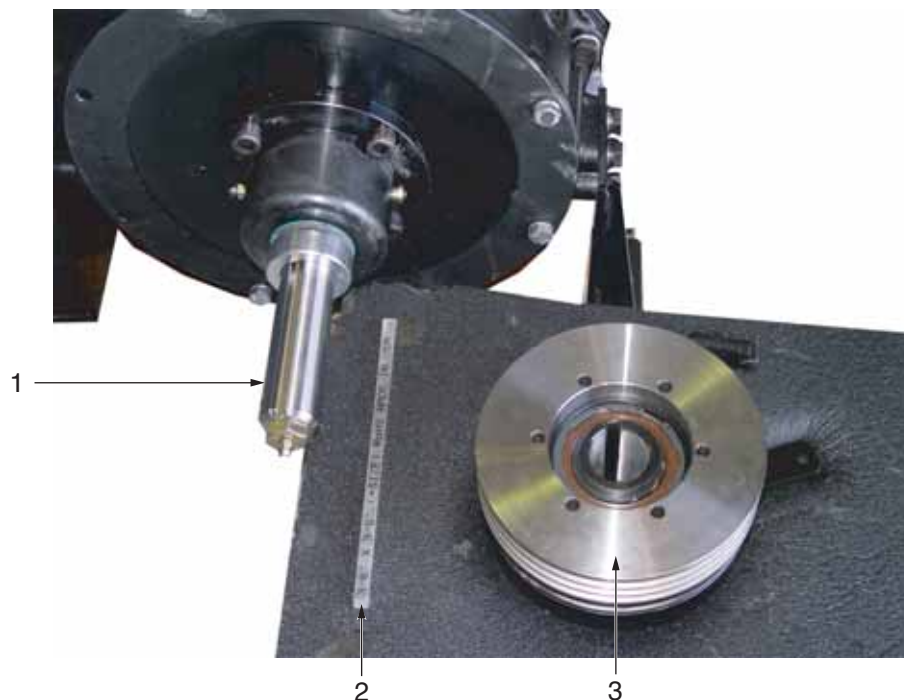
Please have the following information ready when calling:

- Compressor Model
- Compressor Serial Number or Sales Order Number
- Compressor Block Number
- Engine Make and Model if available
- Information on V-belt if available

7.5.5 Replacement Procedures

(See Figure 7-10)

Figure 7-12 Drive Shaft, Key stock & Clutch



1. Drive Shaft (note keyslot at 11 o'clock position)
2. Key Stock (to cut correct length for Key)
3. Clutch & Sheave Assembly.

1. Ensure the power to the unit is turned off.
2. Unplug the clutch's electrical connector from the wire harness. (electric clutch only)
3. Unbolt the clutch's installation bracket from the engine's mounting bracket. (electric clutch only)
4. Loosen the set screw and pull the first collar from the drive shaft.
5. Pull the clutch & sheave assembly from the drive shaft.



CAUTION

Be careful not to damage the Sheave. If the sheave is damaged it may cut into the V-belt when put back into operation.

6. Unbolt the sheave bolts from the clutch and bolt the sheave onto the new clutch. Ensure the keyslots on both the clutch and the sheave are aligned. (electric clutch only)
7. Measure the length of the keyslot of the clutch and sheave assembly. Then using the correct size key stock, cut the measured length. Clean the key of any burrs from the cutting process.
8. Clean the drive shaft and keyslot of any dirt or debris.

9. Slide the new clutch & sheave assembly onto the drive shaft.
10. Align the key slots on the drive shaft and clutch assembly. Tap a shaft key completely into the keyslot. Ensure the shaft key is snug with both the shaft and clutch assembly. There should be no play between the clutch and shaft once the key is in place. The shaft key should run the entire length of the clutch and sheave keyslots.
11. Ensure the collar behind the clutch sheave assembly is snug against the sheave and the set screw is tight.
12. Replace the collar that was removed in step 3.
13. Ensure the collar is tight against the clutch assembly then tighten the set screw.
14. Bolt the clutch's installation bracket to the engine's mounting bracket. (electric clutch only)
15. Plug the clutch's electrical connector into the wire harness. (electric clutch only)
16. Test the unit to ensure the clutch is working correctly.

7.6 Electrical Connections to Engine

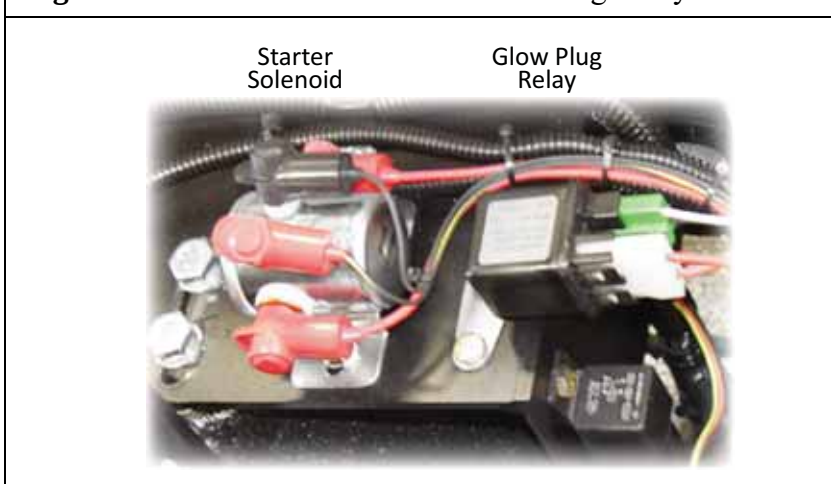
The compressor control panel also controls the drive engine. Electrical connections to the diesel engine include the glow plug relay, starter solenoid, throttle control, fuel filter/pump, alternator, coolant temperature switch, and the oil pressure switch. These connections allow the PLC to control the engine as well as monitor the engine for fault conditions.

7.6.1 Glow Plug Relay

The glow plug assists in starting the diesel engine when the engine is cold. When the engine ignition switch on the control panel is placed in the RUN (Center) position, and the temperature is below 70 °F (21 °C) the glow plugs will heat up to provide the diesel fuel with an appropriate temperature to ignite when compressed.

The glow plug relay is located on the engine bracket between the engine and compressor near the drive belt guard. It provides the electrical connection from the ignition switch to the glow plugs.

Figure 7-13 Starter Solenoid & Glow Plug Relay



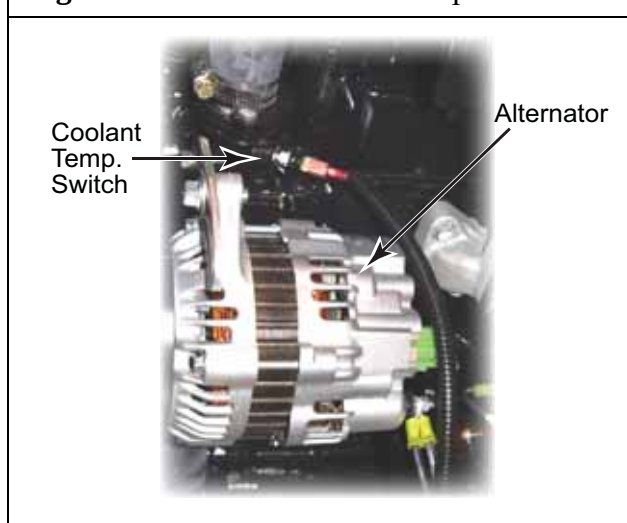
7.6.2 Starter Solenoid

The starter solenoid engages the starter when the ignition switch is placed in the START (full CW) position. It is located on the base of the unit between the engine and compressor.

Figure 7-14 Fuel Filter and Pump



Figure 7-15 Alternator & Temp. Switch



7.6.3 Fuel Filter/Pump

The fuel filter/pump is located on the drive belt guard above the engine. The fuel filter removes impurities from the diesel fuel before it enters the engines combustion chamber. The fuel pump, upper portion of the fuel filter, transfers the diesel fuel from the storage tank to the engine.

7.6.4 Alternator

The alternator is driven by the fanbelt and creates an electrical charge which is transferred to the battery. This keeps the battery charged and provides the electrical power for the unit.

7.6.5 Coolant Temperature Switch

The coolant temperature switch sends a signal back to the PLC if the coolant temperature raises above a preset level. The PLC will then note an engine fault and shutdown the unit. The unit can be restarted once the temperature has lowered below the preset limit.

Figure 7-16 Oil Pressure Switch

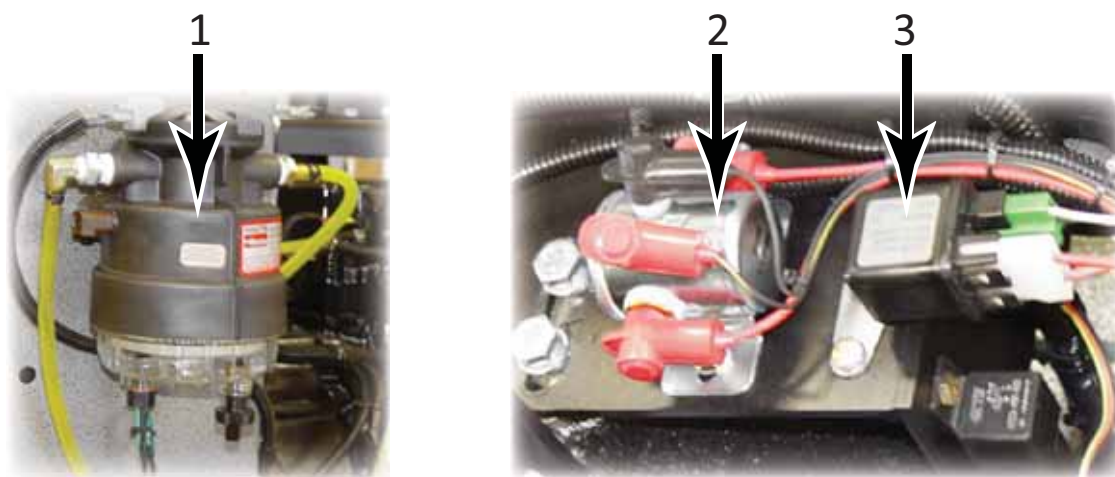


7.6.6 Oil Pressure Switch

The oil pressure switch is located towards the bottom, on the throttle side of the engine, near the fanbelt for the radiator. This switch monitors the oil pressure. If the oil pressure drops to a low level the switch will notify the PLC so the unit can be shutdown. The PLC will signal an engine fault.

7.6.7 Engine Electrical Component Parts List

Figure 7-17 Electrical Component Replacement Parts

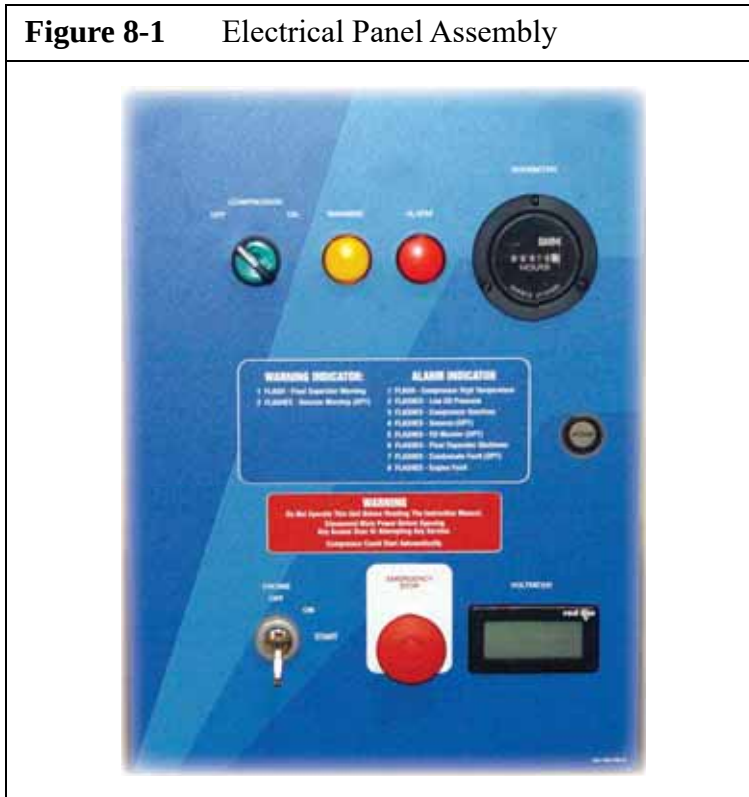


Item	Qty	Part No.	Description	Notes
1	1	FLR-0137	Fuel Filter/Pump	
with	1	ELM-0200	Filtering Element, 10 micron	replaceable filter element
2	1	SLD-0006	Starter Solenoid	
3	1	RLY-0198	Glow Plug Relay	
N.S.	1	—	Alternator	<i>refer to Engine Manual</i>
N.S.	1	—	Coolant Temperature Switch	<i>refer to Engine Manual</i>
N.S.	1	—	Oil Pressure Switch	<i>refer to Engine Manual</i>

CHAPTER 8: ELECTRICAL PANEL ASSEMBLY

8.1 Overview

Figure 8-1 Electrical Panel Assembly



The Electrical Panel Assembly uses a micro Programmable Logic Controller manufactured by Mitsubishi. The control system will provide logical control and safety shutdowns for the compressor equipment. All necessary time delays, counters, shutdowns, sequencing and safety features are incorporated into a proprietary program permanently saved into PLC memory using EEPROM technology. The panel is pre-wired and fused for a diesel engine.

The basic panel components consist of a 30 I/O PLC Controller, Fuses, Alarm and Warning Lamps, Compressor Control Switch, Hourmeter, Voltmeter, Emergency Stop Switch, Engine Ignition Switch, terminal strip for wire connections and wire harness.

To operate the compressor refer to Chapter 2, Operations. Once the engine is running if the pressure in the system is below approximately 4500 psi¹, the air pressure switch will close, and the compressor will start. All other functions of the compressor are automatic. When the air pressure has increased, and the pressure switch opens, then the Diesel engine will idle and compressor will shutdown. All of these functions are accomplished through the use of a Programmable Logic Controller.

8.2 Options

This panel will electrically support all commonly available compressor options offered by Bauer Compressors. These include:

- The Securus® Electronic Moisture Monitoring System monitors the air, and provide first a warning, and later an alarm, to prompt the operator to replace the high pressure purification cartridges.

1. The pressure mentioned is only an example; the switch differential is approximately 10% of the set-point, and is not adjustable.

- The Carbon Monoxide Monitor is used to continuously sample the air that is compressed for use in the system. Again, the unit will alarm and shut down the compressor if unsafe levels are detected. The Carbon Monoxide Monitor also comes with a Calibration Kit to ensure accurate readings are being taken.
- The Audible Alarm consists of 90 dB alarm mounted to the electric panel door. This would come on in conjunction with the Alarm Light.
- The Condensate High Level Alarm will alarm and shutdown the compressor when the condensate level becomes too high. This Alarm is activated by a float switch in the ACD Condensate Collection Tank. This alarm prompts the operator to drain the condensate and prevents spilled condensate.

8.3 Power Requirements

The panel will be supplied with the appropriate voltage by an on board battery and alternator.

The pre-wired panel specifications are written on a label (See Figure 8-2) on the inside of the electrical panel door. In this example shown, the panel is wired for 230 volt, single phase. If a schematic for your machine is not found inside the electrical panel, then please call Bauer Compressors Product Support Group for a replacement. Please have the Serial number of the compressor available; it is written on the same label.

Figure 8-2 Electrical Panel Label

 NORFOLK, VA 23502 USA 757-855-6006		MODEL:	
		SERIAL:	43857
		BLOCK:	
		MFG DATE:	2/2004
PANEL: ASY-0819		UL File No. E109698	
MAXIMUM RATING (AC3)			
600 VAC Max. 1 Ph 60Hz		600 VAC Max. 3 Ph 60Hz	
120V	230V	208V	230V 460V
N/A	10HP	N/A	N/A N/A
N/A	42A	N/A	N/A N/A
60/75° C COPPER WIRE ONLY			
Terminal	Wire Range	Torque	
Line	awg 10-3	45 in-lb	
Load	awg 10-0	100 in-lb	
Ground	awg 14-2	35 in-lb	

8.3.1 Fuses

The panel is fitted with seven fuses.

