



Specifications Systems Operation Troubleshooting Testing and Adjusting Disassembly and Assembly

**All Products Air Conditioning and
Heating R134a for All Caterpillar
Machines**

Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the "Safety Alert Symbol" and followed by a "Signal Word" such as "DANGER", "WARNING" or "CAUTION". The Safety Alert "WARNING" label is shown below.



The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

A non-exhaustive list of operations that may cause product damage are identified by "NOTICE" labels on the product and in this publication.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. You must not use this product in any manner different from that considered by this manual without first satisfying yourself that you have considered all safety rules and precautions applicable to the operation of the product in the location of use, including site-specific rules and precautions applicable to the worksite. If a tool, procedure, work method or operating technique that is not specifically recommended by Caterpillar is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or become unsafe by the operation, lubrication, maintenance or repair procedures that you intend to use.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Cat dealers have the most current information available.



When replacement parts are required for this product Caterpillar recommends using Cat replacement parts or parts with equivalent specifications including, but not limited to, physical dimensions, type, strength and material.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

In the United States, the maintenance, replacement, or repair of the emission control devices and systems may be performed by any repair establishment or individual of the owner's choosing.

Table of Contents

Specifications Section

Refrigerant Compressor	5	System Capacities for Refrigerant (Backhoe Loaders)	101
Refrigerant Compressor	22	System Capacities for Refrigerant (Compact Track Loaders)	104
Refrigerant Compressor	26	System Capacities for Refrigerant (Compact Wheel Loaders)	105
Refrigerant Compressor	28	System Capacities for Refrigerant (Compactors)	106
Refrigerant Compressor	30	System Capacities for Refrigerant (Excavators) (302.5-5080)	109
Refrigerant Compressor	33	System Capacities for Refrigerant (Excavators) (304 CR, 305 CR, 313B CR, 321B CR)	111
Refrigerant Compressor	34	System Capacities for Refrigerant (Excavators) (307B)	111
Refrigerant Compressor	35	System Capacities for Refrigerant (Excavators) (307C, 311C, 320C)	112
Refrigerant Compressor	36	System Capacities for Refrigerant (Excavators) (307D-390D)	117
Refrigerant Compressor	36	System Capacities for Refrigerant (Excavators) (OEM MHPU)	121
Refrigerant Compressor	38	System Capacities for Refrigerant (Excavators) (308C CR-321C CR)	122
Refrigerant Compressor	39	System Capacities for Refrigerant (Excavators) (308D CR-328D CR)	123
Refrigerant Compressor	40	System Capacities for Refrigerant (Excavators) (311B-330B)	124
Refrigerant Compressor	41	System Capacities for Refrigerant (Excavators) (311B-385B)	126
Refrigerant Compressor	44	System Capacities for Refrigerant (Excavators) (312B-5090B)	129
Refrigerant Compressor	47	System Capacities for Refrigerant (Excavators) (312C, 322C-330C, TK1051)	131
Refrigerant Compressor	48	System Capacities for Refrigerant (Excavators) (312C-330C)	134
Refrigerant Compressor	49	System Capacities for Refrigerant (Excavators) (312E - 349E)	136
Refrigerant Compressor	50	System Capacities for Refrigerant (Excavators) (324D FM, 325D FM, 330D FM, 568 FM)	138
Refrigerant Compressor	52	System Capacities for Refrigerant (Excavators) (345C-385C)	139
Refrigerant Compressor	53	System Capacities for Refrigerant (Excavators) (M312 - M320)	140
Refrigerant Compressor	54	System Capacities for Refrigerant (Excavators) (M313C - M325C)	141
Refrigerant Compressor	55	System Capacities for Refrigerant (Excavators) (M313D - M322D)	142
Refrigerant Compressor	57	System Capacities for Refrigerant (Forest Products)	144
Refrigerant Compressor	59	System Capacities for Refrigerant (Integrated Toolcarriers)	147
Refrigerant Compressor	64	System Capacities for Refrigerant (Large Wheel Loaders)	149
Refrigerant Compressor	65	System Capacities for Refrigerant (Load Haul Dump)	150
Refrigerant Compressor	66	System Capacities for Refrigerant (Medium Wheel Loaders)	154
Refrigerant Compressor	67	System Capacities for Refrigerant (Mining Excavators)	156
Refrigerant Compressor	68	System Capacities for Refrigerant (Motor Graders)	159
Refrigerant Compressor	69	System Capacities for Refrigerant (Multi-Terrain Loaders)	161
Refrigerant Compressor	70		
Refrigerant Compressor	71		
Refrigerant Compressor	75		
Refrigerant Compressor	77		
Refrigerant Compressor	78		
Refrigerant Compressor	79		
Refrigerant Compressor	80		
Refrigerant Compressor	81		
Refrigerant Compressor	82		
Refrigerant Compressor	82		
Refrigerant Compressor	84		
Refrigerant Compressor	87		
Refrigerant Compressor	88		
Refrigerant Compressor	90		
Refrigerant Compressor	91		
Refrigerant Compressor	92		
Refrigerant Compressor	92		
Refrigerant Compressor	93		
Refrigerant Compressor	94		
System Capacities for Refrigerant (Agricultural Tractors)	95		
System Capacities for Refrigerant (Articulated Trucks)	97		
System Capacities for Refrigerant (Articulated Trucks) (OEM)	98		

System Capacities for Refrigerant (Off-Highway Trucks)	164
System Capacities for Refrigerant (Off-Highway Trucks) (OEM)	166
System Capacities for Refrigerant (Paving Products)	168
System Capacities for Refrigerant (Skid Steer Loaders)	172
System Capacities for Refrigerant (Small Wheel Loaders)	175
System Capacities for Refrigerant (Telehandlers)	176
System Capacities for Refrigerant (Track-Type Loaders)	177
System Capacities for Refrigerant (Track-Type Tractors)	185
System Capacities for Refrigerant (Underground Articulated Truck)	192
System Capacities for Refrigerant (Wheel Dozers)	193
System Capacities for Refrigerant (Wheel Tractor-Scrapers)	195

Systems Operation Section

General Information	197
Identifying the Refrigerant	197
Identifying the Air Conditioning System	198
Identifying the Heating System	199
Refrigerant Expansion Valve System	201
Refrigerant Orifice Tube System	203
Refrigerant Compressor	204
Refrigerant Condenser	205
Refrigerant Receiver-Dryer	205
Refrigerant Expansion Valve	206
In-line Refrigerant Dryer	207
Refrigerant Orifice Tube Assembly	208
Evaporator Coil	208
Refrigerant Accumulator	209
Refrigerant Compressor Protection System	210
Temperature Control	211
Pressure Switch (Refrigerant)	214
Cab Pressurization and Filtration System	215
Condensate Drainage System	216
Service Intervals	216
Glossary of Terms	220

Troubleshooting Section

Troubleshooting	
Required Tools	222
Machine Preparation for Troubleshooting	223
General Troubleshooting Information	224
Visual Inspection (Troubleshooting)	225
Air Conditioning System Troubleshooting	225
Heating System Troubleshooting	238
Troubleshooting Heating and Air Conditioning Control System	241
Troubleshooting Condensate Drainage System ..	252

Testing and Adjusting Section

Testing and Adjusting	
Machine Preparation for Testing and Adjusting ..	254
Air Conditioning Performance - Test	255
Refrigerant Leakage - Test	256
Manifold Gauge Set (Refrigerant) - Install	258
Refrigerant Recovery	259
Refrigerant System - Flush	262
Refrigerant Oil - Test	268
Refrigerant Compressor - Test	271
Refrigerant System - Evacuate	275
Refrigerant System - Charge	279
Manifold Gauge Set (Refrigerant) - Remove	285
Compressor Protection System - Test	286
Electronic Heat Control - Test	293
Heater Performance - Test	307

Reference Information Section

Heating and Air Conditioning Service Publications	309

Disassembly and Assembly Section

General Information	311
Machine Preparation for Disassembly and Assembly	312
Air Conditioner Lines - Remove and Install	313
Refrigerant Compressor - Remove and Install ..	315
Refrigerant Accumulator - Remove and Install ...	316
Refrigerant Expansion Valve - Remove and Install	316
Refrigerant Receiver-Dryer - Remove and Install	317
In-Line Refrigerant Dryer - Remove and Install ..	318
Refrigerant Orifice Tube Assembly - Remove and Install	320

Index Section

Index	322

Specifications Section

Refrigerant Compressor

SMCS Code: 1802

Part No.: 276-9875
S/N: KWB1-Up

Part No.: 276-9875
S/N: SSB1-Up

Part No.: 276-9875
S/N: MWD1-Up

Part No.: 276-9875
S/N: RED1-Up

Part No.: 276-9875
S/N: RTD1-Up

Part No.: 276-9875
S/N: JWF1-Up

Part No.: 276-9875
S/N: A9H1-Up

Part No.: 276-9875
S/N: B7H1-Up

Part No.: 276-9875
S/N: TNK1-Up

Part No.: 276-9875
S/N: JXM1-Up

Part No.: 276-9875
S/N: GCP1-Up

Part No.: 276-9875
S/N: JMP1-Up

Part No.: 276-9875
S/N: JSP1-Up

Part No.: 276-9875
S/N: DWS1-Up

Part No.: 276-9875
S/N: MAS1-Up

Part No.: 276-9875
S/N: SRS1-Up

Part No.: 276-9875
S/N: MBT1-Up

Part No.: 276-9875
S/N: MET1-Up

Part No.: 276-9875
S/N: MST1-Up

Part No.: 276-9875
S/N: TMW1-Up

i02835645

Part No.: 276-9875
S/N: JAY1-Up

Part No.: 276-9875
S/N: YYZ1-Up

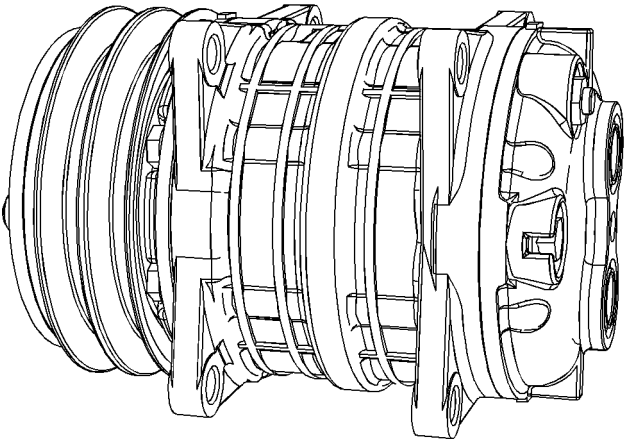


Illustration 1
Typical view of the 276-9875 Compressor

(1) Torque for oil plug 10 ± 2 N·m (89 ± 18 lb in)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(3) Pressure relief valve
Opening pressure of the relief valve 3450 kPa to 3920 kPa
(500 psi to 569 psi)

(4) Torque for pressure switch 8.0 ± 1.5 N·m
(71.00 ± 13.00 lb in)

Displacement per revolution 82 mL (2.8 oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a
ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol (PAG)
Oil capacity 150 mL (5.07 oz)

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC
Coil Resistance for clutch 3.2 ohms
Minimum voltage for engagement 10.5 VDC
Maximum current 3.75 amp

i04970509

Refrigerant Compressor

SMCS Code: 1802

Part No.: 3E-1906
S/N: AKA1-Up

Part No.: 3E-1906
S/N: ASA1-Up

Part No.: 3E-1906
S/N: BCA1-Up

Part No.: 3E-1906
S/N: BDA1-Up

Part No.: 3E-1906
S/N: BEA1-Up

Part No.: 106-5122, 3E-1906
S/N: DDA1-Up

Part No.: 3E-1906
S/N: H2A1-Up

Part No.: 106-5122, 3E-1906
S/N: RTA1-Up

Part No.: 3E-1906
S/N: W6A1-715

Part No.: 3E-1906
S/N: 1AB1510-Up

Part No.: 3E-1906
S/N: 1FB571-Up

Part No.: 3E-1906
S/N: 1JB1-Up

Part No.: 3E-1906
S/N: 4AB5532-Up

Part No.: 3E-1906
S/N: 5WB5586-Up

Part No.: 106-5122
S/N: AAB1-Up

Part No.: 3E-1906
S/N: AFB1-Up

Part No.: 3E-1906
S/N: ASB1-Up

Part No.: 3E-1906
S/N: BBB1-Up

Part No.: 3E-1906
S/N: BEB1-Up

Part No.: 106-5122
S/N: CEB1-Up

Part No.: 106-5122
S/N: GJB1-Up

Part No.: 3E-1906
S/N: H2B1-Up

Part No.: 3E-1906
S/N: HAB1-Up

Part No.: 3E-1906
S/N: JHB1-Up

Part No.: 3E-1906
S/N: JJB1-Up

Part No.: 3E-1906
S/N: LJB1-Up

Part No.: 106-5122, 3E-1906
S/N: RBB1-Up

Part No.: 183-5106
S/N: RCB1-Up

Part No.: 106-5122
S/N: WCB1-Up

Part No.: 106-5122, 3E-1906
S/N: WMB1-Up

Part No.: 3E-1906
S/N: ZEB1-Up

Part No.: 106-5122, 3E-1906
S/N: 4RC5589-Up

Part No.: 3E-1906
S/N: 6FC5542-Up

Part No.: 3E-1906
S/N: 7NC5527-Up

Part No.: 3E-1906
S/N: 8FC5612-Up

Part No.: 3E-1906
S/N: 8RC5967-Up

Part No.: 3E-1906
S/N: 9TC1-Up

Part No.: 3E-1906
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S/N: AFC1-Up

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S/N: BEC1-Up

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S/N: BNC1-Up

Part No.: 3E-1906
S/N: CCC1-Up

Part No.: 3E-1906
S/N: DAC1-Up

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S/N: H2C1-Up

Part No.: 106-5122
S/N: HDC1-Up

Part No.: 106-5122
S/N: RFC1-Up

Part No.: 3E-1906
S/N: SMC1-Up

Part No.: 106-5122
S/N: TBC1-Up

Part No.: 106-5122, 3E-1906
S/N: WAC1-Up

Part No.: 3E-1906
S/N: 1DD6006-Up

Part No.: 3E-1906
S/N: 1JD1-Up

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S/N: 1KD5600-Up

Part No.: 3E-1906
S/N: 1YD5522-Up

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S/N: 2SD5549-Up

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Part No.: 3E-1906
S/N: BMD1-Up

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S/N: CAD1-Up

Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
S/N: H2D1-Up

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Part No.: 3E-1906
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S/N: 5EJ1-Up

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S/N: 5TJ1317

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S/N: 6ZJ1-Up

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S/N: 7WJ1-Up

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S/N: 7XJ124-Up

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S/N: BMJ1-Up

Part No.: 106-5122
S/N: BRJ1-Up

Part No.: 106-5122
S/N: BZJ1-Up

Part No.: 3E-1906
S/N: DAJ1-Up

Part No.: 163-0872
S/N: LAJ1-Up

Part No.: 3E-1906
S/N: LKJ1-Up

Part No.: 106-5122
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Part No.: 3E-1906
S/N: 1HK424-Up

Part No.: 3E-1906
S/N: 1PK1-Up

Part No.: 3E-1906
S/N: 1YK2048-Up

Part No.: 3E-1906
S/N: 2ZK1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 3SK410-Up

Part No.: 3E-1906
S/N: 3XK1909-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 4HK366-Up

Part No.: 3E-1906
S/N: 4MK1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 5KK336-Up

Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 8KK314-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 9LK464-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 9RK308-Up

Part No.: 3E-1906
S/N: 9ZK143-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: AWK1-Up

Part No.: 3E-1906
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Part No.: 106-5122
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S/N: BZK1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
S/N: JLK1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
S/N: 2ZL1-Up

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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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S/N: BZL1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 163-0872
S/N: RSL1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 106-5122
S/N: 2RM142-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 3ZM127-Up

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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 106-5122
S/N: BZM1-Up

Part No.: 3E-1906
S/N: CXM1-Up

Part No.: 3E-1906
S/N: DAM1-Up

Part No.: 106-5122
S/N: DLM1-Up

Part No.: 163-0872
S/N: ERM1-Up

Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 3ZN1-Up

Part No.: 3E-1906
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Part No.: 106-5122
S/N: 4JN1-Up

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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 3ZR1-Up

Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 4TR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 4YR1-Up

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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 3E-1906
S/N: 5RR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 5YR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
S/N: 6LR1-Up

Part No.: 3E-1906
S/N: 6MR1-Up

Part No.: 3E-1906
S/N: 6TR1-Up

Part No.: 106-5122
S/N: 6XR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 7FR1-Up

Part No.: 3E-1906
S/N: 7GR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 8SR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 106-5122
S/N: 9AR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: BDR1-Up

Part No.: 3E-1906
S/N: BER1-Up

Part No.: 3E-1906
S/N: BZR1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: CLR1-Up

Part No.: 3E-1906
S/N: CXR1-Up

Part No.: 106-5122
S/N: DJR1-Up

Part No.: 3E-1906
S/N: DXR1-Up

Part No.: 3E-1906
S/N: SBR1-Up

Part No.: 106-5122, 3E-1906
S/N: TWR1-Up

Part No.: 3E-1906
S/N: W8R1-233

Part No.: 3E-1906
S/N: 1AS1-346

Part No.: 3E-1906
S/N: 1ES1-Up

Part No.: 3E-1906
S/N: 1GS1-143

Part No.: 3E-1906
S/N: 1HS1-Up

Part No.: 3E-1906
S/N: 1JS1-484

Part No.: 3E-1906
S/N: 1KS1-Up

Part No.: 3E-1906
S/N: 1XS1-Up

Part No.: 3E-1906
S/N: 1YS1-Up

Part No.: 3E-1906
S/N: 1ZS1-Up

Part No.: 3E-1906
S/N: 2AS1-Up

Part No.: 106-5122
S/N: 2DS1-Up

Part No.: 3E-1906
S/N: 2ES1-Up

Part No.: 3E-1906
S/N: 2GS1-Up

Part No.: 3E-1906
S/N: 2HS1-Up

Part No.: 106-5122
S/N: 2JS1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 2SS1-Up

Part No.: 106-5122
S/N: 2YS1-Up

Part No.: 3E-1906
S/N: 3AS1-Up

Part No.: 106-5122
S/N: 3BS1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 3ZS1-Up

Part No.: 106-5122
S/N: 4BS1-Up

Part No.: 3E-1906
S/N: 4DS1-Up

Part No.: 106-5122
S/N: 4GS1-Up

Part No.: 3E-1906
S/N: 4HS1-Up

Part No.: 106-5122
S/N: 4JS1-Up

Part No.: 3E-1906
S/N: 4NS1-Up

Part No.: 3E-1906
S/N: 4PS1-Up

Part No.: 3E-1906
S/N: 4RS1-Up

Part No.: 3E-1909
S/N: 4SS1-Up

Part No.: 106-5122
S/N: 4YS1-Up

Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 5CS1-Up

Part No.: 106-5122
S/N: 5ES1-Up

Part No.: 106-5122
S/N: 5FS1-Up

Part No.: 3E-1906
S/N: 5KS1-Up

Part No.: 3E-1906
S/N: 5LS1-Up

Part No.: 3E-1906
S/N: 5MS1-Up

Part No.: 106-5122
S/N: 5RS1-Up

Part No.: 3E-1906
S/N: 5SS1-Up

Part No.: 106-5122
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Part No.: 3E-1906
S/N: 6ES1-Up

Part No.: 3E-1906
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Part No.: 106-5122
S/N: 6PS1-Up

Part No.: 106-5122
S/N: 6WS1-Up

Part No.: 3E-1906
S/N: 6YS1-Up

Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 7LS1-Up

Part No.: 3E-1906
S/N: 8AS1-Up

Part No.: 3E-1906
S/N: 8ES1-Up

Part No.: 3E-1906
S/N: 8PS1-Up

Part No.: 106-5122
S/N: 8RS1-Up

Part No.: 3E-1906
S/N: 8SS1-Up

Part No.: 3E-1906
S/N: 9CS1-Up

Part No.: 3E-1906
S/N: 9FS1-Up

Part No.: 3E-1906
S/N: 9GS1-Up

Part No.: 106-5122
S/N: 9HS1-Up

Part No.: 3E-1906
S/N: 9JS1-269

Part No.: 3E-1906
S/N: 9PS1-Up

Part No.: 3E-1906
S/N: 9RS1-Up

Part No.: 3E-1906
S/N: 9SS1-Up

Part No.: 3E-1906
S/N: 9WS1-Up

Part No.: 3E-1906
S/N: 9XS1-Up

Part No.: 3E-1906
S/N: 9YS1-Up

Part No.: 3E-1906
S/N: 9ZS1-Up

Part No.: 3E-1906
S/N: ACS1-Up

Part No.: 3E-1906
S/N: CES1-Up

Part No.: 106-5122
S/N: DPS1-Up

Part No.: 106-5122
S/N: RLS1-Up

Part No.: 3E-1906
S/N: W2S1-293

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: AKT1-Up

Part No.: 3E-1906
S/N: AST1-Up

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S/N: BLT1-Up

Part No.: 3E-1906
S/N: BTT1-Up

Part No.: 3E-1906
S/N: CKT1-Up

Part No.: 3E-1906
S/N: CNT1-Up

Part No.: 106-5122, 3E-1906
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Part No.: 106-5122
S/N: FDT1-Up

Part No.: 3E-1906
S/N: GCT1-Up

Part No.: 106-5122
S/N: GMT1-Up

Part No.: 106-5122
S/N: MRT1-Up

Part No.: 106-5122
S/N: S6T1-Up

Part No.: 3E-1906
S/N: W2T1-297

Part No.: 106-5122
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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 1GW1-Up

Part No.: 3E-1906
S/N: 1JW1-Up

Part No.: 3E-1906
S/N: 1RW1-Up

Part No.: 3E-1906
S/N: 1SW1-214

Part No.: 3E-1906
S/N: 2DW1-Up

Part No.: 3E-1906
S/N: 2KW1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 2TW1-Up

Part No.: 3E-1906
S/N: 2XW1-Up

Part No.: 3E-1906
S/N: 3AW1-Up

Part No.: 106-5122
S/N: 3JW1-Up

Part No.: 3E-1906
S/N: 3PW1-Up

Part No.: 3E-1906
S/N: 3SW1-Up

Part No.: 106-5122
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Part No.: 3E-1906
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S/N: 4XW1-103

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Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 6PW1-Up

Part No.: 3E-1906
S/N: 6QW1-Up

Part No.: 3E-1906
S/N: 6SW1-Up

Part No.: 106-5122
S/N: 6YW1-Up

Part No.: 3E-1906
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Part No.: 106-5122
S/N: 8JW1-Up

Part No.: 3E-1906
S/N: 8XW1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 9MW1-Up

Part No.: 3E-1906
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Part No.: 106-5122
S/N: 9SW1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: 9ZW1-Up

Part No.: 3E-1906
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Part No.: 3E-1906
S/N: ADW1-Up

Part No.: 3E-1906
S/N: ANW1-Up

Part No.: 3E-1906
S/N: ARW1-Up

Part No.: 3E-1906
S/N: AXW1-Up

Part No.: 3E-1906
S/N: BLW1-Up

S/N: D2W1-Up

S/N: D6W1-Up

S/N: D8W1-Up	Part No.: 106-5122
Part No.: 3E-1906	S/N: S6Y1-Up
S/N: DNW1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 15Z1413-Up
S/N: EXW1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 16Z368-Up
S/N: RLW1-Up	Part No.: 3E-1906
Part No.: 106-5122	S/N: 17Z1614-Up
S/N: TFW1-Up	Part No.: 106-5122
Part No.: 3E-1906	S/N: 1PZ1-Up
S/N: 01X6362-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 1YZ1-Up
S/N: 02X371-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 1ZZ1-Up
S/N: 85X1651-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 21Z5346-Up
S/N: 87X1700-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 2CZ1-Up
S/N: AAX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 2FZ1-Up
S/N: AMX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 2KZ1-Up
S/N: BDX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 2RZ1-Up
S/N: CEX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 2YZ1-Up
S/N: CFX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 3AZ1-Up
S/N: CNX1-Up	Part No.: 106-5122
S/N: D3X1-Up	S/N: 3DZ1-Up
S/N: D9X1-Up	Part No.: 3E-1906
Part No.: 106-5122	S/N: 3GZ1-Up
S/N: LDX1-Up	Part No.: 3E-1906
Part No.: 106-5122	S/N: 3KZ1-Up
S/N: S6X1-Up	Part No.: 106-5122
Part No.: 106-5122, 3E-1906	S/N: 3PZ1-Up
S/N: WGX1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 3RZ1-Up
S/N: BDY1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 3YZ1-Up
S/N: BMY1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 4MZ1-Up
S/N: BTY1-Up	Part No.: 3E-1906
Part No.: 3E-1906	S/N: 5CZ1-Up
S/N: LAY1-Up	Part No.: 3E-1906
	S/N: 5EZ253-Up

Part No.: 3E-1906
S/N: 5KZ1-Up

Part No.: 3E-1906
S/N: 5LZ1-Up

Part No.: 3E-1906
S/N: 6AZ1-Up

Part No.: 3E-1906
S/N: 6DZ1-Up

Part No.: 3E-1906
S/N: 6GZ1-Up

Part No.: 3E-1906
S/N: 6SZ1-Up

Part No.: 3E-1906
S/N: 6YZ1-Up

Part No.: 3E-1906
S/N: 79Z5611-Up

Part No.: 3E-1906
S/N: 7MZ1-Up

Part No.: 3E-1906
S/N: 7PZ1-Up

Part No.: 3E-1906
S/N: 7RZ1-283

Part No.: 3E-1906
S/N: 80Z5518-Up

Part No.: 3E-1906
S/N: 89Z271-Up

Part No.: 3E-1906
S/N: 8XZ1-Up

Part No.: 3E-1906
S/N: 90Z223-Up

Part No.: 3E-1906
S/N: 91Z453-Up

Part No.: 3E-1906
S/N: 92Z580-Up

Part No.: 3E-1906
S/N: 9YZ1-Up

Part No.: 3E-1906
S/N: BCZ1-Up

Part No.: 3E-1906
S/N: BKZ1-Up

Part No.: 106-5122
S/N: BRZ1-Up

Part No.: 3E-1906
S/N: CBZ1-Up

Part No.: 106-5122
S/N: CZZ1-Up

Part No.: 106-5122, 3E-1906
S/N: DFZ1-Up

Part No.: 183-5106
S/N: JZZ1-Up

Part No.: 3E-1906
S/N: PEZ1-Up

Part No.: 3E-1906
S/N: 86X1104-Up; 89X1-Up

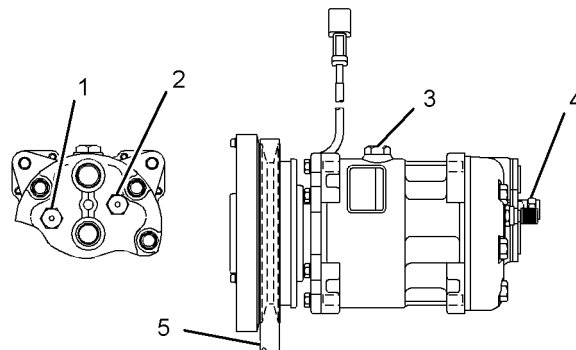


Illustration 2

g01515226

Typical view of the 3E-1906 Refrigerant Compressor Gp or the 106-5122 Refrigerant Compressor Gp

- (1) Installation torque for pressure switch
..... $8.0 \pm 1.5 \text{ N}\cdot\text{m}$ ($71.00 \pm 13.00 \text{ lb in}$)
- (2) Pressure relief valve
Opening pressure of pressure relief valve $3800 \pm 300 \text{ kPa}$ ($551 \pm 44 \text{ psi}$)
Sealing pressure of pressure relief valve 2900 kPa (421 psi)
- (3) Torque for oil plug .. $19.6 \pm 4.9 \text{ N}\cdot\text{m}$ ($14.5 \pm 4 \text{ lb ft}$)
- Note:** Oil plug (3) is under pressure when the system is pressurized.
- (4) Final installation torque .. $35 \pm 3 \text{ N}\cdot\text{m}$ ($26 \pm 2 \text{ lb ft}$)
- (5) V-belt tension
New V-belt $535 \pm 22 \text{ N}$ ($120 \pm 5 \text{ lb}$)
Used V-belt $400 \pm 44 \text{ N}$ ($90 \pm 10 \text{ lb}$)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... $2500 \pm 200 \text{ rpm}$

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic ClutchClutch 24 DCV coil resistance (Green wire) 17.6 ± 0.6 ohms

Power connection DT Connector

Minimum voltage for engagement 16 DCV

Maximum Current 1.42 amp

i03001196

Refrigerant Compressor**SMCS Code:** 1802**Part No.:** 277-7245
S/N: 2211-Up**Part No.:** 163-0872
S/N: 1241-Up**Part No.:** 163-0872
S/N: 1251-Up**Part No.:** 163-0872
S/N: 5251-Up**Part No.:** 163-0872
S/N: 5351-Up**Part No.:** 163-0872
S/N: 5451-Up**Part No.:** 163-0872
S/N: 1261-Up**Part No.:** 218-0324
S/N: A7A1-Up**Part No.:** 163-0872
S/N: AYA1-Up**Part No.:** 163-0872
S/N: BAA1-Up**Part No.:** 163-0872
S/N: CCA1-Up**Part No.:** 163-0872
S/N: JJA1-Up**Part No.:** 163-0872
S/N: JPA1-Up**Part No.:** 163-0872
S/N: MYA1-Up**Part No.:** 163-0872
S/N: N1A1-Up**Part No.:** 163-0872
S/N: N4A1-Up**Part No.:** 163-0872
S/N: SSA1-Up**Part No.:** 163-0872
S/N: WWA1-Up**Part No.:** 163-0872
S/N: AYB1-Up**Part No.:** 163-0872
S/N: BAB1-Up**Part No.:** 163-0872
S/N: ESB1-Up**Part No.:** 163-0872
S/N: RLB1-Up**Part No.:** 163-0872
S/N: RTB1-Up**Part No.:** 183-5106
S/N: WLB1-Up**Part No.:** 163-0872
S/N: WWB1-Up**Part No.:** 163-0872
S/N: AXC1-Up**Part No.:** 163-0872
S/N: B9C1-Up**Part No.:** 163-0872
S/N: BAC1-Up**Part No.:** 163-0872
S/N: CBC1-Up**Part No.:** 277-7245
S/N: H4C1-Up**Part No.:** 163-0872
S/N: LCC1-Up**Part No.:** 218-0324
S/N: WWC1-Up**Part No.:** 163-0872
S/N: A6D1-Up**Part No.:** 163-0872
S/N: A7D1-Up

Part No.: 163-0872
S/N: ASD1-Up

Part No.: 163-0872
S/N: AYD1-Up

Part No.: 163-0872
S/N: B9D1-Up

Part No.: 163-0872
S/N: BAD1-Up

Part No.: 163-0872
S/N: CLD1-Up

Part No.: 163-0872
S/N: CRD1-Up

Part No.: 163-0872
S/N: EED1-Up

Part No.: 183-5106
S/N: KSD1-Up

Part No.: 218-0324
S/N: L4D1-Up

Part No.: 163-0872
S/N: RCD1-Up

Part No.: 218-0324
S/N: WWD1-Up

Part No.: 163-0872
S/N: ASE1-Up

Part No.: 163-0872
S/N: AXE1-Up

Part No.: 163-0872
S/N: AYE1-Up

Part No.: 163-0872
S/N: B9E1-Up

Part No.: 163-0872
S/N: DBE1-Up

Part No.: 163-0872
S/N: AGF1-Up

S/N: AWF1-Up

Part No.: 163-0872
S/N: B9F1-Up

Part No.: 163-0872
S/N: BGF1-Up

Part No.: 163-0872
S/N: BKF1-Up

Part No.: 163-0872
S/N: CAF1-Up

Part No.: 163-0872
S/N: A6G1-Up

Part No.: 163-0872
S/N: A7G1-Up

Part No.: 163-0872
S/N: AYG1-Up

Part No.: 163-0872
S/N: B9G1-Up

Part No.: 163-0872
S/N: CKG1-Up

Part No.: 163-0872
S/N: D9G1-Up

Part No.: 163-0872
S/N: M1G1-Up

Part No.: 163-0872
S/N: M3G1-Up

Part No.: 163-0872
S/N: M5G1-Up

Part No.: 218-0324
S/N: MHG1-Up

Part No.: 163-0872
S/N: B9H1-Up

Part No.: 183-5106
S/N: R9H1-Up

Part No.: 163-0872
S/N: A6J1-Up

Part No.: 163-0872
S/N: A7J1-Up

Part No.: 218-0324
S/N: A8J1-Up

Part No.: 163-0872
S/N: AXJ1-Up

Part No.: 163-0872
S/N: B9J1-Up

Part No.: 163-0872
S/N: J5J1-Up

Part No.: 163-0872
S/N: J6J1-Up

Part No.: 183-5106
S/N: KKJ1-Up

Part No.: 183-5106
S/N: R9J1-Up

Part No.: 106-5122
S/N: BZK1-Up

Part No.: 163-0872
S/N: CBK1-Up

Part No.: 163-0972
S/N: K5K1-Up

Part No.: 163-0872
S/N: K6K1-Up

Part No.: 163-0872
S/N: ARL1-Up

Part No.: 163-0872
S/N: AXL1-Up

Part No.: 163-0872
S/N: AYL1-Up

Part No.: 163-0872
S/N: B1L1-Up

Part No.: 163-0872
S/N: B9L1-Up

Part No.: 163-0872
S/N: BKL1-Up

Part No.: 183-5106
S/N: D5L1-Up

Part No.: 163-0872
S/N: FDL1-Up

Part No.: 183-5106
S/N: JRL1-Up

Part No.: 163-0872
S/N: MXL1-Up

Part No.: 163-0872
S/N: SDL1-Up

Part No.: 163-0872
S/N: SZL1-Up

Part No.: 163-0872
S/N: APM1-Up

Part No.: 141-9676
S/N: AXM1-Up

Part No.: 163-0872
S/N: B1M1-Up

Part No.: 163-0872
S/N: B9M1-Up

Part No.: 163-0872
S/N: SZM1-Up

Part No.: 163-0872
S/N: APN1-Up

Part No.: 163-0872
S/N: AXN1-Up

Part No.: 163-0872
S/N: B9N1-Up

Part No.: 163-0872
S/N: JAN1-Up

Part No.: 183-5106
S/N: KLN1-Up

Part No.: 163-0872
S/N: PHN1-Up

Part No.: 163-0872
S/N: SZN1-Up

Part No.: 141-9676
S/N: AMP1-Up

Part No.: 163-0872
S/N: AWP1-Up

Part No.: 163-0872
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Part No.: 163-0872
S/N: JAP1-Up

Part No.: 163-0872
S/N: JBP1-Up

Part No.: 163-0872
S/N: JRP1-Up

Part No.: 163-0872
S/N: SZP1-Up

Part No.: 141-9676
S/N: AWR1-Up

Part No.: 163-0872
S/N: AXR1-Up

Part No.: 163-0872
S/N: B9R1-Up

Part No.: 163-0872
S/N: BMR1-Up

Part No.: 163-0872
S/N: BWR1-Up

Part No.: 163-0872
S/N: ANS1-Up

Part No.: 163-0872
S/N: ATS1-Up

Part No.: 163-0872
S/N: AXS1-Up

Part No.: 163-0872
S/N: AYS1-Up

Part No.: 163-0872
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Part No.: 163-0872
S/N: DLS1-Up

Part No.: 218-0324
S/N: JMS1-Up

Part No.: 218-0324
S/N: L8S1-Up

Part No.: 183-5106
S/N: RRS1-Up

Part No.: 163-0872
S/N: ANT1-Up

Part No.: 163-0872, 231-2163
S/N: B9T1-Up

Part No.: 163-0872
S/N: CLT1-Up

Part No.: 163-0872
S/N: D9T1-Up

Part No.: 141-9676, 163-0872, 277-7245
S/N: 2TW1-Up

Part No.: 218-0324
S/N: ASW1-Up

S/N: AZW1-Up

Part No.: 163-0872
S/N: B1W1-Up

Part No.: 163-0872
S/N: B9W1-Up

Part No.: 163-0872
S/N: D9W1-Up

Part No.: 163-0872
S/N: JNW1-Up

Part No.: 163-0872
S/N: PCW1-Up

Part No.: 163-0872
S/N: SAW1-Up

Part No.: 163-0872
S/N: AFX1-Up

Part No.: 163-0872
S/N: AXX1-Up

Part No.: 163-0872
S/N: CSX1-Up

Part No.: 183-5106
S/N: D5X1-Up

Part No.: 163-0872
S/N: JLX1-Up

Part No.: 163-0872
S/N: ANY1-Up

Part No.: 163-0872
S/N: AWY1-Up

Part No.: 163-0872
S/N: AXY1-Up

Part No.: 163-0872
S/N: B9Y1-Up

Part No.: 163-0872
S/N: BLY1-Up

S/N: BXY1-Up

Part No.: 163-0872
S/N: SJY1-Up

Part No.: 141-9676
S/N: 6GZ1-Up

Part No.: 141-9676
S/N: 7MZ1-Up

Part No.: 163-0872
S/N: ALZ1-Up

Part No.: 163-0872
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Part No.: 163-0872
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Part No.: 163-0872
S/N: AWZ1-Up

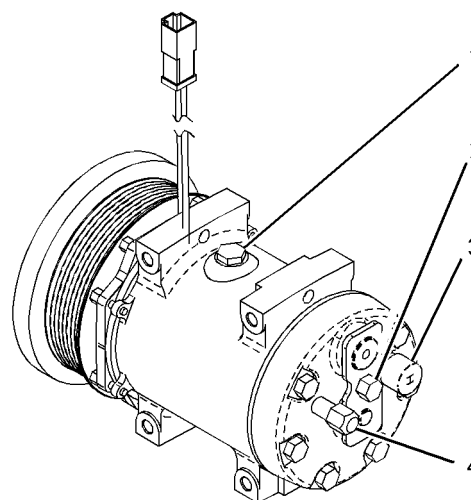


Illustration 3

g01374664

Typical view of the 163-0872 Compressor or the 277-7245 Compressor

(1) Torque for oil plug .. $19.6 \pm 4.9 \text{ N}\cdot\text{m}$ ($14.5 \pm 4 \text{ lb ft}$)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Final installation torque .. $35 \pm 3 \text{ N}\cdot\text{m}$ ($26 \pm 2 \text{ lb ft}$)

(3) Pressure relief valve

Opening pressure of the relief valve 3500 kPa to 4100 kPa
(508 psi to 595 psi)

Sealing pressure of the relief valve 2900 kPa
(420 psi)

(4) Torque for pressure switch 8.0 ± 1.5 N·m
(71.00 ± 13.00 lb in)

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended speed of compressor
..... 2500 ± 200 rpm

Belt tension

New belt 1068 ± 111 N (240 ± 25 lb)
Used belt 890 ± 44 N (200 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 890 ± 44 N (200 ± 10 lb).

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Cat 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil Resistance (24 DCV) for clutch .. 17.6 ± 0.6 ohms

Minimum voltage for engagement 16 DCV

Maximum current 1.42 amp

i03001197

Refrigerant Compressor

SMCS Code: 1802

Part No.: 198-4564
S/N: AGC1-Up

Part No.: 198-4564
S/N: 4XJ376-Up

Part No.: 198-4564
S/N: 7TJ1-Up

Part No.: 198-4564
S/N: 2TK79-Up

Part No.: 198-4564
S/N: 5RK1-Up

Part No.: 198-4564
S/N: 6HK265-Up

Part No.: 198-4564
S/N: 7EK231-Up

Part No.: 198-4564
S/N: 1HL102-Up

Part No.: 198-4564
S/N: 5ZL1-Up

Part No.: 198-4564
S/N: 7LL1-Up

Part No.: 198-4564
S/N: 61M5358-Up

Part No.: 198-4564
S/N: JSM1-Up

Part No.: 198-4564
S/N: 3PR1-Up

Part No.: 198-4564
S/N: 4AR1-Up

Part No.: 198-4564
S/N: 5ER1-Up

Part No.: 198-4564
S/N: CBR1-Up

Part No.: 198-4564
S/N: FKR1-Up

Part No.: 198-4564
S/N: AFS1-Up

Part No.: 198-4564
S/N: 93U3516-Up

Part No.: 198-4564
S/N: 96U9075-Up

Part No.: 198-4564
S/N: 72V15940-Up

Part No.: 198-4564
S/N: 87V9732-Up

Part No.: 198-4564
S/N: 11W1351-Up

Part No.: 198-4564
S/N: 13W896-Up

Part No.: 198-4564
S/N: 2BW1-Up

Part No.: 198-4564
S/N: 2YW1-Up

Part No.: 198-4564
S/N: APX1-Up

Part No.: 198-4564
S/N: AGY1-Up

Part No.: 198-4564
S/N: ATY1-Up

Part No.: 198-4564
S/N: 2PZ1-Up

Part No.: 198-4564
S/N: 3TZ83-Up

Part No.: 198-4564
S/N: 4GZ1-Up

Part No.: 198-4564
S/N: 5AZ1-Up

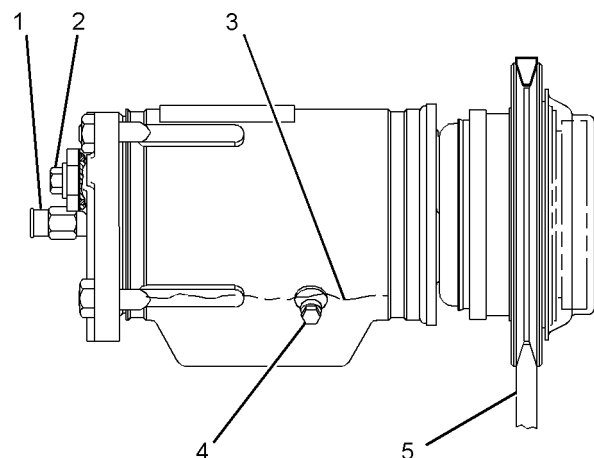


Illustration 4 g01371715

Typical view of the 198-4564 Refrigerant Compressor Gp

(1) Relief valve

Opening pressure of relief valve 3309 kPa
(480 psi)
Sealing pressure of relief valve 2964 kPa
(430 psi)

(2) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(3) Oil capacity 310.0 ± 14.5 mL
(10.50 ± 0.50 fl oz)

(4) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (4) is pressurized.

(5) V-belt tension

New V-belt 712 ± 22 N (160 ± 5 lb)
Used V-belt 489 ± 22 N (110 ± 5 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 489 ± 22 N (110 ± 5 lb). The belt should not run below 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Torque for Fittings

Torque for 3/4 inch threaded fitting 17 N·m
(150 lb in)

Note: The 3/4 inch fitting is located on the metal tube which has an internal diameter of 12.7 mm (0.50 inch).

Torque for 7/8 inch threaded fitting .. 25 N·m (18 lb ft)

Note: The 7/8 inch fitting is located on the metal tube which has an internal diameter of 15.8 mm (0.62 inch).

Torque for 3/8 inch retaining bolt 25 ± 7 N·m
(18 ± 5 lb ft)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol Oil (PAG)

Cat 9U-7551 Air Conditioner Lubricant

Oil capacity 310.0 ± 14.5 mL (10.50 ± 0.50 fl oz)

Magnetic Clutch

Clutch 24 DCV coil resistance 12.5 ohms

Minimum voltage for engagement 16 DCV

i04970462

Refrigerant Compressor

SMCS Code: 1802

Part No.: 176-1895
S/N: BEA1-Up

Part No.: 176-1895
S/N: CBA1-Up

Part No.: 176-1895
S/N: DAA1-Up

Part No.: 176-1895
S/N: EGA1-Up

Part No.: 176-1895
S/N: FAA1-Up

Part No.: 176-1895
S/N: GLA1-Up

Part No.: 176-1895
S/N: GPA1-Up

Part No.: 176-1895
S/N: ANB1-Up

Part No.: 176-1895
S/N: BDB1-Up

Part No.: 176-1895
S/N: BGB1-Up

Part No.: 176-1895
S/N: CFB1-Up

Part No.: 176-1895
S/N: MAB1-Up

Part No.: 176-1895
S/N: PAB1-Up

Part No.: 176-1895
S/N: CJC1-Up

Part No.: 176-1895
S/N: MAC1-Up

Part No.: 176-1895
S/N: PAC1-Up

Part No.: 176-1895
S/N: FED1-Up

Part No.: 176-1895
S/N: AKE1-Up

Part No.: 176-1895
S/N: BDE1-Up

Part No.: 176-1895
S/N: ANF1-Up

Part No.: 176-1895
S/N: BTG1-Up

Part No.: 176-1895
S/N: DBG1-Up

Part No.: 176-1895
S/N: JTG1-Up

Part No.: 176-1895
S/N: AKH1-Up

Part No.: 176-1895
S/N: BPH1-Up

Part No.: 176-1895
S/N: DAH1-Up

Part No.: 176-1895
S/N: SAH1-Up

Part No.: 176-1895
S/N: BKJ1-Up

Part No.: 176-1895
S/N: AXK1-Up

Part No.: 176-1895
S/N: BFK1-Up

Part No.: 176-1895
S/N: BKK1-Up

Part No.: 176-1895
S/N: BBL1-Up

Part No.: 176-1895
S/N: EGL1-Up

Part No.: 176-1895
S/N: JPL1-Up

Part No.: 176-1895
S/N: KGL1-Up

Part No.: 176-1895
S/N: BKM1-Up

Part No.: 176-1895
S/N: BZM1-Up

Part No.: 176-1895
S/N: CAM1-Up

Part No.: 176-1895
S/N: CLM1-Up

Part No.: 176-1895
S/N: BCN1-Up

Part No.: 176-1895
S/N: BNN1-Up

Part No.: 176-1895
S/N: SBN1-Up

Part No.: 176-1895
S/N: BLP1-Up

Part No.: 176-1895
S/N: BER1-Up

Part No.: 176-1895
S/N: BGR1-Up

Part No.: 176-1895
S/N: BPR1-Up

Part No.: 176-1895
S/N: EMR1-Up

Part No.: 176-1895
S/N: MAR1-Up

Part No.: 176-1895
S/N: TBR1-Up

Part No.: 176-1895
S/N: FDS1-Up

Part No.: 176-1895
S/N: CBT1-Up

Part No.: 176-1895
S/N: CFT1-Up

Part No.: 176-1895
S/N: RAW1-Up

Part No.: 176-1895
S/N: BRX1-Up

Part No.: 176-1895
S/N: SLX1-Up

Part No.: 176-1895
S/N: CBY1-Up

Part No.: 176-1895
S/N: MDY1-Up

Part No.: 176-1895
S/N: CLZ1-Up

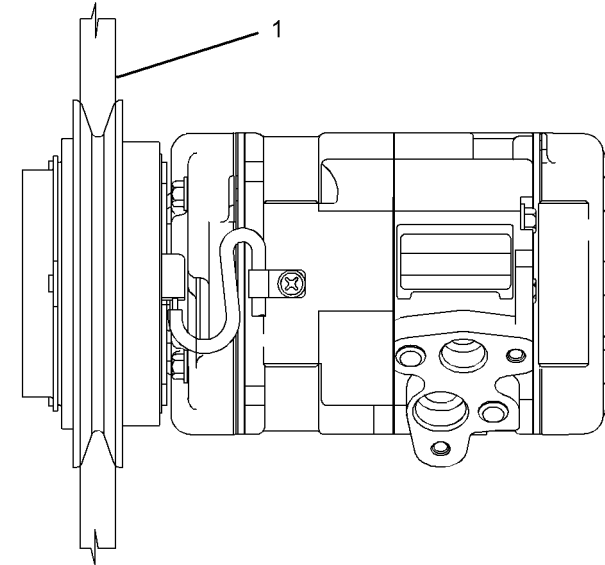


Illustration 5

g01515236

Refer to Specifications, "Air Conditioner Lines" for information concerning the torque of refrigerant lines.

(1) V-belt tension

New V-belt 578 ± 111 N (130 ± 25 lb)
Used V-belt 445 ± 44 N (100 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 445 N (100 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to test the tension of the belt.

Displacement per revolution 188.0 mL (6.36 fl oz)

Maximum allowable speed 6000 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity of compressor 180.0 mL (6.10 fl oz)

Type of compressor oil DENSO ND-OIL8

Magnetic Clutch

Voltage of magnetic clutch 24 VDC

Power consumption of a saturated magnetic
clutch 40 W

i04289951

Refrigerant Compressor

SMCS Code: 1802

Part No.: 338-9100
S/N: 8801-Up

Part No.: 320-1291
S/N: 4431-Up

Part No.: 320-1291
S/N: 5441-Up

Part No.: 320-1291
S/N: 6841-Up

Part No.: 320-1291
S/N: 7441-Up

Part No.: 320-1291
S/N: C641-Up

Part No.: 320-1291
S/N: 5461-Up

Part No.: 320-1291
S/N: CS61-Up

Part No.: 320-1291
S/N: 4371-Up

Part No.: 320-1291
S/N: 4381-Up

Part No.: 320-1291
S/N: 4391-Up

Part No.: 320-1291
S/N: A7A1-Up

Part No.: 324-9711
S/N: AMA1-Up

Part No.: 320-1291
S/N: PBA1-Up

Part No.: 320-1291
S/N: R4A1-Up

Part No.: 320-1291
S/N: T6A1-Up

Part No.: 320-1291
S/N: F1B1-Up

Part No.: 320-1291
S/N: JCB1-Up

Part No.: 324-9711
S/N: KSB1-Up

Part No.: 320-1291
S/N: L7B1-Up

Part No.: 320-1291
S/N: LCB1-Up

Part No.: 324-9711
S/N: ZJB1-Up

Part No.: 324-9711
S/N: JZC1-Up

Part No.: 320-1291
S/N: L8C1-Up

Part No.: 320-1291
S/N: LHC1-Up

Part No.: 324-9711
S/N: DTD1-Up

Part No.: 320-1291
S/N: EJD1-Up

Part No.: 320-1291
S/N: L4D1-Up

Part No.: 320-1291
S/N: M9D1-Up

Part No.: 338-9100
S/N: SPD1-Up

Part No.: 338-9100
S/N: Z4D1-Up

Part No.: 320-1291
S/N: B3E1-Up

Part No.: 320-1291
S/N: L4E1-Up

Part No.: 320-1291
S/N: M9E1-Up

Part No.: 320-1291
S/N: DBF1-Up

Part No.: 320-1291
S/N: L4F1-Up

Part No.: 320-1291
S/N: LCF1-Up

Part No.: 324-9711
S/N: MDG1-Up

Part No.: 324-9711
S/N: PBG1-Up

Part No.: 320-1291
S/N: R9G1-Up

Part No.: 324-9711
S/N: TWG1-Up

Part No.: 320-1291
S/N: J3H1-Up

Part No.: 320-1291
S/N: L4H1-Up

Part No.: 320-1291, 3E-6654
S/N: L8H1-Up

Part No.: 320-1291
S/N: L9H1-Up

Part No.: 320-1291
S/N: MWH1-Up

Part No.: 338-9100
S/N: SHH1-Up

Part No.: 324-9711
S/N: EJJ1-Up

Part No.: 320-1291
S/N: M9J1-Up

Part No.: 324-9711
S/N: SLJ1-Up

Part No.: 320-1291
S/N: TLJ1-Up

Part No.: 320-1291
S/N: DBK1-Up

Part No.: 324-9711
S/N: GMK1-Up

Part No.: 338-9100
S/N: H9K1-Up

Part No.: 320-1291
S/N: HKK1-Up

Part No.: 320-1291
S/N: M9K1-Up

Part No.: 324-9711
S/N: RRK1-Up

Part No.: 320-1291
S/N: W7K1-Up

Part No.: 320-1291
S/N: FLL1-Up

Part No.: 324-9711
S/N: JEL1-Up

Part No.: 320-1291
S/N: R9L1-Up

Part No.: 320-1291
S/N: SWL1-Up

Part No.: 338-9100
S/N: H8M1-Up

Part No.: 320-1291
S/N: J5M1-Up

Part No.: 324-9711
S/N: PEM1-Up

Part No.: 320-1291
S/N: R9M1-Up

Part No.: 320-1291
S/N: RFM1-Up

Part No.: 320-1291
S/N: TNM1-Up

Part No.: 324-9711
S/N: TSM1-Up

Part No.: 320-1291
S/N: W2M1-Up

Part No.: 324-9711
S/N: WLM1-Up

Part No.: 324-9711
S/N: MLN1-Up

Part No.: 320-1291
S/N: RHN1-Up

Part No.: 320-1291, 338-9100
S/N: T4P1-Up

Part No.: 320-1291
S/N: FER1-Up

Part No.: 320-1291
S/N: PER1-Up

Part No.: 320-1291
S/N: PGR1-Up

Part No.: 320-1291
S/N: PWR1-Up

Part No.: 320-1291
S/N: RDR1-Up

Part No.: 320-1291
S/N: T4R1-Up

Part No.: 320-1291
S/N: WMR1-Up

Part No.: 324-9711
S/N: JNS1-Up

Part No.: 320-1291
S/N: JWS1-Up

Part No.: 320-1291
S/N: MJS1-Up

Part No.: 320-1291
S/N: MMS1-Up

Part No.: 320-1291
S/N: T4S1-Up

Part No.: 324-9711
S/N: TFS1-Up

Part No.: 324-9711
S/N: FCT1-Up

Part No.: 320-1291
S/N: LCT1-Up

Part No.: 320-1291
S/N: R9T1-Up

Part No.: 320-1291
S/N: RJT1-Up

Part No.: 320-1291
S/N: RST1-Up

Part No.: 320-1291
S/N: X4T1-Up

Part No.: 320-1291
S/N: DBW1-Up

Part No.: 324-9711
S/N: JRW1-Up

Part No.: 324-9711
S/N: RCW1-Up

Part No.: 324-9711
S/N: Z4W1-Up

Part No.: 320-1291
S/N: CPX1-Up

Part No.: 324-9711
S/N: NGX1-Up

Part No.: 338-9100
S/N: ZMX1-Up

Part No.: 320-1291
S/N: NYY1-Up

Part No.: 320-1291
S/N: EAZ1-Up

Part No.: 320-1291
S/N: GTZ1-Up

Part No.: 338-9100
S/N: Z4Z1-Up

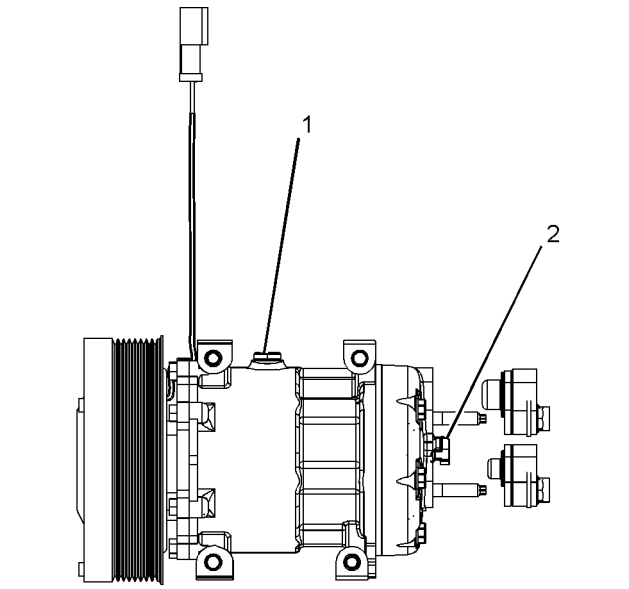


Illustration 6
Typical view of the 324-9711 Refrigerant Compressor Gp

(1) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Pressure relief valve

Opening pressure of the relief
valve 3800 ± 300 kPa (550 ± 44 psi)
Sealing pressure of the relief valve 3010 kPa
(435 psi)

Belt tension

Maximum 1176 N (264 lb)

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2700 ± 200 rpm

Refrigerant Oil

Oil capacity 180 mL (6 oz)

Note: Refer to Systems Operation, “Identifying the Air Conditioning System”.

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL
(8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 24 DCV coil resistance (Black wire) at 20° C (68° F) 17.6 ± 0.6 ohms

Minimum voltage for engagement 16 DCV

Maximum Current at 20° C (68° F) 1.42 amp

i01943954

Refrigerant Compressor

SMCS Code: 1802

Part No.: 218-4994
S/N: CMB1-Up

Part No.: 218-4994
S/N: CNC1-Up

Part No.: 218-4994
S/N: CED1-Up

Part No.: 218-4994
S/N: FDG1-Up

Part No.: 218-4994
S/N: B4L1-Up

Part No.: 218-4994
S/N: CMM1-Up

Part No.: 218-4994
S/N: CNY1-Up

Part No.: 218-4994
S/N: 4YZ1-Up

Part No.: 218-4994
S/N: 5SZ1-Up

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Type of compressor TM-13HD

Displacement per revolution 131 mL (4.4 fl oz)

Recommended Compressor RPM 700 to 6000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol (PAG)

Oil capacity of compressor 150.0 mL (5.07 fl oz)

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC

Power consumption 45 W or less

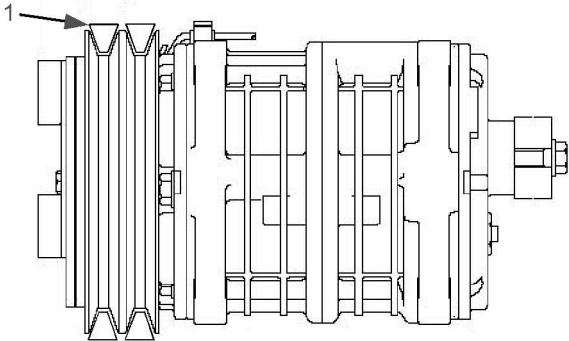


Illustration 7

g01011770

(1) Belt tension

New belt 534 ± 22 N (120 ± 5 lb)

Used belt 400 ± 44 N (90 ± 10 lb)

i05011911

Refrigerant Compressor

SMCS Code: 1802

Part No.: 345-3526
S/N: NLC1-Up

Part No.: 345-3526
S/N: GSL1-Up

Part No.: 345-3526
S/N: HCL1-Up

Part No.: 345-3526
S/N: SHY1-Up

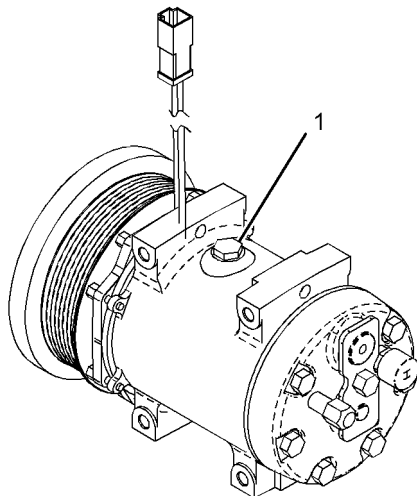


Illustration 8
345-3526 Refrigerant Compressor Gp

g03184496

(1) Torque for oil plug 19.6 ± 4.9 N·m
(173 ± 43 lb in)

Note: Oil plug (1) is under pressure when the system is pressurized.

Displacement per revolution 87 mL (3.0 oz)

Recommended speed of compressor 6500 rpm

Belt tension

New belt 534 ± 22 N (120 ± 5 lb)
Used belt 400 ± 44 N (90 ± 10 lb)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 150 mL (5 oz)

Cat 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil Resistance (24 DCV) for clutch at 20 °C (68 °F) 3.2 ohm

Minimum voltage for engagement 7.5 VDC

Maximum current at 20 °C (68 °F) 3.75 amp

i01714590

Refrigerant Compressor

SMCS Code: 1802

Part No.: 191-9028
S/N: DSA1-Up

Part No.: 191-9028
S/N: NAD1-Up

Part No.: 191-9028
S/N: SMD1-Up

Part No.: 191-9028
S/N: MXH1-Up

Part No.: 191-9028
S/N: DCK1-Up

Part No.: 191-9028
S/N: DCR1-Up

Part No.: 191-9028
S/N: DGT1-Up

Compressor

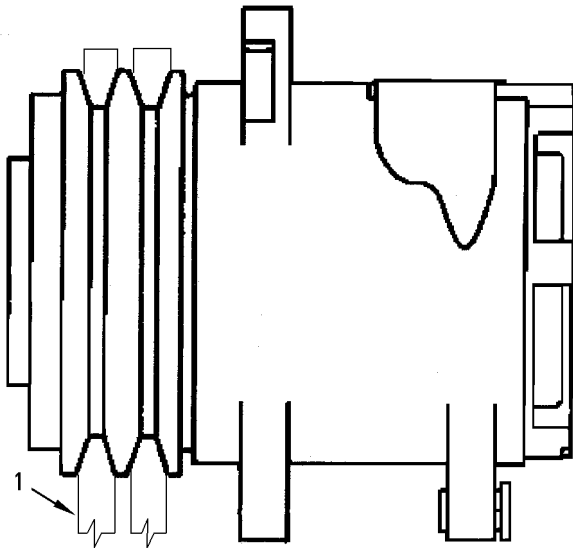


Illustration 9

g00895618

(1) Belt tension

New belt 800 ± 22 N (180 ± 5 lb)
Used belt 489 ± 44 N (110 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 489 ± 44 N (110 ± 10 lb).

Note: Use a Caterpillar 144 - 1102 Belt Tightener.

Type of compressor TM-08 B

Displacement per revolution 82 mL (2.77 fl oz)

Maximum allowable continuous RPM 4000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Type of compressor oil ND-OIL8

Oil capacity of compressor 150.0 mL (5.07 fl oz)

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC

Power consumption 45 W or less

Effective pulley diameter 125 mm (4.92 inch)

i01712047

Refrigerant Compressor

SMCS Code: 1802

Part No.: 163-9852
S/N: DCR1-Up

Compressor

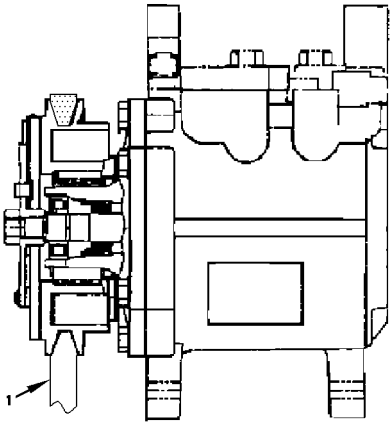


Illustration 10

g00881035

(1) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)

Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144 - 0235 Belt Tightener.

Displacement per revolution 60.0 mL (2.03 fl oz)

Maximum allowable continuous RPM 9000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC

Power consumption 36 W or less

Effective pulley diameter 112.5 mm (4.43 inch)

i04602896

Refrigerant Compressor

SMCS Code: 1802

Part No.: 260-5265

S/N: SMD1-Up

Part No.: 260-5265

S/N: MXH1-Up

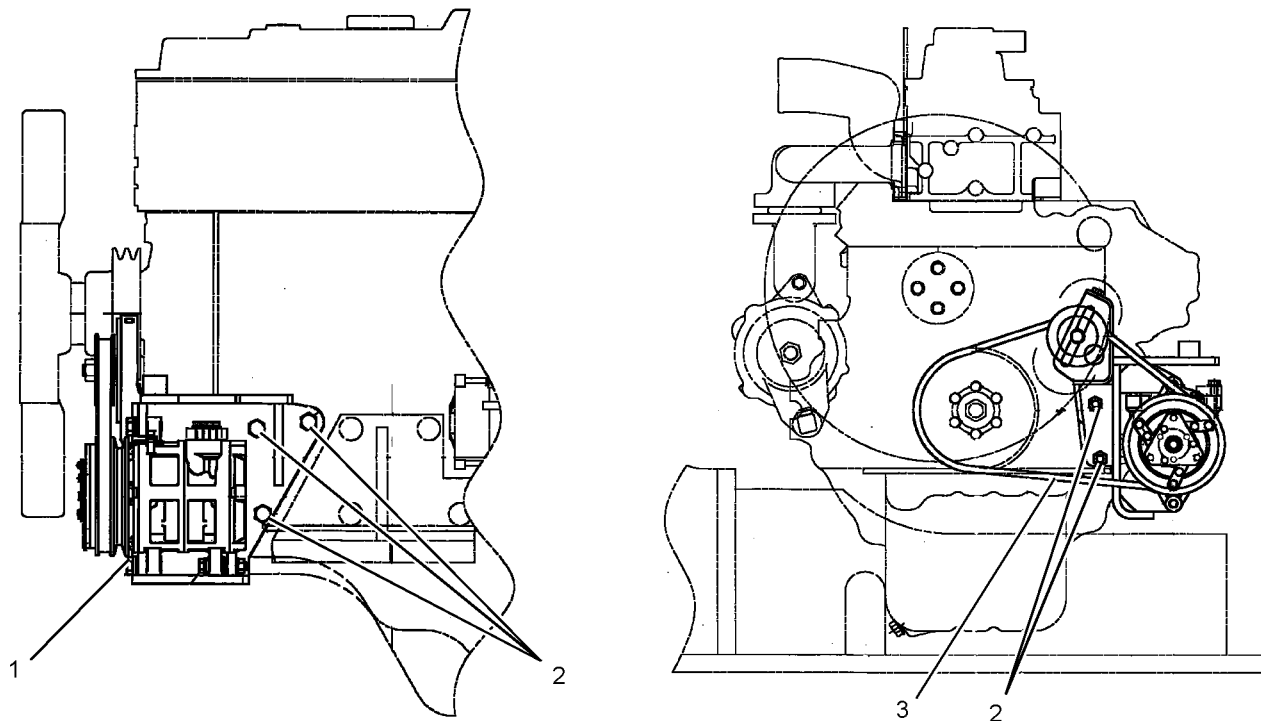


Illustration 11

g02754696

- (1) Torque for two bolts .. 32 ± 3 N·m (283 ± 27 lb in)
- (2) Apply blue Loctite 242 to threads of five bolts.
- (3) Adjust belt tension according to 7N-9693 Tension Chart.

i01725133

Refrigerant Compressor

SMCS Code: 1802

Part No.: 105-9362
S/N: 5PK1001-Up

Part No.: 105-9362
S/N: 7DK3001-Up

Part No.: 105-9362
S/N: 9ZL140-Up

Part No.: 105-9362
S/N: 2PM115-Up

Part No.: 105-9362
S/N: 3XM213-Up

Part No.: 105-9362
S/N: 4JM1446-Up

Part No.: 105-9362
S/N: 6XM217-Up

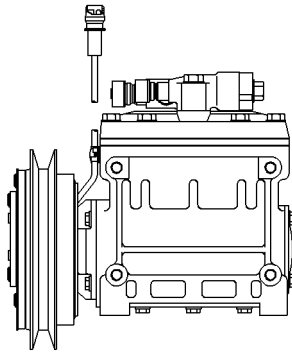


Illustration 12

g00886683

Refer to Specifications, “Air Conditioner Lines” for information concerning the torque of refrigerant lines.

(1) V-belt tension

New V-belt 578 ± 111 N (130 ± 25 lb)
Used V-belt 445 ± 44 N (100 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 445 N (100 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to adjust the tension of the belt.

Maximum continuous speed 7000 rpm

Displacement per revolution 100 mL (3.72 fl oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant

Oil capacity of compressor 230.0 mL (7.78 fl oz)

Magnetic Clutch

Voltage of magnetic clutch 24 VDC

Effective pulley diameter 145 mm (5.71 inch)

i01727037

Refrigerant Compressor

SMCS Code: 1802

Part No.: 117-6353
S/N: APA1-Up

Part No.: 117-6353
S/N: BCB1-Up

Part No.: 117-6353
S/N: BDB1-Up

Part No.: 117-6353
S/N: HBC1-Up

Part No.: 117-6353
S/N: ALF1-Up

Part No.: 117-6353
S/N: AKH1-Up

Part No.: 117-6353
S/N: BAJ1-Up

Part No.: 117-6353
S/N: BCM1-Up

Part No.: 117-6353
S/N: CWP1-Up

Part No.: 117-6353
S/N: 3MR1-Up

Part No.: 117-6353
S/N: 4MR1-Up

Part No.: 117-6353
S/N: 8HR1-Up

Part No.: 117-6353
S/N: 1CS1-Up

Part No.: 117-6353
S/N: 2MS1-Up

Part No.: 117-6353
S/N: 4FS1-Up

Part No.: 117-6353
S/N: 2DW1-Up

Part No.: 117-6353
S/N: 5CW1-Up

Part No.: 117-6353
S/N: ALX1-Up

Part No.: 117-6353
S/N: 2WZ1-Up

Part No.: 117-6353
S/N: 6KZ1-Up

Part No.: 117-6353
S/N: 7DZ1-Up

Part No.: 117-6353
S/N: 7ZZ1-Up

Part No.: 117-6353
S/N: 8GZ1-Up

(3) Refer to Specifications, "Air Conditioner Lines" for information concerning the torque of refrigerant lines.

Refer to Specifications, "Relief Valve (Refrigerant)" for specified pressures.

Size of 1N-4635 V-Belt 13A

Model of compressor MSC90T

Type of compression Scroll

Displacement per revolution 90 mL (3 fl oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol Oil (PAG)

Cat 9U-7551 Air Conditioner Lubricant

Oil capacity of compressor 130.0 ± 10.0 mL
(4.50 ± .30 fl oz)

Magnetic Clutch

Voltage of magnetic clutch 24 VDC

Power consumption of a saturated magnetic clutch 38 W

i01526357

Refrigerant Compressor

SMCS Code: 1802

Part No.: 171-7495
S/N: APA1-Up

Part No.: 171-7495
S/N: FBA1-Up

Part No.: 171-7495
S/N: GAA1-Up

Part No.: 171-7495
S/N: MAA1-Up

Part No.: 171-7495
S/N: PAA1-Up

Part No.: 171-7495
S/N: BCB1-Up

Part No.: 171-7495
S/N: BDB1-Up

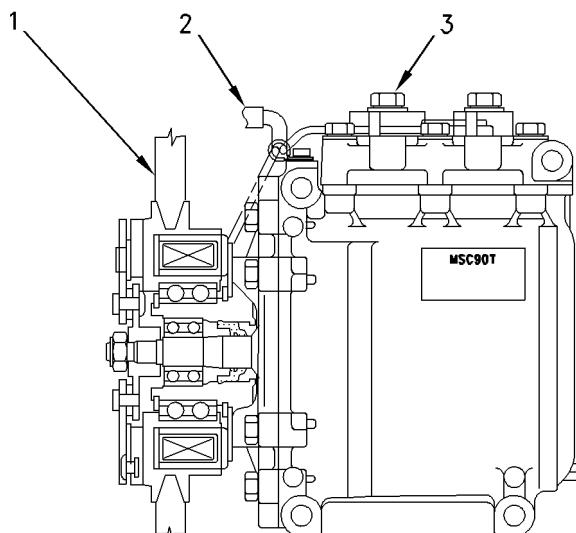


Illustration 13

g00887154

(1) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to adjust the tension of the belt.

(2) Power connection 2 pin DT connector

Part No.: 171-7495
S/N: FBB1-Up

Part No.: 171-7495
S/N: GAB1-Up

Part No.: 171-7495
S/N: HBC1-Up

Part No.: 171-7495
S/N: PAD1-Up

Part No.: 171-7495
S/N: BNE1-Up

Part No.: 171-7495
S/N: CAE1-Up

Part No.: 171-7495
S/N: CKE1-Up

Part No.: 171-7495
S/N: ALF1-Up

Part No.: 171-7495
S/N: AKH1-Up

Part No.: 171-7495
S/N: BAJ1-Up

Part No.: 171-7495
S/N: CLK1-Up

Part No.: 171-7495
S/N: BCM1-Up

Part No.: 171-7495
S/N: CWP1-Up

Part No.: 171-7495
S/N: ALX1-Up

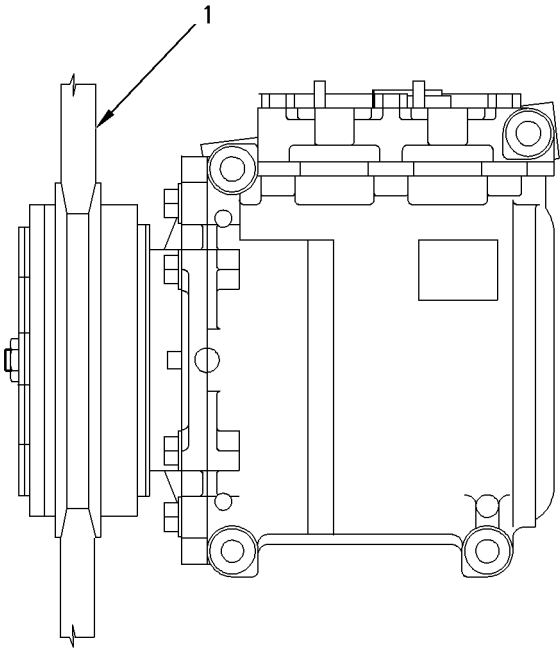


Illustration 14

g00792850

Refer to Specifications, “Air Conditioner Lines” for information concerning the torque of refrigerant lines.

(1) V-belt tension

New V-belt	578 ± 111 N (130 ± 25 lb)
Used V-belt	445 ± 44 N (100 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 445 N (100 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to adjust the tension of the belt.

Maximum continuous speed 9000 rpm

Displacement per revolution 90.0 cc (3.04 fl oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant

Oil capacity of compressor 140.0 mL (4.73 fl oz)

Magnetic Clutch

Voltage of magnetic clutch 24 VDC

Power consumption of a saturated magnetic
clutch 34 W

i04796890

Refrigerant Compressor

SMCS Code: 1802

Part No.: 259-7244
S/N: CLA1-Up

Part No.: 259-7244
S/N: JHA1-Up

Part No.: 259-7244
S/N: JZA1-Up

Part No.: 259-7244
S/N: LKA1-Up

Part No.: 259-7244
S/N: SKA1-Up

Part No.: 259-7244
S/N: ZCA1-Up

Part No.: 259-7244
S/N: ZGB1-Up

Part No.: 259-7244
S/N: HJC1-Up

Part No.: 259-7244
S/N: JBC1-Up

Part No.: 259-7244
S/N: RAC1-Up

Part No.: 259-7244
S/N: SDC1-Up

Part No.: 259-7244
S/N: WGC1-Up

Part No.: 259-7244
S/N: CYD1-Up

Part No.: 259-7244
S/N: JPD1-Up

Part No.: 259-7244
S/N: KBD1-Up

Part No.: 259-7244
S/N: KCD1-Up

Part No.: 259-7244
S/N: KXD1-Up

Part No.: 259-7244
S/N: MZD1-Up

Part No.: 259-7244
S/N: SED1-Up

Part No.: 259-7244
S/N: YSD1-Up

Part No.: 259-7244
S/N: DHE1-Up

Part No.: 259-7244
S/N: MDE1-Up

Part No.: 259-7244
S/N: NDE1-Up

Part No.: 259-7244
S/N: PBE1-Up

Part No.: 259-7244
S/N: TAE1-Up

Part No.: 259-7244
S/N: TLE1-Up

Part No.: 259-7244
S/N: WNE1-Up

Part No.: 259-7244
S/N: A6F1-Up

Part No.: 259-7244
S/N: A8F1-Up

Part No.: 259-7244
S/N: A9F1-Up

Part No.: 259-7244
S/N: AYF1-Up

Part No.: 259-7244
S/N: BZF1-Up

Part No.: 259-7244
S/N: GTF1-Up

Part No.: 259-7244
S/N: KGF1-Up

Part No.: 259-7244
S/N: KTF1-Up

Part No.: 259-7244
S/N: KZF1-Up

Part No.: 259-7244
S/N: NZF1-Up

Part No.: 259-7244
S/N: RKF1-Up

Part No.: 259-7244
S/N: ZMF1-Up

Part No.: 259-7244
S/N: CWG1-Up

Part No.: 259-7244
S/N: DSG1-Up

Part No.: 259-7244
S/N: JLG1-Up

Part No.: 259-7244
S/N: MGG1-Up

Part No.: 259-7244
S/N: BZH1-Up

Part No.: 259-7244
S/N: FMH1-Up

Part No.: 259-7244
S/N: MCH1-Up

Part No.: 259-7244
S/N: PHH1-Up

Part No.: 259-7244
S/N: TDH1-Up

Part No.: 259-7244
S/N: DCJ1-Up

Part No.: 259-7244
S/N: PNJ1-Up

Part No.: 259-7244
S/N: WBJ1-Up

Part No.: 259-7244
S/N: ZKJ1-Up

Part No.: 259-7244
S/N: DHK1-Up

Part No.: 259-7244
S/N: FXK1-Up

Part No.: 259-7244
S/N: LRK1-Up

Part No.: 259-7244
S/N: WPK1-Up

Part No.: 259-7244
S/N: XCK1-Up

Part No.: 259-7244
S/N: XGK1-Up

Part No.: 259-7244
S/N: FAL1-Up

Part No.: 259-7244
S/N: GKL1-Up

Part No.: 259-7244
S/N: LFL1-Up

Part No.: 259-7244
S/N: RHL1-Up

Part No.: 259-7244
S/N: BYM1-Up

Part No.: 259-7244
S/N: KFM1-Up

Part No.: 259-7244
S/N: KLM1-Up

Part No.: 259-7244
S/N: KRM1-Up

Part No.: 259-7244
S/N: NCM1-Up

Part No.: 259-7244
S/N: PBM1-Up

Part No.: 259-7244
S/N: PCM1-Up

Part No.: 259-7244
S/N: BZN1-Up

Part No.: 259-7244
S/N: CJN1-Up

Part No.: 259-7244
S/N: KHN1-Up

Part No.: 259-7244
S/N: SPN1-Up

Part No.: 259-7244
S/N: WBN1-Up

Part No.: 259-7244
S/N: BZP1-Up

Part No.: 259-7244
S/N: DLP1-Up

Part No.: 259-7244
S/N: GDP1-Up

Part No.: 259-7244
S/N: RJP1-Up

Part No.: 259-7244
S/N: DWR1-Up

Part No.: 259-7244
S/N: GKS1-Up

Part No.: 259-7244
S/N: JGS1-Up

Part No.: 259-7244
S/N: KES1-Up

Part No.: 259-7244
S/N: NES1-Up

Part No.: 259-7244
S/N: YDS1-Up

Part No.: 259-7244
S/N: EJT1-Up

Part No.: 259-7244
S/N: SRT1-Up

Part No.: 259-7244
S/N: BWW1-Up

Part No.: 259-7244
S/N: DDW1-Up

Part No.: 259-7244
S/N: DKW1-Up

Part No.: 259-7244
S/N: EAW1-Up

Part No.: 259-7244
S/N: HCW1-Up

Part No.: 259-7244
S/N: EAX1-Up

Part No.: 259-7244
S/N: GMX1-Up

Part No.: 259-7244
S/N: HJX1-Up

Part No.: 259-7244
S/N: PCX1-Up

Part No.: 259-7244
S/N: PHX1-Up

Part No.: 259-7244
S/N: WZX1-Up

Part No.: 259-7244
S/N: CXY1-Up

Part No.: 259-7244
S/N: DAY1-Up

Part No.: 259-7244
S/N: EBY1-Up

Part No.: 259-7244
S/N: TGY1-Up

Part No.: 259-7244
S/N: CYZ1-Up

Part No.: 259-7244
S/N: JFZ1-Up

Part No.: 259-7244
S/N: JGZ1-Up

Part No.: 259-7244
S/N: ZGZ1-Up

Compressor

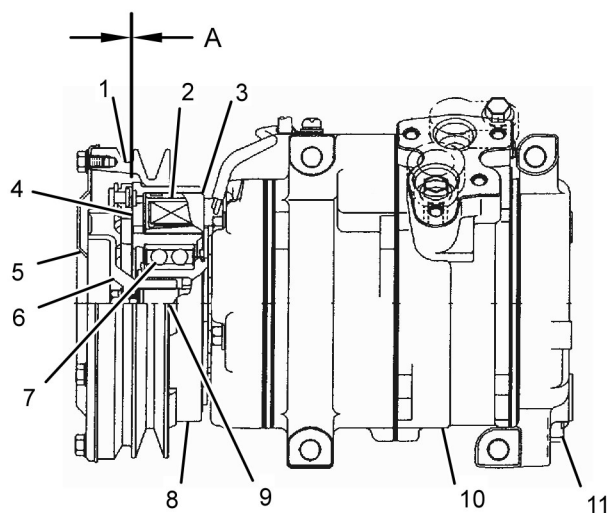


Illustration 15

g02914877

(1) Pulley	(5) Dust cover	(9) Shaft
(2) Coil	(6) Hub	(10) Compressor
(3) Stator	(7) Bearing	
(4) Rotor	(8) Magnetic clutch	

Note: Refer to Specifications, “Air Conditioner Lines” for information concerning the torque specifications of refrigerant lines.

Table 1

Specification for 259-7244 Refrigerant Compressor Gp			
Item	Qty	Part	Specification Description
A	As required use the following washers to obtain the space of 0.35 to 0.60 mm (0.014 to 0.024 inch) between the rotor (4) and the hub (6):		
	1	264-9982 Washer	Thickness is 0.10 ± 0.03 mm (0.004 ± 0.001 inch).
	1	264-9983 Washer	Thickness is 0.30 ± 0.03 mm (0.012 ± 0.001 inch).
	1	264-9984 Washer	Thickness is 0.50 ± 0.03 mm (0.020 ± 0.001 inch).
11	-	-	Torque the pressure relief valve to 13.20 ± 1.47 N·m (116.83 ± 13.01 lb in). Opening pressure of pressure relief valve is 3.785 ± 0.355 MPa (548.968 ± 51.488 psi). Closing pressure is 2.75 MPa (398.85 psi).
-	-	-	Belt Tension: For new belt is 534 ± 22 N (120 ± 5 lb). For used belt is 400 ± 44 N (90 ± 10 lb).
-	-	-	Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).
-	-	-	Use a Caterpillar 144-0235 Belt Tension Gauge.
-	-	-	Power connection - Two pin DT connectors. Type of compressor is 10S17. Displacement per revolution is 160.00 cc (9.76 cubic inch). Maximum allowable continuous RPM is 6000. R-134a Refrigerant: DuPont - SUVA TRANS A/C HFC134a. ICI - KLEA 134a Refrigerant Oil: Type of compressor oil is ND-OIL8. Oil capacity of compressor is 160.0 mL (5.4 oz). Magnetic Clutch: Type of magnetic clutch is L50T. Rated voltage of magnetic clutch is 24 VDC. Power consumption is 40 W or less. Effective pulley diameter is 133.0 mm (5.24 inch).

i02413968

Refrigerant Compressor

SMCS Code: 1802

Part No.: 189-2746
S/N: KJA1-Up

Part No.: 189-2746
S/N: PCA1-Up

Part No.: 189-2746
S/N: WSA1-Up

S/N: KBB1-Up

Part No.: 189-2746
S/N: KHB1-Up

Part No.: 189-2746
S/N: CPE1-Up

Part No.: 189-2746
S/N: HGF1-Up

Part No.: 189-2746
S/N: MCF1-Up

Part No.: 189-2746
S/N: CRW1-Up

Part No.: 189-2746
S/N: KCX1-Up

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144-0235 Belt Tightener.

Displacement per revolution 147 mL (4.97 fl oz)

Refrigerant Oil

Oil capacity 210 mL (7.1 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Voltage of Magnetic Clutch 24 VDC

Maximum RPM 7000 rpm

i02763642

Refrigerant Compressor

SMCS Code: 1802

Part No.: 259-7245
S/N: TXA1-Up

Part No.: 259-7245
S/N: FYC1-Up

Part No.: 259-7245
S/N: PBD1-Up

Part No.: 259-7245
S/N: MPG1-Up

Part No.: 259-7245
S/N: BYJ1-Up

Part No.: 259-7245
S/N: TXN1-Up

Part No.: 259-7245
S/N: WLN1-Up

Part No.: 259-7245
S/N: PDP1-Up

Part No.: 259-7245
S/N: SBP1-Up

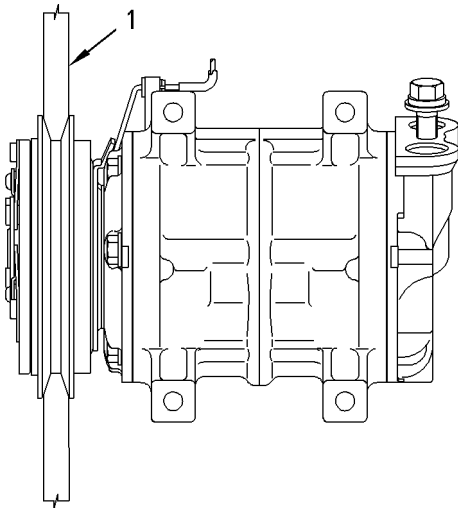


Illustration 16

g00881921

(1) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Part No.: 259-7245
S/N: XHR1-Up

Part No.: 259-7245
S/N: NAS1-Up

Part No.: 259-7245
S/N: GBT1-Up

Part No.: 259-7245
S/N: MDT1-Up

Part No.: 259-7245
S/N: KBZ1-Up

Part No.: 259-7245
S/N: SSZ1-Up

Compressor

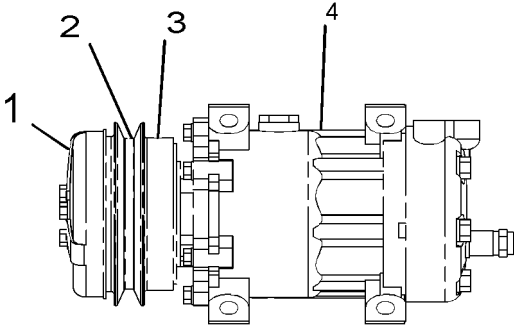


Illustration 17

g01383425

- (1) Dust cover
- (2) Pulley
- (3) Magnetic clutch
- (4) Compressor

Note: Refer to Specifications, “Air Conditioner Lines” for information concerning the torque specifications of refrigerant lines.

Belt Tension

New belt 534 ± 22 N (120 ± 5 lb)
Used belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Power connection 2 pin DT connector
Type of compressor SD7H13
Displacement per revolution 129.2 cc (4.40 fl oz)
Maximum allowable continuous RPM 4000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a
ICI KLEA 134a

Refrigerant Oil

Type of compressor oil SP-20
Oil capacity of compressor 135 mL (5.0 fl oz)

Magnetic Clutch

Type of magnetic clutch L50T
Rated voltage of magnetic clutch 24 VDC
Power consumption 34 W or less
Effective pulley diameter 128.0 mm (5.04 inch)

i04778395

Refrigerant Compressor

SMCS Code: 1802
Part No.: 381 - 1442
S/N: GBJ1-Up

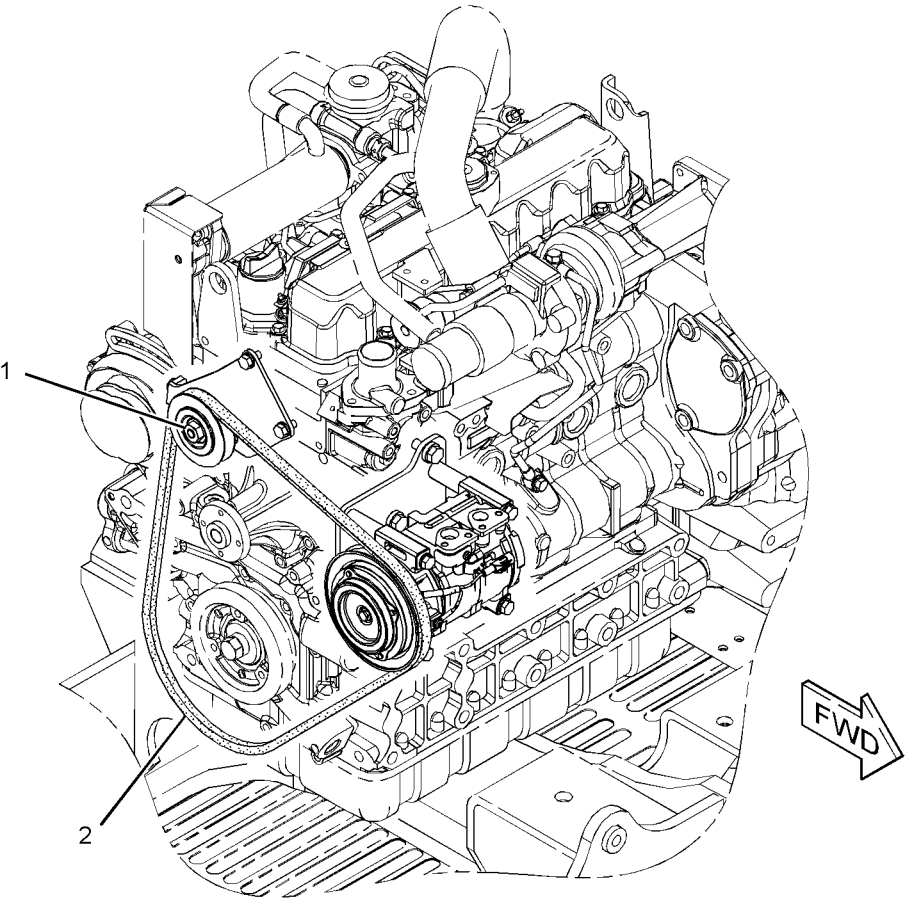


Illustration 18

g02884657

Table 2

Specification for 381 - 1442 Refrigerant Compressor Gp			
Item	Qty	Part	Specification Description
1	1	150 - 2162 Bolt	Tightening torque after belt tension adjustment is 15 ± 3 N·m (133 ± 27 lb in).
2	1	1P - 4334 V-Belt	Adjust belt tension according to 7N - 9693 Tension Chart.

i02735825

Refrigerant Compressor

SMCS Code: 1802
Part No.: 154 - 0490
S/N: ABD1-Up

Part No.: 154 - 0490
S/N: BBG1-Up

Part No.: 154 - 0490
S/N: 8GM299-Up

Part No.: 154 - 0490
S/N: 7EN303-Up

Part No.: 154-0490
S/N: 9HN399-Up

Part No.: 154-0490
S/N: 2JR1-Up

Part No.: 154-0490
S/N: 2RR426-Up

Part No.: 154-0490
S/N: 3LR1-Up

Part No.: 154-0490
S/N: 3NR307-Up

Part No.: 154-0490
S/N: 4NR176-Up

Part No.: 154-0490
S/N: 5BR1639-Up

Part No.: 154-0490
S/N: 5CR264-Up

Part No.: 154-0490
S/N: 6CR2902-Up

Part No.: 154-0490
S/N: 6DR1-Up

Part No.: 154-0490
S/N: 8GR462-Up

Part No.: 154-0490
S/N: 8HR1-Up

Part No.: 154-0490
S/N: 8JR1008-Up

Part No.: 154-0490
S/N: 8MR189-Up

Part No.: 154-0490
S/N: 8NR244-Up

Part No.: 154-0490
S/N: 8PR262-Up

Part No.: 154-0490
S/N: 8RR386-Up

Part No.: 154-0490
S/N: 8SR418-Up

Part No.: 154-0490
S/N: 8TR486-Up

Part No.: 154-0490
S/N: 9GR413-Up

Part No.: 154-0490
S/N: 9KR1-Up

Part No.: 154-0490
S/N: 9MR1-Up

Part No.: 154-0490
S/N: 1BS1-Up

Part No.: 154-0490
S/N: 1ES1-Up

Part No.: 154-0490
S/N: 1GS144-Up

Part No.: 154-0490
S/N: 1HS1-Up

Part No.: 154-0490
S/N: 1KS1-Up

Part No.: 154-0490
S/N: 2LS204-Up

Part No.: 154-0490
S/N: 2MS1-Up

Part No.: 154-0490
S/N: 2NS156-Up

Part No.: 154-0490
S/N: 3FS255-Up

Part No.: 154-0490
S/N: 6LS310-Up

Part No.: 154-0490
S/N: 8ES1639-Up

Part No.: 154-0490
S/N: 9CS2902-Up

Part No.: 154-0490
S/N: 9JS270-Up

Part No.: 154-0490
S/N: 1SW215-Up

Part No.: 154-0490
S/N: 3AW990-Up

Part No.: 154-0490
S/N: 4XW104-Up

Part No.: 154-0490
S/N: 4YW1-Up

Part No.: 154-0490
S/N: 5GW221-Up

Part No.: 154-0490
S/N: 5LW1-Up

Part No.: 154-0490
S/N: 3ZZ1-Up

Part No.: 154-0490
S/N: 5EZ253-Up

Part No.: 154-0490
S/N: 7KZ1-Up

Part No.: 154-0490
S/N: 7RZ284-Up

Compressor

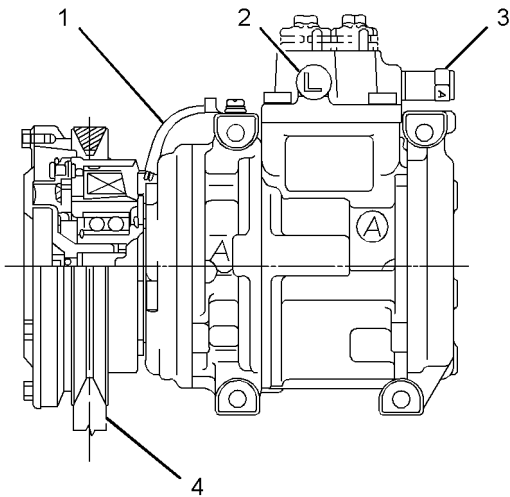


Illustration 19 g01371726

- (1) Power connection 2 pin DT connector
- (2) The port for charging on the low pressure side has a plastic cap.
- (3) Refer to Specifications, “Refrigerant Relief Valve” for specified pressures.

Type of compressor 10PA15C

Displacement per revolution 155.3 mL (5.25 fl oz)

Maximum allowable continuous RPM 6000

- (4) V-belt tension
 - New V-belt 534 ± 22 N (120 ± 5 lb)
 - Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a 144 - 0235 Belt Tension Gauge.

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Compressor Oil

Type of compressor oil ND-OIL8

Oil capacity of compressor 180 mL (6 ounces)

Magnetic Clutch

Type of magnetic clutch L50

Effective pulley diameter 133.0 mm (5.20 inches)

Rated voltage of magnetic clutch 24 VDC

Power consumption 14.4 Ohms

Maximum current 1.2 Amp

V-belt

i04970449

Table 3

Model	Product Identification Number	V-belt (A-ribbed)
311B	8GR462-UP	68 - 5590
311B	2LS204-UP	68 - 5590
312B	9GR413-UP	68 - 5590
312BL	8JR1008-UP	68 - 5590
312B	2NS156-UP	68 - 5590
312BL	3FS255-UP	68 - 5590
315B	1SW215-UP	8L - 8646
315BL	3AW990-UP	8L - 8646
315BL	7RZ284-UP	8L - 8646
318B	3LR1-UP	8L - 8646
318BN	7KZ1-UP	8L - 8646
320B	5BR1639-UP	8L - 8646
320B	8ES1639-UP	8L - 8646
320B	4XW104-UP	8L - 8646
320BL	9CS2902-UP	8L - 8646
320BL	6CR2902-UP	8L - 8646
320BL	5GW221-UP	8L - 8646
320BLL	6LS310-UP	8L - 8646
320BLL	9JS270-UP	8L - 8646
320BN	4NR176-UP	8L - 8646
322B	8MR189-UP	9L - 1128
322B	3NR307-UP	9L - 1128
322B	5CR264-UP	9L - 1128
322BL	8NR244-UP	9L - 1128
322BL	1AS347-UP	9L - 1128
325B	8PR262-UP	5M - 8135
325B	8GM299-UP	5M - 8135
325B	7EN303-UP	5M - 8135
325BL	8RR386-UP	5M - 8135
325BL	1GS144-UP	5M - 8135
330B	8SR418-UP	1N - 4635
330B	9HN399-UP	1N - 4635
330B	2RR426-UP	1N - 4635
330BL	8TR486-UP	1N - 4635
330BL	1JS485-UP	1N - 4635
330B	5EZ253-UP	1N - 4635

Refrigerant Compressor

SMCS Code: 1802

Part No.: 231 - 6984

S/N: AMC1-Up

Part No.: 231 - 6984

S/N: CJC1-Up

Part No.: 231 - 6984

S/N: CCD1-Up

Part No.: 231 - 6984

S/N: GAD1-Up

Part No.: 231 - 6984

S/N: EAG1-Up

S/N: GNG1-Up

Part No.: 231 - 6984

S/N: BWH1-Up

Part No.: 231 - 6984

S/N: AXK1-Up

Part No.: 231 - 6984

S/N: KGL1-Up

Part No.: 231 - 6984

S/N: DBN1-Up

Part No.: 231 - 6194

S/N: HKT1-Up

Part No.: 231 - 6984

S/N: BMZ1-Up

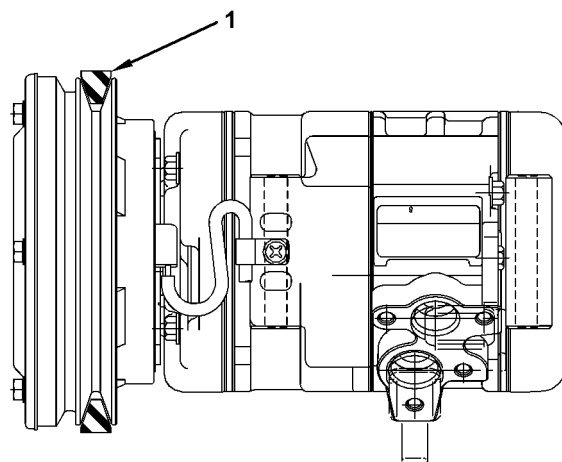


Illustration 20

g01048780

Refer to Specifications, "Air Conditioner Lines" for information concerning the torque of refrigerant lines.

(1) V-belt tension

New V-belt 578 ± 111 N (130 ± 25 lb)

Used V-belt 445 ± 44 N (100 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 445 N (100 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to test the tension of the belt.

Displacement per revolution 188.0 mL (6.36 fl oz)

Maximum allowable speed 6000 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity of compressor 180.0 mL (6.10 fl oz)

Type of compressor oil DENSO ND-OIL8

Magnetic Clutch

Voltage of magnetic clutch 24 VDC

Power consumption of a saturated magnetic clutch 40 W

i04562618

Refrigerant Compressor

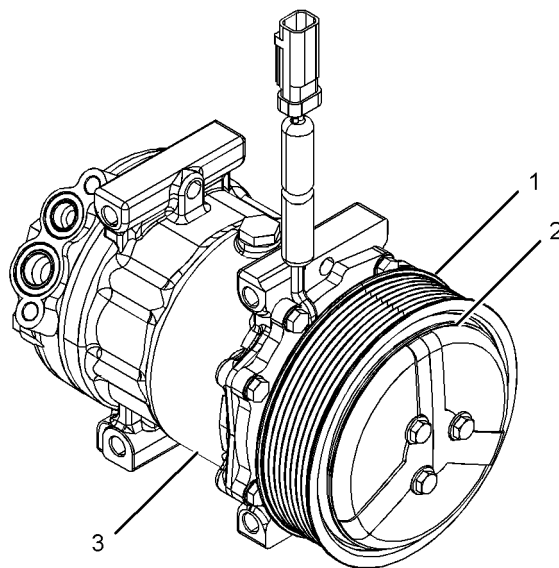
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Illustration 21

g02728756

- (1) Pulley
(2) Magnetic clutch
(3) Compressor

Note: Refer to Specifications, "Air Conditioner Lines" for information concerning the torque specifications of refrigerant lines.

Power connection 2-pin connector receptacle

Displacement per revolution 154.9 cc (5.24 fl oz)

Maximum allowable continuous RPM 4000

Rotation of the compressor Clockwise

Note: Use Cat 4C-2959 Air Conditioner Oil**Refrigerant Oil**

Type Polyalkylene Glycol (PAG) Oil

Oil capacity of compressor 240 cc (8.1 fl oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Operating voltage 24 VDC

Breakaway torque 34.3 N·m (25 lb ft)

Minimum voltage for clutch engagement 16 VDC

Effective pulley diameter 133 mm (5.2 inch)

Type of Belt Serpentine (8 ribs)

New V-belt 535 ± 22 N (120 ± 5 lb)

Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144-0235 Belt Tightener.

Type of compressor TM-08B

Displacement per revolution 82 mL (2.77 fl oz)

Maximum allowable continuous RPM 4000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Type of compressor oil ND-OIL8

Oil capacity of compressor .. 150.0 mL (5.07 ounces)

Magnetic Clutch

Rated voltage of magnetic clutch 24 VDC

Power consumption 45 W or less

Effective pulley diameter 125 mm (4.9 inch)

i02741402

Refrigerant Compressor

SMCS Code: 1802

Part No.: 125-1782

S/N: KGA1-Up

Part No.: 125-1782

S/N: AKG1-Up

Part No.: 125-1782

S/N: BAS1-Up

Part No.: 125-1782

S/N: 9CZ1-Up

Compressor

i04562146

Refrigerant Compressor

SMCS Code: 1802

Part No.: 372-9295

S/N: RLD1-Up

Part No.: 372-9295

S/N: ZCD1-Up

Part No.: 372-9295

S/N: KTE1-Up

Part No.: 372-9295

S/N: SXE1-Up

Part No.: 372-9295

S/N: TLF1-Up

Part No.: 372-9295

S/N: DFG1-Up

Part No.: 372-9295

S/N: LDG1-Up

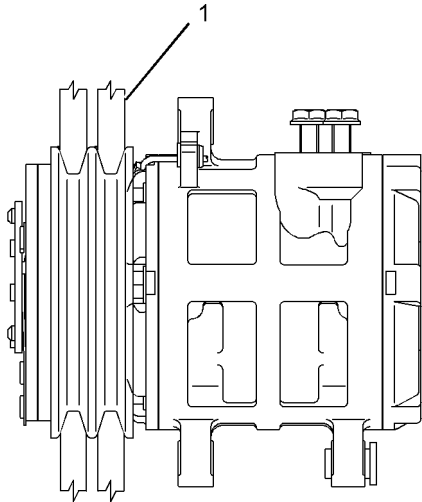


Illustration 22

g01373886

(1) Belt tension

- Part No.:** 372-9295
S/N: TNJ1-Up
- Part No.:** 372-9295
S/N: LAK1-Up
- Part No.:** 372-9295
S/N: WBK1-Up
- Part No.:** 372-9295
S/N: WJK1-Up
- Part No.:** 372-9295
S/N: PNL1-Up
- Part No.:** 372-9295
S/N: LHN1-Up
- Part No.:** 372-9295
S/N: RAP1-Up
- Part No.:** 372-9295
S/N: YRP1-Up
- Part No.:** 372-9295
S/N: AWS1-Up
- Part No.:** 372-9295
S/N: KLT1-Up
- Part No.:** 372-9295
S/N: TST1-Up
- Part No.:** 372-9295
S/N: MEW1-Up
- Part No.:** 372-9295
S/N: PLW1-Up
- Part No.:** 372-9295
S/N: PNW1-Up
- Part No.:** 372-9295
S/N: TDW1-Up
- Part No.:** 372-9295
S/N: RDX1-Up
- Part No.:** 372-9295
S/N: TFX1-Up
- Part No.:** 372-9295
S/N: PTY1-Up
- Part No.:** 372-9295
S/N: JCZ1-Up
- Part No.:** 372-9295
S/N: NAZ1-Up

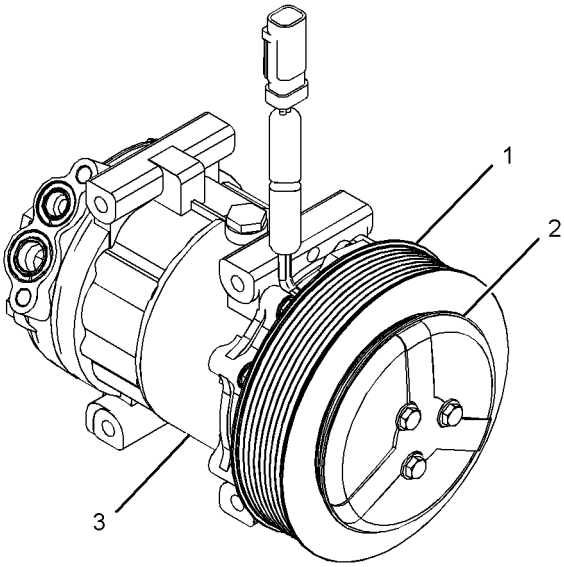


Illustration 23
(1) Pulley
(2) Magnetic clutch
(3) Compressor

Note: Refer to Specifications, “Air Conditioner Lines” for information concerning the torque specifications of refrigerant lines.

- Power connection 2-pin connector receptacle
- Displacement per revolution 154.9 cc (5.24 fl oz)
- Maximum allowable continuous RPM 4000
- Rotation of the compressor Clockwise

Note: Use Cat 4C-2959 Air Conditioner Oil

Refrigerant Oil

- Type Polyalkylene Glycol (PAG) Oil
- Oil capacity of compressor 240 cc (8.1 fl oz)

R-134a Refrigerant

- DuPont SUVA TRANS A/C HFC134a
- ICI KLEA 134a

Magnetic Clutch

- Operating voltage 24 VDC
- Breakaway torque 34.3 N·m (25 lb ft)
- Minimum voltage for clutch engagement 16 VDC
- Effective pulley diameter 126 mm (5 inch)
- Type of Belt Serpentine (12 ribs)

i04970529

Refrigerant Compressor

SMCS Code: 1802

Part No.: 178-5545

S/N: 1011-Up

S/N: 3011-Up

Part No.: 178-5545

S/N: 1021-Up

S/N: 2021-Up

S/N: 3021-Up

Part No.: 178-5545

S/N: 1031-Up

Part No.: 178-5545

S/N: 1041-Up

Part No.: 178-5545

S/N: CYA1-Up

Part No.: 178-5545

S/N: H2A1-Up

Part No.: 178-5545

S/N: MCA1-Up

Part No.: 178-5545

S/N: XJA1-Up

Part No.: 178-5545

S/N: 7MB1-Up

Part No.: 178-5545

S/N: BEB1-Up

Part No.: 178-5545

S/N: CRB1-Up

Part No.: 178-5545

S/N: H2B1-Up

Part No.: 178-5545

S/N: JAB1-Up

Part No.: 178-5545

S/N: D3C1-Up

Part No.: 178-5545

S/N: H2C1-Up

Part No.: 178-5545

S/N: JLC1-Up

Part No.: 178-5545

S/N: S2C1-Up

Part No.: 178-5545

S/N: BTD1-Up

Part No.: 178-5545

S/N: H2D1-Up

Part No.: 178-5545

S/N: JCD1-Up

Part No.: 178-5545

S/N: JLD1-Up

Part No.: 178-5545

S/N: KDD1-Up

Part No.: 178-5545

S/N: BFE1-Up

Part No.: 236-6266

S/N: BTE1-Up

Part No.: 178-5545

S/N: H2E1-Up

Part No.: 178-5545

S/N: DTF1-Up

Part No.: 178-5545

S/N: H2F1-Up

Part No.: 178-5545

S/N: KCF1-Up

Part No.: 178-5545

S/N: H2G1-Up

Part No.: 178-5545

S/N: AMH1-Up

Part No.: 178-5545

S/N: M2H1-Up

Part No.: 178-5545

S/N: CSJ1-Up

Part No.: 178-5545

S/N: B1K1-Up

Part No.: 178-5545

S/N: BDK1-Up

Part No.: 178-5545

S/N: HEK1-Up

Part No.: 178-5545

S/N: JNK1-Up

Part No.: 178-5545

S/N: M2K1-Up

Part No.: 178-5545

S/N: B2L1-Up

Part No.: 178-5545

S/N: G1L1-Up

Part No.: 178-5545

S/N: B3M1-Up

Part No.: 178-5545

S/N: BDM1-Up

Part No.: 178-5545

S/N: BMM1-Up

Part No.: 178-5545
S/N: MKM1-Up

Part No.: 178-5545
S/N: S3M1-Up

Part No.: 178-5545
S/N: B4N1-Up

Part No.: 178-5545
S/N: PAN1-Up

Part No.: 178-5545
S/N: CAP1-Up

Part No.: 178-5545
S/N: Y4P1-Up

Part No.: 178-5545
S/N: BDR1-Up

Part No.: 178-5545
S/N: C3R1-Up

Part No.: 178-5545
S/N: EMR1-Up

Part No.: 178-5545
S/N: LAR1-Up

Part No.: 178-5545
S/N: MAR1-Up

Part No.: 178-5545
S/N: BKW1-Up

Part No.: 236-6266
S/N: ADX1-Up

Part No.: 178-5545
S/N: BDX1-Up

Part No.: 178-5545
S/N: GKX1-Up

Part No.: 178-5545
S/N: BDY1-Up

Part No.: 178-5545
S/N: DKY1-Up

Part No.: 178-5545
S/N: BCZ1-Up

Part No.: 178-5545
S/N: CGZ1-Up

Compressor

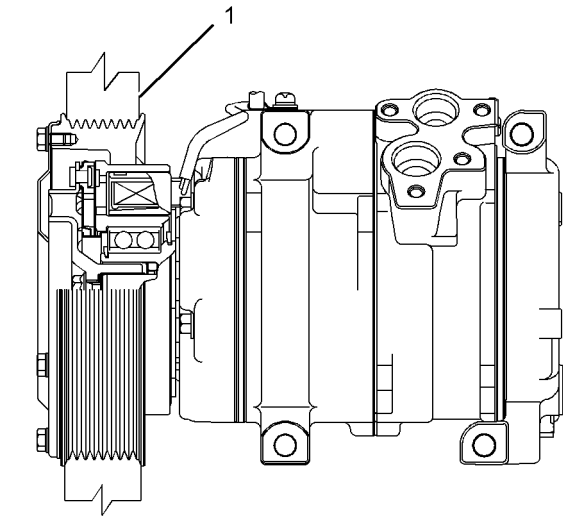


Illustration 24

g01371742

- (1) Type of 146-0894 Belt (8K)-Poly
Displacement per revolution 188.0 mL (6.36 fl oz)
Maximum allowable continuous RPM 6000

R-134a Refrigerant

- DuPont SUVA TRANS A/C HFC134a
ICI KLEA 134a

Refrigerant Oil

- Oil capacity of compressor 180.0 mL (6.10 fl oz)
Type of compressor oil Denso ND-OIL8

Magnetic Clutch

- Rated voltage of magnetic clutch 24 VDC
Resistance 14.4 Ohms
Effective pulley diameter 140.0 mm (5.50 inch)

i02796881

Refrigerant Compressor

SMCS Code: 1802

Part No.: 245-7779
S/N: 1011-Up

Part No.: 245-7779
S/N: 3011-Up

Part No.: 245-7779
S/N: 5111-Up

Part No.: 245-7779
S/N: 5211-Up

Part No.: 245-7779
S/N: 5411-Up

Part No.: 245-7779
S/N: 5511-Up

Part No.: 245-7779
S/N: 1021-Up

Part No.: 245-7779
S/N: 2021-Up

Part No.: 245-7779
S/N: 3021-Up

Part No.: 245-7779
S/N: 5221-Up

Part No.: 245-7779
S/N: 5321-Up

Part No.: 245-7779
S/N: 5521-Up

Part No.: 245-7779
S/N: 1031-Up

Part No.: 245-7779
S/N: 1041-Up

Part No.: 245-7779
S/N: BLA1-Up

Part No.: 245-7779
S/N: DAA1-Up

Part No.: 245-7779
S/N: EDA1-Up

Part No.: 245-7779
S/N: HAA1-Up

Part No.: 245-7779
S/N: MCA1-Up

Part No.: 245-7779
S/N: MMA1-Up

Part No.: 245-7779
S/N: TBA1-Up

Part No.: 245-7779
S/N: XJA1-Up

Part No.: 245-7779
S/N: 7MB1-Up

Part No.: 245-7779
S/N: CRB1-Up

Part No.: 245-7779
S/N: JAB1-Up

Part No.: 245-7779
S/N: KGB1-Up

Part No.: 245-7779
S/N: ELC1-Up

Part No.: 245-7779
S/N: FPC1-Up

Part No.: 245-7779
S/N: GWC1-Up

Part No.: 245-7779
S/N: JLC1-Up

Part No.: 245-7779
S/N: KBC1-Up

Part No.: 245-7779
S/N: MDC1-Up

Part No.: 245-7779
S/N: BTD1-Up

Part No.: 245-7779
S/N: ESD1-Up

Part No.: 245-7779
S/N: FED1-Up

Part No.: 245-7779
S/N: JCD1-Up

Part No.: 245-7779
S/N: JLD1-Up

Part No.: 245-7779
S/N: KDD1-Up

Part No.: 245-7779
S/N: SBE1-Up

Part No.: 245-7779
S/N: T2E1-Up

Part No.: 245-7779
S/N: WDE1-Up

Part No.: 245-7779
S/N: DTF1-Up

Part No.: 245-7779
S/N: KCF1-Up

Part No.: 245-7779
S/N: T2F1-Up

Part No.: 245-7779
S/N: GAG1-Up

Part No.: 245-7779
S/N: HBG1-Up

Part No.: 245-7779
S/N: TDG1-Up

Part No.: 245-7779
S/N: AMH1-Up

Part No.: 245-7779
S/N: BKH1-Up

Part No.: 245-7779
S/N: GPH1-Up

Part No.: 245-7779
S/N: RBH1-Up

Part No.: 245-7779
S/N: CSJ1-Up

Part No.: 245-7779
S/N: TAJ1-Up

Part No.: 245-7779
S/N: JNK1-Up

Part No.: 245-7779
S/N: KKK1-Up

Part No.: 245-7779
S/N: BMM1-Up

Part No.: 245-7779
S/N: BTM1-Up

Part No.: 245-7779
S/N: CJM1-Up

Part No.: 245-7779
S/N: EAM1-Up

Part No.: 245-7779
S/N: JCM1-Up

Part No.: 245-7779
S/N: MEM1-Up

Part No.: 245-7779
S/N: MKM1-Up

Part No.: 245-7779
S/N: FEN1-Up

Part No.: 245-7779
S/N: PAN1-Up

S/N: RFN1-Up

Part No.: 245-7779
S/N: CAP1-Up

Part No.: 245-7779
S/N: DAP1-Up

Part No.: 245-7779
S/N: DHP1-Up

Part No.: 245-7779
S/N: EMR1-Up

S/N: JAR1-Up

Part No.: 245-7779
S/N: M2R1-Up

Part No.: 245-7779
S/N: MAR1-Up

Part No.: 245-7779
S/N: PAR1-Up

Part No.: 245-7779
S/N: D3S1-Up

Part No.: 245-7779
S/N: LYS1-Up

Part No.: 245-7779
S/N: MCS1-Up

Part No.: 245-7779
S/N: BKT1-Up

Part No.: 245-7779
S/N: BKW1-Up

Part No.: 245-7779
S/N: PJW1-Up

Part No.: 245-7779
S/N: WAW1-Up

Part No.: 245-7779
S/N: BLX1-Up

Part No.: 245-7779
S/N: GKX1-Up

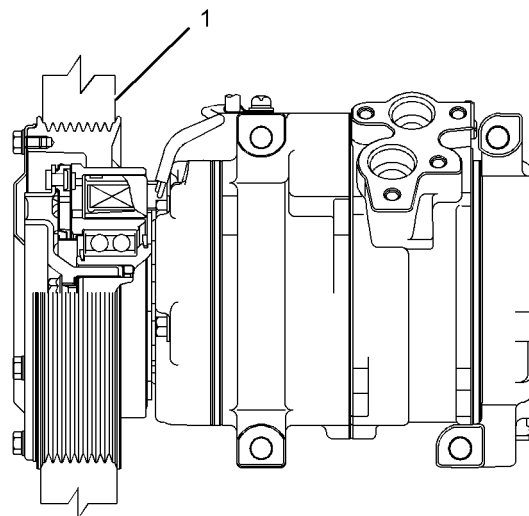
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S/N: BWY1-Up

Part No.: 245-7779
S/N: MCY1-Up

Part No.: 245-7779
S/N: CGZ1-Up

Part No.: 245-7779
S/N: MNZ1-Up

Compressor



(1) 146-0894 Belt (8K)-Poly
Displacement per revolution 188.0 mL (6.36 fl oz)
Maximum allowable continuous RPM 6000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a
ICI KLEA 134a

Refrigerant Oil

Oil capacity of compressor 200.0 mL (6.76 fl oz)
Type of compressor oil Denso ND-OIL8
Caterpillar 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Rated voltage of magnetic clutch 24 VDC
Resistance 14.4 Ohms
Effective pulley diameter 140.0 mm (5.50 inches)

i04794688

Refrigerant Compressor

SMCS Code: 1802

Part No.: 245-7779, 259-7243
S/N: EDA1-Up

Part No.: 245-7779, 259-7243
S/N: MMA1-Up

Part No.: 245-7779, 259-7243
S/N: PJA1-Up

Part No.: 245-7779, 259-7243
S/N: XJA1-Up

Part No.: 245-7779, 259-7243
S/N: GPB1-Up

Part No.: 245-7779, 259-7243
S/N: JGB1-Up

Part No.: 245-7779, 259-7243
S/N: KGB1-Up

Part No.: 245-7779, 259-7243
S/N: LAB1-Up

Part No.: 245-7779, 259-7243
S/N: MNB1-Up

Part No.: 245-7779, 259-7243
S/N: PTB1-Up

Part No.: 245-7779, 259-7243
S/N: XDB1-Up

Part No.: 245-7779, 259-7243
S/N: BFC1-Up

Part No.: 245-7779, 259-7243
S/N: BYC1-Up

Part No.: 245-7779, 259-7243
S/N: EJC1-Up

Part No.: 245-7779, 259-7243
S/N: ELC1-Up

Part No.: 245-7779, 259-7243
S/N: FPC1-Up

Part No.: 245-7779, 259-7243
S/N: GBC1-Up

Part No.: 245-7779, 259-7243
S/N: GWC1-Up

Part No.: 245-7779, 259-7243
S/N: KBC1-Up

Part No.: 245-7779, 259-7243
S/N: NAC1-Up

Part No.: 245-7779, 259-7243
S/N: SPC1-Up

Part No.: 245-7779, 259-7243
S/N: ESD1-Up

Part No.: 245-7779
S/N: MSD1-Up

Part No.: 245-7779, 259-7243
S/N: NBD1-Up

S/N: P5D1-Up

Part No.: 245-7779, 259-7243
S/N: R2D1-Up

Part No.: 245-7779, 259-7243
S/N: RGD1-Up

Part No.: 245-7779, 259-7243
S/N: T2D1-Up

Part No.: 245-7779, 259-7243
S/N: WTD1-Up

Part No.: 245-7779, 259-7243
S/N: GGE1-Up

Part No.: 245-7779, 259-7243
S/N: KBE1-Up

Part No.: 245-7779, 259-7243
S/N: KRE1-Up

Part No.: 245-7779, 259-7243
S/N: MTE1-Up

Part No.: 245-7779, 259-7243
S/N: PKE1-Up

Part No.: 245-7779, 259-7243
S/N: RAE1-Up

Part No.: 245-7779, 259-7243
S/N: SBE1-Up

Part No.: 245-7779, 259-7243
S/N: T2E1-Up

Part No.: 245-7779, 259-7243
S/N: WDE1-Up

Part No.: 245-7779, 259-7243
S/N: YEE1-Up

Part No.: 245-7779, 259-7243
S/N: CZF1-Up

Part No.: 245-7779, 259-7243
S/N: DJF1-Up

Part No.: 245-7779, 259-7243
S/N: EDF1-Up

Part No.: 245-7779, 259-7243
S/N: J2F1-Up

Part No.: 245-7779, 259-7243
S/N: JBF1-Up

Part No.: 245-7779, 259-7243
S/N: NNF1-Up

Part No.: 245-7779, 259-7243
S/N: PRF1-Up

Part No.: 245-7779, 259-7243
S/N: SWF1-Up

Part No.: 245-7779, 259-7243
S/N: T2F1-Up

Part No.: 245-7779, 259-7243
S/N: JJG1-Up

Part No.: 245-7779, 259-7243
S/N: KDG1-Up

Part No.: 245-7779, 259-7243
S/N: KGG1-Up

Part No.: 245-7779, 259-7243
S/N: LMG1-Up

Part No.: 245-7779, 259-7243
S/N: MYG1-Up

Part No.: 245-7779, 259-7243
S/N: NEG1-Up

Part No.: 245-7779, 259-7243
S/N: PZG1-Up

Part No.: 245-7779, 259-7243
S/N: RGG1-Up

Part No.: 245-7779, 259-7243
S/N: TDG1-Up

Part No.: 245-7779, 259-7243
S/N: WAG1-Up

Part No.: 245-7779, 259-7243
S/N: B6H1-Up

Part No.: 245-7779, 259-7243
S/N: C4H1-Up

Part No.: 245-7779, 259-7243
S/N: DBH1-Up

Part No.: 245-7779, 259-7243
S/N: EAH1-Up

Part No.: 245-7779, 259-7243
S/N: EEH1-Up

Part No.: 245-7779, 259-7243
S/N: GPH1-Up

Part No.: 245-7779, 259-7243
S/N: KFH1-Up

S/N: L5H1-Up

Part No.: 245-7779, 259-7243
S/N: TRH1-Up

Part No.: 245-7779, 259-7243
S/N: JHJ1-Up

Part No.: 245-7779, 259-7243
S/N: KDJ1-Up

Part No.: 245-7779, 259-7243
S/N: RAJ1-Up

Part No.: 245-7779, 259-7243
S/N: RBJ1-Up

Part No.: 245-7779, 259-7243
S/N: TAJ1-Up

Part No.: 245-7779, 259-7243
S/N: THJ1-Up

Part No.: 245-7779, 259-7243
S/N: BTK1-Up

Part No.: 245-7779, 259-7243
S/N: C5K1-Up

Part No.: 245-7779, 259-7243
S/N: C7K1-Up

Part No.: 245-7779, 259-7243
S/N: E4K1-Up

Part No.: 245-7779, 259-7243
S/N: ERK1-Up

Part No.: 245-7779, 259-7243
S/N: FFK1-Up

Part No.: 245-7779, 259-7243
S/N: H3K1-Up

Part No.: 245-7779, 259-7243
S/N: KKK1-Up

Part No.: 245-7779, 259-7243
S/N: L2K1-Up

Part No.: 245-7779, 259-7243
S/N: MLK1-Up

Part No.: 245-7779, 259-7243
S/N: RJK1-Up

Part No.: 245-7779, 259-7243
S/N: RSK1-Up

Part No.: 245-7779, 259-7243
S/N: W3K1-Up

Part No.: 245-7779, 259-7243
S/N: WDK1-Up

Part No.: 245-7779, 259-7243
S/N: WRK1-Up

Part No.: 245-7779, 259-7243
S/N: C8L1-Up

Part No.: 245-7779, 259-7243
S/N: GCL1-Up

Part No.: 245-7779, 259-7243
S/N: LAL1-Up

Part No.: 245-7779, 259-7243
S/N: MCL1-Up

Part No.: 245-7779, 259-7243
S/N: MPL1-Up

Part No.: 245-7779, 259-7243
S/N: PAL1-Up

Part No.: 245-7779, 259-7243
S/N: PEL1-Up

Part No.: 245-7779, 259-7243
S/N: C9M1-Up

Part No.: 245-7779, 259-7243
S/N: EAM1-Up

Part No.: 245-7779, 259-7243
S/N: EBM1-Up

Part No.: 245-7779, 259-7243
S/N: JCM1-Up

Part No.: 245-7779, 259-7243
S/N: JJM1-Up

Part No.: 245-7779, 259-7243
S/N: LEM1-Up

Part No.: 245-7779, 259-7243
S/N: LRM1-Up

Part No.: 245-7779, 259-7243
S/N: MEM1-Up

Part No.: 245-7779, 259-7243
S/N: NLM1-Up

Part No.: 245-7779, 259-7243
S/N: S5M1-Up

Part No.: 245-7779, 259-7243
S/N: SYM1-Up

Part No.: 245-7779, 259-7243
S/N: TPM1-Up

Part No.: 245-7779, 259-7243
S/N: FEN1-Up

Part No.: 245-7779, 259-7243
S/N: GTN1-Up

Part No.: 245-7779, 259-7243
S/N: JTN1-Up

S/N: M3N1-Up

Part No.: 245-7779, 259-7243
S/N: MEN1-Up

Part No.: 245-7779, 259-7243
S/N: PAN1-Up

Part No.: 245-7779, 259-7243
S/N: PPN1-Up

Part No.: 245-7779, 259-7243
S/N: TSN1-Up

Part No.: 245-7779, 259-7243
S/N: AZP1-Up

Part No.: 245-7779, 259-7243
S/N: BYP1-Up

Part No.: 245-7779, 259-7243
S/N: DFP1-Up

Part No.: 245-7779, 259-7243
S/N: DHP1-Up

Part No.: 245-7779, 259-7243
S/N: JLP1-Up

Part No.: 245-7779, 259-7243
S/N: MWP1-Up

Part No.: 245-7779, 259-7243
S/N: MYP1-Up

Part No.: 245-7779, 259-7243
S/N: PAP1-Up

Part No.: 245-7779, 259-7243
S/N: WAP1-Up

Part No.: 245-7779, 259-7243
S/N: A3R1-Up

Part No.: 245-7779, 259-7243
S/N: GBR1-Up

Part No.: 245-7779, 259-7243
S/N: JKR1-Up

Part No.: 245-7779, 259-7243
S/N: JWR1-Up

Part No.: 245-7779, 259-7243
S/N: JZR1-Up

Part No.: 245-7779, 259-7243
S/N: M2R1-Up

Part No.: 245-7779, 259-7243
S/N: MBR1-Up

Part No.: 245-7779, 259-7243
S/N: MKR1-Up

Part No.: 245-7779, 259-7243
S/N: PAR1-Up

Part No.: 245-7779, 259-7243
S/N: SCR1-Up

Part No.: 245-7779, 259-7243
S/N: BYS1-Up

Part No.: 245-7779, 259-7243
S/N: D3S1-Up

Part No.: 245-7779, 259-7243
S/N: DTS1-Up

Part No.: 245-7779, 259-7243
S/N: ELS1-Up

Part No.: 245-7779, 259-7243
S/N: HAS1-Up

Part No.: 245-7779, 259-7243
S/N: JLS1-Up

Part No.: 245-7779, 259-7243
S/N: KHS1-Up

Part No.: 245-7779, 259-7243
S/N: LYS1-Up

Part No.: 245-7779, 259-7243
S/N: MCS1-Up

Part No.: 245-7779, 259-7243
S/N: PAS1-Up

Part No.: 245-7779, 259-7243
S/N: RAS1-Up

Part No.: 245-7779, 259-7243
S/N: T2S1-Up

Part No.: 245-7779, 259-7243
S/N: JAT1-Up

Part No.: 245-7779, 259-7243
S/N: JBT1-Up

Part No.: 245-7779, 259-7243
S/N: KKT1-Up

Part No.: 245-7779, 259-7243
S/N: M4T1-Up

Part No.: 245-7779, 259-7243
S/N: PBT1-Up

Part No.: 245-7779, 259-7243
S/N: WBT1-Up

Part No.: 245-7779, 259-7243
S/N: WET1-Up

Part No.: 245-7779, 259-7243
S/N: WLT1-Up

Part No.: 245-7779, 259-7243
S/N: CYW1-Up

Part No.: 245-7779, 259-7243
S/N: PGW1-Up

Part No.: 245-7779, 259-7243
S/N: PJW1-Up

Part No.: 245-7779, 259-7243
S/N: WAW1-Up

Part No.: 245-7779, 259-7243
S/N: YFW1-Up

Part No.: 245-7779, 259-7243
S/N: CJX1-Up

Part No.: 245-7779, 259-7243
S/N: EDX1-Up

Part No.: 245-7779, 259-7243
S/N: PAX1-Up

Part No.: 245-7779, 259-7243
S/N: RMX1-Up

Part No.: 245-7779, 259-7243
S/N: BWY1-Up

Part No.: 245-7779, 259-7243
S/N: KAY1-Up

Part No.: 245-7779, 259-7243
S/N: LKY1-Up

Part No.: 245-7779, 259-7243
S/N: MCY1-Up

Part No.: 245-7779, 259-7243
S/N: MEY1-Up

Part No.: 245-7779, 259-7243
S/N: SCY1-Up

Part No.: 245-7779, 259-7243
S/N: T2Y1-Up

Part No.: 245-7779, 259-7243
S/N: DTZ1-Up

Part No.: 245-7779, 259-7243
S/N: KCZ1-Up

Part No.: 245-7779, 259-7243
S/N: MNZ1-Up

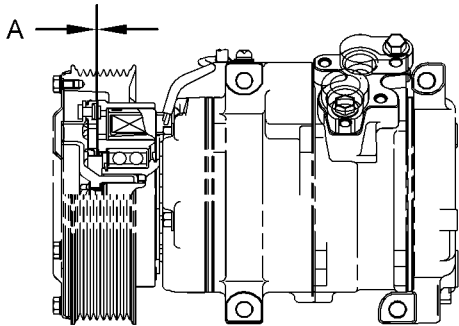


Illustration 26

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Note: Refer to Specifications, “Air Conditioner Lines” for information concerning the torque specifications of refrigerant lines.

Table 4

Specification for 245-7779 Refrigerant Compressor Gp, and 259-7243 Refrigerant Compressor Gp			
Item	Qty	Part	Specification Description
A	As required use the following washers to obtain the space of between the rotor and the hub:		
	1	264-9982 Washer	Thickness is 0.10 ± 0.03 mm (0.004 ± 0.001 inch).
	1	264-9983 Washer	Thickness is 0.30 ± 0.03 mm (0.012 ± 0.001 inch).
	1	264-9984 Washer	Thickness is 0.50 ± 0.03 mm (0.020 ± 0.001 inch).
-	-	-	Power connection is Two pin DT connector . Displacement per revolution is 188.0 cc (11.5 cubic inch). Maximum allowable continuous RPM is 6000. R-134a Refrigerant: Dupont - SUVA TRANS A/C HFC134a. ICI - KLEA 134a Refrigerant Oil: Type of compressor oil is ND-OIL8. Oil capacity of compressor is 200 to 215 cc (12 to 13 cu in). Magnetic Clutch: Rated voltage of magnetic clutch is 24 VDC. Power consumption is 40 W or less. Effective pulley diameter is 140.0 ± 0.5 mm (5.51 ± 0.02 inch). Minimum static friction torque is 53 N·m (39 lb ft).

i04618716

Refrigerant Compressor

SMCS Code: 1802

Part No.: 316-8826, 372-9360
S/N: FJB1-Up

Part No.: 316-8826, 372-9360
S/N: KED1-Up

Part No.: 316-8826, 372-9360
S/N: DGE1-Up

Part No.: 316-8826, 372-9360
S/N: YCE1-Up

Part No.: 316-8826, 372-9360
S/N: SPG1-Up

Part No.: 316-8826, 372-9360
S/N: TEG1-Up

Part No.: 316-8826, 372-9360
S/N: TFG1-Up

Part No.: 316-8826, 372-9360
S/N: FJH1-Up

Part No.: 316-8826, 372-9360
S/N: RGH1-Up

Part No.: 316-8826, 372-9360
S/N: GTJ1-Up

Part No.: 316-8826, 372-9360
S/N: JRJ1-Up

Part No.: 316-8826, 372-9360
S/N: KCN1-Up

Part No.: 316-8826, 372-9360
S/N: YEP1-Up

Part No.: 316-8826, 372-9360
S/N: CMR1-Up

Part No.: 316-8826, 372-9360
S/N: MZW1-Up

Part No.: 316-8826, 372-9360
S/N: KFX1-Up

Part No.: 316-8826, 372-9360
S/N: BZY1-Up

Part No.: 316-8826, 372-9360
S/N: MPZ1-Up

Part No.: 316-8826, 372-9360
S/N: TMZ1-Up

Part No.: 316-8826, 372-9360
S/N: WHZ1-Up

Displacement per revolution 154.9 cc (5.24 fl oz)

Maximum allowable continuous RPM 4000

Rotation of the compressor Clockwise

Note: Use Cat 4C-2959 Air Conditioner Oil

Refrigerant Oil

Type Polyalkylene Glycol (PAG) Oil

Oil capacity of compressor 240 cc (8.1 fl oz)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Operating voltage 24 VDC

Breakaway torque 34.3 N·m (25 lb ft)

Minimum voltage for clutch engagement 16 VDC

Effective pulley diameter 149 mm (5.9 inch)

Type of Belt Serpentine (8 ribs)

i01934419

Refrigerant Compressor

SMCS Code: 1802

S/N: CCC1-Up

Part No.: 161-3632

S/N: AGD1-Up

S/N: FEE1-Up

Part No.: 161-3632

S/N: BKF1-Up

Part No.: 161-3632

S/N: CDJ1-Up

Part No.: 161-3632

S/N: CFJ1-Up

Part No.: 161-3632

S/N: AYR1-Up

Part No.: 161-3632

S/N: 5WS1-Up

Part No.: 161-3632

S/N: 6XS1-Up

Part No.: 161-3632

S/N: DET1-Up

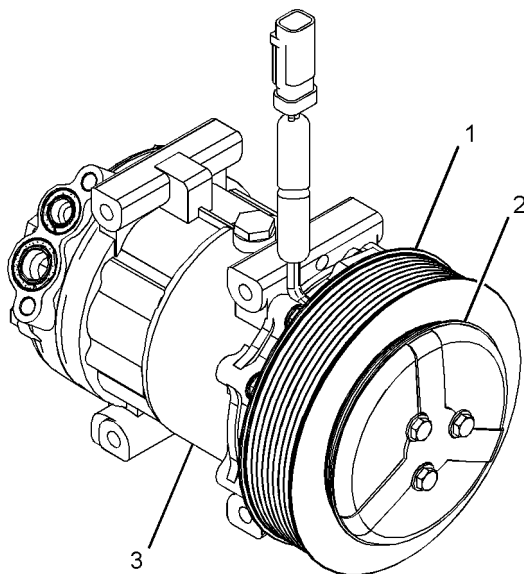


Illustration 27

g02765696

- (1) Pulley
- (2) Magnetic clutch
- (3) Compressor

Note: Refer to Specifications, "Air Conditioner Lines" for information concerning the torque specifications of refrigerant lines.

Power connection 2-pin connector receptacle

Part No.: 161-3632
S/N: 2ZW1-Up

Part No.: 161-3632
S/N: 3MW1-Up

Part No.: 161-3632
S/N: 9CW1-Up

Part No.: 161-3632
S/N: AKX1-Up

Part No.: 161-3632
S/N: BKX1-Up

Part No.: 161-3632
S/N: BLY1-Up

Part No.: 161-3632
S/N: 4XZ1-Up

Compressor

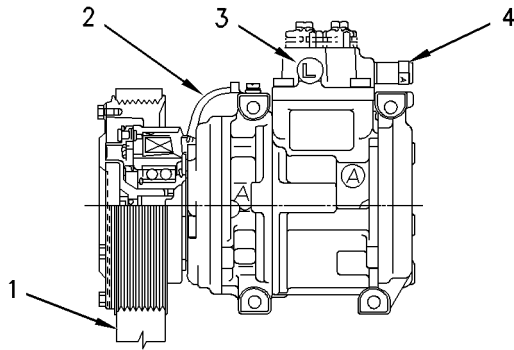


Illustration 28

g00887192

(1) Belt tension

New belt 800 ± 22 N (180 ± 5 lb)
Used belt 489 ± 44 N (110 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 489 ± 44 N (110 ± 10 lb).

Note: Use a Caterpillar 144 - 1102 Belt Tightener.

Type of 146-0894 Belt (8K)-Poly

(2) Power connection 2 pin DT connector

(3) The port for charging on the low pressure side has a plastic cap.

(4) Refer to Specifications, "Refrigerant Relief Valve" for specified pressures.

Type of compressor 10PA15C

Displacement per revolution 155.3 mL (5.25 fl oz)

Maximum allowable continuous RPM 6000

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Type of compressor oil ND-OIL8

Oil capacity of compressor .. 180.0 mL (6.10 ounces)

Magnetic Clutch

Type of magnetic clutch L50

Rated voltage of magnetic clutch 24 VDC

Power consumption 14.4 Ohms

Effective pulley diameter 140.0 mm (5.50 inches)

i02735861

Refrigerant Compressor

SMCS Code: 1802

Part No.: 113-3499
S/N: AGD1-Up

Part No.: 113-3499
S/N: ALD1-Up

Part No.: 113-3499
S/N: AMD1-Up

Part No.: 113-3499
S/N: 8XG1-Up

Part No.: 113-3499
S/N: BTH1-Up

Part No.: 113-3499
S/N: 8WJ77-Up

Part No.: 113-3499
S/N: AKJ1-Up

Part No.: 113-3499
S/N: AMJ1-Up

Part No.: 113-3499
S/N: CFJ1-Up

Part No.: 113-3499
S/N: 6NK1-Up

Part No.: 113-3499
S/N: 6XK89-Up

Part No.: 113-3499
S/N: 7RK336-Up

Part No.: 113-3499
S/N: 8HK144-Up

Part No.: 113-3499
S/N: 9DK216-Up

Part No.: 113-3499
S/N: 2ZL1-Up

Part No.: 113-3499
S/N: 3ML1-Up

Part No.: 113-3499
S/N: 6RL1-Up

Part No.: 113-3499
S/N: 9FL121-Up

Part No.: 113-3499
S/N: 9WL87-Up

Part No.: 113-3499
S/N: 1JM46-Up

Part No.: 113-3499
S/N: AMN1-Up

Part No.: 113-3499
S/N: AYR1-Up

Part No.: 113-3499
S/N: 5WS1-Up

Part No.: 113-3499
S/N: 6XS1-Up

Part No.: 113-3499
S/N: 3MW1-Up

Part No.: 113-3499
S/N: 9CW1-Up

Part No.: 113-3499
S/N: AKX1-Up

Part No.: 113-3499
S/N: 4XZ1-Up

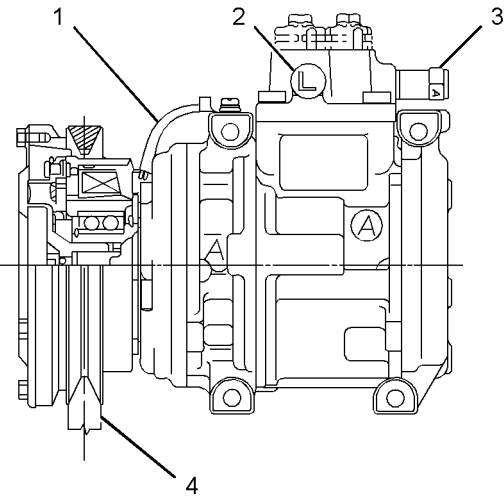


Illustration 29 g01371726

- (1) Power connection 2 pin DT connector
 - (2) The port for charging on the low pressure side has a plastic cap.
 - (3) Refer to Specifications, “Refrigerant Relief Valve” for specified pressures.
- Displacement per revolution 155.3 mL (5.25 fl oz)
- Maximum allowable continuous RPM 6000
- (4) V-belt tension
- New V-belt 534 ± 22 N (120 ± 5 lb)
 - Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a 144 -0235 Belt Tension Gauge.

R-134a Refrigerant

- DuPont SUVA TRANS A/C HFC134a
- ICI KLEA 134a

Compressor Oil

- Type of compressor oil ND-OIL8
- Oil capacity of compressor 180 mL (6 ounces)

Magnetic Clutch

- Effective pulley diameter 152 mm (6 inch)

Rated voltage of magnetic clutch 24 VDC

i03001198

Refrigerant Compressor

SMCS Code: 1802

Part No.: 114-9484
S/N: 8RD1-Up

Part No.: 114-9484
S/N: 9DF1-Up

Part No.: 114-9484
S/N: ABF1-Up

Part No.: 114-9484
S/N: 3BK1-Up

Part No.: 114-9484
S/N: 5DK1-Up

Part No.: 114-9484
S/N: ADK1-Up

Part No.: 114-9484
S/N: 7DM1-Up

Part No.: 114-9484
S/N: 6NN1-Up

Part No.: 114-9484
S/N: 8DN1-Up

Part No.: 114-9484
S/N: AEN1-Up

Part No.: 114-9484
S/N: 1DR201-Up

Part No.: 114-9484
S/N: 4DZ1-Up

(2) Suction port torque for 7/8 inch threaded fitting 32.4 ± 3.9 N·m (23.9 ± 2.9 lb ft)

(3) Discharge port torque for 3/4 inch threaded fitting 23.5 ± 3.4 N·m (17.3 ± 2.5 lb ft)

(4) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Torque for Fittings

Torque for 7/8 inch threaded fitting 32.4 ± 3.9 N·m (23.9 ± 2.9 lb ft)

Note: The 7/8 inch threaded fitting is located on the support suction port.

Torque for 3/4 inch threaded fitting 23.5 ± 3.4 N·m (17.3 ± 2.5 lb ft)

Note: The 3/4 inch threaded fitting is located on the discharge port.

Refrigerant Oil

Oil capacity 270 mL (9 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 12 DCV coil resistance (Black wire) 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 DCV

Maximum Current 3.58 amp

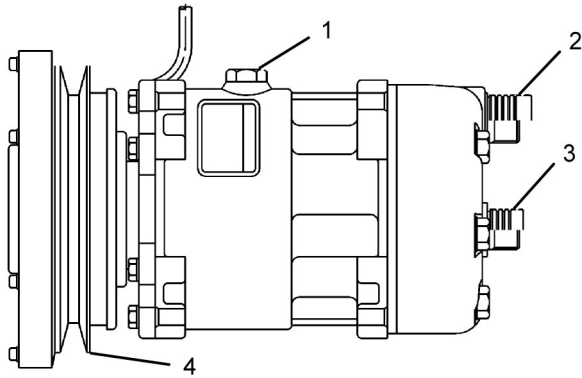


Illustration 30

g01521198

Typical view of the 114-9484 Refrigerant Compressor Gp

(1) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (1) is under pressure when the system is pressurized.

i03001204

Refrigerant Compressor

SMCS Code: 1802

Part No.: 214-4302
S/N: SHA1-Up

Part No.: 214-4302
S/N: ELB1-Up

Part No.: 214-4302
S/N: CBD1-Up

Part No.: 214-4302
S/N: BXE1-Up

Part No.: 214-4302
S/N: HBE1-Up

Part No.: 214-4302
S/N: LBE1-Up

Part No.: 214-4302
S/N: FSH1-Up

Part No.: 214-4302
S/N: DBL1-Up

Part No.: 214-4302
S/N: SNL1-Up

Part No.: 214-4302
S/N: HLS1-Up

Part No.: 214-4302
S/N: DDT1-Up

Part No.: 214-4302
S/N: EAT1-Up

Part No.: 214-4302
S/N: KMW1-Up

Part No.: 214-4302
S/N: GKZ1-Up

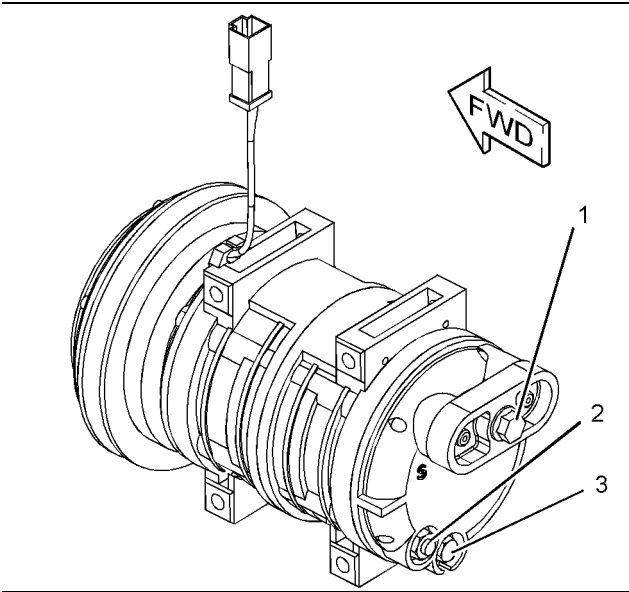


Illustration 31
View of the 214-4302 Compressor

(1) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

Note: Oil plug (3) is under pressure when the system is pressurized.

(2) Pressure relief valve

Installation Torque 13 ± 1 N·m (9.6 ± 0.7 lb ft)
Opening pressure of the relief
valve 3500 kPa to 4100 kPa
(508 psi to 595 psi)
Sealing pressure of the relief valve 2900 kPa
(420 psi)

(3) Oil plug

Displacement per revolution 214.7 cc (13.101 in³)
Maximum Compressor RPM 4000 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a
ICI KLEA 134a

Refrigerant Oil

Oil capacity 180 cc (10.9836 in³)
Cat 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil resistance 3.2 ohms
Voltage 12 DCV
Minimum voltage for engagement 8 DCV

Maximum Current 3.75 amp

Apply 4C-4030 Thread Lock Compound to the mounting screws for the magnetic coil.

i04363113

Refrigerant Compressor

SMCS Code: 1802

Part No.: 299-2212
S/N: JBA1-Up

Part No.: 299-2212
S/N: NBA1-Up

Part No.: 299-2212
S/N: PRA1-Up

Part No.: 299-2212
S/N: HXB1-Up

Part No.: 299-2212
S/N: MXB1-Up

Part No.: 299-2212
S/N: SXB1-Up

Part No.: 299-2212
S/N: BWC1-Up

Part No.: 299-2212
S/N: DXC1-Up

Part No.: 299-2212
S/N: PHC1-Up

Part No.: 299-2212
S/N: SWC1-Up

Part No.: 299-2212
S/N: SCD1-Up

Part No.: 299-2212
S/N: EME1-Up

Part No.: 299-2212
S/N: SEF1-Up

Part No.: 299-2212
S/N: LTG1-Up

Part No.: 299-2212
S/N: DPH1-Up

Part No.: 299-2212
S/N: LBH1-Up

Part No.: 299-2212
S/N: LDH1-Up

Part No.: 299-2212
S/N: LKH1-Up

Part No.: 299-2212
S/N: LNH1-Up

Part No.: 299-2212
S/N: LRH1-Up

Part No.: 299-2212
S/N: LJJ1-Up

Part No.: 299-2212
S/N: SEJ1-Up

Part No.: 299-2212
S/N: DSK1-Up

Part No.: 299-2212
S/N: DJL1-Up

Part No.: 299-2212
S/N: SJL1-Up

Part No.: 299-2212
S/N: DAN1-Up

Part No.: 299-2212
S/N: RLN1-Up

Part No.: 299-2212
S/N: LNR1-Up

Part No.: 299-2212
S/N: PCR1-Up

Part No.: 299-2212
S/N: LMS1-Up

Part No.: 299-2212
S/N: RXS1-Up

Part No.: 299-2212
S/N: LWT1-Up

Part No.: 299-2212
S/N: MAW1-Up

Part No.: 299-2212
S/N: SJW1-Up

Part No.: 299-2212
S/N: LDY1-Up

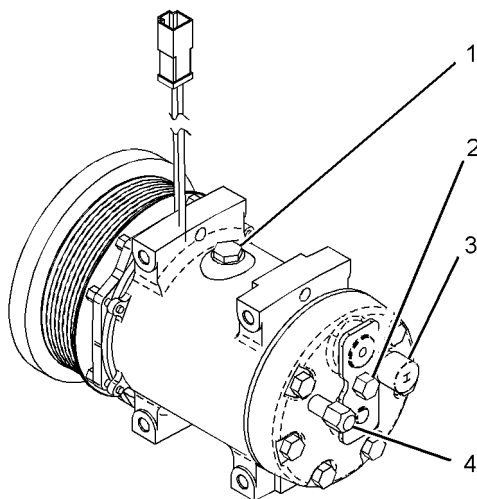


Illustration 32

g01374664

Typical view of the 299-2212 Compressor

(1) Torque for oil plug 10 ± 2 N·m (7.4 ± 1.5 lb ft)**Note:** Oil plug (1) is under pressure when the system is pressurized.(2) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(3) Pressure relief valve

Opening pressure of the relief
valve 3500 kPa to 4100 kPa
(508 psi to 595 psi)

Sealing pressure of the relief valve 3026 kPa
(438.9 psi)

(4) Torque for pressure switch 8.0 ± 1.5 N·m
(71.00 ± 13.00 lb in)

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended speed of compressor
..... 3100 ± 200 rpm

Belt Type PV-8

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Cat 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil Resistance (12 DCV) for clutch .. 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 DCV

Maximum current 3.58 amp

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Refrigerant Compressor

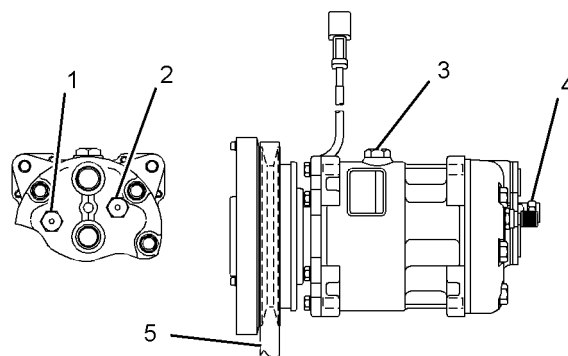
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Illustration 33

g01521192

Typical view of the 3E-1907 Refrigerant Compressor Gp

(1) Installation torque for pressure switch
..... 8.0 ± 1.5 N·m (71.00 ± 13.00 lb in)

(2) Pressure relief valve

Opening pressure of pressure relief
valve 3800 ± 300 kPa (551 ± 44 psi)

Closing pressure of pressure relief
valve 2900 kPa (421 psi)

(3) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (3) is under pressure when the system is pressurized.

(4) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(5) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 12 DCV coil resistance (Black wire) 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 DCV

Maximum Current 3.58 amp

i02999233

Refrigerant Compressor

SMCS Code: 1802

Part No.: 3E-1908
S/N: EAA1-Up

Part No.: 3E-1908
S/N: FEA1-Up

Part No.: 3E-1908
S/N: GCA1-Up

Part No.: 3E-1908
S/N: RXA1-Up

Part No.: 3E-1908
S/N: BNB1-Up

Part No.: 3E-1908
S/N: WGB1-Up

Part No.: 3E-1908
S/N: BKC1-Up

Part No.: 3E-1908
S/N: BMC1-Up

Part No.: 3E-1908
S/N: BXC1-Up

Part No.: 3E-1908
S/N: CFC1-Up

Part No.: 3E-1908
S/N: FDC1-Up

Part No.: 3E-1908
S/N: BLD1-Up

Part No.: 3E-1908
S/N: HYD1-Up

Part No.: 3E-1908
S/N: TBD1-Up

Part No.: 3E-1908
S/N: BPE1-Up

Part No.: 3E-1908
S/N: TPE1-Up

Part No.: 3E-1908
S/N: 1KF1040-Up

Part No.: 3E-1908
S/N: 6XF1-Up

Part No.: 3E-1908
S/N: CFF1-Up

Part No.: 3E-1908
S/N: MJF1-Up

Part No.: 3E-1908
S/N: 8SG5327-Up

Part No.: 3E-1908
S/N: BKG1-Up

Part No.: 3E-1908
S/N: BRG1-Up

Part No.: 3E-1908
S/N: RKG1-Up

Part No.: 3E-1908
S/N: CNH1-Up

Part No.: 3E-1908
S/N: FDH1-Up

Part No.: 3E-1908
S/N: FGH1-Up

Part No.: 3E-1908
S/N: JMH1-Up

Part No.: 3E-1908
S/N: MBH1-Up

Part No.: 3E-1908
S/N: 2ZJ375-1964

Part No.: 3E-1908
S/N: 5YJ1546-Up

Part No.: 3E-1908
S/N: 6MJ650-Up

Part No.: 3E-1908
S/N: 7EJ2812-Up

Part No.: 3E-1908
S/N: BGJ1-Up

Part No.: 3E-1908
S/N: SMJ1-Up

Part No.: 3E-1908
S/N: 1YK2048-Up

Part No.: 3E-1908
S/N: 3KK1136-Up

Part No.: 3E-1908
S/N: 8ZK1796-Up

Part No.: 3E-1908
S/N: 9TK1-Up

Part No.: 3E-1908
S/N: BNK1-Up

Part No.: 3E-1908
S/N: 2YL1-Up

Part No.: 3E-1908
S/N: 5BL386-Up

Part No.: 3E-1908
S/N: 6KL1-Up

Part No.: 3E-1908
S/N: 6SL172-Up

Part No.: 3E-1908
S/N: 6YL141-Up

Part No.: 3E-1908
S/N: 6ZL1-Up

Part No.: 3E-1908
S/N: 7SL1-Up

Part No.: 3E-1908
S/N: 7XL107-Up

Part No.: 3E-1908
S/N: 7YL64-Up

Part No.: 3E-1908
S/N: 8DL35-Up

Part No.: 3E-1908
S/N: 8EL57-Up

Part No.: 3E-1908
S/N: 8FL1-Up

Part No.: 3E-1908
S/N: 9CL78-Up

Part No.: 3E-1908
S/N: 9DL1-Up

Part No.: 3E-1908
S/N: 9EL48-Up

Part No.: 3E-1908
S/N: 9GL1-Up

Part No.: 3E-1908
S/N: BLL1-Up

Part No.: 3E-1908
S/N: BML1-Up

Part No.: 3E-1908
S/N: 1GM1-Up

Part No.: 3E-1908
S/N: 1HM1-Up

Part No.: 3E-1908
S/N: 1NM1-Up

Part No.: 3E-1908
S/N: 1SM1-Up

Part No.: 3E-1908
S/N: 9AM1-Up

Part No.: 3E-1908
S/N: MBM1-Up

Part No.: 3E-1908
S/N: 4ZN1-Up

Part No.: 3E-1908
S/N: 5YN1-Up

Part No.: 3E-1908
S/N: 6XN1-Up

Part No.: 3E-1908
S/N: 7WN1-Up

Part No.: 3E-1908
S/N: 8RN1-Up

Part No.: 3E-1908
S/N: 8TN1-Up

Part No.: 3E-1908
S/N: 9JN1-Up

Part No.: 3E-1908
S/N: 9KN1-Up

Part No.: 3E-1908
S/N: BLN1-Up

Part No.: 3E-1908
S/N: BPN1-Up

Part No.: 3E-1908
S/N: CFN1-Up

Part No.: 3E-1908
S/N: BFP1-Up

Part No.: 3E-1908
S/N: BGP1-Up

Part No.: 3E-1908
S/N: FDP1-Up

Part No.: 3E-1908
S/N: WEP1-Up

Part No.: 3E-1908
S/N: 1CR1-Up

Part No.: 3E-1908
S/N: 1ER1-Up

Part No.: 3E-1908
S/N: 1FR1-Up

Part No.: 3E-1908
S/N: 1MR1-Up

Part No.: 3E-1908
S/N: 1NR1-Up

Part No.: 3E-1908
S/N: 1PR1-Up

Part No.: 3E-1908
S/N: 1RR1-Up

Part No.: 3E-1908
S/N: 1TR1-Up

Part No.: 3E-1908
S/N: 1WR1-Up

Part No.: 3E-1908
S/N: 1XR1-Up

Part No.: 3E-1908
S/N: 1YR1-Up

Part No.: 3E-1908
S/N: 1ZR1-Up

Part No.: 3E-1908
S/N: 2AR1-Up

Part No.: 3E-1908
S/N: 2BR1-Up

Part No.: 3E-1908
S/N: 2CR1-Up

Part No.: 3E-1908
S/N: 2DR1-Up

Part No.: 3E-1908
S/N: 4GR1-Up

Part No.: 3E-1908
S/N: 5AR1-Up

Part No.: 3E-1908
S/N: BKR1-Up

Part No.: 3E-1908
S/N: BYR1-Up

Part No.: 3E-1908
S/N: MER1-Up

Part No.: 3E-1908
S/N: TAR1-Up

Part No.: 3E-1908
S/N: TDR1-Up

Part No.: 3E-1908
S/N: 4KS1-Up

Part No.: 3E-1908
S/N: 4LS1-Up

Part No.: 3E-1908
S/N: 4MS1-Up

Part No.: 3E-1908
S/N: 4TS1-Up

Part No.: 3E-1908
S/N: 5GS1-Up

Part No.: 3E-1908
S/N: 5HS1-Up

Part No.: 3E-1908
S/N: 5JS1-Up

Part No.: 3E-1908
S/N: 6BS1-Up

Part No.: 3E-1908
S/N: 6CS1-Up

Part No.: 3E-1908
S/N: 6DS1-Up

Part No.: 3E-1908
S/N: 6GS1-Up

Part No.: 3E-1908
S/N: 6HS1-Up

Part No.: 3E-1908
S/N: 6JS1-Up

Part No.: 3E-1908
S/N: 6KS1-Up

Part No.: 3E-1908
S/N: 6ZS1-Up

Part No.: 3E-1908
S/N: 7PS1-Up

Part No.: 3E-1908
S/N: 8BS1-Up

Part No.: 3E-1908
S/N: 8CS1-Up

Part No.: 3E-1908
S/N: 8ZS1-Up

Part No.: 3E-1908
S/N: 9TS1-Up

Part No.: 3E-1908
S/N: BNS1-Up

Part No.: 3E-1908
S/N: BMT1-Up

Part No.: 3E-1908
S/N: 1FW1-Up

Part No.: 3E-1908
S/N: FDW1-Up

Part No.: 3E-1908
S/N: DSX1-Up

Part No.: 3E-1908
S/N: TLX1-Up

Part No.: 3E-1908
S/N: BRY1-Up

Part No.: 3E-1908
S/N: CJZ1-Up

Sealing pressure of pressure relief
valve 2900 kPa (421 psi)

(3) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (3) is under pressure when the system is pressurized.

(4) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(5) V-belt tension

New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, “Identifying the Air Conditioning System”.

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 12 DCV coil resistance (Black wire) 3.5 ± 0.15 ohms

Type of connector DT Connector

Minimum voltage for engagement of clutch .. 7.5 DCV

Maximum Current 3.58 amp

i03343221

Refrigerant Compressor

SMCS Code: 1802

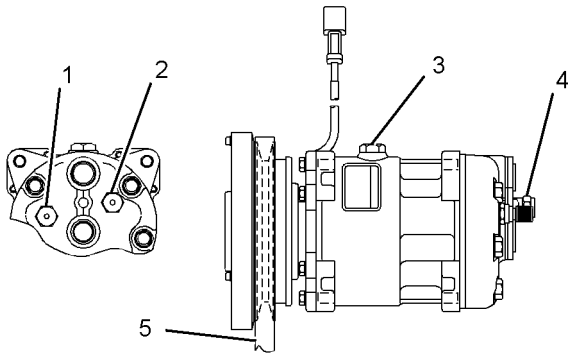


Illustration 34
Typical view of the 3E-1908 Refrigerant Compressor Gp

(1) Installation torque for pressure
switch 8.0 ± 1.5 N·m (71 ± 13 lb in)

(2) Pressure relief valve

Opening pressure of pressure relief valve
..... 3800 ± 300 kPa (551 ± 44 psi)

Part No.: 178-9570
S/N: 5531-Up

Part No.: 178-9570
S/N: 6541-Up

Part No.: 178-9570
S/N: 6651-Up

Part No.: 178-9570
S/N: 7651-Up

Part No.: 178-9570
S/N: 8661-Up

Part No.: 178-9570
S/N: 6571-Up

Part No.: 178-9570
S/N: 7671-Up

Part No.: 178-9570
S/N: 8681-Up

Part No.: 299-2212
S/N: JBA1-Up

Part No.: 299-2212
S/N: NBA1-Up

Part No.: 299-2212
S/N: PRA1-Up

Part No.: 178-9570
S/N: SLA1-Up

Part No.: 299-2212
S/N: HXB1-Up

Part No.: 178-9570
S/N: SLB1-Up

Part No.: 299-2212
S/N: SXB1-Up

Part No.: 299-2212
S/N: BWC1-Up

Part No.: 299-2212
S/N: DXC1-Up

Part No.: 299-2212
S/N: PHC1-Up

Part No.: 178-9570
S/N: SLC1-Up

Part No.: 178-9570
S/N: JTD1-Up

Part No.: 299-2212
S/N: SCD1-Up

Part No.: 178-9570
S/N: SLD1-Up

Part No.: 299-2212
S/N: EME1-Up

Part No.: 178-9570
S/N: GAE1-Up

Part No.: 178-9570
S/N: SLE1-Up

Part No.: 178-9570
S/N: FFF1-Up

Part No.: 178-9570
S/N: JLF1-Up

Part No.: 178-9570
S/N: KFF1-Up

Part No.: 299-2212
S/N: SEF1-Up

Part No.: 178-9570
S/N: TRF1-Up

Part No.: 299-2212
S/N: LTG1-Up

Part No.: 178-9570
S/N: SLG1-Up

Part No.: 299-2212
S/N: DPH1-Up

Part No.: 299-2212
S/N: LBH1-Up

Part No.: 299-2212
S/N: LDH1-Up

Part No.: 299-2212
S/N: LKH1-Up

Part No.: 299-2212
S/N: LNH1-Up

Part No.: 299-2212
S/N: LRH1-Up

Part No.: 178-9570
S/N: SLH1-Up

Part No.: 299-2212
S/N: LJJ1-Up

Part No.: 299-2212
S/N: SEJ1-Up

Part No.: 299-2212
S/N: DSK1-Up

Part No.: 178-9570
S/N: KLL1-Up

Part No.: 178-9570
S/N: LLL1-Up

Part No.: 299-2212
S/N: SJL1-Up

Part No.: 178-9570
S/N: KMM1-Up

Part No.: 178-9570
S/N: MMM1-Up

Part No.: 178-9570
S/N: RJN1-Up

Part No.: 299-2212
S/N: RLN1-Up

Part No.: 178-9570
S/N: KRR1-Up

Part No.: 299-2212
S/N: LNR1-Up

Part No.: 299-2212
S/N: PCR1-Up

Part No.: 178-9570
S/N: RRR1-Up

Part No.: 299-2212
S/N: RXS1-Up

Part No.: 299-2212
S/N: LWT1-Up

Part No.: 178-9570
S/N: KWW1-Up

Part No.: 299-2212
S/N: MAW1-Up

Part No.: 299-2212
S/N: SJW1-Up

Part No.: 178-9570
S/N: WWW1-Up

Part No.: 178-9570
S/N: KYY1-Up

Part No.: 299-2212
S/N: LDY1-Up

Part No.: 178-9570
S/N: YYY1-Up

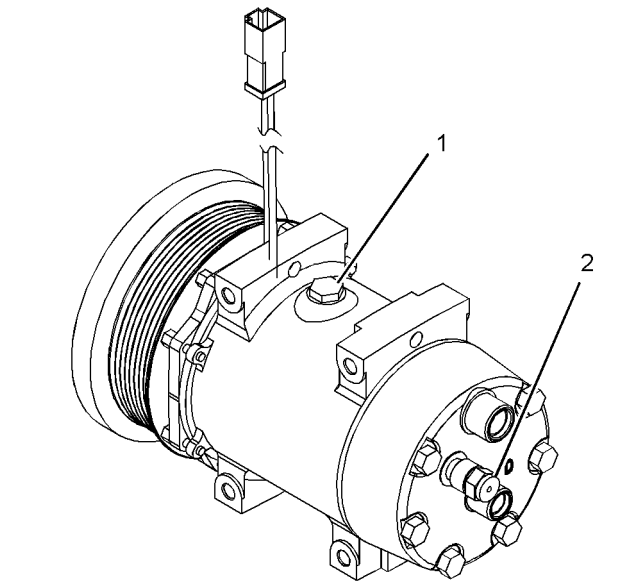


Illustration 35 g01718774

Refer to Systems Operation, SENR5664, “Identifying the Air Conditioning System” for the components of the air conditioning systems.

Note: Use Cat 4C-2959 Air Conditioner Oil

Specifications for refrigerant

Type	Polyalkylene glycol oil (PAG)
Oil capacity	300 cc (18.3 cubic inch)
DuPont	SUVA TRANS A/C HFC134a
ICI	KLEA 134a
Refrigerant	R-134a

Note: Used belt tension is for the belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 890 ± 44 N (200.1 ± 9.9 lb).

Note: Use a Caterpillar 138-2514 Belt Tensioner.