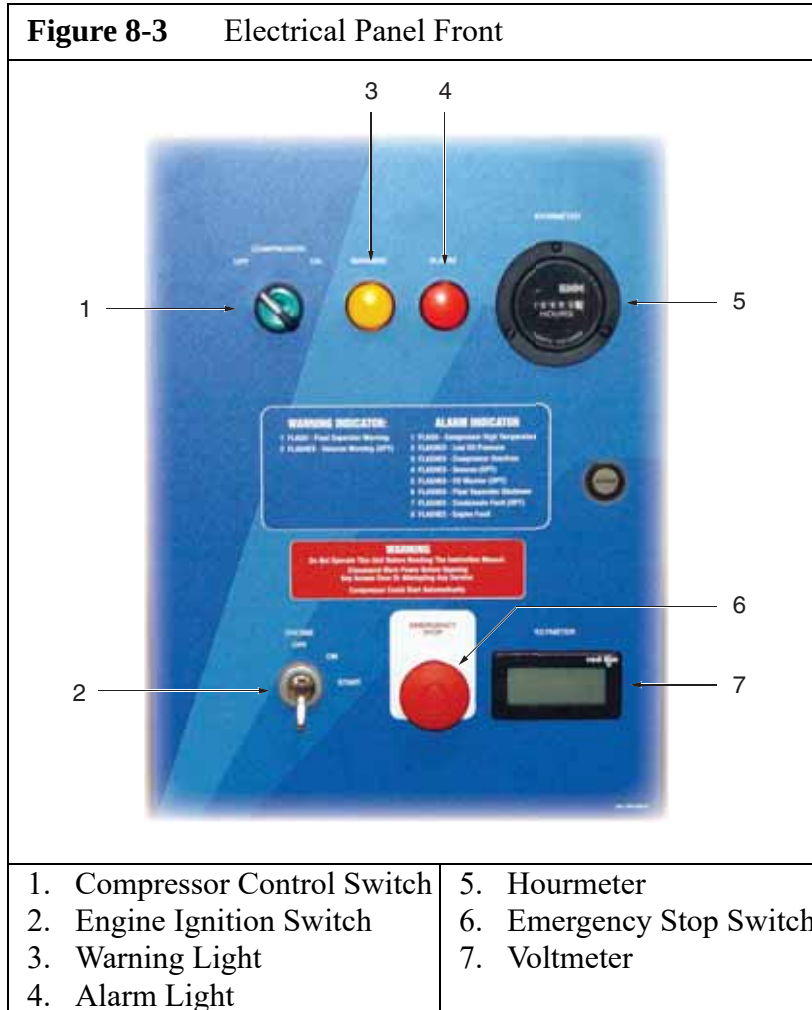
8.3.2 Emergency Stop Switch.

There is a Emergency Stop Switch on the panel. This is a 22 mm device with a 40 mm mushroom head. The button must be pulled out for the unit to operate. In an emergency, depress the push button, which will shutdown the diesel engine and all other periphery devices. Do not use the Emergency Stop Switch for securing the equipment under normal operation. Use the Compressor Control Switch and Engine Ignition Switch.

8.3.3 Compressor Control Switch

OFF Position - The selector switch must be in the OFF position when securing the compressor system.

ON Position - The selector switch must be in the ON position to operate the compressor system. The compressor will start and stop automatically based on the status of the pressure switch.



8.3.4 Indicator Lamps

8.3.4.1 PLC Warning and Alarm Lamps

8.3.4.1.1 Warning Lamp - Amber

The lamp (LIT-0107) has a 22 mm base and a LED lamp for long trouble free life. This lamp should flash a code IAW, In Accordance With, the logic of the controller.

8.3.4.1.2 Alarm Lamp - Red

The lamp (LIT-0128) has a 22 mm base and a LED lamp for long trouble free life. This lamp should flash a code IAW the logic of the controller.

8.3.5 Hourmeter

The panel will be supplied with an hourmeter (HMR-0029). The hourmeter is not resettable and used to monitor the run hours of the compressor.

8.3.6 Voltmeter

The panel will be supplied with an voltmeter (GAG-0151). It shows the voltage supplied by the battery.

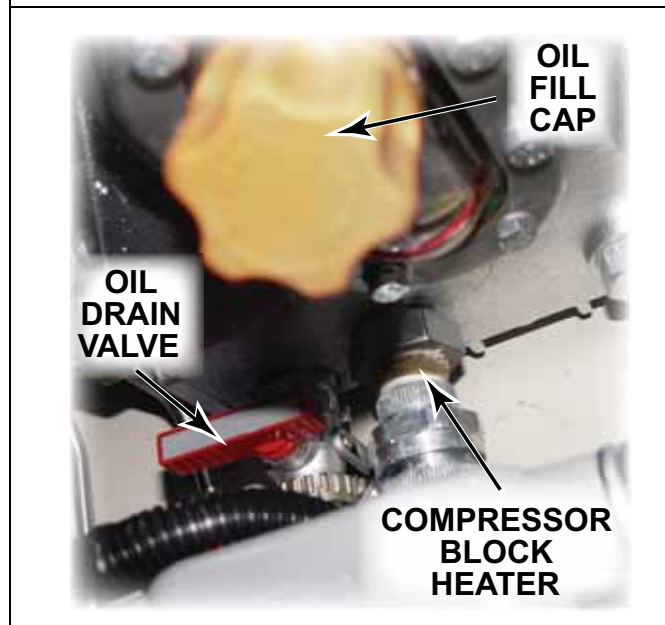
8.3.7 Cold Weather Option

One option available when ordering the unit is a cold weather option. This consists of a compressor block heater and an engine coolant heater, both are powered by an external electrical connection. The standard electrical plug for this option is normally under the compressor control panel in the front.

8.3.7.1 Compressor Block Heater (See Figure 8-4)

This unit may be equipped with an optional block heater (HTR-0112) for the compressor crankcase. This heater operates when the unit is powered on and the block temperature is below 40 °F. The compressor block heater is a cold weather option to keep the compressor block within its operational temperature.

Figure 8-4 Compressor Block Heater



8.3.8 PLC Control

This panel is controlled with a Mitsubishi 30 I/O Programmable Logic Controller. This unit provides logical operations to the overall system that includes the high pressure compressor, purification systems, and other accessories.

8.3.8.1 PLC LEDs

There are three separate groups of LEDs on the PLC.

1. The Input Status LEDs are in the top row.
2. The Output Status LEDs are on the bottom row
3. The PLC Status Lights are on the left hand side and indicate the following.
 - a. POWER - The supply voltage to the PLC is correct.
 - b. RUN - On when the program is running. Off when program execution is stopped.
 - c. PROG E - Program Error
 - d. CPU E - CPU Error



8.3.9 PLC Inputs and Outputs

All PLC inputs are 12 VDC. The power supply physically exists inside the PLC. All PLC outputs are of a relay type. Please refer to unit schematic for the as built specifications.

Table 8-1: PLC Inputs -

X1	High Temperature Switch
X2	Oil Pressure Switch
X3	Final Air Pressure Switch
X4	Carbon Monoxide Monitor Alarm
X5	Securus® Alarm
X6	Condensate Alarm
X7	Securus® Warning
X11	Engine Ignition On
X12	Engine Fault Alarm
X16	Engine Fault Alarm
X17	Compressor Control Switch

Table 8-2: PLC Outputs -

Y2	ACD Final
Y3	Alarm Indicator
Y6	Warning Indicator
Y7	Hourmeter & Clutch Relay
Y10	Speed Module
Y13	Fuel Pump & Run Solenoid
Y14	Glow Plug Relay
Y15	ACD 1

8.4 Installing a new program using an EEPROM cartridge

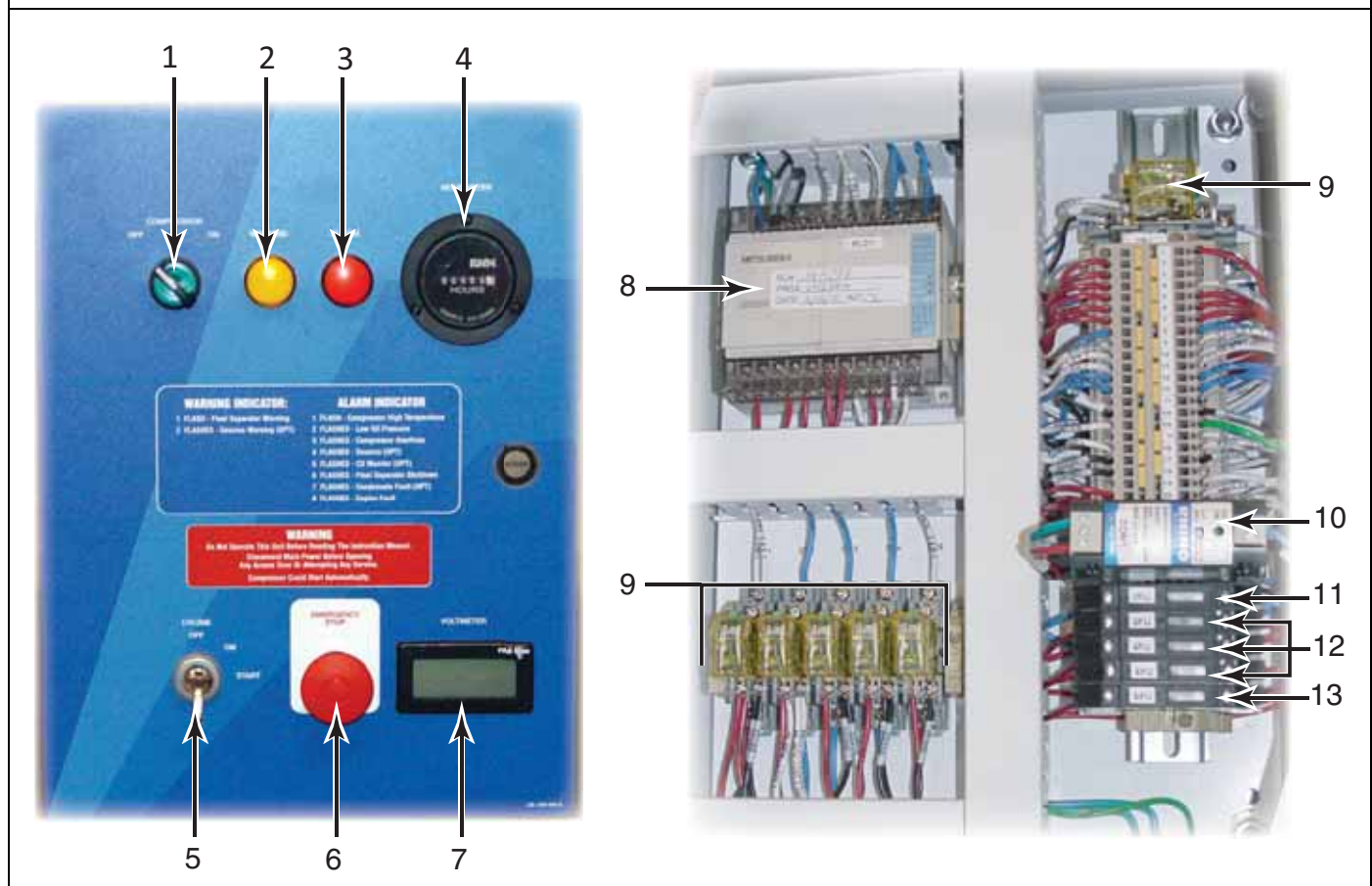
1. Disconnect main power to your unit
2. Open the electrical enclosure door
3. Open the bottom terminal cover on the Twido controller
4. Remove the cartridge cover
5. Push the EEPROM cartridge into the cartridge connector until it “clicks”.
6. Close the terminal cover.
7. Reconnect main power to the unit.
8. Pull out the Emergency Stop push button and wait 10 seconds for the PLC to boot up.
9. Push the Emergency Stop push button in and wait 5 seconds.
10. Pull out the Emergency Stop push button again waiting 10 seconds for the PLC to boot up again.
11. Push in the Emergency Stop push button and wait 5 seconds
12. Disconnect main power to your unit
13. Remove the EEPROM cartridge
14. Replace the cartridge cover
15. The new program is now installed.

8.5 Wire Harness Connections

Device	Description	PLC In	PLC Out	Wire Colors	Pin
1TS	Compressor High Temp. Switch	X1	—	Yellow	23
				Violet	24
2PS	Compressor Oil Pressure Switch	X2	—	Blue	25
				Orange	26
1PS	Compressor Air Pressure Switch	X3	—	Red	29
				Brown	30
CA	Condensate High Level Switch	X6	—	Gray	31
				Pink	32
CO	CO Monitor Power	—		Blue/White	4
	Neutral	—		Red/Yellow	28
SV 1	CO Monitor Solenoid Valve	—	—	Red/Orange	11
	Neutral	—		Violet/White	6
COA	CO Monitor Alarm Contact	X4	—	Red/White	34
				White/Black	33
SEC	Securus® Power	—		Black	3
	Neutral	—		White	15
SW	Securus® Warning Contact	X7	—	Black/Orange	37
	Common	—		Violet/Orange	36
SA	Securus® Alarm Contact	X5	—	Black/White	35
ACD1	Automatic Condensate Drain # 1	—	Y1	Blue/Orange	20
	Neutral	—		White/Orange	27
ACDF	Final ACD Coil		Y2	White/Violet	10
	Neutral	—		Gray/White	22
SCM	Speed Control Module		Y10	White/Yellow	12
RS	Run Solenoid		Y13	Red/Blue	14
GPR	Glow Plug Relay		Y14	Orange/White	18
FP	Fuel Pump		Y13	Violet/Black	
SSR	Starter Solenoid Relay Power	—		Brown/Yellow	16
WTS	Water Temp. Switch Neutral	—		Black/Yellow	2
3PS	Engine Oil Pressure Neutral	—		Brown/White	1

8.6 Replacement Parts List

Figure 8-5 Electrical Panel



Item	Qty	Part No.	Description	Notes
◆	1	ASY-0953	Electrical Panel	
1	1	SWT-0241	Control Switch	2 Position
2	1	LIT-0138	Light Assembly	Amber
—	1	LIT-0092	Lamp, LED, Amber	
3	1	LIT-0139	Light Assembly	Red
—	1	LIT-0105	Lamp, LED, Red	
4	1	HMR-0032	Hourmeter	
5	1	SWT-0044	Ignition Switch	
6	1	SWT-0244	Emergency Stop Switch	
7	1	GAG-0151	Voltmeter	
8	1	CNT-0060	PLC Controller	30 I/O
9	6	RLY-0160	Circuit Relay	
10	1	SPL-0079	Power Supply	
11	1	FUS-0106	Fuse, 3 Amp	
12	3	FUS-0130	Fuse, 5 Amp	
13	1	FUS-0012	Fuse, 10 Amp	

8.7 Trouble Shooting Guide

8.7.1 Compressor Will Not Start

Possible Cause or Problem	Corrective Action
Emergency Stop Switch not pulled out.	Pull out Switch.
Selector Switch not in ON position.	Turn switch to ON.
Lights on PLC not illuminated	Check voltage and phases
Air Pressure not low enough to close pressure switch.	PLC input I3 should be illuminated.

8.7.2 Compressor Is Shutdown, Alarm Code Flashing Sequence.

8.7.2.1 One Flash - Compressor High Temperature

Investigate or Possible Cause	Corrective Action
Compressor is hot	Improve compressor ventilation
Temperature switch electrical connector unplugged	Reconnect plug
Temperature switch failure, check that PLC Input I1 is on.	Replace High Temperature Switch

8.7.2.2 Two Flashes - Compressor Low Oil Pressure

Investigate or Possible Cause	Corrective Action
Low Oil Pressure after oil and filter change.	Restart 1 or 2 more times.
Check Oil Pressure with Gauge, if lower than specified	Check Oil Level
	Replace Oil Filter
	Check Compressor Rotation Direction
Check Oil Pressure with Gauge, if in specified range	Reset Pressure Switch

8.7.2.3 Three Flashes - Compressor Overtime

Investigate or Possible Cause	Corrective Action
The compressor is shut down after 5 hours of continuous operation	Turn Compressor Control Switch to OFF then back to ON.

8.7.2.4 Four Flashes - Securus® Alarm

Investigate or Possible Cause	Corrective Action
Securus® Cable disconnected	Reconnect Securus® Cable
Securus® Cartridge saturated or expired.	Replace all purification system cartridges

8.7.2.5 Five Flashes - Carbon Monoxide Monitor Alarm

Investigate or Possible Cause	Corrective Action
Monitor is not operating with proper pressure and flow	Adjust as required.
Monitor is not properly calibrated	Calibrate Monitor
If above checks are okay	Replace Purifications Cartridges ^a

a. A typical source of carbon monoxide is engine exhaust. Ensure compressor intake is from a fresh air source to prevent premature consumption of the purification cartridges.

8.7.2.6 Six Flashes - Final Separator Shutdown

Investigate or Possible Cause	Corrective Action
Final Separator has reached maximum number of Pressurization Cycles.	Replace Final Separator

8.7.2.7 Seven Flashes -Condensate Fault

Investigate or Possible Cause	Corrective Action
Check Condensate Level, if full	Drain and properly dispose of Condensate Tank contents.
Check Condensate Level, if not full	Clean switch.
If above checks are okay	Replace switch

8.7.2.8 On Steady - Motor Over load Trip	
Investigate or Possible Cause	Corrective Action
Check motor starter for tripped indication	Allow some time to cool, push reset button
Check motor current	Compare to motor current to FLA on motor nameplate
Check setting of Overload Relay to motor FLA	Adjust Overload Relay setting.

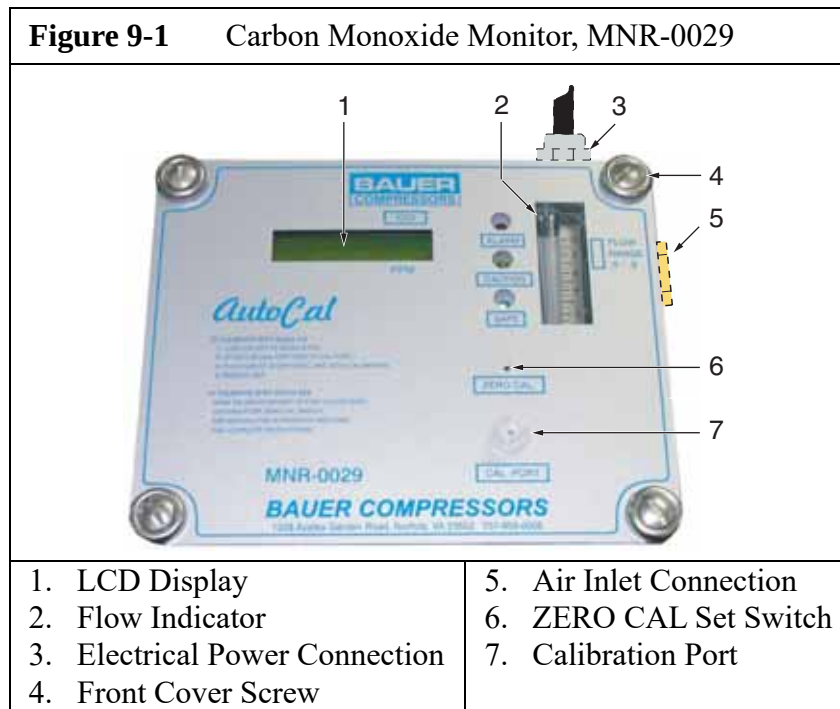
8.7.2.9 Eight Flashes - High Inlet Pressure (Gas Compressors Only)	
Investigate or Possible Cause	Corrective Action
Compressor Inlet Pressure to High	Adjust pressure of feed gas
	Check setting of Inlet Pressure Switch

8.7.2.10 Nine Flashes - Low Inlet Vacuum (Gas Compressors Only)	
Investigate or Possible Cause	Corrective Action
Inlet Pressure to compressor to low	Check operation of Inlet Solenoid Valve.
	Adjust feed rate of feed gas
	Check setting of switch

CHAPTER 9: CARBON MONOXIDE MONITOR

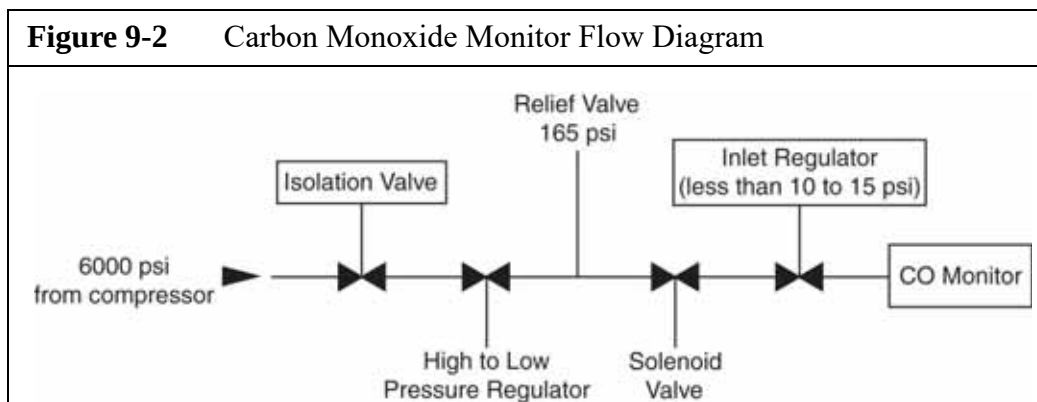
9.1 Description

- The Carbon Monoxide (CO) Monitor is designed to provide continuous monitoring of the carbon monoxide levels in breathing air.
- The Carbon Monoxide Monitor is enclosed in a NEMA-4X case and operates on 12 VDC or 120 VAC.
- Calibration adjustment is performed automatically by the internal microprocessor.
- The Carbon Monoxide Sensor Cell has a life expectancy of one and a half to three years if the calibration check is done every 30 days as recommended.



9.1.1 Component Description

The following are the major components for the standard and trailer Carbon Monoxide Monitor Assembly installations. See Figure 9-2.



9.1.1.1 Isolation Valve

Controls the input of air from the compressor to the Carbon Monoxide Monitor.

9.1.1.2 High Pressure to Low Pressure Regulator

Typically set for 50 psi out with 5,000 psi in.

9.1.1.3 Relief Valve

A relief valve which is factory set to 165 psi to prevent over-pressurization of the Carbon Monoxide Monitor.

9.1.1.4 Solenoid Valve

Allows air to flow to the CO Monitor when the compressor is running.

9.1.1.5 Inlet Regulator

A regulator the operator uses to set the appropriate rate of flow (0.5 to 0.8 SCFH) to the Carbon Monoxide Monitor.

9.1.1.6 Carbon Monoxide Monitor

The Carbon Monoxide Monitor contains the LCD Display, Flow meter, Microprocessor, Carbon Monoxide Sensor Cell, Air Inlet Connection and the Calibration Port.

9.1.1.6.1 Carbon Monoxide Sensor Cell.

The Carbon Monoxide Sensor Cell is an electrochemical element inside the Carbon Monoxide Monitor which senses the amount of Carbon Monoxide in the airstream and produces an analog electrical signal for the control and display functions of the Carbon Monoxide Monitor.

9.1.1.7 Test Gas Storage

This provides a place to keep Calibration Gas bottles so that the Carbon Monoxide Monitor can be calibrated in all situations. Normally these are only found only in trailer installations.

9.2 Carbon Monoxide Monitor Setup

The initial setup of the Carbon Monoxide Monitor is done prior to shipping the unit.

9.3 Operation

1. Start the compressor unit.
2. The LCD Display will show introductory messages and a warm up countdown (WARM XX).
3. After the warm up countdown of 120 seconds, the instrument will display Carbon Monoxide level readings.
4. The Inlet Regulator may be adjusted at any time to set the flow level from 0.5 to 0.8 SCFH on the Flow Indicator.
5. If the compressor is not running then a LOW FLOW indication will show on the display.
6. If carbon monoxide readings remain high or below zero calibration may be needed.

9.4 Maintenance

9.4.1 Calibrating Carbon Monoxide Monitor.

NOTICE

Calibration is recommended every thirty days.

1. Before calibration, be sure that the test gas bottles in the calibration kit have an adequate amount of gas in the them. Attach the fixed flow regulator to the gas bottle and then detach it. You should hear a slight popping sound.
2. Turn on the compressor unit. The compressor itself does not have to run, because the test gas is being substituted for the air supply from the compressor.
3. The compressor unit power needs to be applied to the unit for 15 minutes so the unit can stabilize. If you attempt to calibrate before the end of this 15 minute period, **TO SOON** will appear on the LCD Display.
4. Close the isolation valve by turning it counterclockwise until it stops. This will ensure that the air flow from the compressor unit is shut off.
5. If the gas flow from the compressor unit was not shut off, a message **SUPPLY OFF** will appear. If this message appears, shut off the supply air and then begin the calibration process again.
6. Connect the Zero Gas bottle to the Fixed Flow Regulator and connect it to the Calibration Port of the Carbon Monoxide Monitor.
7. Turn the valve on the Fixed Flow Regulator counterclockwise until the Carbon Monoxide Monitor Flow Indicator shows between 0.5 and 0.8 SCFH.
8. Depress the ZERO CAL Set Switch on the front of the Carbon Monoxide monitor with a paper clip for one to five seconds. The Display should read **ZERO CAL** and will count down from 60 seconds. At the conclusion, the display prompts, **REMOVE ZERO GAS**.
9. Turn the valve on the Fixed Flow Regulator clockwise until it is closed and disconnect it from the Calibration Port.
10. Disconnect the Zero Gas bottle and connect the 20 ppm Carbon Monoxide Test Gas 20 ppm Carbon Monoxide to the fixed flow regulator and connect it to the Calibration Port of the Carbon Monoxide Monitor.
11. Turn the value on the Fixed Flow Regulator counterclockwise until the Carbon Monoxide Monitor Flow Indicator shows between 0.5 and 0.8 SCFH.
12. The Display will count down from 60 seconds. At the conclusion, the display will prompt to **REMOVE CARBON MONOXIDE GAS**.
13. Turn the valve on the Fixed Flow Regulator clockwise until it is closed and disconnect it from the Calibration Port and disconnect the 20 ppm Carbon Monoxide Test Gas bottle from the fixed flow regulator.
14. Allow 10 minutes for the remaining gas in the Carbon Monoxide Sensor Cell to dissipate after the calibration process.

NOTICE

If the compressor is started before the test gas dissipates, it could lead to incorrect Carbon Monoxide level readings.

15. Turn the compressor on, adjust Inlet Regulator to 0.5-0.8 SCFH to restore normal operations.

9.4.2 Troubleshooting a Calibration Failure

If the unit fails to calibrate, it maybe due to low pressure in Test Gas Bottles, mixing up the Test Gas Bottles during calibration or an aging Carbon Monoxide Sensor Cell.

1. Ensure the Test Gas supply is adequate. See Paragraph 9.4.1 Step 1.
2. Reinitialize the Carbon Monoxide Monitor by depressing the ZERO CAL Set Switch, for approximately 30 seconds, until INITING displays in the LCD. This will allow for a greater percentage of compensation for the gas.
3. If the Test Gas is good and the Carbon Monoxide Monitor still refuses to calibrate, replace the Carbon Monoxide Sensor Cell. See Paragraph 9.4.3.
4. If it still doesn't calibrate, contact factory.

Figure 9-3 Basic Calibration Kit & Test Gas Cylinders



9.4.3 Carbon Monoxide Sensor Cell Replacement

(See Figure 9-5)

When Carbon Monoxide test gas fails to show a gas response during calibration, a new Carbon Monoxide Sensor Cell is required. Most Carbon Monoxide Sensor Cells will last from one and a half to three years. After installing a new Carbon Monoxide Sensor Cell, an initialization step permits the Carbon Monoxide Sensor Cell to be calibrated to zero regardless of the background air. Caution must be taken that the inlet air is free of carbon monoxide or an Impurity Free Air test gas is used for the initial calibration.

1. Disconnect the power from the unit.

**CAUTION**

Be sure the power is disconnected from the unit.

2. Remove the four corner screws and open the Carbon Monoxide Monitor front cover.
3. Remove the screws that hold the Carbon Monoxide Sensor Cell cover.
4. Remove the Carbon Monoxide Sensor Cell from its socket by pulling it up from the circuit board.
(See Figure 9-5)
5. Install a new Carbon Monoxide Sensor Cell.

**CAUTION**

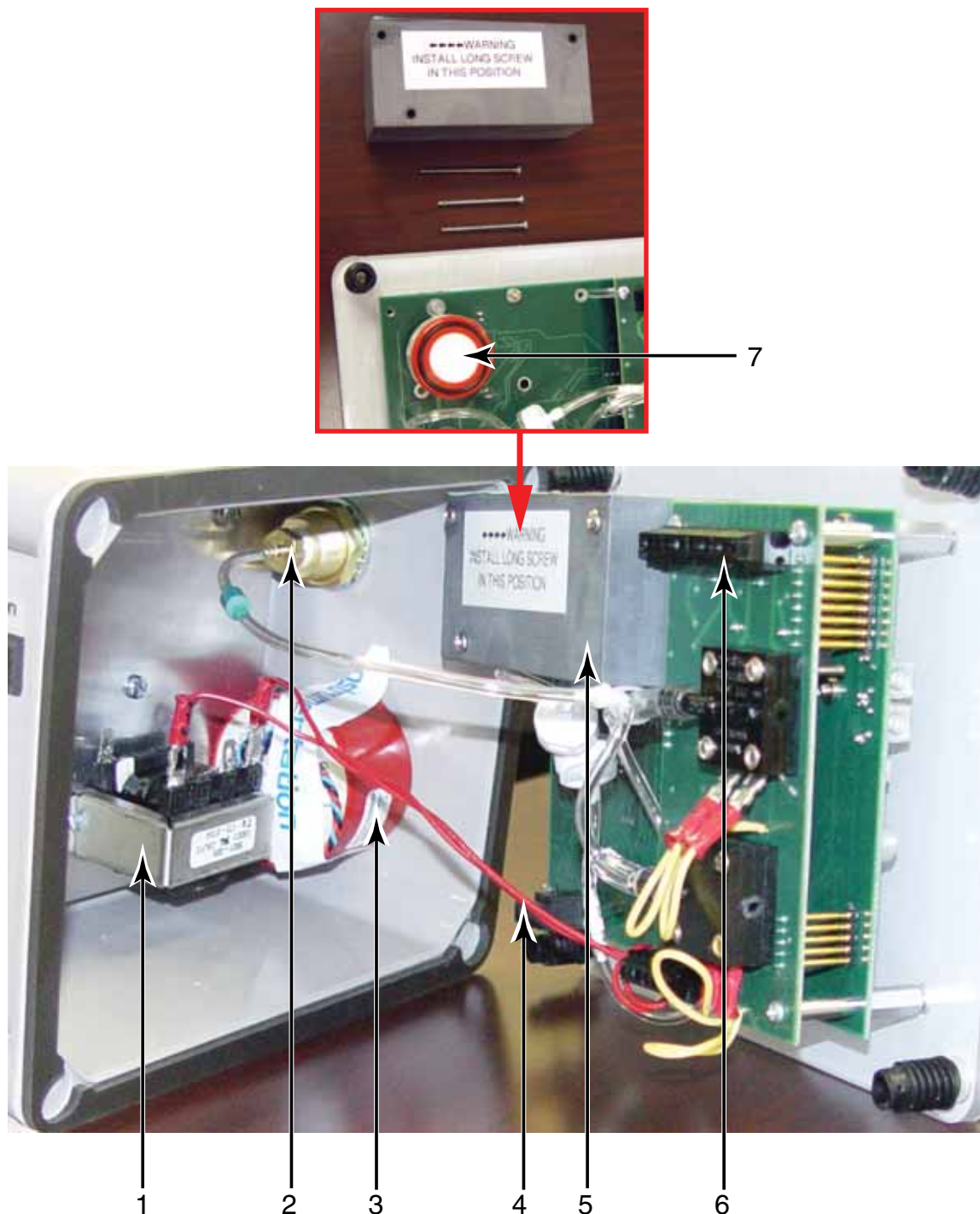
Be sure the shorting wire is removed from the new Carbon Monoxide Sensor Cell.

6. Replace the Carbon Monoxide Sensor Cell Cover, ensuring the longer screw is in its indicated hole.
7. Reassemble the Carbon Monoxide Monitor and reconnect to power.
8. Let the new Carbon Monoxide Sensor Cell warm-up for an hour before doing the initial calibration.
9. See Paragraph 9.4.1 for Carbon Monoxide Monitor calibration procedures.

9.4.4 Calibration Initialization

The Carbon Monoxide Monitor Calibration Initialization follows the same instructions as regular 30 day calibration check (See Paragraph 9.4.1).

Calibration of the Carbon Monoxide Monitor will need to be done if the 30 day calibration check is due or any maintenance on the internal components of the Carbon Monoxide Monitor and/or Remote Display was performed.

Figure 9-4 Carbon Monoxide Monitor Internal Components

- | | |
|---|--------------------------------------|
| 1. Power Connection | 5. Carbon Monoxide Sensor Cell Cover |
| 2. Gas Inlet | 6. Alarm Connections |
| 3. Audible Alarm (not used) | 7. Carbon Monoxide Sensor Cell |
| 4. Remote Display Connection (not used) | |

Figure 9-5 Carbon Monoxide Sensor Cell Removal

9.4.5 Carbon Monoxide Monitor Test Mode Buttons



CAUTION

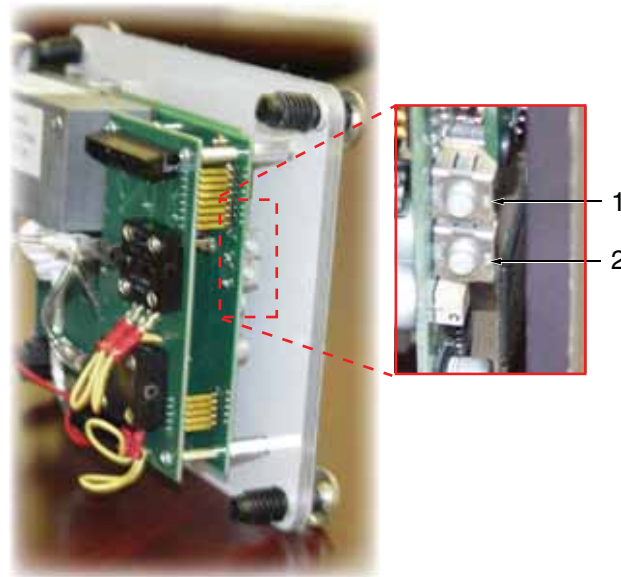
Except for the Carbon Monoxide Sensor Cell, all internal Carbon Monoxide monitor parts are to be serviced only by the manufacturer.

Do not adjust factory settings with the setup menu Mode Buttons unless absolutely necessary and by a trained technician. The only reason to access the setup information is to test the alarm relay interface of the control system which simulates the compressor going into an alarm state. The following describes how to access the TEST MODE.