Specifications for belt tension

New belt	1068 ± 111 N (240 ± 25 lb)
Used belt	890 ± 44 N (200.1 ± 9.9 lb)

Specifications for compressor

Displacement per revolution	154.9 cc (9.5 cubic inch)
Maximum continuous speed	4000 rpm
Recommended speed at engine rated speed	2500 ± 200 rpm

Specifications for magnetic clutch

Voltage	12 VDC
Breakaway torque	34.4 N·m (25 lb ft)
Minimum voltage for engagement	7.5 VDC

Coil resistance at 20 °C
(68 °F) 3.50 ± 0.15 Ohms
Maximum Current at 20 °C (68 °F) 3.58 Amp
Type of belt PV8

Note: The 7/8 inch threaded fitting is located on the support suction port.

Note: The 3/4 inch threaded fitting is located on the discharge port.

Torque specifications for fittings

Torque for 7/8 inch threaded
fitting 32.4 ± 3.9 N·m (24 ± 3 lb ft)
Torque for 3/4 inch threaded
fitting 23.5 ± 3.4 N·m (17 ± 3 lb ft)

Note: The plug assembly (1) is under pressure when the system is pressurized.

(1) Torque for the plug assembly 10 ± 2 N·m
(90 ± 18 lb in)

(2) Operating pressure for PRV

Opening pressure 3500 to 4100 kPa
(510 to 595 psi)
Pressure for reseal 2900 kPa (420 psi)

i05012009

Refrigerant Compressor

SMCS Code: 1802

Part No.: 338-9098

S/N: KSF1-Up

Part No.: 338-9098

S/N: RDF1-Up

Part No.: 338-9098

S/N: JWJ1-Up

Part No.: 338-9098

S/N: SKR1-Up

Part No.: 338-9098

S/N: RGS1-Up

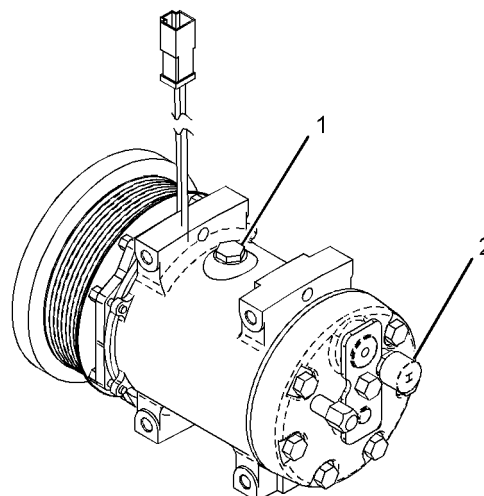


Illustration 36

g03184617

(1) Torque for oil plug 19.6 ± 4.9 N·m
(173 ± 43 lb in)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Pressure relief valve

Opening pressure of the relief
valve 3502 to 4102 kPa (508 to 595 psi)
Sealing pressure of the relief valve 3026 kPa
(439 psi)

Displacement per revolution 154.9 mL (5.3 oz)

Recommended speed of compressor
..... 2700 ± 200 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 300 mL (10 oz)

Cat 4C-2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil Resistance (24 DCV) for clutch at 20 °C
(68 ° F) 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 VDC

Maximum current at 20 °C (68 °F) 3.58 amp

i03495340

Refrigerant Compressor

SMCS Code: 1802

Part No.: 299-2212
S/N: PRA1-Up

Part No.: 299-2212
S/N: HXB1-Up

Part No.: 299-2212
S/N: SXB1-Up

Part No.: 299-2212
S/N: DXC1-Up

Part No.: 299-2212
S/N: PHC1-Up

Part No.: 299-2212
S/N: SCD1-Up

Part No.: 299-2212
S/N: LTG1-Up

Part No.: 299-2212
S/N: LBH1-Up

Part No.: 299-2212
S/N: LDH1-Up

Part No.: 299-2212
S/N: LKH1-Up

Part No.: 299-2212
S/N: LNH1-Up

Part No.: 299-2212
S/N: LRH1-Up

Part No.: 299-2212
S/N: LJJ1-Up

Part No.: 299-2212
S/N: SEJ1-Up

Part No.: 299-2212
S/N: DSK1-Up

Part No.: 299-2212
S/N: RLN1-Up

Part No.: 299-2212
S/N: LNR1-Up

Part No.: 299-2212
S/N: PCR1-Up

Part No.: 299-2212
S/N: RXS1-Up

Part No.: 299-2212
S/N: LWT1-Up

Part No.: 299-2212
S/N: SJW1-Up

Part No.: 299-2212
S/N: LDY1-Up

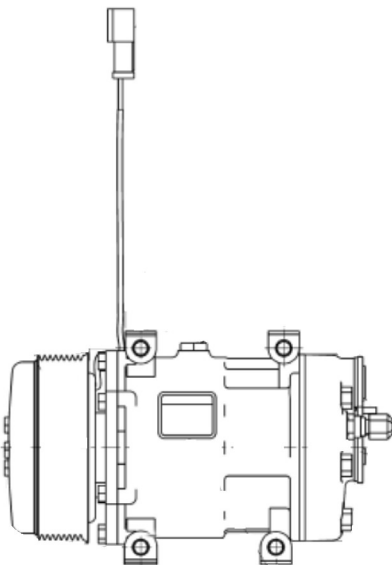


Illustration 37
Typical view of the 299-2212 Refrigerant Compressor Gp

Torque for oil plug 10 ± 2 N·m (89 ± 18 lb in)

Note: The oil plug is under pressure when the system is pressurized.

Final installation torque 35 ± 3 N·m (26 ± 2 lb ft)

Pressure relief valve

Opening pressure of the relief
valve 3502 kPa to 4102 kPa
(508 psi to 595 psi)
Sealing pressure of the relief valve 3026 kPa
(439 psi)

Torque for pressure switch 8.0 ± 1.5 N·m
(71.00 ± 13.00 lb in)

Displacement per revolution 154.9 cc
(9.5 cubic inch)

Maximum compressor rpm 4000 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Polyalkylene Glycol (PAG)

Oil capacity 300 cc (18.3 cubic inch)

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC

Coil resistance for clutch 3.5 ohms

Minimum voltage for engagement 7.5 VDC

Maximum current 3.58 amp

i05012071

Refrigerant Compressor

SMCS Code: 1802

Part No.: 333-2111

S/N: RAK1-Up

Part No.: 333-2111

S/N: JXR1-Up

Part No.: 333-2111

S/N: MTR1-Up

Part No.: 333-2111

S/N: PXR1-Up

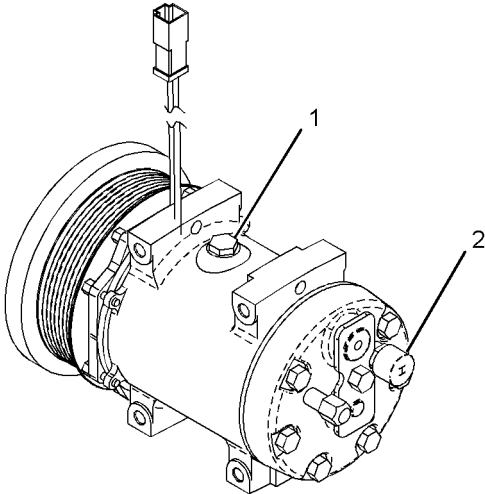


Illustration 38

g03184662

(1) Torque for oil plug $19.6 \pm 4.9 \text{ N}\cdot\text{m}$
($173 \pm 43 \text{ b in}$)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Pressure relief valve

Opening pressure of the relief
valve 3501 to 4099 kPa (508 to 595 psi)
Sealing pressure of the relief valve 3011 kPa
(437 psi)

Displacement per revolution 154.9 mL (5.3 oz)

Recommended speed of compressor
..... $3100 \pm 200 \text{ rpm}$

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 300 mL (10 oz)
Cat 4C - 2959 Air Conditioner Lubricant (PAG)

Magnetic Clutch

Coil Resistance (24 DCV) for clutch at 20 °C
(68 °F) 3.50 ± 0.15 ohms
Minimum voltage for engagement 7.5 VDC
Maximum current at 20 °C (68 °F) 3.58 amp

i04321532

Refrigerant Compressor

SMCS Code: 1802
Part No.: 272-5767
S/N: RBA1-Up
Part No.: 272-5767
S/N: EBL1-Up

(2) Bolt
Installation Torque 35 ± 3 N·m (26 ± 2 lb ft)

Specifications for the Compressor

Bore 32 mm (1.2598 inch)
Stroke 26.7 mm (1.0512 inch)
Displacement per revolution .. 214.7 cc (13.1010 in³)
Number of cylinders 10
Maximum allowable RPM 4000
Refrigerant R134A
Oil
4C - 2959 Air Conditioner Oil
Capacity 180 cc (6.1 fluid oz)

Rotation CW rotation or CCW rotation
Recommended RPM at rated engine
speed 2500 ± 200 RPM

Specifications for the Clutch

Voltage 24 VDC
Breakaway torque 59 N·m (43 lb ft)
Minimum voltage for clutch engagement 16 VDC
Coil resistance at 20° C 13.4 Ohms
Maximum current at 20° C 1.79 amp
Belt type PV-8

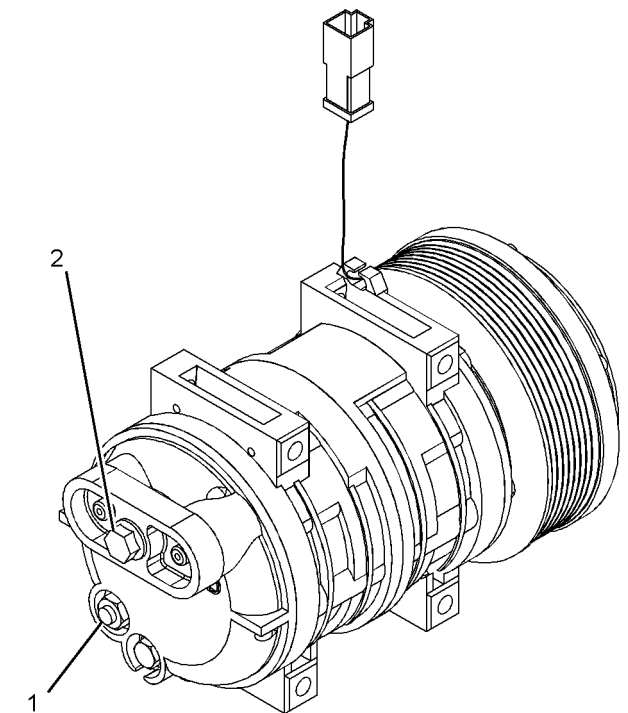


Illustration 39
Typical view of the 217 - 4448 Refrigerant Compressor Gp

(1) Relief valve
Installation Torque 13 N·m (115.06 lb in)
Opening pressure of relief
valve 3450 to 3920 kPa (500 to 568 psi)

i03001209

Refrigerant Compressor

SMCS Code: 1802

Part No.: 222 - 2276

S/N: 4CS130-Up

Part No.: 222 - 2276

S/N: 4HZ1-Up

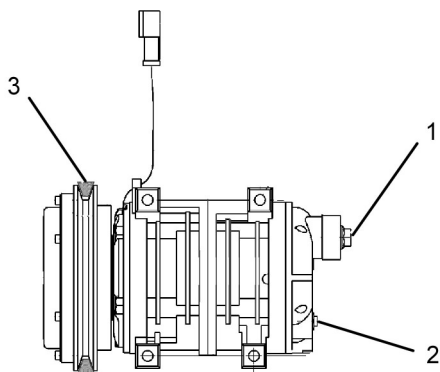


Illustration 40

g01521204

Typical view of the 222 - 2276 Refrigerant Compressor Gp

(1) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(2) Pressure relief valve

Opening pressure of the relief
valve 3500 kPa to 4100 kPa
(508 psi to 595 psi)

Sealing pressure of the relief valve 2000 kPa
(290 psi)

(3) Belt tension

New belt 578 ± 111 N (130 ± 25 lb)
Used belt 445 ± 44 N (100 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 445 ± 44 N (100 ± 10 lb).

Note: Caterpillar 144 - 0235 Belt Tension Gauge

Displacement per revolution 214.7 mL (7.26 fl oz)

Recommended compressor RPM 2500 ± 200 rpm

Maximum allowable RPM 4000

Refrigerant Oil

Oil capacity 180 mL (6 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

Caterpillar 4C - 2959 Air Conditioner Oil

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 24 DCV coil resistance 13.4 ohms

Minimum voltage for engagement 16 DCV

Maximum current 1.79 amp

i03001216

Refrigerant Compressor

SMCS Code: 1802

Part No.: 151 - 5270

S/N: 5531-Up

Part No.: 151 - 5270

S/N: 6651-Up

Part No.: 151 - 5270

S/N: 7DM1-Up

Part No.: 151 - 5270

S/N: 8YW1-Up

Part No.: 151 - 5270

S/N: 3HZ1-Up

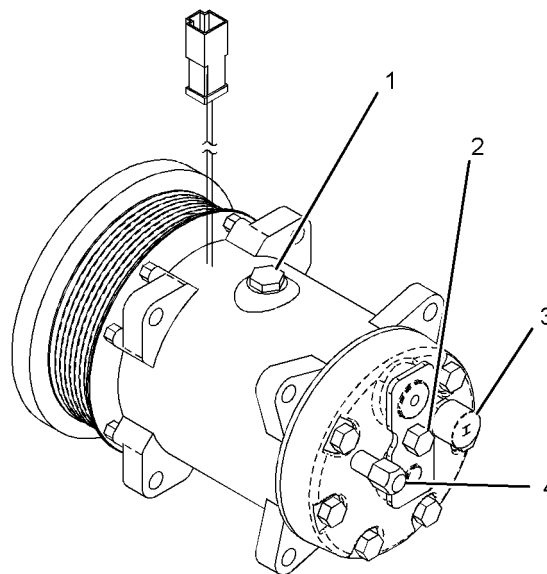


Illustration 41

g01521207

Typical view of the 151 - 5270 Refrigerant Compressor Gp

(1) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)

(3) Pressure relief valve

Opening pressure of the relief
valve 3800 ± 300 kPa (550 ± 44 psi)
Sealing pressure of the relief valve 2900 kPa
(420 psi)

Belt tension

New belt 1068 ± 111 N (240 ± 25 lb)
Used belt 890 ± 44 N (200 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 890 ± 44 N (200 ± 10 lb).

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 12 DCV coil resistance (Black
wire) 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 DCV

Maximum Current 3.58 amp

i04197570

Refrigerant Compressor

SMCS Code: 1802

Part No.: 183-5106
S/N: DFA1-Up

Part No.: 183-5106
S/N: DHA1-Up

Part No.: 183-5106
S/N: DJA1-Up

Part No.: 183-5106
S/N: DBB1-Up

Part No.: 183-5106
S/N: GEB1-Up

Part No.: 183-5106
S/N: J8B1-Up

Part No.: 183-5106
S/N: TPB1-Up

Part No.: 183-5106
S/N: W1B1-Up

Part No.: 183-5106
S/N: DBC1-Up

Part No.: 183-5106
S/N: DHC1-Up

Part No.: 183-5106
S/N: HXC1-Up

Part No.: 183-5106
S/N: W1C1-Up

Part No.: 183-5106
S/N: AKD1-Up

Part No.: 183-5106
S/N: BBD1-Up

Part No.: 183-5106
S/N: BYD1-Up

Part No.: 183-5106
S/N: DBD1-Up

Part No.: 183-5106
S/N: FTD1-Up

Part No.: 183-5106
S/N: KSD1-Up

Part No.: 183-5106
S/N: PED1-Up

Part No.: 183-5106
S/N: C7F1-Up

Part No.: 183-5106
S/N: CBF1-Up

Part No.: 183-5106
S/N: NCF1-Up

Part No.: 183-5106
S/N: P7F1-Up

Part No.: 183-5106
S/N: P8F1-Up

Part No.: 183-5106
S/N: AGG1-Up

Part No.: 183-5106
S/N: CCG1-Up

Part No.: 183-5106
S/N: ALH1-Up

Part No.: 183-5106
S/N: CFH1-Up

Part No.: 183-5106
S/N: FBH1-Up

Part No.: 183-5106
S/N: JAH1-Up

Part No.: 183-5106
S/N: DFJ1-Up

Part No.: 183-5106
S/N: JNJ1-Up

Part No.: 183-5106
S/N: KKJ1-Up

Part No.: 183-5106
S/N: CXK1-Up

Part No.: 183-5106
S/N: C7L1-Up

Part No.: 183-5106
S/N: CBL1-Up

Part No.: 183-5106
S/N: JRL1-Up

Part No.: 183-5106
S/N: 7XM1-Up

Part No.: 183-5106
S/N: AKM1-Up

Part No.: 183-5106
S/N: JTM1-Up

Part No.: 183-5106
S/N: KLN1-Up

Part No.: 183-5106
S/N: C5P1-Up

Part No.: 183-5106
S/N: C6P1-Up

Part No.: 183-5106
S/N: C8P1-Up

Part No.: 183-5106
S/N: FCP1-Up

Part No.: 183-5106
S/N: JCP1-Up

Part No.: 183-5106
S/N: LBP1-Up

Part No.: 183-5106
S/N: ALR1-Up

Part No.: 183-5106
S/N: C5S1-Up

Part No.: 183-5106
S/N: C6S1-Up

Part No.: 183-5106
S/N: C8S1-Up

Part No.: 183-5106
S/N: CCS1-Up

Part No.: 183-5106
S/N: FCS1-Up

Part No.: 183-5106
S/N: JCS1-Up

Part No.: 183-5106
S/N: LCS1-Up

Part No.: 183-5106
S/N: RJS1-Up

Part No.: 183-5106
S/N: RRS1-Up

Part No.: 183-5106
S/N: CKT1-Up

Part No.: 183-5106
S/N: FAT1-Up

Part No.: 183-5106
S/N: BTW1-Up

Part No.: 183-5106
S/N: BBX1-Up

Part No.: 183-5106
S/N: BWX1-Up

Part No.: 183-5106
S/N: CYX1-Up

Part No.: 183-5106
S/N: ALY1-Up

Part No.: 183-5106
S/N: DJY1-Up

Part No.: 183-5106
S/N: KPZ1-Up

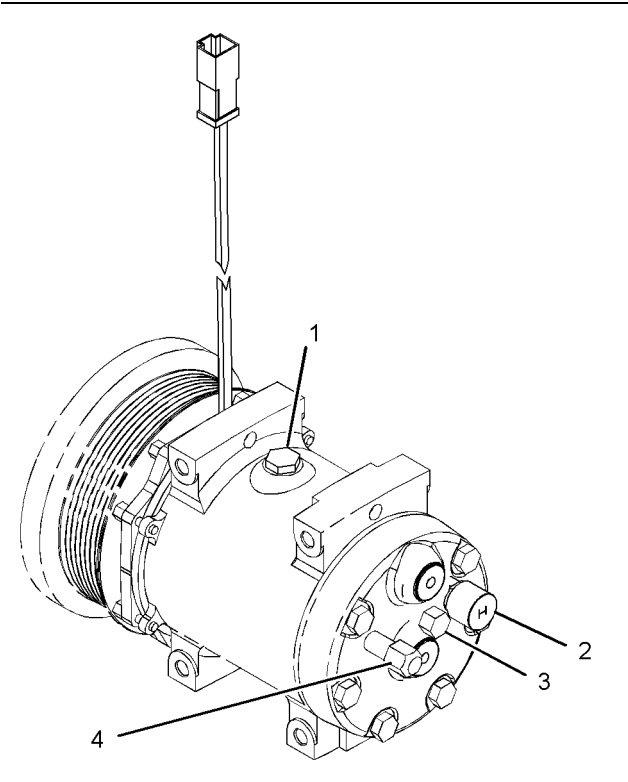


Illustration 42 g02101333

Refer to Systems Operation, SENR5664, “Identifying the Air Conditioning System” for the components of the air conditioning systems.

Note: Use Cat 4C-2959 Air Conditioner Oil

Specifications for refrigerant

Type Polyalkylene glycol oil (PAG)
Oil capacity 300 cc (18.3 cubic inch)
Refrigerant R-134a

Specifications for compressor

Displacement per revolution 154.9 cc
(9.5 cubic inch)
Maximum allowable speed 4000 rpm
Recommended speed at engine rated
speed 2500 ± 200 rpm
Rotation Clockwise
Maximum continuous operating
temperature 95 °C (203 °F)

Specifications for magnetic clutch

Voltage 24 VDC
Breakaway torque 34.4 N·m (25.4 lb ft)
Minimum voltage for engagement 16 VDC
Coil resistance at 20 °C (68 °F) .. 17.6 ± 0.6 Ohms
Maximum Current at 20 °C (68 °F) 1.42 Amp
Type of belt PV8

Note: The plug assembly (1) is under pressure when the system is pressurized.

- (1) Torque for the plug assembly 10 ± 2 N·m
(89 ± 18 lb in)
- (2) Pressure relief Valve assembly
Operating pressure range 3500 to 4100 kPa
(508 to 595 psi)
Minimum pressure for reseal 2900 kPa
(420 psi)
- (3) Final installation torque for the bolt with
required thread engagement of 15 ± 2 mm
(0.6 ± 0.1 inch) 35 ± 3 N·m (26 ± 2 lb ft)
- (4) Torque for the pressure switch 8.0 ± 1.5 N·m
(70.8 ± 13.3 lb in)

i02999236

Refrigerant Compressor

SMCS Code: 1802

Part No.: 134-3997
S/N: 7NC5527-Up

Part No.: 134-3997
S/N: 8FC5612-Up

Part No.: 134-3997
S/N: 8RC5967-Up

Part No.: 134-3997
S/N: 9HC5521-Up

Part No.: 134-3997
S/N: 9TC1-Up

Part No.: 134-3997
S/N: 1DD6006-Up

Part No.: 134-3997
S/N: 1KF1040-Up

Part No.: 134-3997
S/N: 1SF1337-Up

Part No.: 3E-1909
S/N: 6NG234-Up

Part No.: 134-3997
S/N: 8BG2191-Up

Part No.: 134-3997
S/N: 1XJ1-Up

Part No.: 134-3997
S/N: 3BJ100-Up

Part No.: 134-3997
S/N: 3TJ363-Up

Part No.: 134-3997
S/N: 5TJ1317-Up

Part No.: 134-3997
S/N: 5XJ1-Up

Part No.: 134-3997
S/N: 6XJ523-Up

Part No.: 134-3997
S/N: 7XJ124-Up

Part No.: 134-3997
S/N: 8CJ1221-Up

Part No.: 134-3997
S/N: 8PJ533-Up

Part No.: 134-3997
S/N: 8RJ4387-Up

Part No.: 134-3997
S/N: 9GJ945-Up

Part No.: 134-3997
S/N: 9YJ1078-Up

Part No.: 134-3997
S/N: 1YK2048-Up

Part No.: 134-3997
S/N: 3SK410-Up

Part No.: 134-3997
S/N: 4HK366-Up

Part No.: 134-3997
S/N: 4NK147-Up

Part No.: 134-3997
S/N: 4SK22-Up

Part No.: 3E-1909
S/N: 5SK745-Up

Part No.: 134-3997
S/N: 7PK135-Up

Part No.: 134-3997
S/N: 7TK1-Up

Part No.: 3E-1909
S/N: 8AK1-Up

Part No.: 3E-1909
S/N: 8TK816-Up

Part No.: 134-3997
S/N: 9JK361-Up

Part No.: 3E-1909
S/N: 1JL1-Up

Part No.: 134-3997
S/N: 1SL510-Up

Part No.: 3E-1909
S/N: 2XL1-Up

Part No.: 3E-1909
S/N: 3CL751-Up

Part No.: 3E-1909
S/N: 4CL165-Up

Part No.: 134-3997
S/N: 4EL196-Up

Part No.: 134-3997
S/N: 5DL167-Up

Part No.: 3E-1909
S/N: 6XL170-Up

Part No.: 134-3997
S/N: 7PL103-Up

Part No.: 3E-1909
S/N: 1KM1-Up

Part No.: 3E-1909
S/N: 1YM181-Up

Part No.: 3E-1909
S/N: 2LM348-Up

Part No.: 3E-1909
S/N: 2RM142-Up

Part No.: 3E-1909
S/N: 7YM1-Up

Part No.: 3E-1909
S/N: 8SM142-Up

Part No.: 134-3997
S/N: 1GN1-Up

Part No.: 134-3997
S/N: 4RN1-Up

Part No.: 3E-1909
S/N: 6FN238-Up

Part No.: 134-3997
S/N: 6KN51-Up

Part No.: 134-3997
S/N: 6MN75-Up

Part No.: 134-3997
S/N: 7PN75-Up

Part No.: 3E-1909
S/N: 7SN142-Up

Part No.: 134-3997
S/N: 8JN1-Up

Part No.: 134-3997
S/N: 2KR1-Up

Part No.: 134-3997
S/N: 2SR1-Up

Part No.: 134-3997
S/N: 8ZR1-Up

Part No.: 134-3997
S/N: 63W4011-Up

Part No.: 134-3997
S/N: 64W195-Up

Part No.: 134 - 3997
S/N: 21Z5346-Up

Cat 4C - 2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

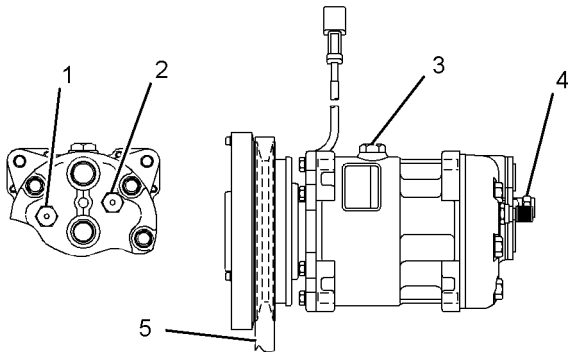


Illustration 43
Typical view of the 134 - 3997 Refrigerant Compressor Gp or the 3E - 1909 Refrigerant Compressor Gp

- (1) Installation torque for pressure switch
..... 8.0 ± 1.5 N·m (71.00 ± 13.00 lb in)
- (2) Pressure relief valve
Opening pressure of relief valve
..... 3800 ± 300 kPa (551 ± 44 psi)
Sealing pressure of pressure relief valve
..... 2900 kPa (421 psi)
- (3) Torque for oil plug .. 19.6 ± 4.9 N·m (14.5 ± 4 lb ft)
- Note:** Oil plug (3) is under pressure when the system is pressurized.
- (4) Final installation torque .. 35 ± 3 N·m (26 ± 2 lb ft)
- (5) V-belt tension
New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144 - 0235 Belt Tension Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, "Identifying the Air Conditioning System".

Poly Alkaline Glycol Oil (PAG)

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 24 DCV coil resistance (Green wire) 17.6 ± 0.6 ohms

Minimum voltage for engagement 16 DCV

Maximum Current 1.42 amp

i04414991

Refrigerant Compressor

SMCS Code: 1802

Part No.: 217-4448

S/N: 4421-Up

Part No.: 217-4448

S/N: FDB1-Up

Part No.: 217-4448

S/N: DWC1-Up

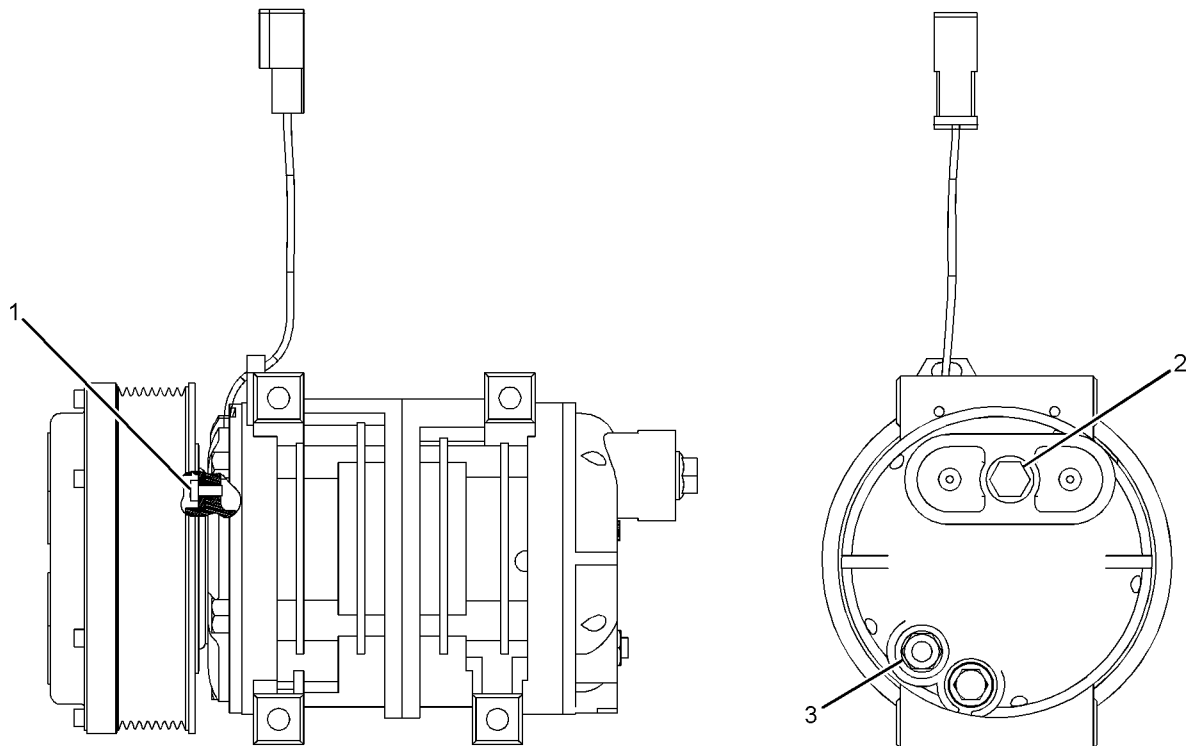


Illustration 44

g02611896

Table 5

Specification for 217-4448 Refrigerant Compressor Gp			
Item	Qty	Part	Specification Description
1	-	-	Apply Loctite 242 to magnetic field coil screws.
			Torque to 5.35 ± 0.50 N·m (47.00 ± 4.00 lb in).
2	-	-	Torque to 35 ± 3 N·m (26 ± 2 lb ft).
			Required minimum thread engagement is 20.0 ± 2.0 mm (0.79 ± 0.08 inch).
3	1	229-7356 Relief Valve As	Torque to 12 to 14 N·m (106 to 124 lb in).
			Opening pressure of relief valve is 3450 to 3920 kPa (500 to 569 psi).
Do not use this refrigerant compressor on any system which does not provide a low-pressure shutoff switch in the high-pressure side.			
The refrigerant compressor must be mounted within 15° of the vertical centerline.			
Specification for the Compressor: Bore is 32.0 mm (1.26 inch). Stroke is 26.7 mm (1.05 inch). Displacement per revolution is 214.7 cc (13.1 in³). Number of cylinders is 10. Maximum allowable RPM is 4000. Refrigerant is R134A. Capacity of 4C-2959 Air Conditioner Oil is 180.0 mL (6.1 oz). Rotation is Clockwise or Counter Clockwise. Recommended RPM at rated engine speed is 2500 ± 200 RPM.			
Specification for the Clutch: Voltage is 24VDC. Breakaway torque is 59 N·m (44 lb ft). Minimum voltage for clutch engagement is 16 VDC. Coil resistance at 20° C is 13.4 ohms. Maximum current at 20° C is 1.79 amp. Belt type is PV-8.			

i03495620

Refrigerant Compressor

SMCS Code: 1802

Part No.: 315-6547
S/N: JRD1-Up

Part No.: 315-6547
S/N: LMD1-Up

Part No.: 315-6547
S/N: TPE1-Up

Part No.: 315-6547
S/N: JRF1-Up

Part No.: 315-6547
S/N: MJF1-Up

Part No.: 315-6547
S/N: MXF1-Up

Part No.: 315-6547
S/N: SDH1-Up

Part No.: 315-6547
S/N: SJM1-Up

Part No.: 315-6547
S/N: JRS1-Up

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 400 ± 44 N (90 ± 10 lb).

Note: Use a Caterpillar 144-0235 Belt Tension Gauge in order to test the tension of the belt.

Displacement per revolution 129.2 mL (4.4 oz)

Maximum allowable speed 4000 rpm

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity of compressor 300 mL (10 oz)

Cat 4C-2959 Air Conditioner Oil

Magnetic Clutch

Rated voltage of magnetic clutch 12 VDC

Power consumption 48 W

Minimum voltage for engagement 7.5 VDC

Pulley diameter 138.5 mm (5.5 inch)

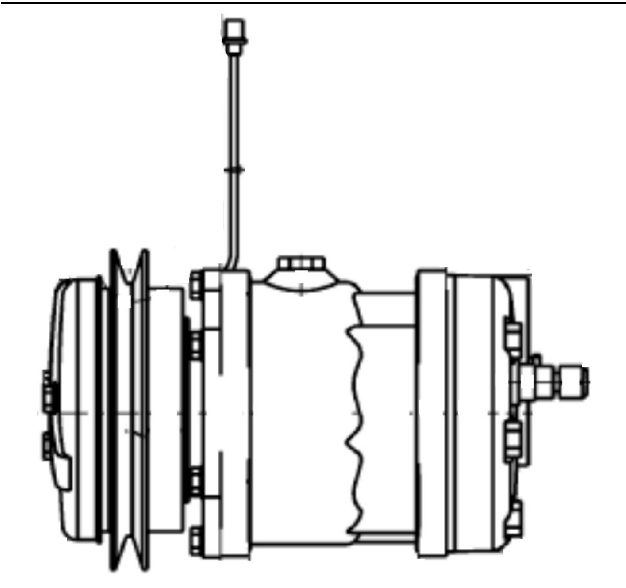


Illustration 45
Typical view of the 315-6547 Refrigerant Compressor Gp

V-belt tension

New V-belt 534 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

i04783228

Refrigerant Compressor

SMCS Code: 1802

Part No.: 360-6927
S/N: JXE1-Up

Part No.: 360-6927
S/N: JXL1-Up

Part No.: 360-6927
S/N: GRT1-Up

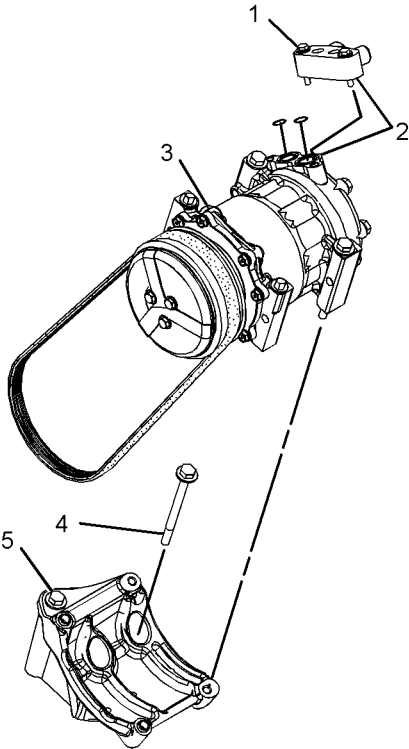


Illustration 46

g02892437

Table 6

Specification for 360-6927 Refrigerant Compressor Gp			
Item	Qty	Part	Specification description
1	2	7x - 2537 Bolt	Torque to 14.7 ± 2.0 N·m (130.1 ± 17.7 lb in).
2	-	-	Sealing surfaces must be free from nicks.
3	1	7T - 4532 Plug As	Torque to 19.6 ± 4.9 N·m (173.5 ± 43.4 lb in).
4	2	8T - 6869 Bolt	Torque to 22 ± 5 N·m (195 ± 44 lb in).
5	1	7X - 2539 Bolt	Torque to 22 ± 5 N·m (195 ± 44 lb in).

i03923371

i04289949

Refrigerant Compressor

SMCS Code: 1802

Part No.: 294 - 8140

S/N: MDB1-Up

Part No.: 294 - 8140

S/N: SCG1-Up

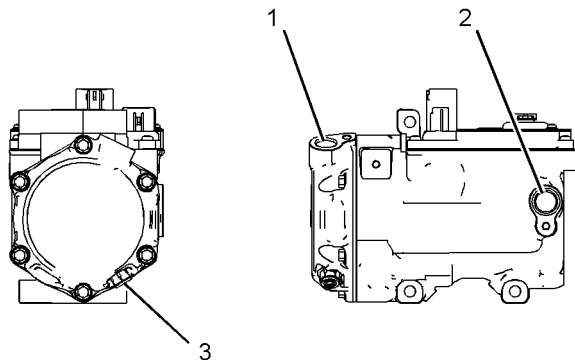


Illustration 47

g02152148

Typical view of the 294 - 8140 Compressor Assembly

- (1) Torque for the fitting in the discharge port $9.8 \pm 1 \text{ N}\cdot\text{m}$ ($87 \pm 9 \text{ lb in}$)
- (2) Torque for the fitting in the suction port $9.8 \pm 1 \text{ N}\cdot\text{m}$ ($87 \pm 9 \text{ lb in}$)
- (3) Torque for the pressure relief valve $13.25 \pm 1.45 \text{ N}\cdot\text{m}$ ($117.25 \pm 12.85 \text{ lb in}$)

R-134a Refrigerant

Dupont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Refrigerant Oil

Oil capacity 120 mL (4.05 oz)

Cat 353 - 3147 Air Conditioner Lubricant

NOTICE

Do not use Polyalkylene Glycol (PAG) oil in 294 - 8140 Compressor Assembly. Use Polyol Ester (POE) oil. The use of any other oil will cause rapid dielectric failure of the compressor.

Refrigerant Compressor

SMCS Code: 1802

Part No.: 294 - 8140

S/N: TJA1-Up

Part No.: 294 - 8140

S/N: MDB1-Up

Part No.: 294 - 8140

S/N: SCG1-Up

Part No.: 294 - 8140

S/N: TAN1-Up

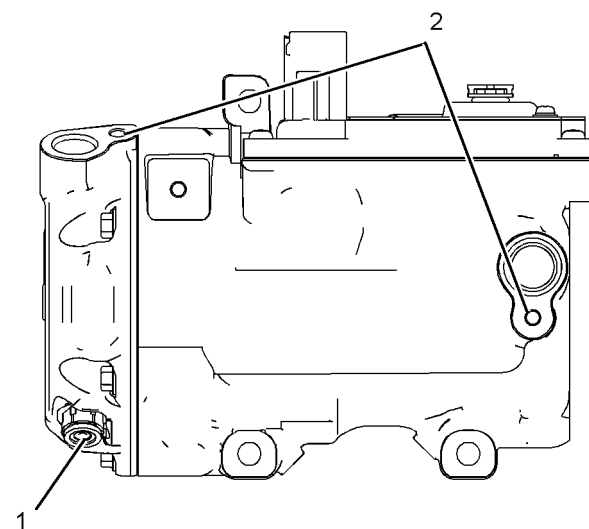


Illustration 48

g02460659

Typical view of the 294 - 8140 Compressor Assembly

- (1) Relief valve
 - Tightening torque $13.25 \pm 1.45 \text{ N}\cdot\text{m}$ ($117 \pm 13 \text{ lb in}$)
 - Operating pressure of pressure relief valve $3785 \pm 355 \text{ kPa}$ ($550 \pm 50 \text{ psi}$)
 - Sealing pressure of pressure relief valve 2750 kPa (400 psi)
- (2) Installation torque for mounting $20 \text{ N}\cdot\text{m}$ (177 lb in)
- (2) Installation torque for refrigerant fittings .. $9.8 \text{ N}\cdot\text{m}$ (87 lb in)

Displacement per revolution .. 27 cc (1.65 cubic inch)

Allowable Compressor RPM range .. 600 to 8600 rpm

Refrigerant Oil

Oil capacity $120 \pm 15 \text{ mL}$ ($4.1 \pm 0.5 \text{ oz}$)

Note: Refer to Systems Operation, “Identifying the Air Conditioning System”.

Polyolester oil (POE)

Cat 353-3147 Lubricant (250 mL (8.5 oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Driver

Driver voltage 9.5 - 16 DCV

High Voltage Input Power

Maximum motor current 15 amp

Operating voltage range 200 - 400 DCV

i01445890

Refrigerant Compressor

SMCS Code: 1802

Part No.: 151-5270

S/N: 8YW1-Up

Part No.: 151-5270

S/N: 9FW1-Up

Part No.: 151-5270

S/N: 3HZ1-Up

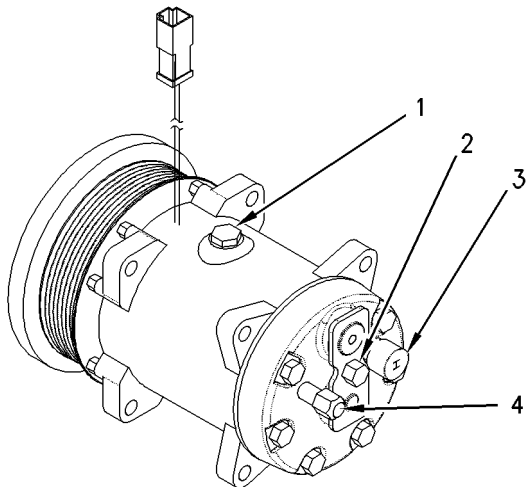


Illustration 49

g00754247

(1) Torque for oil plug 10 ± 2 N·m (89 ± 18 lb in)

Note: Oil plug (1) is under pressure when the system is pressurized.

(2) Final installation torque .. 25 ± 7 N·m (18 ± 5 lb ft)

(3) Pressure relief valve

Opening pressure of the relief valve 3500 kPa to 4100 kPa
(508 psi to 595 psi)

Sealing pressure of the relief valve 2900 kPa
(420 psi)

(4) Torque for pressure switch 8.0 ± 1.5 N·m
(71.00 ± 13.00 lb in)

Belt tension

New belt 800 ± 22 N (180 ± 5 lb)

Used belt 489 ± 44 N (110 ± 10 lb)

Note: Used belt tension is for a belt that has been operated for at least 30 minutes at the rated speed. Operate the air conditioner for 30 minutes. Then, adjust the tension of the drive belt to 489 ± 44 N (110 ± 10 lb).

Note: Use a Caterpillar 138-2514 Belt Tightener.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 300 mL (10 fl oz)

Note: Refer to Systems Operation, “Identifying the Air Conditioning System”.

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (250 mL (8.45 Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Magnetic Clutch

Clutch 12 DCV coil resistance (Black wire) 3.5 ± 0.15 ohms

Minimum voltage for engagement 7.5 DCV

Maximum Current 3.58 amp

i04375241

Refrigerant Compressor

SMCS Code: 1802

Part No.: 318-4258
S/N: W6A716-Up

Part No.: 318-4258
S/N: W3H396-Up

Part No.: 318-4258
S/N: W5M375-Up

Part No.: 318-4258
S/N: W8P716-Up

Part No.: 318-4258
S/N: W8R234-Up

Part No.: 318-4258
S/N: W2S294-Up

Part No.: 318-4258
S/N: W2T298-Up

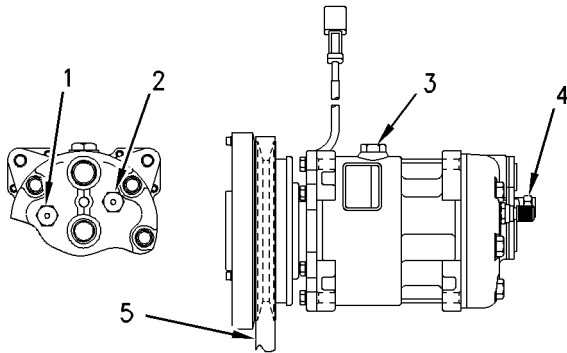


Illustration 50

g00887217

(1) Installation torque for pressure switch
..... 8.0 ± 1.5 N·m (71.00 ± 13.00 lb in)

(2) Pressure relief valve
Opening pressure of pressure relief
valve 3800 ± 300 kPa (551 ± 44 psi)
Sealing pressure of pressure relief valve
..... 2900 kPa (421 psi)

(3) Torque for oil plug 10 ± 2 N·m (89 ± 18 lb in)

Note: Oil plug (3) is under pressure when the system
is pressurized.

(4) Final installation torque .. 25 ± 7 N·m (18 ± 5 lb ft)

(5) V-belt tension
New V-belt 535 ± 22 N (120 ± 5 lb)
Used V-belt 400 ± 44 N (90 ± 10 lb)

Note: Used belt tension is for a belt that has been
operated for at least 30 minutes at the rated speed.
Operate the air conditioner for 30 minutes. Then,
adjust the tension of the drive belt to 400 N (90 lb).

Note: Use a Caterpillar 144-0235 Belt Tension
Gauge.

Displacement per revolution 154.9 mL (5.20 fl oz)

Recommended Compressor RPM ... 2500 ± 200 rpm

Refrigerant Oil

Oil capacity 150 mL (5.1 oz)

Note: Refer to Systems Operation, "General
Information".

Poly Alkaline Glycol Oil (PAG)

Cat 4C-2959 Air Conditioner Lubricant (240 mL (8
Oz))

R-134a Refrigerant

DuPont SUVA TRANS A/C HFC134a

ICI KLEA 134a

Torque for Fittings

Torque for 7/8 inch threaded fitting .. 25 N·m (18 lb ft)

Note: The 7/8 inch threaded fitting is located on
the metal tube which has an internal diameter of
15.8 mm (.62 inch).

Torque for 3/4 inch threaded fitting 17 N·m
(150 lb in)

Note: The 3/4 inch threaded fitting is located on
the metal tube which has an internal diameter of
12.7 mm (.50 inch).

M10 x 1.5 retaining bolt torque 25 ± 7 N·m
(18 ± 5 lb ft)

Note: The retaining bolt is for the block fitting.

Magnetic Clutch

Clutch 24 DCV coil resistance (Green
wire) 17.6 ± 0.6 ohms

Power connection DT Connector

Minimum voltage for engagement 16 DCV

Maximum Current 1.42 amp

i03001249

System Capacities for Refrigerant (Agricultural Tractors)

SMCS Code: 1809

Part No.: 3E-6654
S/N: 8RD1-Up

Part No.: 3E-6654
S/N: 9DF1-Up

Part No.: 3E-6654
S/N: ABF1-Up

Part No.: 3E-6654
S/N: 2ZJ1-1964

Part No.: 3E-6654
S/N: 2ZJ1965-Up

Part No.: 3E-6654
S/N: 3BK1-Up

Part No.: 3E-6654
S/N: 4KK347-Up

Part No.: 3E-6654
S/N: 5DK1-Up

Part No.: 3E-6654
S/N: 9TK1-Up

Part No.: 3E-6654
S/N: ADK1-Up

Part No.: 3E-6654
S/N: 2YL1-Up

Part No.: 3E-6654
S/N: 1GM1-Up

Part No.: 3E-6654
S/N: 1HM1-Up

Part No.: 3E-6654
S/N: 1NM1-Up

Part No.: 3E-6654
S/N: 1SM1-Up

Part No.: 3E-6654
S/N: 7DM1-Up

Part No.: 3E-6654
S/N: 6NN1-Up

Part No.: 3E-6654
S/N: 8DN1-Up

Part No.: 3E-6654
S/N: AEN1-Up

Part No.: 3E-6654
S/N: 1DR201-Up

Part No.: 3E-6654
S/N: 4GR1-Up

Part No.: 3E-6654
S/N: 5AR1-Up

Part No.: 3E-6654
S/N: 3HS1-Up

Part No.: 3E-6654
S/N: 6GS1-Up

Part No.: 3E-6654
S/N: 6HS1-Up

Part No.: 3E-6654
S/N: 6JS1-Up

Part No.: 3E-6654
S/N: 6KS1-Up

Part No.: 3E-6654
S/N: 4KW1-Up

Part No.: 3E-6654
S/N: 4DZ1-Up

Part No.: 3E-6654
S/N: 7TZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

DV87 Refrigerant Capacities

DV87

9AM1-Up 2 kg (4.4 lb)

Challenger 35 Refrigerant Capacities

Challenger 35

8DN1-Up 2.3 kg (5 lb)
8RD1-Up 2.3 kg (5 lb)
AKD1-Up 2.3 kg (5 lb)
9DF1-Up 2.3 kg (5 lb)
3HS1-Up 2.3 kg (5 lb)

Challenger 45 Refrigerant Capacities

Challenger 45

4DZ1-Up 2.3 kg (5 lb)
1DR201-Up 2.3 kg (5 lb)
ABF1-Up 2.3 kg (5 lb)
3BK1-Up 2.3 kg (5 lb)
4KW1-Up 2.3 kg (5 lb)

Challenger 55 Refrigerant Capacities

Challenger 55

7DM1-200	2.3 kg (5 lb)
7DM201-Up	2.3 kg (5 lb)
AEN1-Up	2.3 kg (5 lb)
6NN1-Up	2.3 kg (5 lb)
5DK1-Up	2.3 kg (5 lb)
7TZ1-Up	2.3 kg (5 lb)

Challenger 65 Refrigerant Capacities

Challenger 65C

2ZJ1-374	1.9 kg (4.2 lb)
2ZJ375-1964	1.9 kg (4.2 lb)

Challenger 65D

2ZJ1965-2299	1.9 kg (4.2 lb)
2ZJ2300-Up	2.1 kg (4.6 lb)

Challenger 65E

6GS1-Up	1.9 kg (4.2 lb)
1GM1-Up	2.0 kg (4.4 lb)

Challenger 70C Refrigerant Capacities

Challenger 70C

2YL1-Up	1.9 kg (4.2 lb)

Challenger 75 Refrigerant Capacities

Challenger 75C

4KK374-Up	1.9 kg (4.2 lb)

Challenger 75D

5AR1-Up	1.9 kg (4.2 lb)

Challenger 75E

6HS1-Up	1.9 kg (4.2 lb)
1HM1-Up	2.0 kg (4.4 lb)

Challenger 85 Refrigerant Capacities

Challenger 85C

9TK1-Up	1.9 kg (4.2 lb)

Challenger 85D

4GR1-Up	1.9 kg (4.2 lb)

Challenger 85E

6JS1-Up	1.9 kg (4.2 lb)
1NM1-Up	2.0 kg (4.4 lb)

Challenger 95E Refrigerant Capacities

Challenger 95E

6KS1-Up	1.9 kg (4.2 lb)
1SM1-Up	2.0 kg (4.4 lb)

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System Capacities for Refrigerant (Articulated Trucks)

SMCS Code: 1809

Part No.: 3E-6654
S/N: L4D1-Up

Part No.: 3E-6654
S/N: L4E1-Up

Part No.: 3E-6654
S/N: 8TF787-Up

Part No.: 3E-6654
S/N: 9RF511-Up

Part No.: 3E-6654
S/N: AGF1-Up

Part No.: 3E-6654
S/N: APF1-Up

Part No.: 3E-6654
S/N: L4F1-Up

Part No.: 3E-6654
S/N: 5MG221-Up

Part No.: 3E-6654
S/N: 6NG234-Up

Part No.: 3E-6654
S/N: 9MG119-Up

Part No.: 3E-6654
S/N: 2JJ100-Up

Part No.: 3E-6654
S/N: 3AJ331-Up

Part No.: 3E-6654
S/N: 4EJ1-Up

Part No.: 3E-6654
S/N: 1HK424-Up

Part No.: 3E-6654
S/N: B1L1-Up

Part No.: 3E-6654
S/N: AXM1-Up

Part No.: 3E-6654
S/N: B1M1-Up

Part No.: 3E-6654
S/N: 5TN1-Up

Part No.: 3E-6654
S/N: 7FN1-Up

Part No.: 3E-6654
S/N: B1N1-Up

Part No.: 3E-6654
S/N: B1P1-Up

Part No.: 3E-6654
S/N: T4P1-Up

Part No.: 3E-6654
S/N: 2YR1-Up

Part No.: 3E-6654
S/N: 9LR1-Up

Part No.: 3E-6654
S/N: AWR1-Up

Part No.: 3E-6654
S/N: B1R1-Up

Part No.: 3E-6654
S/N: T4R1-Up

Part No.: 3E-6654
S/N: 4PS1-Up

Part No.: 3E-6654
S/N: 5KS1-Up

Part No.: 3E-6654
S/N: 8PS1-Up

Part No.: 3E-6654
S/N: T4S1-Up

Part No.: 3E-6654
S/N: 2XW1-Up

Part No.: 3E-6654
S/N: B1W1-Up

Part No.: 3E-6654
S/N: AFX1-Up

Part No.: 3E-6654
S/N: AZZ1-Up

D20 Refrigerant Capacities

D20D

9MG119-Up 2.0 kg (4.5 lb)

D25 Refrigerant Capacities

D25D

1HK424-Up 2.0 kg (4.5 lb)

D30 Refrigerant Capacities

D30D

3AJ331-Up 2.0 kg (4.5 lb)

D40 Refrigerant Capacities

D40D

2JJ100-Up 2.0 kg (4.5 lb)

D250 Refrigerant Capacities

D250D

6NG234-Up 2.0 kg (4.5 lb)

D250E

5TN1-Up 1.8 kg (4.0 lb)

D250E Series II

4PS1-Up 2.0 kg (4.5 lb)

D300 Refrigerant Capacities

D300D

5MG221-Up 2.0 kg (4.5 lb)

D300E

7FN1-Up 1.8 kg (4.0 lb)

D300E Series II

5KS1-Up 2.0 kg (4.5 lb)

D350 Refrigerant Capacities

D350D

9RF511-Up 2.0 kg (4.5 lb)

D350E

9LR1-Up 1.8 kg (4.0 lb)

D350E Series II

2XW1-Up 2.0 kg (4.5 lb)

D400 Refrigerant Capacities

D400D

8TF787-Up 2.0 kg (4.5 lb)

D400D

4EJ1-Up 2.0 kg (4.5 lb)

D400E

2YR1-Up 2.0 kg (4.5 lb)

D400E Series II

8PS1-Up 2.0 kg (4.5 lb)

D400E Series II Ejector

8PS1-Up 2.0 kg (4.5 lb)

725 Refrigerant Capacities

725

AFX1-Up 2.0 kg (4.5 lb)

B1L1-Up 2.0 kg (4.5 lb)

730 Refrigerant Capacities

730

AGF1-Up 2.0 kg (4.5 lb)

B1M1-Up 2.0 kg (4.5 lb)

730 Ejector

B1W1-Up 2.0 kg (4.5 lb)

735 Refrigerant Capacities

735

AWR1-Up 2.0 kg (4.5 lb)

B1N1-Up 2.0 kg (4.5 lb)

735B

T4P1-Up 2.1 kg (4.6 lb)

L4D1-Up 2.1 kg (4.6 lb)

740 Refrigerant Capacities

740

AXM1-Up 2.0 kg (4.5 lb)

B1P1-Up 2.0 kg (4.5 lb)

740 Ejector

AZZ1-Up 2.0 kg (4.5 lb)

B1R1-Up 2.0 kg (4.5 lb)

740B

T4R1-Up 2.1 kg (4.6 lb)

L4E1-Up 2.1 kg (4.6 lb)

740BEjector

T4S1-Up 2.1 kg (4.6 lb)

L4F1-Up 2.1 kg (4.6 lb)

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System Capacities for Refrigerant (Articulated Trucks) (OEM)

SMCS Code: 1809

Part No.: 3E-6654

S/N: WWA1-Up

Part No.: 3E-6654

S/N: WWB1-Up

Part No.: 3E-6654

S/N: WWC1-Up

Part No.: 3E-6654

S/N: WWD1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

725 Refrigerant Capacities

WWA1-Up 2.0 kg (4.5 lb)

730 Refrigerant Capacities

WWB1-Up 2.0 kg (4.5 lb)

735 Refrigerant Capacities

WWC1-Up 2.0 kg (4.5 lb)

740 Refrigerant Capacities

WWD1-Up 2.0 kg (4.5 lb)

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System Capacities for Refrigerant (Backhoe Loaders)

SMCS Code: 1809

Part No.: 114-0063
S/N: JBA1-Up

Part No.: 114-0063
S/N: NBA1-Up

Part No.: 114-0063
S/N: PRA1-Up

Part No.: 313-5196
S/N: RBA1-Up

Part No.: 3E-6654
S/N: RXA1-Up

Part No.: 3E-6654
S/N: SHA1-Up

Part No.: 3E-6654
S/N: BNB1-Up

Part No.: 255-0800
S/N: ELB1-Up

Part No.: 114-0063
S/N: HXB1-Up

Part No.: 114-0063
S/N: MXB1-Up

Part No.: 114-0063
S/N: SXB1-Up

Part No.: 3E-6654
S/N: BKC1-Up

Part No.: 3E-6654
S/N: BMC1-Up

Part No.: 114-0063
S/N: BWC1-Up

Part No.: 3E-6654
S/N: BXC1-Up

Part No.: 114-0063
S/N: DXC1-Up

Part No.: 114-0063
S/N: PHC1-Up

Part No.: 114-0063
S/N: SWC1-Up

Part No.: 3E-6654
S/N: BLD1-Up

Part No.: 3E-6654
S/N: CBD1-Up

Part No.: 114-0063
S/N: SCD1-Up

Part No.: 3E-6654
S/N: TBD1-Up

Part No.: 3E-6654
S/N: BPE1-Up

Part No.: 3E-6654
S/N: BXE1-Up

Part No.: 114-0063
S/N: EME1-Up

Part No.: 3E-6654
S/N: HBE1-Up

Part No.: 3E-6654
S/N: LBE1-Up

Part No.: 255-0800, 3E-6654
S/N: 6XF1-Up

Part No.: 114-0063
S/N: KSF1-Up

Part No.: 114-0063
S/N: RDF1-Up

Part No.: 114-0063
S/N: SEF1-Up

Part No.: 3E-6654
S/N: 8SG5327-Up

Part No.: 3E-6654
S/N: BKG1-Up

Part No.: 3E-6654
S/N: BRG1-Up

Part No.: 114-0063
S/N: LTG1-Up

Part No.: 114-0063
S/N: DPH1-Up

Part No.: 114-0063
S/N: LBH1-Up

Part No.: 3E-6654
S/N: LDH1-Up

Part No.: 114-0063
S/N: LKH1-Up

Part No.: 114-0063
S/N: LNH1-Up

Part No.: 114-0063
S/N: LRH1-Up

Part No.: 3E-6654
S/N: MBH1-Up

Part No.: 3E-6654
S/N: 5YJ546-Up

Part No.: 3E-6654
S/N: 6MJ650-Up

Part No.: 3E-6654
S/N: 7EJ2812-Up

Part No.: 3E-6654
S/N: BGJ1-Up

Part No.: 114-0063
S/N: JWW1-Up

Part No.: 3E-6654
S/N: LJJ1-Up

Part No.: 114-0063
S/N: SEJ1-Up

Part No.: 3E-6654
S/N: SMJ1-Up

Part No.: 3E-6654
S/N: 3KK1136-Up

Part No.: 3E-6654
S/N: 8ZK1769-Up

Part No.: 3E-6654
S/N: BNK1-Up

Part No.: 114-0063
S/N: DSK1-Up

Part No.: 114-0063
S/N: RAK1-Up

Part No.: 3E-6654
S/N: 5BL386-Up

Part No.: 3E-6654
S/N: 6KL1-Up

Part No.: 3E-6654
S/N: 7FL1-Up

Part No.: 3E-6654
S/N: BLL1-Up

Part No.: 3E-6654
S/N: BML1-Up

Part No.: 3E-6654
S/N: DBL1-Up

Part No.: 114-0063
S/N: DJL1-Up

Part No.: 313-5196
S/N: EBL1-Up

Part No.: 114-0063
S/N: SJL1-Up

Part No.: 3E-6654
S/N: SNL1-Up

Part No.: 3E-6654
S/N: MBM1-Up

Part No.: 3E-6654
S/N: 4ZN1-Up

Part No.: 3E-6654
S/N: 5YN1-Up

Part No.: 3E-6654
S/N: 6XN1-Up

Part No.: 3E-6654
S/N: 7WN1-Up

Part No.: 3E-6654
S/N: 8RN1-Up

Part No.: 3E-6654
S/N: 8TN1-Up

Part No.: 3E-6654
S/N: 9JN1-Up

Part No.: 3E-6654
S/N: 9KN1-Up

Part No.: 3E-6654
S/N: BLN1-Up

Part No.: 3E-6654
S/N: BPN1-Up

Part No.: 114-0063
S/N: DAN1-Up

Part No.: 114-0063
S/N: RLN1-Up

Part No.: 3E-6654
S/N: BFP1-Up

Part No.: 3E-6654
S/N: BGP1-Up

Part No.: 3E-6654
S/N: CXP1-Up

Part No.: 3E-6654
S/N: FDP1-Up

Part No.: 3E-6654
S/N: WEP1-Up

Part No.: 3E-6654
S/N: 1CR1-Up

Part No.: 3E-6654
S/N: 1ER1-Up

Part No.: 3E-6654
S/N: 1FR1-Up

Part No.: 3E-6654
S/N: 1HR1-Up

Part No.: 3E-6654
S/N: 1JR1-Up

Part No.: 3E-6654
S/N: 1MR1-Up

Part No.: 3E-6654
S/N: 1NR1-Up

Part No.: 3E-6654
S/N: 1PR1-Up

Part No.: 3E-6654
S/N: 1RR1-Up

Part No.: 3E-6654
S/N: 1TR1-Up

Part No.: 3E-6654
S/N: 1WR1-Up

Part No.: 3E-6654
S/N: 1XR1-Up

Part No.: 3E-6654
S/N: 1YR1-Up

Part No.: 3E-6654
S/N: 1ZR1-Up

Part No.: 3E-6654
S/N: 2AR1-Up

Part No.: 3E-6654
S/N: 2BR1-Up

Part No.: 3E-6654
S/N: 2CR1-Up

Part No.: 3E-6654
S/N: 2DR1-Up

Part No.: 3E-6654
S/N: BKR1-Up

Part No.: 3E-6654
S/N: JXR1-Up

Part No.: 114-0063
S/N: LNR1-Up

Part No.: 3E-6654
S/N: MTR1-Up

Part No.: 114-0063
S/N: PCR1-Up

Part No.: 114-0063
S/N: PXR1-Up

Part No.: 114-0063
S/N: SKR1-Up

Part No.: 3E-6654
S/N: TDR1-Up

Part No.: 3E-6654
S/N: BNS1-Up

Part No.: 3E-6654
S/N: HLS1-Up

Part No.: 114-0063
S/N: LMS1-Up

Part No.: 114-0063
S/N: RGS1-Up

Part No.: 114-0063
S/N: RXS1-Up

Part No.: 3E-6654
S/N: BMT1-Up

Part No.: 3E-6654
S/N: DDT1-Up

Part No.: 3E-6654
S/N: EAT1-Up

Part No.: 114-0063
S/N: LWT1-Up

Part No.: 3E-6654
S/N: KMW1-Up

Part No.: 114-0063
S/N: MAW1-Up

Part No.: 114-0063
S/N: SJW1-Up

Part No.: 3E-6654
S/N: DSX1-Up

Part No.: 3E-6654
S/N: BRY1-Up

Part No.: 114-0063
S/N: LDY1-Up

Part No.: 3E-6654
S/N: CJZ1-Up

Part No.: 3E-6654
S/N: GKZ1-Up

Part No.: 3E-6654
S/N: GJB1-Up; 1AR1-Up

414 Refrigerant Capacities

414E

ELB1-Up 3.2 kg (7.1 lb)

416 Refrigerant Capacities

416B

8SG5327-Up 2.1 kg (4.6 lb)

8ZK1769-Up 2.1 kg (4.6 lb)

416C

4ZN1-Up 1.8 kg (4.0 lb)

5YN1-Up 1.8 kg (4.0 lb)

1BR1-Up 1.8 kg (4.0 lb)

1KR1-Up 1.8 kg (4.0 lb)

1LR1-Up 1.8 kg (4.0 lb)

1WR1-Up 1.8 kg (4.0 lb)

1XR1-Up 1.8 kg (4.0 lb)

416D

CXP1-Up 1.4 kg (3.0 lb)

B2D1-Up 1.4 kg (3.0 lb)

BFP1-Up 1.4 kg (3.0 lb)

BKG1-Up 1.4 kg (3.0 lb)

BGJ1-Up 1.4 kg (3.0 lb)

416E

SHA1-Up 3.2 kg (7.06 lb)

CBD1-Up 3.2 kg (7.06 lb)

BWC1-Up 2.0 kg (4.4 lb)

LMS1-Up 2.0 kg (4.4 lb)

420 Refrigerant Capacities

420D

FDP1-Up 1.4 kg (3.0 lb)

BKC1-Up 1.4 kg (3.0 lb)

BMC1-Up 1.4 kg (3.0 lb)

MBH1-Up 1.4 kg (3.0 lb)

BLN1-Up 1.4 kg (3.0 lb)

420E

HLS1-Up 3.2 kg (7.06 lb)

KMW1-Up 3.2 kg (7.06 lb)

PHC1-Up 2.0 kg (4.4 lb)

PRA1-Up 2.0 kg (4.4 lb)

DAN1-Up 2.0 kg (4.4 lb)

DJL1-Up 2.0 kg (4.4 lb)

422 Refrigerant Capacities

422E

HBE1-Up 3.2 kg (7.06 lb)

MAW1-Up 2.0 kg (4.4 lb)

DSK1-Up 2.0 kg (4.4 lb)

424 Refrigerant Capacities

424D

BGP1-Up 1.4 kg (3.0 lb)

BKR1-Up 1.4 kg (3.0 lb)

CJZ1-Up 1.4 kg (3.0 lb)

RXA1-Up 1.4 kg (3.0 lb)

426 Refrigerant Capacities

426B

5YJ1546-Up 2.1 kg (4.6 lb)

6KL1769-Up 2.1 kg (4.6 lb)

426C

6XN1-Up 1.8 kg (4.0 lb)

7WN1-Up 1.8 kg (4.0 lb)

1CR1-Up 1.8 kg (4.0 lb)

1ER1-Up 1.8 kg (4.0 lb)

1MR1-Up 1.8 kg (4.0 lb)

1NR1-Up 1.8 kg (4.0 lb)

1YR1-Up 1.8 kg (4.0 lb)

1ZR1-Up 1.8 kg (4.0 lb)

428 Refrigerant Capacities

428B

7EJ2812-Up 2.1 kg (4.6 lb)

428C

8RN1-Up	1.8 kg (4.0 lb)
1HR1-Up	1.8 kg (4.0 lb)
1SR1-Up	1.8 kg (4.0 lb)
2CR1-Up	1.8 kg (4.0 lb)

428D

BLL1-Up	1.4 kg (3.0 lb)
BMT1-Up	1.4 kg (3.0 lb)
BNS1-Up	1.4 kg (3.0 lb)
BNB1-Up	1.4 kg (3.0 lb)
BXC1-Up	1.4 kg (3.0 lb)
DSX1-Up	1.4 kg (3.0 lb)
MBM1-Up	1.4 kg (3.0 lb)

428E

SNL1-Up	3.2 kg (7.06 lb)
DPH1-Up	2.0 kg (4.4 lb)
DXC1-Up	2.0 kg (4.4 lb)

430 Refrigerant Capacities**430D**

BML1-Up	1.4 kg (3.0 lb)
BNK1-Up	1.4 kg (3.0 lb)

430E

DDT1-Up	3.2 kg (7.06 lb)
EAT1-Up	3.2 kg (7.06 lb)
SCD1-Up	2.0 kg (4.4 lb)
RLN1-Up	2.0 kg (4.4 lb)
MXB1-Up	2.0 kg (4.4 lb)
SWC1-Up	2.0 kg (4.4 lb)

432 Refrigerant Capacities**432D**

BLD1-Up	1.4 kg (3.0 lb)

TDR1-Up	1.4 kg (3.0 lb)

WEP1-Up	1.4 kg (3.0 lb)

432E

BXE1-Up	3.2 kg (7.06 lb)
JBA1-Up	2.0 kg (4.4 lb)
RXS1-Up	2.0 kg (4.4 lb)

434 Refrigerant Capacities**434E**

FSH1-Up	3.2 kg (7.06 lb)
SJL1-Up	2.0 kg (4.4 lb)
SEF1-Up	2.0 kg (4.4 lb)
SXB1-Up	2.0 kg (4.4 lb)

436 Refrigerant Capacities**436B**

6MJ650-Up	2.1 kg (4.6 lb)
7FL1-Up	2.1 kg (4.6 lb)

436C

8TN1-Up	1.8 kg (4.0 lb)
9JN1-Up	1.8 kg (4.0 lb)
1FR1-Up	1.8 kg (4.0 lb)
1GR1-Up	1.8 kg (4.0 lb)
1PR1-Up	1.8 kg (4.0 lb)
1RR1-Up	1.8 kg (4.0 lb)
2AR1-Up	1.8 kg (4.0 lb)
2BR1-Up	1.8 kg (4.0 lb)

438 Refrigerant Capacities**438B**

3KK1136-Up	2.1 kg (4.6 lb)

438C

1JR1-Up	1.8 kg (4.0 lb)

9KN1-Up	1.8 kg (4.0 lb)
1TR1-Up	1.8 kg (4.0 lb)
2DR1-Up	1.8 kg (4.0 lb)

438D

BPN1-Up	1.4 kg (3.0 lb)
BPE1-Up	1.4 kg (3.0 lb)

442 Refrigerant Capacities

442D

BRY1-Up	1.4 kg (3.0 lb)
BRG1-Up	1.4 kg (3.0 lb)
SMJ1-Up	1.4 kg (3.0 lb)
TBD1-Up	1.4 kg (3.0 lb)

442E

GKZ1-Up	3.2 kg (7.06 lb)
EME1-Up	2.0 kg (4.4 lb)
PCR1-Up	2.0 kg (4.4 lb)

444 Refrigerant Capacities

444E

LBE1-Up	3.2 kg (7.06 lb)
NBA1-Up	2.0 kg (4.4 lb)
HXB1-Up	2.0 kg (4.4 lb)

446 Refrigerant Capacities

446B

5BL386-Up	2.2 kg (4.85 lb)
6XF386-Up	2.2 kg (4.85 lb)

446D

DBL386-Up	1.6 kg (3.53 lb)

450 Refrigerant Capacities

450E

EBL1-Up	2.3 kg (5.1 lb)

RBA1-Up	2.3 kg (5.1 lb)

i04357892

System Capacities for Refrigerant (Compact Track Loaders)

SMCS Code: 1809

Part No.: 3E-6654
S/N: KWB1-Up

Part No.: 3E-6654
S/N: NLC1-Up

Part No.: 3E-6654
S/N: RTD1-Up

Part No.: 3E-6654
S/N: GSL1-Up

Part No.: 3E-6654
S/N: HCL1-Up

Part No.: 3E-6654
S/N: JMP1-Up

Part No.: 3E-6654
S/N: JSP1-Up

Part No.: 3E-6654
S/N: MBT1-Up

Part No.: 3E-6654
S/N: SHY1-Up

Part No.: 246-9039
S/N: YYZ1-Up

259 Refrigerant Capacities

259B3

YYZ1-Up	0.8 kg (1.8 lb)

279 Refrigerant Capacities

279C

MBT1-Up	1.27 kg (2.80 lb)

289 Refrigerant Capacities

289C

JMP1-Up	1.27 kg (2.80 lb)

299 Refrigerant Capacities

299C

JSP1-Up 0.81 kg (1.786 lb)

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System Capacities for
Refrigerant (Compact Wheel
Loaders)

SMCS Code: 1809

Part No.: 3E-6654
S/N: JRD1-Up

Part No.: 3E-6654
S/N: LMD1-Up

Part No.: 3E-6654
S/N: TPE1-Up

Part No.: 3E-6654
S/N: JRF1-Up

Part No.: 3E-6654
S/N: MJF1-Up

Part No.: 3E-6654
S/N: MXF1-Up

Part No.: 3E-6654
S/N: SDH1-Up

Part No.: 3E-6654
S/N: B4L1-Up

Part No.: 3E-6654
S/N: SJM1-Up

Part No.: 3E-6654
S/N: MER1-Up

Part No.: 3E-6654
S/N: TAR1-Up

Part No.: 3E-6654
S/N: 6ZS1-Up

Part No.: 3E-6654
S/N: 8BS1-Up

Part No.: 3E-6654
S/N: JRS1-Up

904 Refrigerant Capacities

904B

B4L1-Up 0.7 kg (1.54 lb)

904H

H4T1-Up 0.7 kg (1.54 lb)

906 Refrigerant Capacities

906

6ZS1-Up 1.7 kg (3.75 lb)

MER1-Up 1.7 kg (3.75 lb)

906H

TPE1-Up 1.5 kg (3.3 lb)

SDH1-Up 1.5 kg (3.3 lb)

JRF1-Up 1.5 kg (3.3 lb)

907 Refrigerant Capacities

907H

MJF1-Up 1.5 kg (3.3 lb)

JRS1-Up 1.5 kg (3.3 lb)

SJM1-Up 1.5 kg (3.3 lb)

908 Refrigerant Capacities

908

8BS1-Up 1.6 kg (3.53 lb)

TAR1-Up 1.7 kg (3.75 lb)

908H

MXF1-Up 1.5 kg (3.31 lb)

LMD1-Up 1.5 kg (3.31 lb)

JRD1-Up 1.5 kg (3.31 lb)

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System Capacities for
Refrigerant (Compactors)

SMCS Code: 1809

Part No.: 3E-6654
S/N: AXB1-Up

Part No.: 3E-6654
S/N: ZHC1-Up

Part No.: 3E-6654
S/N: BXD1-Up

Part No.: 3E-6654
S/N: AWF1-Up

Part No.: 3E-6654
S/N: AYH1-Up

Part No.: 3E-6654
S/N: 3RL35-Up

Part No.: 3E-6654
S/N: BKL1-Up

Part No.: 3E-6654
S/N: BRL1-Up

Part No.: 3E-6654
S/N: 1GN1-Up

Part No.: 3E-6654
S/N: 43N1-Up

Part No.: 3E-6654
S/N: 5FN1-Up

Part No.: 3E-6654
S/N: 6RN1-Up

Part No.: 3E-6654
S/N: 7LN1-Up

Part No.: 3E-6654
S/N: BYN1-Up

Part No.: 3E-6654
S/N: 7FR1-Up

Part No.: 3E-6654
S/N: BMR1-Up

Part No.: 3E-6654
S/N: BZR1-Up

Part No.: 3E-6654
S/N: XTR1-Up

Part No.: 3E-6654
S/N: 2BS1-Up

Part No.: 3E-6654
S/N: ZXT1-Up

Part No.: 3E-6654
S/N: 58U1-Up

Part No.: 3E-6654
S/N: AZW1-Up

Part No.: 3E-6654
S/N: 87X1700-Up

Part No.: 3E-6654
S/N: 15Z1413-Up

Part No.: 3E-6654
S/N: 17Z1614-Up

Part No.: 3E-6654
S/N: 7MZ1-Up

Part No.: 3E-6654
S/N: 86X1104-Up; 89X1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

Soil Compactors

815 Refrigerant Capacities

815B

17Z1614-Up 1.4 kg (3.1 lb)

815F

BKL1-Up 1.9 kg (4.2 lb)

1GN1-Up 2.1 kg (4.6 lb)

2BS1-Up 1.9 kg (4.2 lb)

815F II

BYN1-Up 1.9 kg (4.2 lb)

825 Refrigerant Capacities

825B

43N1-Up 1.9 kg (4.2 lb)

825C

86X1104-Up 2.1 kg (4.6 lb)

89X1-Up 1.4 kg (3.1 lb)

825G

6RN1-Up 2.5 kg (5.5 lb)

825G II

AXB1-Up 2.5 kg (5.5 lb)

825H

AZW1-Up 2.5 kg (5.5 lb)

Landfill Compactors

816 Refrigerant Capacities

816B

15Z1413-Up 2.5 kg (5.5 lb)

816F

5FN1-Up 2.1 kg (4.6 lb)

BMR1-Up 1.6 kg (3.5 lb)

816F II

BZR1-Up 1.6 kg (3.5 lb)

826 Refrigerant Capacities

826B

58U1-Up 1.9 kg (4.2 lb)

826C

87X1700-Up 2.3 kg (5 lb)

826G

7LN1-534 2.5 kg (5.5 lb)

7LN535-Up 1.6 kg (3.5 lb)

826G II

AYH1-Up 1.5 kg (3.3 lb)

826H

AWF1-Up 1.5 kg (3.3 lb)

836 Refrigerant Capacities

836

3RL35-Up 3 kg (6.6 lb)

7FR1-Up 3 kg (6.6 lb)

836G

BRL1-Up 1.5 kg (3.3 lb)

7MZ1-Up 1.5 kg (3.3 lb)

836H

BXD1-Up 1.5 kg (3.3 lb)

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**System Capacities for
Refrigerant (Excavators)
(302.5-5080)****SMCS Code:** 1809**Part No.:** 3E-6654
S/N: XFA1-Up**Part No.:** 3E-6654
S/N: GBB1-Up**Part No.:** 3E-6654
S/N: SMD1-Up**Part No.:** 3E-6654
S/N: 8XG1-Up**Part No.:** 3E-6654
S/N: 9WG1-Up**Part No.:** 3E-6654
S/N: MXH1-Up**Part No.:** 3E-6654
S/N: 4ZJ1-Up**Part No.:** 3E-6654
S/N: 8WJ1-Up**Part No.:** 3E-6654
S/N: 9LJ1-Up**Part No.:** 3E-6654
S/N: 9PJ1-Up**Part No.:** 3E-6654
S/N: GBJ1-Up**Part No.:** 3E-6654
S/N: HWJ1-Up**Part No.:** 3E-6654
S/N: 3XK1-Up**Part No.:** 3E-6654
S/N: 5WK1-Up**Part No.:** 3E-6654
S/N: 6GK1-Up**Part No.:** 3E-6654
S/N: 6KK1-Up**Part No.:** 3E-6654
S/N: 6NK1-Up**Part No.:** 3E-6654
S/N: 6SK1-Up**Part No.:** 3E-6654
S/N: 6XK1-Up**Part No.:** 3E-6654
S/N: 6ZK1-Up**Part No.:** 3E-6654
S/N: 7RK1-Up**Part No.:** 3E-6654
S/N: 7WK1-Up**Part No.:** 3E-6654
S/N: 8CK1-Up**Part No.:** 3E-6654
S/N: 8FK1-Up**Part No.:** 3E-6654
S/N: 8HK1-Up**Part No.:** 3E-6654
S/N: 8LK1-Up

Part No.: 3E-6654
S/N: 8NK1-Up

Part No.: 3E-6654
S/N: 8YK1-Up

Part No.: 3E-6654
S/N: 9DK1-Up

Part No.: 3E-6654
S/N: 9KK1-Up

Part No.: 3E-6654
S/N: 9ZK1-Up

Part No.: 3E-6654
S/N: DCK1-Up

Part No.: 3E-6654
S/N: FPK1-Up

Part No.: 3E-6654
S/N: 1KL1-Up

Part No.: 3E-6654
S/N: 2DL1-Up

Part No.: 3E-6654
S/N: 2EL1-Up

Part No.: 3E-6654
S/N: 2SL1-Up

Part No.: 3E-6654
S/N: 2ZL1-Up

Part No.: 3E-6654
S/N: 3LL1-Up

Part No.: 3E-6654
S/N: 3ML1-Up

Part No.: 3E-6654
S/N: 6BL1-Up

Part No.: 3E-6654
S/N: 6RL1-Up

Part No.: 3E-6654
S/N: 7WL1-Up

Part No.: 3E-6654
S/N: 8CL1-Up

Part No.: 3E-6654
S/N: 8HL1-Up

Part No.: 3E-6654
S/N: 8ML1-Up

Part No.: 3E-6654
S/N: 8NL1-Up

Part No.: 3E-6654
S/N: 8RL1-Up

Part No.: 3E-6654
S/N: 8SL1-Up

Part No.: 3E-6654
S/N: 9FL1-Up

Part No.: 3E-6654
S/N: 9JL1-Up

Part No.: 3E-6654
S/N: 9KL1-Up

Part No.: 3E-6654
S/N: 9ML1-Up

Part No.: 3E-6654
S/N: 9RL1-Up

Part No.: 3E-6654
S/N: 9WL1-Up

Part No.: 3E-6654
S/N: 1JM1-Up

Part No.: 3E-6654
S/N: 1XM1-Up

Part No.: 3E-6654
S/N: 2KM1-Up

Part No.: 3E-6654
S/N: 2PM1-Up

Part No.: 3E-6654
S/N: 2WM1-Up

Part No.: 3E-6654
S/N: 2ZM1-Up

Part No.: 3E-6654
S/N: 3XM1-Up

Part No.: 3E-6654
S/N: 3ZM1-Up

Part No.: 3E-6654
S/N: 4MM1-Up

Part No.: 3E-6654
S/N: 4RM1-Up

Part No.: 3E-6654
S/N: 4YM1-Up

Part No.: 3E-6654
S/N: 5YM1-Up

Part No.: 3E-6654
S/N: 6KM1-Up

Part No.: 3E-6654
S/N: 6RM1-Up

Part No.: 3E-6654
S/N: 6YM1-Up

Part No.: 3E-6654
S/N: 7LM1-Up

Part No.: 3E-6654
S/N: 2BN1-Up

Part No.: 3E-6654
S/N: TTN1-Up

Part No.: 3E-6654
S/N: 9SR1-Up

Part No.: 3E-6654
S/N: BXT1-Up

Part No.: 3E-6654
S/N: DMY1-Up

Part No.: 3E-6654
S/N: FKY1-Up

Part No.: 3E-6654
S/N: RKY1-Up

Part No.: 3E-6654
S/N: CXZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

302.5C Refrigerant Capacities

302.5C

GBB1-Up 0.45 kg (0.992 lb)

303C CR Refrigerant Capacities

303C CR

BXT1-Up 0.6 kg (1.3 lb)

303.5C CR Refrigerant Capacities

303.5C CR

DMY1-Up 0.6 kg (1.3 lb)

303.5D CR Refrigerant Capacities

303.5D CR

RHP1-Up 0.7 kg (1.54 lb)

303.5E CR Refrigerant Capacities

303.5E CR

RKY1-Up 0.7 kg (1.54 lb)

304C CR Refrigerant Capacities

304C CR

FPK1-Up 0.6 kg (1.3 lb)

304D CR Refrigerant Capacities

304D CR

TYK1-Up 0.7 kg (1.54 lb)

304E CR Refrigerant Capacities

304E CR

TTN1-Up 0.7 kg (1.54 lb)

305C CR Refrigerant Capacities

305C CR

HWJ1-Up 0.6 kg (1.3 lb)

305D CR Refrigerant Capacities

305D CR

XER1-Up 0.8 kg (1.76 lb)

305E CR Refrigerant Capacities

305E CR

XFA1-Up 0.8 kg (1.76 lb)

305.5D CR Refrigerant Capacities

305.5D CR

FLZ1-Up 0.8 kg (1.76 lb)

305.5E CR Refrigerant Capacities

305.5E CR

FKY1-Up 0.8 kg (1.76 lb)

305.5 Refrigerant Capacities

305.5

DCK1-Up 0.6 kg (1.3 lb)

CXZ1-Up 0.6 kg (1.3 lb)

306 Refrigerant Capacities

306

MXH1-Up 0.6 kg (1.3 lb)

SMD1-Up 0.6 kg (1.3 lb)

307 Refrigerant Capacities

307

2PM1-Up 0.9 kg (2.0 lb)

2WM1-Up 1.0 kg (2.2 lb)

308E CR Refrigerant Capacities

308E CR

GBJ1-Up 0.7 kg (1.54 lb)

311 Refrigerant Capacities

311

9LJ1-Up 1.0 kg (2.2 lb)
2KM1-Up 1.0 kg (2.2 lb)

312 Refrigerant Capacities

312

6GK1-Up 1.0 kg (2.2 lb)
6BL1-Up 1.8 kg (4 lb)

315 Refrigerant Capacities

315

3ZM1-Up 1.8 kg (4.0 lb)
4YM1-Up 1.0 kg (2.2 lb)
6YM1-Up 1.0 kg (2.2 lb)

317 Refrigerant Capacities

317

4MM1-Up 1.8 kg (4.0 lb)
9SR1-Up 1.8 kg (4.0 lb)

320 Refrigerant Capacities

320

4ZJ1-Up 1.8 kg (4.0 lb)
8LK1-Up 1.0 kg (2.2 lb)
2DL1-Up 1.0 kg (2.2 lb)
2BN1-Up 1.0 kg (2.2 lb)
3XM1-Up 1.0 kg (2.2 lb)
7WK1-Up 1.0 kg (2.2 lb)
8HL1-Up 1.0 kg (2.2 lb)

320 L

3XK1-Up 1.8 kg (4.0 lb)
9KK1-Up 1.0 kg (2.2 lb)
1KL1-Up 1.0 kg (2.2 lb)

320 N

9WG1-Up 1.8 kg (4.0 lb)
1XM1-Up 1.0 kg (2.2 lb)

320 S

6KM1-Up 1.8 kg (4.0 lb)

322 Refrigerant Capacities

322 L

8ML1-Up 1.7 kg (4.0 lb)
9RL1-Up 1.7 kg (4.0 lb)
7WL1-Up 1.0 kg (2.2 lb)
8CL1-Up 1.0 kg (2.2 lb)

322 N

9JL1-Up 1.7 kg (4.0 lb)

322 LN

4RM1-Up 1.7 kg (4.0 lb)

325 Refrigerant Capacities

325

5WK1-Up 1.0 kg (2.2 lb)
9ZK1-Up 1.7 kg (3.7 lb)
8NL1-Up 1.0 kg (2.2 lb)
6RM1-Up 1.7 kg (3.7 lb)
8NK1-Up 1.0 kg (2.2 lb)
8YK1-Up 1.0 kg (2.2 lb)

325 L

6KK1-Up 1.0 kg (2.2 lb)
2SL1-Up 1.7 kg (3.7 lb)
9KL1-Up 1.0 kg (2.2 lb)
7LM1-Up 1.7 kg (3.7 lb)

325 LN

3LL1-Up 1.7 kg (3.7 lb)

330 Refrigerant Capacities

330

6ZK1-Up 1.7 kg (3.7 lb)
8FK1-Up 1.0 kg (2.2 lb)
8RL1-Up 1.0 kg (2.2 lb)
2ZM1-Up 1.7 kg (3.7 lb)
6SK1-Up 1.0 kg (2.2 lb)
9PJ1-Up 1.0 kg (2.2 lb)

330 L

2EL1-Up 1.7 kg (3.7 lb)
9ML1-Up 1.0 kg (2.2 lb)
5YM1-Up 1.7 kg (3.7 lb)

330 LN

8CK1-Up 1.7 kg (3.7 lb)

350 Refrigerant Capacities

350

8HK1-Up	2.2 kg (4.9 lb)
2ZL1-Up	2.2 kg (4.9 lb)
7RK1-Up	1.0 kg (2.2 lb)

350 L

9FL1-Up	2.2 kg (4.9 lb)
3ML1-Up	2.2 kg (4.9 lb)
9DK1-Up	1.0 kg (2.2 lb)

375 Refrigerant Capacities**375**

8WJ1-Up	2.2 kg (5.0 lb)
6NK1-Up	2.2 kg (5.0 lb)
8XG1-Up	1.0 kg (2.2 lb)

375 L

6RL1-Up	1.8 kg (4.0 lb)
9WL1-Up	2.2 kg (5.0 lb)
1JM1-Up	2.2 kg (5.0 lb)

5080 Refrigerant Capacities**5080**

6XK1-Up	2.2 kg (5.0 lb)
8SL1-Up	2.2 kg (5.0 lb)

i02994283

System Capacities for Refrigerant (Excavators) (304 CR, 305 CR, 313B CR, 321B CR)**SMCS Code:** 1809**Part No.:** 3E-6654
S/N: DSA1-Up**Part No.:** 3E-6654
S/N: KGA1-Up**Part No.:** 3E-6654
S/N: NAD1-Up**Part No.:** 3E-6654
S/N: BAS1-Up**Part No.:** 3E-6654
S/N: DGT1-Up**Reference:** For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".**304 CR Refrigerant Capacities****304 CR**

NAD1-Up	0.6 kg (1.3 lb)

305 CR Refrigerant Capacities**305 CR**

DSA1-Up	0.6 kg (1.3 lb)
DGT1-Up	0.8 kg (1.8 lb)

313B CR Refrigerant Capacities**313B CR**

BAS1-Up	0.9 kg (2 lb)
AEX1-Up	0.9 kg (2 lb)

313B SR

9PR1-Up	0.9 kg (2 lb)

321B LCR Refrigerant Capacities**321B LCR**

KGA1-Up	0.9 kg (2 lb)

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System Capacities for Refrigerant (Excavators) (307B)**SMCS Code:** 1809**S/N:** AFB1-Up**S/N:** 5CW1-Up**S/N:** 6KZ1-Up**S/N:** 7DZ1-Up**Reference:** For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".**307B Refrigerant Capacities****307B**

7DZ1-Up	0.9 kg (2 lb)

307B SB

AFB1-Up	1.9 kg (4.2 lb)
5CW1-Up	0.9 kg (2 lb)
6KZ1-Up	0.9 kg (2 lb)

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System Capacities for Refrigerant (Excavators) (307C, 311C, 320C)

SMCS Code: 1809

Part No.: 3E-6654
S/N: BCB1-Up

S/N: HBC1-Up

S/N: PAD1-Up

S/N: BNE1-Up

S/N: CKE1-Up

S/N: BCM1-Up

Part No.: 3E-6654
S/N: HKT1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

307C Refrigerant Capacities

307C

BCM1-UP 0.9 kg (2 lb)
BNE1-UP 0.9 kg (2 lb)

311C Refrigerant Capacities

311C

CKE1-UP 0.9 kg (2 lb)
PAD1-UP 0.9 kg (2 lb)

320C Refrigerant Capacities

320C L

HBC1-UP 0.9 kg (2 lb)
BCB1-UP 1.0 kg (2.2 lb)
HKT1-UP 1.0 kg (2.2 lb)

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System Capacities for Refrigerant (Excavators) (307D-390D)

SMCS Code: 1809

Part No.: 3E-6654
S/N: CLA1-Up

Part No.: 3E-6654
S/N: JHA1-Up

Part No.: 3E-6654
S/N: JZA1-Up

Part No.: 3E-6654
S/N: LKA1-Up

Part No.: 3E-6654
S/N: PJA1-Up

Part No.: 3E-6654
S/N: SKA1-Up

Part No.: 3E-6654
S/N: ZCA1-Up

Part No.: 3E-6654
S/N: GPB1-Up

Part No.: 3E-6654
S/N: JGB1-Up

Part No.: 3E-6654
S/N: LAB1-Up

Part No.: 3E-6654
S/N: MNB1-Up

Part No.: 3E-6654
S/N: PTB1-Up

Part No.: 3E-6654
S/N: XDB1-Up

Part No.: 3E-6654
S/N: ZGB1-Up

Part No.: 3E-6654
S/N: BFC1-Up

Part No.: 3E-6654
S/N: BYC1-Up

Part No.: 3E-6654
S/N: EJC1-Up

Part No.: 3E-6654
S/N: GBC1-Up

Part No.: 3E-6654
S/N: HJC1-Up

Part No.: 3E-6654
S/N: JBC1-Up

Part No.: 3E-6654
S/N: NAC1-Up

Part No.: 3E-6654
S/N: RAC1-Up

Part No.: 3E-6654
S/N: SDC1-Up

Part No.: 3E-6654
S/N: WGC1-Up

Part No.: 3E-6654
S/N: CYD1-Up

Part No.: 3E-6654
S/N: JPD1-Up

Part No.: 3E-6654
S/N: KBD1-Up

Part No.: 3E-6654
S/N: KCD1-Up

Part No.: 3E-6654
S/N: KXD1-Up

Part No.: 3E-6654
S/N: MND1-Up

Part No.: 3E-6654
S/N: MZD1-Up

Part No.: 3E-6654
S/N: NBD1-Up

Part No.: 3E-6654
S/N: PLD1-Up

Part No.: 3E-6654
S/N: R2D1-Up

Part No.: 3E-6654
S/N: RGD1-Up

Part No.: 3E-6654
S/N: SED1-Up

Part No.: 3E-6654
S/N: T2D1-Up

Part No.: 3E-6654
S/N: WTD1-Up

Part No.: 3E-6654
S/N: YSD1-Up

Part No.: 3E-6654
S/N: DHE1-Up

Part No.: 3E-6654
S/N: GGE1-Up

Part No.: 3E-6654
S/N: KBE1-Up

Part No.: 3E-6654
S/N: KLE1-Up

Part No.: 3E-6654
S/N: MDE1-Up

Part No.: 3E-6654
S/N: NDE1-Up

Part No.: 3E-6654
S/N: PBE1-Up

Part No.: 3E-6654
S/N: PKE1-Up

Part No.: 3E-6654
S/N: RAE1-Up

Part No.: 3E-6654
S/N: TAE1-Up

Part No.: 3E-6654
S/N: TLE1-Up

Part No.: 3E-6654
S/N: WNE1-Up

Part No.: 3E-6654
S/N: YEE1-Up

Part No.: 3E-6654
S/N: A6F1-Up

Part No.: 3E-6654
S/N: A8F1-Up

Part No.: 3E-6654
S/N: A9F1-Up

Part No.: 3E-6654
S/N: AYF1-Up

Part No.: 3E-6654
S/N: CZF1-Up

Part No.: 3E-6654
S/N: DJF1-Up

Part No.: 3E-6654
S/N: EDF1-Up

Part No.: 3E-6654
S/N: GKF1-Up

Part No.: 3E-6654
S/N: GTF1-Up

Part No.: 3E-6654
S/N: J2F1-Up

Part No.: 3E-6654
S/N: JBF1-Up

Part No.: 3E-6654
S/N: KGF1-Up

Part No.: 3E-6654
S/N: KTF1-Up

Part No.: 3E-6654
S/N: KZF1-Up

Part No.: 3E-6654
S/N: NNF1-Up

Part No.: 3E-6654
S/N: NZF1-Up

Part No.: 3E-6654
S/N: PRF1-Up

Part No.: 3E-6654
S/N: RKF1-Up

Part No.: 3E-6654
S/N: SWF1-Up

Part No.: 3E-6654
S/N: ZMF1-Up

Part No.: 3E-6654
S/N: CWG1-Up

Part No.: 3E-6654
S/N: DSG1-Up

Part No.: 3E-6654
S/N: JJG1-Up

Part No.: 3E-6654
S/N: JLG1-Up

Part No.: 3E-6654
S/N: KDG1-Up

Part No.: 3E-6654
S/N: KGG1-Up

Part No.: 3E-6654
S/N: LMG1-Up

Part No.: 3E-6654
S/N: MGG1-Up

Part No.: 3E-6654
S/N: MYG1-Up

Part No.: 3E-6654
S/N: NEG1-Up

Part No.: 3E-6654
S/N: PZG1-Up

Part No.: 3E-6654
S/N: RGG1-Up

Part No.: 3E-6654
S/N: WAG1-Up

Part No.: 3E-6654
S/N: B6H1-Up

Part No.: 3E-6654
S/N: BZH1-Up

Part No.: 3E-6654
S/N: C4H1-Up

Part No.: 3E-6654
S/N: DBH1-Up

Part No.: 3E-6654
S/N: EAH1-Up

Part No.: 3E-6654
S/N: EEH1-Up

Part No.: 3E-6654
S/N: FMH1-Up

Part No.: 3E-6654
S/N: KFH1-Up

Part No.: 3E-6654
S/N: KLH1-Up

Part No.: 3E-6654
S/N: MCH1-Up

Part No.: 3E-6654
S/N: PHH1-Up

Part No.: 3E-6654
S/N: TDH1-Up

Part No.: 3E-6654
S/N: TRH1-Up

Part No.: 3E-6654
S/N: JHJ1-Up

Part No.: 3E-6654
S/N: KDJ1-Up

Part No.: 3E-6654
S/N: MGJ1-Up

Part No.: 3E-6654
S/N: PNJ1-Up

Part No.: 3E-6654
S/N: RAJ1-Up

Part No.: 3E-6654
S/N: RBJ1-Up

Part No.: 3E-6654
S/N: THJ1-Up

Part No.: 3E-6654
S/N: WBJ1-Up

Part No.: 3E-6654
S/N: ZKJ1-Up

Part No.: 3E-6654
S/N: BTK1-Up

Part No.: 3E-6654
S/N: C5K1-Up

Part No.: 3E-6654
S/N: DHK1-Up

Part No.: 3E-6654
S/N: ERK1-Up

Part No.: 3E-6654
S/N: FFK1-Up

Part No.: 3E-6654
S/N: FXK1-Up

Part No.: 3E-6654
S/N: GPK1-Up

Part No.: 3E-6654
S/N: LRK1-Up

Part No.: 3E-6654
S/N: MLK1-Up

Part No.: 3E-6654
S/N: RJK1-Up

Part No.: 3E-6654
S/N: RSK1-Up

Part No.: 3E-6654
S/N: W3K1-Up

Part No.: 3E-6654
S/N: WDK1-Up

Part No.: 3E-6654
S/N: WPK1-Up

Part No.: 3E-6654
S/N: WRK1-Up

Part No.: 3E-6654
S/N: XCK1-Up

Part No.: 3E-6654
S/N: XGK1-Up

Part No.: 3E-6654
S/N: FAL1-Up

Part No.: 3E-6654
S/N: GKL1-Up

Part No.: 3E-6654
S/N: LAL1-Up

Part No.: 3E-6654
S/N: LFL1-Up

Part No.: 3E-6654
S/N: MCL1-Up

Part No.: 3E-6654
S/N: MPL1-Up

Part No.: 3E-6654
S/N: PAL1-Up

Part No.: 3E-6654
S/N: PEL1-Up

Part No.: 3E-6654
S/N: RHL1-Up

Part No.: 3E-6654
S/N: TZL1-Up

Part No.: 3E-6654
S/N: BYM1-Up

Part No.: 3E-6654
S/N: EBM1-Up

Part No.: 3E-6654
S/N: JJM1-Up

Part No.: 3E-6654
S/N: KFM1-Up

Part No.: 3E-6654
S/N: KLM1-Up

Part No.: 3E-6654
S/N: KRM1-Up

Part No.: 3E-6654
S/N: LEM1-Up

Part No.: 3E-6654
S/N: LRM1-Up

Part No.: 3E-6654
S/N: NCM1-Up

Part No.: 3E-6654
S/N: NLM1-Up

Part No.: 3E-6654
S/N: PBM1-Up

Part No.: 3E-6654
S/N: PCM1-Up

Part No.: 3E-6654
S/N: PJM1-Up

Part No.: 3E-6654
S/N: SYM1-Up

Part No.: 3E-6654
S/N: TPM1-Up

Part No.: 3E-6654
S/N: BZN1-Up

Part No.: 3E-6654
S/N: CJN1-Up

Part No.: 3E-6654
S/N: ERN1-Up

Part No.: 3E-6654
S/N: JTN1-Up

Part No.: 3E-6654
S/N: KHN1-Up

Part No.: 3E-6654
S/N: MEN1-Up

Part No.: 3E-6654
S/N: PPN1-Up

Part No.: 3E-6654
S/N: SPN1-Up

Part No.: 3E-6654
S/N: TSN1-Up

Part No.: 3E-6654
S/N: WBN1-Up

Part No.: 3E-6654
S/N: AZP1-Up

Part No.: 3E-6654
S/N: BYP1-Up

Part No.: 3E-6654
S/N: BZP1-Up

Part No.: 3E-6654
S/N: DFP1-Up

Part No.: 3E-6654
S/N: DLP1-Up

Part No.: 3E-6654
S/N: GDP1-Up

Part No.: 3E-6654
S/N: JLP1-Up

Part No.: 3E-6654
S/N: MWP1-Up

Part No.: 3E-6654
S/N: MYP1-Up

Part No.: 3E-6654
S/N: PAP1-Up

Part No.: 3E-6654
S/N: RJP1-Up

Part No.: 3E-6654
S/N: WAP1-Up

Part No.: 3E-6654
S/N: A3R1-Up

Part No.: 3E-6654
S/N: DWR1-Up

Part No.: 3E-6654
S/N: GBR1-Up

Part No.: 3E-6654
S/N: JWR1-Up

Part No.: 3E-6654
S/N: JZR1-Up

Part No.: 3E-6654
S/N: SCR1-Up

Part No.: 3E-6654
S/N: WGR1-Up

Part No.: 3E-6654
S/N: BYS1-Up

Part No.: 3E-6654
S/N: DTS1-Up

Part No.: 3E-6654
S/N: HAS1-Up

Part No.: 3E-6654
S/N: JGS1-Up

Part No.: 3E-6654
S/N: KES1-Up

Part No.: 3E-6654
S/N: KHS1-Up

Part No.: 3E-6654
S/N: NES1-Up

Part No.: 3E-6654
S/N: PAS1-Up

Part No.: 3E-6654
S/N: RAS1-Up

Part No.: 3E-6654
S/N: T2S1-Up

Part No.: 3E-6654
S/N: TZS1-Up

Part No.: 3E-6654
S/N: YDS1-Up

Part No.: 3E-6654
S/N: EJT1-Up

Part No.: 3E-6654
S/N: JAT1-Up

Part No.: 3E-6654
S/N: JBT1-Up

Part No.: 3E-6654
S/N: KKT1-Up

Part No.: 3E-6654
S/N: M4T1-Up

Part No.: 3E-6654
S/N: PBT1-Up

Part No.: 3E-6654
S/N: PYT1-Up

Part No.: 3E-6654
S/N: SRT1-Up

Part No.: 3E-6654
S/N: WBT1-Up

Part No.: 3E-6654
S/N: WET1-Up

Part No.: 3E-6654
S/N: WLT1-Up

Part No.: 3E-6654
S/N: CYW1-Up

Part No.: 3E-6654
S/N: DDW1-Up

Part No.: 3E-6654
S/N: DKW1-Up

Part No.: 3E-6654
S/N: EAW1-Up

Part No.: 3E-6654
S/N: HCW1-Up

Part No.: 3E-6654
S/N: PGW1-Up

Part No.: 3E-6654
S/N: YFW1-Up

Part No.: 3E-6654
S/N: CJX1-Up

Part No.: 3E-6654
S/N: EDX1-Up

Part No.: 3E-6654
S/N: GMX1-Up

Part No.: 3E-6654
S/N: HJX1-Up

Part No.: 3E-6654
S/N: PAX1-Up

Part No.: 3E-6654
S/N: PCX1-Up

Part No.: 3E-6654
S/N: PHX1-Up

Part No.: 3E-6654
S/N: RMX1-Up

Part No.: 3E-6654
S/N: WZX1-Up

Part No.: 3E-6654
S/N: CXY1-Up

Part No.: 3E-6654
S/N: DAY1-Up

Part No.: 3E-6654
S/N: EBY1-Up

Part No.: 3E-6654
S/N: KAY1-Up

Part No.: 3E-6654
S/N: LKY1-Up

Part No.: 3E-6654
S/N: MEY1-Up

Part No.: 3E-6654
S/N: SCY1-Up

Part No.: 3E-6654
S/N: T2Y1-Up

Part No.: 3E-6654
S/N: TGY1-Up

Part No.: 3E-6654
S/N: DTZ1-Up

Part No.: 3E-6654
S/N: JFZ1-Up

Part No.: 3E-6654
S/N: JGZ1-Up

Part No.: 3E-6654
S/N: KCZ1-Up

Part No.: 3E-6654
S/N: RXZ1-Up

Part No.: 3E-6654
S/N: ZGZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

307D Refrigerant Capacities

307D

DSG1-Up 0.9 kg (2.0 lb)
WZX1-Up 0.9 kg (2.0 lb)

311D Refrigerant Capacities

311D

LKA1-Up 0.8 kg (1.8 lb)
CLA1-Up 0.8 kg (1.8 lb)
PNJ1-Up 0.8 kg (1.8 lb)
DWR1-Up 0.8 kg (1.8 lb)
DDW1-Up 0.8 kg (1.8 lb)

312D Refrigerant Capacities

312D

JBC1-Up 0.9 kg (2.0 lb)
KCD1-Up 0.9 kg (2.0 lb)
KLE1-Up 0.9 kg (2.0 lb)
PHH1-Up 0.9 kg (2.0 lb)
LRK1-Up 0.9 kg (2.0 lb)
RHL1-Up 0.9 kg (2.0 lb)
DLP1-Up 0.9 kg (2.0 lb)
HCW1-Up 0.9 kg (2.0 lb)
HJX1-Up 0.9 kg (2.0 lb)
TGY1-Up 0.9 kg (2.0 lb)
RXZ1-Up 0.9 kg (2.0 lb)

312D L

SKA1-Up 0.9 kg (2.0 lb)
RKF1-Up 0.9 kg (2.0 lb)
MGJ1-Up 0.9 kg (2.0 lb)
XGK1-Up 0.9 kg (2.0 lb)
KES1-Up 0.9 kg (2.0 lb)

313D Refrigerant Capacities

313D

KXD1-Up 0.9 kg (2.0 lb)
PLD1-Up 0.9 kg (2.0 lb)
WPK1-Up 0.9 kg (2.0 lb)

315D Refrigerant Capacities

315D

KBD1-Up 0.8 kg (1.8 lb)
NCM1-Up 0.8 kg (1.8 lb)
CJN1-Up 0.8 kg (1.8 lb)

315D L

JHA1-Up	0.8 kg (1.8 lb)
TLE1-Up	0.8 kg (1.8 lb)
BZN1-Up	0.8 kg (1.8 lb)
JGS1-Up	0.8 kg (1.8 lb)

318D Refrigerant Capacities

318D L

ZKJ1-Up	0.8 kg (1.8 lb)
WGR1-Up	0.8 kg (1.8 lb)
TZS1-Up	0.8 kg (1.8 lb)

319D Refrigerant Capacities

319D

BZH1-Up	0.8 kg (1.8 lb)
FMH1-Up	0.8 kg (1.8 lb)
EAW1-Up	0.8 kg (1.8 lb)
DAY1-Up	0.8 kg (1.8 lb)

319D L

ZCA1-Up	0.8 kg (1.8 lb)
AYF1-Up	0.8 kg (1.8 lb)
KRM1-Up	0.8 kg (1.8 lb)
ZGZ1-Up	0.8 kg (1.8 lb)

319D LN

WBJ1-Up	0.8 kg (1.8 lb)
KFM1-Up	0.8 kg (1.8 lb)
RJP1-Up	0.8 kg (1.8 lb)

320D Refrigerant Capacities

320D

JZA1-Up	0.8 kg (1.8 lb)
JPD1-Up	0.8 kg (1.8 lb)
MZD1-Up	0.8 kg (1.8 lb)
A6F1-Up	0.8 kg (1.8 lb)
KGF1-Up	0.8 kg (1.8 lb)
KTF1-Up	0.8 kg (1.8 lb)
MCH1-Up	0.8 kg (1.8 lb)
FAL1-Up	0.8 kg (1.8 lb)
KLM1-Up	0.8 kg (1.8 lb)
KHN1-Up	0.8 kg (1.8 lb)
BZP1-Up	0.8 kg (1.8 lb)
CXY1-Up	0.8 kg (1.8 lb)
JFZ1-Up	0.8 kg (1.8 lb)
JGZ1-Up	0.8 kg (1.8 lb)

320D L

MDE1-Up	0.8 kg (1.8 lb)
A8F1-Up	0.8 kg (1.8 lb)
A9F1-Up	0.8 kg (1.8 lb)
KZF1-Up	0.8 kg (1.8 lb)
MGG1-Up	0.8 kg (1.8 lb)
TDH1-Up	0.8 kg (1.8 lb)
DHK1-Up	0.8 kg (1.8 lb)

SPN1-Up	0.8 kg (1.8 lb)
GDP1-Up	0.8 kg (1.8 lb)
PHX1-Up	0.8 kg (1.8 lb)

320D LN

PCM1-Up	0.8 kg (1.8 lb)
WBN1-Up	0.8 kg (1.8 lb)
PCX1-Up	0.8 kg (1.8 lb)

320D RR Refrigerant Capacities

320D LRR

ZGB1-Up	0.9 kg (2.0 lb)
HJC1-Up	0.9 kg (2.0 lb)
DHE1-Up	0.9 kg (2.0 lb)
FXK1-Up	0.9 kg (2.0 lb)
XCK1-Up	0.9 kg (2.0 lb)
EJT1-Up	0.9 kg (2.0 lb)
EBY1-Up	0.9 kg (2.0 lb)

320D RR

TAE1-Up	0.9 kg (2.0 lb)
GKL1-Up	0.9 kg (2.0 lb)
YDS1-Up	0.9 kg (2.0 lb)
SRT1-Up	0.9 kg (2.0 lb)
GMX1-Up	0.9 kg (2.0 lb)

323D Refrigerant Capacities

323D

PBE1-Up	0.8 kg (1.8 lb)
WNE1-Up	0.8 kg (1.8 lb)

323D L

SDC1-Up	0.9 kg (2.0 lb)
YSD1-Up	0.8 kg (1.8 lb)
NDE1-Up	0.8 kg (1.8 lb)
ZMF1-Up	0.8 kg (1.8 lb)
JLG1-Up	0.8 kg (1.8 lb)
GTF1-Up	0.8 kg (1.8 lb)
NZF1-Up	0.8 kg (1.8 lb)
LFL1-Up	0.8 kg (1.8 lb)
BYM1-Up	0.8 kg (1.8 lb)
PBM1-Up	0.9 kg (2.0 lb)

323D LN

RAC1-Up	0.9 kg (2.0 lb)
WGC1-Up	0.8 kg (1.8 lb)
CYD1-Up	0.9 kg (2.0 lb)
CWG1-Up	0.9 kg (2.0 lb)

323D S

SED1-Up	0.9 kg (2.0 lb)
DKW1-Up	0.9 kg (2.0 lb)

323D SA

NES1-Up 0.9 kg (2.0 lb)

324D Refrigerant Capacities

324D

MND1-Up 0.8 kg (1.8 lb)

324D L

LAB1-Up 0.8 kg (1.8 lb)
 T2D1-Up 0.8 kg (1.8 lb)
 JG1-Up 0.8 kg (1.8 lb)
 BTK1-Up 0.8 kg (1.8 lb)
 GPK1-Up 0.8 kg (1.8 lb)
 SYM1-Up 0.8 kg (1.8 lb)
 TSN1-Up 0.8 kg (1.8 lb)
 DFP1-Up 0.8 kg (1.8 lb)
 JZR1-Up 0.8 kg (1.8 lb)
 JAT1-Up 0.9 kg (2.0 lb)
 PYT1-Up 0.9 kg (2.0 lb)
 CJX1-Up 0.8 kg (1.8 lb)

324D LN

EJC1-Up 0.8 kg (1.8 lb)
 TRH1-Up 0.9 kg (2.0 lb)

M325D Refrigerant Capacities

M325D MH

EDF1-Up 1 kg (2.2 lb)
 KGG1-Up 1 kg (2.2 lb)
 KAY1-Up 1 kg (2.2 lb)

325D Refrigerant Capacities

325D L

GPB1-Up 0.8 kg (1.8 lb)
 NAC1-Up 0.8 kg (1.8 lb)
 KBE1-Up 0.8 kg (1.8 lb)
 KDG1-Up 0.8 kg (1.8 lb)
 DBH1-Up 0.8 kg (1.8 lb)
 ERK1-Up 0.8 kg (1.8 lb)
 LAL1-Up 0.8 kg (1.8 lb)
 MCL1-Up 0.8 kg (1.8 lb)
 PAL1-Up 0.8 kg (1.8 lb)
 AZP1-Up 0.8 kg (1.8 lb)
 A3R1-Up 0.8 kg (1.8 lb)
 GBR1-Up 0.8 kg (1.8 lb)
 SCR1-Up 0.8 kg (1.8 lb)
 T2S1-Up 0.8 kg (1.8 lb)
 CYW1-Up 1.3 kg (2.87 lb)

325D LN

PKE1-Up 0.8 kg (1.8 lb)

325D MH

C4H1-Up 1.0 kg (2.2 lb)

RJK1-Up 1.1 kg (2.4 lb)

326D Refrigerant Capacities

326D

PJM1-Up 0.8 kg (1.8 lb)

328D LCR Refrigerant Capacities

328D LCR

SWF1-Up 0.8 kg (1.8 lb)
 RMX1-Up 0.8 kg (1.8 lb)

329D Refrigerant Capacities

329D

WDK1-Up 0.8 kg (1.8 lb)
 BYS1-Up 0.8 kg (1.8 lb)
 DTZ1-Up 0.8 kg (1.8 lb)

329D L

XDB1-Up 0.8 kg (1.8 lb)
 MNB1-Up 0.8 kg (1.8 lb)
 BFC1-Up 0.8 kg (1.8 lb)
 DJF1-Up 0.8 kg (1.8 lb)
 CZF1-Up 0.8 kg (1.8 lb)
 JHJ1-Up 0.8 kg (1.8 lb)
 RSK1-Up 0.8 kg (1.8 lb)
 TZL1-Up 0.8 kg (1.8 lb)
 TPM1-Up 0.8 kg (1.8 lb)
 WLT1-Up 0.8 kg (1.8 lb)
 YFW1-Up 0.8 kg (1.8 lb)

329D LN

EBM1-Up 1.0 kg (2.2 lb)
 SCY1-Up 1.0 kg (2.2 lb)

330D Refrigerant Capacities

330D

B6H1-Up 0.9 kg (2.0 lb)
 EAH1-Up 0.9 kg (2.0 lb)
 THJ1-Up 0.9 kg (2.0 lb)
 JLP1-Up 0.9 kg (2.0 lb)
 MEY1-Up 0.9 kg (2.0 lb)

330D L

GBC1-Up 0.9 kg (2.0 lb)
 NBD1-Up 0.9 kg (2.0 lb)
 R2D1-Up 0.9 kg (2.0 lb)
 FFK1-Up 0.9 kg (2.0 lb)
 ERN1-Up 0.9 kg (2.0 lb)
 LRM1-Up 0.9 kg (2.0 lb)
 MWP1-Up 0.9 kg (2.0 lb)
 HAS1-Up 0.9 kg (2.0 lb)
 RAS1-Up 0.9 kg (2.0 lb)

T2Y1-Up	0.9 kg (2.0 lb)
EDX1-Up	0.9 kg (2.0 lb)

330D LN

GGE1-Up	0.9 kg (2.0 lb)

330D MH

C5K1-Up	1.1 kg (2.4 lb)
PEL1-Up	1.3 kg (3.0 lb)
LEM1-Up	1.3 kg (3 lb)

330D WH

JJM1-Up	1.1 kg (2.4 lb)

336D Refrigerant Capacities

336D

KKT1-Up	0.9 kg (2.0 lb)
JBT1-Up	0.9 kg (2.0 lb)
PGW1-Up	0.9 kg (2.0 lb)

336D L

PTB1-Up	0.9 kg (2.0 lb)
J2F1-Up	0.9 kg (2.0 lb)
JBF1-Up	0.9 kg (2.0 lb)
PRF1-Up	0.9 kg (2.0 lb)
LMG1-Up	0.9 kg (2.0 lb)
KDJ1-Up	0.9 kg (2.0 lb)
W3K1-Up	0.9 kg (2.0 lb)
WRK1-Up	0.9 kg (2.0 lb)
MPL1-Up	0.9 kg (2.0 lb)
ZML1-Up	0.9 kg (2.0 lb)
PPN1-Up	0.9 kg (2.0 lb)
JWR1-Up	0.9 kg (2.0 lb)
DTS1-Up	0.9 kg (2.0 lb)
MDS1-Up	0.9 kg (2.0 lb)
M4T1-Up	0.9 kg (2.0 lb)
WET1-Up	0.9 kg (2.0 lb)

336D LN

MYG1-Up	0.9 kg (2.0 lb)
MYP1-Up	0.9 kg (2.0 lb)

340D Refrigerant Capacities

340D

JTN1-Up	0.9 kg (2.0 lb)

345D Refrigerant Capacities

345D

NEG1-Up	0.9 kg (2.0 lb)

345D L

BYC1-Up	0.9 kg (2.0 lb)

RGD1-Up	0.9 kg (2.0 lb)
RAE1-Up	0.9 kg (2.0 lb)
YEE1-Up	0.9 kg (2.0 lb)
RGG1-Up	0.9 kg (2.0 lb)
EEH1-Up	0.9 kg (2.0 lb)
KFH1-Up	0.9 kg (2.0 lb)
RAJ1-Up	0.9 kg (2.0 lb)
MLK1-Up	0.9 kg (2.0 lb)
NLM1-Up	0.9 kg (2.0 lb)
JKN1-Up	0.9 kg (2.0 lb)
PBT1-Up	0.9 kg (2.0 lb)
LKY1-Up	0.9 kg (2.0 lb)

349D Refrigerant Capacities

349D

GKF1-Up	0.9 kg (2.0 lb)
MEN1-Up	0.9 kg (2.0 lb)

349D L

JGB1-Up	0.9 kg (2.0 lb)
WTD1-Up	0.9 kg (2.0 lb)
NNF1-Up	0.9 kg (2.0 lb)
PZG1-Up	0.9 kg (2.0 lb)
KLH1-Up	0.9 kg (2.0 lb)
RBJ1-Up	0.9 kg (2.0 lb)
KHS1-Up	0.9 kg (2.0 lb)

374D Refrigerant Capacities

374D L

PJA1-Up	1.1 kg (2.4 lb)
PAP1-Up	1.1 kg (2.4 lb)
PAS1-Up	1.1 kg (2.4 lb)
PAX1-Up	1.1 kg (2.4 lb)

390D Refrigerant Capacities

390D

BYP1-Up	1.1 kg (2.4 lb)
KCZ1-Up	1.1 kg (2.4 lb)

390D L

WAG1-Up	1.1 kg (2.4 lb)
WAP1-Up	1.1 kg (2.4 lb)
WBT1-Up	1.1 kg (2.4 lb)

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System Capacities for Refrigerant (Excavators) (OEM MHPU)

SMCS Code: 1809

Part No.: 305-0325
S/N: SRC1-Up

Part No.: 305-0325
S/N: D3D1-Up

Part No.: 305-0325
S/N: H3D1-Up

Part No.: 259-7244
S/N: JPD1-Up

Part No.: 259-7244
S/N: KXD1-Up

Part No.: 305-0325
S/N: M3D1-Up

Part No.: 305-0325
S/N: P5D1-Up

Part No.: 305-0325
S/N: M3E1-Up

Part No.: 305-0325
S/N: GKF1-Up

Part No.: 305-0325
S/N: M3F1-Up

Part No.: 305-0325
S/N: MSF1-Up

Part No.: 305-0325
S/N: NRF1-Up

Part No.: 305-0324
S/N: MSG1-Up

Part No.: 305-0325
S/N: KLH1-Up

Part No.: 259-7244
S/N: DCJ1-Up

Part No.: 259-7244
S/N: ZKJ1-Up

Part No.: 305-0325
S/N: GPK1-Up

Part No.: 259-7244
S/N: WPK1-Up

Part No.: 305-0325
S/N: TZL1-Up

Part No.: 305-0325
S/N: M3M1-Up

Part No.: 305-0325
S/N: PJM1-Up

Part No.: 305-0325
S/N: B6N1-Up

Part No.: 305-0325
S/N: C3N1-Up

Part No.: 305-0325
S/N: H3N1-Up

Part No.: 305-0325
S/N: M3N1-Up

Part No.: 305-0325
S/N: X3N1-Up

Part No.: 305-0325
S/N: KJR1-Up

Part No.: 305-0325
S/N: M3W1-Up

Part No.: 259-7244
S/N: WZX1-Up

Part No.: 305-0325
S/N: GSZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

323D Refrigerant Capacities

323D LN

DCJ1-Up 0.8 kg (1.8 lb)

324D LN Refrigerant Capacities

KJR1-Up 0.8 kg (1.8 lb)

325C Refrigerant Capacities

MSG1-Up 1.3 kg (2.9 lb)

325D Refrigerant Capacities

325D

C3N1-Up 0.8 kg (1.8 lb)

325D L

H3N1-Up 0.8 kg (1.8 lb)

SRC1-Up 0.8 kg (1.8 lb)

X3N1-Up 0.8 kg (1.8 lb)

330C Refrigerant Capacities

MSD1-Up 0.9 kg (2 lb)

330D Refrigerant Capacities

330D

D3D1-Up 0.9 kg (2 lb)

330D L

H3D1-Up 0.9 kg (2 lb)

M3D1-Up 0.9 kg (2 lb)

336D Refrigerant Capacities

336D

M3N1-Up 0.9 kg (2 lb)

336D L

M3M1-Up 0.9 kg (2 lb)

345C Refrigerant Capacities

345C

M3F1-Up 0.9 kg (2 lb)

345C L

NRF1-Up 0.9 kg (2 lb)

B6N1-Up 0.9 kg (2 lb)

M3E1-Up 0.9 kg (2 lb)

345D Refrigerant Capacities

P5D1-Up 0.9 kg (2 lb)

365C L Refrigerant Capacities

GSZ1-Up 1.1 kg (2.4 lb)

385C Refrigerant Capacities

385C

MSF1-Up 1.1 kg (2.4 lb)

385C L

M3W1-Up 1.1 kg (2.4 lb)

System Capacities for Refrigerant (Excavators) (308C CR-321C CR)

i02992526

SMCS Code: 1809

Part No.: 3E-6654

S/N: KJA1-Up

Part No.: 3E-6654

S/N: PCA1-Up

Part No.: 3E-6654

S/N: MCF1-Up

Part No.: 3E-6654

S/N: KCR1-Up

Part No.: 3E-6654

S/N: KCX1-Up

Part No.: 3E-6654

S/N: SNY1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

308C CR Refrigerant Capacities

308C CR

KCX 1-UP 1 kg (2.2 lb)

314C CR Refrigerant Capacities

314C CR

KJA 1-UP 0.9 kg (2 lb)

SNY 1-UP 0.9 kg (2 lb)

314C LCR

PCA 1-UP 0.9 kg (2 lb)

321C CR Refrigerant Capacities

321C CR

MCF 1-UP 0.9 kg (2 lb)

321C LCR

KCR 1-UP 0.8 kg (1.8 lb)

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System Capacities for Refrigerant (Excavators) (308D CR-328D CR)

SMCS Code: 1809

Part No.: 3E-6654
S/N: TXA1-Up

Part No.: 3E-6654
S/N: FYC1-Up

Part No.: 3E-6654
S/N: PBD1-Up

Part No.: 3E-6654
S/N: MPG1-Up

Part No.: 3E-6654
S/N: BYJ1-Up

Part No.: 3E-6654
S/N: GTN1-Up

Part No.: 3E-6654
S/N: TXN1-Up

Part No.: 3E-6654
S/N: WLN1-Up

Part No.: 3E-6654
S/N: PDP1-Up

Part No.: 3E-6654
S/N: SBP1-Up

Part No.: 3E-6654
S/N: MKR1-Up

Part No.: 3E-6654
S/N: XHR1-Up

Part No.: 3E-6654
S/N: NAS1-Up

Part No.: 3E-6654
S/N: GBT1-Up

Part No.: 3E-6654
S/N: MDT1-Up

Part No.: 3E-6654
S/N: KBZ1-Up

Part No.: 3E-6654
S/N: SSZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

308D CR Refrigerant Capacities

308D CR

FYC 1-UP 0.8 kg (1.8 lb)
GBT 1-UP 0.8 kg (1.8 lb)

314D CR Refrigerant Capacities

314D CR

BYJ 1-UP 0.8 kg (1.8 lb)
WLN 1-UP 0.8 kg (1.8 lb)
PDP 1-UP 0.8 kg (1.8 lb)
SBP 1-UP 0.8 kg (1.8 lb)

314D LCR

TXN 1-UP 0.8 kg (1.8 lb)
XHR 1-UP 0.8 kg (1.8 lb)
SSZ 1-UP 0.8 kg (1.8 lb)

321D LCR Refrigerant Capacities

321D LCR

TXA 1-UP 0.8 kg (1.8 lb)
PBD 1-UP 0.8 kg (1.8 lb)
MPG 1-UP 0.8 kg (1.8 lb)
NAS 1-UP 0.8 kg (1.8 lb)
MDT 1-UP 0.8 kg (1.8 lb)
KBZ 1-UP 0.8 kg (1.8 lb)

328D LCR Refrigerant Capacities

328D LCR

GTN 1-UP 0.8 kg (1.8 lb)
MKR 1-UP 0.8 kg (1.8 lb)

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System Capacities for Refrigerant (Excavators) (311B-330B)

SMCS Code: 1809

Part No.: 3E-6654
S/N: 8GM1-Up

Part No.: 3E-6654
S/N: 7EN1-Up

Part No.: 3E-6654
S/N: 4NR1-175

Part No.: 3E-6654
S/N: 5BR1-1638

Part No.: 3E-6654
S/N: 6CR1-2901

Part No.: 3E-6654
S/N: 8GR1-461

Part No.: 3E-6654
S/N: 8JR1-1007

Part No.: 3E-6654
S/N: 8MR1-188

Part No.: 3E-6654
S/N: 8NR1-243

Part No.: 3E-6654
S/N: 8PR1-261

Part No.: 3E-6654
S/N: 8RR1-385

Part No.: 3E-6654
S/N: 8SR1-417

Part No.: 3E-6654
S/N: 8TR1-485

Part No.: 3E-6654
S/N: 9GR1-412

Part No.: 3E-6654
S/N: 1AS1-346

Part No.: 3E-6654
S/N: 1GS1-143

Part No.: 3E-6654
S/N: 1JS1-484

Part No.: 3E-6654
S/N: 2LS1-203

Part No.: 3E-6654
S/N: 2NS1-155

Part No.: 3E-6654
S/N: 3FS1-254

Part No.: 3E-6654
S/N: 6LS1-309

Part No.: 3E-6654
S/N: 9JS1-269

Part No.: 3E-6654
S/N: 1SW1-214

Part No.: 3E-6654
S/N: 3AW1-989

Part No.: 3E-6654
S/N: 4XW1-103

Part No.: 3E-6654
S/N: 5GW1-220

Part No.: 3E-6654
S/N: 7RZ1-283

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

311B Refrigerant Capacities

311B

8GR1-461	1.0 kg (2.2 lb)
2LS1-203	1.0 kg (2.2 lb)

312B Refrigerant Capacities

312B

9GR1-412	1.0 kg (2.2 lb)
2NS1-155	1.0 kg (2.2 lb)

312B L

8JR1-1007	1.0 kg (2.2 lb)
3FS1-254	1.0 kg (2.2 lb)

315B Refrigerant Capacities

315B

1SW1-214	1.0 kg (2.2 lb)
1SW215-Up	1.1 kg (2.4 lb)
7RZ1-283	1.0 kg (2.2 lb)

315B L

3AW1-989	1.0 kg (2.2 lb)

320B Refrigerant Capacities

320B

5BR1-1638	1.0 kg (2.2 lb)
8ES1-1638	1.0 kg (2.2 lb)
9CS1-2901	1.0 kg (2.2 lb)
4XW1-103	1.0 kg (2.2 lb)

320B L

6CR1-2901	1.0 kg (2.2 lb)
5GW1-220	1.0 kg (2.2 lb)

320B LL

6LS1-309	0.9 kg (2 lb)
9JS1-269	0.9 kg (2 lb)

320B N

4NR1-175	1.0 kg (2.2 lb)

322B Refrigerant Capacities

322B

8MR1-188	1.0 kg (2.2 lb)
3NR1-Up	1.0 kg (2.2 lb)
5CR1-Up	1.0 kg (2.2 lb)

322B L

8NR1-243 1.0 kg (2.2 lb)
1AS1-346 1.0 kg (2.2 lb)

Part No.: 3E-6654
S/N: 4NR176-Up

325B Refrigerant Capacities

325B

8PR1-261 1.0 kg (2.2 lb)
8PR262-Up 1.1 kg (2.4 lb)
5LW215-Up 1.1 kg (2.4 lb)
7EN215-Up 1.1 kg (2.4 lb)
8GM215-Up 1.1 kg (2.4 lb)
ABD215-Up 1.1 kg (2.4 lb)

Part No.: 3E-6654
S/N: 5BR1639-Up

Part No.: 3E-6654
S/N: 6CR2902-Up

Part No.: 3E-6654
S/N: 8GR462-Up

Part No.: 3E-6654
S/N: 8JR1008-Up

325B L

8RR1-385 1.0 kg (2.2 lb)
1GS1-143 1.0 kg (2.2 lb)

Part No.: 3E-6654
S/N: 8MR189-Up

Part No.: 3E-6654
S/N: 8NR244-Up

330B Refrigerant Capacities

330B

8SR1-417 1.0 kg (2.2 lb)
8SR418-Up 1.2 kg (2.6 lb)

Part No.: 3E-6654
S/N: 8PR262-Up

Part No.: 3E-6654
S/N: 8RR386-Up

Part No.: 3E-6654
S/N: 8SR418-Up

330B L

8TR1-485 1.0 kg (2.2 lb)
1JS1-484 1.0 kg (2.2 lb)

Part No.: 3E-6654
S/N: 8TR486-Up

Part No.: 3E-6654
S/N: 9GR413-Up

Part No.: 3E-6654
S/N: 9KR1-Up

Part No.: 3E-6654
S/N: 9MR1-Up

Part No.: 3E-6654
S/N: 1GS144-Up

Part No.: 3E-6654
S/N: 2LS204-Up

Part No.: 3E-6654
S/N: 2NS156-Up

Part No.: 3E-6654
S/N: 3FS255-Up

Part No.: 3E-6654
S/N: 5WS1-Up

Part No.: 3E-6654
S/N: 6LS310-Up

Part No.: 3E-6654
S/N: 6XS1-Up

Part No.: 3E-6654
S/N: 8ES1-Up

Part No.: 3E-6654
S/N: 9CS1-Up

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System Capacities for Refrigerant (Excavators) (311B-385B)

SMCS Code: 1809

Part No.: 3E-6654
S/N: ABD1-Up

Part No.: 3E-6654
S/N: AGD1-Up

Part No.: 3E-6654
S/N: ALD1-Up

Part No.: 3E-6654
S/N: BKF1-Up

Part No.: 3E-6654
S/N: BBG1-Up

Part No.: 3E-6654
S/N: AKJ1-Up

Part No.: 3E-6654
S/N: CFJ1-Up

Part No.: 3E-6654
S/N: 3LR1-Up

Part No.: 3E-6654
S/N: 9JS270-Up

Part No.: 3E-6654
S/N: 1SW215-Up

Part No.: 3E-6654
S/N: 2ZW1-Up

Part No.: 3E-6654
S/N: 3AW990-Up

Part No.: 3E-6654
S/N: 3MW1-Up

Part No.: 3E-6654
S/N: 4XW104-Up

Part No.: 3E-6654
S/N: 4YW1-Up

Part No.: 3E-6654
S/N: 5GW221-Up

Part No.: 3E-6654
S/N: 5LW1-Up

Part No.: 3E-6654
S/N: AKX1-Up

Part No.: 3E-6654
S/N: BLY1-Up

Part No.: 3E-6654
S/N: 3ZZ1-Up

Part No.: 3E-6654
S/N: 4XZ1-Up

Part No.: 3E-6654
S/N: 7KZ1-Up

Part No.: 3E-6654
S/N: 7RZ284-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

311B Refrigerant Capacities

311B

8GR462-Up	1.1 kg (2.4 lb)
9MR1-Up	1.1 kg (2.4 lb)
2LS204-Up	1.1 kg (2.4 lb)

312B Refrigerant Capacities

312B

9GR413-Up	1.1 kg (2.4 lb)
2NS156-Up	1.1 kg (2.4 lb)

312B L

8JR1008-Up	1.1 kg (2.4 lb)

3FS255-Up	1.1 kg (2.4 lb)

315B Refrigerant Capacities

315B

1SW215-Up	1.1 kg (2.4 lb)

315B L

7RZ284-Up	1.4 kg (3.1 lb)
3AW990-Up	1.1 kg (2.4 lb)

318B Refrigerant Capacities

318B L

3LR1-Up	1.1 kg (2.4 lb)

318B LN

7KZ1-Up	1.1 kg (2.4 lb)

320B Refrigerant Capacities

320B

4XW104-Up	1.1 kg (2.4 lb)
5BR1639-Up	1.1 kg (2.4 lb)
9KR1-Up	1.0 kg (2.2 lb)
8ES1-Up	1.1 kg (2.4 lb)

320B L

AED1-Up	1.0 kg (2.2 lb)
BBG1-Up	1.1 kg (2.4 lb)
6CR2902-Up	1.1 kg (2.4 lb)
9CS1-Up	1.1 kg (2.4 lb)
5GW221-Up	1.1 kg (2.4 lb)

320B N

4NR176-Up	1.1 kg (2.4 lb)

320B LL

6LS310-Up	1.4 kg (3.1 lb)
9JS270-Up	1.4 kg (3.1 lb)

322B Refrigerant Capacities

322B

8MR189-Up	1.1 kg (2.4 lb)

322B L

8NR244-Up	1.1 kg (2.4 lb)

325B Refrigerant Capacities

325B

ABD1-Up	1.1 kg (2.4 lb)

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8PR262-Up 1.1 kg (2.4 lb)

325B L

8RR386-Up 1.1 kg (2.4 lb)

1GS144-Up 1.1 kg (2.4 lb)

5LW1-Up 1.1 kg (2.4 lb)

330B Refrigerant Capacities**330B**

8SR418-Up 1.2 kg (2.6 lb)

4YW1-Up 1.2 kg (2.6 lb)

330B L

8TR486-Up 1.2 kg (2.6 lb)

3ZZ1-Up 1.2 kg (2.6 lb)

345B Refrigerant Capacities**345B**

6XS1-Up 1.1 kg (2.4 lb)

2ZW1-Up 1.1 kg (2.4 lb)

345B L

5WS1-Up 1.1 kg (2.4 lb)

3MW1-Up 1.1 kg (2.4 lb)

345B Series II Refrigerant Capacities**345B Series II**

ALD1-Up 1.1 kg (2.4 lb)

AKJ1-Up 1.1 kg (2.4 lb)

AKX1-Up 1.1 kg (2.4 lb)

365B Refrigerant Capacities**365B L**

AGD1-Up 1.5 kg (3.3 lb)

CFJ1-Up 1.4 kg (3.1 lb)

4XZ1-Up 1.5 kg (3.3 lb)

385B Refrigerant Capacities**385B**

BKF1-Up 1.4 kg (3.1 lb)

385B L

BLY1-Up 1.4 kg (3.1 lb)

System Capacities for Refrigerant (Excavators) (312B-5090B)**SMCS Code:** 1809**Part No.:** 3E-6654**S/N:** MYA1-Up**Part No.:** 3E-6654**S/N:** ALB1-Up**Part No.:** 3E-6654**S/N:** APB1-Up**Part No.:** 3E-6654**S/N:** JMB1-Up**Part No.:** 3E-6654**S/N:** ADC1-Up**Part No.:** 3E-6654**S/N:** CCC1-Up**Part No.:** 3E-6654**S/N:** CLD1-Up**Part No.:** 3E-6654**S/N:** RCD1-Up**Part No.:** 3E-6654**S/N:** AME1-Up**Part No.:** 3E-6654**S/N:** FEE1-Up**Part No.:** 3E-6654**S/N:** BFG1-Up**Part No.:** 3E-6654**S/N:** PEG1-Up**Part No.:** 3E-6654**S/N:** AEJ1-Up**Part No.:** 3E-6654**S/N:** ANJ1-Up**Part No.:** 3E-6654**S/N:** CDJ1-Up**Part No.:** 3E-6654**S/N:** FDL1-Up**Part No.:** 3E-6654**S/N:** SDL1-Up**Part No.:** 3E-6654**S/N:** CFM1-Up**Part No.:** 3E-6654**S/N:** 6DN1-Up**Part No.:** 3E-6654**S/N:** 8FN1-Up

Part No.: 3E-6654
S/N: 9HN1-Up

Part No.: 3E-6654
S/N: BGN1-Up

Part No.: 3E-6654
S/N: 2JR1-Up

Part No.: 3E-6654
S/N: 2RR1-Up

Part No.: 3E-6654
S/N: 3MR1-Up

Part No.: 3E-6654
S/N: 3NR1-Up

Part No.: 3E-6654
S/N: 3YR1-Up

Part No.: 3E-6654
S/N: 4MR1-Up

Part No.: 3E-6654
S/N: 5CR1-Up

Part No.: 3E-6654
S/N: 5LR1-Up

Part No.: 3E-6654
S/N: 6DR1-Up

Part No.: 3E-6654
S/N: 7JR1-Up

Part No.: 3E-6654
S/N: DER1-Up

Part No.: 3E-6654
S/N: 1CS1-Up

Part No.: 3E-6654
S/N: 1XS1-Up

Part No.: 3E-6654
S/N: 1YS1-Up

Part No.: 3E-6654
S/N: 1ZS1-Up

Part No.: 3E-6654
S/N: 2AS1-Up

Part No.: 3E-6654
S/N: 2ES1-Up

Part No.: 3E-6654
S/N: 4DS1-Up

Part No.: 3E-6654
S/N: 4FS1-Up

Part No.: 3E-6654
S/N: 4RS1-Up

Part No.: 3E-6654
S/N: 4SS1-Up

Part No.: 3E-6654
S/N: 5BS1-Up

Part No.: 3E-6654
S/N: 5LS1-Up

Part No.: 3E-6654
S/N: 5MS1-Up

Part No.: 3E-6654
S/N: 7KS1-Up

Part No.: 3E-6654
S/N: 9FS1-Up

Part No.: 3E-6654
S/N: 9GS1-Up

Part No.: 3E-6654
S/N: 9WS1-Up

Part No.: 3E-6654
S/N: AGS1-Up

Part No.: 3E-6654
S/N: ANS1-Up

Part No.: 3E-6654
S/N: CLS1-Up

Part No.: 3E-6654
S/N: DET1-Up

Part No.: 3E-6654
S/N: 2KW1-Up

Part No.: 3E-6654
S/N: 2NW1-Up

Part No.: 3E-6654
S/N: 2SW1-Up

Part No.: 3E-6654
S/N: 5SW1-Up

Part No.: 3E-6654
S/N: 6LW1-Up

Part No.: 3E-6654
S/N: 6SW1-Up

Part No.: 3E-6654
S/N: 9NW1-Up

Part No.: 3E-6654
S/N: 9WW1-Up

Part No.: 3E-6654
S/N: DCW1-Up

Part No.: 3E-6654
S/N: CDY1-Up

Part No.: 3E-6654
S/N: CTY1-Up

Part No.: 3E-6654
S/N: SJY1-Up

Part No.: 3E-6654
S/N: 2WZ1-Up

Part No.: 3E-6654
S/N: 3YZ1-Up

Part No.: 3E-6654
S/N: 5EZ1-Up

Part No.: 3E-6654
S/N: 6DZ1-Up

Part No.: 3E-6654
S/N: 7ZZ1-Up

Part No.: 3E-6654
S/N: 8GZ1-Up

Part No.: 3E-6654
S/N: 9PZ1-Up

Part No.: 3E-6654
S/N: 9TZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

312B Refrigerant Capacities

312B

6SW1-Up	1.0 kg (2.2 lb)
9NW1-Up	1.0 kg (2.2 lb)

312B L

9FS1-Up	1.0 kg (2.2 lb)
2KW1-Up	1.0 kg (2.2 lb)

315B Refrigerant Capacities

315B L

5SW1-Up	1.5 kg (3.3 lb)

317B Refrigerant Capacities

317B

9WW1-Up	1.5 kg (3.3 lb)

317B N

6DZ1-Up	1.5 kg (3.3 lb)

318B Refrigerant Capacities

318B L

ADC1-Up	1.5 kg (3.3 lb)

318B LN

AEJ1-Up	1.5 kg (3.3 lb)

320B Refrigerant Capacities

320B

1XS1-Up	1.7 kg (3.7 lb)
1XS1-Up	1.7 kg (3.7 lb)
1CS1-Up	1.0 kg (2.2 lb)
2WZ1-Up	0.9 kg (2.0 lb)
3MR1-Up	0.9 kg (2.0 lb)
4FS1-Up	0.9 kg (2.0 lb)
4MR1-Up	0.9 kg (2.0 lb)
7ZZ1-Up	0.9 kg (2.0 lb)
8GZ1-Up	1.7 kg (3.7 lb)
9CS2902-Up	1.1 kg (2.4 lb)

320B L

7JR1-Up	1.7 kg (3.7 lb)
2AS1-Up	1.7 kg (3.7 lb)
9WS1-Up	1.7 kg (3.7 lb)
6LW1-Up	1.7 kg (3.7 lb)

320B LN

3YZ1-Up	1.7 kg (3.7 lb)

320B S

5MS1-Up	1.7 kg (3.7 lb)

322B Refrigerant Capacities

322B

1YS1-Up	1.7 kg (3.7 lb)
3NR1-Up	1.0 kg (2.2 lb)
5CR1-Up	1.0 kg (2.2 lb)

322B L

2ES1-Up	1.7 kg (3.7 lb)

322B LN

1ZS1-Up	1.7 kg (3.7 lb)

325B Refrigerant Capacities

325B L

2JR1-Up	1.7 kg (3.7 lb)
6DN1-Up	1.7 kg (3.7 lb)
8FN1-Up	1.7 kg (3.7 lb)
4DS1-Up	1.7 kg (3.7 lb)
5BS1-Up	1.7 kg (3.7 lb)

M325B Refrigerant Capacities

M325B L

BGN1-Up	1.7 kg (3.7 lb)

330B Refrigerant Capacities

330B

AME1-Up	1.7 kg (3.7 lb)
4RS1-Up	1.7 kg (3.7 lb)
2RR1-Up	1.2 kg (2.6 lb)
3ZZ1-Up	1.1 kg (2.4 lb)
4YW1-Up	1.1 kg (2.4 lb)
5EZ1-Up	1.2 kg (2.6 lb)
9HN1-Up	1.2 kg (2.6 lb)

330B L

3YR1-Up	1.7 kg (3.7 lb)
6DR1-Up	1.7 kg (3.7 lb)
5LS1-Up	1.7 kg (3.7 lb)

330B LN

5LR1-Up	1.7 kg (3.7 lb)

345B Refrigerant Capacities

345B

BFG1-Up	2.2 kg (4.8 lb)
2NW1-Up	2.2 kg (4.8 lb)

345B L

4SS1-Up	2.2 kg (4.8 lb)
7KS1-Up	2.2 kg (4.8 lb)
9GS1-Up	2.2 kg (4.8 lb)
2SW1-Up	2.2 kg (4.8 lb)

345B MH

APB1-Up	2.2 kg (4.8 lb)

345B Series II Refrigerant Capacities

345B Series II

ALB1-Up	2.2 kg (4.8 lb)
CCC1-Up	2.2 kg (4.8 lb)
FEE1-Up	2.2 kg (4.8 lb)
ANJ1-Up	2.2 kg (4.8 lb)
CDJ1-Up	2.2 kg (4.8 lb)
AGS1-Up	2.2 kg (4.8 lb)
DET1-Up	2.2 kg (4.8 lb)
DCW1-Up	2.2 kg (4.8 lb)

345B Series II MH

APB1-Up	2.2 kg (4.8 lb)
CFM1-Up	2.2 kg (4.8 lb)

W345B Series II Refrigerant Capacities

W345B Series II

CDY1-Up	2.2 kg (4.8 lb)

365B Refrigerant Capacities

365B L

9PZ1-Up	1.9 kg (4.2 lb)
9TZ1-Up	1.9 kg (4.2 lb)

365B MH

CTY1-Up	1.9 kg (4.2 lb)

365B Series II Refrigerant Capacities

365B Series II

JMB1-Up	1.9 kg (4.2 lb)
DER1-Up	1.9 kg (4.2 lb)
BTH1-Up	1.5 kg (3.3 lb)

365B Series II MH

SDL1-Up	1.9 kg (4.2 lb)

365B Series II FS

PEG1-Up	1.9 kg (4.2 lb)

385B Refrigerant Capacities

385B

MYA1-Up	2.2 kg (4.8 lb)
RCD1-Up	2.2 kg (4.8 lb)
CLS1-Up	2.2 kg (4.8 lb)

385B L

FDL1-Up	2.2 kg (4.8 lb)
ANS1-Up	2.2 kg (4.8 lb)

5090B Refrigerant Capacities

5090B

CLD1-Up	2.2 kg (4.8 lb)
SJY1-Up	2.2 kg (4.8 lb)

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System Capacities for Refrigerant (Excavators) (312C, 322C-330C, TK1051)

SMCS Code: 1809

Part No.: 3E-6654

S/N: D3C1-Up

Part No.: 3E-6654
S/N: S2C1-Up

Part No.: 3E-6654
S/N: BFE1-Up

Part No.: 3E-6654
S/N: BPH1-Up

Part No.: 3E-6654
S/N: M2H1-Up

Part No.: 3E-6654
S/N: BKJ1-Up

Part No.: 3E-6654
S/N: B1K1-Up

Part No.: 3E-6654
S/N: HEK1-Up

Part No.: 3E-6654
S/N: M2K1-Up

Part No.: 3E-6654
S/N: B2L1-Up

Part No.: 3E-6654
S/N: G1L1-Up

Part No.: 3E-6654
S/N: B3M1-Up

Part No.: 3E-6654
S/N: CAM1-Up

Part No.: 3E-6654
S/N: S3M1-Up

Part No.: 3E-6654
S/N: B4N1-Up

Part No.: 3E-6654
S/N: BNN1-Up

Part No.: 3E-6654
S/N: Y4P1-Up

Part No.: 3E-6654
S/N: C3R1-Up

Part No.: 3E-6654
S/N: LAR1-Up

Part No.: 3E-6654
S/N: CBT1-Up

Part No.: 3E-6654
S/N: SLX1-Up

Part No.: 3E-6654
S/N: CBY1-Up

Part No.: 3E-6654
S/N: DKY1-Up

Part No.: 3E-6654
S/N: 9HZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

312C Refrigerant Capacities

312C

BNN1-Up 0.80 kg (1.8 lb)

312C L

CBT1-Up 0.80 kg (1.8 lb)

322C Refrigerant Capacities

322C

BPH1-Up 1.30 kg (2.9 lb)

CAM1-Up 1.30 kg (2.9 lb)

CBY1-Up 1.30 kg (2.9 lb)

SLX1-Up 1.30 kg (2.9 lb)

322C L

BKJ1-Up 1.40 kg (3.09 lb)

HEK1-Up 1.05 kg (2.32 lb)

322C FM

M2H1-Up 1.30 kg (3 lb)

C3R1-Up 1.30 kg (3 lb)

LAR1-Up 1.30 kg (3 lb)

325C Refrigerant Capacities

325C FM

M2K1-Up 1.30 kg (2.9 lb)

G1L1-Up 1.30 kg (2.9 lb)

S3M1-Up 1.30 kg (2.9 lb)

Y4P1-Up 1.30 kg (2.9 lb)

325C L

BFE1-Up 1.05 kg (2.32 lb)

325C MH

S2C1-Up 1.30 kg (2.9 lb)

330C Refrigerant Capacities

330C

B1K1-Up 1.30 kg (2.9 lb)

B3M1-Up 1.30 kg (2.9 lb)

B4N1-Up 1.30 kg (2.9 lb)

330C L

DKY1-Up 1.05 kg (2.32 lb)

330C FM

B2L1-Up 1.05 kg (2.32 lb)

330C MH

D3C1-Up 1.30 kg (2.9 lb)

TK1051 Refrigerant Capacities

TK1051

9HZ1-Up 1.30 kg (2.9 lb)

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System Capacities for Refrigerant (Excavators) (312C-330C)

SMCS Code: 1809

Part No.: 3E-6654
S/N: APA1-Up

Part No.: 3E-6654
S/N: BEA1-Up

Part No.: 3E-6654
S/N: CBA1-Up

Part No.: 3E-6654
S/N: CYA1-Up

Part No.: 3E-6654
S/N: DAA1-Up

Part No.: 3E-6654
S/N: EGA1-Up

Part No.: 3E-6654
S/N: FAA1-Up

Part No.: 3E-6654
S/N: GLA1-Up

Part No.: 3E-6654
S/N: GPA1-Up

Part No.: 3E-6654
S/N: MCA1-Up

Part No.: 3E-6654
S/N: ANB1-Up

Part No.: 3E-6654
S/N: BDB1-Up

Part No.: 3E-6654
S/N: BGB1-Up

Part No.: 3E-6654
S/N: CFB1-Up

Part No.: 3E-6654
S/N: CRB1-Up

Part No.: 3E-6654
S/N: JAB1-Up

Part No.: 3E-6654
S/N: MAB1-Up

Part No.: 3E-6654
S/N: PAB1-Up

Part No.: 3E-6654
S/N: AMC1-Up

Part No.: 3E-6654
S/N: BDC1-Up

Part No.: 3E-6654
S/N: CJC1-Up

Part No.: 3E-6654
S/N: JLC1-Up

Part No.: 3E-6654
S/N: MAC1-Up

Part No.: 3E-6654
S/N: PAC1-Up

Part No.: 3E-6654
S/N: BTD1-Up

Part No.: 3E-6654
S/N: CCD1-Up

Part No.: 3E-6654
S/N: FED1-Up

Part No.: 3E-6654
S/N: GAD1-Up

Part No.: 3E-6654
S/N: JCD1-Up

Part No.: 3E-6654
S/N: JLD1-Up

Part No.: 3E-6654
S/N: KDD1-Up

Part No.: 3E-6654
S/N: AKE1-Up

Part No.: 3E-6654
S/N: BDE1-Up

Part No.: 3E-6654
S/N: NAE1-Up

Part No.: 3E-6654
S/N: ALF1-Up

Part No.: 3E-6654
S/N: ANF1-Up

Part No.: 3E-6654
S/N: DTF1-Up

Part No.: 3E-6654
S/N: BTG1-Up

Part No.: 3E-6654
S/N: DBG1-Up

Part No.: 3E-6654
S/N: EAG1-Up

Part No.: 3E-6654
S/N: GNG1-Up

Part No.: 3E-6654
S/N: JTG1-Up

Part No.: 3E-6654
S/N: AKH1-Up

Part No.: 3E-6654
S/N: AMH1-Up

Part No.: 3E-6654
S/N: BWH1-Up

Part No.: 3E-6654
S/N: DAH1-Up

Part No.: 3E-6654
S/N: SAH1-Up

Part No.: 3E-6654
S/N: CSJ1-Up

Part No.: 3E-6654
S/N: AXK1-Up

Part No.: 3E-6654
S/N: BFK1-Up

Part No.: 3E-6654
S/N: BKK1-Up

Part No.: 3E-6654
S/N: JNK1-Up

Part No.: 3E-6654
S/N: BBL1-Up

Part No.: 3E-6654
S/N: EGL1-Up

Part No.: 3E-6654
S/N: JPL1-Up

Part No.: 3E-6654
S/N: KGL1-Up

Part No.: 3E-6654
S/N: BKM1-Up

Part No.: 3E-6654
S/N: BMM1-Up

Part No.: 3E-6654
S/N: CLM1-Up

Part No.: 3E-6654
S/N: MKM1-Up

Part No.: 3E-6654
S/N: BCN1-Up

Part No.: 3E-6654
S/N: BNN1-Up

Part No.: 3E-6654
S/N: DBN1-Up

Part No.: 3E-6654
S/N: SBN1-Up

Part No.: 3E-6654
S/N: BLP1-Up

Part No.: 3E-6654
S/N: CAP1-Up

Part No.: 3E-6654
S/N: BER1-Up

Part No.: 3E-6654
S/N: BGR1-Up

Part No.: 3E-6654
S/N: BPR1-Up

Part No.: 3E-6654
S/N: EMR1-Up

Part No.: 3E-6654
S/N: MAR1-Up

Part No.: 3E-6654
S/N: TBR1-Up

Part No.: 3E-6654
S/N: FDS1-Up

Part No.: 3E-6654
S/N: CBT1-Up

Part No.: 3E-6654
S/N: CFT1-Up

Part No.: 3E-6654
S/N: HKT1-Up

Part No.: 3E-6654
S/N: BKW1-Up

Part No.: 3E-6654
S/N: RAW1-Up

Part No.: 3E-6654
S/N: ALX1-Up

Part No.: 3E-6654
S/N: BRX1-Up

Part No.: 3E-6654
S/N: GKX1-Up

Part No.: 3E-6654
S/N: MDY1-Up

Part No.: 3E-6654
S/N: BMZ1-Up

Part No.: 3E-6654
S/N: CGZ1-Up

Part No.: 3E-6654
S/N: CLZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

312C Refrigerant Capacities

312C

DBN1-Up	1 kg (2.2 lb)
FDS1-Up	1 kg (2.2 lb)

312C High Ambient Cooling

BNN1-Up	0.95 kg (2.1 lb)

312C L

CBA1-Up	0.95 kg (2.1 lb)
BWH1-Up	1 kg (2.2 lb)

312C High Ambient Cooling

CBT1-Up	1 kg (2.2 lb)

315C Refrigerant Capacities

315C

CFB1-Up	0.9 kg (2.0 lb)
AKE1-Up	1 kg (2.2 lb)
CFT1-Up	1 kg (2.2 lb)

315C L

CJC1-Up	1 kg (2.2 lb)
ANF1-Up	0.9 kg (2.0 lb)

318C Refrigerant Capacities

318C

FAA1-Up	0.8 kg (1.8 lb)
GPA1-Up	1 kg (2.2 lb)
BTG1-Up	0.8 kg (1.8 lb)
DAH1-Up	0.8 kg (1.8 lb)
MDY1-Up	1 kg (2.2 lb)
CWP1-Up	0.9 kg (2.0 lb)

319C Refrigerant Capacities

319C LN

KGL1-Up	0.8 kg (1.8 lb)

320C Refrigerant Capacities

320C

MAB1-Up	1 kg (2.2 lb)
AMC1-Up	1 kg (2.2 lb)

BDC1-Up	1 kg (2.2 lb)
CCD1-Up	1 kg (2.2 lb)
NAE1-Up	1 kg (2.2 lb)
DBG1-Up	0.9 kg (2.0 lb)
GNG1-Up	1 kg (2.2 lb)
BCN1-Up	1 kg (2.2 lb)
BPR1-Up	1 kg (2.2 lb)
RAW1-Up	1 kg (2.2 lb)
AKH1-Up	1 kg (2.2 lb)
ALF1-Up	1 kg (2.2 lb)
ALX1-Up	1 kg (2.2 lb)
APA1-Up	1 kg (2.2 lb)
BDB1-Up	1 kg (2.2 lb)

320C L

GLA1-Up	0.9 kg (2.0 lb)
ANB1-Up	1 kg (2.2 lb)
PAB1-Up	1 kg (2.2 lb)
BDE1-Up	1 kg (2.2 lb)
EAG1-Up	0.9 kg (2.0 lb)
SBN1-Up	1 kg (2.2 lb)
BER1-Up	1 kg (2.2 lb)
HKT1-Up	1 kg (2.2 lb)
BRX1-Up	1 kg (2.2 lb)

320C LN

BEA1-Up	1 kg (2.2 lb)
JTG1-Up	0.9 kg (2.0 lb)
AXK1-Up	0.9 kg (2.0 lb)

320C LRR

GAD1-Up	0.9 kg (2.0 lb)

320C S

BBL1-Up	0.9 kg (2.0 lb)
EGL1-Up	0.9 kg (2.0 lb)
BMZ1-Up	0.9 kg (2.0 lb)

320C U

MAC1-Up	0.9 kg (2.0 lb)
CLM1-Up	1 kg (2.2 lb)

320C LU

PAC1-Up	1 kg (2.2 lb)
CLZ1-Up	1 kg (2.2 lb)

320C MH

EGA1-Up	0.9 kg (2.0 lb)
JPL1-Up	0.9 kg (2.0 lb)

320C FM

BGB1-Up	1.4 kg (3.1 lb)
BKK1-Up	1.4 kg (3.1 lb)
TBR1-Up	1.4 kg (3.1 lb)
SAH1-Up	1.4 kg (3.1 lb)

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322C Refrigerant Capacities**322C**

DAA1-Up	1.0 kg (2.2 lb)
BLP1-Up	0.9 kg (2.0 lb)

322C L

FED1-Up	1 kg (2.2 lb)
BKM1-Up	0.9 kg (2.0 lb)
BGR1-Up	1 kg (2.2 lb)
MAR1-Up	1 kg (2.2 lb)

322C LN

BFK1-Up	1 kg (2.2 lb)
EMR1-Up	1 kg (2.2 lb)

325C Refrigerant Capacities**325C**

JLD1-Up	1 kg (2.2 lb)
DTF1-Up	1 kg (2.2 lb)
AMH1-Up	0.9 kg (2.0 lb)
BKW1-Up	0.9 kg (2.0 lb)

325C L

CRB1-Up	0.9 kg (2.0 lb)
JLC1-Up	1 kg (2.2 lb)
BTD1-Up	0.9 kg (2.0 lb)
BMM1-Up	0.9 kg (2.0 lb)

325C LN

CSJ1-Up	0.9 kg (2.0 lb)

330C Refrigerant Capacities**330C**

MCA1-Up	1 kg (2.2 lb)
JAB1-Up	1 kg (2.2 lb)
JCD1-Up	1 kg (2.2 lb)

330C L

CYA1-Up	0.9 kg (2.0 lb)
KDD1-Up	1 kg (2.2 lb)
JNK1-Up	1 kg (2.2 lb)
CAP1-Up	1 kg (2.2 lb)
GKX1-Up	1 kg (2.2 lb)

330C LN

CGZ1-Up	1 kg (2.2 lb)

330C MH

MKM1-Up	1 kg (2.2 lb)

**System Capacities for
Refrigerant (Excavators)
(312E - 349E)****SMCS Code:** 1809**Part No.:** 3E-6654
S/N: FJB1-Up**Part No.:** 3E-6654
S/N: GAC1-Up**Part No.:** 3E-6654
S/N: KED1-Up**Part No.:** 3E-6654
S/N: MJD1-Up**Part No.:** 3E-6654
S/N: RLD1-Up**Part No.:** 3E-6654
S/N: ZCD1-Up**Part No.:** 3E-6654
S/N: DGE1-Up**Part No.:** 3E-6654
S/N: KTE1-Up**Part No.:** 3E-6654
S/N: SXE1-Up**Part No.:** 3E-6654
S/N: YCE1-Up**Part No.:** 3E-6654
S/N: DZF1-Up**Part No.:** 3E-6654
S/N: TLF1-Up**Part No.:** 3E-6654
S/N: DFG1-Up**Part No.:** 3E-6654
S/N: LDG1-Up**Part No.:** 3E-6654
S/N: SPG1-Up**Part No.:** 3E-6654
S/N: TEG1-Up**Part No.:** 3E-6654
S/N: TFG1-Up**Part No.:** 3E-6654
S/N: FJH1-Up**Part No.:** 3E-6654
S/N: RGH1-Up**Part No.:** 3E-6654
S/N: GTJ1-Up

Part No.: 3E-6654
S/N: JRJ1-Up

Part No.: 3E-6654
S/N: TNJ1-Up

Part No.: 3E-6654
S/N: LAK1-Up

Part No.: 3E-6654
S/N: WBK1-Up

Part No.: 3E-6654
S/N: WJK1-Up

Part No.: 3E-6654
S/N: PNL1-Up

Part No.: 3E-6654
S/N: PZL1-Up

Part No.: 3E-6654
S/N: KCN1-Up

Part No.: 3E-6654
S/N: LHN1-Up

Part No.: 3E-6654
S/N: RAP1-Up

Part No.: 3E-6654
S/N: YEP1-Up

Part No.: 3E-6654
S/N: YRP1-Up

Part No.: 3E-6654
S/N: CMR1-Up

Part No.: 3E-6654
S/N: AWS1-Up

Part No.: 3E-6654
S/N: WZS1-Up

Part No.: 3E-6654
S/N: KLT1-Up

Part No.: 3E-6654
S/N: TST1-Up

Part No.: 3E-6654
S/N: DZW1-Up

Part No.: 3E-6654
S/N: MEW1-Up

Part No.: 3E-6654
S/N: MZW1-Up

Part No.: 3E-6654
S/N: PLW1-Up

Part No.: 3E-6654
S/N: PNW1-Up

Part No.: 3E-6654
S/N: TDW1-Up

Part No.: 3E-6654
S/N: KFX1-Up

Part No.: 3E-6654
S/N: RDX1-Up

Part No.: 3E-6654
S/N: TFX1-Up

Part No.: 3E-6654
S/N: BZY1-Up

Part No.: 3E-6654
S/N: PTY1-Up

Part No.: 3E-6654
S/N: WEY1-Up

Part No.: 3E-6654
S/N: WZY1-Up

Part No.: 3E-6654
S/N: JCZ1-Up

Part No.: 3E-6654
S/N: MPZ1-Up

Part No.: 3E-6654
S/N: NAZ1-Up

Part No.: 3E-6654
S/N: TMZ1-Up

Part No.: 3E-6654
S/N: WHZ1-Up

Part No.: 3E-6654
S/N: YZZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to the Testing and Adjusting, "Refrigerant System - Charge".