CAUTION

Except for testing the Display LCD, adjusting the parameters set at factory incorrectly could be dangerous.
Adjustment, if necessary, must be done by a trained technician

Figure 9-6 Mode Buttons Close-up

1. Mode Scroll Button

2. Value Change Button

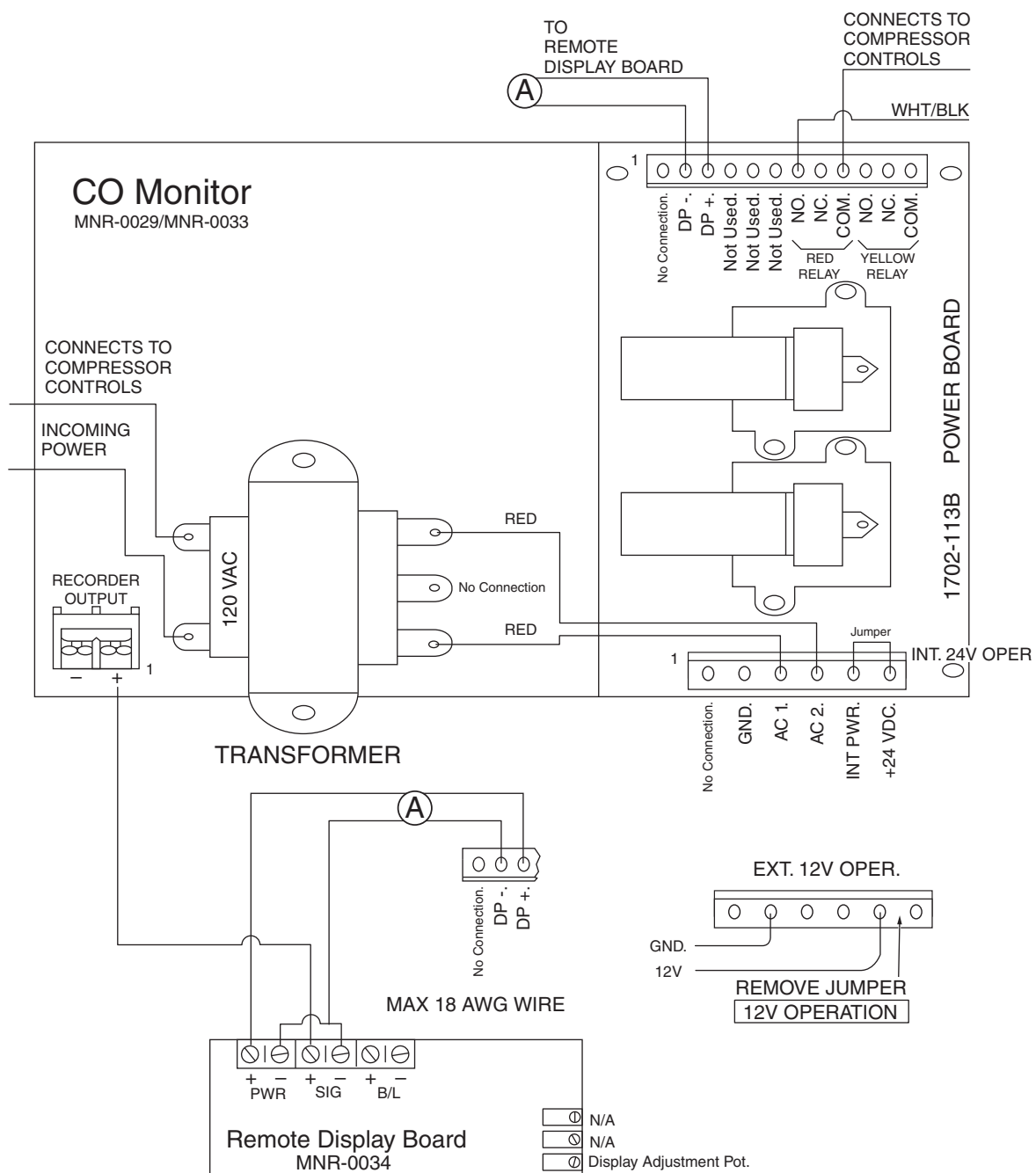
1. Unscrew the four large screws on all corners of the Front Cover (See Figure 9-2).
2. Lift the Front Cover carefully, to not harm any of the attached wires inside the Carbon Monoxide monitor.
3. Find the two white mode buttons on the left side of the motherboard (See Figure 9-6). By briefly depressing the top button six times it is possible to cycle through the set up parameters to access the TEST MODE.
4. When TEST MODE is displayed simply depress the bottom Value Change Button. Depressing the Value Change Button sends an input signal to the PLC, shutting down the compressor system and annunciating a high Carbon Monoxide alarm (reference the electrical section of this manual for more information). TEST MODE also sounds the auxiliary horn (if installed) and activates the solid squares on Front Cover LED Readout.
5. The top mode button must be depressed again to return to Normal Mode.
6. Replace Front Cover and screw in place.

9.5 Replacement Parts List

Figure 9-7 Carbon Monoxide Monitor Assembly - TCom Trailer



Item	Qty	Part No.	Description	Notes
♦		ASY-0890	Carbon Monoxide Monitor Assembly	
1	1	MNR-0029	Carbon Monoxide Monitor	
with	1	SEN-0025	Carbon Monoxide Sensor Cell	
2	1	VAL-0076	Isolation Valve	
3	1	REG-0043	High - Low Pressure Regulator	
4	1	VAL-0384	Safety Valve	165 psi maximum
5	1	VAL-0348	Solenoid	115 VAC
or	1	VAL-0349	Solenoid	12 VDC
6	1	REG-0060	Inlet Regulator	
N.S.	1	CYL-0020	Zero CO, Test Gas Cylinder	0 ppm
N.S.	1	CYL-0016	CO Test Gas Cylinder	20 ppm

Figure 9-8 Carbon Monoxide Monitor Schematic


CHAPTER 10: CFS 5.5 OPERATION AND MAINTENANCE

This system is capable of operating with pressures in excess of the normal bottle fill pressure. It is important not to overfill bottles as explosive forces may be released if the bottle fails. For this reason only the most reliable, trained personnel should be delegated this responsibility.

Every bottle is stamped with a maximum pressure and the last inspection date. Do not fill a bottle with an outdated inspection stamp.

Visually inspect each bottle and valve for signs of damage before filling. Do not fill any bottles which appear to be damaged. See ASME and DOT regulations and manufacturer's recommendations for damage criteria. Be sure the regulator and safety valves are properly set.

10.1 Description

The containment fill station has been tested and offers the operator protection against the explosive force and resulting shrapnel should a cylinder fail during the filling operation.

	WARNING
If a cylinder fails during a filling operation, the Containment Fill Station must be considered damaged beyond repair and destroyed to prevent its ever being used again.	

The fill station features fill hoses complete with bleed valves and SCBA fill adapters of choice, mechanical door interlock, and a fill control panel with individual pressure gauges.

10.2 Operation

1. Unlock the fill station door by pushing the fill station door handle down and then pull the door
2. Insert the bottle riser, supplied with your system, into the bottom of the bottle holder. Adjust the bottle riser height by lifting the bottle riser and rotating it to one of the two predetermined positions which are noted by the numbers 1 and 2 on the top of the bottle riser. (See Figure 10-1). Different SCBA bottles have different lengths. A proper height adjustment will leave the bottle valve slightly below the top of the bottle holder.



**CAUTION**

Minimum bend radius for the fill hose is 1½ inches. Less than this will cause damage to or failure of the fill hose. Place the bottle so that the bend radius of the hose is greater than 1½ inches.

3. Place the bottle(s) to be filled into the holder and connect the fill adapter(s) to the bottle(s) to be filled.
4. Close the hose bleed valve(s) and open the bottle valve(s).
5. Close and lock the fill station door by pushing the fill station door closed, allowing the Door Lock bar to drop into position.

NOTICE

The Containment Fill Stations will not fill the bottles unless the door is closed and locked.

6. By closing the door, the bottle holders are returned to their upright position.
7. Set the regulator to the appropriate fill pressure.
8. Open the fill valve(s) to fill the bottle(s).
9. The pressure indication on the fill pressure gauge will drop while bottles are filling. Filling is completed when the fill pressure gauge reaches the desired pressure.
10. Close the fill valve(s).
11. Unlock the fill station door by pushing the door handle down.
12. Open the fill station door. The bottles are now in a tilted position.
13. Close the bottle valve(s) and open the fill hose bleed valve(s).
14. Remove the fill adapter(s) from the filled bottle(s) and place them in the hose holder(s).

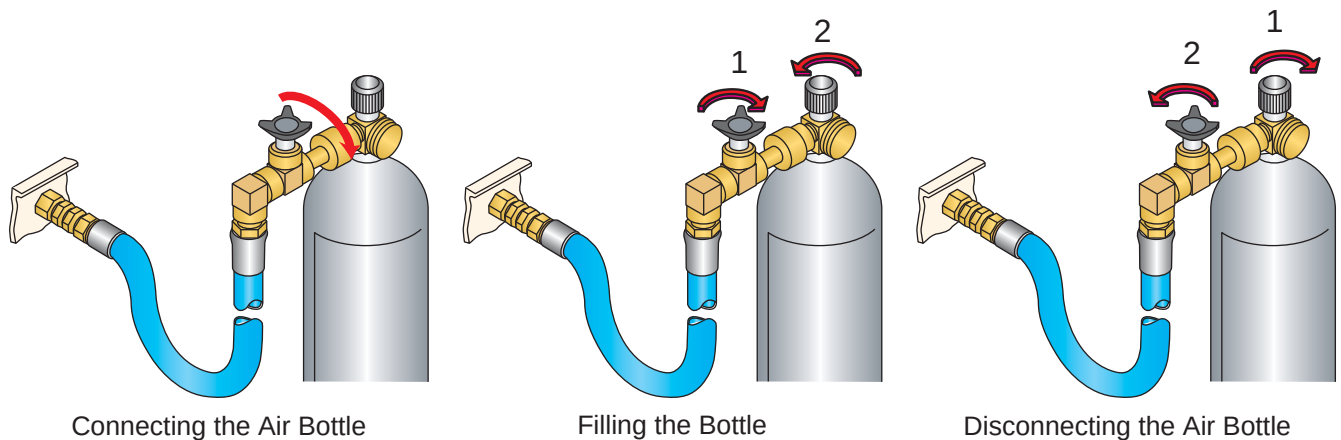


Figure 10-2 Bottle Valve Sequences

10.2.1 Connecting an Air Bottle

Connect to the air bottle valve using a fill hose with the CGA-346 fill adapter for 2,216 psi bottles, a CGA-347 adapter for 4,500 psi bottles or a SCUBA yoke for SCUBA bottles. The CGA-347 fill adapter seals on 4,500 psi rated bottle valves, but vents on lower rated pressure bottles. CGA valves should be hand tightened only.

10.2.2 Filling the Air Bottle

1. Close the bleed valve on the fill hose (1) (figure Figure 10-2).
2. Open the bottle valve (2).
3. Adjust the regulator on the fill panel to the desired pressure.
4. Open the filling valve on the fill panel to the filling position. The bottle will fill.

10.2.3 Removing the Air Bottle

1. After reaching the desired bottle pressure, close the fill valve located on the fill panel.
2. After the fill valve is closed, close the bottle valve.
3. Open the bleed valve (2) to vent the residual pressure in the fill hose.
4. Disconnect the fill adapter from the air bottle valve.

10.2.4 Operating the Cascade Panel (Optional)

1. If the panel is equipped with the optional 3-way ball valve select the input air pressure source.¹
2. Filling from a compressor is best suited for “topping off” bottles.
3. Filling from air storage is best suited for multiple and cascade bottle fillings.
4. For cascade filling from air storage, open the desired bank valve. Use the fill pressure regulator to adjust the fill pressure to the desired pressure.
5. Open the fill valve(s) to fill the bottle(s). The pressure indication on the fill pressure gauge will drop while the bottles are filling.
6. When the fill pressure gauge returns to the desired pressure, filling is completed.
7. If the pressures between the bank and the fill gauge equalize before the desired fill pressure is reached, close the bank valve in use and open another bank valve. Repeat this procedure as necessary.
8. Close the bank valve and the fill valve(s).
9. Push the Door Handle down to unlock and open the door.
10. Close the bottle valve(s) and open the fill hose bleed valve(s).
11. Remove the fill adapter(s) from the filled bottle(s) and connect them to the hose holder(s).

1. Optional Accessory

10.3 Fill Station Air Flow

Refer to the Pneumatic Diagram (DGM-1137 or DGM-1138) bound after the Appendix.

10.3.1 Containment Fill Stations CFSII-2S and CFSII-3S

From the air inlet, compressed air flows to the Fill Pressure Regulator (R1) where the desired bottle fill pressure is set and maintained. The Regulator Inlet Pressure Gauge (P1) indicates the supply pressure to the Regulator (R1). The Regulator Outlet Pressure Gauge (P2) indicates this regulated pressure. The Fill Pressure Relief Valve (RV1) ensures against overfilling the bottle if the Fill Pressure Regulator (R1) fails.

The Door Interlock Valves (V1) are operated when the door is closed and the lock bar is in the down/locked position. This prevents the filling of bottles until the door is properly closed and locked.

When the Mechanical Door Interlock Valves (V1) are operated it allows compressed air to flow from the outlet of the Fill Pressure Regulator (R1) to the Fill Hoses (H1) via the Fill Hose Shut Off Valve (V2).

Fill Pressure Gauge (P3) is used to monitor the progress of the recharging operation.

The operator closes the Fill Hose Shut Off Valve (V2) when the bottle reaches the desired pressure, stopping the flow of air to the bottle.

The optional Fill Pressure Relief Valves (RV2) can be used to allow multiple fill pressures in the same CFS.

Should the operator not close the Fill Hose Shut Off Valve (V2) when the bottle is full, the Relief Valve (RV2) will open, venting excess pressure.

When the recharging operation is complete the operator presses down on the Door Handle and opens the door which disengages the Mechanical Door Interlock Valves (V1) eliminating the possibility of the flow of compressed air to the bottles.

Before the bottle(s) can be removed from the fill station the bottle valve must be closed and the pressure remaining in the Fill Hoses (H1) bled off by opening the Drain/Bleed Valve (V3).

10.3.2 Containment Fill Stations CFSII-2M and CFSII-3M

The airflow is essentially the same as Paragraph 10.3.1, however an additional Fill Control Panel is required. The Fill Panel needs to contain the Inlet Pressure Gauge (P1), Fill Pressure Regulator (R1), Outlet Pressure Gauge (P2), Fill Pressure Relief Valve (RV1), Fill Hose Shut Off Valves (V2), and the Fill Pressure Gauges (P3).

The Fill Panel Regulator (R1) will supply regulated air to the Mechanical Door Interlock Valves (V1).

The Mechanical Door Interlock Valves (V1), when actuated, will supply pressure back to the Fill Control Panel.

The Fill Control Panel will distribute the return from the Mechanical Door Interlock Valves (V1) to the Fill Hose Shut Off Valves (V2).

The Fill Hose Shut Off Valves (V2) will be used to control the supply of air to the individual Fill ports on the CFS.

10.4 Maintenance

10.4.1 General Maintenance

Develop a regular program of visual inspection, looking for clogged drains and broken or missing parts.

10.4.2 Nonadjustable Valves

The condensate drain valve, bleed valve and check valves are not adjustable. The condensate drain valve and bleed valve have seats and seals which should be replaced if the valve leaks. Check valves are not adjustable or repairable and must be replaced if they malfunction.

10.4.3 Pressure Gauges

Observe the pressure gauges daily. If the readings of any of the gauges seem to be incorrect, bleed off all system pressure. Check that the gauges correctly read zero then reapply pressure to the system. If the reading is still incorrect contact Bauer Compressors for service. All broken or damaged gauges must be replaced immediately.

10.4.4 Safety Valves

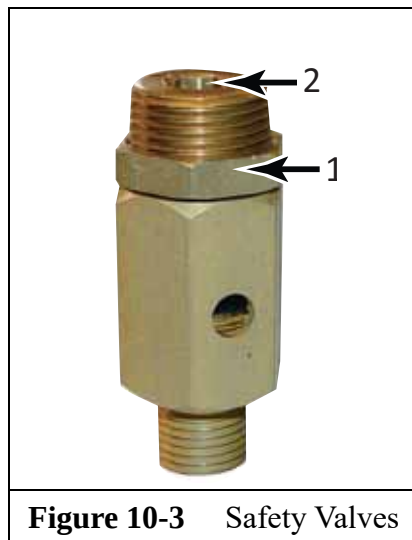


Figure 10-3 Safety Valves

The safety valve must be checked periodically for proper functioning.

1. Operate the compressor with the shut-off valve closed until the safety valve vents.
2. Note the pressure registered on the pressure gauge.

The safety valve is adjusted at the factory to the required pressure and does not normally require maintenance or readjustment. In case readjustment does become necessary, have the safety valve adjusted by a BAUER qualified technician (contact the BAUER service department for details) or return the valve to the factory.

10.5 Pneumatic Connections



WARNING

Maintenance of pipe and tubing connections should not be attempted while the unit is under pressure. Serious injury or equipment damage will result if the connection fails or is loosened.

After determining that a pneumatic connection is leaking. Relieve compressed air pressure and tighten just firmly enough so that leakage is stopped (finger tight plus up to an additional 1/2 turn as necessary). Please note that the compression type coupling fittings are capable of exerting extreme force on the tubing and should not be tightened more than is required to seal the joint. To improve the sealing of the pipe connections and to facilitate installation, the following should be observed:

Apply a thin layer of Never-Seez NSWT or equivalent on the outside of the ferrule during assembly.