312E Refrigerant Capacities

312E

GAC1-Up	0.9 kg (2.0 lb)
PZL1-Up	0.9 kg (2.0 lb)

312E L

MJD1-Up	0.9 kg (2.0 lb)
WEY1-Up	0.9 kg (2.0 lb)

316E Refrigerant Capacities

316E L

DZW1-Up	1 kg (2.2 lb)
WZY1-Up	1 kg (2.2 lb)
YZZ1-Up	1 kg (2.2 lb)

318E Refrigerant Capacities

318E

WZS1-Up	1 kg (2.2 lb)
DZF1-Up	1 kg (2.2 lb)

320E Refrigerant Capacities

320E

SXE1-Up	1 kg (2.2 lb)
AWS1-Up	1 kg (2.2 lb)

320E L

TNJ1-Up	1 kg (2.2 lb)
LAK1-Up	1 kg (2.2 lb)
WBK1-Up	1 kg (2.2 lb)
KLT1-Up	1 kg (2.2 lb)
NAZ1-Up	1 kg (2.2 lb)

320E LN

DFG1-Up	1 kg (2.2 lb)

320E RR

LHN1-Up	1 kg (2.2 lb)

320E LRR

PNL1-Up	1 kg (2.2 lb)
MEW1-Up	1 kg (2.2 lb)
TFX1-Up	1 kg (2.2 lb)

323E Refrigerant Capacities

323E L

RAP1-Up	1 kg (2.2 lb)

323E LN

TDW1-Up	1 kg (2.2 lb)

323E SA

YRP1-Up	1 kg (2.2 lb)

324E Refrigerant Capacities

324E

JCZ1-Up	0.9 kg (2.0 lb)

324E L

KTE1-Up	0.9 kg (2.0 lb)
TLF1-Up	0.9 kg (2.0 lb)
PNW1-Up	0.9 kg (2.0 lb)

324E LN

LDG1-Up	0.9 kg (2.0 lb)

329E Refrigerant Capacities

329E

PTY1-Up	0.9 kg (2.0 lb)

329E L

ZCD1-Up	0.9 kg (2.0 lb)
WJK1-Up	0.9 kg (2.0 lb)
TST1-Up	0.9 kg (2.0 lb)
PLW1-Up	0.9 kg (2.0 lb)
RDX1-Up	0.9 kg (2.0 lb)

329E LN

RLD1-Up	0.9 kg (2.0 lb)

336E Refrigerant Capacities

336E

KED1-Up	0.9 kg (2.0 lb)
CMR1-Up	0.9 kg (2.0 lb)

336E L

TEG1-Up	0.9 kg (2.0 lb)
FJH1-Up	0.9 kg (2.0 lb)
GTJ1-Up	0.9 kg (2.0 lb)
JRJ1-Up	0.9 kg (2.0 lb)
YCE1-Up	0.9 kg (2.0 lb)
YEP1-Up	0.9 kg (2.0 lb)
BZY1-Up	0.9 kg (2.0 lb)

336E LN

TMZ1-Up	0.9 kg (2.0 lb)

349E Refrigerant Capacities

349E

FJB1-Up	0.9 kg (2.0 lb)
RGH1-Up	0.9 kg (2.0 lb)

349E L

DGE1-Up	0.9 kg (2.0 lb)
SPG1-Up	0.9 kg (2.0 lb)
TFG1-Up	0.9 kg (2.0 lb)
KCN1-Up	0.9 kg (2.0 lb)
MZW1-Up	0.9 kg (2.0 lb)
KFX1-Up	0.9 kg (2.0 lb)
MPZ1-Up	0.9 kg (2.0 lb)
WHZ1-Up	0.9 kg (2.0 lb)

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System Capacities for Refrigerant (Excavators) (324D FM, 325D FM, 330D FM, 568 FM)

SMCS Code: 1809

Part No.: 3E-6654
S/N: BRB1-Up

Part No.: 3E-6654
S/N: C7K1-Up

Part No.: 3E-6654
S/N: E4K1-Up

Part No.: 3E-6654
S/N: H3K1-Up

Part No.: 3E-6654
S/N: JGK1-Up

Part No.: 3E-6654
S/N: L2K1-Up

Part No.: 3E-6654
S/N: C8L1-Up

Part No.: 3E-6654
S/N: C9M1-Up

Part No.: 3E-6654
S/N: JKR1-Up

Part No.: 3E-6654
S/N: JLS1-Up

Part No.: 3E-6654
S/N: YJX1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

324D FM Refrigerant Capacities

324D FM

JGK1-Up	1.3 kg (2.87 lb)
JKR1-Up	1.3 kg (2.87 lb)
JLS1-Up	1.3 kg (2.87 lb)

325D FM Refrigerant Capacities

325D FM

C7K1-Up	1.3 kg (2.87 lb)
C8L1-Up	1.3 kg (2.87 lb)
C9M1-Up	1.3 kg (2.87 lb)

330D FM Refrigerant Capacities

330D FM

E4K1-Up	1.3 kg (2.87 lb)
H3K1-Up	1.3 kg (2.87 lb)
L2K1-Up	1.3 kg (2.87 lb)

568 Refrigerant Capacities

568 FM

BRB1-Up	1.2 kg (2.65 lb)
YJX1-Up	1.2 kg (2.65 lb)

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System Capacities for Refrigerant (Excavators) (345C-385C)

SMCS Code: 1809

Part No.: 3E-6654
S/N: EDA1-Up

Part No.: 3E-6654
S/N: MMA1-Up

Part No.: 3E-6654
S/N: TBA1-Up

Part No.: 3E-6654
S/N: KGB1-Up

Part No.: 3E-6654
S/N: ELC1-Up

Part No.: 3E-6654
S/N: FPC1-Up

Part No.: 3E-6654
S/N: GWC1-Up

Part No.: 3E-6654
S/N: KBC1-Up

Part No.: 3E-6654
S/N: SPC1-Up

Part No.: 3E-6654
S/N: ESD1-Up

Part No.: 3E-6654
S/N: MTE1-Up

Part No.: 3E-6654
S/N: SBE1-Up

Part No.: 3E-6654
S/N: T2E1-Up

Part No.: 3E-6654
S/N: WDE1-Up

Part No.: 3E-6654
S/N: MSF1-Up

Part No.: 3E-6654
S/N: T2F1-Up

Part No.: 3E-6654
S/N: TDG1-Up

Part No.: 3E-6654
S/N: GPH1-Up

Part No.: 3E-6654
S/N: TAJ1-Up

Part No.: 3E-6654
S/N: KKK1-Up

Part No.: 3E-6654
S/N: GCL1-Up

Part No.: 3E-6654
S/N: EAM1-Up

Part No.: 3E-6654
S/N: JCM1-Up

Part No.: 3E-6654
S/N: MEM1-Up

Part No.: 3E-6654
S/N: S5M1-Up

Part No.: 3E-6654
S/N: FEN1-Up

Part No.: 3E-6654
S/N: SCN1-Up

Part No.: 3E-6654
S/N: DHP1-Up

Part No.: 3E-6654
S/N: M2R1-Up

Part No.: 3E-6654
S/N: PAR1-Up

Part No.: 3E-6654
S/N: D3S1-Up

Part No.: 3E-6654
S/N: ELS1-Up

Part No.: 3E-6654
S/N: LYS1-Up

Part No.: 3E-6654
S/N: MCS1-Up

Part No.: 3E-6654
S/N: PJW1-Up

Part No.: 3E-6654
S/N: WAW1-Up

Part No.: 3E-6654
S/N: BWY1-Up

Part No.: 3E-6654
S/N: MCY1-Up

Part No.: 3E-6654
S/N: MNZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

345C Refrigerant Capacities

345C

BWY1-UP 0.9 kg (2.0 lb)

345C L

TBA1-UP 0.9 kg (2.0 lb)
FPC1-UP 0.9 kg (2.0 lb)
SPC1-UP 0.9 kg (2.0 lb)
ESD1-UP 0.9 kg (2.0 lb)
WDE1-UP 0.9 kg (2.0 lb)
TDG1-UP 0.9 kg (2.0 lb)
GPH1-UP 0.9 kg (2.0 lb)
TAJ1-UP 0.9 kg (2.0 lb)
GCL1-UP 0.9 kg (2.0 lb)
SCN1-UP 0.9 kg (2.0 lb)
DHP1-UP 0.9 kg (2.0 lb)
GJR1-UP 0.9 kg (2.0 lb)
ELS1-UP 0.9 kg (2.0 lb)
LYS1-UP 0.9 kg (2.0 lb)
PJW1-UP 0.9 kg (2.0 lb)
S5M1-UP 0.9 kg (2.0 lb)

345C MH

MTE1-UP 1.1 kg (2.4 lb)
M2R1-UP 1.1 kg (2.4 lb)
D3S1-UP 1.1 kg (2.4 lb)

365C Refrigerant Capacities

365C L

ELC1-UP 1.1 kg (2.4 lb)
FEN1-UP 1.1 kg (2.4 lb)
MEM1-UP 1.1 kg (2.4 lb)
MCS1-UP 1.1 kg (2.4 lb)
MCY1-UP 1.1 kg (2.4 lb)

365C MH

GWC1-UP 1.1 kg (2.4 lb)

365C FS

PAR1-UP 1.1 kg (2.4 lb)

385C Refrigerant Capacities

385C

KBC1-UP 1.1 kg (2.4 lb)

JCM1-UP	1.1 kg (2.4 lb)
MNZ1-UP	1.1 kg (2.4 lb)
MSF1-UP	1.1 kg (2.4 lb)

385C L

EDA1-UP	1.1 kg (2.4 lb)
KGB1-UP	1.1 kg (2.4 lb)
SBE1-UP	1.1 kg (2.4 lb)
T2E1-UP	1.1 kg (2.4 lb)
KKK1-UP	1.1 kg (2.4 lb)

385C MH

WAW1-UP	1.1 kg (2.4 lb)

385C FS

MMA1-UP	1.1 kg (2.4 lb)
T2F1-UP	1.1 kg (2.4 lb)
EAM1-UP	1.1 kg (2.4 lb)
GLT1-UP	1.1 kg (2.4 lb)

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System Capacities for Refrigerant (Excavators) (M312 - M320)

SMCS Code: 1809

S/N: 6TL1-Up

S/N: 6WL1-Up

S/N: 7ML1-Up

S/N: 8AL1-Up

S/N: 6ES1-Up

S/N: 8SS1-Up

S/N: 9PS1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

M312 Refrigerant Capacities

M312

6TL1-UP	1.3 kg (2.9 lb)

M315 Refrigerant Capacities

M315

7ML1-UP	1.3 kg (2.9 lb)

M318 Refrigerant Capacities

M318

8AL1-UP	1.3 kg (2.9 lb)
6ES1-UP	1.3 kg (2.9 lb)
8SS1-UP	1.3 kg (2.9 lb)

M320 Refrigerant Capacities

M320

6WL1-UP	1.3 kg (2.9 lb)
9PS1-UP	1.3 kg (2.9 lb)

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System Capacities for Refrigerant (Excavators) (M313C - M325C)

SMCS Code: 1809

Part No.: 3E-6654
S/N: H2A1-Up

Part No.: 3E-6654
S/N: XJA1-Up

Part No.: 3E-6654
S/N: BEB1-Up

Part No.: 3E-6654
S/N: H2B1-Up

Part No.: 3E-6654
S/N: H2C1-Up

Part No.: 3E-6654
S/N: H2D1-Up

Part No.: 3E-6654
S/N: H2E1-Up

Part No.: 3E-6654
S/N: H2F1-Up

Part No.: 3E-6654
S/N: H2G1-Up

Part No.: 3E-6654
S/N: BDK1-Up

Part No.: 3E-6654
S/N: BDM1-Up

Part No.: 3E-6654
S/N: PAN1-Up

Part No.: 3E-6654
S/N: BDR1-Up

Part No.: 3E-6654
S/N: BDX1-Up

Part No.: 3E-6654
S/N: BDY1-Up

Part No.: 3E-6654
S/N: BCZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

M313C Refrigerant Capacities

M313C

BDR1-UP 2.2 kg (4.85 lb)
H2A1-UP 2.2 kg (4.85 lb)

M315C Refrigerant Capacities

M315C

BDM1-UP 2.2 kg (4.85 lb)
H2B1-UP 2.2 kg (4.85 lb)

M316C Refrigerant Capacities

M316C

BDX1-UP 2.2 kg (4.85 lb)
H2C1-UP 2.2 kg (4.85 lb)

M318C Refrigerant Capacities

M318C

BCZ1-UP 2.2 kg (4.85 lb)
H2D1-UP 2.2 kg (4.85 lb)

M318C MH

BEB1-UP 2.5 kg (5.50 lb)
H2F1-UP 2.5 kg (5.50 lb)

M322C Refrigerant Capacities

M322C

BDK1-UP 2.2 kg (4.85 lb)
H2E1-UP 2.2 kg (4.85 lb)

M322C MH

BDY1-UP 2.5 kg (5.50 lb)
H2G1-UP 2.5 kg (5.50 lb)

M325C Refrigerant Capacities

M325C MH

XJA1-UP 1.0 kg (2.2 lb)
PAN1-UP 1.0 kg (2.2 lb)

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System Capacities for Refrigerant (Excavators) (M313D - M322D)

SMCS Code: 1809

Part No.: 3E-6654

S/N: W6A1-Up

Part No.: 3E-6654

S/N: W3H1-Up

Part No.: 3E-6654

S/N: W5M1-Up

Part No.: 3E-6654

S/N: W8P1-Up

Part No.: 3E-6654

S/N: W8R1-Up

Part No.: 3E-6654

S/N: W2S1-Up

Part No.: 3E-6654

S/N: W2T1-Up

Part No.: 3E-6654

S/N: D2W1-Up

Part No.: 3E-6654

S/N: D6W1-Up

Part No.: 3E-6654

S/N: D8W1-Up

S/N: D3X1-Up

S/N: D9X1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

Note: Only for use with machines that are equipped with a 252-9822 Cab Riser Ar.

M313D Refrigerant Capacities

M313D

W3H1-Up 0.85 kg (1.87 lb)

W3H1-Up (Equipped with fixed cab riser) .. 0.9 kg
(1.98 lb)

J3A1-Up 0.85 kg (1.87 lb)

M315D Refrigerant Capacities

M315D

W5M1-Up 0.85 kg (1.87 lb)

W5M1-Up (Equipped with fixed cab riser) .. 0.9 kg
(1.98 lb)

J5B1-Up 0.85 kg (1.87 lb)

M316D Refrigerant Capacities

M316D

W6A1-Up 0.85 kg (1.87 lb)

W6A1-Up (Equipped with fixed cab riser) .. 0.9 kg
(1.98 lb)

D6W1-Up 0.85 kg (1.87 lb)

M318D Refrigerant Capacities

M318D

W8P1-Up 0.85 kg (1.87 lb)

W8P1-Up (Equipped with fixed cab riser) .. 0.9 kg
(1.98 lb)

D8W1-Up 0.85 kg (1.87 lb)

M318D MH

W8R1-Up 1.10 kg (2.43 lb)

D9X1-Up 1.10 kg (2.43 lb)

M322D Refrigerant Capacities

M322D

W2S1-Up 0.85 kg (1.87 lb)

W2S1-Up (Equipped with fixed cab riser) .. 0.9 kg
(1.98 lb)

D2W1-Up 0.85 kg (1.87 lb)

M322D MH

W2T1-Up 1.10 kg (2.43 lb)

D3X1-Up 1.10 kg (2.43 lb)

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System Capacities for Refrigerant (Forest Products)

SMCS Code: 1809

Part No.: 3E-6654

S/N: 1011-Up

Part No.: 3E-6654

S/N: 3011-Up

Part No.: 3E-6654

S/N: 5111-Up

Part No.: 3E-6654

S/N: 5211-Up

Part No.: 3E-6654

S/N: 5411-Up

Part No.: 3E-6654

S/N: 5511-Up

Part No.: 3E-6654
S/N: 1021-Up

Part No.: 3E-6654
S/N: 2021-Up

Part No.: 3E-6654
S/N: 3021-Up

Part No.: 3E-6654
S/N: 5221-Up

Part No.: 3E-6654
S/N: 5321-Up

Part No.: 3E-6654
S/N: 5521-Up

Part No.: 3E-6654
S/N: 1031-Up

Part No.: 3E-6654
S/N: 1041-Up

Part No.: 3E-6654
S/N: 5251-Up

Part No.: 3E-6654
S/N: 5351-Up

Part No.: 3E-6654
S/N: 5451-Up

Part No.: 3E-6654
S/N: F7A1-Up

S/N: TRA1-Up

Part No.: 3E-6654
S/N: F1B1-Up

Part No.: 3E-6654
S/N: F7B1-Up

Part No.: 3E-6654
S/N: HAB1-Up

Part No.: 3E-6654
S/N: JCB1-Up

Part No.: 3E-6654
S/N: P6B1-Up

Part No.: 3E-6654
S/N: F7C1-Up

Part No.: 3E-6654
S/N: F7D1-Up

Part No.: 3E-6654
S/N: P2D1-Up

Part No.: 3E-6654
S/N: WBD1-Up

Part No.: 3E-6654
S/N: AAE1-Up

Part No.: 3E-6654
S/N: B3E1-Up

Part No.: 3E-6654
S/N: HAE1-Up

Part No.: 3E-6654
S/N: WBE1-Up

Part No.: 3E-6654
S/N: B3F1-Up

Part No.: 3E-6654
S/N: HAF1-Up

Part No.: 3E-6654
S/N: CKG1-Up

Part No.: 3E-6654
S/N: F7G1-Up

Part No.: 3E-6654
S/N: HAG1-Up

Part No.: 3E-6654
S/N: WBG1-Up

Part No.: 3E-6654
S/N: P3H1-Up

Part No.: 3E-6654
S/N: TGH1-Up

Part No.: 3E-6654
S/N: WBH1-Up

Part No.: 3E-6654
S/N: ASJ1-Up

Part No.: 3E-6654
S/N: BZJ1-Up

Part No.: 3E-6654
S/N: P5J1-Up

Part No.: 3E-6654
S/N: BZK1-Up

Part No.: 3E-6654
S/N: P4K1-Up

Part No.: 3E-6654
S/N: PAK1-Up

Part No.: 3E-6654
S/N: PBK1-Up

Part No.: 3E-6654
S/N: BZL1-Up

Part No.: 3E-6654
S/N: 1AM1-Up

Part No.: 3E-6654
S/N: 1FM1-Up

Part No.: 3E-6654
S/N: BZM1-Up

Part No.: 3E-6654
S/N: W2M1-Up

Part No.: 3E-6654
S/N: 1DN1-Up

Part No.: 3E-6654
S/N: 7CN1-Up

Part No.: 3E-6654
S/N: 7ZN1-Up

Part No.: 3E-6654
S/N: KBN1-Up

Part No.: 3E-6654
S/N: 4LR1-Up

Part No.: 3E-6654
S/N: 4XR1-Up

Part No.: 3E-6654
S/N: CDR1-Up

Part No.: 3E-6654
S/N: PGR1-Up

Part No.: 3E-6654
S/N: 2RS1-Up

Part No.: 3E-6654
S/N: 3DS1-Up

Part No.: 3E-6654
S/N: 4NS1-Up

Part No.: 3E-6654
S/N: RLS1-Up

Part No.: 3E-6654
S/N: CLT1-Up

Part No.: 3E-6654
S/N: RJT1-Up

Part No.: 3E-6654
S/N: 5WW1-Up

Part No.: 3E-6654
S/N: 6PW1-Up

Part No.: 3E-6654
S/N: SAW1-Up

Part No.: 3E-6654
S/N: 1PZ1-Up

Part No.: 3E-6654
S/N: 2FZ1-Up

Part No.: 3E-6654
S/N: 3KZ1-Up

Part No.: 3E-6654
S/N: 9HZ1-Up

Part No.: 3E-6654
S/N: CZZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

Wheel Skidders

515 Refrigerant Capacities

4LR1-Up 1.6 kg (3.5 lb)

525 Refrigerant Capacities

525

1DN1-Up 1.6 kg (3.5 lb)

525B

3KZ1-Up 1.6 kg (3.5 lb)

525C

5251-Up 1.6 kg (3.5 lb)

535 Refrigerant Capacities

535B

AAE1-Up 1.6 kg (3.5 lb)

535C

5351-Up 1.6 kg (3.5 lb)

545 Refrigerant Capacities

545

2FZ1-Up 1.6 kg (3.5 lb)

545C

5451-Up 1.6 kg (3.5 lb)

Track Skidders

517 Refrigerant Capacities

5WW1-Up 1.6 kg (3.5 lb)

6PW1-Up 1.6 kg (3.5 lb)

527 Refrigerant Capacities

4NS1-Up 1.6 kg (3.5 lb)

2RS1-Up 1.6 kg (3.5 lb)

3DS1-Up 1.6 kg (3.5 lb)

PTR1-Up 1.6 kg (3.5 lb)

JSR1-Up 1.6 kg (3.5 lb)

Knuckleboom Loaders**539 Refrigerant Capacities**

1PZ1-Up 1.5 kg (3.25 lb)

Forwarders**554 Refrigerant Capacities**

1AM1-Up 1.2 kg (2.60 lb)

TGH1-Up 1.10 kg (2.42 lb)

564 Refrigerant Capacities

KBN1-Up 1.14 kg (2.51 lb)

574 Refrigerant Capacities

574

1FM1-Up 1.2 kg (2.60 lb)

574B

CZZ1-Up 1.14 kg (2.51 lb)

RLS1-Up 1.14 kg (2.51 lb)

584 Refrigerant Capacities

584

PAK 2.9 kg (6.5 lb)

584HD

PBK 2.9 kg (6.5 lb)

Wheel Harvesters**550 Refrigerant Capacities**

550

7ZN1-Up 1.2 kg (2.60 lb)

550B

SAW1-Up 1.40 kg (3.09 lb)

560B Refrigerant Capacities

TRA1-Up 1.40 kg (3.09 lb)

570 Refrigerant Capacities

570

4XR1-Up 1.2 kg (2.60 lb)

570B

CKG1-Up 1.40 kg (3.09 lb)

580 Refrigerant Capacities

580

7CN1-Up 1.2 kg (2.6 lb)

580B

CLT1-Up 1.40 kg (3.09 lb)

Wheel Feller Bunchers**TK370 Refrigerant Capacities**

WBD1-Up 1.3 kg (2.9 lb)

TK371 Refrigerant Capacities

WBG1-Up 1.1 kg (2.42 lb)

TK380 Refrigerant Capacities

WBE1-Up 1.1 kg (2.42 lb)

TK381 Refrigerant Capacities

WBH1-Up 1.1 kg (2.42 lb)

533 Refrigerant Capacities

CDR1-Up 1.1 kg (2.42 lb)

543 Refrigerant Capacities

ASJ1-Up 1.1 kg (2.42 lb)

553C Refrigerant Capacities

PGR1-Up 2.5 kg (5.5 lb)

563C Refrigerant Capacities

JCB1-Up 2.5 kg (5.5 lb)

573C Refrigerant Capacities

RJT1-Up 2.5 kg (5.5 lb)

2570C Refrigerant Capacities

F1B1-Up 2.5 kg (5.5 lb)

2670C Refrigerant Capacities

B3E1-Up 2.5 kg (5.5 lb)

HA Series Refrigerant Capacities

HA770

HAB1-Up 1.1 kg (2.42 lb)

HA771

HAF1-Up 1.1 kg (2.42 lb)

HA870

HAE1-Up 1.1 kg (2.42 lb)

HA871

HAG1-Up 1.1 kg (2.42 lb)

Track Feller Bunchers

511 Refrigerant Capacities

5111-Up 1.3 kg (2.9 lb)

521 Refrigerant Capacities

5211-Up 1.3 kg (2.9 lb)

522 Refrigerant Capacities

5221-Up 1.3 kg (2.9 lb)

532 Refrigerant Capacities

5321-Up 1.3 kg (2.9 lb)

541 Refrigerant Capacities

5411-Up 1.3 kg (2.9 lb)

541 Series 2 Refrigerant Capacities

F7D1-Up 1.7 kg (3.75 lb)

551 Refrigerant Capacities

5511-Up 1.3 kg (2.9 lb)

552 Refrigerant Capacities

5521-Up 1.3 kg (2.9 lb)

552 Series 2 Refrigerant Capacities

F7G1-Up 1.7 kg (3.75 lb)

TK711 Refrigerant Capacities

1011-Up 1.3 kg (2.9 lb)

TK721 Refrigerant Capacities

1021-Up 1.3 kg (2.9 lb)

TK722 Refrigerant Capacities

1031-Up 1.3 kg (2.9 lb)

TK732 Refrigerant Capacities

1041-Up 1.3 kg (2.9 lb)

TK741 Refrigerant Capacities

2021-Up 1.3 kg (2.9 lb)

TK751 Refrigerant Capacities

3011-Up 1.3 kg (2.9 lb)

TK752 Refrigerant Capacities

3021-Up 1.3 kg (2.9 lb)

TK1051 Refrigerant Capacities

9HZ1-Up 1.70 kg (3.75 lb)

1090 Refrigerant Capacities

BZJ1-Up 1.3 kg (2.9 lb)

1190 Refrigerant Capacities

BZK1-Up 1.3 kg (2.9 lb)

1190T Refrigerant Capacities

BZL1-Up 1.3 kg (2.9 lb)

1290T Refrigerant Capacities

BZM1-Up 1.3 kg (2.87 lb)

1390 Refrigerant Capacities

B3F1-Up 1.3 kg (2.87 lb)

1490 Refrigerant Capacities

B4F1-Up 1.3 kg (2.87 lb)

1490T Refrigerant Capacities

B5F1-Up 1.3 kg (2.87 lb)

2290 Refrigerant Capacities

P2D1-Up 1.7 kg (3.75 lb)

2390 Refrigerant Capacities

P3H1-Up 1.7 kg (3.75 lb)

2391 Refrigerant Capacities

P4K1-Up 1.7 kg (3.75 lb)

2491 Refrigerant Capacities

P5J1-Up 1.7 kg (3.75 lb)

2590 Refrigerant Capacities

P6B1-Up 1.7 kg (3.75 lb)

i04357289

**System Capacities for
Refrigerant (Integrated
Toolcarriers)****SMCS Code:** 1809**Part No.:** 3E-6654
S/N: AYA1-Up**Part No.:** 3E-6654
S/N: WAC1-Up**Part No.:** 3E-6654
S/N: 1KF1040-Up**Part No.:** 3E-6654
S/N: 6ZF307-Up**Part No.:** 3E-6654
S/N: EWF1-Up**Part No.:** 3E-6654
S/N: M5G1-Up**Part No.:** 3E-6654
S/N: 5EJ1-Up**Part No.:** 3E-6654
S/N: JNJ1-Up**Part No.:** 3E-6654
S/N: 1JL1-Up**Part No.:** 3E-6654
S/N: 3CL751-Up**Part No.:** 3E-6654
S/N: 4EL196-Up**Part No.:** 3E-6654
S/N: 8ZM1-Up**Part No.:** 3E-6654
S/N: 1WN94-Up**Part No.:** 3E-6654
S/N: 4NN51-Up**Part No.:** 3E-6654
S/N: 6FN238-Up**Part No.:** 3E-6654
S/N: 6KN51-Up**Part No.:** 3E-6654
S/N: JAN1-Up**Part No.:** 3E-6654
S/N: AKP1-Up**Part No.:** 3E-6654
S/N: ERP1-Up**Part No.:** 3E-6654
S/N: 5DR1-Up**Part No.:** 3E-6654
S/N: 8CR1-Up**Part No.:** 3E-6654
S/N: 9AR1-Up**Part No.:** 3E-6654
S/N: 6PS1-Up**Part No.:** 3E-6654
S/N: 7BS1-Up**Part No.:** 3E-6654
S/N: DBT1-Up**Part No.:** 3E-6654
S/N: 1CW1-Up**Part No.:** 3E-6654
S/N: CSX1-Up**Reference:** For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".**Small Integrated Toolcarriers****IT12F Refrigerant Capacities**

1KF1040-Up 1.6 kg (3.5 lb)

IT14 Refrigerant Capacities

IT14F

4EL196-Up 1.6 kg (3.5 lb)

IT14G

1WN94-Up 1.2 kg (2.7 lb)
8ZM1-Up 1.2 kg (2.7 lb)
KZN1-Up 1.2 kg (2.7 lb)

ERP1-Up 1.3 kg (2.9 lb)

IT18F Refrigerant Capacities

6ZF307-Up 2.0 kg (4.5 lb)

5EJ1-Up 2.0 kg (4.5 lb)

IT24F Refrigerant Capacities

4NN51-Up 2.0 kg (4.5 lb)

6KN51-Up 2.0 kg (4.5 lb)

IT28 Refrigerant Capacities

IT28F

1JL1-Up 2.5 kg (5.5 lb)
3CL751-Up 2.5 kg (5.5 lb)

IT28G

8CR1-Up 1.2 kg (2.7 lb)
9AR1-Up 1.2 kg (2.7 lb)
DBT1-Up 1.3 kg (2.9 lb)
WAC1-Up 1.3 kg (2.9 lb)
EWF1-Up 1.3 kg (2.9 lb)

Medium Integrated Toolcarriers

IT38 Refrigerant Capacities

IT38F

6FN238-Up 2.0 kg (4.4 lb)
5DR1-Up 2.0 kg (4.4 lb)

IT38G

7BS1-Up 1.5 kg (3.3 lb)
1CW1-Up 1.5 kg (3.3 lb)

IT38G II

CSX1-Up 1.5 kg (3.3 lb)
JAN1-Up 1.5 kg (3.3 lb)

IT38H

JNJ1-Up 1.5 kg (3.3 lb)

IT62 Refrigerant Capacities

IT62G

6PS1-Up 2.3 kg (5.0 lb)
AKP1-Up 2.3 kg (5.0 lb)

IT62G II

AYA1-Up 2.0 kg (4.4 lb)

IT62H

M5G1-Up 1.9 kg (4.2 lb)

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**System Capacities for
Refrigerant (Large Wheel
Loaders)**

SMCS Code: 1809

Part No.: 3E-6654
S/N: 8801-Up

Part No.: 3E-6654
S/N: 4421-Up

Part No.: 3E-6654
S/N: A7A1-Up

Part No.: 346-5808
S/N: DWC1-Up

Part No.: 277-7245
S/N: H4C1-Up

Part No.: 3E-6654
S/N: Z4D1-Up

Part No.: 3E-6654
S/N: 9YF83-Up

Part No.: 3E-6654
S/N: 8YG492-Up

Part No.: 3E-6654
S/N: BNH1-Up

Part No.: 3E-6654
S/N: 7MJ340-Up

Part No.: 3E-6654
S/N: 7HK28-Up

Part No.: 3E-6654
S/N: 2ZR1-Up

Part No.: 3E-6654
S/N: 4FR1-Up

Part No.: 3E-6654
S/N: 7HR1-Up

Part No.: 3E-6654
S/N: BCR1-Up

Part No.: 3E-6654
S/N: L8S1-Up

Part No.: 3E-6654
S/N: 2TW1-Up

Part No.: 3E-6625
S/N: AZX1-Up

Part No.: 3E-6654
S/N: BWX1-Up

Part No.: 3E-6654
S/N: ZMX1-Up

Part No.: 3E-6654
S/N: BXY1-Up

Part No.: 3E-6654
S/N: 3TZ83-Up

Part No.: 3E-6654
S/N: ADZ1-Up

Part No.: 3E-6654
S/N: Z4Z1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

986 Refrigerant Capacities

986H

L8S1-Up 2.7 kg (6.0 lb)

988 Refrigerant Capacities

988F

8YG492-Up 2.7 kg (6.0 lb)

988F II

2ZR1-Up 2.8 kg (6.0 lb)

988G

2TW1-Up 2.6 kg (5.7 lb)

BNH1-Up 2.6 kg (5.7 lb)

988H

BXY1-Up 2.6 kg (5.7 lb)

A7A1-Up 2.6 kg (5.7 lb)

990 Refrigerant Capacities

990

7HK28-Up 3.9 kg (8.6 lb)

990 II

4FR1-372 3.9 kg (8.6 lb)

4FR373-Up 4.1 kg (9.0 lb)

BCR1-Up 2.7 kg (6.0 lb)

990H

BWX1-Up 2.3 kg (5.1 lb)

992 Refrigerant Capacities

992D

7MJ340-Up 2.8 kg (6.2 lb)

992G

AZX1-Up 2.3 kg (5.1 lb)

7HR1-Up 2.3 kg (5.1 lb)

ADZ1-Up 2.3 kg (5.1 lb)

992K

H4C1-Up 2.7 kg (6.0 lb)

8801-Up 2.7 kg (6.0 lb)

ZMX1-Up 2.7 kg (6.0 lb)

993 Refrigerant Capacities

993K

Z9K1-Up 2.5 kg (5.5 lb)

LWA1-Up 2.5 kg (5.5 lb)

Z4D1-Up 2.5 kg (5.5 lb)

Z4Z1-Up 2.5 kg (5.5 lb)

994 Refrigerant Capacities

994

9YF83-Up 2.7 kg (6.0 lb)

994D

3TZ1-Up 2.7 kg (6.0 lb)

994F

4421-Up 3.6 kg (8.0 lb)

994H

DWC1-Up 3.2 kg (7.1 lb)

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System Capacities for Refrigerant (Load Haul Dump)

SMCS Code: 1809

Part No.: 3E-6654
S/N: LJB1-Up

Part No.: 3E-1906
S/N: 9SD1-Up

Part No.: 3E-6654
S/N: GLK1-Up

Part No.: 3E-6654
S/N: JLK1-Up

Part No.: 3E-6654
S/N: RSL1-Up

Part No.: 3E-1906
S/N: RCM1-Up

Part No.: 3E-6654
S/N: 9PP1-Up

Part No.: 3E-6654
S/N: 9XP1-Up

Part No.: 3E-6654
S/N: BAR1-Up

S/N: SBR1-Up

Part No.: 3E-6654
S/N: 5TW1-Up

Part No.: 3E-6654
S/N: 6QW1-Up

Part No.: 3E-6654
S/N: 9EW1-Up

Part No.: 3E-6654
S/N: 4LZ1-Up

Part No.: 3E-6654
S/N: 8XZ1-Up

Part No.: 3E-6654
S/N: 9YZ1-Up

Reference: For the correct procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

Note: The following refrigerant capacities are for underground machines.

R1300 Refrigerant Capacities

R1300

6QW1-Up 2.0 kg (4.4 lb)

R1300G

LJB1-Up 2.0 kg (4.4 lb)

NJB1-Up 2.0 kg (4.4 lb)

R1300G Series II

RSL1-Up 1.18 kg (2.6 lb)

R1600 Refrigerant Capacities

R1600

9EW1-Up 2.0 kg (4.4 lb)

9XP1-Up 2.7 kg (5.9 lb)

R1600G

9PP1-Up 2.7 kg (5.9 lb)

9YZ1-Up 2.7 kg (5.9 lb)

R1600H

9SD1-Up 2.7 kg (5.9 lb)

R1700 Refrigerant Capacities

R1700

4LZ1-Up 2.0 kg (4.4 lb)

R1700G

8XZ1-Up 2.0 kg (4.4 lb)

SBR1-Up 2.7 kg (5.9 lb)

R2900 Refrigerant Capacities

R2900

5TW1-Up 2.0 kg (4.4 lb)

BAR1-Up 2.0 kg (4.4 lb)

R2900G

GLK1-Up 2.3 kg (5.0 lb)

JLK1-Up 2.7 kg (5.9 lb)

R3000H

RCM1-Up 2.7 kg (5.9 lb)

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System Capacities for Refrigerant (Medium Wheel Loaders)

SMCS Code: 1809**Part No.:** 3E-6654
S/N: BAA1-Up**Part No.:** 3E-6654
S/N: GTA1-Up**Part No.:** 3E-6654
S/N: N1A1-Up**Part No.:** 3E-6654
S/N: N4A1-Up**Part No.:** 367-8035
S/N: R4A1-Up**Part No.:** 3E-6654
S/N: SSA1-Up**Part No.:** 367-8035
S/N: T6A1-Up**Part No.:** 3E-6654
S/N: WLA1-Up**Part No.:** 3E-6654
S/N: AYB1-Up**Part No.:** 3E-6654
S/N: BAB1-Up**Part No.:** 3E-6654
S/N: RTB1-Up**Part No.:** 3E-6654
S/N: AXC1-Up**Part No.:** 3E-6654
S/N: BAC1-Up**Part No.:** 3E-6654
S/N: LCC1-Up**Part No.:** 3E-6654
S/N: A6D1-Up**Part No.:** 3E-6654
S/N: A7D1-Up**Part No.:** 3E-6654
S/N: AYD1-Up**Part No.:** 3E-6654
S/N: BAD1-Up**Part No.:** 3E-6654
S/N: CRD1-Up**Part No.:** 3E-6654
S/N: JAD1-Up**Part No.:** 3E-6654
S/N: AXE1-Up**Part No.:** 3E-6654
S/N: AYE1-Up**Part No.:** 3E-6654
S/N: 7ZF348-Up**Part No.:** 3E-6654
S/N: RYF1-Up**Part No.:** 3E-6654
S/N: 4YG1-Up**Part No.:** 3E-6654
S/N: 6YG348-Up**Part No.:** 3E-6654
S/N: 8BG2191-Up**Part No.:** 3E-6654
S/N: A6G1-Up**Part No.:** 3E-6654
S/N: A7G1-Up**Part No.:** 3E-6654
S/N: AXG1-Up**Part No.:** 3E-6654
S/N: AYG1-Up**Part No.:** 3E-6654
S/N: M1G1-Up**Part No.:** 3E-6654
S/N: M3G1-Up**Part No.:** 3E-6654
S/N: MHG1-Up**Part No.:** 367-8035
S/N: PBG1-Up**Part No.:** 3E-6654
S/N: AAH1-Up**Part No.:** 3E-6654
S/N: AWH1-Up**Part No.:** 3E-6654
S/N: HDH1-Up**Part No.:** 3E-6654
S/N: 3XJ1-Up**Part No.:** 3E-6654
S/N: 4DJ2240-Up**Part No.:** 3E-6654
S/N: 5XJ1-Up**Part No.:** 3E-6654
S/N: 8AJ855-Up**Part No.:** 3E-6654
S/N: 8CJ1221-Up

Part No.: 3E-6654
S/N: 9YJ1078-Up

Part No.: 3E-6654
S/N: 9ZJ167-Up

Part No.: 3E-6654
S/N: A6J1-Up

Part No.: 3E-6654
S/N: A7J1-Up

Part No.: 3E-6654
S/N: A8J1-Up

Part No.: 3E-6654
S/N: AXJ1-Up

Part No.: 3E-6654
S/N: J5J1-Up

Part No.: 3E-6654
S/N: J6J1-Up

Part No.: 3E-6654
S/N: 3HK1-Up

Part No.: 3E-6654
S/N: 4TK1-Up

Part No.: 3E-6654
S/N: 5SK745-Up

Part No.: 3E-6654
S/N: 7SK225-Up

Part No.: 3E-6654
S/N: 8TK816-Up

Part No.: 3E-6654
S/N: 9JK361-Up

Part No.: 3E-6654
S/N: 9MK350-Up

Part No.: 3E-6654
S/N: K5K1-Up

Part No.: 3E-6654
S/N: K6K1-Up

Part No.: 367-8035
S/N: W7K1-Up

Part No.: 3E-6654
S/N: 1SL510-Up

Part No.: 3E-6654
S/N: 4CL165-Up

Part No.: 3E-6654
S/N: 6XL170-Up

Part No.: 3E-6654
S/N: 7HL1-Up

Part No.: 3E-6654
S/N: 7PL103-Up

Part No.: 3E-6654
S/N: AXL1-Up

Part No.: 3E-6654
S/N: AYL1-Up

Part No.: 3E-6654
S/N: FLL1-Up

Part No.: 3E-6654
S/N: MAL1-Up

Part No.: 3E-6654
S/N: MXL1-Up

Part No.: 3E-6654
S/N: TAL1-Up

Part No.: 3E-6654
S/N: 1KM1-Up

Part No.: 3E-6654
S/N: 1YM181-Up

Part No.: 3E-6654
S/N: 2LM348-Up

Part No.: 3E-6654
S/N: 2RM142-Up

Part No.: 3E-6654
S/N: 8SM142-Up

Part No.: 3E-6654
S/N: 9CM1-Up

Part No.: 367-8035
S/N: J5M1-Up

Part No.: 367-8035
S/N: PEM1-Up

Part No.: 3E-6654
S/N: 4RN1-Up

Part No.: 3E-6654
S/N: 7SN142-Up

Part No.: 3E-6654
S/N: 8JN1-Up

Part No.: 3E-6654
S/N: AXN1-Up

Part No.: 3E-6654
S/N: PHN1-Up

Part No.: 3E-6654
S/N: AWP1-Up

Part No.: 3E-6654
S/N: AXP1-Up

Part No.: 3E-6654
S/N: BDP1-Up

Part No.: 3E-6654
S/N: 2KR1-Up

Part No.: 3E-6654
S/N: 2SR1-Up

Part No.: 3E-6654
S/N: AXR1-Up

Part No.: 3E-6654
S/N: FER1-Up

Part No.: 3E-6654
S/N: 2JS1-Up

Part No.: 3E-6654
S/N: 3BS1-Up

Part No.: 3E-6654
S/N: 3ZS1-Up

Part No.: 3E-6654
S/N: 4BS1-Up

Part No.: 3E-6654
S/N: 4YS1-Up

Part No.: 3E-6654
S/N: 5AS1-Up

Part No.: 3E-6654
S/N: 5RS1-Up

Part No.: 3E-6654
S/N: 6NS1-Up

Part No.: 3E-6654
S/N: 6WS1-Up

Part No.: 3E-6654
S/N: 7LS1-Up

Part No.: 3E-6654
S/N: 8DS1-Up

Part No.: 3E-6654
S/N: 8RS1-Up

Part No.: 3E-6654
S/N: 8TS1-Up

Part No.: 3E-6654
S/N: 9HS1-Up

Part No.: 3E-6654
S/N: 9RS1-Up

Part No.: 3E-6654
S/N: AXS1-Up

Part No.: 3E-6654
S/N: AYS1-Up

Part No.: 3E-6654
S/N: JMS1-Up

Part No.: 367-8035
S/N: TFS1-Up

Part No.: 3E-6654
S/N: ANT1-Up

Part No.: 3E-6654
S/N: AYT1-Up

Part No.: 367-8035
S/N: X4T1-Up

Part No.: 3E-6654
S/N: 1EW1-Up

Part No.: 3E-6654
S/N: 3JW1-Up

Part No.: 3E-6654
S/N: 3PW1-Up

Part No.: 3E-6654
S/N: 3SW1-Up

Part No.: 3E-6654
S/N: 4PW1-Up

Part No.: 3E-6654
S/N: 4WW1-Up

Part No.: 3E-6654
S/N: 5FW1-Up

Part No.: 3E-6654
S/N: 5MW1-Up

Part No.: 3E-6654
S/N: 6AW1-Up

Part No.: 3E-6654
S/N: 6EW1-Up

Part No.: 3E-6654
S/N: 6HW1-Up

Part No.: 3E-6654
S/N: 7BW1-Up

Part No.: 3E-6654
S/N: 8JW1-Up

Part No.: 3E-6654
S/N: 8XW1-Up

Part No.: 3E-6654
S/N: 9GW1-Up

Part No.: 3E-6654
S/N: AAW1-Up

Part No.: 3E-6654
S/N: FMW1-Up

Part No.: 3E-6654
S/N: PCW1-Up

Part No.: 367-8035
S/N: Z4W1-Up

Part No.: 3E-6654
S/N: AXX1-Up

Part No.: 3E-6654
S/N: JLX1-Up

Part No.: 3E-6654
S/N: NGX1-Up

Part No.: 3E-6654
S/N: ANY1-Up

Part No.: 3E-6654
S/N: AWY1-Up

Part No.: 3E-6654
S/N: AXY1-Up

Part No.: 3E-6654
S/N: B9Y1-Up

Part No.: 3E-6654
S/N: ANZ1-Up

Part No.: 3E-6654
S/N: AWZ1-Up

Part No.: 367-8035
S/N: GTZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

936F Refrigerant Capacities

8AJ855-Up	2.5 kg (5.5 lb)
9MK350-Up	2.5 kg (5 lb)

938 Refrigerant Capacities

938F

1KM1-Up	2.0 kg (4.4 lb)
2RM142-Up	2.0 kg (4.4 lb)
8SM142-Up	2.0 kg (4.4 lb)
7SN142-Up	2.0 kg (4.4 lb)

938G

4YS1-554	1.8 kg (4 lb)
4YS555-Up	1.5 kg (3.3 lb)
6WS1-Up	1.5 kg (3.3 lb)
8RS1-Up	1.5 kg (3.3 lb)
9HS1-415	1.8 kg (4 lb)
9HS416-Up	1.5 kg (3.3 lb)

938G II

CRD1-Up	1.5 kg (3.3 lb)
PHN1-Up	1.5 kg (3.3 lb)
RTB1-Up	1.5 kg (3.3 lb)
B9Y1-Up	1.5 kg (3.3 lb)

950 Refrigerant Capacities

950F

6YG348-Up	2 kg (4.4 lb)
7ZF348-Up	2 kg (4.4 lb)

950F II

4DJ2240-Up	2 kg (4.4 lb)
5SK745-Up	2 kg (4.4 lb)
8TK816-Up	2 kg (4.4 lb)
2LM348-Up	2 kg (4.4 lb)

950G

2JS1-Up	2.3 kg (5 lb)
8JW1-Up	2.3 kg (5 lb)
5MW1-Up	2.3 kg (5 lb)
3JW1-Up	2.3 kg (5 lb)
8DS1-Up	2.3 kg (5 lb)
6NS1-Up	2.3 kg (5 lb)
4BS1-Up	2.3 kg (5 lb)
5FW1-Up	2.3 kg (5 lb)

950G II

AYD1-Up	1.7 kg (3.75 lb)
AXX1-Up	1.7 kg (3.75 lb)
BAA1-Up	1.7 kg (3.75 lb)
AYB1-Up	1.7 kg (3.75 lb)
AYL1-Up	1.7 kg (3.75 lb)
AYS1-Up	1.7 kg (3.75 lb)
AXR1-Up	1.7 kg (3.75 lb)

950H

K5K1-Up	1.9 kg (4.2 lb)
N1A1-Up	1.9 kg (4.2 lb)
M1G1-Up	1.9 kg (4.2 lb)
J5J1-Up	1.9 kg (4.2 lb)
JAD1-Up	1.9 kg (4.2 lb)
MXL1-Up	1.9 kg (4.2 lb)
JLX1-Up	1.9 kg (4.2 lb)

950K

R4A1-Up	1.8 kg (4.0 lb)
J5M1-Up	1.8 kg (4.0 lb)
FER1-Up	1.8 kg (4.0 lb)

960F Refrigerant Capacities

9ZJ167-Up	2 kg (4.4 lb)
4CL165-Up	2 kg (4.4 lb)
6XL170-Up	2 kg (4.4 lb)
1YM181-Up	2 kg (4.4 lb)

962 Refrigerant Capacities

962G

4PW1-Up	2.3 kg (5 lb)
5RS1-Up	2.3 kg (5 lb)
5AS1-Up	2.3 kg (5 lb)
3BS1-Up	2.3 kg (5 lb)
6EW1-Up	2.3 kg (5 lb)
7BW1-Up	2.3 kg (5 lb)

6HW1-Up	2.3 kg (5 lb)
BDP1-Up	2.3 kg (5 lb)

962G II

AYE1-Up	1.7 kg (3.75 lb)
BAB1-Up	1.7 kg (3.75 lb)
AXS1-Up	1.7 kg (3.75 lb)
AYG1-Up	1.7 kg (3.75 lb)
AXY1-Up	1.7 kg (3.75 lb)
BAD1-Up	1.7 kg (3.75 lb)
BAC1-Up	1.7 kg (3.75 lb)

962H

K6K1-Up	1.9 kg (4.2 lb)
N4A1-Up	1.9 kg (4.2 lb)
M3G1-Up	1.9 kg (4.2 lb)
J6J1-Up	1.9 kg (4.2 lb)
MAL1-Up	1.9 kg (4.2 lb)
PCW1-Up	1.9 kg (4.2 lb)
SSA1-Up	1.9 kg (4.2 lb)

962K

X4T1-Up	1.8 kg (4.0 lb)
T6A1-Up	1.8 kg (4.0 lb)
FLL1-Up	1.8 kg (4.0 lb)

966 Refrigerant Capacities**966F**

3XJ1-Up	2.1 kg (4.6 lb)
4YG1-Up	2.1 kg (4.6 lb)

966F II

8BG2191-Up	2.1 kg (4.6 lb)
9YJ1078-Up	2 kg (4.4 lb)
1SL510-Up	2 kg (4.4 lb)
7HL1-Up	2 kg (4.4 lb)

966G

3SW1-Up	2.3 kg (5 lb)
9RS1-Up	2.3 kg (5 lb)
3ZS1-Up	2.3 kg (5 lb)
3PW1-Up	2.3 kg (5 lb)
AAH1-Up	2.3 kg (5 lb)
8XW1-Up	2.3 kg (5 lb)

966G II

AWY1-Up	1.9 kg (4.2 lb)
AXJ1-Up	1.9 kg (4.2 lb)
ANT1-Up	1.9 kg (4.2 lb)
ANZ1-Up	1.9 kg (4.2 lb)
AWZ1-Up	1.9 kg (4.2 lb)
AXL1-Up	1.9 kg (4.2 lb)

966H

A6D1-Up	1.9 kg (4.2 lb)
A6G1-Up	1.9 kg (4.2 lb)

A6J1-Up	1.9 kg (4.2 lb)
CYR1-Up	1.9 kg (4.2 lb)
FMW1-Up	1.9 kg (4.2 lb)
RYF1-Up	1.9 kg (4.2 lb)
TAL1-Up	1.9 kg (4.2 lb)

966K

TFS1-Up	1.8 kg (4.0 lb)
PBG1-Up	1.8 kg (4.0 lb)
NGX1-Up	1.8 kg (4.0 lb)

970F Refrigerant Capacities

7SK225-Up	2 kg (4.5 lb)
9JK361-Up	2 kg (4.5 lb)
7PL103-Up	2 kg (4.5 lb)

972 Refrigerant Capacities**972G**

1EW1-Up	2.3 kg (5 lb)
6AW1-Up	2.3 kg (5 lb)
9GW1-Up	2.3 kg (5 lb)
7LS1-Up	2.3 kg (5 lb)
4WW1-Up	2.3 kg (5 lb)
AAW1-Up	2.3 kg (5 lb)

972G II

AXC1-Up	1.9 kg (4.2 lb)
AXN1-Up	1.9 kg (4.2 lb)
ANY1-Up	1.9 kg (4.2 lb)
AWP1-Up	1.9 kg (4.2 lb)
AXE1-Up	1.9 kg (4.2 lb)
AXP1-Up	1.9 kg (4.2 lb)

972H

A7D1-Up	1.9 kg (4.2 lb)
A7G1-Up	1.9 kg (4.2 lb)
A7J1-Up	1.9 kg (4.2 lb)
WLA1-Up	1.9 kg (4.2 lb)
GTA1-Up	1.9 kg (4.2 lb)
LCC1-Up	1.9 kg (4.2 lb)

972K

Z4W1-Up	1.8 kg (4.0 lb)
PEM1-Up	1.8 kg (4.0 lb)

980 Refrigerant Capacities**980F**

8CJ1221-Up	2.3 kg (5 lb)

980F II

8JN1-Up	2.3 kg (5 lb)

4RN1-Up	2.3 kg (5 lb)
5XJ1-Up	2.3 kg (5 lb)

980G

9CM1-Up	2.5 kg (5.5 lb)
2KR1-Up	2.5 kg (5.5 lb)
2SR1-Up	2.5 kg (5.5 lb)

980G II

AYT1-Up	1.9 kg (4.2 lb)
AWH1-Up	1.9 kg (4.2 lb)
AXG1-Up	1.9 kg (4.2 lb)

980H

JMS1-Up	1.9 kg (4.2 lb)
MHG1-Up	1.9 kg (4.2 lb)
A8J1-Up	1.9 kg (4.2 lb)

980K

W7K1-Up	1.8 kg (4.0 lb)
GTZ1-Up	1.8 kg (4.0 lb)

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System Capacities for Refrigerant (Mining Excavators)

SMCS Code: 1809

Part No.: 3E-6654

S/N: AAA1-Up

Part No.: 3E-6654

S/N: 7TJ1-Up

Part No.: 3E-6654

S/N: AAK1-Up

Part No.: 3E-6654

S/N: 5ZL1-Up

Part No.: 3E-6654

S/N: 7LL1-Up

Part No.: 3E-6654

S/N: 4CS130-Up

Part No.: 3E-6654

S/N: AAT1-Up

Part No.: 3E-6654

S/N: 4HZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

5110 Refrigerant Capacities

5110B

AAA1-Up	2.7 kg (6 lb)
AAT1-Up	2.7 kg (6 lb)
AAK1-Up	2.7 kg (6 lb)

5130 Refrigerant Capacities

5130

5ZL1-Up	3 kg (6.6 lb)
7TJ1-Up	3 kg (6.6 lb)

5130B

4CS130-Up	3.75 kg (8.25 lb)

5230 Refrigerant Capacities

5230

7LL1-85	3 kg (6.6 lb)
7LL86-Up	3.75 kg (8.25 lb)

5230B

4HZ1-Up	3.75 kg (8.25 lb)

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System Capacities for Refrigerant (Motor Graders)

SMCS Code: 1809

Part No.: 3E-6654

S/N: 1241-Up

Part No.: 3E-6654

S/N: 1251-Up

Part No.: 3E-6654

S/N: 1261-Up

Part No.: 3E-6654

S/N: CCA1-Up

Part No.: 3E-6654

S/N: JJA1-Up

Part No.: 3E-6654

S/N: JPA1-Up

Part No.: 3E-6654

S/N: B9C1-Up

Part No.: 3E-6654

S/N: CBC1-Up

Part No.: 3E-6654

S/N: 4HD1-Up

Part No.: 3E-6654
S/N: 4JD186-Up

Part No.: 3E-6654
S/N: 5MD1-Up

Part No.: 3E-6654
S/N: ASD1-Up

Part No.: 3E-6654
S/N: B9D1-Up

Part No.: 3E-6654
S/N: M9D1-Up

Part No.: 3E-6654
S/N: ASE1-Up

Part No.: 3E-6654
S/N: B9E1-Up

Part No.: 3E-6654
S/N: M9E1-Up

Part No.: 3E-6654
S/N: B9F1-Up

Part No.: 3E-6654
S/N: CAF1-Up

Part No.: 3E-6654
S/N: 8ZG1-Up

Part No.: 3E-6654
S/N: B9G1-Up

Part No.: 3E-6654
S/N: D9G1-Up

Part No.: 3E-6654
S/N: R9G1-Up

Part No.: 3E-6654
S/N: B9H1-Up

Part No.: 3E-6654
S/N: R9H1-Up

Part No.: 3E-6654
S/N: XZH1-Up

Part No.: 3E-6654
S/N: 6ZJ1-Up

Part No.: 3E-6654
S/N: 7WJ1-Up

Part No.: 3E-6654
S/N: 9EJ1-Up

Part No.: 3E-6654
S/N: B9J1-Up

Part No.: 3E-6654
S/N: BDJ1-Up

Part No.: 3E-6654
S/N: M9J1-Up

Part No.: 3E-6654
S/N: R9J1-Up

Part No.: 3E-6654
S/N: XZJ1-Up

Part No.: 3E-6654
S/N: 2ZK1-Up

Part No.: 3E-6654
S/N: 3YK1-Up

Part No.: 3E-6654
S/N: 4MK1-Up

Part No.: 3E-6654
S/N: 5AK1-Up

Part No.: 3E-6654
S/N: 7KK1-Up

Part No.: 3E-6654
S/N: B9K1-Up

Part No.: 3E-6654
S/N: CBK1-Up

Part No.: 3E-6654
S/N: M9K1-Up

Part No.: 3E-6654
S/N: XZK1-Up

Part No.: 3E-6654
S/N: 1AL1-Up

Part No.: 3E-6654
S/N: ARL1-Up

Part No.: 3E-6654
S/N: B9L1-Up

Part No.: 3E-6654
S/N: R9L1-Up

Part No.: 3E-6654
S/N: SZL1-Up

Part No.: 3E-6654
S/N: 2FM186-Up

Part No.: 3E-6654
S/N: 3GM1-Up

Part No.: 3E-6654
S/N: 4XM1-Up

Part No.: 3E-6654
S/N: 5FM1-Up

Part No.: 3E-6654
S/N: 5HM1-Up

Part No.: 3E-6654
S/N: 5ZM1-Up

Part No.: 3E-6654
S/N: 61M5358-Up

Part No.: 3E-6654
S/N: 6NM1-Up

Part No.: 3E-6654
S/N: 6TM1-Up

Part No.: 3E-6654
S/N: 6WM1-Up

Part No.: 3E-6654
S/N: 7PM1-Up

Part No.: 3E-6654
S/N: 8JM1-Up

Part No.: 3E-6654
S/N: 8KM1-Up

Part No.: 3E-6654
S/N: 9JM1-Up

Part No.: 3E-6654
S/N: APM1-Up

Part No.: 3E-6654
S/N: B9M1-Up

Part No.: 3E-6654
S/N: R9M1-Up

Part No.: 3E-6654
S/N: SZM1-Up

Part No.: 3E-6654
S/N: 2AN1-Up

Part No.: 3E-6654
S/N: 6YN1-Up

Part No.: 3E-6654
S/N: 8MN1-Up

Part No.: 3E-6654
S/N: 8WN1-Up

Part No.: 3E-6654
S/N: 9FN1-Up

Part No.: 3E-6654
S/N: 9TN1-Up

Part No.: 3E-6654
S/N: 9ZN1-Up

Part No.: 3E-6654
S/N: APN1-Up

Part No.: 3E-6654
S/N: B9N1-Up

Part No.: 3E-6654
S/N: SZN1-Up

Part No.: 3E-6654
S/N: CCP1-Up

Part No.: 3E-6654
S/N: JAP1-Up

Part No.: 3E-6654
S/N: JBP1-Up

Part No.: 3E-6654
S/N: SZP1-Up

Part No.: 3E-6654
S/N: 2LR1-Up

Part No.: 3E-6654
S/N: 2WR1-Up

Part No.: 3E-6654
S/N: 4ER1-Up

Part No.: 3E-6654
S/N: 9YR1-Up

Part No.: 3E-6654
S/N: B9R1-Up

Part No.: 3E-6654
S/N: 2GS1-Up

Part No.: 3E-6654
S/N: 2HS1-Up

Part No.: 3E-6654
S/N: 3AS1-Up

Part No.: 3E-6654
S/N: ATS1-Up

Part No.: 3E-6654
S/N: SZS1-Up

Part No.: 3E-6654
S/N: B9T1-Up

Part No.: 3E-6654
S/N: D9T1-Up

Part No.: 3E-6654
S/N: R9T1-Up

Part No.: 3E-6654
S/N: 93U3516-Up

Part No.: 3E-6654
S/N: 96U9075-Up

Part No.: 3E-6654
S/N: 72V15940-Up

Part No.: 3E-6654
S/N: 74V2604-Up

Part No.: 3E-6654
S/N: 87V9732-Up

Part No.: 3E-6654
S/N: 11W1351-Up

Part No.: 3E-6654
S/N: B9W1-Up

Part No.: 3E-6654
S/N: D9W1-Up

Part No.: 3E-6654
S/N: SZW1-Up

Part No.: 3E-6654
S/N: AMX1-Up

Part No.: 3E-6654
S/N: ALZ1-Up

Part No.: 3E-6654
S/N: AMZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

12 Refrigerant Capacities

12H

4ER1-Up	1.9 kg (4.2 lb)
2GS1-Up	1.9 kg (4.2 lb)
1251-Up	2.1 kg (4.6 lb)
AMZ1-Up	2.1 kg (4.6 lb)
CBK1-Up	2.1 kg (4.6 lb)
5ZM1-Up	1.9 kg (4.2 lb)
XZJ1-Up	1.9 kg (4.2 lb)

12H ES

2LR1-Up	1.6 kg (3.5 lb)

12H NA

4XM1-3131	1.6 kg (3.5 lb)
4XM3132-Up	1.6 kg (3.5 lb)
8MN1-Up	1.6 kg (3.5 lb)
2WR1-Up	1.6 kg (3.5 lb)

12K

JJA1-Up	2.1 kg (4.6 lb)
SZP1-Up	2.1 kg (4.6 lb)

12M

B9R1-Up	1.8 kg (4.0 lb)
B9F1-Up	1.8 kg (4.0 lb)

120 Refrigerant Capacities

120G

87V9732-Up	1.9 kg (4.2 lb)
11W1351-Up	1.9 kg (4.2 lb)
61M15358-Up	2.4 kg (5.3 lb)
4HD1-Up	1.9 kg (4.2 lb)

120H

2AN1-Up	1.6 kg (3.5 lb)
5FM1-Up	1.9 kg (4.2 lb)
1241-Up	2.1 kg (4.6 lb)
ALZ1-Up	2.1 kg (4.6 lb)
CAF1-Up	2.1 kg (4.6 lb)

6TM1-Up	2.1 kg (4.6 lb)
9FN1-Up	2.1 kg (4.6 lb)

120H ES

9YR1-Up	1.6 kg (3.5 lb)
6NM1-Up	1.6 kg (3.5 lb)

120H NA

4MK1-Up	1.6 kg (3.5 lb)
6YN1-Up	1.6 kg (3.5 lb)

120K

JAP1-Up	2.1 kg (4.6 lb)
SZN1-Up	2.1 kg (4.6 lb)

120K Series 2

SZS1-Up	2.1 kg (4.6 lb)

120M

B9N1-Up	1.8 kg (4.0 lb)
B9C1-Up	1.8 kg (4.0 lb)
B9W1-Up	1.8 kg (4.0 lb)
D9W1-Up	1.8 kg (4.0 lb)

130 Refrigerant Capacities

130G

74V2604-Up	1.9 kg (4.2 lb)

135 Refrigerant Capacities

135H

8ZG1-Up	1.6 kg (3.5 lb)
8WN1-Up	1.9 kg (4.2 lb)
7PM1-Up	1.9 kg (4.2 lb)
AMX1-Up	2.1 kg (4.6 lb)
CBC1-Up	2.1 kg (4.6 lb)

135H NA

3YK1-Up	1.6 kg (3.5 lb)
BDJ1-Up	1.6 kg (3.5 lb)

14 Refrigerant Capacities

14G

96U9075-Up	1.9 kg (4.2 lb)

14H

7WJ1-2242	1.6 kg (3.5 lb)
7WJ2243-Up	1.6 kg (3.5 lb)
ASE1-Up	2.1 kg (4.6 lb)

14M

B9J1-Up	1.8 kg (4.0 lb)

R9J1-Up 1.8 kg (4.0 lb)

140 Refrigerant Capacities

140G

72V15940-Up 2.4 kg (5.3 lb)
5MD1-Up 1.9 kg (4.2 lb)

140H

5HM1-Up 1.9 kg (4.2 lb)
3AS1-Up 1.6 kg (3.5 lb)
APM1-Up 2.1 kg (4.6 lb)
CCA1-Up 2.1 kg (4.6 lb)
1261-Up 2.1 kg (4.6 lb)
8JM1-Up 1.9 kg (4.2 lb)
XZH1-Up 1.9 kg (4.2 lb)

140H ES

8KM1-Up 1.6 kg (3.5 lb)

140H NA

2ZK1-7566 1.6 kg (3.5 lb)
2ZK7567-Up 1.6 kg (3.5 lb)
9TN1-Up 1.6 kg (3.5 lb)
9ZN1-Up 1.6 kg (3.5 lb)

140K

JPA1-Up 2.1 kg (4.6 lb)
SZL1-Up 2.1 kg (4.6 lb)

140K Series 2

SZW1-Up 2.1 kg (4.6 lb)

140M

B9M1-Up 1.8 kg (4.0 lb)
B9D1-Up 1.8 kg (4.0 lb)
B9G1-Up 1.8 kg (4.0 lb)
D9G1-Up 1.8 kg (4.0 lb)

140M Series 2

M9D1-Up 1.6 kg (3.5 lb)
R9M1-Up 1.6 kg (3.5 lb)
M9J1-Up 1.6 kg (3.5 lb)
R9G1-Up 1.6 kg (3.5 lb)

143 Refrigerant Capacities

143H

APN1-Up 2.1 kg (4.6 lb)

143H NA

1AL1-Up 2 kg (4.5 lb)

16 Refrigerant Capacities

16G

93U3516-Up 1.9 kg (4.2 lb)

16H

6ZJ1-982 1.6 kg (3.5 lb)
6ZJ983-Up 1.6 kg (3.5 lb)
ATS1-Up 2.1 kg (4.6 lb)

16M

B9H1-Up 2.3 kg (5.0 lb)
R9H1-Up 2.3 kg (5.0 lb)

160 Refrigerant Capacities

160G

4JD186-Up 2.3 kg (5 lb)

160H

2FM186-Up 1.9 kg (4.2 lb)
ASD1-Up 2.1 kg (4.6 lb)
CCP1-Up 2.1 kg (4.6 lb)
2HS1-Up 1.6 kg (3.5 lb)
9JM1-Up 1.9 kg (4.2 lb)
XZK1-Up 1.9 kg (4.2 lb)

160H ES

6WM1-Up 1.6 kg (3.5 lb)

160H NA

9EJ1-1264 1.6 kg (3.5 lb)
9EJ1265-Up 1.6 kg (3.5 lb)
3GM1-Up 1.6 kg (3.5 lb)

160K

JBP1-Up 2.1 kg (4.6 lb)
SZM1-Up 2.1 kg (4.6 lb)

160M

B9L1-Up 1.8 kg (4.0 lb)
B9E1-Up 1.8 kg (4.0 lb)
B9T1-Up 1.8 kg (4.0 lb)
D9T1-Up 1.8 kg (4.0 lb)

160M Series 2

M9E1-Up 1.6 kg (3.5 lb)
R9L1-Up 1.6 kg (3.5 lb)
M9K1-Up 1.6 kg (3.5 lb)
R9T1-Up 1.6 kg (3.5 lb)

163 Refrigerant Capacities

163H

ARL1-Up	2.1 kg (4.6 lb)
163H NA	
5AK1-Up	2 kg (4.5 lb)

24 Refrigerant Capacities

24H	
7KK1-Up	2.6 kg (5.7 lb)
24M	
B9K1-Up	2.3 kg (5.0 lb)

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System Capacities for
Refrigerant (Multi-Terrain
Loaders)

SMCS Code: 1809

Part No.: 3E-6654
S/N: ZSA1-Up

Part No.: 3E-6654
S/N: KWB1-Up

Part No.: 3E-6654
S/N: SSB1-Up

Part No.: 3E-6654
S/N: CNC1-Up

Part No.: 3E-6654
S/N: CYC1-Up

Part No.: 3E-6654
S/N: KCC1-Up

Part No.: 3E-6654
S/N: RTD1-Up

Part No.: 3E-6654
S/N: JWF1-Up

Part No.: 3E-6654
S/N: B7H1-Up

Part No.: 3E-6654
S/N: MDH1-Up

Part No.: 3E-6654
S/N: SLK1-Up

Part No.: 3E-6654
S/N: CML1-Up

Part No.: 3E-6654
S/N: MTL1-Up

Part No.: 3E-6654
S/N: TSL1-Up

Part No.: 3E-6654
S/N: CMM1-Up

Part No.: 3E-6654
S/N: CMP1-Up

Part No.: 3E-6654
S/N: GCP1-Up

Part No.: 3E-6654
S/N: JMP1-Up

Part No.: 3E-6654
S/N: JSP1-Up

Part No.: 3E-6654
S/N: MAS1-Up

Part No.: 3E-6654
S/N: MBT1-Up

Part No.: 3E-6654
S/N: MET1-Up

Part No.: 3E-6654
S/N: CNY1-Up

247 Refrigerant Capacities

247

CML1-Up	0.81 kg (1.786 lb)

247B

MTL1-Up	0.81 kg (1.786 lb)

247B3

TSL1-Up	0.81 kg (1.786 lb)

257 Refrigerant Capacities

257

CMM3400-Up	0.68 kg (1.500 lb)

257B

SLK1-Up	0.81 kg (1.786 lb)

257B3

B7H1-Up	0.81 kg (1.786 lb)

267 Refrigerant Capacities

267

CMP1-Up	0.81 kg (1.786 lb)

267B

CYC1-Up 0.81 kg (1.786 lb)

277 Refrigerant Capacities

277

CNC3400-Up 0.68 kg (1.500 lb)

277B

MDH1-Up 0.81 kg (1.786 lb)

277C

JWF1-Up 1.27 kg (2.80 lb)

KCC1-Up 1.27 kg (2.80 lb)

MET1-Up 1.27 kg (2.80 lb)

279 Refrigerant Capacities

279C

MBT1-Up 1.27 kg (2.80 lb)

KWB1-Up 1.27 kg (2.80 lb)

287 Refrigerant Capacities

287B

ZSA1-Up 0.81 kg (1.786 lb)

287C

MAS1-Up 1.27 kg (2.80 lb)

SSB1-Up 1.27 kg (2.80 lb)

289 Refrigerant Capacities

289C

JMP1-Up 1.27 kg (2.80 lb)

RTD1-Up 1.27 kg (2.80 lb)

297 Refrigerant Capacities

297C

GCP1-Up 0.81 kg (1.786 lb)

299 Refrigerant Capacities

299C

JSP1-Up 0.81 kg (1.786 lb)

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System Capacities for Refrigerant (Off-Highway Trucks)

SMCS Code: 1809

Part No.: 3E-6654

S/N: BCA1-Up

Part No.: 3E-6654

S/N: BDA1-Up

Part No.: 3E-6654

S/N: BBB1-Up

Part No.: 3E-6654

S/N: FDB1-Up

Part No.: 3E-6654

S/N: RLB1-Up

Part No.: 3E-6654

S/N: AGC1-Up

Part No.: 3E-6654

S/N: BEC1-Up

Part No.: 3E-6654

S/N: EED1-Up

Part No.: 3E-6654

S/N: SPD1-Up

Part No.: 3E-6654

S/N: KEG1-Up

Part No.: 3E-6654

S/N: MWH1-Up

Part No.: 3E-6654

S/N: SHH1-Up

Part No.: 3E-6654

S/N: 3BJ100-Up

Part No.: 3E-6654

S/N: 4XJ367-Up

Part No.: 3E-6654

S/N: 7XJ1-Up

Part No.: 3E-6654

S/N: LAJ1-Up

Part No.: 3E-6654

S/N: NBJ1-Up

Part No.: 3E-6654
S/N: 2TK79-Up

Part No.: 3E-6654
S/N: 5RK1-Up

Part No.: 3E-6654
S/N: 6HK265-Up

Part No.: 3E-6654
S/N: 7EK231-Up

Part No.: 3E-6654
S/N: 1HL102-Up

Part No.: 3E-6654
S/N: ERM1-Up

Part No.: 3E-6654
S/N: JSM1-Up

Part No.: 3E-6654
S/N: RFM1-Up

Part No.: 3E-6654
S/N: TNM1-Up

Part No.: 3E-6654
S/N: JRP1-Up

Part No.: 3E-6654
S/N: SSP1-Up

Part No.: 3E-6654
S/N: 3PR1-Up

Part No.: 3E-6654
S/N: 4AR1-Up

Part No.: 3E-6654
S/N: 5ER1-Up

Part No.: 3E-6654
S/N: 5TR1-Up

Part No.: 3E-6654
S/N: 6JR1-Up

Part No.: 3E-6654
S/N: 6KR1-Up

Part No.: 3E-6654
S/N: 7ER1-Up

Part No.: 3E-6654
S/N: CBR1-Up

Part No.: 3E-6654
S/N: FKR1-Up

Part No.: 3E-6654
S/N: RDR1-Up

Part No.: 3E-6654
S/N: 5SS1-Up

Part No.: 3E-6654
S/N: 6YS1-Up

Part No.: 3E-6654
S/N: 7CS1-Up

Part No.: 3E-6654
S/N: 8AS1-Up

Part No.: 3E-6654
S/N: 9SS1-Up

Part No.: 3E-6654
S/N: 9XS1-Up

Part No.: 3E-6654
S/N: 9YS1-Up

Part No.: 3E-6654
S/N: AFS1-Up

Part No.: 3E-6654
S/N: DLS1-Up

Part No.: 3E-6654
S/N: JWS1-Up

Part No.: 3E-6654
S/N: MJS1-Up

Part No.: 3E-6654
S/N: 1GW1-Up

Part No.: 3E-6654
S/N: 2BW1-Up

Part No.: 3E-6654
S/N: 2YW1-Up

Part No.: 3E-6654
S/N: 5YW1-Up

Part No.: 3E-6654
S/N: 63W4011-Up

Part No.: 3E-6654
S/N: 64W195-Up

Part No.: 3E-6654
S/N: 01X6362-Up

Part No.: 3E-6654
S/N: 02X371-Up

Part No.: 3E-6654
S/N: APX1-Up

Part No.: 3E-6654
S/N: AGY1-Up

Part No.: 3E-6654
S/N: ATY1-Up

Part No.: 3E-6654
S/N: 2PZ1-Up

Part No.: 3E-6654
S/N: 4GZ1-Up

Part No.: 3E-6654
S/N: 5AZ1-Up

Part No.: 3E-6654
S/N: BZZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

Note: Refrigerant capacities for models 69D and 73D are for underground machines.

69 Refrigerant Capacities

69D

9XS1-Up 1.8 kg (4 lb)
9SS1-Up 1.3 kg (2.9 lb)

73 Refrigerant Capacities

73D

9YS1-Up 1.8 kg (4 lb)
1GW1-Up 1.3 kg (2.9 lb)

768 Refrigerant Capacities

768C

02X371-Up 1.9 kg (4.2 lb)

769 Refrigerant Capacities

769C

01X6362-Up 1.9 kg (4.2 lb)

769D

5TR1-969 1.8 kg (4.0 lb)
5TR970-Up 1.8 kg (4.0 lb)
BBB1-Up 3.0 kg (6.5 lb)
5SS1-Up 1.8 kg (4.0 lb)

770 Refrigerant Capacities

770

BZZ1-Up 2.0 kg (4.4 lb)

771 Refrigerant Capacities

771C

3BJ100-Up 1.9 kg (4.2 lb)

771D

6JR1-Up 1.8 kg (4.0 lb)
BCA1-Up 3.0 kg (6.5 lb)
6YS1-Up 1.8 kg (4.0 lb)

772 Refrigerant Capacities

772

RLB1-Up 2.0 kg (4.4 lb)

772B

64W195-Up 1.9 kg (4.2 lb)

773 Refrigerant capacities

773B

63W4011-Up 1.9 kg (4.2 lb)

773D

7ER1-Up 1.8 kg (4.0 lb)
7CS1-Up 1.8 kg (4.0 lb)
NBJ1-Up 1.8 kg (4.0 lb)

773E

BDA1-Up 2.5 kg (5.5 lb)
ASK1-Up 2.5 kg (5.5 lb)
KEG1-Up 2.5 kg (5.5 lb)

773F

EED1-Up 2.4 kg (5.3 lb)

773G

JWS 2.2 kg (4.9 lb)
MWH 2.2 kg (4.9 lb)

775 Refrigerant Capacities

775B

7XJ124-Up 1.9 kg (4.2 lb)

775D

6KR1-Up 1.8 kg (4.0 lb)
8AS1-Up 1.8 kg (4.0 lb)

775E

BEC1-Up 1.8 kg (4.0 lb)

775F

DLS1-Up 2.4 kg (5.3 lb)
EFG1-Up 2.4 kg (5.3 lb)

775G

MJS 2.2 kg (4.9 lb)
RFM 2.2 kg (4.9 lb)

776 Refrigerant Capacities

776C

2TK79-Up 1.9 kg (4.2 lb)

776D5ER1-Up 1.8 kg (4.0 lb)
AFS1-Up 1.8 kg (4.0 lb)**777 Refrigerant Capacities****777C**

4XJ367-Up 1.9 kg (4.2 lb)

777D3PR1-Up 1.8 kg (4.0 lb)
AGC1-Up 1.8 kg (4.0 lb)
AGY1-Up 1.8 kg (4.0 lb)
2YW1-Up 1.8 kg (4.0 lb)
FKR1-Up 1.8 kg (4.0 lb)**777F**

JRP1-Up 2.4 kg (5.3 lb)

777GRDR1-Up 2.4 kg (5.3 lb)
TNM1-Up 2.4 kg (5.3 lb)**784 Refrigerant Capacities****784B**

5RK1-Up 2.1 kg (4.6 lb)

784C

2PZ1-Up 2.1 kg (4.6 lb)

785 Refrigerant Capacities**785B**

6HK265-Up 2.1 kg (4.6 lb)

785C5AZ1-Up 3 kg (6.6 lb)
APX1-Up 3 kg (6.6 lb)
1HW1-Up 3 kg (6.6 lb)**785D**

MSY1-Up 3 kg (6.6 lb)

789 Refrigerant Capacities**789B**

7EK231-Up 2.1 kg (4.6 lb)

789C

2BW1-Up 3 kg (6.6 lb)

789DSPD1-Up 2.1 kg (4.6 lb)
SHH1-Up 2.1 kg (4.6 lb)**793 Refrigerant Capacities****793B**

1HL102-Up 2.1 kg (4.6 lb)

793C4AR1-Up 2.1 kg (4.6 lb)
ATY1-243 2.1 kg (4.6 lb)
ATY244-Up 3 kg (6.6 lb)
CBR1-Up 3 kg (6.6 lb)
4GZ1-Up 2.1 kg (4.6 lb)**793D**

FDB1-Up 2.7 kg (6 lb)

793F

SSP1-Up 2.3 kg (5 lb)

795 Refrigerant Capacities**795F AC**

ERM1-Up 2.3 kg (5 lb)

797 Refrigerant Capacities**797**

5YW1-Up 2 kg (4.5 lb)

797B

JSM1-Up 2.7 kg (6 lb)

797F

LAJ1-Up 2.3 kg (5 lb)

i04375450

System Capacities for Refrigerant (Off-Highway Trucks) (OEM)

SMCS Code: 1809

Part No.: 3E-6654
S/N: DMC1-Up

Part No.: 3E-6654
S/N: EXD1-Up

Part No.: 3E-6654
S/N: EYG1-Up

Part No.: 3E-6654
S/N: JXP1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

773F Refrigerant capacities

EXD1-Up 2.4 kg (5.3 lb)

775F Refrigerant Capacities

EYG1-Up 2.4 kg (5.3 lb)

777F Refrigerant Capacities

JXP1-Up 2.4 kg (5.3 lb)

785D Refrigerant Capacities

DMC1-Up 3 kg (6.6 lb)

i05009050

System Capacities for Refrigerant (Paving Products)

SMCS Code: 1809

Part No.: 3E-6654
S/N: 4431-Up

Part No.: 3E-6654
S/N: 4731-Up

Part No.: 3E-6654
S/N: 6841-Up

Part No.: 3E-6654
S/N: 7441-Up

Part No.: 3E-6654
S/N: C641-Up

Part No.: 3E-6654
S/N: CS61-Up

Part No.: 3E-6654
S/N: 4371-Up

Part No.: 3E-6654
S/N: 4381-Up

Part No.: 3E-6654
S/N: 4391-Up

Part No.: 3E-6654
S/N: ASA1-Up

Part No.: 3E-6654
S/N: EAA1-Up

Part No.: 3E-6654
S/N: FEA1-Up

Part No.: 3E-6654
S/N: GCA1-Up

Part No.: 3E-6654
S/N: ASB1-Up

Part No.: 3E-6654
S/N: C2B1-Up

Part No.: 3E-6654
S/N: CAB1-Up

Part No.: 3E-6654
S/N: CEB1-Up

Part No.: 3E-6654
S/N: L7B1-Up

Part No.: 3E-6654
S/N: LCB1-Up

Part No.: 3E-6654
S/N: AFC1-Up

Part No.: 3E-6654
S/N: DAC1-Up

Part No.: 3E-6654
S/N: L8C1-Up

Part No.: 3E-6654
S/N: LHC1-Up

Part No.: 3E-6654
S/N: DAD1-Up

Part No.: 3E-6654
S/N: BWE1-Up

Part No.: 3E-6654
S/N: BZE1-Up

Part No.: 3E-6654
S/N: CYE1-Up

Part No.: 3E-6654
S/N: EAE1-Up

Part No.: 3E-6654
S/N: JXE1-Up

Part No.: 3E-6654
S/N: TBE1-Up

Part No.: 3E-6654
S/N: AEF1-Up

Part No.: 3E-6654
S/N: ASF1-Up

Part No.: 3E-6654
S/N: C7F1-Up

Part No.: 3E-6654
S/N: C8F1-Up

Part No.: 3E-6654
S/N: LCF1-Up

Part No.: 3E-6654
S/N: P7F1-Up

Part No.: 3E-6654
S/N: P8F1-Up

Part No.: 3E-6654
S/N: ASG1-Up

Part No.: 3E-6654
S/N: BWG1-Up

Part No.: 3E-6654
S/N: BZG1-Up

Part No.: 3E-6654
S/N: CNG1-Up

Part No.: 3E-6654
S/N: DAG1-Up

Part No.: 3E-6654
S/N: AGH1-Up

Part No.: 3E-6654
S/N: ASH1-Up

Part No.: 3E-6654
S/N: CNH1-Up

Part No.: 3E-6654
S/N: FGH1-Up

Part No.: 3E-6654
S/N: J3H1-Up

Part No.: 3E-6654
S/N: L4H1-Up

Part No.: 3E-6654
S/N: L8H1-Up

Part No.: 3E-6654
S/N: L9H1-Up

Part No.: 3E-6654
S/N: SCH1-Up

Part No.: 3E-6654
S/N: DAJ1-Up

Part No.: 3E-6654
S/N: LTJ1-Up

Part No.: 3E-6654
S/N: TLJ1-Up

Part No.: 3E-6654
S/N: CFK1-Up

Part No.: 3E-6654
S/N: DAK1-Up

Part No.: 3E-6654
S/N: AFL1-Up

Part No.: 3E-6654
S/N: ASL1-Up

Part No.: 3E-6654
S/N: C7L1-Up

Part No.: 3E-6654
S/N: DCL1-Up

Part No.: 3E-6654
S/N: JXL1-Up

Part No.: 3E-6654
S/N: RLL1-Up

Part No.: 3E-6654
S/N: ASM1-Up

Part No.: 3E-6654
S/N: C8M1-Up

Part No.: 3E-6654
S/N: DAM1-Up

Part No.: 3E-6654
S/N: ASN1-Up

Part No.: 3E-6654
S/N: CNN1-Up

Part No.: 3E-6654
S/N: RJN1-Up

Part No.: 3E-6654
S/N: C5P1-Up

Part No.: 3E-6654
S/N: C6P1-Up

Part No.: 3E-6654
S/N: C8P1-Up

Part No.: 3E-6654
S/N: CFP1-Up

Part No.: 3E-6654
S/N: FCP1-Up

Part No.: 3E-6654
S/N: JCP1-Up

Part No.: 3E-6654
S/N: 3RR1-Up

Part No.: 3E-6654
S/N: 5GR1-Up

Part No.: 3E-6654
S/N: AGR1-Up

Part No.: 3E-6654
S/N: ASR1-Up

Part No.: 3E-6654
S/N: BWR1-Up

Part No.: 3E-6654
S/N: 7FS1-Up

Part No.: 3E-6654
S/N: C5S1-Up

Part No.: 3E-6654
S/N: C6S1-Up

Part No.: 3E-6654
S/N: C8S1-Up

Part No.: 3E-6654
S/N: FCS1-Up

Part No.: 3E-6654
S/N: JCS1-Up

Part No.: 3E-6654
S/N: MMS1-Up

Part No.: 3E-6654
S/N: AET1-Up

Part No.: 3E-6654
S/N: AST1-Up

Part No.: 3E-6654
S/N: BTT1-Up

Part No.: 3E-6654
S/N: CNT1-Up

Part No.: 3E-6654
S/N: GRT1-Up

Part No.: 3E-6654
S/N: 9MW1-Up

Part No.: 3E-6654
S/N: 9ZW1-Up

Part No.: 3E-6654
S/N: ASW1-Up

Part No.: 3E-6654
S/N: AXW1-Up

Part No.: 3E-6654
S/N: CFX1-Up

Part No.: 3E-6654
S/N: CNX1-Up

Part No.: 3E-6654
S/N: CPX1-Up

Part No.: 3E-6654
S/N: CYX1-Up

Part No.: 3E-6654
S/N: BTY1-Up

Part No.: 3E-6654
S/N: 1SZ1-Up

Part No.: 3E-6654
S/N: 2CZ1-Up

Part No.: 3E-6654
S/N: 2RZ1-Up

Part No.: 3E-6654
S/N: 3AZ1-Up

Part No.: 3E-6654
S/N: 4MZ1-Up

Part No.: 3E-6654
S/N: 5CZ1-Up

Part No.: 3E-6654
S/N: 5FZ1-Up

Part No.: 3E-6654
S/N: 5LZ1-Up

Part No.: 3E-6654
S/N: 6AZ1-Up

Part No.: 3E-6654
S/N: 6LZ1-Up

RR-250 Refrigerant Capacities

RR-250B

3RR1-Up 1.7 kg (3.75 lb)

SS-250 Refrigerant Capacities

SS-250B

5GR1-Up 1.7 kg (3.75 lb)

RM-300 Refrigerant Capacities

RM-300

BWR1-Up 1.7 kg (3.75 lb)

RM-350 Refrigerant Capacities**RM-350B**

7FS1-Up 1.8 kg (4.0 lb)

AXW1-Up 1.0 kg (2.2 lb)

RM-500 Refrigerant Capacities**RM-500**

ASW1-Up 1.7 kg (3.75 lb)