Lubricate the threads of the connector with Never-Seez NSWT or a similar PFTE base lubricant to facilitate future disassembly.

10.6 Bearings for Bottle Door Pivot

There is no need for relubrication under normal conditions.

If the setscrews should become loose, tighten as follows:

Setscrew diameter	Hex size	Recommended torque (inch lbs)
5/16"	5/32"	165

10.7 Pressure Hoses

The hoses should be inspected periodically for wear and damage. If a hose is worn or damaged, remove and replace it.

10.8 Door Gas Spring

A special tool, Spring Holder, TOO-0103 is required.

Figure 10-4 Special Tool, TOO-103



To remove and install a Door Gas Spring proceed as follows:

1. Place a piece of cardboard in the bottom of the door opening to protect the finish of the Door and Enclosure.
2. Remove the Door Stop and Mount from the inside rear of the Enclosure.
3. Lower the Door until it touches the cardboard.
4. Install the Spring Holder, TOO-0103. and raise the Door until the Holder is holding the Door Gas Spring.
5. Remove the nut on the lower mounting stud and remove the Door Gas Spring from the Door.
6. Lower the Door and allow it to rest on the cardboard.
7. Remove the nut on the upper spring mounting stud and remove the Door Gas Spring.
8. Install the replacement Door gas Spring in the reverse order.

10.9 Standard Fill Panel Removal

The Standard Fill Panels may be removed either from the front of the unit or the rear of the unit if the rear is accessible. (See Figure 10-6).

10.9.1 To remove the Fill Panel from the front.

1. First remove the pressure from the inlet of the Fill Station, drain any residual pressure, and open the Fill Station Door.
2. Remove the Lever (3) from the Door Interlock Valve (1) by loosening the bolt on the front of the Door Interlock Valve. You may need to keep the stem of the Door Interlock Valve from turning.
3. Remove the bolts that hold the Interlock Bracket (2).
4. Lower the Interlock Bracket and disconnect the hoses that connect to the Fill Panel.
5. Remove the 4 plastic caps from the front of the Fill Panel.
6. Remove the 4 screws that hold the Fill Panel in place.
7. Pull the Fill Panel straight out the front.
8. Disconnect the Main Inlet Hose from the Regulator.
9. Install in the reverse order.

10.9.2 To remove the Fill Panel from the rear.

1. First remove the pressure from the inlet of the Fill Station and drain any residual pressure.
2. Disconnect the hoses that connect the Fill Panel to the rear of the Fill Station.
3. Remove the 4 plastic caps from the front of the Fill Panel.
4. Remove the 4 screws that hold the Fill Panel in place.
5. Pull the Fill panel straight out the front.
6. Disconnect the Main Inlet Hose from the Regulator. Install in the reverse order.

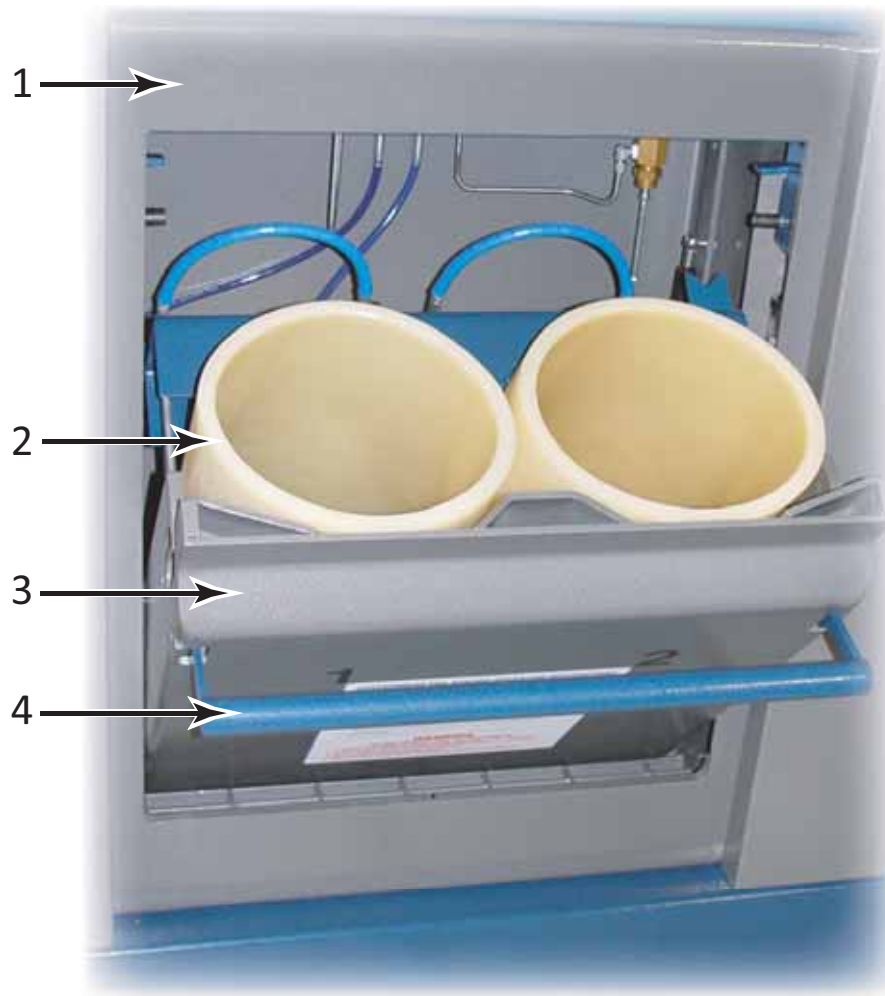
10.9.3 Replacement Parts List CFS 5.5 Assemblies

Figure 10-5 Containment Fill Station

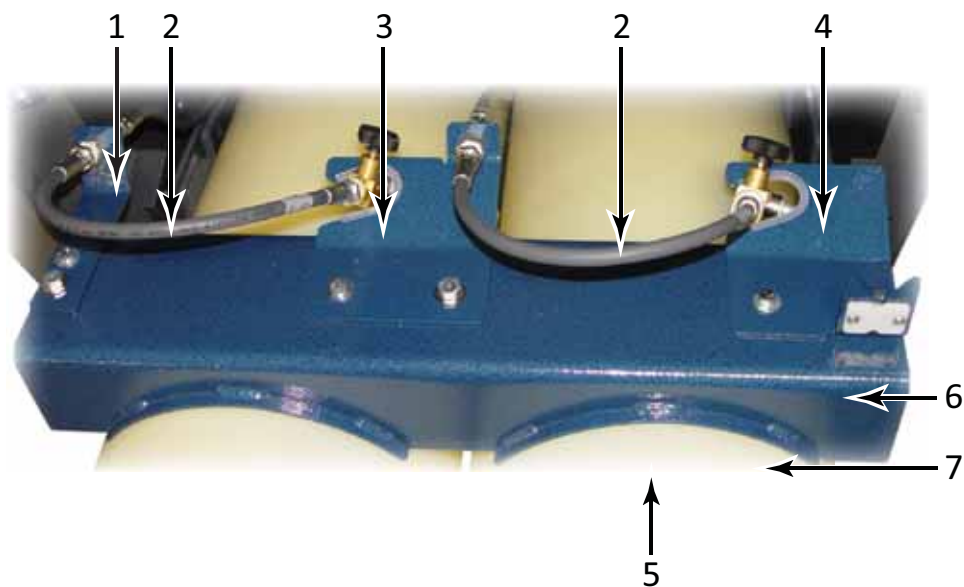


Item	Qty	Part No.	Description	Notes
1	1	—	Hose Reel Assembly	See Figure 12-4
2	1	—	CFS 5.5	See Figure 10-6
3	1	—	Cascade Assembly	See Figure 10-12
4	1	—	CFS Controls	See Figure 10-11

Figure 10-6 CFS 5.5 Assembly

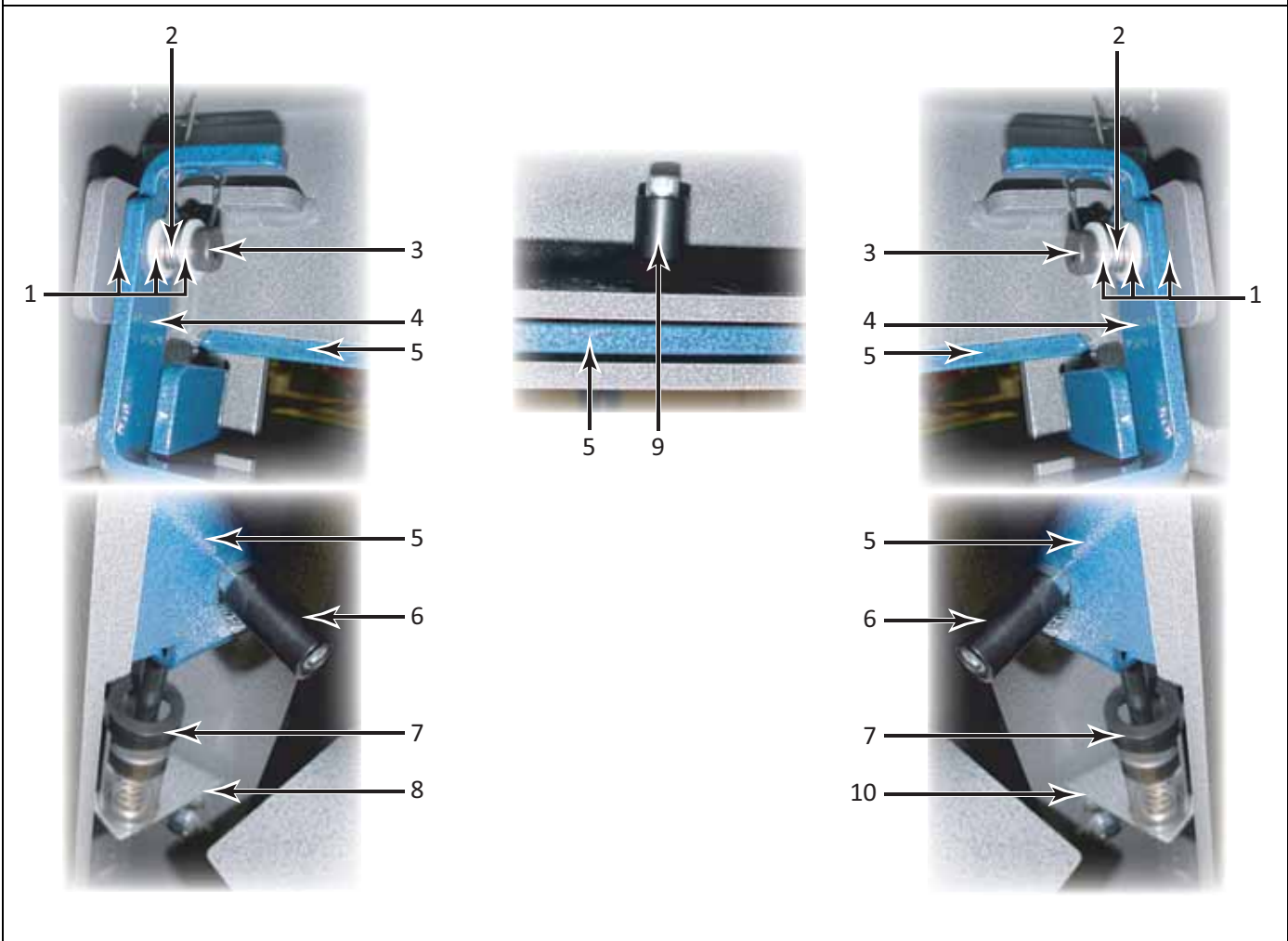


Item	Qty	Part No.	Description	Notes
1	1	ENC-0315	Enclosure	
2	2	HOL-0124	Bottle Holder	
3	1	DOR-0112	Door	
4	1	HAN-0074	Handle	

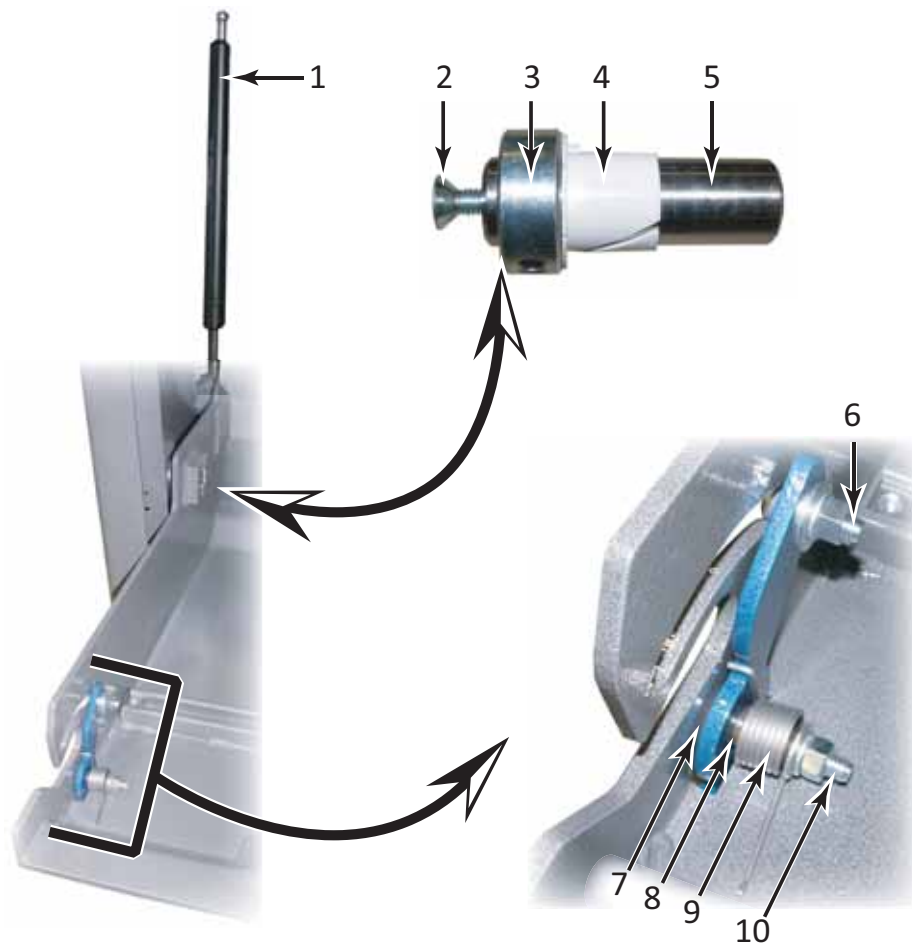
Figure 10-7 Fill Whips & Brackets

Item	Qty	Part No.	Description	Notes
1	1	MTS-0316	Hose Bracket	
2	2	HOS-0145	Fill Whip	
3	1	MTS-0315	Hose Bracket with Whip Holder	
4	1	HOL-0077	Fill Whip Holder with Door Interlock Actuator	
5	2	SPC-0118	Bottle Riser	
6	1	BRK-0143	Bottle Holder Bracket	
7	2	HOL-0124	Bottle Holder	

Figure 10-8 CFS5.5 Door Lock Assembly

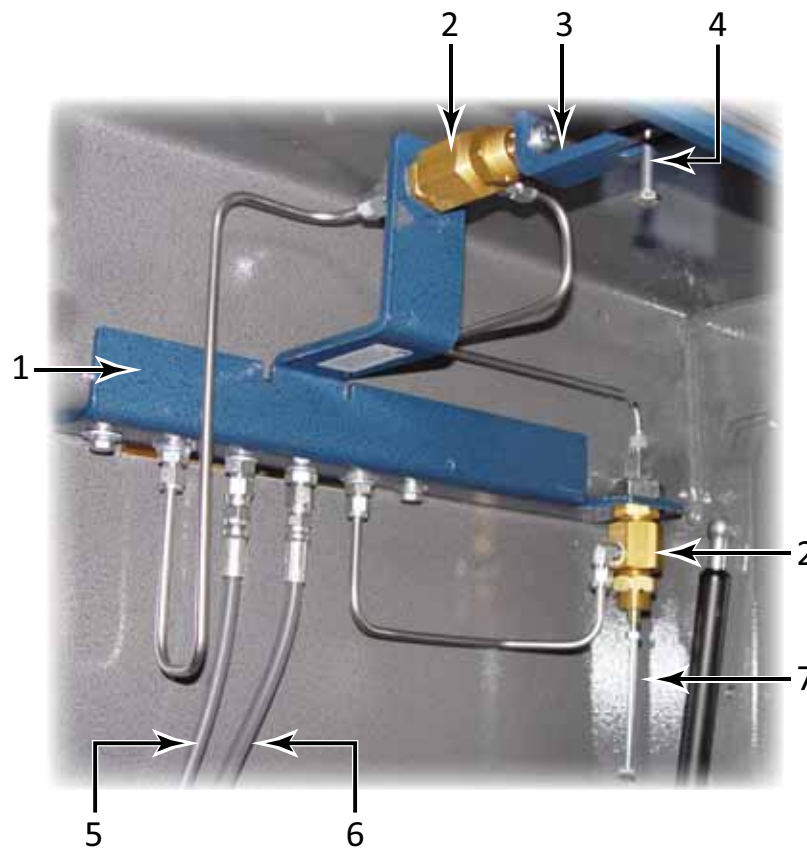


Item	Qty	Part No.	Description	Notes
1	6	—	Nylon Flat Washer	3/8"
2	2	SPG-0052	Torsion Spring	
3	2	—	Socket Head Shoulder Screw	3/8" x 7/8"
4	2	LCH-0048	Latch	
5	1	LCH-0088	Door Lock	
6	3	BUS-0153	Bushing	
7	2	CYL-0059	Damper	
8	1	BRK-0673	Cylinder Bracket	Right
9	1	BRK-0672	Cylinder Bracket	Left

Figure 10-9 Door Handle, Pivot and Bracket

Item	Qty	Part No.	Description	Notes
1	1	SPG-0077	Gas Spring	
2	2		Flat Head Socket Cap Screw	5/16x18 x 3/4" UNC
3	2	CLR-0001	Collar	
4	2	BUS-0121	Bushing	
5	2	PIN-0047	Pin	
6	2		Socket Head Cap Screw	3/8-16 x 1" UNC
7	2		Washer, Nylon	5/8"
8	2	BUS-0122	Bushing	
9	1	SPG-0054	Spring	Right Side
NS	1	SPG-0053	Spring	Left Side
10	2		Socket Head Cap Screw	3/8-16 x 2" UNC

Figure 10-10 CFS5.5 Door Interlock



Item	Qty	Part No.	Description	Notes
1	1	BRK-0668	Bracket	
2	2	VAL-0130	Interlock Valve	
3	1	LEV-0025	Lever	
4	1	SCR-0078	Hex Head Cap Screw	1/4-20 x 4" UNC
5	1	HOS-0147	Hose, Left	2 & 3 Position Units Only
6	2	HOS-0146	Hose	
7	1	—	Hex Head Cap Screw	1/4-20 x 4 1/2" UNC

Figure 10-11 CFSIII Fill Control Panel (CFSII-2S shown)

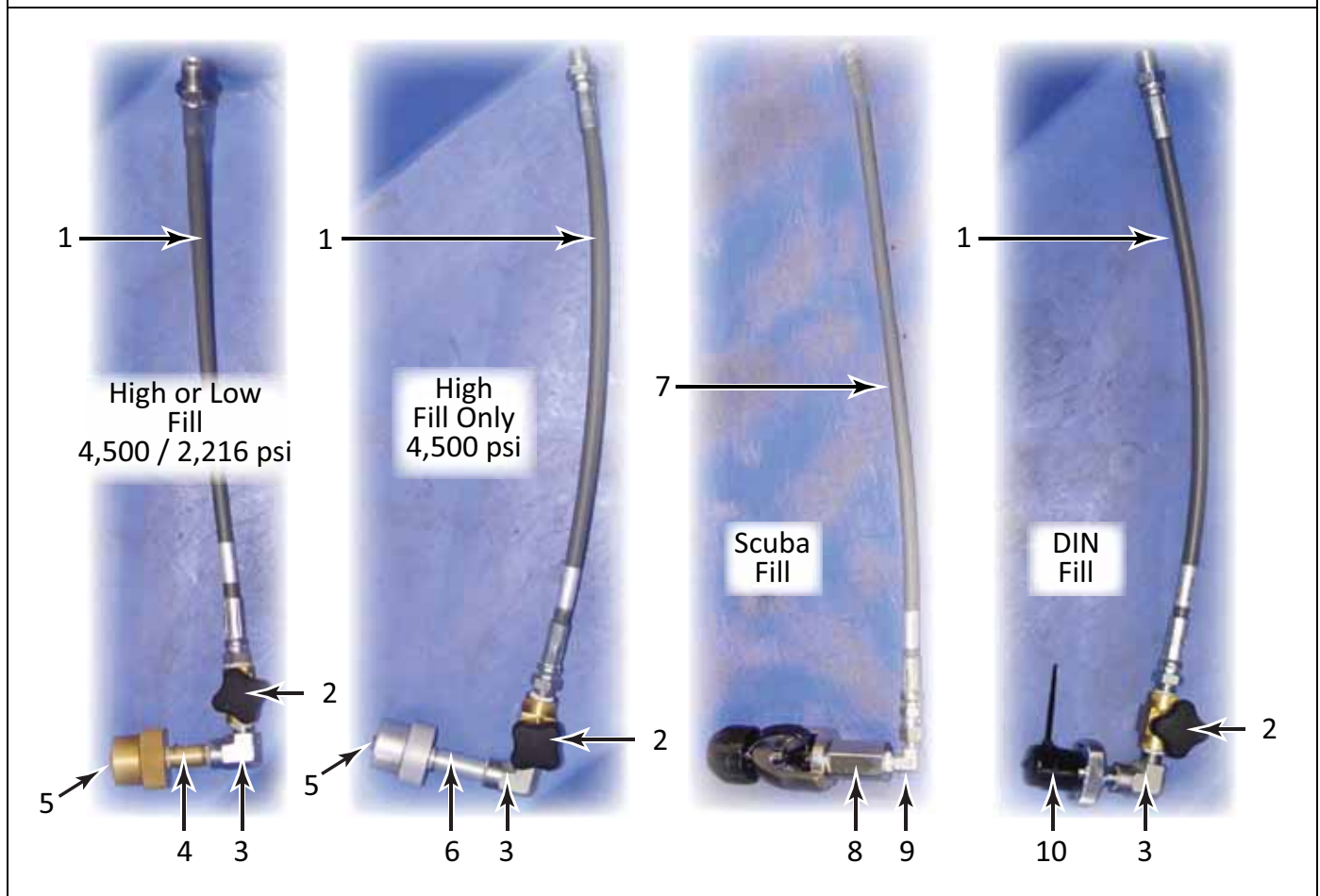
Item	Qty	Part No.	Description	Notes
1	4	GAG-0009W	Pressure Gauge	2 for regulator & 1 per fill position
2	1	REG-0003	Regulator	
3	2	VAL-0076	Fill Valve	1 per Fill Position

Figure 10-12 Cascade Panel



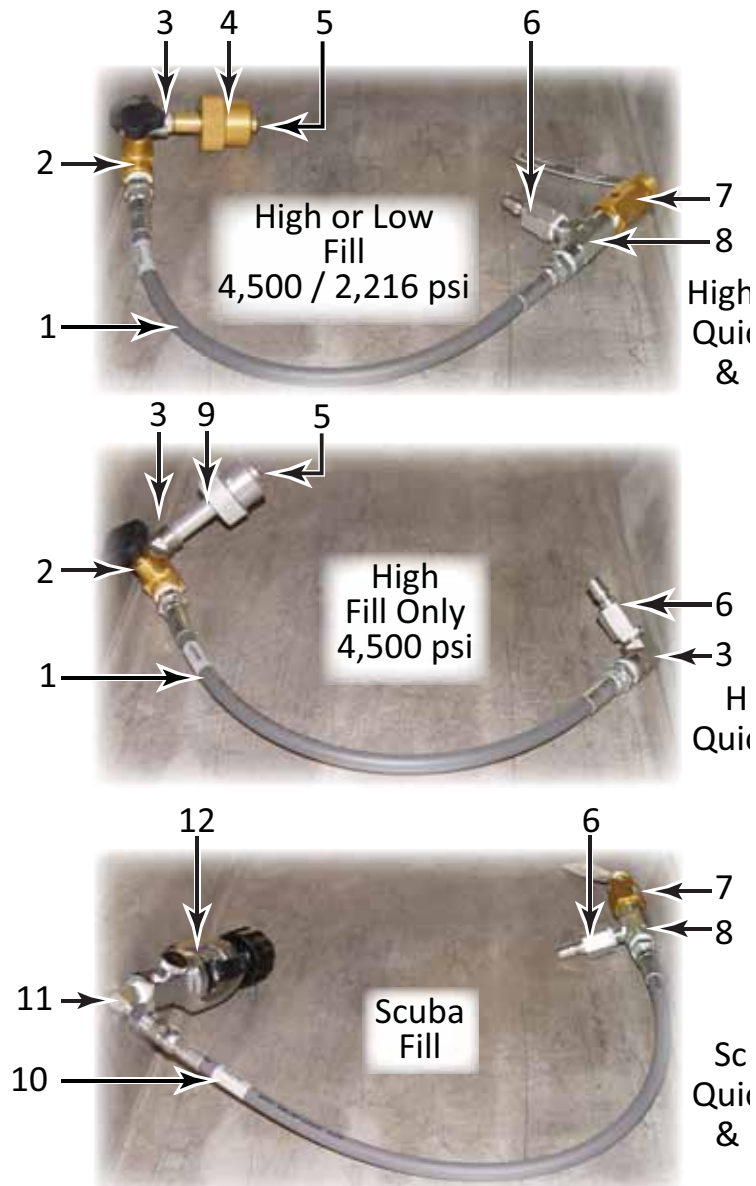
Item	Qty	Part No.	Description	Notes
1	1	VAL-0067	3-way Ball Valve, Source Selector	Dual Function Only
2	4	GAG00009W	Pressure Gauge	0 - 7,500 psi
3	5	VAL-0076	Fill Valve	needle valve

10.10 Fill Hose Assemblies

Figure 10-13 Standard Fill Hose Assemblies


Item	Qty	Part No.	Description	Notes
1	1	HOS-0145	Fill Hose	25"
2	1	065126	Bleed Valve	
3	1	ELL-0018	Elbow	
4	1	ADP- 0112	Adapter	4,500 / 2,216 psi Cylinder
5	1	N04483	O-ring	
6	1	ADP-0113	Adapter	4,500 psi Cylinder
7	1	HOS-0150	Fill Hose, Scuba	27"
8	1	ELL-0031	Elbow	<i>scuba fill only</i>
9	1	YOK-0001	Scuba Fill Yoke with Bleed Valve	
10	1	ADP-0207	DIN Fill Adapter	4,350 psig (300 bar)

Figure 10-14 Fill Whips with Options



Item	Qty	Part No.	Description	Notes
1	1	HOS-0145	Fill Hose	4,500 / 2,216 psi Cylinder
2	1	065126	Bleed Valve	
3	-	ELL-0018	Elbow	
4	1	ADP- 0112	Adapter	
5	1	N04483	O-ring	
6	1	CON-0223	Quick Disconnect	
7	1	VAL-0169	Safety Valve	
8	1	TEE-0014	Tee	

Figure 10-14 (cont.) Standard Fill Hose Assemblies

Item	Qty	Part No.	Description	Notes
9	1	ADP-0113	Adapter	4,500 psi Cylinder
10	1	HOS-0150	Fill Hose, Scuba	
11	1	ELL-0031	Elbow	
12	1	YOK-0001	Scuba Fill Yoke with Bleed Valve	

CHAPTER 11: HP AIR STORAGE

11.1 Storage Cylinders

The storage cylinders on the TCOM Lite are approved by the Department of Transportation. Operating temperature range for the storage systems is -20°F to 150°F. The cylinders must be equipped with the proper cylinder valve and CGA recommended outlet. Retest period for D.O.T. 6000 psig cylinders is mandatory every five (5) years in accordance with 49/CFR173.34.

	D.O.T
	6,000 psig
Material	Lightweight Steel Alloy
Volume	509 cf @ 6000 psig
Working Pressure	6,000 psig
Test Pressure	9,000 psig
Diameter	9 9/32"
Height	55" with Valve
Weight	188 lbs
Cylinder	CGA 702
Finish	Primer and Topcoat

Figure 11-1 High Pressure Storage System



11.2 Maintenance

11.2.1 Storage Bottles

All storage bottles should be visually inspected internally every year. Check local and state regulations regarding testing of DOT bottles. Some states require an annual visual inspection, and hydrotesting requirements also differ from state to state.

11.2.2 Pressure Gauges

1. Observe the pressure gauges daily.
2. If the readings of any of the gauges seem to be incorrect, bleed off all system pressure.

3. Then, remove the gauge and check for wear and tear, accuracy and proper functioning by comparing it to a precision test gauge or a dead weight tester.
4. Replace all broken or damaged gauges immediately.

11.2.3 Tube Connections

Pipe connections (swivel nuts): Tighten just firmly enough so that leakage is stopped (finger tight plus up to an additional 1/2 turn as necessary). Please note that the compression type coupling fittings are capable of exerting extreme force on the tubing and should not be tightened more than is required to seal the joint.

To improve the sealing of the pipe connections and to facilitate installation apply a thin layer of Never-Seez® NSW or a similar PTFE base lubricant to the ferrule and the threads of the connector to facilitate future disassembly.

11.2.3.1 Safety Valve

Figure 11-2 Safety Valve



Develop a regular program of visual inspection, looking for clogged drains and discharge pipe, dirt build-up in and around the valve and broken or missing parts.

Avoid excessive operation of the safety valve. Even one opening can provide a means for leakage.

Do not paint, oil or otherwise cover any interior or working parts of any safety valve. They do not require any lubrication or protective coating to work properly.

11.2.3.2 Pressure Hoses

The hoses should be inspected periodically for wear and damage. If a hose is worn or damaged, remove and replace it.

CHAPTER 12: OPTION PACKAGES

12.1 Option Package A - Spare Tire and Wheel Cover

12.1.1 Spare Tire and Cover

Figure 12-1 Spare Tire		Figure 12-2 Spare Tire Cover
		

The Spare Tire is a ST225/75R15 tire mounted on the tongue and is a direct replacement for either trailer tire. To maintain the proper inflation the spare tire cover is removed and the Spare Tire pressure of 65 psi must be checked on a regular basis.

12.1.2 Part Numbers

- | | |
|--------------------|----------|
| • Tire and Rim | WHE-0033 |
| • Spare Tire Cover | CVR-0194 |

12.2 Option Package B - Remote Fill Connection and Interior Lights

12.2.1 Remote Fill Connection

See Figure 12-4. The optional remote fill connection is rated for up to 6,000 psig service. The spring rewind hose reel is furnished with 75 feet of hose.

12.2.1.1 Connecting an Air Bottle

Connect to the air bottle valve using a fill hose an appropriate fill adapter. The fill adapter should be hand tightened only.

12.2.1.2 Filling the Air Bottle

1. Close the bleed valve on the fill hose (4).
2. Open the SCBA bottle valve.
3. Adjust the regulator (1) on the remote fill panel until the desired pressure is indicated on the Pressure Gauge (2).
4. Open the Fill Valve (3) on the Remote Fill Panel to the filling position. The bottle will fill.

12.2.1.3 Removing the Air Bottle

1. After reaching the desired bottle pressure, close the Fill Valve (3) on the Remote Fill Panel.
2. After the Fill Valve (3) is closed, close the SCBSA bottle valve.
3. Open the bleed valve (4) to vent the residual pressure in the fill hose.
4. Disconnect the fill adapter from the air bottle valve.

12.2.2 Interior Lights

The interior lights have two white light fixtures.

Figure 12-3 Interior Light



12.2.2.1 Part Numbers

- Fuse FUS-0106
- Light Assembly LIT-0147

12.2.2.2 Remote Fill Parts

Figure 12-4 Remote Fill Parts (Optional)



Item	Qty	Part No.	Description	Notes
1	1	REG-0039	Air Pressure Regulator	6,000 psi
2	1	GAG-009W	Pressure Gauge	7,500 psi
3	1	VAL-0076	Needle Valve	
4	1	GDE-0003	Hose Guide	
5	1	HOS-0164	Air Hose	75 feet
6	1	STP-0008	Hose Stop	
7	1	VAL -0140	Bleed Valve	
8	1	CON-0223	Quick Disconnect Connector	
9	1	REL-0009	Hose Reel	

12.3 Option Package C -Lunette Eye Hitch

Option Package C replaces the 2 inch ball towing hitch with a Lunette Eye Hitch

Figure 12-5 Lunette Eye Hitch



12.4 Option Package D - Two (2) Additional 6,000 psi DOT Cylinders

Option Package D doubles the storage capacity of the TCOM Lite by adding two 6,000 psi DOT cylinders to the storage bottles in the undercarriage of the unit.

Figure 12-6 6,000 psi DOT Cylinders



12.5 Nonadjustable Valves

The condensate drain valve, bleed valve and check valves are not adjustable. The condensate drain valve and bleed valve have seats and seals which should be replaced if the valve leaks. Check valves are not adjustable or repairable and must be replaced if they malfunction.

Figure 12-7 Check Valve



Figure 12-8 Pressure Maintaining Valves (PMV)



12.6 Pressure Maintaining Valve

The pressure maintaining valve is adjusted at the factory to the required pressure and does not normally require maintenance or readjustment.

If readjustment does become necessary proceed as follows.

1. Loosen the locking nut (1).
2. Set the adjusting screw (2) to the required pressure using an appropriate hex type wrench.
3. Turn clockwise to increase pressure, counterclockwise to decrease pressure.
4. Determine if the PMV is properly adjusted:
 - a. De-pressurize the final separator and purifier chamber by slowly opening the bleed valve.
 - b. Close the bleed valve and start the compressor.
 - c. Observe the final pressure gauge and note the pressure at which the valve opens (delivers).
 - d. If the pressure is not at the specified pressure ± 100 psi, readjust the PMV.

12.7 Safety Valves

Figure 12-9 Safety Valves



The safety valves are adjusted at the factory to the required pressure and do not normally require maintenance or readjustment. They should be checked annually for proper operation. In case readjustment does become necessary, have the safety valve adjusted by a Bauer qualified technician or return the valve to the factory (contact the Bauer Product Support Department for details).