CB-434 Refrigerant Capacities**CB-434D**

CNH1-Up 1.2 kg (2.7 lb)

CB-534 Refrigerant Capacities**CB-534D**

FGH1-Up 1.2 kg (2.7 lb)

GCA1-Up 1.2 kg (2.7 lb)

EAA1-Up 1.2 kg (2.7 lb)

FEA1-Up 1.2 kg (2.7 lb)

C2B1-Up 1.2 kg (2.7 lb)

C8M1-Up 1.2 kg (2.7 lb)

CB-534D XW

C4B1-Up 1.2 kg (2.7 lb)

CB44B Refrigerant Capacities**CB44B**

JXL1-Up 2.04 kg (4.50 lb)

CB54B Refrigerant Capacities**CB54B**

RJN1-Up 2.04 kg (4.50 lb)

CD44B Refrigerant Capacities**CD44B**

JXE1-Up 2.04 kg (4.50 lb)

CD54B Refrigerant Capacities**CD54B**

GRT1-Up 2.04 kg (4.50 lb)

CP/CS-423 Refrigerant Capacities**CP-423E**

BWG1-Up 1.3 kg (2.9 lb)

CS-423E

CFX1-Up 1.3 kg (2.9 lb)

DCL1-Up 1.3 kg (2.9 lb)

AGH1-Up 1.3 kg (2.9 lb)

ASH1-Up 1.3 kg (2.9 lb)

EAE1-Up 1.3 kg (2.9 lb)

AST1-Up 1.3 kg (2.9 lb)

CP/CS-433 Refrigerant Capacities**CP-433E**

CFK1-Up 1.3 kg (2.9 lb)

CYE1-Up 1.3 kg (2.9 lb)

BTY1-Up 1.3 kg (2.9 lb)

ASN1-Up 1.3 kg (2.9 lb)

CS-433E

CFP1-Up 1.3 kg (2.9 lb)

DAC1-Up 1.3 kg (2.9 lb)

BTT1-Up 1.3 kg (2.9 lb)

ASR1-Up 1.3 kg (2.9 lb)

CS-531 Refrigerant Capacities**CS-531D**

3AZ1-Up 1.3 kg (2.9 lb)

4MZ1-Up 1.3 kg (2.9 lb)

AGH1-Up 1.3 kg (2.9 lb)

CP/CS-533 Refrigerant Capacities

CP-533D

6AZ1-Up	1.3 kg (2.9 lb)
AFC1-Up	1.3 kg (2.9 lb)
DAM1-Up	1.3 kg (2.9 lb)
ASM1-Up	1.3 kg (2.9 lb)
BZG1-Up	1.3 kg (2.9 lb)

CS-533D

5CZ1-Up	1.3 kg (2.9 lb)
AET1-Up	1.3 kg (2.9 lb)

CS-533E

DAK1-Up	1.3 kg (2.9 lb)
ASL1-Up	1.3 kg (2.9 lb)
BZE1-Up	1.3 kg (2.9 lb)
TBE1-Up	1.3 kg (2.9 lb)

CP/CS-563 Refrigerant Capacities

CP-56

C5P1-Up	1.2 kg (2.7 lb)
FCP1-Up	1.2 kg (2.7 lb)

CP-563D

5LZ1-Up	1.3 kg (2.9 lb)
9ZW1-Up	1.3 kg (2.9 lb)

CP-563E

CNT1-Up	1.3 kg (2.9 lb)
BWE1-Up	1.3 kg (2.9 lb)

CS-56

CS51-Up	1.2 kg (2.7 lb)
FCS1-Up	1.2 kg (2.7 lb)

CS-563D

2RZ1-Up	1.3 kg (2.9 lb)

9MW1-Up	1.3 kg (2.9 lb)

1SZ1-Up	1.3 kg (2.9 lb)

CS-563E

CNG1-Up	1.3 kg (2.9 lb)

ASA1-Up	1.3 kg (2.9 lb)

MCP1-Up	1.3 kg (2.9 lb)

CP54B Refrigerant Capacities

CP54B

CPX1-Up	0.8 kg (1.8 lb)

CP56B Refrigerant Capacities

CP56B

LHC1-Up	0.8 kg (1.8 lb)
4381-Up	0.8 kg (1.8 lb)

CP68B Refrigerant Capacities

CP68B

LCF1-Up	0.8 kg (1.8 lb)
6841-Up	0.8 kg (1.8 lb)

CP74B Refrigerant Capacities

CP74B

L7B1-Up	0.8 kg (1.8 lb)
7441-Up	0.8 kg (1.8 lb)

CS-573 Refrigerant Capacities

CS-573E

CNN1-Up	1.3 kg (2.9 lb)

CEB1-Up	1.3 kg (2.9 lb)

CS-583 Refrigerant Capacities

CS-583D

2CZ1-Up	1.3 kg (2.9 lb)

3GZ1-Up	1.3 kg (2.9 lb)

CS-583E

CNX1-Up	1.3 kg (2.9 lb)

DAJ1-Up	1.3 kg (2.9 lb)

CP-633 Refrigerant Capacities**CP-633E**

ASF1-Up 1.3 kg (2.9 lb)

DAF1-Up 1.3 kg (2.9 lb)

CP-64 Refrigerant Capacities**CP-64**

C6P1-Up 1.2 kg (2.7 lb)

CP-64

P7F1-Up 1.2 kg (2.7 lb)

CS-64 Refrigerant Capacities**CS-64**

C6X1-Up 1.2 kg (2.7 lb)

C7F1-Up 1.2 kg (2.7 lb)

CP/CS-663 Refrigerant Capacities**CP-663E**

ASF1-Up 1.3 (2.9)

AFL1-Up 1.3 kg (2.9 lb)

CS-663E

AEF1-Up 1.3 kg (2.9 lb)

DAG1-Up 1.3 kg (2.9 lb)

ASB1-Up 1.3 kg (2.9 lb)

CS54B Refrigerant Capacities**CS54B**

L4H1-Up 0.8 kg (1.8 lb)

CS56B Refrigerant Capacities**CS56B**

L8H1-Up 0.8 kg (1.8 lb)

4371-Up 0.8 kg (1.8 lb)

CS64B Refrigerant Capacities**CS64B**

C641-Up 0.8 kg (1.8 lb)

CS66B Refrigerant Capacities**CS66B**

CS61-Up 0.8 kg (1.8 lb)

CS68B Refrigerant Capacities**CS68B**

MMS1-Up 0.8 kg (1.8 lb)

4391-Up 0.8 kg (1.8 lb)

CS74B Refrigerant Capacities**CS74B**

LCB1-Up 0.8 kg (1.8 lb)

CS76B Refrigerant Capacities**CS76B**

L9H1-Up 0.8 kg (1.8 lb)

CS78B Refrigerant Capacities**CS78B**

L8C1-Up 0.8 kg (1.8 lb)

4431-Up 0.8 kg (1.8 lb)

CS-683 Refrigerant Capacities**CS-683E**

DAD1-Up 1.3 kg (2.9 lb)

ASG1-Up 1.3 kg (2.9 lb)

AGR1-Up 1.3 kg (2.9 lb)

CP-74 Refrigerant Capacities**CP-74**

C8P1-Up 1.2 kg (2.7 lb)

P8F1-Up 1.2 kg (2.7 lb)

CS-74 Refrigerant Capacities**CS-74**

C8S1-Up 1.2 kg (2.7 lb)

C8F1-Up 1.2 kg (2.7 lb)

CP-76 Refrigerant Capacities

CP-76

JCP1-Up 1.2 kg (2.7 lb)

C7L1-Up 1.2 kg (2.7 lb)

CS-76 Refrigerant Capacities

CS-76

JCS1-Up 1.2 kg (2.7 lb)

CYX1-Up 1.2 kg (2.7 lb)

i05011449

System Capacities for Refrigerant (Skid Steer Loaders)

SMCS Code: 1809

Part No.: 3E-6654
S/N: LBA1-Up

Part No.: 3E-6654
S/N: CAB1-Up

Part No.: 3E-6654
S/N: CMB1-Up

Part No.: 3E-6654
S/N: CED1-Up

Part No.: 246-9039
S/N: MWD1-Up

Part No.: 3E-6654
S/N: RED1-Up

Part No.: 3E-6654
S/N: FDG1-Up

Part No.: 246-9039
S/N: A9H1-Up

Part No.: 3E-6654
S/N: MJH1-Up

Part No.: 246-9039
S/N: TNK1-Up

Part No.: 3E-6654
S/N: SCL1-Up

Part No.: 3E-6654
S/N: BXM1-Up

Part No.: 3E-6654
S/N: JXM1-Up

Part No.: 3E-6654
S/N: HEN1-Up

Part No.: 3E-6654
S/N: SCP1-Up

Part No.: 3E-6654
S/N: DWS1-Up

Part No.: 246-9039
S/N: SRS1-Up

Part No.: 3E-6654
S/N: MST1-Up

Part No.: 3E-6654
S/N: PAT1-Up

Part No.: 3E-6654
S/N: PDT1-Up

Part No.: 3E-6654
S/N: TMW1-Up

Part No.: 3E-6654
S/N: JAY1-Up

Part No.: 3E-6654
S/N: 4NZ3400-Up

Part No.: 3E-6654
S/N: 4YZ1-Up

Part No.: 3E-6654
S/N: 5SZ1-Up

216 Refrigerant Capacities

216

4NZ3400-Up 0.68 kg (1.500 lb)

216B

RLL1-Up 0.81 kg (1.5 lb)

216B3

JXM1-Up 0.81 kg (1.5 lb)

226 Refrigerant Capacities

226

5FZ1-Up 0.68 kg (1.500 lb)

226B

MJH1-Up 0.81 kg (1.786 lb)

226B3

MWD1-Up 0.81 kg (1.786 lb)

232**232**

CAB1-Up 0.68 kg (1.500 lb)

232B

SCH1-Up 0.81 kg (1.786 lb)

236 Refrigerant Capacities**236**

4YZ1-Up 0.68 kg (1.500 lb)

236B

HEN1-Up 0.81 kg (1.786 lb)

236B3

A9H1-Up 0.81 kg (1.786 lb)

242 Refrigerant Capacities**242**

CMB1-Up 0.68 kg (1.500 lb)

242B

BXM1-Up 0.81 kg (1.786 lb)

242B3

SRS1-Up 0.81 kg (1.786 lb)

246 Refrigerant Capacities**246**

5SZ1-Up 0.68 kg (1.500 lb)

246B

PAT1-Up 0.81 kg (1.786 lb)

246C

JAY1-Up 1.27 kg (2.80 lb)

248 Refrigerant Capacities**248**

6LZ1-Up 0.68 kg (1.500 lb)

248B

SCL1-Up 0.81 kg (1.786 lb)

252 Refrigerant Capacities**252**

FDG1-Up 0.68 kg (1.500 lb)

252B

SCP1-Up 0.81 kg (1.786 lb)

252B3

TNK1-Up 0.81 kg (1.786 lb)

256 Refrigerant Capacities**256C**

DWS1-Up 1.27 kg (2.80 lb)

262 Refrigerant Capacities**262**

CED1-Up 0.68 kg (1.500 lb)

262B

PDT1-Up 0.81 kg (1.786 lb)

262C

MST1-Up 1.27 kg (2.80 lb)

TMW1-Up 1.27 kg (2.80 lb)

268 Refrigerant Capacities**268B**

LBA1-Up 0.81 kg (1.786 lb)

272 Refrigerant Capacities**272C**

RED1-Up 0.81 kg (1.786 lb)

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System Capacities for Refrigerant (Small Wheel Loaders)

SMCS Code: 1809

Part No.: 3E-6654
S/N: DDA1-Up

Part No.: 3E-6654
S/N: RTA1-Up

Part No.: 3E-6654
S/N: AAB1-Up

Part No.: 3E-6654
S/N: RBB1-Up

Part No.: 3E-6654
S/N: RCB1-Up

Part No.: 3E-6654
S/N: WLB1-Up

Part No.: 3E-6654
S/N: WMB1-Up

Part No.: 3E-6654
S/N: DHC1-Up

Part No.: 3E-6654
S/N: HXC1-Up

Part No.: 3E-6654
S/N: BYD1-Up

Part No.: 3E-6654
S/N: DJD1-Up

Part No.: 3E-6654
S/N: FTD1-Up

Part No.: 3E-6654
S/N: PED1-Up

Part No.: 3E-6654
S/N: 1SF1337-Up

Part No.: 3E-6654
S/N: PDF1-Up

Part No.: 3E-6654
S/N: WLG1-Up

Part No.: 3E-6654
S/N: 3TJ363-Up

Part No.: 3E-6654
S/N: 8AK1-Up

Part No.: 3E-6654
S/N: CXK1-Up

Part No.: 3E-6654
S/N: 2XL1-Up

Part No.: 3E-6654
S/N: 5DL167-Up

Part No.: 3E-6654
S/N: JRL1-Up

Part No.: 3E-6654
S/N: SWL1-Up

Part No.: 3E-6654
S/N: 7YM1-Up

Part No.: 3E-6654
S/N: 7ZM1-Up

Part No.: 3E-6654
S/N: 9WM87-Up

Part No.: 3E-6654
S/N: JTM1-Up

Part No.: 3E-6654
S/N: 4YN75-Up

Part No.: 3E-6654
S/N: 5NN75-Up

Part No.: 3E-6654
S/N: 6MN75-Up

Part No.: 3E-6654
S/N: 7PN75-Up

Part No.: 3E-6654
S/N: AAN1-Up

Part No.: 3E-6654
S/N: KLN1-Up

Part No.: 3E-6654
S/N: RHN1-Up

Part No.: 3E-6654
S/N: KNP1-Up

Part No.: 3E-6654
S/N: 6XR1-Up

Part No.: 3E-6654
S/N: 7SR1-Up

Part No.: 3E-6654
S/N: AKR1-Up

Part No.: 3E-6654
S/N: PWR1-Up

Part No.: 3E-6654
S/N: TWR1-Up

Part No.: 3E-6654
S/N: RRS1-Up

Part No.: 3E-6654
S/N: 6YW1-Up

Part No.: 3E-6654
S/N: 9SW1-Up

Part No.: 3E-6654
S/N: TFW1-Up

Part No.: 3E-6654
S/N: WGX1-Up

Part No.: 3E-6654
S/N: 3DZ1-Up

Part No.: 3E-6654
S/N: 3PZ1-Up

Part No.: 3E-6654
S/N: DFZ1-Up

Part No.: 3E-6654
S/N: JZZ1-Up

910 Refrigerant Capacities

910F

1SF1337-Up 1.6 kg (3.53 lb)

910G

AKR1-Up 1.3 kg (2.87 lb)

914 Refrigerant Capacities

914G

9WM87-Up 1.3 kg (2.9 lb)

7ZM1-Up 1.3 kg (2.9 lb)

PDF1-Up 1.3 kg (2.9 lb)

KNP1-Up 1.3 kg (2.9 lb)

918 Refrigerant Capacities

918F

3TJ363-Up 2.0 kg (4.41 lb)

5DL167-Up 2.0 kg (4.41 lb)

924 Refrigerant Capacities

924F

4YN75-Up 2.0 kg (4.41 lb)

5NN75-Up 2.0 kg (4.41 lb)

6MN75-Up 2.0 kg (4.41 lb)

7PN75-Up 2.0 kg (4.41 lb)

924G

9SW1-Up 1.3 kg (2.87 lb)

3PZ1-Up 1.3 kg (2.87 lb)

AAN1-Up 1.3 kg (2.87 lb)

DDA1-Up 1.3 kg (2.87 lb)

RBB1-Up 1.3 kg (2.87 lb)

WMB1-Up 1.3 kg (2.87 lb)

6YW1-Up 1.3 kg (2.87 lb)

3DZ1-Up 1.3 kg (2.87 lb)

924GZ

DFZ1-Up 1.3 kg (2.87 lb)

RTA1-Up 1.3 kg (2.87 lb)

WGX1-Up 1.3 kg (2.87 lb)

AAB1-Up 1.3 kg (2.87 lb)

924H

KLN1-Up 1.6 kg (3.53 lb)

JTM1-Up 1.6 kg (3.53 lb)

HXC1-Up 1.6 kg (3.53 lb)

RRS1-Up 1.6 kg (3.53 lb)

WLB1-Up 1.6 kg (3.53 lb)

JRL1-Up 1.6 kg (3.53 lb)

924HZ

RCB1-Up 1.6 kg (3.5 lb)

WLB1-Up 1.6 kg (3.5 lb)

PED1-Up 1.6 kg (3.5 lb)

JZZ1-Up 1.6 kg (3.5 lb)

928 Refrigerant Capacities

928F

8AK1-Up 2.5 kg (5.51 lb)

2XL1-Up 2.5 kg (5.51 lb)

7YM1-Up 2.5 kg (5.51 lb)

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928G

6XR1-Up	1.3 kg (2.87 lb)
7SR1-Up	1.3 kg (2.87 lb)
DJD1-Up	1.3 kg (2.87 lb)
WLG1-Up	1.3 kg (2.87 lb)

928HZ

BYD1-Up	1.6 kg (3.53 lb)
CXK1-Up	1.6 kg (3.53 lb)

930 Refrigerant Capacities

930G

TWR1-Up	1.3 kg (2.87 lb)
TFW1-Up	1.3 kg (2.87 lb)

930H

DHC1-Up	1.6 kg (3.53 lb)
FTD1-Up	1.6 kg (3.53 lb)

**System Capacities for
Refrigerant (Telehandlers)**

SMCS Code: 1809

Part No.: 3E-6654
S/N: SLA1-Up

Part No.: 3E-6654
S/N: SLB1-Up

Part No.: 3E-6654
S/N: CEC1-Up

Part No.: 3E-6654
S/N: SLC1-Up

Part No.: 3E-6654
S/N: SLD1-Up

Part No.: 3E-6654
S/N: SLE1-Up

Part No.: 3E-6654
S/N: SLF1-Up

Part No.: 3E-6654
S/N: CEG1-Up

Part No.: 3E-6654
S/N: SLG1-Up

Part No.: 3E-6654
S/N: SLH1-Up

Part No.: 3E-6654
S/N: JRK1-Up

TH210 Refrigerant Capacities

TH210

MHT1-Up	1.2 kg (2.65 lb)
CEC1-Up	1.2 kg (2.65 lb)

TH215 Refrigerant Capacities

TH215

MHS1-Up	1.2 kg (2.65 lb)
CEG1-Up	1.2 kg (2.65 lb)

TH220 Refrigerant Capacities

TH220B

SLA1-Up	0.8 kg (1.76 lb)

TH330 Refrigerant Capacities

TH330B

SLB1-Up 0.8 kg (1.76 lb)

TH340 Refrigerant Capacities

TH340B

SLC1-Up 0.8 kg (1.76 lb)

TH350 Refrigerant Capacities

TH350B

SLD1-Up 0.8 kg (1.76 lb)

TH355 Refrigerant Capacities

TH355B

JRK1-Up 0.8 kg (1.76 lb)

TH360 Refrigerant Capacities

TH360B

SLE1-Up 0.8 kg (1.76 lb)

TH460 Refrigerant Capacities

TH460B

SLF1-Up 0.8 kg (1.76 lb)

TH560 Refrigerant Capacities

TH560B

SLG1-Up 0.8 kg (1.76 lb)

TH580 Refrigerant Capacities

TH580B

SLH1-Up 0.8 kg (1.76 lb)

Part No.: 3E-6654
S/N: BBD1-Up

Part No.: 3E-6654
S/N: 86G1556-Up

Part No.: 3E-6654
S/N: 5MK1651-Up

Part No.: 3E-6654
S/N: 8FL1-Up

Part No.: 3E-6654
S/N: 9BL1-Up

Part No.: 3E-6654
S/N: 9EL48-Up

Part No.: 3E-6654
S/N: 9GL91-Up

Part No.: 3E-6654
S/N: 2ZN1-Up

Part No.: 3E-6654
S/N: BCP1-Up

Part No.: 3E-6654
S/N: LBP1-Up

Part No.: 3E-6654
S/N: LCP1-Up

Part No.: 3E-6654
S/N: 2DS1-Up

Part No.: 3E-6654
S/N: 4MS1-Up

Part No.: 3E-6654
S/N: 5JS1-Up

Part No.: 3E-6654
S/N: 6DS1-Up

Part No.: 3E-6654
S/N: LCS1-Up

Part No.: 3E-6654
S/N: BBX1-Up

Part No.: 3E-6654
S/N: LDX1-Up

Part No.: 3E-6654
S/N: 21Z5346-Up

Part No.: 3E-6654
S/N: 3RZ1-Up

**System Capacities for
Refrigerant (Track-Type
Loaders)**

SMCS Code: 1809

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, “Refrigerant System - Charge”.

933 Refrigerant Capacities

933C

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8FL70-Up	1.8 kg (4 lb)
9EL48-Up	1.8 kg (4 lb)
5JS1-Up	1.9 kg (4.2 lb)
4MS1-Up	1.9 kg (4.2 lb)

939 Refrigerant Capacities

939C

9GL1-Up	1.8 kg (4 lb)
6DS1-Up	1.9 kg (4.2 lb)

953 Refrigerant Capacities

953B

5KM1651-Up	1.6 kg (3.5 lb)

953C

2ZN1-1748	1.1 kg (2.4 lb)
2ZN1749-Up	1.4 kg (3.0 lb)
BBX1-Up	1.4 kg (3.0 lb)

953D

LBP1-Up	1.9 kg (4.2 lb)

963 Refrigerant Capacities

963

21Z5346-Up	1.7 kg (3.7 lb)

963B

9BL1-Up	1.6 kg (3.5 lb)

963C

2DS1-Up	1.4 kg (3 lb)
BBD1-Up	1.4 kg (3 lb)

963D

LCS1-Up	1.9 kg (4.2 lb)

973 Refrigerant Capacities

973

86G1556-Up	1.6 kg (3.5 lb)

973C

3RZ1-Up	1.4 kg (3 lb)
BCP1-Up	1.4 kg (3 lb)
LDX1-Up	1.4 kg (3 lb)

973D

LCP1-Up	1.9 kg (4.2 lb)

System Capacities for Refrigerant (Track-Type Tractors)

SMCS Code: 1809

Part No.: 3E-6654
S/N: AKA1-Up

Part No.: 3E-6654
S/N: AMA1-Up

Part No.: 3E-6654
S/N: DHA1-Up

Part No.: 3E-6654
S/N: DJA1-Up

Part No.: 3E-6654
S/N: PBA1-Up

Part No.: 3E-6654
S/N: TJA1-Up

Part No.: 3E-6654
S/N: 4AB5532-Up

Part No.: 3E-6654
S/N: 5WB5586-Up

Part No.: 3E-6654
S/N: 7MB1-Up

Part No.: 3E-6654
S/N: 8KB1-Up

Part No.: 3E-6654
S/N: GEB1-Up

Part No.: 3E-6654
S/N: GJB1-Up

Part No.: 3E-6654
S/N: J8B1-Up

Part No.: 3E-6654
S/N: JHB1-Up

Part No.: 3E-6654
S/N: JJB1-Up

Part No.: 3E-6654
S/N: KSB1-Up

Part No.: 294-8140
S/N: MDB1-Up

Part No.: 3E-6654
S/N: TPB1-Up

Part No.: 3E-6654
S/N: WCB1-Up

Part No.: 3E-6654
S/N: WGB1-Up

Part No.: 3E-6654
S/N: ZEB1-Up

Part No.: 3E-6654
S/N: ZJB1-Up

Part No.: 3E-6654
S/N: 4RC5589-Up

Part No.: 3E-6654
S/N: 6FC5542-Up

Part No.: 3E-6654
S/N: 7NC5527-Up

Part No.: 3E-6654
S/N: 8FC5612-Up

Part No.: 3E-6654
S/N: 8RC5967-Up

Part No.: 3E-6654
S/N: 9HC5521-Up

Part No.: 3E-6654
S/N: 9TC1-Up

Part No.: 3E-6654
S/N: AEC1-Up

Part No.: 3E-6654
S/N: BNC1-Up

Part No.: 3E-6654
S/N: CFC1-Up

Part No.: 3E-6654
S/N: FDC1-Up

Part No.: 3E-6654
S/N: HDC1-Up

Part No.: 3E-6654
S/N: JZC1-Up

Part No.: 3E-6654
S/N: RFC1-Up

Part No.: 3E-6654
S/N: SMC1-Up

Part No.: 3E-6654
S/N: TBC1-Up

Part No.: 3E-6654
S/N: 1DD6006-Up

Part No.: 3E-6654
S/N: 1JD1-Up

Part No.: 3E-6654
S/N: 1KD5600-Up

Part No.: 3E-6654
S/N: 1YD5522-Up

Part No.: 3E-6654
S/N: 2KD5618-Up

Part No.: 3E-6654
S/N: 2SD5549-Up

Part No.: 3E-6654
S/N: 3MD5594-Up

Part No.: 3E-6654
S/N: 4KD5585-Up

Part No.: 3E-6654
S/N: AFD1-Up

Part No.: 3E-6654
S/N: AKD1-Up

Part No.: 3E-6654
S/N: CAD1-Up

Part No.: 3E-6654
S/N: DTD1-Up

Part No.: 3E-6654
S/N: HCD1-Up

Part No.: 3E-6654
S/N: HYD1-Up

Part No.: 3E-6654
S/N: JTD1-Up

Part No.: 3E-6654
S/N: JWD1-Up

Part No.: 3E-6654
S/N: KSD1-Up

Part No.: 3E-6654
S/N: LBD1-Up

Part No.: 3E-6654
S/N: ADE1-Up

Part No.: 3E-6654
S/N: BLE1-Up

Part No.: 3E-6654
S/N: BRE1-Up

Part No.: 3E-6654
S/N: DAE1-Up

Part No.: 3E-6654
S/N: GAE1-Up

Part No.: 3E-6654
S/N: HKE1-Up

Part No.: 3E-6654
S/N: LAE1-Up

Part No.: 3E-6654
S/N: 3GF1-Up

Part No.: 3E-6654
S/N: 3ZF5736-Up

Part No.: 3E-6654
S/N: 4YF5575-Up

Part No.: 3E-6654
S/N: 5BF5690-Up

Part No.: 3E-6654
S/N: 5HF5582-Up

Part No.: 3E-6654
S/N: 6CF5565-Up

Part No.: 3E-6654
S/N: AAF1-Up

Part No.: 3E-6654
S/N: CBF1-Up

Part No.: 3E-6654
S/N: CFF1-Up

Part No.: 3E-6654
S/N: FFF1-Up

Part No.: 3E-6654
S/N: JLF1-Up

Part No.: 3E-6654
S/N: KFF1-Up

Part No.: 3E-6654
S/N: NCF1-Up

Part No.: 3E-6654
S/N: TRF1-Up

Part No.: 3E-6654
S/N: 2RG5622-Up

Part No.: 3E-6654
S/N: 2TG5593-Up

Part No.: 3E-6654
S/N: 3XG5515-Up

Part No.: 3E-6654
S/N: 3YG5772-Up

Part No.: 3E-6654
S/N: 4FG5537-Up

Part No.: 3E-6654
S/N: 4GG5632-Up

Part No.: 3E-6654
S/N: 4LG5598-Up

Part No.: 3E-6654
S/N: AFG1-Up

Part No.: 3E-6654
S/N: AGG1-Up

Part No.: 3E-6654
S/N: C6G1-Up

Part No.: 3E-6654
S/N: C7G1-Up

Part No.: 3E-6654
S/N: CCG1-Up

Part No.: 3E-6654
S/N: DJG1-Up

Part No.: 3E-6654
S/N: MDG1-Up

Part No.: 3E-6654
S/N: RJG1-Up

Part No.: 3E-6654
S/N: RKG1-Up

Part No.: 294-8140
S/N: SCG1-Up

Part No.: 3E-6654
S/N: TWG1-Up

Part No.: 3E-6654
S/N: WCG1-Up

Part No.: 3E-6654
S/N: WRG1-Up

Part No.: 3E-6654
S/N: ALH1-Up

Part No.: 3E-6654
S/N: CFH1-Up

Part No.: 3E-6654
S/N: DSH1-Up

Part No.: 3E-6654
S/N: FBH1-Up

Part No.: 3E-6654
S/N: FDH1-Up

Part No.: 3E-6654
S/N: JAH1-Up

Part No.: 3E-6654
S/N: JMH1-Up

Part No.: 3E-6654
S/N: WFH1-Up

Part No.: 3E-6654
S/N: 1FJ5542-Up

Part No.: 3E-6654
S/N: 1XJ1-Up

Part No.: 3E-6654
S/N: 3YJ1-Up

Part No.: 3E-6654
S/N: 5FJ1-Up

Part No.: 3E-6654
S/N: 5TJ1317-Up

Part No.: 3E-6654
S/N: 6XJ523-Up

Part No.: 3E-6654
S/N: 8PJ533-Up

Part No.: 3E-6654
S/N: 8RJ4387-Up

Part No.: 3E-6654
S/N: 8ZJ319-Up

Part No.: 3E-6654
S/N: 9GJ945-Up

Part No.: 3E-6654
S/N: 9KJ441-Up

Part No.: 3E-6654
S/N: ABJ1-Up

Part No.: 3E-6654
S/N: ACJ1-Up

Part No.: 3E-6654
S/N: BMJ1-Up

Part No.: 3E-6654
S/N: BRJ1-Up

Part No.: 3E-6654
S/N: BWJ1-Up

Part No.: 3E-6654
S/N: CBJ1-Up

Part No.: 3E-6654
S/N: EJJ1-Up

Part No.: 3E-6654
S/N: KKJ1-Up

Part No.: 3E-6654
S/N: LKJ1-Up

Part No.: 3E-6654
S/N: MTJ1-Up

Part No.: 3E-6654
S/N: SLJ1-Up

Part No.: 3E-6654
S/N: 3SK410-Up

Part No.: 3E-6654
S/N: 4HK366-Up

Part No.: 3E-6654
S/N: 4NK147-Up

Part No.: 3E-6654
S/N: 5KK336-Up

Part No.: 3E-6654
S/N: 6CK354-Up

Part No.: 3E-6654
S/N: 7PK135-Up

Part No.: 3E-6654
S/N: 7TK1-Up

Part No.: 3E-6654
S/N: 7ZK349-Up

Part No.: 3E-6654
S/N: 8KK314-Up

Part No.: 3E-6654
S/N: 8SK369-Up

Part No.: 3E-6654
S/N: 9LK464-Up

Part No.: 3E-6654
S/N: 9RK308-Up

Part No.: 3E-6654
S/N: ABK1-Up

Part No.: 3E-6654
S/N: BMK1-Up

Part No.: 3E-6654
S/N: BPK1-Up

Part No.: 3E-6654
S/N: CCK1-Up

Part No.: 3E-6654
S/N: DMK1-Up

Part No.: 3E-6654
S/N: GMK1-Up

Part No.: 3E-6654
S/N: JEK1-Up

Part No.: 3E-6654
S/N: RRK1-Up

Part No.: 3E-6654
S/N: 1YL320-Up

Part No.: 3E-6654
S/N: 2BL347-Up

Part No.: 3E-6654
S/N: 2TL346-Up

Part No.: 3E-6654
S/N: 6SL172-Up

Part No.: 3E-6654
S/N: 6YL1-Up

Part No.: 3E-6654
S/N: 6ZL116-Up

Part No.: 3E-6654
S/N: 7SL1-Up

Part No.: 3E-6654
S/N: 7TL1-Up

Part No.: 3E-6654
S/N: 7XL107-Up

Part No.: 3E-6654
S/N: 7YL64-Up

Part No.: 3E-6654
S/N: 8BL1-Up

Part No.: 3E-6654
S/N: 8DL35-Up

Part No.: 3E-6654
S/N: 8EL1-Up

Part No.: 3E-6654
S/N: 9CL78-Up

Part No.: 3E-6654
S/N: 9DL209-Up

Part No.: 3E-6654
S/N: ACL1-Up

Part No.: 3E-6654
S/N: BNL1-Up

Part No.: 3E-6654
S/N: CBL1-Up

Part No.: 3E-6654
S/N: D5L1-Up

Part No.: 3E-6654
S/N: EXL1-Up

Part No.: 3E-6654
S/N: JDL1-Up

Part No.: 3E-6654
S/N: JEL1-Up

Part No.: 3E-6654
S/N: KJL1-Up

Part No.: 3E-6654
S/N: KLL1-Up

Part No.: 3E-6654
S/N: LLL1-Up

Part No.: 3E-6654
S/N: SKL1-Up

Part No.: 3E-6654
S/N: 2HM1-Up

Part No.: 3E-6654
S/N: 4FM1-Up

Part No.: 3E-6654
S/N: 7XM1-Up

Part No.: 3E-6654
S/N: 8TM1-Up

Part No.: 3E-6654
S/N: 9BM1-Up

Part No.: 3E-6654
S/N: 9EM1-Up

Part No.: 3E-6654
S/N: 9HM1-Up

Part No.: 3E-6654
S/N: 9ZM1-Up

Part No.: 3E-6654
S/N: AEM1-Up

Part No.: 3E-6654
S/N: AFM1-Up

Part No.: 3E-6654
S/N: AGM1-Up

Part No.: 3E-6654
S/N: AKM1-Up

Part No.: 3E-6654
S/N: BNM1-Up

Part No.: 3E-6654
S/N: BPM1-Up

Part No.: 3E-6654
S/N: BRM1-Up

Part No.: 3E-6654
S/N: DLM1-Up

Part No.: 3E-6654
S/N: KMM1-Up

Part No.: 3E-6654
S/N: LFM1-Up

Part No.: 3E-6654
S/N: MMM1-Up

Part No.: 3E-6654
S/N: TSM1-Up

Part No.: 3E-6654
S/N: WDM1-Up

Part No.: 3E-6654
S/N: WLM1-Up

Part No.: 3E-6654
S/N: 2EN1-Up

Part No.: 3E-6654
S/N: 2RN1-Up

Part No.: 3E-6654
S/N: 2YN1-Up

Part No.: 3E-6654
S/N: 3DN1-Up

Part No.: 3E-6654
S/N: 3WN1-Up

Part No.: 3E-6654
S/N: 3ZN1-Up

Part No.: 3E-6654
S/N: 4HN1-Up

Part No.: 3E-6654
S/N: 4JN1-Up

Part No.: 3E-6654
S/N: 4MN1-Up

Part No.: 3E-6654
S/N: 5LN1-Up

Part No.: 3E-6654
S/N: 6GN1-Up

Part No.: 3E-6654
S/N: 6JN1-Up

Part No.: 3E-6654
S/N: 7KN1-Up

Part No.: 3E-6654
S/N: 8LN1-Up

Part No.: 3E-6654
S/N: 8XN1-Up

Part No.: 3E-6654
S/N: 9MN1-Up

Part No.: 3E-6654
S/N: 9PN1-Up

Part No.: 3E-6654
S/N: AGN1-Up

Part No.: 3E-6654
S/N: CFN1-Up

Part No.: 3E-6654
S/N: DLN1-Up

Part No.: 3E-6654
S/N: MLN1-Up

Part No.: 3E-6654
S/N: TAN1-Up

Part No.: 3E-6654
S/N: AEP1-Up

Part No.: 3E-6654
S/N: BPP1-Up

Part No.: 3E-6654
S/N: DMP1-Up

Part No.: 3E-6654
S/N: LGP1-Up

Part No.: 3E-6654
S/N: 2HR1-Up

Part No.: 3E-6654
S/N: 3CR1-Up

Part No.: 3E-6654
S/N: 3DR1-Up

Part No.: 3E-6654
S/N: 3KR1-Up

Part No.: 3E-6654
S/N: 3SR1-Up

Part No.: 3E-6654
S/N: 3ZR1-Up

Part No.: 3E-6654
S/N: 4BR1-Up

Part No.: 3E-6654
S/N: 4JR1-Up

Part No.: 3E-6654
S/N: 4SR1-Up

Part No.: 3E-6654
S/N: 4TR1-Up

Part No.: 3E-6654
S/N: 4WR1-Up

Part No.: 3E-6654
S/N: 5MR1-Up

Part No.: 3E-6654
S/N: 5NR1-Up

Part No.: 3E-6654
S/N: 5PR1-Up

Part No.: 3E-6654
S/N: 5RR1-Up

Part No.: 3E-6654
S/N: 5WR1-Up

Part No.: 3E-6654
S/N: 6ER1-Up

Part No.: 3E-6654
S/N: 6FR1-Up

Part No.: 3E-6654
S/N: 6GR1-Up

Part No.: 3E-6654
S/N: 6HR1-Up

Part No.: 3E-6654
S/N: 6LR1-Up

Part No.: 3E-6654
S/N: 6MR1-Up

Part No.: 3E-6654
S/N: 7AR1-Up

Part No.: 3E-6654
S/N: 7DR1-Up

Part No.: 3E-6654
S/N: 7GR1-Up

Part No.: 3E-6654
S/N: 7LR1-Up

Part No.: 3E-6654
S/N: 8ZR1-Up

Part No.: 3E-6654
S/N: 9TR1-Up

Part No.: 3E-6654
S/N: 9XR1-Up

Part No.: 3E-6654
S/N: ALR1-Up

Part No.: 3E-6654
S/N: BYR1-Up

Part No.: 3E-6654
S/N: DJR1-Up

Part No.: 3E-6654
S/N: KRR1-Up

Part No.: 3E-6654
S/N: LJR1-Up

Part No.: 3E-6654
S/N: PER1-Up

Part No.: 3E-6654
S/N: RRR1-Up

Part No.: 3E-6654
S/N: WMR1-Up

Part No.: 3E-6654
S/N: 2YS1-Up

Part No.: 3E-6654
S/N: 4GS1-Up

Part No.: 3E-6654
S/N: 4HS1-Up

Part No.: 3E-6654
S/N: 4JS1-Up

Part No.: 3E-6654
S/N: 4KS1-Up

Part No.: 3E-6654
S/N: 4LS1-Up

Part No.: 3E-6654
S/N: 4TS1-Up

Part No.: 3E-6654
S/N: 5ES1-Up

Part No.: 3E-6654
S/N: 5FS1-Up

Part No.: 3E-6654
S/N: 5GS1-Up

Part No.: 3E-6654
S/N: 5HS1-Up

Part No.: 3E-6654
S/N: 6AS1-Up

Part No.: 3E-6654
S/N: 6BS1-Up

Part No.: 3E-6654
S/N: 6CS1-Up

Part No.: 3E-6654
S/N: 7PS1-Up

Part No.: 3E-6654
S/N: 8CS1-Up

Part No.: 3E-6654
S/N: 8ZS1-Up

Part No.: 3E-6654
S/N: 9TS1-Up

Part No.: 3E-6654
S/N: 9ZS1-Up

Part No.: 3E-6654
S/N: ACS1-Up

Part No.: 3E-6654
S/N: BPS1-Up

Part No.: 3E-6654
S/N: CCS1-Up

Part No.: 3E-6654
S/N: DPS1-Up

Part No.: 3E-6654
S/N: GHS1-Up

Part No.: 3E-6654
S/N: JNS1-Up

Part No.: 3E-6654
S/N: RJS1-Up

Part No.: 3E-6654
S/N: WGS1-Up

Part No.: 3E-6654
S/N: AKT1-Up

Part No.: 3E-6654
S/N: BLT1-Up

Part No.: 3E-6654
S/N: BPT1-Up

Part No.: 3E-6654
S/N: CKT1-Up

Part No.: 3E-6654
S/N: FAT1-Up

Part No.: 3E-6654
S/N: FCT1-Up

Part No.: 3E-6654
S/N: FDT1-Up

Part No.: 3E-6654
S/N: GCT1-Up

Part No.: 3E-6654
S/N: GMT1-Up

Part No.: 3E-6654
S/N: MRT1-Up

Part No.: 3E-6654
S/N: RST1-Up

Part No.: 3E-6654
S/N: S6T1-Up

Part No.: 3E-6654
S/N: 65V1-Up

Part No.: 3E-6654
S/N: 92V410-Up

Part No.: 3E-6654
S/N: 1FW1-Up

Part No.: 3E-6654
S/N: 1RW1-Up

Part No.: 3E-6654
S/N: EXW1-Up

Part No.: 3E-6654
S/N: FDW1-Up

Part No.: 3E-6654
S/N: JRW1-Up

Part No.: 3E-6654
S/N: KWW1-Up

Part No.: 3E-6654
S/N: MLW1-Up

Part No.: 3E-6654
S/N: RCW1-Up

Part No.: 3E-6654
S/N: RLW1-Up

Part No.: 3E-6654
S/N: WWW1-Up

Part No.: 3E-6654
S/N: AAX1-Up

Part No.: 3E-6654
S/N: BNX1-Up

Part No.: 3E-6654
S/N: D5X1-Up

Part No.: 3E-6654
S/N: S6X1-Up

Part No.: 3E-6654
S/N: TLX1-Up

Part No.: 3E-6654
S/N: ALY1-Up

Part No.: 3E-6654
S/N: BMY1-Up

Part No.: 3E-6654
S/N: DJY1-Up

Part No.: 3E-6654
S/N: KYY1-Up

Part No.: 3E-6654
S/N: LAY1-Up

Part No.: 3E-6654
S/N: S6Y1-Up

Part No.: 3E-6654
S/N: YYY1-Up

Part No.: 3E-6654
S/N: 5KZ1-Up

Part No.: 3E-6654
S/N: 6YZ1-Up

Part No.: 3E-6654
S/N: 74Z1-Up

Part No.: 3E-6654
S/N: 79Z5611-Up

Part No.: 3E-6654
S/N: 7PZ1-Up

Part No.: 3E-6654
S/N: 80Z5518-Up

Part No.: 3E-6654
S/N: BPZ1-Up

Part No.: 3E-6654
S/N: BRZ1-Up

Part No.: 3E-6654
S/N: CBZ1-Up

Part No.: 3E-6654
S/N: KPZ1-Up

Part No.: 3E-6654
S/N: PEZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, “Refrigerant System - Charge”.

D3C Series III Refrigerant Capacities

D3C Series III	
6SL172-Up	1.9 kg (4.2 lb)
7XL107-Up	1.9 kg (4.2 lb)
9CL78-Up	1.9 kg (4.2 lb)
8DL35-Up	1.9 kg (4.2 lb)
D3C Series III HS	
4KS1-Up	1.9 kg (4.2 lb)
D3C Series III HS XL	
4TS1-Up	1.9 kg (4.2 lb)
D3C Series III HS LGP	
5GS1-Up	1.9 kg (4.2 lb)
D3C Series III XL	

9TS1-Up 1.9 kg (4.2 lb)

D3G Refrigerant Capacities

D3G

CFC1-Up 1.1 kg (2.4 lb)
CFF1-Up 1.1 kg (2.4 lb)

D3G LGP

BYR1-Up 1.1 kg (2.4 lb)

D3G XL

JMH1-Up 1.1 kg (2.4 lb)

D3K Refrigerant Capacities

D3K

FFF1-Up 1.3 kg (2.9 lb)
LLL1-Up 1.3 kg (2.9 lb)
JTD1-Up 1.3 kg (2.9 lb)

D3K2 Refrigerant Capacities

D3K2

GAE1-Up 1.3 kg (2.9 lb)
KFF1-Up 1.3 kg (2.9 lb)
KLL1-Up 1.3 kg (2.9 lb)

D4C series III Refrigerant Capacities

D4C series III

6YL141-Up 1.9 kg (4.2 lb)
7SL78-Up 1.9 kg (4.2 lb)
8EL57-Up 1.9 kg (4.2 lb)
1FW1-Up 1.9 kg (4.2 lb)

D4C series III HS

6BS1-Up 1.9 kg (4.2 lb)

D4C series III HS XL

8CS1-Up 1.9 kg (4.2 lb)

D4C series III HS LGP

4LS1-Up 1.9 kg (4.2 lb)

D4G Refrigerant Capacities

D4G

CFN1-Up 1.1 kg (2.4 lb)
FDC1-Up 1.1 kg (2.4 lb)

D4G LGP

TXL1-Up 1.1 kg (2.4 lb)

D4G XL

HYD1-Up 1.1 kg (2.4 lb)

D4H Series II Refrigerant Capacities

D4H Series II

9GJ945-Up 1.6 kg (3.5 lb)
4NK147-Up 1.6 kg (3.5 lb)

D4H Series II XL

8PJ533-Up 1.6 kg (3.5 lb)

D4H TSK Series III Refrigerant Capacities

D4H TSK Series III

7PK135-Up 1.6 kg (3.5 lb)

D4K Refrigerant Capacities

D4K

MMM1-Up 1.3 kg (2.9 lb)
RRR1-Up 1.3 kg (2.9 lb)

D4K2 Refrigerant Capacities

D4K2

KMM1-Up 1.3 kg (2.9 lb)
KRR1-Up 1.3 kg (2.9 lb)

D5C Series III Refrigerant Capacities

D5C Series III

6ZL116-Up 1.9 kg (4.2 lb)
7YL64-Up 1.9 kg (4.2 lb)
9DL209-Up 1.9 kg (4.2 lb)
8ZS1-Up 1.9 kg (4.2 lb)

D5C Series III HS

5HS1-Up 1.9 kg (4.2 lb)

D5C Series III HS XL

7PS1-Up 1.9 kg (4.2 lb)

D5C Series III HS LPG

6CS1-Up 1.9 kg (4.2 lb)

D5G Refrigerant Capacities**D5G**

FDH1-Up	1.1 kg (2.4 lb)
FDW1-Up	1.1 kg (2.4 lb)

D5G LGP

RKG1-Up	1.1 kg (2.4 lb)

D5G XL

WGB1-Up	1.1 kg (2.4 lb)

D5K Refrigerant Capacities**D5K**

WWW1-Up	1.3 kg (2.9 lb)
YYY1-Up	1.3 kg (2.9 lb)
JLF1-Up	1.3 kg (2.9 lb)

D5K2 Refrigerant Capacities**D5K2**

KWW1-Up	1.3 kg (2.9 lb)
KYY1-Up	1.3 kg (2.9 lb)
TRF1-Up	1.3 kg (2.9 lb)

D5H Series II Refrigerant Capacities**D5H Series II**

7NC5527-Up	1.6 kg (3.5 lb)
8RC5967-Up	1.6 kg (3.5 lb)
9HC5521-Up	1.6 kg (3.5 lb)
1DD6006-Up	1.6 kg (3.5 lb)
1YD5522-Up	1.6 kg (3.5 lb)
3MD5594-Up	1.6 kg (3.5 lb)
2SD5549-Up	1.6 kg (3.5 lb)
4KD5585-Up	1.6 kg (3.5 lb)

D5H Series II XL

8RJ4387-Up	1.6 kg (3.5 lb)

D5M Refrigerant Capacities**D5M**

3CR1-Up	1.6 kg (3.5 lb)
3DR1-Up	1.6 kg (3.5 lb)
4BR1-Up	1.6 kg (3.5 lb)
4JS1-Up	1.6 kg (3.5 lb)
7LR1-Up	1.6 kg (3.5 lb)
5ES1-Up	1.6 kg (3.5 lb)
5FS1-Up	1.6 kg (3.5 lb)
6AS1-Up	1.6 kg (3.5 lb)
6GN1-Up	1.6 kg (3.5 lb)

D5N Refrigerant Capacities**D5N**

AGG1-Up	1.8 kg (4.0 lb)
AKD1-Up	1.8 kg (4.0 lb)

D5N LPG

CKT1-Up	1.8 kg (4.0 lb)

D5N XL

CFH1-Up	1.8 kg (4.0 lb)

D5R Refrigerant Capacities**D5R**

D5X1-Up	1.5 kg (3.3 lb)
D5L1-Up	1.5 kg (3.3 lb)

D6C Refrigerant Capacities**D6C**

8ZS1-Up	1.8 kg (4.0 lb)

D6G Refrigerant Capacities**D6G**

3SR1-Up	1.7 kg (3.7 lb)

D6G2 XL

C6G1-Up	1.8 kg (4.0 lb)
BWJ1-Up	1.8 kg (4.0 lb)

D6H Series II Refrigerant Capacities**D6H Series II**

8FC5612-Up	2 kg (4.4 lb)
1KD5600-Up	2 kg (4.4 lb)
2KD5618-Up	2 kg (4.4 lb)
5HF5582-Up	2 kg (4.4 lb)
6CF5565-Up	2 kg (4.4 lb)
2TG5593-Up	2 kg (4.4 lb)
4GG5632-Up	2 kg (4.4 lb)
4LG5598-Up	2 kg (4.4 lb)
1FJ5542-Up	2 kg (4.4 lb)
3YJ1-Up	2 kg (4.4 lb)

D6H Series II XR

4RC5589-Up	2 kg (4.4 lb)
6FC5542-Up	2 kg (4.4 lb)
3ZF5736-Up	2 kg (4.4 lb)
3YG5772-Up	2 kg (4.4 lb)
5KK336-Up	2 kg (4.4 lb)
6CK354-Up	2 kg (4.4 lb)
7ZK349-Up	2 kg (4.4 lb)
1YL320-Up	2 kg (4.4 lb)

2BL347-Up	2 kg (4.4 lb)
2TL346-Up	2 kg (4.4 lb)
8KB1-Up	2 kg (4.4 lb)

D6H Series II XL

4YF5575-Up	2 kg (4.4 lb)
8ZJ319-Up	2 kg (4.4 lb)
9KJ441-Up	2 kg (4.4 lb)
8KK314-Up	2 kg (4.4 lb)
8SK369-Up	2 kg (4.4 lb)
9LK464-Up	2 kg (4.4 lb)
9RK308-Up	2 kg (4.4 lb)

D6K Refrigerant Capacities

D6K LGP

DHA1-Up	1.5 kg (3.3 lb)

D6K XL

FBH1-Up	1.5 kg (3.3 lb)
NCF1-Up	1.5 kg (3.3 lb)

D6K2 Refrigerant Capacities

D6K2

RST1-Up	1.9 kg (4.2 lb)
WMR1-Up	1.9 kg (4.2 lb)

D6M Refrigerant Capacities

D6M

3WN1-Up	1.6 kg (3.5 lb)
4JN1-Up	1.6 kg (3.5 lb)
2RN1-Up	1.6 kg (3.5 lb)
2YS1-Up	1.6 kg (3.5 lb)
4GS1-Up	1.6 kg (3.5 lb)
4HS1-Up	1.6 kg (3.5 lb)
5NR1-Up	1.6 kg (3.5 lb)
5WR1-Up	1.6 kg (3.5 lb)
6LR1-Up	1.6 kg (3.5 lb)
9ZM1-Up	1.6 kg (3.5 lb)

D6N Refrigerant Capacities

D6N

ALH1-Up	1.8 kg (4.0 lb)
ALR1-Up	1.8 kg (4.0 lb)
PER1-Up	1.8 kg (4.0 lb)
PBA1-Up	1.8 kg (4.0 lb)

D6N LGP

ALY1-Up	1.8 kg (4.0 lb)
CCG1-Up	1.8 kg (4.0 lb)
CCS1-Up	1.8 kg (4.0 lb)
DJY1-Up	1.5 kg (3.3 lb)
GHS1-Up	1.5 kg (3.3 lb)

D6N XL

AKM1-Up	1.8 kg (4.0 lb)
CCK1-Up	1.8 kg (4.0 lb)
CBJ1-Up	1.8 kg (4.0 lb)
CBL1-Up	1.8 kg (4.0 lb)
CBF1-Up	1.8 kg (4.0 lb)
DJA1-Up	1.5 kg (3.3 lb)
JAH1-Up	1.5 kg (3.3 lb)
LJR1-Up	1.5 kg (3.3 lb)
MLW1-Up	1.5 kg (3.3 lb)

D6R Refrigerant Capacities

D6R

1RW1-Up	1.6 kg (3.5 lb)
2YN1-Up	1.6 kg (3.5 lb)
3ZN1-Up	1.6 kg (3.5 lb)
4FM1-Up	1.6 kg (3.5 lb)
4HN1-Up	1.6 kg (3.5 lb)
4JR1-Up	1.6 kg (3.5 lb)
4MN1-Up	1.6 kg (3.5 lb)
4TR1-Up	1.6 kg (3.5 lb)
9MN1-Up	1.6 kg (3.5 lb)
9PN1-Up	1.6 kg (3.5 lb)
4WR1-Up	1.6 kg (3.5 lb)
5LN1-Up	1.6 kg (3.5 lb)
5PR1-Up	1.6 kg (3.5 lb)
5RR1-Up	1.6 kg (3.5 lb)
6FR1-Up	1.6 kg (3.5 lb)
6HR1-Up	1.6 kg (3.5 lb)
6JN1-Up	1.6 kg (3.5 lb)
6MR1-Up	1.6 kg (3.5 lb)
6GR1-Up	1.6 kg (3.5 lb)
7AR1-Up	1.6 kg (3.5 lb)
7DR1-Up	1.6 kg (3.5 lb)
7GR1-Up	1.6 kg (3.5 lb)
7KN1-Up	1.6 kg (3.5 lb)
8LN1-Up	1.6 kg (3.5 lb)
8TM1-Up	1.6 kg (3.5 lb)
8XN1-Up	1.6 kg (3.5 lb)
9BM1-Up	1.6 kg (3.5 lb)
2HM1-Up	1.6 kg (3.5 lb)
9ZS1-Up	1.6 kg (3.5 lb)
BMJ1-Up	1.6 kg (3.5 lb)
BMJ1-Up	1.6 kg (3.5 lb)
DAE1-Up	1.6 kg (3.5 lb)
DMP1-Up	1.6 kg (3.5 lb)
S6X1-Up	1.6 kg (3.5 lb)
S6T1-Up	1.6 kg (3.5 lb)
S6Y1-Up	1.6 kg (3.5 lb)

D6R Series II Refrigerant Capacities

D6R Series II

AEM1-Up	1.6 kg (3.5 lb)
BLE1-Up	1.6 kg (3.5 lb)
AFM1-Up	1.6 kg (3.5 lb)
BLT1-Up	1.6 kg (3.5 lb)
AGM1-Up	1.6 kg (3.5 lb)
AAX1-Up	1.6 kg (3.5 lb)

ACJ1-Up	1.6 kg (3.5 lb)
ADE1-Up	1.6 kg (3.5 lb)
BNC1-Up	1.6 kg (3.5 lb)
AEP1-Up	1.6 kg (3.5 lb)
AFD1-Up	1.6 kg (3.5 lb)
FDT1-Up	1.6 kg (3.5 lb)
BRJ1-Up	1.6 kg (3.5 lb)
BPM1-Up	1.6 kg (3.5 lb)
CAD1-Up	1.6 kg (3.5 lb)
BRZ1-Up	1.6 kg (3.5 lb)
BMK1-Up	1.6 kg (3.5 lb)
BPP1-Up	1.6 kg (3.5 lb)
BNL1-Up	1.6 kg (3.5 lb)
BRE1-Up	1.6 kg (3.5 lb)
BPS1-Up	1.6 kg (3.5 lb)
BPZ1-Up	1.6 kg (3.5 lb)

D6R Series III Refrigerant Capacities

D6R Series III

HKE1-Up	1.6 kg (3.5 lb)
GJB1-Up	1.6 kg (3.5 lb)
WCB1-Up	1.6 kg (3.5 lb)
HDC1-Up	1.6 kg (3.5 lb)
WRG1-Up	1.6 kg (3.5 lb)
MRT1-Up	1.6 kg (3.5 lb)
HCD1-Up	1.6 kg (3.5 lb)
TBC1-Up	1.6 kg (3.5 lb)
LFM1-Up	1.6 kg (3.5 lb)
DPS1-Up	1.6 kg (3.5 lb)
DMK1-Up	1.6 kg (3.5 lb)
RFC1-Up	1.6 kg (3.5 lb)
MTJ1-Up	1.6 kg (3.5 lb)
DLM1-Up	1.6 kg (3.5 lb)
GMT1-Up	1.6 kg (3.5 lb)
JDL1-Up	1.6 kg (3.5 lb)
JEK1-Up	1.6 kg (3.5 lb)
EXL1-Up	1.6 kg (3.5 lb)
EXW1-Up	1.6 kg (3.5 lb)
LGP1-Up	1.6 kg (3.5 lb)

D6T Refrigerant Capacities

D6T LGP

KJL1-Up	1.6 kg (3.5 lb)
JWD1-Up	1.6 kg (3.5 lb)
WCG1-Up	1.6 kg (3.5 lb)
LKJ1-Up	1.6 kg (3.5 lb)
GMK1-Up	1.6 kg (3.5 lb)
DTD1-Up	1.6 kg (3.5 lb)
JRW1-Up	1.6 kg (3.5 lb)
EJJ1-Up	1.6 kg (3.5 lb)

D6T STD

JHB1-Up	1.6 kg (3.5 lb)
JMC1-Up	1.6 kg (3.5 lb)
PEZ1-Up	1.6 kg (3.5 lb)

D6T XL

LAY1-Up	1.6 kg (3.5 lb)
GCT1-Up	1.6 kg (3.5 lb)
LAE1-Up	1.6 kg (3.5 lb)
WFH1-Up	1.6 kg (3.5 lb)
ZEB1-Up	1.6 kg (3.5 lb)
ZJB1-Up	1.6 kg (3.5 lb)
KSB1-Up	1.6 kg (3.5 lb)
TSM1-Up	1.6 kg (3.5 lb)
JZC1-Up	1.6 kg (3.5 lb)

D6T XW

SKL1-Up	1.6 kg (3.5 lb)
LBD1-Up	1.6 kg (3.5 lb)
DJG1-Up	1.6 kg (3.5 lb)
RLW1-Up	1.6 kg (3.5 lb)
SLJ1-Up	1.6 kg (3.5 lb)
RCW1-Up	1.6 kg (3.5 lb)
WLM1-Up	1.6 kg (3.5 lb)
RRK1-Up	1.6 kg (3.5 lb)

D7E Refrigerant Capacities

D7E

MDB1-Up	1.4 kg (3.1 lb)
SCG1-Up	1.4 kg (3.1 lb)
TAN1-Up	1.7 kg (3.7 lb)
TJA1-Up	1.7 kg (3.7 lb)

D7G Refrigerant Capacities

D7G2

C7G1-Up	1.8 kg (4.0 lb)
7MB1-Up	1.3 kg (2.9 lb)
3GF1-Up	1.9 kg (4.2 lb)
65V1-Up	1.9 kg (4.2 lb)

D7H Series II Refrigerant Capacities

D7H Series II

4AB5532-Up	1.6 kg (3.5 lb)
5WB5586-Up	1.6 kg (3.5 lb)
5BF5690-Up	1.6 kg (3.5 lb)
2RG5622-Up	1.6 kg (3.5 lb)
3XG5515-Up	1.6 kg (3.5 lb)
4FG5537-Up	1.6 kg (3.5 lb)
79Z5611-Up	1.6 kg (3.5 lb)
80Z5518-Up	1.6 kg (3.5 lb)

D7R Series II Refrigerant Capacities

D7R Series II

ADW1-Up	1.6 kg (3.5 lb)
ACS1-Up	1.6 kg (3.5 lb)
AFG1-Up	1.6 kg (3.5 lb)
AEC1-Up	1.6 kg (3.5 lb)
AGN1-Up	1.6 kg (3.5 lb)

ABJ1-Up	1.6 kg (3.5 lb)
BPK1-Up	1.6 kg (3.5 lb)
BNM1-Up	1.6 kg (3.5 lb)
BPT1-Up	1.6 kg (3.5 lb)
BNX1-Up	1.6 kg (3.5 lb)
BRM1-Up	1.6 kg (3.5 lb)
BRP1-Up	1.6 kg (3.5 lb)

D7R Refrigerant Capacities

D7R

2EN1-Up	1.6 kg (3.5 lb)
2HR1-Up	1.6 kg (3.5 lb)
3DN1-Up	1.6 kg (3.5 lb)
3ZR1-Up	1.6 kg (3.5 lb)
4SR1-Up	1.6 kg (3.5 lb)
5KZ1-Up	1.6 kg (3.5 lb)
5MR1-Up	1.6 kg (3.5 lb)
6ER1-Up	1.6 kg (3.5 lb)
9HM1-Up	1.6 kg (3.5 lb)
CBZ1-Up	1.6 kg (3.5 lb)
DSH1-Up	1.6 kg (3.5 lb)
DJR1-Up	1.6 kg (3.5 lb)
DLN1-Up	1.6 kg (3.5 lb)

D8N Refrigerant Capacities

D8N

5TJ1317-Up	1.6 kg (3.5 lb)
7TK1-Up	1.6 kg (3.5 lb)
1XJ1-Up	1.6 kg (3.5 lb)
9TC1-Up	1.6 kg (3.5 lb)

D8R Refrigerant Capacities

D8R

7XM1-Up	1.7 kg (3.7 lb)
9EM1-Up	1.7 kg (3.7 lb)
6YZ1-Up	1.7 kg (3.7 lb)
AKA1-Up	1.7 kg (3.7 lb)

D8R Refrigerant Capacities

Note: Remote condenser

D8R

7XM1-Up	1.6 kg (3.5 lb)
9EM1-Up	1.6 kg (3.5 lb)
6YZ1-Up	1.6 kg (3.5 lb)
AKA1-Up	1.6 kg (3.5 lb)

D8T Refrigerant Capacities

Note: Remote condenser

D8T

KPZ1-Up	1.7 kg (3.7 lb)

J8B1-Up	1.7 kg (3.7 lb)

D8T Refrigerant Capacities

D8T

KPZ1-Up	1.9 kg (4.2 lb)
J8B1-Up	1.9 kg (4.2 lb)
FCT1-Up	1.9 kg (4.2 lb)
MLN1-Up	1.9 kg (4.2 lb)

D9N Refrigerant Capacities

D9N

5FJ1-Up	1.6 kg (3.5 lb)
1JD1-Up	1.6 kg (3.5 lb)
6XJ523-Up	2.1 kg (4.6 lb)

D9R Refrigerant Capacities

D9R

7TL1-Up	2.1 kg (4.6 lb)
8BL1-Up	2.1 kg (4.6 lb)
JJB1-Up	2.8 kg (6.2 lb)
WDM1-Up	2.8 kg (6.2 lb)
ACL1-Up	2.8 kg (6.2 lb)

D9R Refrigerant Capacities

Note: Remote condenser

D9R

7TL1-Up	1.6 kg (3.5 lb)
8BL1-Up	1.6 kg (3.5 lb)
WDM1-Up	2.3 kg (5.1 lb)
ACL1-Up	2.3 kg (5.1 lb)
ABK1-Up	2.3 kg (5.1 lb)

D9T Refrigerant Capacities

Note: Remote condenser

D9T

RJS1-Up	2.3 kg (5.1 lb)
TWG1-Up	2.3 kg (5.1 lb)

D9T Refrigerant Capacities

Note: Fender mount condenser

D9T

RJS1-Up	2.3 kg (5.1 lb)

D10N Refrigerant Capacities

D10N

3SK410-Up	2 kg (4.4 lb)
92V410-Up	2 kg (4.4 lb)

D10R Refrigerant Capacities

D10R

3KR1-Up	2.1 kg (4.6 lb)
AKT1-Up	2.1 kg (4.6 lb)

D10R Refrigerant Capacities

Note: Large accumulator

D10R

3KR1-Up	2.6 kg (5.7 lb)

D10R Refrigerant Capacities

Note: Roof mount with large accumulator

D10R

3KR1-Up	2.1 kg (4.6 lb)

D10T Refrigerant Capacities

Note: Remote condenser

D10T

RJG1-Up	2.1 kg (4.6 lb)

D10T Refrigerant Capacities

D10T

RJG1-Up	2.0 kg (4.4 lb)

D11N Refrigerant Capacities

D11N

4HK366-Up	2.5 kg (5.5 lb)
74Z1-Up	2.5 kg (5.5 lb)

D11R Refrigerant Capacities

D11R

8ZR1-Up	2.5 kg (5.5 lb)
9TR1-Up	2.5 kg (5.5 lb)
9XR1-Up	2.5 kg (5.5 lb)
7PZ1-Up	2.5 kg (5.5 lb)
AAF1-Up	2.5 kg (5.5 lb)

D11R Refrigerant Capacities

Note: Large accumulator

D11R

8ZR1-Up	3 kg (6.6 lb)
9TR1-Up	3 kg (6.6 lb)
9XR1-Up	3 kg (6.6 lb)
7PZ1-Up	3 kg (6.6 lb)
AAF1-Up	3 kg (6.6 lb)

D11R Refrigerant Capacities

Note: Roof mount with large accumulator

D11R

8ZR135-Up	2.1 kg (4.6 lb)
9TR135-Up	2.1 kg (4.6 lb)
9XR135-Up	2.1 kg (4.6 lb)
7PZ135-Up	2.1 kg (4.6 lb)
AAF135-Up	2.1 kg (4.6 lb)

D11T

GEB1-Up	3.0 kg (6.6 lb)
TPB1-Up	3.0 kg (6.6 lb)
JEL1-Up	3.0 kg (6.6 lb)
JNS1-Up	3.0 kg (6.6 lb)
AMA1-Up	3.0 kg (6.6 lb)
MDG1-Up	3.0 kg (6.6 lb)

583T Pipelayer Refrigerant Capacities

583T Pipelayer

CMX1-179	1.8 kg (4.0 lb)
CMX180-Up	2.1 kg (4.6 lb)

587T Pipelayer Refrigerant Capacities

587T Pipelayer

FAT1-254	1.8 kg (4.0 lb)
FAT255-Up	2.1 kg (4.6 lb)

PL61 Pipelayer Refrigerant Capacities

PL61 Pipelayer

WGS1-Up	1.5 kg (3.3 lb)

PL83 Pipelayer Refrigerant Capacities

PL83 Pipelayer

KSD1-Up	1.5 kg (3.3 lb)

PL87 Pipelayer Refrigerant Capacities

PL87 Pipelayer

KKJ1-Up	1.5 kg (3.3 lb)

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System Capacities for Refrigerant (Underground Articulated Truck)

SMCS Code: 1809

Part No.: 163-0872
S/N: SSA1-Up

Part No.: 163-0872
S/N: LCC1-Up

Part No.: 163-0872
S/N: MXL1-Up

Part No.: 3E-6654
S/N: CXM1-Up

Part No.: 3E-6654
S/N: CXR1-Up

Part No.: 3E-6654
S/N: DXR1-Up

Part No.: 3E-6654
S/N: ANW1-Up

Part No.: 3E-6654
S/N: BLW1-Up

Part No.: 3E-6654
S/N: DNW1-Up

Part No.: 3E-6654
S/N: JNW1-Up

Part No.: 163-0872
S/N: KNW1-Up

Part No.: 163-0872
S/N: PCW1-Up

Part No.: 163-0872
S/N: JLX1-Up

Part No.: 3E-6654
S/N: 1YZ1-Up

Part No.: 3E-6654
S/N: 1ZZ1-Up

Part No.: 3E-6654
S/N: BKZ1-Up

Reference: For the correct procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

AD30 Refrigerant Capacities

AD30

CXR1-Up	2.0 kg (4.4 lb)
DXR1-Up	2.0 kg (4.4 lb)

AD40 and AE40 Refrigerant Capacities

AD40

1YZ1-Up	2.5 kg (5.5 lb)

AE40

1ZZ1-Up	2.5 kg (5.5 lb)

AE40 Series II

BLW1-Up	2.5 kg (5.5 lb)

AD45 Refrigerant Capacities

AD45

BKZ1-Up	2.5 kg (5.5 lb)

AD45B

CXM1-Up	2.7 kg (5.9 lb)

AD55 Refrigerant Capacities

AD55

ANW1-380	1.8 kg (4.0 lb)
ANW381-Up	2.3 kg (5.0 lb)
DNW1-Up	2.7 kg (5.9 lb)

AD55B

JNW1-Up	2.7 kg (5.9 lb)

AD60

KNW1-Up	2.7 kg (5.9 lb)

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System Capacities for Refrigerant (Wheel Dozers)

SMCS Code: 1809

Part No.: 277-7245
S/N: 2211-Up

Part No.: 3E-6654
S/N: BPC1-Up

Part No.: 3E-6654
S/N: XDC1-Up

Part No.: 3E-6654
S/N: BGF1-Up

Part No.: 3E-6654
S/N: BXG1-Up

Part No.: 3E-6654
S/N: 36H1-Up

Part No.: 3E-6654
S/N: H9K1-Up

Part No.: 3E-6654
S/N: 9DM1-Up

Part No.: 3E-6654
S/N: H8M1-Up

Part No.: 3E-6654
S/N: 4SN1-Up

Part No.: 3E-6654
S/N: BBN1-Up

Part No.: 3E-6654
S/N: AMP1-Up

Part No.: 3E-6654
S/N: 7BR1-Up

Part No.: 3E-6654
S/N: 1JW1-Up

Part No.: 3E-6654
S/N: A4W1-Up

Part No.: 3E-6654
S/N: AWW1-Up

Part No.: 3E-6654
S/N: BTW1-Up

Part No.: 3E-6654
S/N: 85X1651-Up

Part No.: 3E-6654
S/N: ASX1-Up

Part No.: 3E-6654
S/N: 16Z368-Up

Part No.: 3E-6654
S/N: 2KZ1-Up

Part No.: 3E-6654
S/N: 6GZ1-Up

Part No.: 3E-6654
S/N: 92Z580-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

814 Refrigerant Capacities

814B

16Z368-Up 1.4 kg (3.1 lb)

814F

9DM1-Up 2.1 kg (4.6 lb)

BGF1-Up 1.9 kg (4.2 lb)

814FII

BXG1-Up 1.9 kg (4.2 lb)

824 Refrigerant Capacities

824B

36H1-Up 1.9 kg (4.2 lb)

824C

85X1651-Up 2.5 kg (5.5 lb)

824G

4SN1-Up 2.5 kg (5.5 lb)

824G II

AWW1-Up 2.5 kg (5.5 lb)

824H

ASX1-Up 2.5 kg (5.5 lb)

834 Refrigerant Capacities

834B

92Z580-Up 3 kg (6.6 lb)

7BR1-Up 2.8 kg (6.1 lb)

834G

6GZ1-Up 2.6 kg (5.7 lb)

BPC1-Up 2.6 kg (5.7 lb)

834H

BTX1-Up 2.6 kg (5.7 lb)

844 Refrigerant Capacities

590B/844

2KZ1-Up 4.1 kg (9.0 lb)

844

BBN1-Up 2.7 kg (5.9 lb)

844H

BTW1-Up 2.3 kg (5.0 lb)

854 Refrigerant Capacities

790G/854G

IJW1-Up 2.3 kg (5.0 lb)

854G

AMP1-Up 2.3 kg (5.0 lb)

A4W1-Up 2.3 kg (5.0 lb)

854K

2211-Up 2.7 kg (6.0 lb)

H8M1-Up 2.7 kg (6.0 lb)

H9K1-Up 2.7 kg (6.0 lb)

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System Capacities for Refrigerant (Wheel Tractor-Scrapers)

SMCS Code: 1809

Part No.: 3E-6654
S/N: DFA1-Up

Part No.: 3E-6654
S/N: 1AB1510-Up

Part No.: 3E-6654
S/N: 1BB1-Up

Part No.: 3E-6654
S/N: 1EB1-Up

Part No.: 3E-6654
S/N: 1FB571-Up

Part No.: 3E-6654
S/N: 1HB1-Up

Part No.: 3E-6654
S/N: 1JB1-Up

Part No.: 3E-6654
S/N: 1NB1-Up

Part No.: 3E-6654
S/N: AWB1-Up

Part No.: 3E-6654
S/N: DBB1-Up

Part No.: 3E-6654
S/N: ESB1-Up

Part No.: 3E-6654
S/N: W1B1-Up

Part No.: 3E-6654
S/N: DBC1-Up

Part No.: 3E-6654
S/N: W1C1-Up

Part No.: 3E-6654
S/N: DBD1-Up

Part No.: 3E-6654
S/N: EJD1-Up

Part No.: 3E-6654
S/N: DBE1-Up

Part No.: 3E-6654
S/N: AXF1-Up

Part No.: 3E-6654
S/N: DBF1-Up

Part No.: 3E-6654
S/N: W1F1-Up

Part No.: 3E-6654
S/N: 5SG1-Up

Part No.: 3E-6654
S/N: 9XG343-Up

Part No.: 3E-6654
S/N: A4G1-Up

Part No.: 3E-6654
S/N: ANG1-Up

Part No.: 3E-6654
S/N: CEH1-Up

Part No.: 3E-6654
S/N: 8LJ884-Up

Part No.: 3E-6654
S/N: DFJ1-Up

Part No.: 3E-6654
S/N: 4SK22-Up

Part No.: 3E-6654
S/N: 4YK1-Up

Part No.: 3E-6654
S/N: 5JK1-Up

Part No.: 3E-6654
S/N: 6BK1-Up

Part No.: 3E-6654
S/N: AWK1-Up

Part No.: 3E-6654
S/N: AYK1-Up

Part No.: 3E-6654
S/N: DBK1-Up

Part No.: 3E-6654
S/N: HKK1-Up

Part No.: 3E-6654
S/N: 1DL18-Up

Part No.: 3E-6654
S/N: 8PL1-Up

Part No.: 3E-6654
S/N: 9NL1-Up

Part No.: 3E-6654
S/N: CEN1-Up

Part No.: 3E-6654
S/N: ALP1-Up

Part No.: 3E-6654
S/N: 4YR1-Up

Part No.: 3E-6654
S/N: 5XR1-Up

Part No.: 3E-6654
S/N: 5YR1-Up

Part No.: 3E-6654
S/N: 6TR1-Up

Part No.: 3E-6654
S/N: 7KR1-Up

Part No.: 3E-6654
S/N: CLR1-Up

Part No.: 3E-6654
S/N: 2PS1-Up

Part No.: 3E-6654
S/N: CES1-Up

Part No.: 3E-6654
S/N: AXT1-Up

Part No.: 3E-6654
S/N: LCT1-Up

Part No.: 3E-6654
S/N: 3XW1-Up

Part No.: 3E-6654
S/N: 5EW1-Up

Part No.: 3E-6654
S/N: ARW1-Up

Part No.: 3E-6654
S/N: DBW1-Up

Part No.: 3E-6654
S/N: CEX1-Up

Part No.: 3E-6654
S/N: DBX1-Up

Part No.: 3E-6654
S/N: DEY1-Up

Part No.: 3E-6654
S/N: NYY1-Up

Part No.: 3E-6654
S/N: 6SZ1-Up

Part No.: 3E-6654
S/N: 89Z271-Up

Part No.: 3E-6654
S/N: 90Z223-Up

Part No.: 3E-6654
S/N: 91Z453-Up

Part No.: 3E-6654
S/N: AXZ1-Up

Part No.: 3E-6654
S/N: EAZ1-Up

Reference: For the proper procedure to handle refrigerant, refer to Testing and Adjusting, "Refrigerant System - Charge".

611 Refrigerant Capacities

611

6SZ1-Up 1.7 kg (3.7 lb)

613 Refrigerant Capacities

613 Series II

8LJ884-Up 1.7 kg (3.7 lb)

613G

DBE1-Up 1.7 kg (3.7 lb)

ESB1-Up 1.7 kg (3.7 lb)

615 Refrigerant Capacities

615 Series II

9XG343-Up 1.7 kg (3.7 lb)

621 Refrigerant Capacities

621F

4SK22-Up 1.8 kg (4 lb)

8PL1-Up 1.8 kg (4 lb)

5JK1-Up 1.8 kg (4 lb)

9NL1- 1.8 kg (4 lb)

621G

APL1-Up 1.8 kg (4 lb)

CEN1-Up 1.8 kg (4 lb)

DBB1-Up 2.0 kg (4.4 lb)

ANG1-Up 1.8 kg (4 lb)

DBX1-Up 1.8 kg (4 lb)

MSE1-Up 1.8 kg (4 lb)

621H

DBK1-Up 1.8 kg (4 lb)
EAZ1-Up 1.8 kg (4 lb)
HKK1-Up 1.8 kg (4 lb)
NYY1-Up 1.8 kg (4 lb)

623 Refrigerant Capacities

623F

6BK1-Up 1.8 kg (4 lb)
5EW1-Up 1.8 kg (4 lb)
3XW1-Up 1.8 kg (4 lb)
5SG1-Up 1.8 kg (4 lb)

623G

ARW1-Up 1.8 kg (4 lb)
CES1-Up 1.8 kg (4 lb)
DBC1-Up 2.0 kg (4.4 lb)
AWB1-Up 1.8 kg (4 lb)

623H

DBF1-Up 1.8 kg (4 lb)
EJD1-Up 1.8 kg (4 lb)

627 Refrigerant Capacities

627F

1DL18-Up 1.8 kg (4 lb)
4YK1-Up 1.8 kg (4 lb)

627G

AXF1-Up 1.8 kg (4 lb)
CEX1-Up 1.8 kg (4 lb)
DBD1-Up 2.0 kg (4.4 lb)
AYK1-Up 1.8 kg (4 lb)

627H

DBW1-Up 1.8 kg (4 lb)
LCT1-Up 1.8 kg (4 lb)

631 Refrigerant Capacities

631E Series II

1NB1-Up 2 kg (4.4 lb)
1AB1510-Up 2 kg (4.4 lb)
1BB1-Up 2 kg (4.4 lb)

631G

AWK1-Up 1.8 kg (4 lb)
CLR1-Up 1.8 kg (4 lb)
DFA1-Up 2.4 kg (5.3 lb)
AXZ1-Up 1.8 kg (4 lb)
M1W1-Up 1.8 kg (4 lb)

633 Refrigerant Capacities

633E

2PS1-Up 2 kg (4.4 lb)
1EB1-Up 2 kg (4.4 lb)

637 Refrigerant Capacities

637E

1JB1-Up 2.4 kg (5.3 lb)

637E Series II

1FB571-Up 2 kg (4.4 lb)
1HB1-Up 2 kg (4.4 lb)
7CB1-Up 2 kg (4.4 lb)

637G

AXT1-Up 1.8 kg (4 lb)
CEH1-Up 1.8 kg (4 lb)
DFJ1-Up 2.4 kg (5.3 lb)
DEY1-Up 2.4 kg (5.3 lb)

651 Refrigerant Capacities

651E

89Z271-Up 2.1 kg (4.6 lb)
4YR1-Up 2.1 kg (4.6 lb)
5XR1-Up 2.1 kg (4.6 lb)

657 Refrigerant Capacities

657E

6TR1-Up 2.1 kg (4.6 lb)
5YR1-Up 2.1 kg (4.6 lb)
90Z223-Up 2.4 kg (5.3 lb)
91Z453-Up 2.4 kg (5.3 lb)
7KR1-Up 2.4 kg (5.3 lb)

657G

W1B1-Up 2.1 kg (4.6 lb)
W1C1-Up 2.1 kg (4.6 lb)
A4G1-Up 2.1 kg (4.6 lb)
W1F1-Up 2.1 kg (4.6 lb)

Systems Operation Section

i03007150

General Information

SMCS Code: 7309

The purpose of this service manual is to describe the operation, testing and adjusting procedures, and disassembly and assembly procedures of Caterpillar operator station heating and air conditioning systems.

These systems are designed to provide thermal comfort to machine operators in various conditions.

Both systems are closed loop systems that work by exchanging heat between the system fluid and the air that is supplied to the operator station. The fluid in the air conditioning system is refrigerant, and the fluid in the heating system is engine coolant.

In the air conditioning system, heat is transferred from the hot cab air to the cold refrigerant in the evaporator. The refrigerant is then transported to the condenser. Heat is deposited outside the condenser.

In the heating system, heat is transferred from the hot engine coolant to the cold cab air in the heater coil. The engine coolant is then transported to the engine. When the coolant is back in the engine, the coolant is heated again.

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Identifying the Refrigerant

SMCS Code: 1809

Before servicing the air conditioning system, the type of refrigerant that is used must be determined so that the correct service manual can be selected.

A tag that is placed in the cab or near the compressor can identify the refrigerant. The machine can have factory installed tag (1), or the machine can have tag (2) that is installed by the dealer.



Illustration 51

g01507259

- (1) Factory installed identification tag
- (2) Retrofit tag that is installed by the dealer

One may also identify the type of refrigerant that is used in the air conditioning system by examining the charging ports. Systems with R-134a will use ports that are quick disconnect (4) while systems with the older R-12 will use threaded ports (3). These ports are usually found in the block fittings that attach to the compressor.

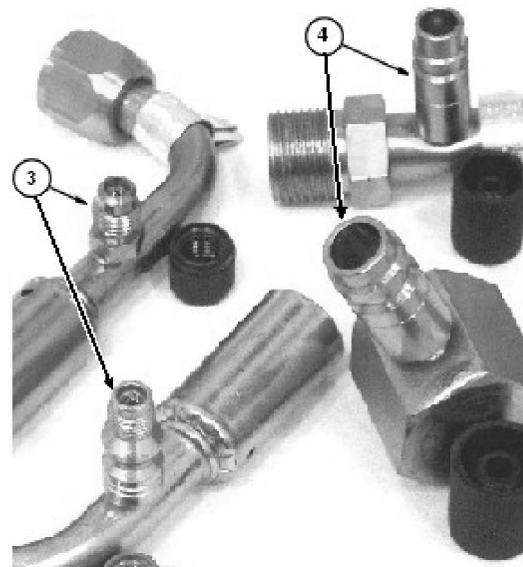


Illustration 52

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- (3) R-12 charging port
- (4) R-134a charging port

If the system contains R-12 and needs to be serviced, refer to Service Manual, SENR3334, "Air Conditioning and Heater R-12".

If the system contains R-12 and needs to be retrofitted for use with R-134a, refer to Special Instruction, SEHS9734, "Retrofitting Caterpillar R-12 Air Conditioning System to R-134a Refrigerant".

i02979466

Identifying the Air Conditioning System

SMCS Code: 1808; 7320-ZJ; 7322

The R-134a air conditioning system can be identified as an orifice tube system or an expansion valve system.

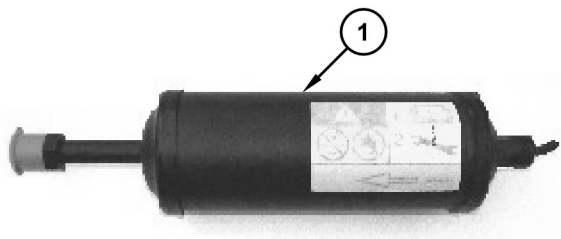


Illustration 53

g01507394

(1) In-line dryer

One identifies the orifice tube system by locating either an in-line dryer (1) or an accumulator (2) in the system. The orifice tube is located within the in-line dryer or within the evaporator inlet tube and the orifice tube cannot be seen.