CHAPTER 13:APPENDIX**13.1 Safety****13.1.1 General Safety Precautions**

- Read the operating manual before installing or operating this compressor unit. Follow appropriate handling, operation and maintenance procedures from the very beginning. The maintenance schedule contains measures required to keep this compressor unit in good condition. Maintenance is simple, but must be executed regularly to achieve safe operation, maximum efficiency and long service life.
- We recommend that all maintenance work be recorded in a service book, showing the date and details of the work carried out. This will help to avoid expensive repair caused by missed maintenance work. If it is necessary to make a Claim against the warranty, it will help to have proof that regular maintenance has been carried out and that the damage has not been caused by insufficient maintenance.
- This compressor unit must be installed, operated, maintained and repaired only by BAUER authorized, trained and qualified personnel. Information on BAUER training and becoming BAUER authorized can be accessed at (757)858-6006 or productsupport@bauercomp.com.
- Consult and follow all OSHA, NEMA, ASME and local regulations, laws and codes covering the installation and operation of this compressor and accessories before operating the unit.
- Do not operate this unit in excess of its rated capacity, speed, pressure, temperature, or otherwise than in accordance with the instructions contained in this manual. Operation of this unit in excess of the conditions set forth in this manual will subject the unit to limits which it may not be designed to withstand.
- Keep safety guards in place.
- Do not modify the compressor or its systems.
- Do not wear loose clothing around machinery. Loose clothing, neckties, rings, wrists watches, bracelets, hand rags, etc. are potential hazards.
- Provide adequate fire protection. Make sure fire extinguishers are accessible. Select alternate routes of escape and post such routes.
- Make sure you are equipped with all required safety equipment; hearing protection, safety glasses, hard hats, safety shoes and fire extinguisher.
- Visually inspect the unit before starting. Remove and or replace any loose or broken components, tools, valves, missing equipment, etc.
- Do not tamper with, modify, or bypass safety and shutdown equipment.
- Do not tighten or adjust fittings or connections under pressure.
- The use of plastic pipe or rubber hose in place of steel tube or iron pipe, soldered joints or failure to ensure system compatibility of flex joints and flexible hose can result in mechanical failure, property damage, and serious injury or death.
- The use of plastic or nonmetallic bowls on line filters without metal guards can be dangerous.
- Replace damaged fan blades promptly. Fan assemblies must remain in proper balance. An unbalanced fan can fly apart and create an extremely dangerous condition.

- Allow the compressor to cool before servicing. Whenever the compressor is shut down and overheating is suspected, a minimum period of 15 minutes must elapse before opening the crankcase. Premature opening of the crankcase of an overheated unit can result in an explosion.
- Incorrect placement of the inlet and pressure valves in a compressor cylinder head can cause an extremely dangerous condition. Refer to the appropriate section of this manual before installing or replacing valves.
- Before doing any work involving maintenance or adjustment, be sure the electrical supply has been disconnected, and the complete compressor system has been vented of all internal pressure. Failure to follow these warnings may result in an accident causing personal injury and/or property damage.
- Before working on the electrical system, be sure to disconnect the electrical supply from the system at the circuit breaker or other manual disconnect. Do not rely on the ON/OFF switch to disconnect the electrical supply.
- Installer must provide an earth ground and maintain proper clearance for all electrical components.
- All electrical installation must be in accordance with recognized national, state, and local electrical codes.
- Do not use gasoline, diesel fuel or other flammable products as a cleaning solution.
- A compressor which has been used for gas service is unsuitable for Gas applications. Should the purchaser and/or user proceed to use the compressor for Gas service after it has been used for gas, the purchaser and/or user assumes all liability resulting therefrom without any responsibility being assumed by Bauer Compressors, Inc. The purchaser is urged to include the above provision in any agreement for resale of this compressor.
- The use of repair parts other than those listed in this manual or purchased from Bauer Compressors, Inc. may create unsafe conditions over which Bauer has no control. Such unsafe conditions can lead to accidents that may be life-threatening, cause substantial bodily injury, and/or result in damage to the equipment. Therefore, Bauer Compressors, Inc. can bear no responsibility for equipment in which non-approved repair parts are installed.

13.1.2 Safety Warning Labels

Notes, labels and warning signs are displayed on the compressor unit according to model, application or equipment and may include any of the following.

	HOT SURFACES DO NOT TOUCH! Danger of burning if cylinders, cylinder heads, or pressure lines of individual compressor stages are touched.
	HIGH VOLTAGE! Life threatening danger of electrical shock. Maintenance work on electric units or operating equipment should be carried out by a qualified electrician or by a person supervised by a qualified electrician according to electrical regulations.
	AUTOMATIC COMPRESSOR CONTROL UNIT MAY START WITHOUT WARNING! Before carrying out maintenance and repair work, switch off at the main switch and ensure the unit will not restart.
	THE INSTRUCTIONS MUST BE READ BEFORE OPERATING THE UNIT! The instruction manual and all other applicable instructions, regulations, etc. must be read and understood by the operating personnel before using the machine.
	HEARING PROTECTION MUST BE WORN! Hearing protectors must be worn when working on a machine which is running.
	DIRECTION OF ROTATION! When switching on the machine, check the arrow on the compressor to ensure correct direction of rotation by the drive motor.

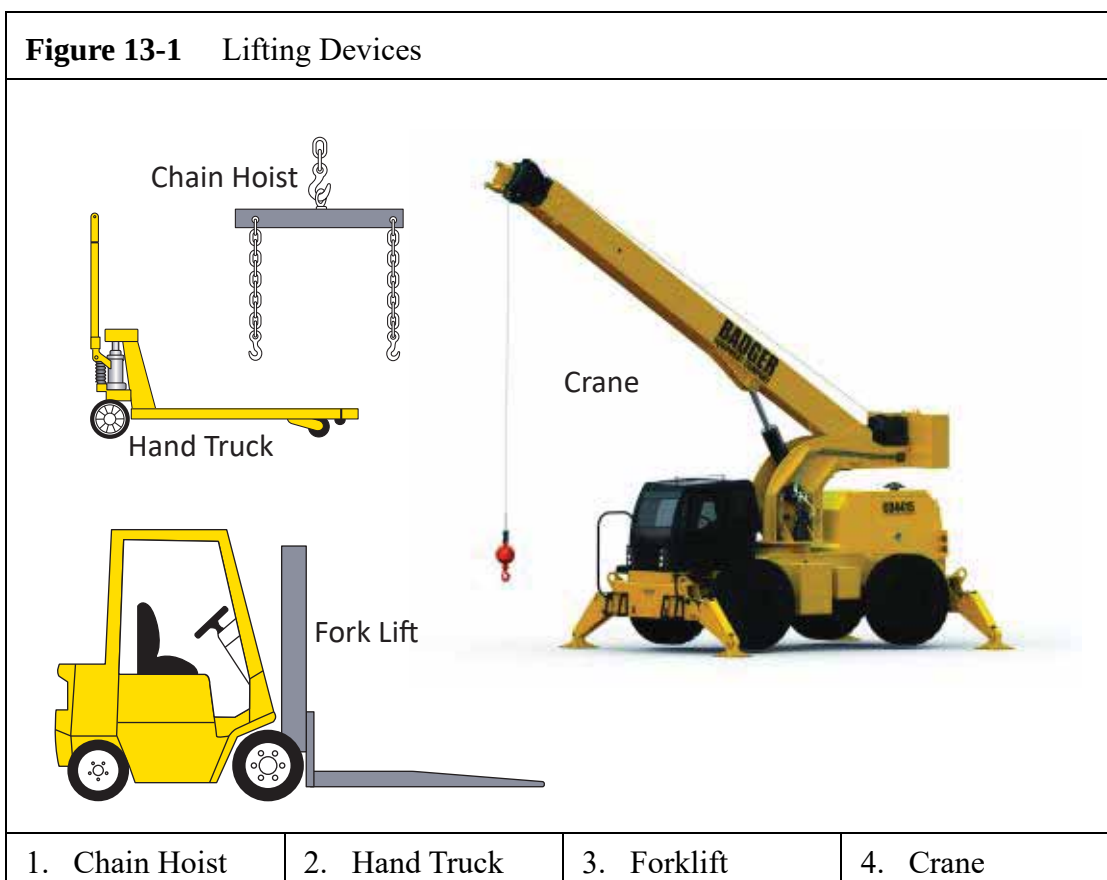
13.2 Unpacking, Handling and Installation

13.2.1 Unpacking and Handling

This compressor unit is packaged according to the requirements for shipping via the requested type of carrier service. It is possible that the compressor unit could have been damaged during shipping. For this reason, we urge you to thoroughly examine the unit for possible damage and report any such damage to the shipping company immediately.

Care must be taken in unpacking the compressor unit. Serious damage could result by not checking for clearance between the item being unpacked and the packaging to be removed.

Handling of the unpacked unit should be performed using only the following devices. See Figure 13-1.



WARNING

Be sure the lifting devices are capable of handling the weight of the unit (see Paragraph 1.4 for the approximate weight of the unit). Before lifting the unit, secure all loose or swinging parts to keep them from moving. Stay clear of lifted load.

The compressor unit may be furnished with one or more shipping braces for shipping and handling only. After installation and before operation, these braces must be removed entirely. Under no circumstances should the braces remain installed during operation or the manufacturer's warranty for the compressor unit will be voided. All braces are tagged and labeled.

13.2.2 Installation of the Compressor Unit

13.2.2.1 General

The floor site must be capable of supporting the weight of the unit. Secure the compressor unit to the floor using ½” lag bolts. Position the unit so that it is level. Permissible inclination of the compressor unit is listed in Paragraph 1.4.

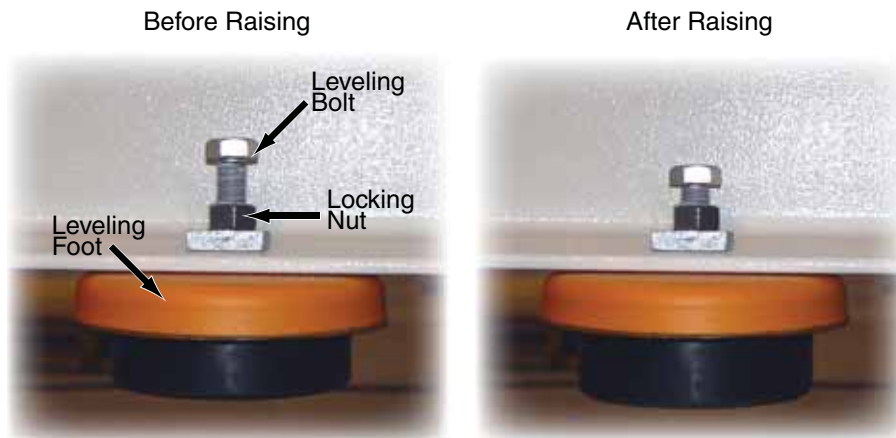


CAUTION

The inclination values listed in Paragraph 1.4 are valid only if the oil level of the compressor is level with but does not exceed the upper mark of the oil dipstick or oil level sight glass.

If equipped with machine leveling feet, ensure the unit is leveled to prevent movement when operating. Raise the unit with a forklift or crane to raise the unit at the leveling foot. Loosen the locking nut and turn the leveling bolt clockwise to desired height. Lock the leveling foot in place with the provided hex-nut once the desired height is achieved. Set the unit back down on the floor and check adjusted height. If further adjustment is needed repeat.

Figure 13-2 Leveling Feet



If the unit has the second type of feet pictured above, adjust the feet by loosening the bolt and adjust the height of the base on each corner till the unit is level. When installing a new unit it should be leveled by adjusting the feet and any of the enclosure that is out of square should be adjusted.

NOTICE

During shipping units may vibrate out of square. Ensure the base is leveled and frame is squared before commissioning.

Ensure that the compressor Gas intake is supplied with fresh Gas. The intake Gas must not contain any exhaust fumes or flammable vapors such as paint solvents, which may cause an internal fire. Make sure that the intake Gas is unobstructed and moisture in the intake Gas is kept to a minimum. It is important that units draw in clean Gas. The quality of the incoming Gas determines the quality of the compressed Gas. This is important even for industrial Gas, as any incoming fumes will also be compressed and will increase the toxicity to anyone working with the compressed Gas.

If a remote control is provided, the unit must be equipped with a clearly visible plate warning the possibility of the unit starting. As an additional measure, anyone starting the unit by remote control must make sure that no one is checking or operating the unit. For this purpose, a second warning plate should be provided at the remote control unit.

**AUTOMATIC COMPRESSOR CONTROL
UNIT MAY START WITHOUT WARNING!**

Before carrying out maintenance and repair work, switch off at the main switch and ensure the unit will not restart.

Observe and maintain an ambient temperature range of 40 - 115 °F (5 - 45 °C).

The area in which the compressor unit is installed should be well lit and easily accessible to facilitate servicing and routine maintenance.

13.2.2.2 Ventilation

During normal compression, heat is generated by the compressor and by the drive motorengine. For Gas-cooled compressor units, this heat needs to be vented away by sufficient ventilation.

13.2.2.2.1 Outdoor Installation

It is recommended that all gasoline and diesel engine driven compressor units be installed outdoors. Electrically driven compressor units may be installed outdoors only if enclosed with weatherproof enclosure panels.

13.2.2.2.2 Indoor Installation

The best location to install the compressor unit indoors is against an outside wall with a suitably large Gas vent in front of the cooling fan. Additionally, it is necessary to position an exhaust opening in the opposite wall, close to the ceiling or in the ceiling.

As a basic rule of thumb, the room should be ventilated sufficiently so as to prevent the ambient room temperature from exceeding 105 °F (41 °C). Additional heat generating equipment or piping should be avoided or must be well insulated.

13.2.2.2.3 Natural Ventilation

Natural ventilation should only be used up to a maximum drive power of 20 Hp. Units with higher powered drives should incorporate forced ventilation. To determine the size of the required intake and exhaust openings for natural ventilation, refer to the following table:

Drive Hp	Intake and Exhaust Openings Dependent on Room Volume (V) and Height (h)					
	V = 1750 ft ³ h = 6.5 ft		V = 3500 ft ³ h = 10 ft		V = 7000 ft ³ h = 13 ft	
	Intake (ft ²)	Exhaust (ft ²)	Intake (ft ²)	Exhaust (ft ²)	Intake (ft ²)	Exhaust (ft ²)
3	1.3	1.1	...	...	...	...
5	3.2	2.7	1.3	1.1	...	...
7.5	4.5	3.8	2.6	2.2	1.3	1.1
10	9.7	8.1	6.5	5.4	2.6	2.2
15	14.5	12.4	9.7	8.1	5.8	4.8
20	20.6	17.2	15.6	12.9	9.7	8.1

13.2.2.2.4 Forced Ventilation

Forced ventilation should be utilized on units with drive power higher than 20 Hp. For units with lower powered drive natural ventilation may be used. To determine the size of the required intake and exhaust openings for forced ventilation, refer to the following table

Drive Hp	Intake & Exhaust Openings Dependent on Room Volume (V) and Height (h) ^a					
	V = 1750 ft ³ h = 8 ft		V = 3500 ft ³ h = 10 ft		V = 7000 ft ³ h = 13 ft	
	Intake (ft ²)	Exhaust cfm	Intake (ft ²)	Exhaust cfm	Intake (ft ²)	Exhaust cfm
25	3.3	3,300	3.2	3,200	3.0	3,000
30	4.0	3,960	3.8	3,840	3.6	3,600
40	5.3	5,280	5.1	5,120	4.8	4,800
50	6.6	6,600	6.4	6,400	6.0	6,000
60	7.9	7,920	7.7	7,680	7.2	7,200
75	9.9	9,900	9.6	9,600	9.0	9,000
100	13.2	13,200	12.8	12,800	12.0	12,000
125	16.5	16,500	16.0	16,000	15.0	15,000
150	19.8	19,800	19.2	19,200	18.0	18,000

a. The intake sizes given in the above table are for a cooling Gas velocity of 1000 ft.min. Bauer recommends that the cooling Gas velocity be in the range of 600 ft. min. to 2000 ft.min.

13.2.3 Intake Gas

The quality of Gas produced by the compressor unit is directly related to the quality of Gas that is taken in by the compressor. Bauer compressors require clean, dry, shop Gas for optimal performance. The intake Gas source must be free of contaminants such as fumes, engine exhaust, and solvents. If the intake source will be piped in adhere to the following general rules:

- Use PVC or similar material that will not corrode and contaminate the incoming Gas.
- The entire run should be the same sized piping
- Install a moisture trap with a drain prior to the compressor inlet
- If using glue on the piping, allow sufficient time for the vapors to dissipate before using the compressor

13.2.3.1 Inside Gas Source

The location of the compressor and its Gas intake are significant to the quality of the Gas produced and the performance of the drying system. Locating the Gas intake near other heat producing equipment must be avoided when possible. A close proximity to water heaters, boilers, and such are potential contaminants to the quality of the processed Gas. Drying cartridge lifespans are dramatically reduced when the processed Gas's temperature is elevated. Inadequate ventilation reduces the ability of the compressor to cool itself or the Gas being compressed.