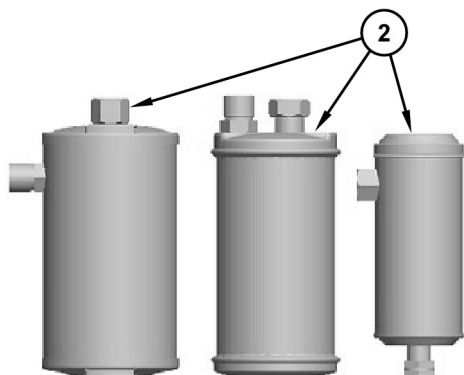


Illustration 54

g01507395

(2) Accumulators

The following components are the six components of the orifice tube system:

- Compressor
- Condenser coil

- Dryer
- Orifice tube
- Evaporator Coil
- Accumulator

The expansion valve system can be identified by locating a Thermostatic Expansion Valve (TXV) in the system. The two main types of TXV's are block (3) and 90° expansion valves (4). Expansion valve systems also contain a receiver-dryer (5).

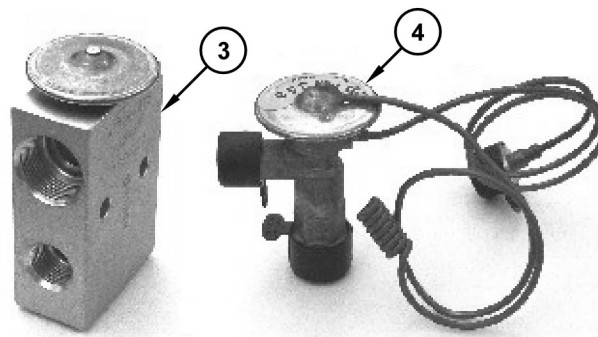


Illustration 55

g01507433

(3) Block expansion valve
(4) 90° expansion valve

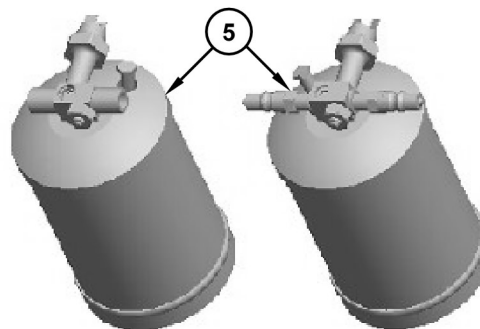


Illustration 56

g01507435

(5) Receiver-dryers

The following components are the five components of the expansion valve system:

- Compressor
- Condenser coil
- Receiver-dryer
- Expansion valve
- Evaporator coil

i02980711

Identifying the Heating System

SMCS Code: 7304; 7309

Identifying the Heating System

The heating system can be identified as either a water valve control system or a blend door control system. The control system for the water valve regulates the amount of hot engine coolant that is circulated through the heater coil. The control system for the blend door regulates the amount of air that is routed through the heater coil. Both the water valve and the blend door can be regulated through either a mechanical cable or through an electronic actuator.

Heating System with Water Valve Control

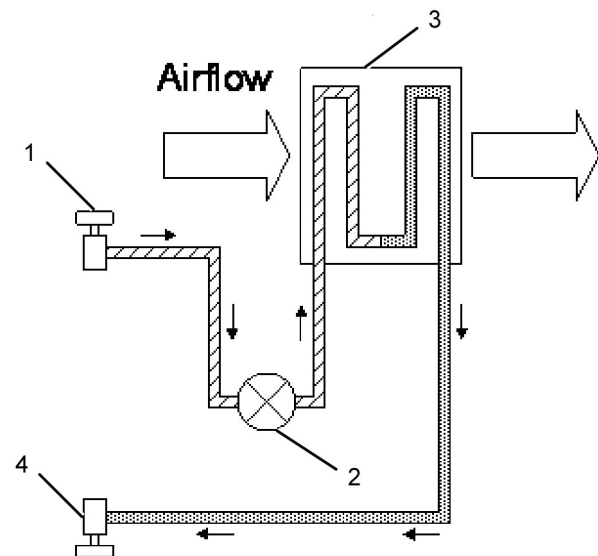


Illustration 57

g01510721

- (1) Outlet valve for the engine cooling system
- (2) Heater control valve
- (3) Heater coil
- (4) Return valve for the engine cooling system

The hot coolant from the engine circulates through the heating system. This coolant flows from the outlet valve for engine cooling system (1), through heater control valve (2), through heater coil (3), and back to the return valve for the engine cooling system (4). The temperature control knob, which is located on the control panel within the cab, regulates the flow of coolant.

With the temperature control knob in the maximum cold position, heater control valve (2) is closed. This prevents the flow of coolant into heater coil (3). When the control knob is moved away from the maximum cold position toward the maximum heating position, the heater control valve begins to open. As the control valve opens, coolant begins to flow from the outlet valve for engine cooling system (1) through the heater control valve and into the heater coil. As the hot coolant flows through the heater coil, the temperature of the air that is flowing through the coil increases.

The temperature of the air that is flowing out of heater coil (3) and into the cab is controlled by the amount of coolant that circulates through the heater coil. The coolant transfers the heat into the air stream. By increasing the amount of coolant that is circulating through the heater coil, the temperature of the air that is flowing out of the coil also increases. The coolant leaves the heater coil at a reduced temperature and flows back into the return valve for the engine cooling system (4).

Heating System with Blend Door Control

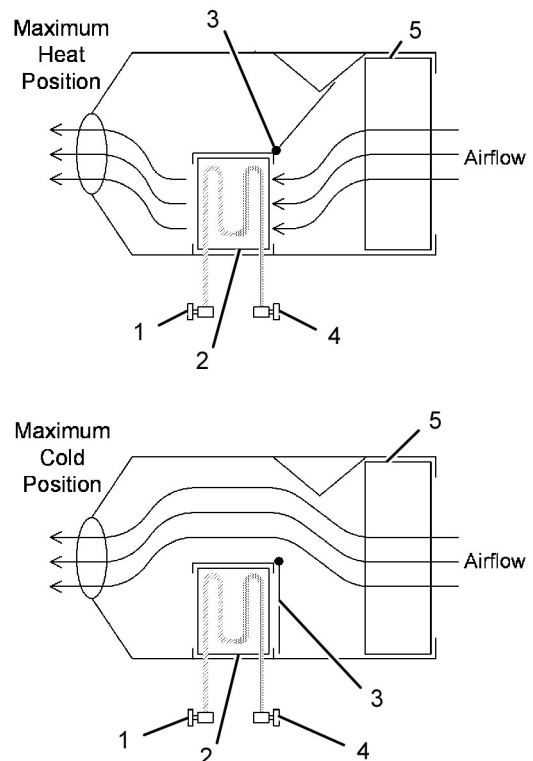


Illustration 58

g01508235

- (1) Outlet valve for the engine cooling system
- (2) Heater coil
- (3) Blend door
- (4) Return valve for the engine cooling system
- (5) Evaporator coil

The hot coolant from the engine circulates through the heating system. This coolant flows from the outlet valve for the engine cooling system (1), through heater control valve (2), through heater coil (3), and back to the return valve for the engine cooling system (4). The temperature control knob, which is located on the control panel within the cab, regulates the flow of coolant.

The air from outside of the unit is pulled through evaporator coil (5). This is through a series of ducts and filters. The incoming air is directed through the use of a blend door (3). The air can be directed in order to flow through heater coil (2), or the air can be directed in order to bypass the heater coil. With the temperature control knob in the maximum cold position, blend door (3) is closed. This prevents the air from flowing through heater coil (2). This air flows directly from evaporator coil (5) to the cab.

When the control knob is moved away from the maximum cold toward the maximum heat position, blend door (3) begins to open. As the blend door opens, air begins to flow through heater coil (2) and mixes with the colder air that is flowing through evaporator coil (5). This mixture of air is delivered to the cab through the air ducts. As the amount of air that is flowing through the heater coil increases, the overall temperature of the air that is flowing into the cab also increases.

Heater Coil

The heater coil is a device that is similar to a radiator. The heater coil heats the cab of the machine. The heater coil is exposed to the air which passes across the evaporator coil. The heater transfers the heat from the hot engine coolant into the air that is traveling across the engine. The heat transfer will heat up the air that is flowing to the cab, which also reduces the temperature of the coolant that is flowing back to the engine cylinder.

Water Valve

The water valve is a device that is used to regulate the flow of engine coolant to the heater coil and the flow of engine coolant from the heater coil. The water valve is a necessary component in the control system for the water valve. The water valve can be used in a blend door controlled system. In the blend door system, the water valve would allow coolant to flow through the coil, or the water valve would block coolant flow completely.

Depending on the type of system that is being used, the water valve can be connected to a mechanical cable, or the water valve can be connected to an electronic actuator. The mechanical cable is connected between the control knob in the cab and the valve. The control knob opens the valve and the control knob closes the valve. The electronic actuator is connected to the water valve and wired to the control panel.

Blend Door

The blend door is a device that is used to control the temperature of the cab air. The blend door controls the temperature by regulating the amount of air that is allowed to pass through the heater coil and mixing the air with the cool air from the evaporator coil. As the blend door gradually opens, the hot coolant that is flowing through the heater coil transfers heat to the cooler air that is flowing across the heater coil. This warmer air mixes with the cool air that is flowing across the evaporator in order to regulate the air temperature that is entering the ducts in the cab.

The blend door is typically plastic with insulation on both sides in order to prevent any unnecessary heat transfer when the system is set to the maximum heat position or the maximum cold position. The blend door is controlled by an electronic actuator, which is wired into the control panel within the cab.

i02979504

Refrigerant Expansion Valve System

SMCS Code: 7320

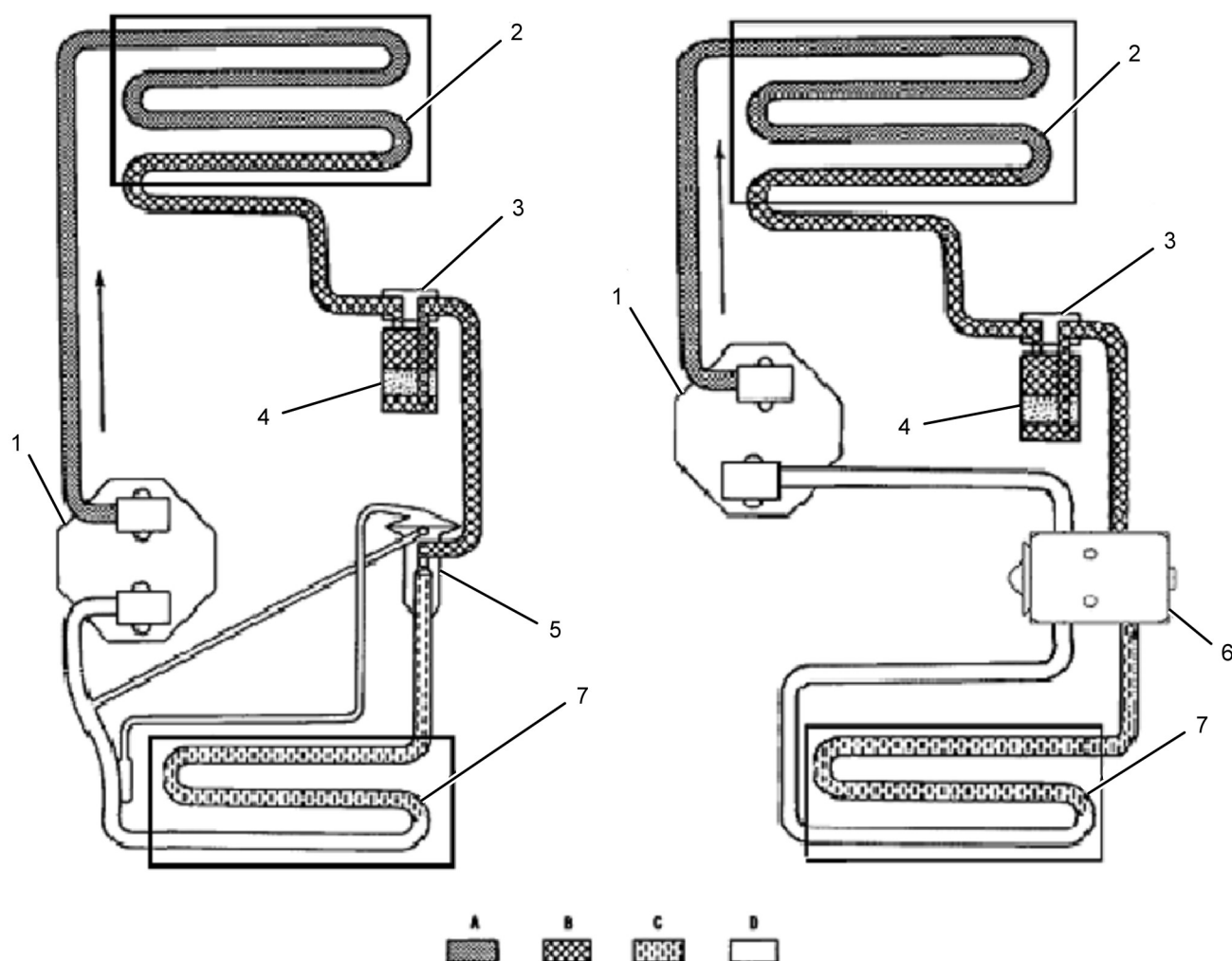


Illustration 59

g01507473

- (1) Compressor
- (2) Condenser
- (3) Receiver-dryer
- (4) Desiccant
- (5) 90° expansion valve
- (6) Block expansion valve

- (7) Evaporator
- (A) High temperature high pressure refrigerant vapor
- (B) High temperature and high pressure refrigerant liquid

- (C) Low temperature, low pressure refrigerant liquid vapor mixture
- (D) Low temperature low pressure refrigerant vapor

The air conditioner refrigerant begins to flow in the air conditioning system at the refrigerant compressor (1). The compressor is designed to change the air conditioner refrigerant from a vapor that has low pressure into a vapor that has high pressure. Also, the compressor changes the refrigerant from a vapor with low temperature to a vapor with high temperature. The increase in pressure causes the increase in temperature.

The refrigerant is sent through the condenser coil (2). In the condenser coil, heat is transferred from the refrigerant to the outside air. This changes the refrigerant to a high temperature and high pressure liquid.

From the condenser coil, the refrigerant moves to the receiver-dryer (3). In the receiver-dryer, moisture is removed from the refrigerant by the desiccant (4).

The refrigerant moves from the receiver-dryer to either the 90° expansion valve (5) or the block expansion valve (6). In the expansion valve, the refrigerant is changed from a high pressure and a high temperature liquid to a low pressure and a low temperature mixture of liquid and vapor.

The low pressure and low temperature refrigerant moves to the evaporator coil (7). While the refrigerant is in the evaporator coil, the refrigerant absorbs heat from the cab. This changes the refrigerant to a low pressure and low temperature vapor.

The refrigerant returns to the compressor as a low pressure and low temperature vapor. This marks the end of the cycle. The cycle is repeated continuously.

i03028705

Refrigerant Orifice Tube System

SMCS Code: 7320-QT

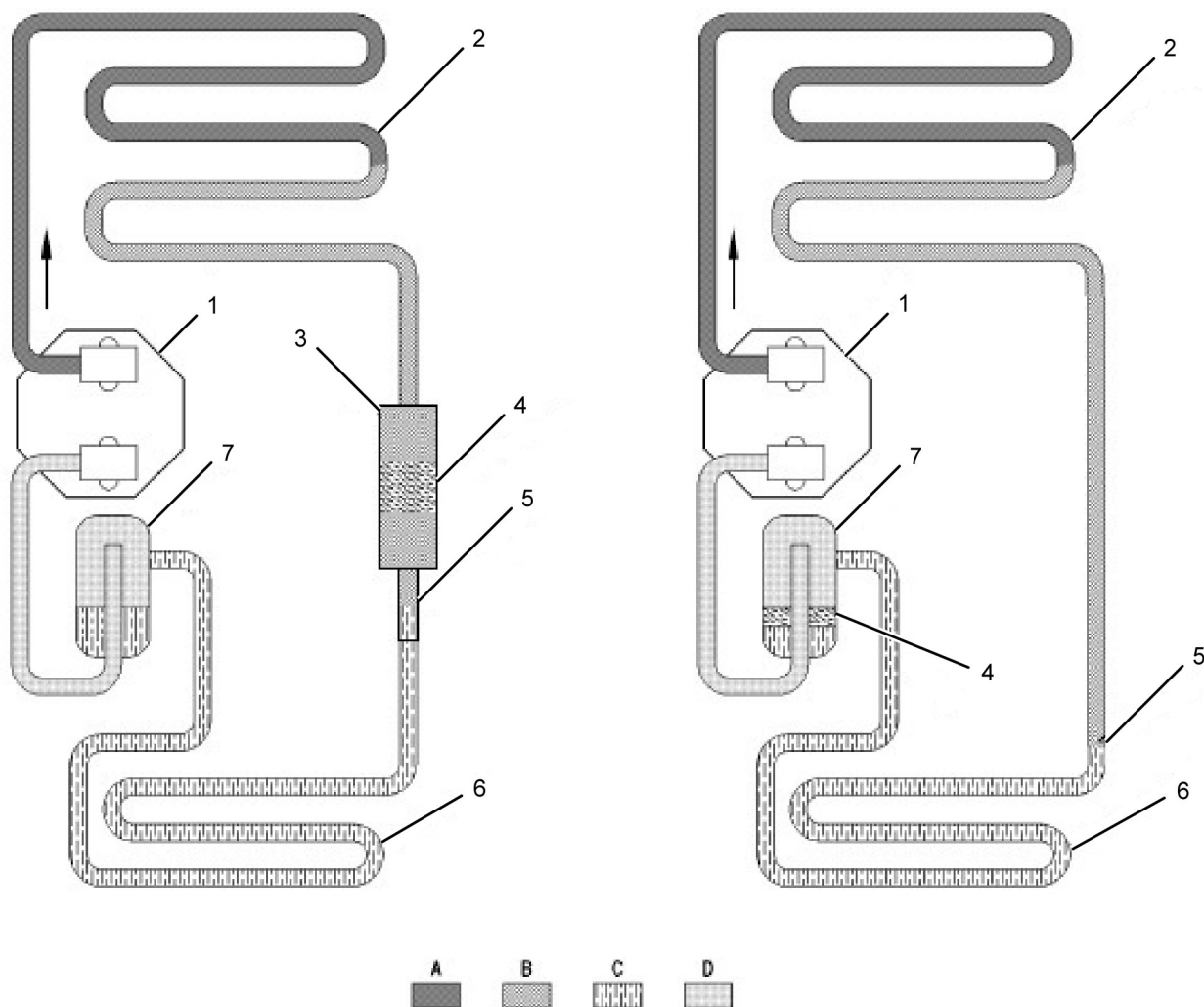


Illustration 60

g01507889

- (1) Compressor
(2) Condenser
(3) In-line dryer
(4) Desiccant
(5) Orifice Tube
(6) Evaporator

- (7) Accumulator
(A) High temperature high pressure refrigerant vapor
(B) High temperature, high pressure refrigerant liquid

- (C) Low temperature, low pressure refrigerant liquid vapor mixture
(D) Low temperature low pressure refrigerant vapor

The air conditioner refrigerant begins to flow in the air conditioning system at refrigerant compressor (1). The compressor is designed to change the air conditioner refrigerant from a vapor that has low pressure into a vapor that has high pressure. Also, the compressor changes the refrigerant from a vapor with low temperature to a vapor with high temperature. The increase in pressure causes the increase in temperature.

The refrigerant is sent through condenser coil (2). In the condenser coil, heat is transferred from the refrigerant to the outside air. This changes the refrigerant to a high temperature and high pressure liquid.

From condenser coil (2), the refrigerant moves to in-line dryer (3). In in-line dryer (3), moisture is removed from the refrigerant by desiccant (4). Some orifice tube systems will not contain an in-line dryer. In this case, the desiccant is located in accumulator (7).

Next, the refrigerant flows to the orifice tube. When the refrigerant is at the orifice tube, the refrigerant is changed from a high pressure and high temperature liquid to a liquid vapor mixture that is low pressure and low temperature.

The low pressure and low temperature refrigerant moves to evaporator coil (6). While the refrigerant is in the evaporator coil the refrigerant absorbs heat from the cab. This changes the refrigerant to a low pressure and low temperature vapor.

After the evaporator coil, the refrigerant flows to the accumulator. The accumulator stores liquid refrigerant that is exiting the evaporator and the accumulator allows only vapor to continue to the compressor.

The low pressure and low temperature vapor returns to the compressor. This marks the end of the cycle. The cycle is repeated continuously.

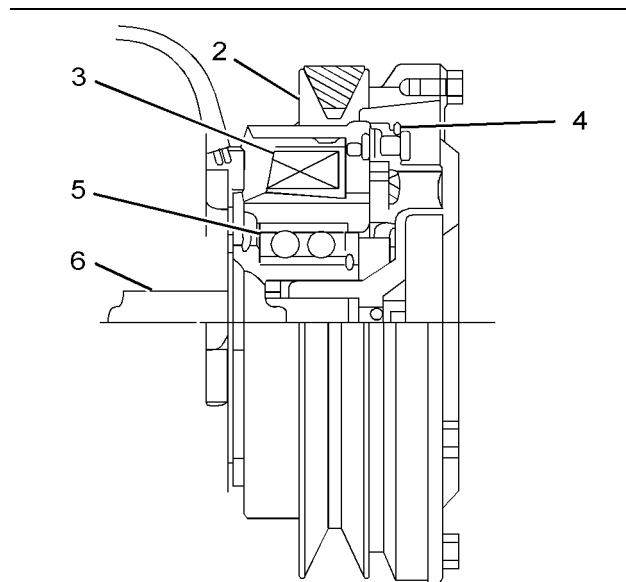


Illustration 62

g01266606

- (2) Magnetic clutch and pulley assembly
- (3) Coil assembly
- (4) Drive plate
- (5) Bearing
- (6) Compressor shaft

The compressor is driven by the engine. A belt connects the engine to the clutch and pulley assembly (2). The pulley assembly is located on the clutch. The drive plate (4) is fastened to the shaft of the compressor. The clutch and pulley assembly (2) turns on the bearing (5). The clutch and pulley assembly (2) are not connected to the shaft (6). The electric current from the thermostat controls a magnetic field in the coil assembly (3).

The magnetic field pulls the drive plate (4) against the clutch and pulley assembly (2). The clutch and the pulley assembly (2) turns the shaft (6) that operates the compressor. When the current to the coil assembly (3) is stopped, the magnetic field is removed. This allows the drive plate (4) to move away from the clutch and pulley assembly (2). The clutch and the pulley assembly (2) will turn freely on the bearing (5). The sequence of connecting and disconnecting the pulley to the compressor shaft (6) is called compressor cycling. The compressor cycling is controlled by the thermostat. The thermostat is controlled by the capillary tube, which is installed between the fins of the evaporator coil.

i02998460

Refrigerant Compressor

SMCS Code: 1802

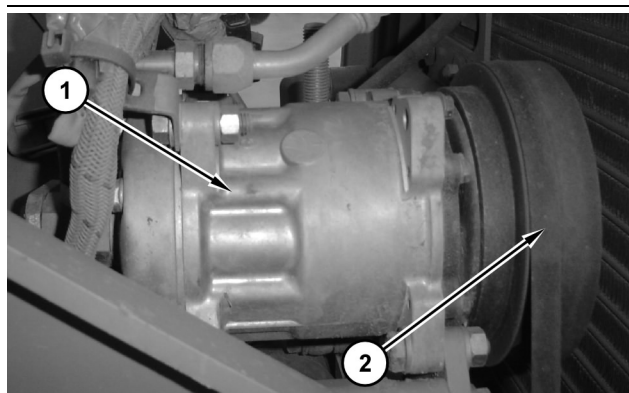


Illustration 61

g01257036

- (1) Compressor
- (2) Magnetic clutch and pulley assembly

i02982781

Refrigerant Condenser

SMCS Code: 1805



Illustration 63

g00289099

Typical Condenser

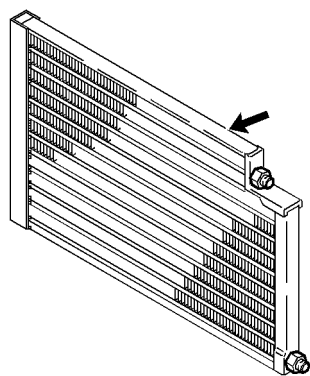


Illustration 64

g01514061

Typical Condenser

When the refrigerant leaves the compressor, the refrigerant is a vapor. The temperature of the refrigerant is high and the pressure of the refrigerant is high when the refrigerant leaves the compressor. The increase in pressure of the refrigerant causes an increase in temperature of the refrigerant. The refrigerant vapor leaves the compressor and the refrigerant enters the condenser (1).

The refrigerant must be converted into a liquid that has high temperature and high pressure. The refrigerant must be converted into a liquid in order to increase the efficiency of the air conditioning system. The condenser (1) converts the refrigerant vapor into a liquid that has high temperature and high pressure.

When the refrigerant vapor leaves the compressor, the refrigerant vapor enters the condenser. The condenser is in a location that is exposed to outside air. In order to convert the refrigerant into a liquid, the refrigerant must lose heat. The refrigerant must reach the temperature of saturation. At the temperature of saturation, the refrigerant vapor will become a liquid. The temperature of saturation of the refrigerant depends on the pressure of the refrigerant.

As the high temperature, high pressure refrigerant vapor passes through the condenser (1), the condenser absorbs heat from the refrigerant vapor. The condenser transfers the heat to the outside air. The temperature of the refrigerant and the pressure of the refrigerant decrease until the temperature of saturation is reached. When the temperature of the refrigerant vapor is equal to the temperature of saturation, the refrigerant becomes a high temperature, high pressure liquid. When the refrigerant is converted into a liquid, the refrigerant leaves the condenser (1).

i02980695

Refrigerant Receiver-Dryer

SMCS Code: 7322

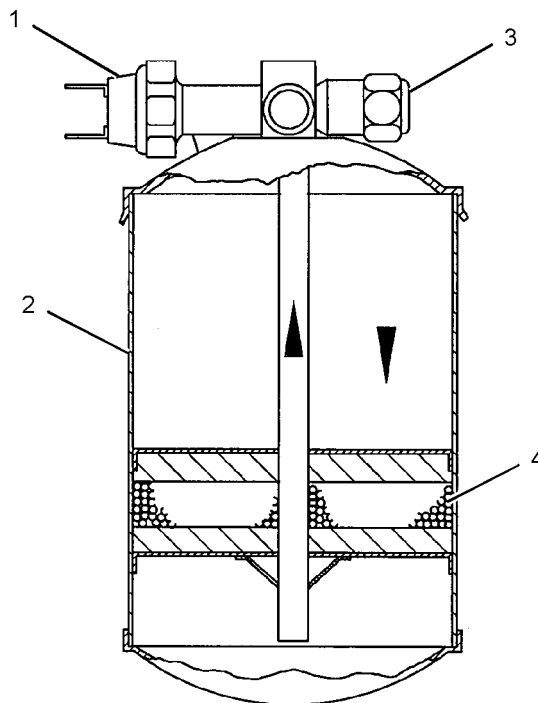


Illustration 65

g01508209

- (1) Low pressure cutoff switch
- (2) Receiver-dryer
- (3) High pressure relief valve
- (4) Desiccant

i02979742

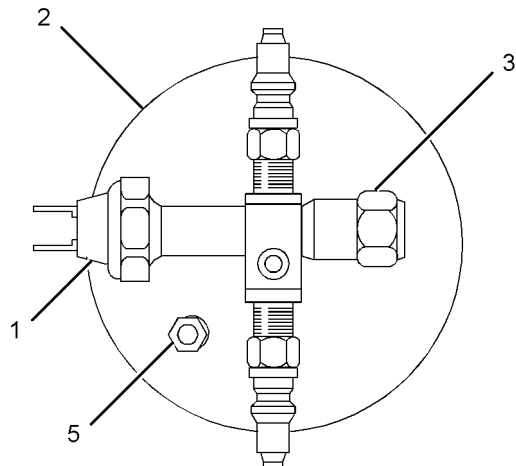


Illustration 66

g01508210

- (1) Low pressure cutoff switch
- (2) Receiver-dryer
- (3) High pressure relief valve
- (5) Moisture indicator

High pressure and high temperature refrigerant leaves the condenser coil and passes through the receiver-dryer (2). The liquid refrigerant inside the receiver-dryer passes through desiccant (4). The desiccant absorbs a small amount of moisture.

The receiver-dryer stores a small amount of refrigerant. This stored refrigerant is used in order to compensate for the changing system demands. These system demands can result from changing the speeds on the compressor, varying heat loads, or small losses of refrigerant.

A high pressure relief valve (3) is located on most receiver-dryers. The valve allows the refrigerant to be released to the atmosphere if the pressure increases to approximately 3450 kPa (500 psi). Most receiver-dryers also have a low pressure cutoff switch (1). If the system pressure lowers to approximately 175 kPa (25 psi), the switch opens. This will open the electric circuit to the magnetic clutch and the compressor will not operate.

Some receiver-dryers will have a moisture indicator (5). This moisture indicator is used in order to determine the relative moisture in the system. If the moisture indicator is blue, the system is dry. If the moisture indicator is pink or white, then the receiver-dryer must be replaced. Refer to Disassembly and Assembly, SEN5664, "Receiver-Dryer Remove and Install".

Refrigerant Expansion Valve

SMCS Code: 7320-EV

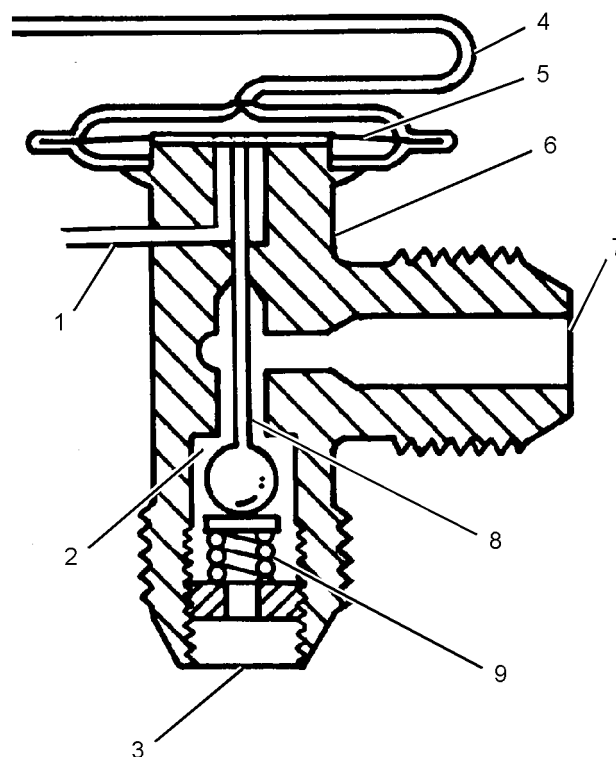


Illustration 67

g01507656

- (1) External equalizer line
- (2) Metered restriction
- (3) Outlet
- (4) Capillary tube and temperature sensing bulb
- (5) Diaphragm
- (6) 90° style expansion valve
- (7) Inlet
- (8) Ball and rod
- (9) Spring

The expansion valve (6) is designed to convert the refrigerant from a high pressure and high temperature liquid into a low pressure and low temperature liquid vapor mixture. The expansion valve also controls the amount of refrigerant that is supplied to the evaporator.

The two main types of expansion valve are the 90° expansion valve and the block expansion valve. The internal operation is identical for both of the valves. The valve configuration on the air conditioning system can be found in Systems Operation, SEN5664, "Refrigerant Expansion Valve System".

The liquid refrigerant with high pressure and high temperature enters the expansion valve at the inlet (7) from the condenser. An amount of refrigerant is allowed to flow through the metered restriction (2) and the outlet (3) to the evaporator.

The size of the metered restriction is controlled by three components:

- Pressure in the capillary tube (4)
- Pressure in the external equalizer line (1)
- Force due to the spring (9)

The capillary tube is filled with saturated refrigerant. There is a temperature sensing bulb at the end of the capillary tube. The temperature sensing bulb is held to the evaporator outlet. As the temperature of the evaporator outlet increases, the pressure in the capillary tube increases. This pressure creates a downward force on the diaphragm (5). Some types of block valves have an internal temperature sensing bulb.

The external equalizer line connects the evaporator outlet with the underside of the diaphragm. The pressure in the line creates an upward force on the diaphragm. In a block style expansion valve, there is not a required separate external equalizer line. There is not a separate external equalizer line because the line for the evaporator outlet is routed through the block valve.

The ball and rod (8) is attached to the diaphragm and the spring. The spring creates an upward force on the ball and rod.

When the force due to the pressure in the capillary tube is greater than the combined forces due to the spring and the pressure in the external equalizer line, the valve opens wider. This allows more refrigerant flow. When the force due to the pressure in the capillary tube is less than the combined forces due to the spring and the pressure in the external equalizer line, the valve closes. This restricts the refrigerant flow.

This metering action allows only the required amount of refrigerant to be supplied to the evaporator in varying load conditions.

In-line Refrigerant Dryer

SMCS Code: 7322

i02980139

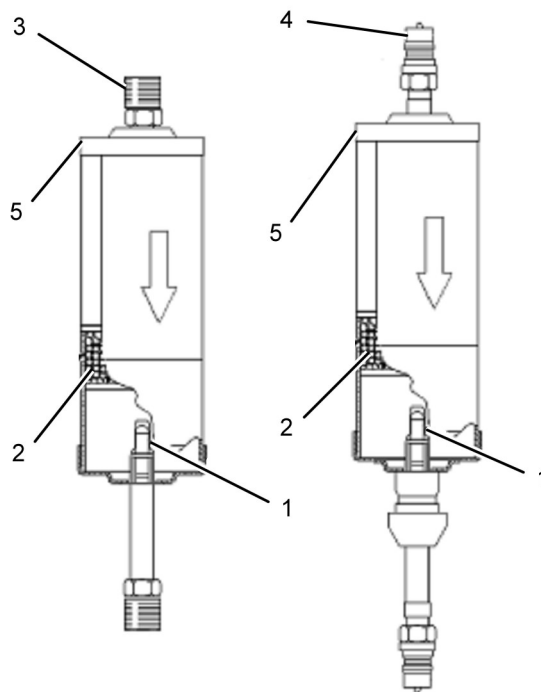


Illustration 68

g01507863

- (1) Orifice tube assembly
- (2) Desiccant
- (3) Tube O-ring fitting
- (4) Quick disconnect fitting
- (5) In-line dryer

The in-line dryer (5) receives the high temperature high pressure liquid refrigerant from the condenser coil. The refrigerant passes through the desiccant (2). The moisture is removed in the desiccant (2). The refrigerant continues to the orifice tube assembly (1), which is the location where the high temperature high pressure liquid is changed into a liquid vapor mixture that is low temperature low pressure. After exiting the in-line dryer, the refrigerant continues to the evaporator coil.

The in-line dryer connects to the refrigerant circuit with either tube O-ring fitting (3) or a quick disconnect fitting (4).

i03022273

Refrigerant Orifice Tube Assembly

SMCS Code: 7320-QT

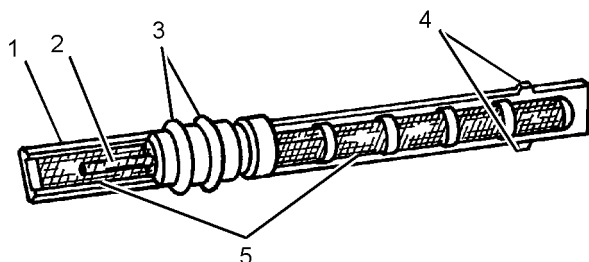


Illustration 69

g01507883

- (1) Orifice tube assembly
- (2) Orifice tube
- (3) O-ring seal
- (4) Tab
- (5) Screen

The orifice tube assembly (1) contains a plastic body, two screens (5), and a small brass tube. The small brass tube is referred to as an orifice tube (2), and it is located in the center of the body. The O-ring seals (3) are positioned on the body of the orifice tube to seal against leakage around the orifice tube.

The orifice tube assembly is contained within the in-line dryer. If there is no in-line dryer, the orifice tube is located in the inlet to the evaporator.

The orifice tube (2) restricts the flow of refrigerant. This restriction creates a pressure drop across the orifice tube. This changes the refrigerant from a high temperature high pressure liquid into a liquid vapor mixture that is low temperature low pressure. The flow rate is controlled by the pressure difference across the orifice tube.

i02982788

Evaporator Coil

SMCS Code: 7343

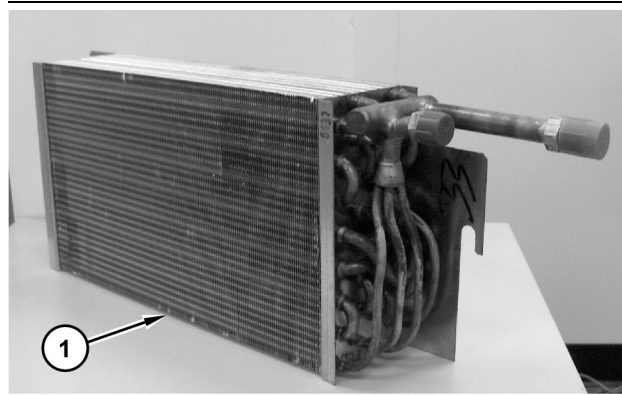


Illustration 70

g01265314

(1) Typical evaporator coil

In an expansion valve system, the evaporator coil receives liquid refrigerant from the expansion valve. In an orifice tube system, the evaporator receives liquid refrigerant from the orifice tube assembly. The liquid refrigerant that is received by the evaporator has low pressure and low temperature. Since the pressure of the liquid refrigerant is low, the temperature of saturation of the refrigerant is low. At the temperature of saturation, the refrigerant changes from a liquid into a vapor. The temperature of saturation of a fluid increases when the pressure of a fluid increases.

The evaporator coil is exposed to the air that is inside of the cab. The heat from the air that is inside of the cab is absorbed by the evaporator. The evaporator transfers the heat to the refrigerant. The amount of heat that is required to reach the temperature of saturation is called the latent heat of vaporization. When this heat is absorbed by the refrigerant, the temperature of the refrigerant will reach the temperature of saturation. The refrigerant will change from a liquid into a vapor. The vaporized refrigerant will leave the evaporator. The vaporized refrigerant will carry away the heat from the cab. The vaporized refrigerant will return to the compressor when the refrigerant leaves the evaporator. This process is repeated continuously.

i02980104

Refrigerant Accumulator

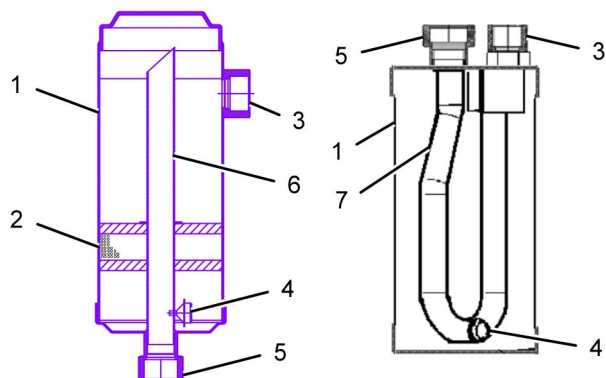
SMCS Code: 7320-ZJ

Illustration 71

g01507822

- (1) Accumulator
- (2) Desiccant
- (3) Inlet
- (4) Filter for the oil drain
- (5) Outlet
- (6) Standpipe
- (7) J-tube

Low temperature low pressure refrigerant leaves the evaporator coil and passes into the accumulator (1) through the inlet (3). Liquid refrigerant that was not evaporated in the evaporator is stored in the bottom of the accumulator. Vapor refrigerant passes through either the standpipe (6) or the J-tube (7) before exiting through the outlet (5). The oil goes to the compressor through a filter for the oil drain (4).

The accumulator stores some refrigerant in order to compensate for the changing system demands. These system demands can result from changing speeds in the compressor, varying heat loads, or small losses of refrigerant.

The accumulator will contain desiccant (2) if the system does not contain an in-line dryer. The liquid refrigerant will pass through the desiccant, which will remove a small amount of moisture.

i02980429

Refrigerant Compressor Protection System

SMCS Code: 1802

TYPICAL COMPRESSOR PROTECTION SUBSYSTEM SCHEMATIC

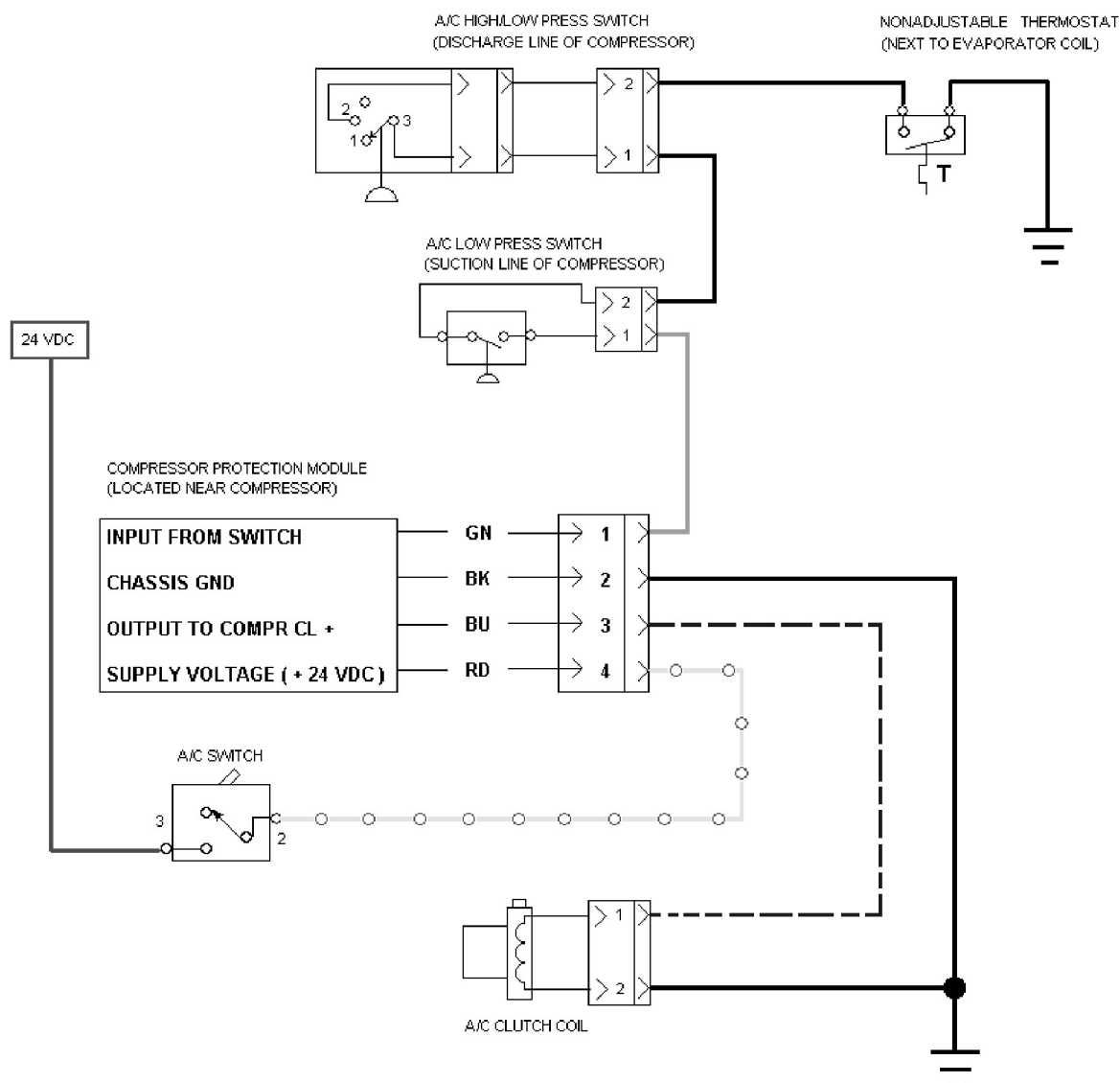


Illustration 72

g01518521

Compressor protection schematic with an on delay timer (Compressor Protection Module)

The protection system uses an on delay timer assembly for the refrigerant compressor that monitors three switches in order to protect the refrigerant compressor. The on delay timer assembly will perform the following functions:

- Increase the life of the refrigerant compressor if the air conditioning system has a low refrigerant charge.
- Delay the refrigerant compressor from engaging during engine start-up.

- Protect the compressor clutch from low voltage and high voltage.

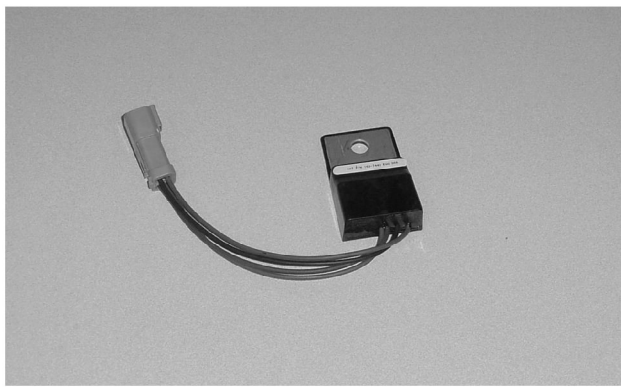


Illustration 73
On Delay Timer Assembly for the Refrigerant Compressor

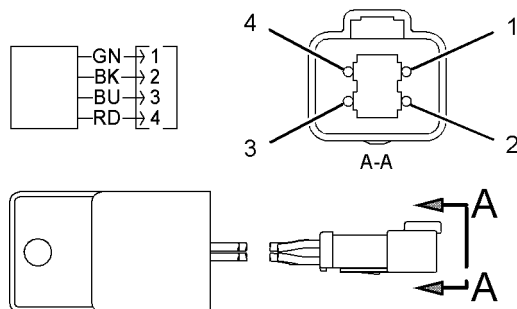


Illustration 74
(1) Output (signal voltage)
(2) Chassis ground
(3) Compressor clutch
(4) Power supply

When the air conditioning switch is activated inside the cab, the air conditioning switch supplies voltage to the on delay timer assembly through pin (4). If the voltage at pin (4) is outside the acceptable range, the on delay timer assembly will not engage the compressor clutch coil. If the proper voltage is present, the on delay timer assembly delays the engagement of the compressor clutch for 15 to 20 seconds after the air conditioning switch is activated. The on delay timer assembly monitors the status of three switches by sending a signal voltage through pin (1). The following three switches are monitored by the on delay timer assembly:

- The high/low pressure switch on the high side of the air conditioning system
- The low pressure switch on the low side of the air conditioning system
- The thermostat switch

The three switches are connected in series to ground. If any one switch creates an open circuit, the on delay timer assembly detects the signal.

If any of the switches cycle on and off in rapid succession, the on delay timer assembly will start a time delay. The time delay limits the cycles of the refrigerant compressor to 4 times per minute.

104923811

Temperature Control

SMCS Code: 7309

Adjustable Thermostat

A Heating Ventilation Air Conditioning (HVAC) system that is controlled by an adjustable thermostat contains two temperature control knobs.

The first temperature control knob is for the air conditioning system and the control knob is connected to the adjustable thermostat.

A thermostat is a switch that opens and closes. The thermostat switch opens and the thermostat switch closes because of the changes that can occur in the temperature of the sensing element. A sensing element is also known as a capillary tube. Sensing temperatures for the element less than the switch point on the thermostat will open the thermostat switch. Sensing temperatures for the element more than the switch point for the thermostat will close the thermostat switch.

When the first temperature control knob is in the OFF position, the electric circuit that connects the adjustable thermostat and the magnetic clutch is OPEN. In the OFF position, the compressor does not operate. The temperature of the air and the position of the temperature control knob determines if the thermostat switch is CLOSED. When the thermostat switch is CLOSED, the current moves through the switch and the coil assembly in the magnetic clutch, and this causes the compressor to operate. The temperature of the air through the evaporator coil is monitored by the capillary tube that is placed between the fins of the evaporator coil.

The second temperature control knob is for heating. This knob is connected to the heater control valve, which controls the flow of coolant through the heater coil. The temperature of the cab is maintained by the position of the air conditioning and heating temperature control knobs.

Nonadjustable Thermostat (Freeze Control System)

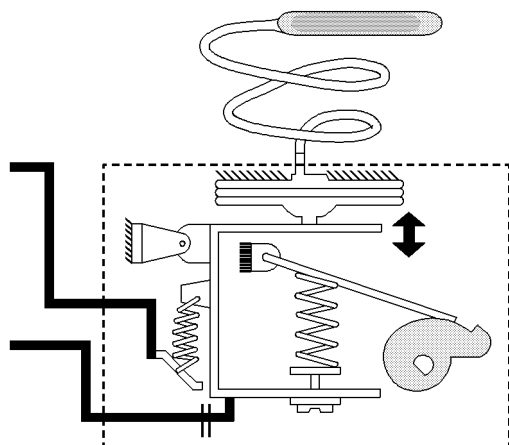


Illustration 75

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An HVAC system using a nonadjustable thermostat contains one temperature control knob. The temperature control knob is connected to the heater control valve, which controls the flow of coolant through the heater coil. The temperature of the cab is maintained by the position of the temperature control knob on the heater.

The temperature of the air that crosses the evaporator coil is kept at the coldest possible temperature allowed by the nonadjustable thermostat. The thermostat switch opens at a temperature of approximately -1.1°C (30°F) in order to prevent the condensation from freezing to the evaporator coil. In addition, the thermostat switch closes at approximately 2.2°C (36°F). Condensation that is frozen will restrict the air flow through the evaporator coils. When the switch opens, the electric circuit that connects the thermostat switch to the magnetic clutch is OPEN and the compressor does not operate. When the switch is CLOSED, the current moves through the switch and through the coil assembly in the magnetic clutch. This causes the compressor to operate. In order to operate the system in the correct manner, the heater core supply must not be closed. Also, in order to operate the system in the correct manner, the return coolant line valve must not be closed.

ATC System Operation

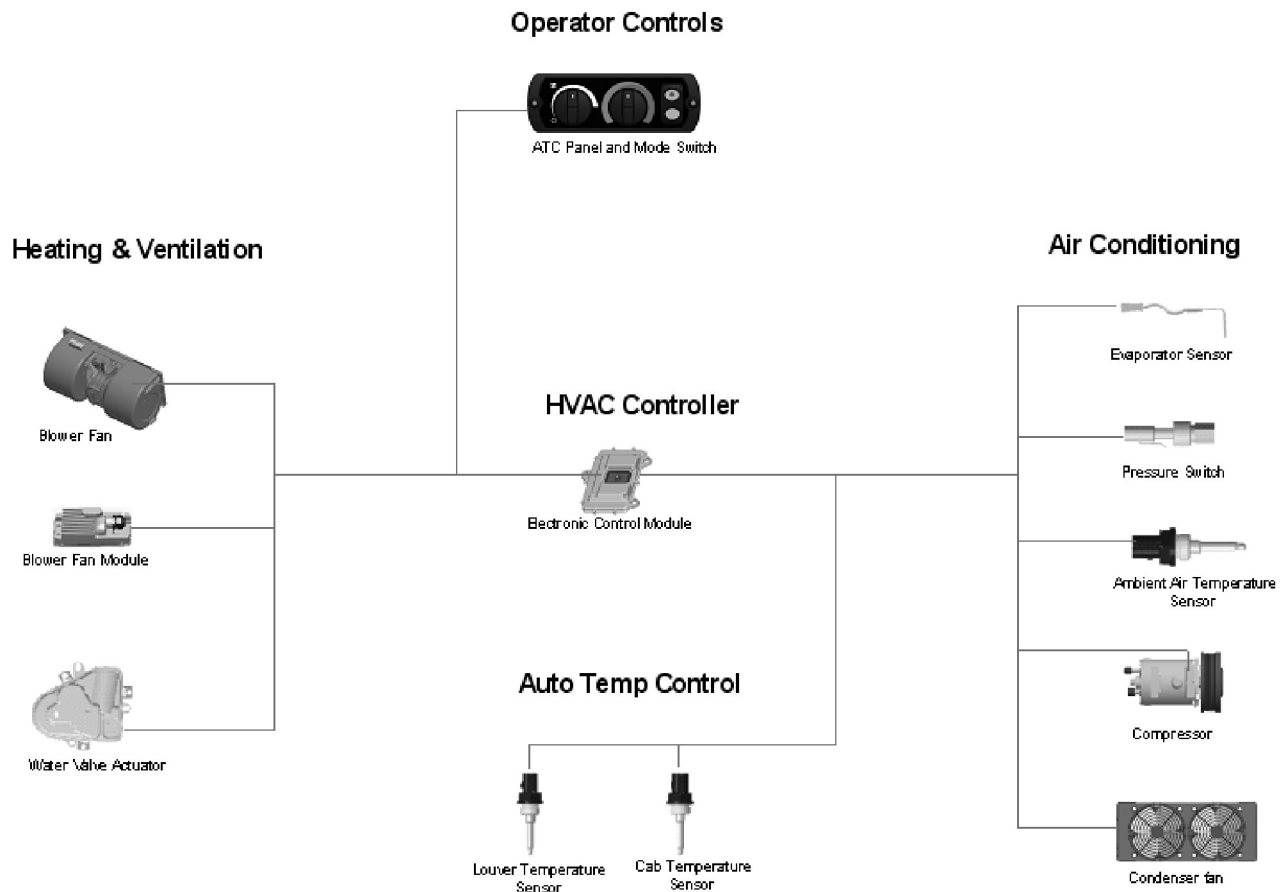


Illustration 76

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Typical HVAC Components

The Automatic Temperature Control (ATC) system includes all of the standard HVAC components for manual temperature control along with the louver and recirculation temperature sensors. There are a few steps to enable ATC.

- Select the Auto position on the mode selection switch located on the control panel
- Rotate the temperature dial to the desired temperature setting
- Rotate the blower fan dial to the desired speed –
Note: There has to be some fan speed in order for the ATC to operate, full CW position of the dial will turn off the ATC.

The Electronic Control Module (ECM) receives the requested temperature from the control panel and the cab temperature sensor and automatically controls the water valve actuator and compressor to reach and maintain that temperature. Some machines are also equipped with an Auto Blower option that adjusts the blower fan speed based on the cab temperature error, the larger temperature difference the faster the blower fan speed.

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Pressure Switch (Refrigerant)

SMCS Code: 1435-PX; 7320-QW

Air Conditioning High Low Pressure Switch

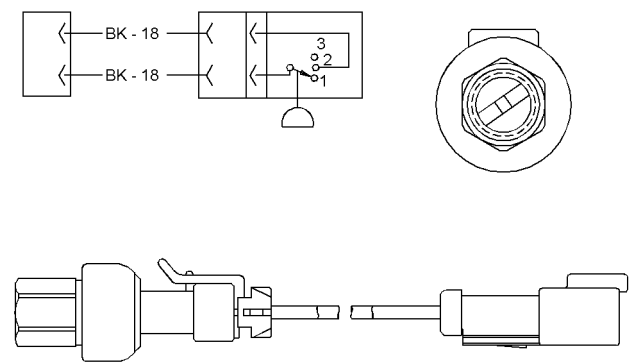


Illustration 77

g01506776

Schematic symbol and drawing for the high low pressure switch

The High Low pressure switch is used in order to monitor the refrigerant pressure that is coming out of the discharge side of the refrigerant compressor. The pressure switch prevents the compressor from operating when the pressure in the discharge line exceeds a specific pressure range or when the pressure in the discharge line fails to maintain a specific pressure range. This switch is electrically connected in series with the magnetic clutch for the refrigerant compressor, and the evaporator coil thermostat. Similarly to the thermostat switch, the compressor will not operate when the High-Low pressure switch is OPEN. When the High-Low pressure switch is CLOSED, the current moves through the switch and through the coil assembly in the magnetic clutch. This causes the compressor to operate.

The High-Low pressure switch has two pressure set points that will cause the switch contacts to OPEN. For a low pressure condition, the switch contacts will move OPEN whenever the pressure value for the discharge line decreases to less than 170 kPa (25 psi). The switch contacts will remain in the OPEN position until the pressure value increases to 275 kPa (40 psi) or more. For the high pressure condition, the switch contacts will move OPEN whenever the pressure value for the discharge line exceeds 2800 kPa (405 psi). The switch contacts will remain in the OPEN position until the pressure value decreases to 1750 kPa (255 psi) or less.

Air Conditioning Low Pressure Switch

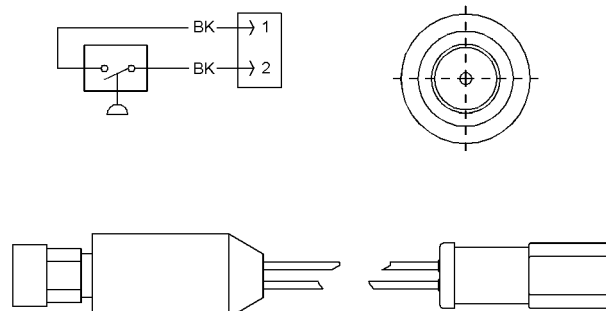


Illustration 78

g01506713

Schematic symbol and drawing for the low pressure switch

The Low pressure switch is used only in applications for the machine that also use the compressor protection time delay relay. The Low pressure switch is used to monitor the refrigerant pressure that comes into the suction side of the refrigerant compressor. The pressure switch prevents the compressor from operating when the pressure for the suction line fails to maintain a specific pressure range. This switch is electrically connected in series with the compressor protection time delay relay, the high low pressure switch, and the thermostat for the evaporator coil. The compressor will not operate when the Low pressure switch is OPEN. When the Low pressure switch is CLOSED, a ground signal is sent to the compressor protection time delay relay. A CLOSED low pressure switch indicates that the pressure for the suction line is high enough to allow the refrigerant compressor to operate. The compressor protection time delay relay will then turn on causing the compressor to operate.

The switch contacts on the low pressure switch will move OPEN whenever the pressure value for the suction line decreases to less than 34 kPa (5 psi). The switch contacts will remain in the OPEN position until the pressure value increases to 104 kPa (15 psi) or more.

i02991866

Cab Pressurization and Filtration System

SMCS Code: 7320; 7342

Caterpillar machines with an enclosed cab area need to provide adequate air flow to the operator inside the cab area so that a standard air pressure is met. Maintaining a proper air pressure level is accomplished by ensuring that the appropriate seals are used. When the appropriate seals are correctly installed, the cab will be pressurized by the ventilation system. See Troubleshooting, SEN5664, "Troubleshooting Cab Pressurization and Filtration System" for tips on resolving problems.

Maintaining the proper pressurization level in the cab area is important to the health of the operator because changes to the air pressure may lead to problems with breathing. Low pressure can cause dust to enter the cab and the Heating Ventilation Air Conditioning (HVAC) system, which can lead to premature system deterioration. Low pressure is often caused by improper sealing of the cab. Poor sealing of the cab requires an increase in the fresh air flow to maintain pressurization. The increase in fresh air flow will lead to a lower air conditioning and heater performance. The increase in fresh air flow will also lead to increased intervals in filter service. Additional noise that is entering the cab can also result from poor sealing of the cab.

Cab sealing objectives for the operator cab environment are for the cab to pressurize to a minimum of 50 Pa (0.2 inch of H₂O) with no more than 76 m³/hr (45 cfm) () of fresh air flow. The minimum cab fresh air flow while the ventilation system is operating on any fan speed is 43 m³/hr (25 cfm). This objective satisfies the requirements for fresh air flow from SAE J1503 and ISO 10263-4. In HVAC systems with a mode door that controls the balance of fresh air and recirculation air, the control shall be set to minimum fresh air flow while measuring cab pressure.

The air flow of a HVAC system is used to pressurize a cab as the air flow passes through different components. First, outside air is drawn into the HVAC compartment after being filtered for dust particles. Air is drawn in with the help of a blower fan. The blower fan pulls air or pushes air across the heater and/or the evaporator coil. The air flow is then directed into the ventilation ducts of the system. The air flow travels into the environment of the cab through the directional louvers. Finally, the air inside the cab area returns to the HVAC system through the recirculation filter.

Some ventilation systems can be enhanced by using different options. One option that is available for a wide variety of Caterpillar machines is the inclusion of a powered precleaner unit. As part of the pressurized system of the cab, a precleaner removes additional dirt/dust from the fresh air flow that is entering the cab. This provides extended life for the filter to the fresh air filter. These precleaners are coupled with higher efficiency fresh air filters in order to prevent finer particles of dirt from entering the cab area. In addition to the precleaner, some newer systems may include filters that are low restriction. A media filter that is low restriction can filter dust effectively, and offer more air flow through the HVAC system.

Cab Air Filters

Most Caterpillar machines with the R134a system have two cab air filters. One type of air filter is the fresh air filter and the other type of filter is a recirculation filter inside the cab. Some of the machines have a third air filter that is made of foam. The third filter is designed to remove large debris before the air reaches the fresh air filter.

Some Caterpillar machines are equipped with a precleaner for the cab. The system is designed to remove excessive dust and dirt from the air that is entering the cab. The precleaner is part of the pressurized cab.

There are optional replacement filters that are available for use in the field with certain machine applications. Carbon impregnated filters are used for improved odor reduction in place of the fresh air filter. High efficiency filters are also used as a replacement for the fresh air filter in environments with high concentrations of dust. High efficiency filters also provide better filtering efficiencies in order to reduce the intake of dust into the cab. Filters that are low restriction are also available for certain applications as a way to reduce the system restriction through the filter. Filters that are low restriction reduce the restriction that is in the system, and the filters continue to maintain efficiencies in filtering dust.

Reference: For optional replacement of filters, see Datasheet, PEHJ0092, "Cat Cabin Air Filters Datasheet".

Air filters for Caterpillar cabs are not intended for filtering out hazardous materials. When you are working in an environment with potentially hazardous materials, all of the safety precautions for working with that material should be followed. As the requirements are defined by the local agencies, additional personal protection equipment may be required for the operator.

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i03861420

Condensate Drainage System

SMCS Code: 7320

Caterpillar machines that are equipped with Heating Ventilation Air Conditioning (HVAC) units need to have an adequate system for drainage in order to properly remove condensate from the HVAC system. Condensate collects on the coils as moisture is removed from the air during air conditioning operation. After the condensate has developed on the coil, the condensate will drip off the coil. In order to prevent any condensate from entering the enclosure for the operator, a drainage system that is maintained correctly is needed.

Drainage of the condensate can be achieved in different ways. Some systems have a collection reservoir that is built into the case compartment that encloses the evaporator coil. The floor of the case slopes to the holes for drainage, and this allows condensate to drain away from the HVAC unit.

Other systems incorporate a separate drain pan that is located under the coil, in the case compartment that is used to collect condensate. The drain pan is shaped in order to allow condensate to flow toward the holes for drainage and away from the HVAC unit.

Whether integrated into the case design, or integrated through the use of a drain pan, the drain hoses and the valves are attached to the drain holes. Drainage hoses are commonly used to route the condensate around critical components on the machine, so that the water can be diverted to a proper point of exit below the machine. Drain valves are intended to prevent dust and debris from entering the HVAC unit. The location of the drainage unit may change the way that the condensate will be removed from the system. Some units will allow drainage to drain directly out of the case without the use of drain valves and hoses.

Service Intervals

SMCS Code: 7000; 7309; 7320

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Note: Before performing any maintenance, refer to Troubleshooting, SEN5664, "Machine Preparation for Troubleshooting" for the correct lockout procedure.

Regular maintenance must be performed in order to maximize the performance of the air conditioning system. Regular maintenance must be performed in order to minimize the downtime of the machine. Failure to inspect these systems will cause poor performance and premature failure. Inspect and maintain the Heater and the Air conditioner system per the chart below. For additional information on the component and system maintenance instructions, refer to Service Manual, SENR5664, "testing and adjusting".

Table 7

Component or System	Clean/Inspect	Replace
Dryer with Quick Disconnect		Every 2000 hours
Dryer with Tube O-Ring Connect		Every 4000 hours
Recirculation Filter	Weekly	Monthly
Condenser Coil	as needed	
Fresh Air Filter	Each shift	Weekly
Heating and A/C Maintenance checklist	Seasonal	

- Perform regular maintenance on the refrigerant service units in accordance to the instructions from the manufacturer. Change the oil that is in the vacuum pumps according to the instructions from the manufacturer.
- Check the scale that is used for charging for accuracy after every 30 days. Check after every 30 uses according to the instructions from the manufacturer.

Heating and A/C Maintenance Checklist

Table 8

Filters	
Operation	Check if OK
Check the cleanliness of the Fresh Air Filter.	
Check the cleanliness of the Recirculation Filter.	

Table 9

Coils	
Operation	Check if OK
Check the condenser coil for damage or debris.	
Check the evaporator coil for damage or debris.	
Check the heater coil for damage or debris.	

Table 10

Blowers and Fans	
Operation	Check if OK
Check the remote condenser fans in order to make sure that the fans operate when the air conditioning system is running.	
Make sure that the blower fans for the cab operate on all speed settings.	

Table 11

Condensate Drain Lines	
Operation	Check if OK
Make sure that the drain lines are clean and that the drain lines allow condensate flow.	
Make sure that the drain valves are present and correctly located.	

Table 12

Dryer	
Operation	Check if OK
If the dryer has quick disconnects, make sure that the dryer has been replaced within the last 2000 hours. Replace according to the maintenance chart	
If the dryer has tube connections that are an O-ring, make sure that the dryer has been replaced within the last 4000 hours. Replace according to the maintenance chart	

Table 13

Compressor	
Operation	Check if OK
Check the cleanliness of the wire connections for the compressor and make sure that the connections are free of damage.	
Make sure that the dust caps are securely installed on the service ports.	
Make sure that the clutch engages when the A/C switch is on and the thermostat is set to maximum cooling.	

Table 14

Compressor Drive Belt	
Operation	Check if OK
Check for wear and damage on the compressor drive belt.	
Make sure that the auto tension pulleys are functioning correctly.	
Make sure that the drive belt is aligned within 1/3 of a degree.	

Table 15

Hoses and Connections	
Operation	Check if OK
Check for wear and damage on the refrigerant lines	
Check for leaks on the refrigerant lines	
Check for wear and damage on the heater lines	
Check for leaks on the heater lines	
Make sure that the heater valves are open for use in the winter.	

Table 16

Performance	
Operation	Check if OK
Make sure that a performance check on the air conditioning indicates a system that is functioning properly. Refer to testing and adjusting, SENR5664, "Performance Checks for the Air Conditioning System".	
Make sure that a performance check on the heater system indicates that the system is properly functioning. Refer to testing and adjusting, SENR5664, "Performance Checks for the Air Conditioning System".	

Air Filters-Clean

The cab air filters are designed to provide clean air to the evaporator and the heater coils. The cab air filters are also designed to keep the cab pressurized. If the filters are not properly maintained, the coils will be coated with dirt. Dirty coils will result in loss of heating and cooling. Dirty coils could also result in failure of the compressor. Refer to testing and adjusting, SENR5664, "Coil Cleaning".

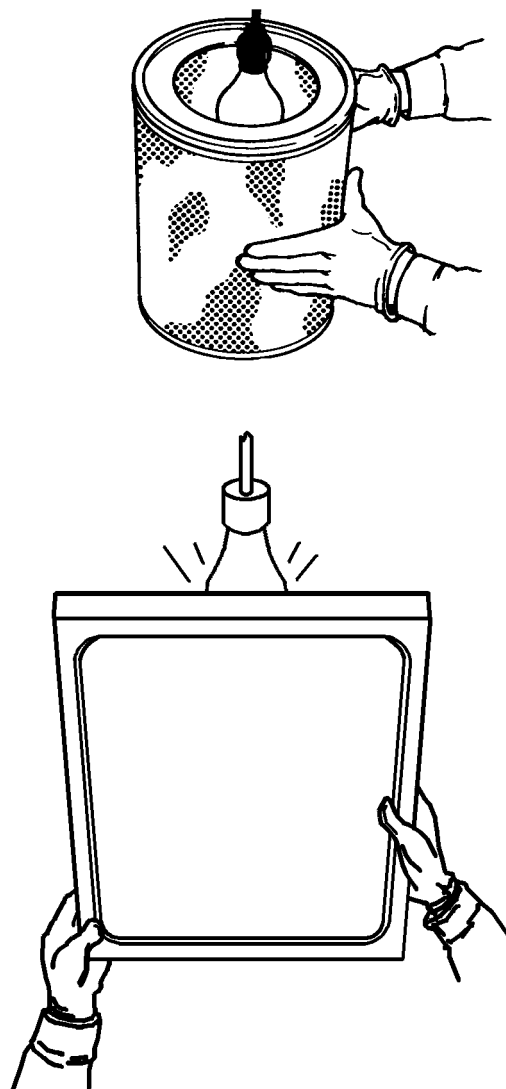


Illustration 79

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Cab air filters should be inspected regularly. Any inspection variance depends on the environmental conditions. Fresh air filters should be checked after every shift (8 to 10 hours). Fresh air filters should be changed after every week (40 to 50 hours). Recirculation filters should be checked after every week (40 to 50 hours). Recirculation filters should be changed after every month (160 to 200 hours). Inspect the filter for holes. Look through the filter toward a bright light. Check for damaged gaskets or dented metal parts. Do not use damaged filters. For extreme dust conditions, the filters should be inspected daily, and the filters should be cleaned whenever is necessary.

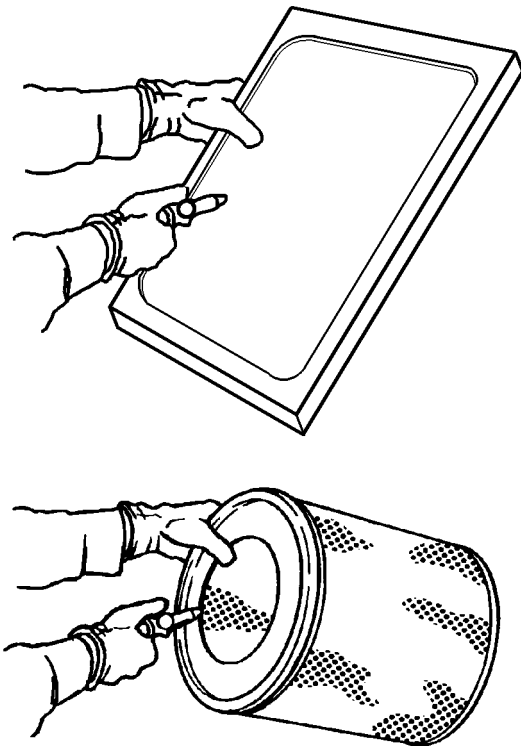


Illustration 80

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Remove loose dirt with compressed air. Do not exceed 690 kPa (100 psi) from an air nozzle that is 3.18 mm (0.125 inch) diameter. Keep the air nozzle at least 51 mm (2 inch) from the filter.

The filters that are made of foam can be blown out with low-pressure air. The filters that are made of foam can also be gently washed with a mild detergent. After washing the filters, dry the filters with low-pressure air.

If the carbon is still active, the carbon impregnated filters may be blown out with low-pressure air. Do not wash the carbon impregnated filters.

Standard filters or high efficiency filters may be blown out with low-pressure air. Do not wash the standard filters or the high efficiency filters.

Coil Cleaning

NOTICE

Do not use steam to clean the coils, under any circumstance. The heat from the steam will induce thermal stresses on the construction of the components of the coil. The stress can weaken the overall construction and permanently damaging the coil.

NOTICE

Do not use any other objects in order to straighten the fins, such as a screwdriver or a knife. These objects can damage the coil.

In order for an HVAC coil to function properly, air must be able to flow freely across the fins without any major obstructions. Because the coils need to stay clean, cleaning the coil is important in order for the coils to provide sufficient air flow. Some job applications may cause the coils to become dirty quickly, and dirty coils requires frequent cleaning. There are different methods that are utilized for proper cleaning. The different methods that are used depend on the type of coil that is used.

Condenser coils typically have a thicker, more durable fin structure that is designed to withstand the conditions of the environment. Due to the construction of the condenser coils, condenser coils can be washed with a low-pressure power washer. Power wash in order to remove any dirt from the coil and any debris from the coil. The coils should be cleaned from a safe distance. However, if the nozzle is too close to the coil the water still can damage the fins.

The evaporator and heater coils typically reside within an enclosed area. In order to protect the evaporator and the heater coils from the environment and outside dirt and debris. Therefore, the construction is not strong enough to withstand washing with direct pressure. In order to clean the coils, use a low-pressure air nozzle that is like the one that is used in cleaning the filter. Carefully use the low-pressure air nozzle in order to blow out any dirt and debris that is present on the coils.

During normal operation and routine cleaning, the fins may possibly get bent. The bent fins could cause blockages in the air flow, which will reduce overall system performance. Straighten the fins by using the 208 - 1350 Radiator Tool Gp. Start at one side of the coil and work toward the other side. Be careful not to rip or tear the fins during straightening, as this straightening will cause an unwanted reduction in performance.

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Glossary of Terms

SMCS Code: 7320

Accumulator – The accumulator is a component in the air conditioning system that separates liquid refrigerants from the circuit. The accumulator is used to store a small amount of liquid refrigerant. The accumulator may also contain a desiccant which will remove moisture from the system.

Ambient air – Outside air

Charge – The charge is a predetermined amount of refrigerant that is put into the air conditioning system. The charge is measured in units of weight.

Compressor – The compressor is a component in the system that increases the pressure of the refrigerant. The compressor increases the pressure of the refrigerant in the system by pumping.

Condenser – The condenser is a component in the system where the refrigerant changes from a vapor to a liquid.

Contaminants – Dirt, water, and air

Desiccant – The desiccant is used in the receiver-dryer and in the accumulator. The desiccant removes moisture from the air conditioning system.

Detecting – Detecting is finding the source of the problem in the system.

Diaphragm – The diaphragm is a rubber-like material. The diaphragm divides the upper chamber and the lower chamber in the thermostatic expansion valve.

Discharge – Discharge is the removal of some of the refrigerant or the removal of all the refrigerant from the air conditioning system.

Discharge side – The discharge side is the outlet from the compressor to the condenser coil.

Evacuating – Evacuating is the removal of air and moisture from the air conditioning system.

Evaporation – Evaporation is the process of changing a liquid to a vapor.

Evaporator – The evaporator is the component in the air conditioning system that changes the refrigerant from a liquid to a vapor. The evaporator transfers heat to the liquid refrigerant in order to convert the refrigerant into a vapor.

Expansion Valve – The expansion valve is a component in the air conditioning system that regulates the flow of liquid refrigerants into the evaporator.

Fluid – Fluid is a liquid or a gas.

Flush – Flushing is the removal of foreign material and oil from the air conditioning system. Flush the system with a fluid that is approved. The fluid must be approved by SAE and ISO standards.

Freeze – Freezing causes a liquid to become a solid.

Gas – A gas is a substance that contains small particles which float in the air. A gas does not contain liquid or solid particles.

Graduated Container – A graduated container is a glass container with markings on the side of the container. The markings are used in order to measure the amount of fluid in the container. The markings normally have units of ounces or units of milliliters.

Heat – Thermal energy

Identifier – The identifier is an instrument that is used for testing the system. The identifier is used for determining the type of refrigerant that is in the system. The identifier is also used for determining the percentage of air that is in the system.

In-line Dryer – The in-line dryer is a component in the air conditioning system that removes moisture from the system. The in-line dryer may have an air conditioner quick disconnect in the system. The in-line dryer may have an orifice tube in the system.

Latent heat of evaporation – The quantity of heat that is absorbed by a liquid as the liquid is changed from a liquid into a vapor at a constant temperature.

Leak detector – The leak detector is a device that is used to locate leaks in the air conditioning system.

Liquid line – The liquid line is the line that connects the condenser coil, the dryer receiver, and the expansion valve together in an expansion valve system. The liquid line is also the line that connects the condenser coil and the orifice tube together in an orifice tube system.

Magnetic clutch – The magnetic clutch is a device which is used as a coupling between the pulley and the compressor. The magnetic clutch turns the compressor on and off. An electric current activates the clutch.

Manifold gauge set – The manifold gauge set contains gauges and hoses that are used to measure the pressures in the air conditioning system.

Moisture – Moisture is water that is in the air or water that is in the refrigerant.

Moisture indicator – The moisture indicator is a device that uses color to indicate if the material in the dryer is fully soaked with moisture. The moisture indicator will display a pink color or a white color if the moisture indicator is soaked with moisture. The moisture indicator will display a blue color if the moisture indicator can absorb more moisture.

Orifice tube – The orifice tube has a body that is plastic with a metal tube device. The orifice tube is a metering control. The orifice tube is located between the high-pressure side and the low-pressure side in the orifice tube system.

Overcharge – A system is overcharged when an excessive amount of refrigerant is present in the air conditioning system.

Partial charge – A partial charge is less than a full charge of refrigerant. An air conditioning system has a partial charge when there is not enough refrigerant in the system.

Performance test – The performance test is the notation of temperatures and pressures under controlled conditions. The performance test is used in order to determine if the air conditioning system is operating normally.

Refrigerant quick-check procedure – The refrigerant quick-check procedure is a brief inspection of the system. No instruments are required in order to perform a refrigerant quick-check procedure.

Receiver-dryer – The receiver-dryer is the component in the air conditioning system that removes the contaminants (moisture) from the circuit. The receiver-dryer is also a storage area for a small amount of liquid refrigerant. The receiver-dryer may also have a pressure switch that deactivates the compressor if the pressure of the refrigerant is lower than approximately 175 kPa (25 psi).

Reclaim – The reclaiming and the restoring of the air conditioner refrigerant must meet the SAE specifications and the specifications for the ISO. The reclaiming of the air conditioner refrigerant requires processes that are available only at a remanufacturing facility.

Recover – Recovering is the removal of the air conditioner refrigerant from the air conditioner system. The refrigerant must be stored in an approved container. The refrigerant should not be tested or processed when the refrigerant is recovered from the system.

Recycle – The recycling of the refrigerant is completed at the site or at the service shop. The refrigerant can be cleaned by using oil separation. The refrigerant can be cleaned by passing the refrigerant through a filter dryer.

Refrigerant – The refrigerant is the fluid that is used in the air conditioning system. The refrigerant removes heat from the operator compartment.

Refrigerant oil – Refrigerant oil is the oil that is used in the air conditioning system. The refrigerant oil lubricates the compressor.

Sight glass – The sight glass is used to observe the flow of refrigerant in the air conditioning system. A sight glass may be located at the top of the receiver-dryer or in the line that is leaving the receiver-dryer. Most newer systems do not have a sight glass.

Stabilize – If the performance of the system is constant, the system is stabilized.

Stuck – Sticking will cause the prevention of free movement.

Subcooling – The additional cooling of the refrigerant in the bottom of the condenser after the refrigerant has changed from a vapor to a liquid.

Suction side – The suction side is the connection that is between the evaporator coil and the compressor.

Superheat – The additional heating of the refrigerant in the bottom of the evaporator after the refrigerant has changed from a liquid to a vapor.

Temperature of saturation – At the temperature of saturation, a liquid will change into a vapor and a vapor changes into a liquid. The temperature of saturation depends on the pressure of the fluid. The temperature of saturation increases when the pressure of fluid increases.

Thermal Expansion Valve (TXV) – Thermal Expansion Valve or TXV is a device in the AC system that maintains the pressure difference between the condenser and the evaporator. The Thermal Expansion Valve is used to obtain the best performance in the refrigeration system.

Vapor – Gas

Troubleshooting Section

Troubleshooting

i04078289

Required Tools

SMCS Code: 7309

Table 17

Required Tools	
Part Number	Part Description
Recovery, Recycling, and Recharging Systems	
285-7352	Refrigerant Service Unit (Recovery/Recycling/Recharging)(115 V / 60 Hz)
285-7353	Refrigerant Service Unit (Recovery/Recycling/Recharging)(220-240 V / 50 Hz)
208-1338	Refrigerant Service Unit (Recovery)
197-1915	Refrigerant Service Unit (230 V / 50/60 Hz)
208-1317	Refrigerant Filter-Dryer
Charging Scales and Manifold Gauges	
168-1959	Electronic Charging Scale (115 V / 60 Hz)
168-1961	Electronic Charging Scale (220-240 V / 50 Hz)
168-1958	Electronic Charging Scale (Battery)
208-1341	Manifold Gauge Set
Tanks and Hoses	
300-3526	Refrigerant Tank (22.7 kg (50 lb))
208-1352	Heater Blanket As
272-3090	Refrigerant Charging Hose
208-1332	Refrigerant Hose
208-1333	Refrigerant Hose
208-1339	Refrigerant Coupler (Low Pressure)
208-1340	Refrigerant Coupler (High Pressure)
Vacuum Pumps and Accessories	
208-1381	Vacuum Pump (1.2 CFM, 110 V / 60 Hz)
208-1356	Vacuum Pump (4 CFM, 110V / 60Hz)
208-1357	Vacuum Pump (4 CFM, 220-250 V / 50-60 Hz)
208-1353	Thermistor Gauge
1U-9763	Vacuum Pump Oil

(continued)

(Table 17, contd)

Required Tools	
Part Number	Part Description
Miscellaneous Air Conditioning Tools	
208-1378	Refrigerant Analyzer Tool Gp
262-4934	Refrigerant Identifier (110/220 V 60/50 Hz)
153-8537	Air Conditioner Flushing Unit (Cart)
153-8538	Refrigerant Flushing Solution
153-9033	Adapter Kit (Air Conditioner Flushing)
208-1374	Leak Detector Kit
9U-6494	Refrigerant Oil Injector
208-1375	Orifice Tool Gp
144-0235	Belt Tension Gauge
208-1350	Radiator Tool Gp
9U-5325	Thermometer
270-1540	O-ring Kit
Miscellaneous Tools	
233-8583	Eye Protection Goggles (Vented)
5P-7277	Voltage Tester
8T-0500	Continuity Tester
269-3123	Pen Light UV Leak Detection
146-4080	Digital Multimeter Gp
1U-8590	Spanner Wrench

Note: The schrader valves used in the high and low-pressure sides of the A/C system are located in 149-2491 Air Conditioner Fitting As which contains 3E-4051 Seal Cap and 3E-4057 Valve As for the low-pressure side. 236-9888 Air Conditioner Fitting As which contains 3E-4052 Seal Cap and 3E-4058 Valve As for the high-pressure side.