High levels of CO₂ are another cause of breathing Gas to become contaminated. CO₂ limits are 1,000 ppm. and most fresh Gas already contains about 330 ppm. A number of people inside poorly ventilated rooms can easily bring the CO₂ levels up to 600 ppm or more. If high levels of CO₂ are normally present at the compressor intake, increased ventilation may alleviate the problem. Moving the intake to an outside location is another viable solution.

13.2.3.2 Outside Gas Source

Moving a compressor's Gas intake to an outside location can improve the quality of the processed Gas and increase the lifespan of the drying filters. Before moving a compressor's intake to an outside location take into account the changing conditions that may occur around where the Gas intake will be.

Other exhausts vents, vehicle or machinery exhausts and fumes may contaminate the Gas in the area you wish to place your Gas intake. Gas samples can be taken and submitted for laboratory analysis if there are any doubts in the Gas quality.

If your Gas source is located outside, inspect the inlet piping regularly to ensure nothing has obstructed or contaminated the Gas that is being taken in.

13.2.4 Compressor Intake Piping

It is best to keep intake piping as short and straight as possible. Minimum height should be 8 - 10 ft. The end of the piping should point downward to avoid precipitation. Nothing should be allowed to restrict the Gas flow.

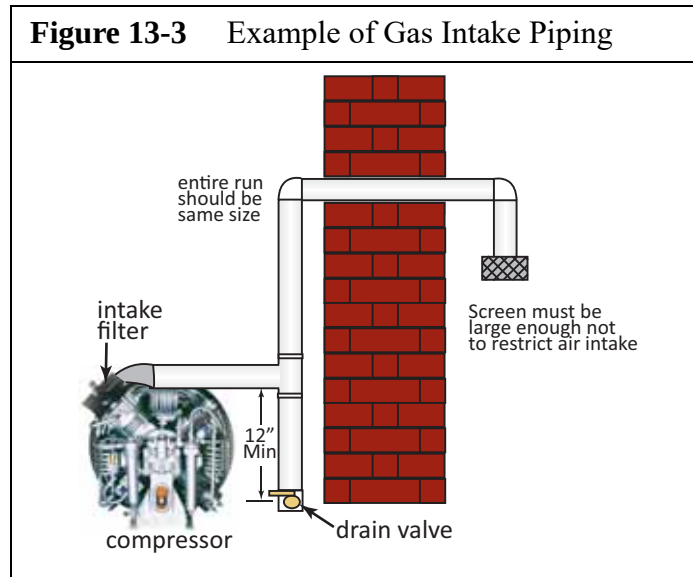
Breathing Gas can often fail to meet CGA standards, unless procedures are taken to provide a fresh Gas source for the compressor intake. The inlet source should be the cleanest ambient Gas available. Factors to consider when installing compressor intake piping in a building are the length of pipe, the diameter, and the number of 90° bends. All intake pipes must have a bug screen on the inlet end to prevent birds, bugs, or large debris from entering the inlet system. A gooseneck end or water trap on the pipe will prevent water from entering the compressor system. See the following table for recommended inlet pipe diameter.

Guideline for Intake Piping with Max. Four 90° bends		
Inlet Capacity	Distance	Pipe Diameter^a
≤ 13 SCFM	≤50 ft	2"
	50 - 100 ft	3"
	100 - 150 ft	4"
13 - 30 SCFM	≤50 ft	3"
	50 - 100 ft	4"
	100 - 150 ft	5"
30 - 50 SCFM	≤50 ft	4"
	50 - 100 ft	5"
	100 - 150 ft	6"

a. Add 1" of pipe diameter if the number of 90° bends exceeds four

13.2.5 Installation Procedures

1. Use PVC pipe for ease of installation.
2. Ensure pipe is attached securely to the wall.
3. Terminate the PVC pipe 3 to 5 ft from the compressor intake with a stub reducer the same size as the compressor inlet housing pipe.



13.2.6 Electrical Installation

13.2.6.1 Electric Drive

When making the electrical connections to the system, the following instructions are mandatory:

- Comply with all local, state and federal regulations concerning electrical installation.
- Arrange for the electrical connections to be made by a certified electrician only.
- Ensure that the motor voltage, control unit voltage, and frequency conform with the main voltage and frequency. Do not connect the compressor unit to a voltage other than the one specified on the name-plate.
- Provide all necessary cables and main fuses and a master disconnect switch. The fuse protection for the compressor must be carried out in compliance with local, state and national electrical regulations.

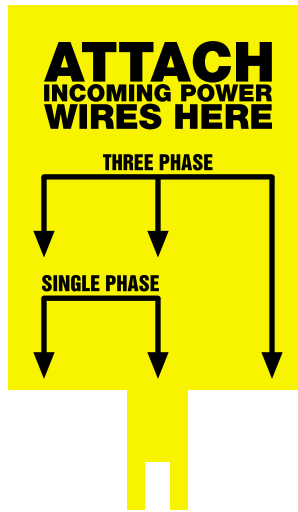
13.2.6.2 Electrical Supply

The machine is factory wired according to order. If the voltage is to be changed, consult the factory for instructions and necessary parts.

For standard models the only customer wiring necessary is from the customer supplied disconnect switch to the compressor unit electrical enclosure. All wiring should be done by a licensed electrician familiar with national, state and local electrical codes.

The label shown in Figure 13-4 indicates where the incoming power is connected to the compressor unit electrical enclosure. This label must be removed before using the equipment.

Figure 13-4 Incoming Power Wiring Label



The use of improperly sized wire can result in sluggish operation, unnecessary tripping of overload relays and/or blowing of fuses. The following tables are provided as a guide for proper wire size

1 PHASE									
Motor Hp	Full Load Amps			Fuse Amps ^a			Minimum Wire Size ^b		
	120 V	208 V	230 V	120 V	208 V	230 V	120 V	208 V	230 V
2	24	13.2	12	30	20	17.5	10	...	14
3	34	18.7	17	50	30	25	8	10	10
5	56	30.8	28	80	50	40	4	8	8
7.5	80	44	40	100	70	60	3	8	8
10	...	55	50	...	90	60	...	6	6

a. Dual element time delay fuse Amps.

b. Normal Copper wire with THW, THWN, or XHHW insulation.

3 PHASE									
Motor Hp	Full Load Amps			Fuse Amps ^a			Minimum Wire Size ^b		
	208 V	230 V	460V	208 V	230 V	460V	208 V	230 V	460V
2	7.5	6.8	3.4	12	10	5.6	14	14	14
3	10.6	9.6	4.8	17.5	15	8	14	14	14
5	16.7	15.2	7.6	25	25	12	10	12	14
7.5	24.2	22	11	40	30	17.5	8	10	14
10	30.8	28	14	50	40	20	8	8	12
15	46.2	42	21	60	60	30	6	6	10
20	59.4	54	27	90	80	40	4	4	8
25	74.8	68	34	100	100	50	3	4	8
30	88	80	40	125	100	60	2	3	8
40	114	104	52	175	150	80	1/0	1	6
50	143	130	65	200	200	100	3/0	2/0	4
60	169	154	77	250	200	100	4/0	3/0	3
75	211.2	192	96	300	300	150	300 mcm ^c	250 mcm	1
100	273	248	124	400	350	175	500 mcm	350 mcm	20
125	343.2	312	156	500	400	200	700 mcm	600 mcm	30
150	396	360	180	600	500	250	900 mcm	700 mcm	40
175	—	—	203	—	—	300	—	—	300 mcm

a. Dual element time delay fuse Amps.

b. Normal Copper wire with THW, THWN or XHHW insulation.

c. mcm = 1,000 circular mils

In the above tables, all values are based on 2011 NEC articles 430 and 310 (NFPA 70). These values are provided as a general guide; however, the information given on the motor nameplate supersedes the above information.

13.2.7 Pneumatic Leaks

Each unit is tested prior to leaving the manufacturing facility. All loose or leaking fittings are tightened prior to shipping. During the shipping process pneumatic connections may work loose and leaks may develop. Ensure each unit is leak tested prior to being placed in full operational usage.



WARNING

Never tighten or adjust fittings or connections under pressure. Always de-pressurize first.

13.3 Long Term Storage

13.3.1 General

If the compressor unit will be out of service for more than six months, it should be preserved in accordance with the following instructions:

1. Make sure that the compressor is kept indoors in a dry, dust-free room.
2. Cover the compressor with plastic sheets only if no condensation will form under the sheet.
3. Remove the sheet from time to time and clean the outside of the unit.
4. If this procedure cannot be followed, or if the compressor will be out of service for more than 24 months, please contact Bauer Product Support for special instructions.

13.3.2 Preparations

Prior to preserving the compressor unit, it must be run until warm, i.e., up to the specified service pressure. Operate the unit for approximately 10 minutes, then carry out the following checks.

1. Check all pipes, filters and valves (including safety valves) for leakage.
2. Tighten all couplings, as required.
3. After 10 minutes, open the outlet valve and operate the compressor at adjusted minimum pressure using the pressure maintaining valve for approximately 5 minutes.
4. After the 5 minutes, shut the compressor unit down and completely drain all separators and filters. Close all valves.
5. Remove filter heads and lubricate the threads with petroleum jelly.

13.3.2.1 Units Equipped with a Filter System

1. Ensure that cartridges remain in the drying system chambers. This will prevent oil from entering the outlet lines as a result of preservation procedures.
2. Remove the drying inlet tubing completely.

13.3.3 Preserving the Compressor

1. Operate the compressor again and slowly spray approximately 0.35 oz. (10 cc) of oil into the inlet port while the compressor is running. Keep the shut-off valve and the condensate drain valves open.
2. After spraying the oil into the inlet port, run the compressor unit for an additional 5 minutes before shutting the compressor unit down.

3. Close the shut-off valve and condensate drain valves.
4. Close the inlet port with a dust cap and/or tape.

13.3.4 Preventive Maintenance During Storage

Operate the compressor once every six months as follows:

1. Remove the dust cap from the inlet port and install the inlet filter.
2. Open the outlet valve and allow the system to run approximately 5 minutes until there is outflow from the valve and oil is visible in the sight glass of the oil regulating valve.
3. Shut down the compressor.
4. Open the condensate drain valves, de-pressurize the unit, then close the drain valves again.
5. Remove the intake filter and replace the dust cap on the inlet port.

13.3.5 Lubrication Oils for Preservation

1. After prolonged storage periods, the oil will age in the compressor crankcase. The oil must be drained at least every 24 months and replaced with fresh oil.
2. The stated period can only be attained when the crankcase is sealed during the preservation period in accordance with the preservation requirements.
3. After changing the oil, the compressor must be operated according to the instructions above.
4. Check the lubrication of the compressor during the every-six-month brief operation.
5. The oil pump is functioning properly when oil can be seen flowing through the sight glass of the oil pressure regulator or if the oil pressure gauge indicates the prescribed pressure.

13.3.6 Reactivating the Compressor Unit

1. Remove any dust cap or tape from the inlet port and install an intake filter cartridge.
2. Change the oil, ensuring proper oil level when refilled.
3. The motor must be thoroughly dry before applying power.
4. For units with a drying system, change all cartridges.
5. Run the compressor with open outlet valve for approximately 10 minutes. Check for proper operation of the lubricating system.
6. After 10 minutes, close the shut-off valve and run the system up to final pressure until the final pressure safety valve vents. On compressor units with a compressor control system, raise the pressure switch setting the switch above normal limits to override the pressure switch. Be sure to reset the switch after checking.
7. Check the interstage safety valves for leakage.
8. Establish the cause of any faults and remedy.
9. Stop the unit when it is running properly. The compressor is then ready for operation.

13.4.1 Scheduled Maintenance Form

1st Edition, Rev. 0 Chg. 13

Weekly or as required.	Para.	Date	Signature

500 Operating Hours.	Para.	Date	Signature

1,000 Operating Hours.	Para.	Date	Signature

2,000 Operating Hours.	Para.	Date	Signature

3,000 Operating Hours.	Para.	Date	Signature

Annually.	Para.	Date	Signature

Biennially. (Every two years)	Para.	Date	Signature

13.4.2 Cartridge Operating Hours

[illegible]

[illegible][illegible]

13.5 Reference Data

13.5.1 Tightening Torque Values

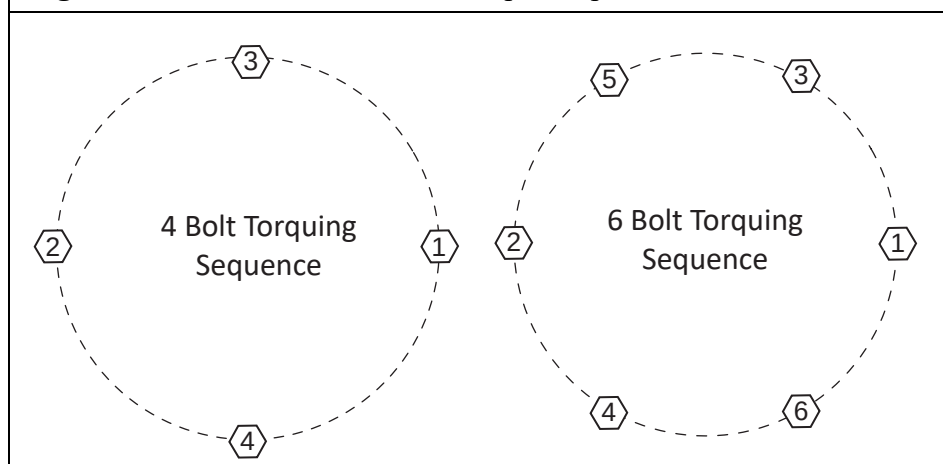
1. Unless otherwise specified in text, the torque values in Table 1 apply.
2. The indicated torque values are valid for bolts in greased condition.
3. Self locking nuts must be replaced on reassembly
4. Pipe connections (swivel nuts) should be tightened just enough so that leakage is stopped. Not more than finger tight plus up to an additional half turn.

Table 13-1: Torque Values

Bolt or Screw	Size	Max. Torque
Hex and Socket Head	1/4 in (6 mm)	7 ft-lb. (9.5 N m)
Hex and Socket Head	5/16 in (8 mm)	18 ft-lb. (24.4 N m)
Hex and Socket Head	3/8 in (10 mm)	32 ft-lb. (43.4 N m)
Hex and Socket Head	1/2 in. (12 mm)	53 ft-lb. (71.9 N m)
Hex and Socket Head	9/16 in (14 mm)	85 ft-lb. (115.3 N m)
Hex and Socket Head	5/8 in (16 mm)	141 ft-lb. (191.2 N m)

13.5.2 Torque Sequence Diagrams

Figure 13-5 6 Bolt and 4 Bolt Torque Sequence



13.5.3 Conversion Formulas

$$^{\circ}\text{F} = 9/5 \text{ }^{\circ}\text{C} + 32$$

$$\text{psi} = \text{bar} \times 14.5$$

$$^{\circ}\text{C} = 5/9 \times (^{\circ}\text{F} - 32)$$

$$\text{bar} = \text{psi} \times 0.0689$$

13.5.4 Approved Lubricants Chart

Unless otherwise specified in text, use the lubricants in Table 2.

Table 13-2: Lubricant Chart	
Usage	Lubricants
O-rings, rubber and plastic parts; filter housing threads, sealing rings	Parker Super “O” Lube
Bolts, nuts, studs, valve parts, Copper gaskets and tube connection parts (threads, cap nut and compression rings)	Never-Seez® NSWT, Pipe Dope or teflon tape
Paper gaskets	DOW Corning 732 or equivalent silicone compound applied on both sides before assembly,
High temperature connections	DOW Corning 732 or equivalent temperature resistant compound,
Tube connection ferrules,	Never-Seez® NSWT

13.5.5 Glossary of Abbreviations and Acronyms

AC	Activated Charcoal, removes odor and taste
ACD	Automatic Condensate Drain
ASME	American Society of Mechanical Engineers
CW	Clock Wise
CCW	Counter-Clockwise
CGA	Compressed Gas Association
DIN	Deutsches Institut für Normung (≈ ASME)
DOT	Department of Transportation
E1	single phase electrical supply (Electric 1)
E3	three phase electrical supply (Electric 3)
HP	Hopcalite, a chemical catalyst which converts carbon monoxide to carbon dioxide
IAW	In Accordance With
MS	Molecular Sieve, removes moisture
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety & Health Administration
ODP	Open Drip-proof (motor)
OEM	Original Equipment Manufacturer
PLC	Programmable Logic Controller
PMV	Pressure Maintaining Valve
SC	Securus® moisture sensing device

13.6 Additional Documents

13.6.1 Diagrams and Drawings

Any included drawings, wiring diagrams, pneumatic flow diagrams, etc., will be bound next to the back cover in a hard copy manual or included as a separate file on a CD.

13.6.2 Other Documents

OEM Manuals and other Bauer manuals may be included in the documentation shipping package.

CORRECTIONS & COMMENTS

In an effort towards constant improvement, the Documentation section of Bauer Compressors, Inc. would like to give you the opportunity to suggest improvements or corrections to this manual. If you find any inaccuracies or have suggestions feel free to E-mail us at: *documentation@bauercomp.com*, or fill out the form below and mail it to us:

Submitters Contact Information:

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(number & street)

(city, state \ zip)

E-mail: _____
(optional)

Unit Information:

Model: _____

Serial#: _____

Block#: _____

MFG Date: _____

Inaccuracies: page# _____ figure# _____ paragraph# _____

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