Note: Use of a portable flushing unit is permissible only if 153-8538 Refrigerant Flushing Solution is used and all procedures are followed per Testing and Adjusting, SENR5664, "Refrigerant System - Flush". The refrigerant flushing solution can ONLY be reused after being filtered.

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Machine Preparation for Troubleshooting

SMCS Code: 7000; 7320-035

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

Before any problem solving procedures are performed, read the manual for the heating and air conditioning system. Make a visual inspection of the complete air conditioning and heating system.

During any service of the Air conditioning System, all open connections are required to be capped or plugged with clean plastic part. Failure to cap open connections or failure to plug open connections will allow moisture into the system and lead to further damage.

When one is preparing to work on the air conditioning system, it is important to properly prepare the machine by performing a lockout/tagout procedure on the machine and on the air conditioning system. All charging and leak testing must be done in a well ventilated area.

Lockout/Tagout Procedure

1. When possible, park the machine on a smooth, level surface.
2. Set the parking brake.
3. Lower and lock all hydraulic implements.
4. Turn the key start switch to the OFF position and remove the key.
5. Turn the battery disconnect switch to the OFF position.

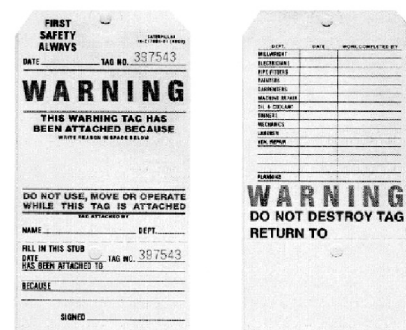


Illustration 81

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6. Tag the machine with a warning tag that is similar to the one that is shown in illustration 81 in order to ensure that no one else attempts to start the machine during service.
7. As it is necessary, continue to service the component.

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General Troubleshooting Information

SMCS Code: 7320-035

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

The following is a list of general concerns and comments regarding the function of the air conditioning and heating systems. Additional information can be found in the troubleshooting articles that are specific to troubleshooting each system.

- Low refrigerant charge will cause a loss of cooling ability and a loss of lubrication in the compressor, which will result in failure of the compressor.
- Overcharge of refrigerant will cause a loss of cooling ability. A system that is overcharged will contain excess liquid refrigerant, which will severely damage the compressor.
- The appearance of frost does not always indicate a failure. Refer to troubleshooting, SENR5664, "Air Conditioning System Troubleshooting" in order to diagnose a blockage in the air conditioning system properly.
- A small amount of moisture will penetrate the hoses that are used in R134a systems. Replace the dryer or replace the accumulator that is containing the desiccant according to recommendations in System Operations, SENR5664, "Service Intervals".
- The formation of black sludge deposits in the system is caused by the presence of moisture in R134a systems and by mixing charges of R134a and R12. The black sludge deposits can cause a blockage in the system.

A loss of cooling ability of the system and failure of the compressor may be caused by one or more of the following conditions.

- Low charge
- Overcharge
- Too much oil
- Too little oil
- Dirty filter or plugged filter
- Dirty condenser or plugged condenser
- Dirty evaporator or plugged evaporator
- Dirty orifice tube or plugged orifice tube
- Dirty expansion valve or plugged expansion valve
- Too much moisture in the system
- Missing drain valves for the evaporator

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Visual Inspection (Troubleshooting)

SMCS Code: 7320-035

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

A visual inspection is essential before conducting any performance tests or before conducting any service to the air conditioning system or to the heating system.

1. Inspect and clean the fresh air filter.
2. Inspect and clean the recirculation air filter.
3. Inspect the condenser and the evaporator.
 - a. Check for any type of restriction that will obstruct the air flow. Check for dirt, insects, plastic bags, etc.
 - b. For machines that are equipped with condensers that are mounted on the roof, always make sure that both fan motors are running. Check for restrictions.
4. Check for a loose belt on the compressor.
5. If there is a moisture indicator on either the receiver-dryer or the in-line dryer, check the indicator.
 - a. If the moisture indicator is blue, the system is normal.
 - b. If the indicator is pink or white, there is moisture in the system. Replace the receiver-dryer or the in-line dryer.

Note: Refer to Disassembly and Assembly, SEN5664, "Refrigerant Receiver-Dryer - Remove and Install" for instructions on replacing the receiver-dryer.

Note: Refer to Disassembly and Assembly, SEN5664, "In-Line Refrigerant Dryer - Remove and Install" for instructions on replacing the in-line dryer.

6. Inspect the condensate drain tube on the evaporator. The drain plug should not be obstructed.
7. Inspect refrigerant lines and hoses for damage from excessive heat or rubbing. Check for oily surfaces along hose and coupling connections. This can be an indication of a refrigerant leak. Refer to Testing and Adjusting, SEN5664, "Refrigerant Leakage - Test".

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Air Conditioning System Troubleshooting

SMCS Code: 7320-035-YC

Note: Before you conduct a performance check, refer to the Service Manual, SEN5664, "Visual Inspection" section.

Note: Refer to the Service Manual, SENR5664, "Machine Preparation for Troubleshooting" section before service work is performed on the air conditioning system.

Problem Solving

The following problem solving section is provided for identifying and correcting problems that may occur in the air conditioning system. Several problems can have the same system condition or similar system conditions. Before you start the procedure in order to correct the problems, it is necessary to be complete in the diagnosis of the problems.

The problem solving procedures are based on the system condition during the problem. In order to indicate the system pressures, the manifold gauge set must be installed. The manifold gauge set is used only in order to diagnose problems. The refrigerant lines can give an indication of system operation that is abnormal. Temperature differences between the high-pressure side and the low-pressure side can be an indication of abnormal operation in a line. This can also be found by cold spots (frost) on the line. In R134a air conditioning systems, the lines can have spots of frost and the system can be operating normally. Frost will most often form after the orifice and on the lower portion of the accumulator. The temperature of the air flow from the evaporator will also indicate a problem with the system. Knowing the complete system condition is an important step in making a correct diagnosis.

Note: R134a air conditioning system problem diagnosis requires a combination of symptoms or indicators in order to correctly identify problems and solve problems.

Problem Solving Procedure

1. Install the manifold gauge set. Refer to the Service Manual, SENR5664, "Manifold Gauge Set (Refrigerant) - Install" section in Testing and Adjusting.
2. Run the engine at 1000 rpm. Put the air conditioner temperature control knob in the Maximum COOL position. Put the fan switch in the HIGH position on the AIR CONDITIONING side. In order to stabilize the system, operate the engine for a minimum of 10 minutes.
3. Adjust the engine speed to approximately 1300 to 1400 rpm. Record the readings on the low-pressure gauges and the high-pressure gauges. The gauge readings will be a partial indication of the system condition.

4. Compare the discharge and suction pressures on the manifold gauge set to the Pressure Ranges that are in Table 18 in order to determine if the system is functioning correctly for the current ambient temperature. Use the table to determine if the system is operating normally. If the pressures according to the chart are high or the pressures according to the chart are low, refer to the system conditions that are listed in "Refrigerant Circuit Problems".

During normal operation of the air conditioning system in 21 °C (70 °F) weather, the discharge pressure will be 820 kPa (120 psi) to 1300 kPa (190 psi).

The pressure on the suction side will be 70 kPa (10 psi) to 130 kPa (20 psi).

The outside temperature and humidity will have an effect on the pressures. If the outside temperature is high, the discharge pressure will be high. In very hot weather, the suction and the discharge pressures will be high. In cooler weather, the suction and the discharge pressure will be normal or the pressure can be lower.

Note: All pressures are given as a guide only. Weight is the only absolute means of determining proper refrigerant charge. Improper refrigerant charge will cause premature failure of the compressor .

Table 18

Pressure Range ⁽¹⁾		
Ambient Air Temperature C° (F°)	High-pressure Test Fitting kPa (psi) ⁽²⁾	Low-pressure Test Fitting kPa (psi) ⁽³⁾
21°C (70°F)	820 to 1300 kPa (120 to 190 psi)	70 to 138 kPa (10 to 20 psi)
27°C (80°F)	950 to 1450 kPa (140 to 210 psi)	70 to 173 kPa (10 to 25 psi)
32°C (90°F)	1175 to 1650 kPa (170 to 240 psi)	105 to 210 kPa (15 to 30 psi)
38°C (100°F)	1300 to 1850 kPa (190 to 270 psi)	105 to 210 kPa (15 to 30 psi)
43°C (110°F)	1450 to 2075 kPa (210 to 300 psi)	105 to 210 kPa (15 to 30 psi)

(1) This table is only for reference.

(2) Pressure may be slightly higher in very humid conditions and lower in very dry conditions.

(3) Pressure before clutch disengagement

Indications from the Compressor Pressures

Use Table 19 in order to diagnose indications from the pressures.

Table 19

	High Discharge	High Suction	Low Discharge	Low Suction	Pressure's Sporadically Fluctuating
Too much refrigerant charge	X	X			
too much oil	X				
Restriction on air side of condenser	X				
Plugged orifice tube	X				
Restriction in high side of refrigerant circuit	X				
Condenser fans are not operating correctly	X				
System load high (high ambient, high humidity, doors open)	X				
Air in the refrigerant circuit	X				
Missing orifice tube		X			
Thermostat faulty or improperly adjusted		X			
Low refrigerant charge			X	X	
Belt slipping - check tension			X		
Clutch slipping			X		
Restriction on low side of refrigerant circuit			X		
Leak in the refrigerant circuit				X	
Moisture in the refrigerant circuit					X
Blockage in the refrigerant circuit					X
Air in the refrigerant circuit					X

Refrigerant Circuit Problems

There is no or only little cool temperature to the air flow from the evaporator.

System Condition 1

1. Low-pressure gauge reading is below normal.

For normal operating pressures, refer to Table 18.

2. High-pressure gauge reading is below normal.

For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. From the evaporator, the temperature of the air flow is partially cool.

Probable Cause

Leaks in the refrigerant circuit will cause the system to be low on refrigerant.

- Perform a leak test. refer to the Service Manual, SENR5664, "Refrigerant Leakage - Test" section in Testing and Adjusting.

- If leaks are found, recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- Repair leaks.
- If a large amount of refrigerant was lost, it is important to check the compressor for loss of oil.
- Perform a partial charge of the system.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Service Manual, SENR5664, "Air Conditioning Performance - Test"

System Condition 2

1. **Low-pressure gauge reading is normal.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading bounces or the reading is unsteady.**

Probable Cause

Air is in the system.

- Reclaim the refrigerant from the air conditioning system.
- Evacuate the air conditioning system.
- Recharge the air conditioning system.

System Condition 3

1. **Low-pressure gauge reading is below normal.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is above normal.** For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. The temperature of the air flow from the evaporator is warm.

Probable Cause

Air or moisture (water) in the system

- Recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- Replace the receiver-dryer or the in-line dryer. The desiccant may be full of moisture. This will release water into the system. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly. For in-line dryers, refer to the Service Manual, SENR5664, "In-Line Refrigerant Dryer - Remove and Install" section in Disassembly and Assembly.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Service Manual, SENR5664, "Air Conditioning Performance - Test"

System Condition 4

1. **Low-pressure gauge reading is below normal.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is normal to the below normal range.** For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. The temperature of the air flow from the evaporator is partially cool.
4. The high side liquid line or the receiver-dryer is frosted. The high side liquid line or the receiver-dryer is cool to the touch.

Probable Cause

Restriction in the high-pressure liquid line can cause the refrigerant to be removed from the evaporator at a faster rate. The restriction can cause the evaporator to be low on refrigerant from the receiver-dryer or from the in-line dryer. Clogged filters or a failure of the blower motor can cause possible restrictions to the air flow.

- Recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- If the restriction is found at the receiver-dryer, replace the receiver-dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly.
- If the restriction is found at the in-line dryer, replace the in-line dryer.
- If the restriction is found at the liquid line, replace the liquid line.
- Cap all the open lines and fittings.

Note: Restrictions of the refrigerant flow are identified by frost or cold spots in the line. Also, restrictions of the refrigerant flow are identified by frost or cold spots in the receiver-dryer or the in-line dryer.

- Replace filters or remove any of the restrictions.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.

- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Service Manual, SENR5664, "Air Conditioning Performance - Test"

System Condition 5

Note: The system only cools the cab in the morning and in the evening. The system does not cool the cab during the hot part of the day.

1. **Low-pressure gauge reading is normal, but the gauge reading may drop into the vacuum range during the testing procedure.** For normal operating pressures, refer to Table 18.
2. **The high-pressure gauge reading is normal, but the gauge reading is below normal when the low-pressure gauge drops into the vacuum range.** For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. Air flow from the evaporator is very cold, but the air flow will become warm when the low-pressure gauge drops into vacuum.

Probable Cause

The system has a large amount of moisture. The desiccant in the receiver-dryer or the in-line dryer is full of water. The water is released during high ambient temperatures. Ice collects in the orifice or the expansion valve and the ice can block the flow of refrigerant.

- Recover the refrigerant from the system. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
- Replace the receiver-dryer or the in-line dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly. For in-line dryers, refer to the Service Manual, SENR5664, "In-Line Refrigerant Dryer - Remove and Install" section in Disassembly and Assembly.
- Remove the moisture from the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

Note: Low-pressure (suction) drops into vacuum when ice forms in the expansion valve. High-pressure (discharge) drops when low-pressure drops into vacuum.

System Condition 6

1. The low-pressure gauge reading does not change. **The pressure should rise when the compressor is not in operation.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is at the high end of the normal range.**

Note: Ambient temperature is above 21°C (70°F).

3. The temperature of the air flow from the evaporator is partially cool.

Probable Cause

The system has air or moisture in the system. The system does not have a full charge of refrigerant.

- Perform a leak test and carefully test around the compressor seal. Refer to the Service Manual, SENR5664, "Refrigerant Leakage - Test" section in Testing and Adjusting.
- Recover the refrigerant from the system. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
- Repair leaks.
- Check the compressor for loss of oil.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

System Condition 7

1. **Low-pressure gauge reading is above normal.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is above normal.** For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. High-pressure (liquid line) is very hot.
4. The compressor may become noisy and the drive belt may slip.

Note: The compressor is not operating under ambient temperatures that are extreme. The compressor is not operating under high humidity that is extreme.

Probable Cause

The system is overcharged.

- Recover the remaining refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- Perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

Note: Perform the following procedure if the system has not been serviced for an extended period. Perform the following procedure if the pressures of the system are not within the correct specifications.

- Recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting. If service work has not been performed for an extended period, replace the receiver-dryer or the in-line dryer.
- Charge the system with the correct amount of refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

System Condition 8

1. **Low-pressure gauge reading is above normal.**
For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is below normal.**
For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F) and the system has a refrigerant charge that is full.

3. The temperature of the air flow from the evaporator is partially cool.

Probable Cause

The compressor has internal leaks. The reed valve has leakage. The compressor piston, rings, or cylinders are worn.

- Check the compressor drive belt for the correct tension.
- Perform a leak test. Isolate the problem to the compressor. Refer to the Service Manual, SENR5664, "Refrigerant Leakage - Test" section in Testing and Adjusting.

If an internal leak is found, perform the following procedure.

- Replace the compressor. Refer to the Service Manual, SENR5664, "refrigerant Compressor - remove and Install" section in Disassembly and Assembly.
- Replace the receiver-dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Testing and Adjusting.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

If an external leak such as a hose connection is found, perform the following procedure.

- Recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
- Repair leaks.

If a large amount of refrigerant is lost, check the compressor for the loss of oil.

- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.

- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

System Condition 9

- 1. Low-pressure gauge reading is above normal.**
For normal operating pressures, refer to Table 18.
- 2. High-pressure gauge reading is normal or low.**
For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F) and the system has a refrigerant charge that is full.

3. The temperature of the air flow from the evaporator is warm.
4. The suction hose and the evaporator are covered with moisture (sweating).

Probable Cause

Flow of refrigerant through the evaporator coil is excessive. The expansion valve could be stuck or held in the OPEN position.

1. Test the expansion valve for the correct operation. Use the following procedure.
 - Position the air conditioner temperature control knob in the maximum COOL position and the fan switch in the HIGH position.
 - Cool the head of the expansion valve diaphragm chamber and the capillary tube with ice or liquid nitrogen. Record the low-pressure gauge reading. The low-pressure gauge should indicate a vacuum.
 - If the low-pressure gauge indicates a vacuum, place a hand over the expansion valve diaphragm chamber. The hand will warm the expansion valve diaphragm chamber. In order to ensure the correct operation of the expansion valve, cool the head of the expansion valve diaphragm chamber and the capillary tube with ice or liquid nitrogen again. If the operation of the expansion is correct, refer to Step 2.
 - If the low-pressure gauge does not indicate the proper operation of the expansion valve, recover the refrigerant from the system. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.

- Replace the expansion valve. Refer to the Service Manual, SENR5664, "Expansion Valve - (Air Conditioner) Remove and Install" section in Disassembly and Assembly.

Note: The sensing bulb must be installed correctly in order to ensure the proper operation of the expansion valve.

- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
 - Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
 - After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".
2. If the pressure gauge indicates the correct operation of the expansion valve, perform the following procedure.
 - Use a 8P-6355 Clip in order to hold the sensing bulb onto the evaporator outlet pipe. The sensing bulb should be as close to the evaporator as possible. The bulb should be upstream of the pressure sensing connection on the evaporator outlet pipe. The following items must be wound tightly with 5P-7070 Strip Insulation: the clip, the sensing bulb, and the outlet pipe. There should be no insulation between the bulb and the outlet pipe.
 - In order to ensure that the system operates correctly, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

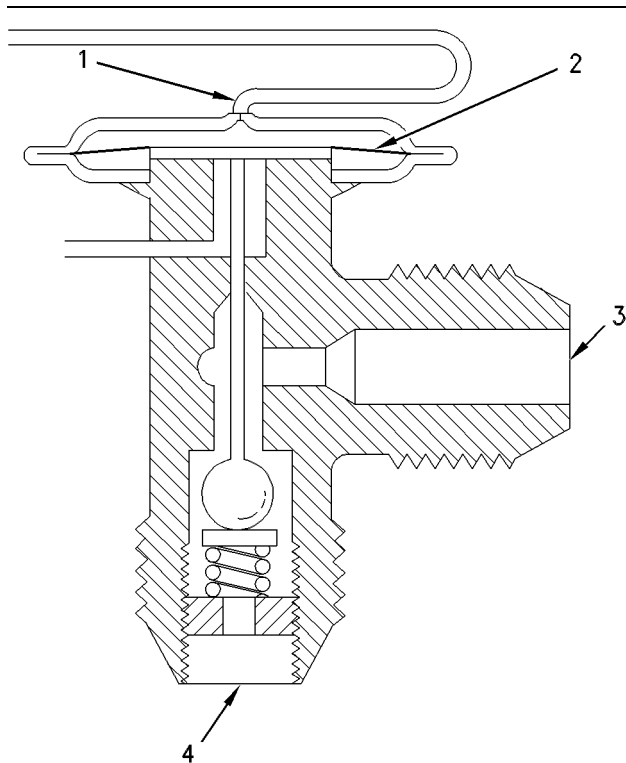


Illustration 82 g00409166

Expansion valve in the open position (Typical Example)

- (1) Capillary tube
- (2) Expansion valve diaphragm chamber
- (3) Inlet
- (4) Outlet

System Condition 10

1. Low-pressure gauge reading is too low. For normal operating pressures, refer to Table 18.

2. High-pressure gauge reading is too low. For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

- 3.** The temperature of the air flow from the evaporator is partially cool or warm.
- 4.** Moisture (water) or frost is on the expansion valve inlet or orifice tube assembly.

Probable Cause

The problems that are described in Step 1 through Step 4 can be caused by the following faults:

Note: The following faults will cause a restriction of the flow of refrigerant to the evaporator.

- Improper operation of the expansion valve (stuck valve)
- Blockage at the evaporator inlet

- No charge in temperature sensing bulb

Note: The inlet to the expansion valve will be warm during normal operation.

- 1.** If the expansion valve inlet is cool to the touch, perform the following procedure:
 - Position the air conditioner temperature control knob to the maximum COOL position and the fan switch to the HIGH position.
 - Cool the head of the expansion valve diaphragm chamber and capillary tube with ice or liquid nitrogen. Record the low-pressure gauge reading. The low-pressure gauge should indicate a vacuum.
 - If a vacuum is indicated on the low-pressure gauge, place a hand over the expansion valve diaphragm chamber. The hand will warm the expansion valve diaphragm chamber. In order to ensure the correct operation of the expansion valve, cool the head of the expansion valve diaphragm chamber and the capillary tube with ice or liquid nitrogen again. If the operation of expansion valve is correct, refer to Step 2.
 - If the low-pressure gauge does not indicate proper operation of the expansion valve, remove the refrigerant from the system. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
 - Replace the expansion valve. Refer to the Service Manual, SENR5664, "Expansion Valve - (Air Conditioner) Remove and Install" section in Disassembly and Assembly.

Note: The sensing bulb must be installed correctly in order to ensure the correct operation of the expansion valve. Clean the location for the sensing bulb with steel wool or emery paper. Use a 8P - 6355 Clip in order to attach the sensing bulb securely to the evaporator coil outlet pipe. Completely cover the assembly with 5P - 7070 Strip Insulation.

- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

2. If the low-pressure gauge indicates the correct operation of the expansion valve, perform the following procedure:
 - The sensing bulb must be in the correct position on the evaporator outlet pipe and the sensing bulb must be the correct distance away from the evaporator outlet. The bulb should be upstream from the pressure sensing connection in the evaporator outlet pipe. The insulation must be around the sensing bulb and the clip on the evaporator outlet pipe.
 - In order to ensure the correct systems operation, perform a performance check. Service Manual, SENR5664, "Air Conditioning Performance - Test"
3. Replace the in-line dryer or replace the orifice tube.
 - Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
 - Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
 - After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

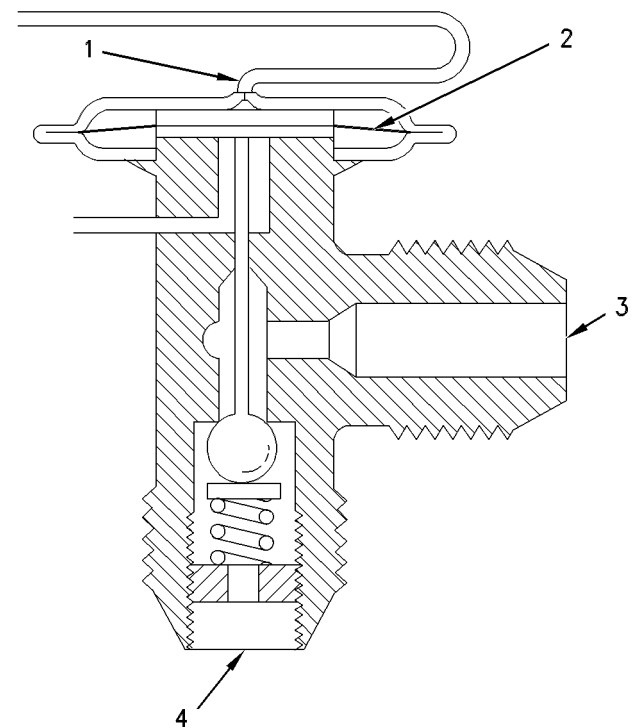


Illustration 83

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Expansion valve in the closed position (Typical Example)

- (1) Capillary tube
- (2) Expansion valve diaphragm chamber
- (3) Inlet
- (4) Outlet

Note: For expansion valve systems, refer to Step 1. For orifice tube systems, refer to Step 3.

System Condition 11

1. **Low-pressure gauge reading is too high.** For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is too high.** For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. The temperature of the air flow from the evaporator is warm.

Probable Cause

The condenser is not functioning properly.

Note: The system may have a normal or overcharge of refrigerant.

1. Check for a blockage in the flow of air through the condenser.

2. If a blockage is found in the condenser, remove all blockages and perform a performance check. The performance check will ensure proper system operation. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".
3. If the problem still exists, perform the following procedure. Check the system for an overcharge of refrigerant.

Note: Do not operate the engine.

- Recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
- Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
- Recharge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.

Note: With the ambient temperature above 21°C (70°F), the normal gauge reading for the low-pressure side is 70 to 138 kPa (10 to 20 psi) while the normal gauge reading for the high-pressure side is 820 to 1300 kPa (120 to 190 psi).

- In order to ensure the correct systems operation, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".
4. If the low-pressure gauge reading and the high-pressure gauge readings are too high, perform the following procedure:
 - Recover the refrigerant from the system. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
 - Replace the receiver-dryer or replace the in-line dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly. For in-line dryers, refer to the Service Manual, SENR5664, "In-Line Refrigerant Dryer - Remove and Install" section in Disassembly and Assembly.
 - If the receiver-dryer or the in-line dryer is not equipped with quick couplers, evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.

- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
- After the system is charged and operated for a minimum of 10 minutes, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

System Condition 12

- **Water is in the vents.**
- **Water is leaking from the unit.**

Probable Cause

- The non-return valve of the drain
1. Check the non-return valve for proper positioning and proper direction.

The Compressor will not Engage

If the machine is equipped with the protection system for the refrigerant compressor, Refer to the Service Manual, SENR 5664, "Troubleshooting Heating and Air Conditioning Control Systems" in order to test the on delay timer assembly for the refrigerant compressor.

System Condition 13

1. **Low-pressure gauge reading is above normal.**
For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is below normal.**
For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. Air flow to the operator's compartment is warm.

Probable Cause

1. The thermostatic switch is stuck open. This does not allow the magnetic clutch to cycle the compressor.
 - a. Check the wire connectors on the thermostatic switch and on the magnetic clutch.
2. The connection of wire leads on switch is improper. The connection of wire leads on the magnetic clutch is improper.
 - a. Check for insulation that is broken. The insulation failure can expose the wires from the switch to the magnetic clutch.

3. The wire that connects the switch to the magnetic clutch has an opening.
 - a. Check the resistance of the coil with a multimeter. Refer to the Service Manual, SENR5664, "Refrigerant Compressor" section in Specifications.
 - b. Check for the proper electrical ground at the magnetic clutch.
 - c. Touch the two wires on the switch together. Check for the proper operation of the magnetic clutch.
 - d. In order to check the electrical components, refer to Service Manual, SENR5664, "Troubleshooting Heating and Air Conditioning Control System" in Testing and Adjusting.

If the problem is a loose wire on the switch or a loose wire on the magnetic clutch, make the repairs that are needed. If the wires to the clutch were damaged, the damaged wires can cause the switch to remain open. Make the needed repairs to the damaged wires. In order to ensure the correct system operation, perform a performance check. Service Manual, SENR5664, "Air Conditioning Performance - Test"

4. The charge of refrigerant in the capillary tube has been lost.
 - a. If the capillary tube has no charge or the switch remains open, the problem is in the thermostatic switch.
 - Replace the switch.
 - In order to ensure the correct system operation, perform a performance check. Refer to Service Manual, SENR5664, "Air Conditioning Performance - Test".

The Compressor Continues to Cycle or the Clutch will not Disengage.

Note: The cause of the problem may be one of the following conditions: low charge, overcharge, and evaporator freeze-up .

System Condition 14

1. **Low-pressure gauge reading is below normal.**
For normal operating pressures, refer to Table 18.
2. **High-pressure gauge reading is below normal.**
For normal operating pressures, refer to Table 18.

Note: Ambient temperature is above 21°C (70°F).

3. The air flow to the operator's compartment is very cold, or the air flow may be restricted completely at times.

Probable Cause

The thermostat switch is held closed. There is a short in the wire to the magnetic clutch. The magnetic clutch will not release.

- Check the wire that goes to the magnetic clutch. The wire may have an electrical short.
- Replace the thermostat switch.
- Make the necessary repairs to the magnetic clutch.

Additional Refrigerant Circuit Problems for Orifice Tube System

System Condition 15

The compressor clutch is engaged but the system has insufficient cooling.

Probable Cause

- The system is improperly charged.
 - A compressor drive belt that is loose or a compressor drive belt that is worn can cause insufficient cooling.
 - Restrictions, insects, foreign material in the condenser, or any restriction of air flow can cause insufficient cooling.
 - A missing or a plugged orifice tube can cause insufficient cooling.
 - A restriction in a liquid line or a low amount of refrigerant charge can cause insufficient cooling.
1. Install the manifold gauge set. Refer to the Service manual, SENR5664, "Manifold Gauge Set (Refrigerant) - Install" section.
 2. Start the engine. Operate the engine at 1400 rpm. Move the temperature control knob to the Maximum position and the fan to the High position. Close all windows and doors. In order to stabilize the system, operate the system for a minimum of 10 minutes.

Note: Ambient temperature is above 21°C (70°F).

3. The outlet on the accumulator should be cold to the touch. If the outlet is not cold, check the readings on the manifold gauges.

- If the low side reading is above 345 kPa (50 psi), check for a missing orifice tube. Refer to Service Manual, SENR5664, "Orifice Tube (Air Conditioner) - Remove and Install" in Disassembly and Assembly.
 - If the low side reading is into vacuum, check for a plugged orifice tube or a restriction in the line.
 - A restriction in the liquid line can be detected by running a hand along the line until there is a change in temperature. A change in temperature in the line will usually indicate the location of the restriction.
4. If the inlet and the outlet on the accumulator are warm, refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting. Also, refer to the Service Manual, SENR5664, "Refrigerant Leakage-Test" section in Testing and Adjusting.

False Seizure of the Compressor

Table 20

Required Tools	
Part Number	Part Description
1U-8590	Spanner Wrench

On the initial start-up of the air conditioner system, slipping drive belts and broken drive belts may be experienced if the air conditioner system has not been used for an extended period. Also, scored clutch surfaces may be experienced. This would indicate a seized compressor. However, replacement of the compressor may not be necessary.

Changes in temperature can cause expansion of the refrigerant in the compressor during extended periods of nonuse. Also, changes in temperature can cause contraction of the refrigerant in the compressor during extended periods of nonuse. During this movement, lubricating oil that is carried by the refrigerant migrates. The lubricating oil moves away from highly polished surfaces in the compressor. Without lubricating oil at the polished surfaces, the polished surfaces rub together. This can appear as a seized compressor.

The compressor should be checked for seizure before the compressor is replaced. Use the procedures that follow in order to check the compressor for seizure.

1. With a spanner wrench on the clutch drive plate, rock the shaft in the opposite direction of normal rotation.
2. After the clutch drive plate is movable, rotate the clutch drive plate at least three complete revolutions in the counterclockwise direction.

3. Start the engine. Operate the compressor for a minimum of one minute.

This procedure will not correct a seized compressor. However, this procedure should be attempted before you replace a compressor that has been idle for a month or longer.

Red Dot Automatic Temperature Control (ATC) - Fault Codes: (only for 584 Forwarders and 584HD Forwarders)



Illustration 84

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To display fault codes, depress the ON key three times in rapid succession. The digital display will then display any active fault codes. Pressing the ON key again repeatedly will scroll through any existing error codes. After five seconds without further key presses, the system will exit the diagnostics mode and return to normal operation.

No Faults – E0

Cab Sensor Shorted – E1

Cab Sensor Open – E2

Evaporator Probe Shorted – E3

Evaporator Probe Open – E4

Duct Sensor Shorted – E5

Duct Sensor Open – E6

Pressure Transducer Open – E151

Pressure Transducer Shorted – E12

Water Valve Actuator Error – E13

Electronics or Comm. Error – E17

Clutch Open – E18

Clutch Shorted – E19*

No Refrigerant – E20*

High-pressure – E22*

Low Voltage Error – E23*

* Future implementation

Advanced Diagnostics:

The Red Dot ATC Advanced Diagnostics control panel allows the technician to see real-time system information on the control panel display. Control panel display will assist in A/C-heater servicing. This real-time information can help the service technician diagnose certain system problems.

To display advanced diagnostics, depress ON key three times in rapid succession (fault codes displayed) then immediately press and hold ON key for five seconds. The text "CAB" will be displayed. After a few seconds, the real-time value of the cab temperature measured by the ATC is displayed. This value, as well as any other value displayed by the control panel, will continuously update. Pressing the ON key again repeatedly will scroll through all of the available diagnostics information

CAB – Cab Air Temperature (°C or °F)

EVAP – Evaporator Core Temperature (°C or °F)

DUCT – Duct Air Temperature (°C or °F)

HEAT – Water Valve Command (% of valve open)

A-C – A-C Clutch Request (on / off)

FAN – Blower Fan Speed (% of maximum fan speed)

DEF – Defrost Mode Active (On/Off)

HI-P – High Side Pressure (psig or bar)

PRHT – Blower Enable Active (On/Off)

VOLT – System Voltage (DC Volts)

Note: The system can be operated normally while in advanced diagnostics mode, including changing the temperature set point or changing the blower fan speed, to evaluate the response of the system.

Firmware Version Mode

The firmware version of the control panel and Electronic Control Unit (ECU) can be displayed. From the advanced diagnostics mode, press and hold the ON key for five seconds. The text CTRL will be displayed and after a few seconds, the control panel firmware version number will be displayed. Pressing the ON key will toggle to the ECU firmware version.

The following firmware version information is available:

CTRL – Control Panel Version

ECU – ECU Version

Exiting the Diagnostic Mode:

To exit the advanced diagnostic mode or firmware Version mode, turn the system OFF by pressing the OFF key.

Additional Troubleshooting:

No Display

- Turn on control panel with the ON key.
- Check to see if the display illuminates.
- Verify that the control panel is plugged into the wire harness.
- Check to see if wire harness is wired into vehicle properly.

No Fan

- Turn up fan with the fan UP key.
- Make sure that the fan is plugged into wire harness, verify all wiring connections.
- Verify that the circuit breakers or fuses are intact.
- If all other functions work properly, replace ECU.

No Heat

- Turn up heat with the Temperature UP key. Use the advanced diagnostics to verify that the water valve is commanded open.
- Inspect and verify all wiring connections.
- Verify that any coolant shut off valves on the engine are open.
- Verify that warm coolant is flowing into the heater core by testing the heater hoses.

- Inspect and replace the electronic water valve if necessary.
- Inspect and replace ECU if necessary.

No Cooling

- Turn down heat with the Temperature DOWN key and enable the defrost mode. Use the advanced diagnostics to verify that the A/C clutch is requested ON.
- Verify that the system is fully charged with refrigerant.
- Verify that voltage is present at the compressor clutch.
- Verify that the correct voltage is present at the clutch relay on the wire harness.
- Inspect and verify all wiring connections.
- Inspect and replace clutch relay if necessary.
- Inspect and replace refrigerant high-pressure and/or low-pressure cut out switches if necessary.
- Inspect compressor and clutch assembly and replace clutch if necessary.

The system is not controlling the cab temperature properly

- Inspect the cab air temperature sensor.
- Verify that the recirculation vent inlet is not obstructed. Inspect and replace recirculation vent air filter if necessary.
- Inspect and replace recirculation vent air filter, if necessary.
- Change the setpoint temperature in small increments.
- Verify that the water valve is working properly. Refer "No Heat"(see No Heat).
- Verify that the compressor clutch is working properly. Refer "No Cooling".

The evaporator core is icing up and restricting airflow

- Inspect the evaporator core probe.
- Verify that the probe is making good contact with the evaporator fins and is not loosely inserted.
- Reposition the probe and check the core temperature during operation using the advanced diagnostics.

- Replace the evaporator core if necessary.

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Heating System Troubleshooting

SMCS Code: 7304-035; 7309-035-YC

The following problem solving section is provided for identifying and correcting problems that may occur in the heating system. Several problems can have the same system condition (symptom) or similar system conditions. Before you start the procedure in order to correct the problems, evaluate the performance using the Testing and Adjusting, SENR 5664, "Heater Performance –Test". It is necessary to be complete in the diagnosis of the problem. Repair the components or replace any damaged component if the components are faulty during the inspection.

Symptom: There is little or no warm air that is flowing to the cab when the heater control knob is set to the position of maximum heat.

Possible Cause 1

The blower motor is not working.

1. Inspect the circuit breaker or the fuse panel in order to ensure that there is no open circuit.
2. Visually inspect the wire harnesses in order to check for any broken wires or missing connectors. Use the electrical schematic for the respective machine to ensure proper connections.
3. Check the fan blade in order to make sure that the fan blade is not blocked or seized.
4. Check for the proper function of the fan switch at each setting. The blower motor should engage at all settings and temperatures.

Possible Cause 2

There is a leak that is present in the system.

1. Check the hose clamps in order to make sure that the hose clamps are present and that the hose clamps are also tightened to the correct torque value that is shown on the drawing.
2. Check the heater coil for any visible cracks or signs of a leak.
3. Check the water valve in order to make sure that the water valve is properly installed and operational.

Possible Cause 3

The inlet/outlet ports for the engine cooling system are closed.

1. Inspect the valves that connect the heater hoses to the engine block.
2. Make sure that the valves are adjusted so that the valves are fully open.

Possible Cause 4

The hose that is connecting the system together is kinked or blocked.

1. Check for blockage or bends in the hoses. Blockages and bends in the heater hoses restrict the flow of coolant and the blockages reduce the performance of the entire heating system.
2. Replace any hoses that appear to be restricting the flow of coolant.

Possible Cause 5

There is a failure with the device for the heater control.

1. Determine the type of controlling device that is used on the machine.
2. If there is a water valve that is present, continue to Step 3. If there is a blend door that is present, continue to Step 6.
3. Inspect the water valve for any signs of damage.
4. Check the water valve in order to make sure that the water valve opens completely when the temperature control knob is set to the position of maximum heat.
5. If the water valve fails to open or the water valve fails to close, move to "Possible Cause 6".
6. Inspect the blend door.
7. Check the blend door for any damage.
8. Make sure that the insulation is still attached to the blend door.
9. Make sure that the actuator is connected to the blend door.
10. Check the blend door in order to make sure that the blend door opens completely when the temperature control knob is set to the position of maximum heat.

Possible Cause 6

There is a failure with the cable for the water valve or the potentiometer.

1. Determine the type of control for the water valve that is being used on the machine.
2. If there is a cable that is attached to the water valve, continue to Step 3. If the machine has a built-in potentiometer, continue to Step 5.
3. Check the machine in order to make sure that the cable is attached to the water valve handle.
4. Check the water valve in order to make sure that the water valve opens completely when the temperature control knob is moved to the position of maximum heat.
5. Check the machine in order to make sure that the potentiometer is attached to the wire harness within the dash of the cab.
6. Check the water valve in order to make sure that the water valve opens completely when the temperature control knob is moved to the position of maximum heat.

Symptom: The heat that is within the cab is uncontrollable.

Possible Cause 1

The water valve is installed incorrectly or backward.

1. If the machine is equipped with a water valve control, check the water valve in order to make sure that the water valve is installed properly.
2. Some water valves are manufactured so that there is an arrow that shows the flow direction on the side of the valve body. Make sure that the arrow is pointed toward the line that leads to the heater coil.
3. If the machine is equipped with a cable driven water valve, make sure that the cable is not wrapped around the water valve, or that the cable is not wrapped around the frame of the machine.
4. If the machine is equipped with an electronically driven water valve, make sure that the actuator is attached securely to the water valve.

Possible Cause 2

There is an electrical failure with the control panel.

1. Inspect the control panel in order to make sure that the control panel is receiving power when the machine is turned on.
2. Check in order to make sure that the wire harness is connected to the control panel.
3. Inspect the wire harness for any breakage or exposed wires.
4. Inspect the circuit breaker or the fuses in order to ensure that there is not an open circuit.

Possible Cause 3

There is a failure with the cable for the water valve or the potentiometer.

1. Determine the type of water valve control that is present on the machine.
2. If there is a cable that is attached to the water valve, continue to Step 3. If the machine has a built-in potentiometer, continue to Step 5.
3. Check in order to make sure that the cable is attached to the water valve handle.
4. Check in order to make sure that the water valve opens completely when the temperature control knob is moved to the position of maximum heat.
5. Check in order to make sure that the potentiometer is attached to the wire harness within the dash of the cab.
6. Check in order to make sure that the water valve opens completely when the temperature control knob is moved to the position of maximum heat.

Symptom: There is a coolant smell that is present within the cab.

Possible Cause 1

There is a leak that is present at the hose or the hose clamps.

1. Inspect the connections between the heater coil and the heater hoses.
2. Check the hoses for cuts.
3. Check in order to make sure that the hose clamps are tightened to the proper torques that are shown on the dimension drawings.

Possible Cause 2

There is a leak that is present at the heater coil.

1. Inspect the heater coil in order to determine if there are any visible cracks or holes in the tubing.
2. Check in order to make sure that the hose clamps are tightened to the proper torques.

Possible Cause 3

There is a leak that is present at the water valve.

1. Inspect the water valve for any damage.
2. Check in order to make sure that the hose clamps are tightened to the proper torques.
3. If the water valve passes both these initial tests, refer to the Troubleshooting, SENR5664, "Troubleshooting Heating & Air Conditioning Control System".

Symptom: There is no flow of air to the operators compartment. The evaporator blower motors do not operate when the fan switch is activated.

Probable Cause 1

There is an open circuit.

1. Inspect the circuit breaker or inspect the fuses for an open circuit.
2. Perform a visual inspection of all wire connections. Use the electrical schematic for the respective machine.
3. Use a 5P - 7277 Voltage Tester or use a 9U - 7330 Digital Multimeter in order to check the voltage in all components of the electrical system. Refer to the electrical schematic section for additional information for the machine.
4. Check for the proper function of the fan switch at each setting. The evaporator blower motor must run at each setting. The evaporator blower motor should be operating in the cold mode and in the heating mode.

Probable Cause 2

There is a blockage in the fan blades.

1. Check for blockages at the fan blades.

Probable Cause 3

The motor has failed.

1. Make necessary repairs or replace motors and components.
2. After a new motor or blower wheel is installed, inspect operation for the correct rotation.

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Troubleshooting Heating and Air Conditioning Control System

SMCS Code: 7309-035-YC

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Heating System

In order to conduct a performance check of the heating system, perform the following procedure.

1. Run the engine at 1000 rpm.
2. Adjust the temperature control knob to the setting for maximum heating.
3. Put the fan switch in the HIGH position on heat.
4. When the engine coolant temperature is in the normal operating range, the temperature of the air that is flowing from the louvers (air ducts) should be warm.

If the temperature of the air that is flowing is not warm within 10 minutes of operation, refer to "Problem 2" section.

Problem 1

There is little warm air flow or no warm air flow when the heater control knob is set for maximum heating.

1. Perform the following procedure:
 - a. Check the engine coolant temperature. The temperature of the coolant must be at normal operating range.
 - b. The heater control valve must be functioning properly. Check for the correct linkage adjustment from the temperature control lever to the heater control valve. The heater control valve must open completely when the temperature control knob is set for maximum heating.
 - c. Check for blockage and check for bends in the heater hoses. Blockages and bends in the heater hoses would stop the flow of coolant through the system.
 - d. Inspect the petcocks that connect the heater hoses to the engine block. Make sure that the petcocks are adjusted so that the petcocks are fully open.
2. Make repairs to the components or replace any damaged component.

Electrical System

Problem 2

The operator compartment has no flow. The evaporator blower motors do not operate when the fan switch is activated.

1. Perform the following procedure:
 - a. Inspect the circuit breaker or inspect the fuses for an open circuit.
 - b. Perform a visual inspection of all wire connections. Use the electrical schematic for the respective machine.
 - c. Check for blockages at the fan blade.
 - d. Check for the proper function of the fan switch at each setting. The evaporator blower motor will run at each setting. The evaporator blower motor should be operating in the cold mode and in the heating mode.
 - e. Use a 5P-7277 Voltage Tester or use a 9U-7330 Multimeter in order to check the voltages in all components of the electrical system. Refer to the electrical schematic section for additional information for the machine.
2. If necessary, make repairs or replace the components.

Test Procedure for Testing Electrical Components in the Air Conditioning System

The air conditioning systems on Caterpillar machines use pressure switches in order to protect the air conditioning system. Some air conditioning systems on Caterpillar machines use pressure switches and on delay timer assembly for the refrigerant compressor in order to protect the air conditioning system. Arc suppressors protect other electrical components in the air conditioning system. Arc suppressors are applied in order to discharge electrical inductance when the compressor disengages. Failure of the arc suppressor can affect the reliability of the pressure switch. Failure of the arc suppressor may cause failure of the pressure switch.

The following procedures are for the testing of the on delay timer assembly, pressure switches, and components of the arc suppressor.

Table 21

Required Tools	
Part Number	Part Description
146-4080	Digital Multimeter (RS-232)

On Delay Timer Assembly for the Refrigerant Compressor Tests

In order to diagnose a faulty on delay timer assembly for the refrigerant compressor, the engine start switch must be in the ON position and the air conditioning switch activated.

Note: The on delay timer assembly will delay the power supply to the compressor clutch coil for 30 seconds after the air conditioning switch is activated.

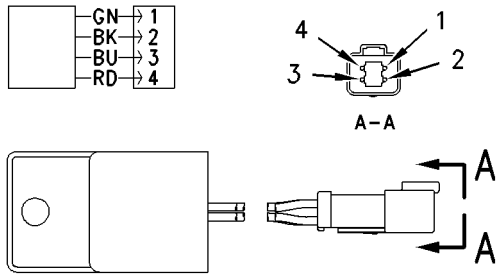


Illustration 85

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- (1) Output (signal voltage)
- (2) Chassis ground
- (3) Compressor clutch
- (4) Power supply

1. Separate the four pin connectors from the wiring harness.
2. Set the 146-4080 Digital Multimeter to DC voltage. Connect the positive probe to pin (4) on the wiring harness and connect the negative probe to a suitable ground. The multimeter should read 12 V for a 12volt system or the multimeter should read 24 V for a 24 V system.

Note: If the voltage is below 9 V or the voltage is above 24 V for a 12 V system, the on delay timer assembly will not supply power to the compressor.

Note: If the voltage is below 18 V or the voltage is above 32 V for a 24 V system, the on delay timer assembly will not supply power to the compressor.

3. Set the 146-4080 Digital Multimeter to OHMS. Connect the positive probe to pin location (2) on the wiring harness and connect the negative probe to a suitable chassis ground. The multimeter will display OL if the ground is not present.

4. Set the 146-4080 Digital Multimeter OHMS. Connect the positive probe to pin location (1) on the wiring harness and connect the negative probe to a suitable chassis ground. If the multimeter displays OL one of the three switches are open. Check each of the switches if an open condition occurs.

Note: There must be refrigerant in the air conditioning system in order to close both of the pressure switches.

5. In order to check the power is getting from the on delay timer assembly to the compressor clutch coil, reconnect the on delay timer assembly to the wiring harness. Set the 146-4080 Digital Multimeter to DC voltage. Remove the 2-pin connector from the compressor clutch coil. Connect the negative probe to a suitable chassis ground. Check each one of the two pins on the wiring harness for voltage. One of the two pins should supply 12 V for a 12 V system or 24 V for a 24 V system.
6. In order to check the ground path from the compressor clutch coil to the chassis, turn off the air conditioning switch in the cab. Set the 146-4080 Digital Multimeter OHMS. Remove the 2-pin connector from the compressor clutch coil. Connect the negative lead to a suitable ground. Check each of the two pins on the two pin connectors for continuity. One of the two pins should display OL.
7. If both the correct voltage and ground are present check the resistance of the compressor clutch coil. Refer to the Service Manual, SENR 5664, "Refrigerant Compressor" section in Specifications.

Pressure Switch Tests

Test Procedure for 114-5333 Pressure Switch and 114-5334 Pressure Switch (NORMALLY OPEN)

Pressure switches are used in order to protect the a/c compressor. The two most commonly used pressure switches are the 114-5333 Pressure Switch and the 114-5334 Pressure Switch. The only difference between the two switches is the connector. Only one of these switches is used per machine. The high pressure and low-pressure switches have three possible switch positions which are given below:

OPEN – System pressure is low.

CLOSED – System pressure is correct.

OPEN – System pressure is high.

The two OPEN positions of the pressure switch protect the air conditioning system. The OPEN position prevents the compressor from actuating when potentially harmful pressures exist in the system. The CLOSED position is the normal operating switch position. The following table contains the logic for the pressure switches:

Table 22

Pressure	Range	Contact Position (Pressure Rise)	Contact Position (Falling Pressure)
High Position 3	Above 2800 kPa (406 psi)	OPEN	OPEN
Hysteresis Band ⁽¹⁾	1750 kPa (254 psi) to 2800 kPa (406 psi)	CLOSED	OPEN
Middle (Position 2)	275 kPa (40 psi) to 1750 kPa (254 psi)	CLOSED	CLOSED
Hysteresis Band ⁽¹⁾	170 kPa (25.0 psi) to 275 kPa (40 psi)	OPEN	CLOSED
Low Position 1	0 kPa (0 psi) to 170 kPa (25.0 psi)	OPEN	OPEN

⁽¹⁾ Pressure must pass through the hysteresis band in order to provide the correct conditions for the switch contact.



Illustration 86

g00651406

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146-4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.

4. If the system pressure is between 275 kPa (40 psi) and 1750 kPa (254 psi), the multimeter will display a value that is less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is within acceptable limits, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

8T-8639 Low Pressure Switch (NORMALLY OPEN)

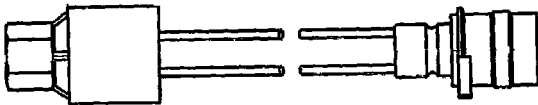


Illustration 87

g00651418

Table 23

Specifications for Pressure Switch	
Actuation Pressure ⁽²⁾	344 ± 34 kPa (50 ± 5 psi)
Deactuation Pressure ⁽³⁾	172 ± 21 kPa (25 ± 3 psi)

⁽²⁾ Close when pressure increases.

⁽³⁾ Open when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146-4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.

3. Measure the resistance of the pressure switch.
4. If the system pressure is above 344 ± 34 kPa (50 ± 5 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance) and the system pressure is not below the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

149-6371 Low Pressure Switch (NORMALLY OPEN)

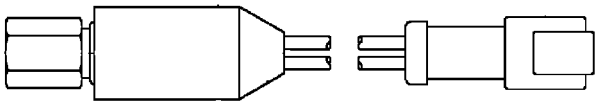


Illustration 88

g00651452

Table 24

Specifications for Pressure Switch	
Actuation Pressure ⁽²⁾	103 ± 14 kPa (15 ± 2 psi)
Deactuation Pressure ⁽³⁾	35 ± 7 kPa (5 ± 1 psi)

⁽²⁾ Close when pressure increases.

⁽³⁾ Open when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.

2. Connect the 146 - 4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is above 103 ± 14 kPa (15 ± 2 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not below the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

3E - 6462 High Pressure Switch (NORMALLY CLOSED)



Illustration 89

g00651464

Table 25

Specifications for Pressure Switch	
Actuation Pressure ⁽⁴⁾	2400 $\pm$ 140 kPa (348 $\pm$ 20 psi)
Deactuation Pressure ⁽⁵⁾	1725 $\pm$ 100 kPa (250 $\pm$ 15 psi)

⁽⁴⁾ Open when pressure increases.

⁽⁵⁾ Close when pressure decreases.

Note: A pressure switch that is NORMALLY CLOSED will open when the system pressure increases. The pressure switch will close when the system pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146 - 4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is below 2400 ± 140 kPa (348 ± 20 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not above the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

7X - 1076 High Pressure Switch (NORMALLY CLOSED)



Illustration 90

g00651571

Table 26

Specifications for Pressure Switch	
Actuation Pressure ⁽⁴⁾	2412 ± 140 kPa (350 ± 20 psi)
Deactuation Pressure ⁽⁵⁾	1723 ± 100 kPa (250 ± 15 psi)

⁽⁴⁾ Open when pressure increases.

⁽⁵⁾ Close when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146 - 4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is below 2412 ± 140 kPa (350 ± 20 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not above the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

Test Procedures for Arc Suppressors:

106 - 8704 Arc Suppressor

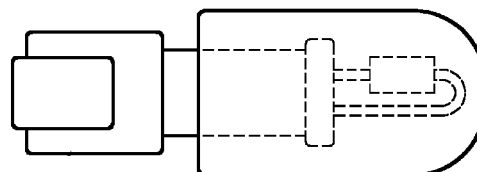


Illustration 91

g00651378

106 - 8704 Arc Suppressor

1. Place the multimeter in the DIODE test mode.
2. Place the red probe in the red terminal (positive terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 2 of the connector on the arc suppressor. Place the black probe on Pin 1 of the connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.
6. Place the red probe on Pin 1 of the connector on the arc suppressor. Place the black probe on Pin 2 of the connector on the arc suppressor.
7. The multimeter should display OL.
8. If the above conditions do not exist, the component should be considered faulty. The component will not provide adequate protection if the above conditions do not exist.
9. Replace the component if the component has failed.

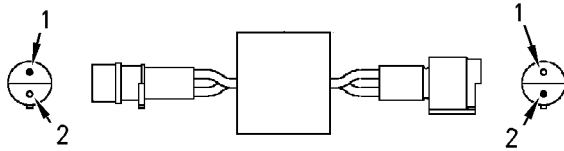
3E-9169 Arc Suppressor and 130-8134 Arc Suppressor

Illustration 92

g00651923

Arc Suppressor with Sure Seal Connectors

- (1) Pin 1
(2) Pin 2

8. Place the red probe on pin 1 of the female connector. Place the black probe on pin 1 of the male connector.
9. The multimeter should have a reading of less than 0.01 VDC.
10. Place the red probe on Pin 2 of the female connector. Place the black probe on Pin 2 of the male connector.
11. The multimeter should have a reading of less than 0.01 VDC.
12. The component is faulty if any of the conditions do not exist.
13. If the component is faulty, replace the component.

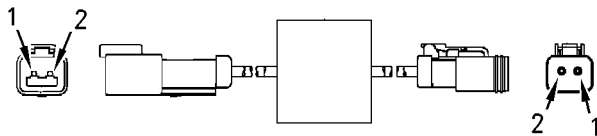
105-8827 Arc Suppressor and 130-0956 Arc Suppressor

Illustration 93

g00651621

Arc Suppressor with DT Connectors

- (1) Pin 1
(2) Pin 2

1. Place the multimeter in the DIODE test mode.
2. Place the red probe in the red terminal (positive terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 1 of either connector on the arc suppressor. Place the black probe on Pin 2 of either connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.
6. Place the red probe on Pin 2 of either connector of arc suppressor. Place the black probe on Pin 1 of either connector on the arc suppressor.
7. The multimeter should display OFL or OL.

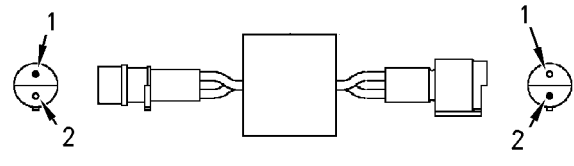


Illustration 94

g00651923

Arc Suppressor with Sure Seal Connectors

- (1) Pin 1
(2) Pin 2

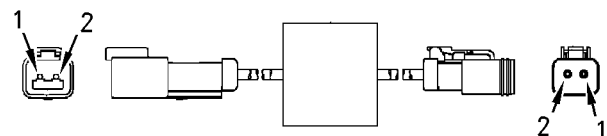


Illustration 95

g00651621

Arc Suppressor with DT Connectors

- (1) Pin 1
(2) Pin 2

1. Place the multimeter in the DIODE test mode.

2. Place the red probe in the red terminal (plus terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 1 of either connector on the arc suppressor. Place the black probe on Pin 2 of either connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.
6. Place the red probe on pin 2 of either connector of arc suppressor. Place the black probe on pin 1 of either connector on the arc suppressor.
7. The multimeter should display OFL or OL.
8. Place the red probe on pin 1 of the female connector. Place the black probe on pin 1 of the male connector.
9. The multimeter should have a reading of less than 0.01 VDC.
10. Place the red probe on pin 2 of the female connector. Place the black probe on pin 2 of the male connector.
11. The multimeter should have a reading of less than 0.01 VDC.
12. The component is faulty if any of the conditions do not exist.
13. If the component is faulty, replace the component.

Correct Mounting of Arc Suppressors

Certain arc suppressors may experience failure of the wire leads due to vibration if the arc suppressor is not properly supported.

Use a 2U-4497 Strap to tie-wrap the arc suppressor. Securely tie-wrap the arc suppressor to a stationary support in order to prevent any motion of the body of the arc suppressor. Additionally, the connectors on both ends of the arc suppressor should be secured.

A suitable bracket for supporting an arc suppressor is the 116-6100 Plate. The addition of a 9R-2926 Plate should permit the mounting of the 116-6100 Plate around obstacles. Use the 9R-2926 Plate if the 116-6100 Plate cannot be installed directly in an existing application.

The Sure Seal connectors on the 3E-9169 Arc Suppressor and the 105-8827 Arc Suppressor should be secured with two 9G-9150 Clips in order to prevent movement of the connectors relative to the body of the arc suppressor. The DT connectors on the 130-0956 Arc Suppressor and 130-8134 Arc Suppressor should be secured with two 9U-2297 Clips. The clips should be bolted through the slotted holes on the 116-6100 Plate.

The 106-8704 Arc Suppressor is an integral arc suppressor. The integral arc suppressor can be found on the newer machines. The 106-8704 Arc Suppressor is lighter than the other arc suppressors. The 106-8704 Arc Suppressor can be strapped directly to the wiring harnesses that are connected to the arc suppressor.

Red Dot Automatic Temperature Control (ATC) - Fault Codes: (only for 584 Forwarders and 584HD Forwarders)



Illustration 96

g01912574

To display fault codes, depress the ON key three times in rapid succession. The digital display will then display any active fault codes. Pressing the ON key again repeatedly will scroll through any existing error codes. After five seconds without further key presses, the system will exit the diagnostics mode and return to normal operation.

No Faults – E0

Cab Sensor Shorted – E1

Cab Sensor Open – E2

Evaporator Probe Shorted – E3

Evaporator Probe Open – E4

Duct Sensor Shorted – E5

Duct Sensor Open – E6

Pressure Transducer Open – E151

Pressure Transducer Shorted – E12

Water Valve Actuator Error – E13

Electronics or Comm. Error – E17

Clutch Open – E18*

Clutch Shorted – E19*

No Refrigerant – E20*

High-pressure – E22*

Low Voltage Error – E23*

* Future implementation

Advanced Diagnostics:

The Red Dot ATC Advanced Diagnostics control panel allows the technician to see real-time system information on the control panel display. Control panel display will assist in A/C-heater servicing. This real-time information can help the service technician diagnose certain system problems.

To display advanced diagnostics, depress ON key three times in rapid succession (fault codes displayed) then immediately press and hold ON key for five seconds. The text "CAB" will be displayed. After a few seconds, the real-time value of the cab temperature measured by the ATC is displayed. This value, as well as any other value displayed by the control panel, will continuously update. Pressing the ON key again repeatedly will scroll through all of the available diagnostics information

CAB – Cab Air Temperature (°C or °F)

EVAP – Evaporator Core Temperature (°C or °F)

DUCT – Duct Air Temperature (°C or °F)

HEAT – Water Valve Command (% of valve open)

A-C – A-C Clutch Request (on / off)

FAN – Blower Fan Speed (% of maximum fan speed)

DEF – Defrost Mode Active (On/Off)

HI-P – High Side Pressure (psig or bar)

PRHT – Blower Enable Active (On/Off)

VOLT – System Voltage (DC Volts)

Note: The system can be operated normally while in advanced diagnostics mode, including changing the temperature set point or changing the blower fan speed, to evaluate the response of the system.

Firmware Version Mode

The firmware version of the control panel and Electronic Control Unit (ECU) can be displayed. From the advanced diagnostics mode, press and hold the ON key for five seconds. The text CTRL will be displayed and after a few seconds, the control panel firmware version number will be displayed. Pressing the ON key will toggle to the ECU firmware version.

The following firmware version information is available:

CTRL – Control Panel Version

ECU – ECU Version

Exiting the Diagnostic Mode:

To exit the advanced diagnostic mode or firmware Version mode, turn the system OFF by pressing the OFF key.

Additional Troubleshooting:

No Display

- Turn on control panel with the ON key.
- Check to see if the display illuminates.
- Verify that the control panel is plugged into the wire harness.
- Check to see if wire harness is wired into vehicle properly.

No Fan

- Turn up fan with the fan UP key.
- Make sure that the fan is plugged into wire harness, verify all wiring connections.
- Verify that the circuit breakers or fuses are intact.
- If all other functions work properly, replace ECU.

No Heat

- Turn up heat with the Temperature UP key. Use the advanced diagnostics to verify that the water valve is commanded open.
- Inspect and verify all wiring connections.

- Verify that any coolant shut off valves on the engine are open.
- Verify that warm coolant is flowing into the heater core by testing the heater hoses.
- Inspect and replace the electronic water valve if necessary.
- Inspect and replace ECU if necessary.

No Cooling

- Turn down heat with the Temperature DOWN key and enable the defrost mode. Use the advanced diagnostics to verify that the A/C clutch is requested ON.
- Verify that the system is fully charged with refrigerant.
- Verify that voltage is present at the compressor clutch.
- Verify that the correct voltage is present at the clutch relay on the wire harness.
- Inspect and verify all wiring connections.
- Inspect and replace clutch relay if necessary.
- Inspect and replace refrigerant high-pressure and/or low-pressure cut out switches if necessary.
- Inspect compressor and clutch assembly and replace clutch if necessary.

The system is not controlling the cab temperature properly

- Inspect the cab air temperature sensor.
- Verify that the recirculation vent inlet is not obstructed. Inspect and replace recirculation vent air filter if necessary.
- Inspect and replace recirculation vent air filter, if necessary.
- Change the setpoint temperature in small increments.
- Verify that the water valve is working properly. Refer "No Heat"(see No Heat).
- Verify that the compressor clutch is working properly. Refer "No Cooling".

The evaporator core is icing up and restricting airflow

- Inspect the evaporator core probe.

- Verify that the probe is making good contact with the evaporator fins and is not loosely inserted.
- Reposition the probe and check the core temperature during operation using the advanced diagnostics.
- Replace the evaporator core if necessary.

Automatic Temperature Control Troubleshooting

Use this procedure to troubleshoot the performance of the HVAC system for machines equipped with automatic temperature control.

Connect Electronic Technician (ET) and check for diagnostics associated with the HVAC system. Refer to the Machine Troubleshooting Guide if any of the following codes are active.

HVAC Diagnostic Troubleshooting Codes	
CID-FMI	Description
2357-3	Evaporator Coil Temperature Sensor Voltage Above Normal
2357-4	Evaporator Coil Temperature Sensor Voltage Below Normal
2671-5	Air Conditioner Compressor Solenoid Current Below Normal
2671-6	Air Conditioner Compressor Solenoid Current Above Normal
2659-2	HVAC Operator Switch Data Erratic, Intermittent, or Incorrect
2661-3	Cab Air Temperature Dial Voltage Above Normal
2661-4	Cab Air Temperature Dial Voltage Below Normal
2811-3	Cab Blower Speed Control Voltage Above Normal
2811-4	Cab Blower Speed Control Voltage Below Normal
779-3	Cab Air Temperature Sensor Voltage Above Normal
779-4	Cab Air Temperature Sensor Voltage Below Normal
2663-3	HVAC Duct Temperature Sensor Voltage Above Normal
2663-4	HVAC Duct Temperature Sensor Voltage Below Normal

Illustration 97

g03090916

HVAC Diagnostic Codes

Description	Value	Unit	Min	Max	ECM
A/C Compressor	ON				Implement Control
Air Conditioning Refrigerant Monitoring Circuit Status	Closed				Implement Control
Cab Air Temperature Control Switch Position	Auto				Implement Control
Operator Requested Cab Air Temperature	72	Deg F			Implement Control
Cab Air Temperature	72	Deg F			Implement Control
Cab Ventilation Duct Air Temperature	70	Deg F			Implement Control
Cab Blower Speed Control Position	50	%			Implement Control
Cab Blower Motor Command Percentage	50	%			Implement Control
Cab Air Heater Engine Coolant Actuator Duty Cycle	25	%			Implement Control
Air Conditioner Evaporator Coil Temperature	60	Deg F			Implement Control

Illustration 98

g03090917

Typical HVAC ET status parameters and values

Symptom Troubleshooting

Cab Temperature is High

Probable Causes

- Diagnostic Codes

- Low Pressure Switch / High Pressure Switch
- Low Refrigerant Charge
- Water Valve Actuator
- A/C Compressor

Recommended Actions

Diagnostic Codes

Connect Cat ET to the service tool connector. Check for active diagnostic codes. Look for active codes that are related to the HVAC system in Illustration 97. Use the appropriate circuit test to troubleshoot any active codes before continuing.

Low Pressure Switch / High Pressure Switch

Use Cat ET to monitor the "Air Conditioning Refrigerant Monitoring Circuit" status parameter. With a proper charge the status should be closed. If the status is open check the pressure switches and circuit (refer to the pressure switch tests section in this book).

Low Refrigerant Charge

Refer to Air Conditioning Performance - Test

Water Valve Actuator

Test the water value actuator control by switching to heat mode. Use Cat ET and monitor the "Cab Air Heater Engine Coolant Actuator Duty Cycle" status parameter while rotating the temperature dial. The parameter should go to 5% when the temperature dial is full CCW and 95% when the temperature dial is full CW. If the Cab Air Heater Engine Coolant Actuator Duty Cycle" doesn't move with the temperature dial, check the temperature dial (see the troubleshooting section 2661 in the machine troubleshooting guide). If the Cab Air Heater Engine Coolant Actuator Duty Cycle" moves with the temperature dial, verify the water valve actuator circuit and that the actuator is rotating.

A/C Compressor

Switch to AC mode and use Cat ET to monitor the "A/C Compressor" status parameter with the engine running. If the compressor status does not turn to ON after 20 seconds, check the evaporation temperature circuit (refer to 2357 diagnostic code in the machine TSG) and the pressure switch circuits (refer to the pressure switch tests section in this book). If the compressor status is ON and the compressor does not turn on, check for power at the compressor connection.

Note: If the compressor status is on and there is power at the compressor clutch, then replace the compressor.

Cab Temperature Low

Probable Causes

• Diagnostic Codes

• Water Valve Actuator

Recommended Actions

Diagnostic Codes

Connect Cat ET to the service tool connector. Check for active diagnostic codes. Look for active codes that are related to the HVAC system in Illustration 97. Use the appropriate circuit test to troubleshoot any active codes before continuing.

Water Valve Actuator

Test the water value actuator control by switching to heat mode. Use Cat ET and monitor the "Cab Air Heater Engine Coolant Actuator Duty Cycle" status parameter while rotating the temperature dial. The parameter should go to 5% when the temperature dial is full CCW and 95% when the temperature dial is full CW. If the Cab Air Heater Engine Coolant Actuator Duty Cycle" doesn't move with the temperature dial, check the temperature dial (see the troubleshooting section 2661 in the machine troubleshooting guide). If the Cab Air Heater Engine Coolant Actuator Duty Cycle" moves with the temperature dial verify the water valve actuator circuit and that the actuator is rotating.

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Troubleshooting Condensate Drainage System

SMCS Code: 7320-035

Regular inspection is needed in order to ensure that the holes for the condensate drainage are not plugged with debris. Regular inspection is also needed in order to ensure that adequate flow is seen from the case. When the air conditioning system is in operation, there should be evidence of condensate that is exiting the machine from the drain lines.

- Check the drain lines in order to ensure that the drain lines are not pinched.
- Inspect the drain valves in order to ensure that the drain valves are present and installed correctly. The valve should be located between 0.0 mm (0.0 inch) and 76 mm (3 inch) from the end of the drain line.
- If the lines are plugged with dirt and debris, flush the lines with water and relocate the valve.

In order to make sure that the drainage system is working, open the HVAC case and inspect the interior sloped floor or the drain pan.

- Ensure that no large debris is clogging the drain valves from the case.

- If any large debris is observed, the HVAC case should be cleaned in order to prevent any future buildup from clogging the path of drainage.
- Once the area for drainage has been cleaned, reassemble the HVAC case in order to make sure that the system works. Run the system and check the drain lines for condensate flow.

Testing and Adjusting Section

Testing and Adjusting

i03862431

Machine Preparation for Testing and Adjusting

SMCS Code: 7000; 7309-025; 7309-081

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

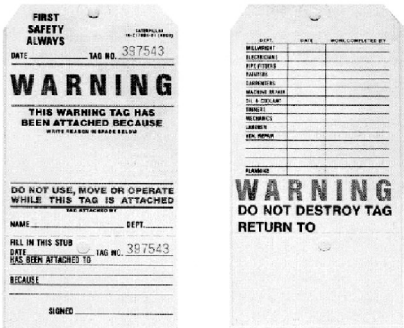
Before any problem solving procedures are performed, read the manual for the heating and air conditioning system. Make a visual inspection of the complete air conditioning and heating system.

During any service of the Air conditioning System, all open connections are required to be capped or plugged with clean plastic part. Failure to cap open connections or failure to plug open connections will allow moisture into the system and lead to further damage.

When one is preparing to work on the air conditioning system, it is important to properly prepare the machine by performing a lockout/tagout procedure on the machine and on the air conditioning system. All charging and leak testing must be done in a well ventilated area.

Lockout/Tagout Procedure

1. When possible, park the machine on a smooth, level surface.
2. Set the parking brake.
3. Lower and lock all hydraulic implements.
4. Turn the key start switch to the OFF position and remove the key.
5. Turn the battery disconnect switch to the OFF position.



6. Tag the machine with a warning tag that is similar to the one that is shown in illustration 99 in order to ensure that no one else attempts to start the machine during service.
7. As it is necessary, continue to service the component.

i03862449

Air Conditioning Performance - Test

SMCS Code: 7320-081

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

Note: A performance check of the air conditioning system must be made with a manifold gauge set. Refer to the Testing and Adjusting, SENR5664, "Manifold Gauge Set - Install".

Note: Before you conduct a performance test, refer to the Troubleshooting, SENR5664, "Visual Inspection".

Note: Refer to the Troubleshooting, SENR5664, "Machine Preparation for Troubleshooting" section before service work is performed on the air conditioning system.

Note: The ambient temperature must be at least 21 °C (70 °F) in order to conduct the following test.

1. Install the manifold gauge set. Refer to the Testing and Adjusting, SENR5664, "Manifold Gauge Set (Refrigerant) - Install".
2. Start the engine and operate the engine at 1000 rpm (Low idle).
3. Move the temperature control knob to the maximum cool position. Put the fan switch in the HIGH position on the side that is for air conditioning.
4. In order to stabilize the system, continue to operate the system at 1000 rpm for a minimum of ten minutes.
5. Adjust the engine speed to approximately 1300 to 1400 rpm. Record the readings on the gauge for discharge (high pressure), and on the gauge for suction (low pressure).
6. Compare the discharge and suction pressures on the manifold gauge set to the pressure ranges in Table 27 in order to determine if the system is functioning correctly for the current ambient temperature.

Table 27

i03862452

Pressure Range ⁽¹⁾		
Ambient Air Temperature C° (F°)	High Pressure Test Fitting kPa (psi) ⁽²⁾	Low Pressure Test Fitting kPa (psi) ⁽³⁾
21°C (70°F)	820 to 1300 kPa (120 to 190 psi)	70 to 138 kPa (10 to 20 psi)
27°C (80°F)	950 to 1450 kPa (140 to 210 psi)	70 to 173 kPa (10 to 25 psi)
32°C (90°F)	1175 to 1650 kPa (170 to 240 psi)	105 to 210 kPa (15 to 30 psi)
38°C (100°F)	1300 to 1850 kPa (190 to 270 psi)	105 to 210 kPa (15 to 30 psi)
43°C (110°F)	1450 to 2075 kPa (210 to 300 psi)	105 to 210 kPa (15 to 30 psi)

(1) This table is only for reference.

(2) Pressure may be slightly higher in very humid conditions and lower in very dry conditions.

(3) Pressure before clutch disengagement

7. If the suction and the discharge pressures are not within the normal operating range, refer to the Troubleshooting, SEN5664, "Air Conditioning System Troubleshooting".

During normal operation of the air conditioning system in 21 °C (70 °F) weather, the discharge pressure will be 820 kPa (120 psi) to 1300 kPa (190 psi). The suction side pressure will be 70 kPa (10 psi) to 130 kPa (20 psi).

The outside temperature and humidity will have an effect on the pressures. If the outside temperature is high, the discharge pressure will be high. In very hot weather, the suction and the discharge pressures will be high. In cooler weather, the suction and the discharge pressure will be normal or the pressure can be lower.

Refrigerant Leakage - Test

SMCS Code: 1809-081

Dye

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Table 28

Required Tools		
Part Number	Part Description	Quantity
192 - 2331	Leak Detection Lamp Gp	1

In the middle of 1999, Caterpillar began installing dye in the refrigeration systems of Caterpillar machines. The dye is used in order to assist in identifying points of leakage in the refrigeration system.

Finding leaks and repairing leaks from refrigerant is important since the air conditioner is a closed circuit system.

The system must contain at least 0.4 kg (.88 lb) of refrigerant. Install the manifold gauge set. The manifold gauge set can determine if pressure exists in the system. A leak test can be performed if the system indicates pressure.

Note: Refrigerant vapor is heavier than air. For best results, place the black light directly below possible leaks.

Note: Leaks that are in the high pressure side of the system are more easily found if the air conditioner is operated for 5 to 10 minutes. The leak test must be performed immediately after the unit is turned OFF. The leak test for the high pressure side is performed before the pressures in the system equalize. Leaks that are in the low pressure side of the system are more easily found if the air conditioner has been turned OFF for 5 to 10 minutes. The leak test for the low pressure side is performed after the pressures in the system equalize.

1. Move the black light along possible leak points. When a leak is present, the black light will illuminate the dye that is in the refrigerant.

Note: Leaks that are indicated by the presence of dye should always be confirmed with an electronic leak detector.

2. If a leak is found in the air conditioning system, use a 4C-2964 Refrigerant Leak Detector in order to confirm the leak that was detected by the use of the black light.
3. Repair the leak in the air conditioning system and clean the area with 192-4727 Dye Cleaning Solution.

Leak Detector

The 208-1374 Refrigerant Leak Detectors are designed in order to detect leaks as small as 7.4 mL (.25 oz) per year of refrigerant in the air conditioning system. Perform the following procedure in order to determine if the system has a leak.

The system must contain at least 0.4 kg (.88 lb) of refrigerant. Install the manifold gauge set. The manifold gauge set can determine if pressure exists in the system. A leak test can be performed if the system indicates pressure.

Note: Refrigerant vapor is heavier than air. For best results, place the sensor tip directly below possible leaks.

Note: Leaks in the high pressure side of the system are more easily found if the air conditioner is operated for a few minutes. The leak test must be performed immediately after the unit is turned OFF. The leak test for the high pressure side is performed before the pressures in the system equalize. Leaks in the low pressure side of the system are more easily found if the air conditioner has been turned OFF for several minutes. The leak test for the low pressure side is performed after the pressures in the system equalize.

1. Move the sensor tip along possible leak points at a rate of one inch per second.
2. It may not be necessary to recover refrigerant if a loose fitting or a loose connection is causing a leak. Tighten the loose connection and perform the performance check procedure. If necessary, add refrigerant to the air conditioning system. Refer to the Testing and Adjusting, "Refrigerant System - Charge" section for the proper procedure.
3. If the repair of a leak calls for the removal or the replacement of a component, refer to the Service Manual, SEN5664, "Machine Preparation for Disassembly and Assembly" section in Disassembly and Assembly.

Note: Refrigerants that are not approved by Caterpillar may have higher leakage rates.

i03862454

Manifold Gauge Set (Refrigerant) - Install

SMCS Code: 7465-012

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

2. Connect the manifold gauge set to the service ports near the refrigerant compressor. The service ports for charging are located on the refrigerant lines. Connect the low pressure hose to the service port on the suction side of the compressor. Connect the high pressure hose to the service port on the discharge side of the compressor. Make sure that the valved couplings are turned counterclockwise for installation. Then, turn the valved couplings clockwise in order to open the valves.
3. Turn the pressure valves clockwise and make sure that both pressure valves on the manifold gauge set are closed.
4. Place a clean rag over the charging hose fitting that is loosened at the manifold gauge set. This will prevent the spraying of compressor oil. Open the low pressure valve on the gauge set about 1/2 turn. Keep the valve open for 2 to 3 seconds in order to flush air from the low pressure hose. This will also flush air from the gauge set. Close the low pressure valve on the gauge set. Repeat this process for the high pressure valve. Tighten the charging hose fitting at the manifold gauge set.

Note: Use the refrigerant identifier. The refrigerant identifier will prevent refrigerants that are not R134a from contaminating the recovery and charging tools.

1. Use the 138-6629 Refrigerant Identifier in order to verify that the refrigerant that is in the air conditioning system is R134a.

i03862469

Refrigerant Recovery

SMCS Code: 1809-576

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

If service work is required on an air conditioning system, the refrigerant must be recovered first before components are removed or installed. Use the following procedure:

1. Use the refrigerant identifier. The refrigerant identifier will detect refrigerants that are not R134a. The refrigerant identifier will prevent the refrigerants from contaminating the tools for recovery and the tools for charging. The refrigerant identifier will also detect the percentage of air that may be in the system.

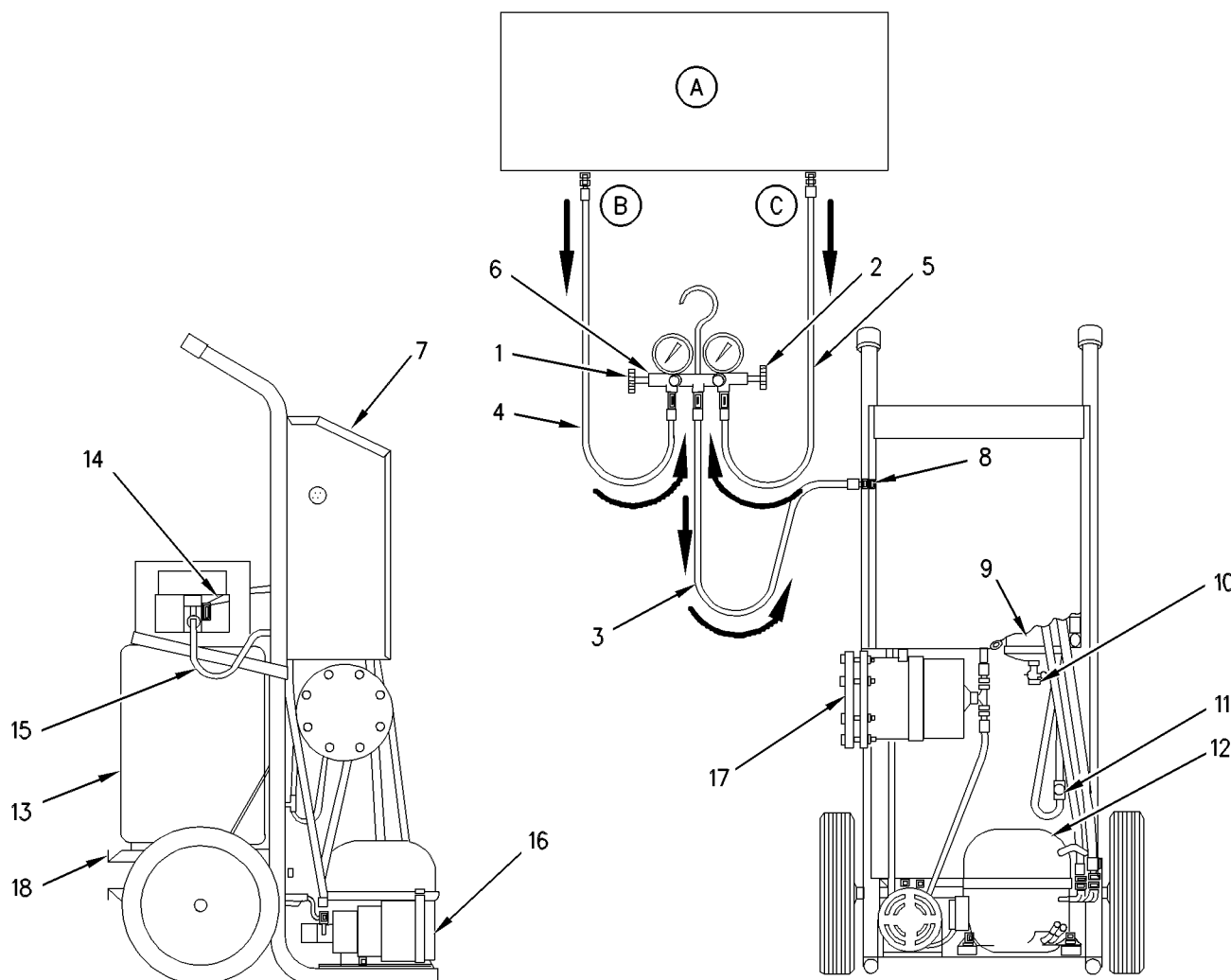


Illustration 100

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(1) Low pressure valve. (2) High pressure valve. (3) Charging hose. (4) Low pressure hose. (5) High pressure hose. (6) Manifold gauge set. (7) Control panel. (8) Inlet on recovery station. (9) Accumulator/oil separator. (10) Drain valve. (11) Pressure valve on accumulator. (12) Compressor. (13) Refrigerant tank. (14) Hose (liquid). (15) Hose (vapor). (16) Refrigerant pump. (17) Filter dryer. (18) Scale. (A) Refrigerant compressor. (B) Low pressure side (suction). (C) High pressure side (discharge).

2. Install the manifold gauge set (6). Make sure that both valves are closed. Turn the valves clockwise in order to close the valves. Refer to the Testing and Adjusting, "Manifold Gauge Set (Refrigerant) - Install" section.

Note: Do not operate the engine.

3. Attach charging hose (3) of the Manifold gauge set to the inlet (8) on the refrigerant service unit.
4. Slowly open valves (1) and (2) in order to release the air from the charging hose. Ensure that the valves on the refrigerant tank (13) are open. One valve is for vapor and the other valve is for liquid.

5. Plug the recovery station into an electrical outlet and turn the power switch ON. This switch is located on the control panel (7).
6. Press the "Compressor Start". The amber "Compressor On" light will come on and compressor (12) will start. The compressor will automatically shut off when the recovery of refrigerant is complete.

7. Drain accumulator (9) of refrigerant oil. Open accumulator pressurizing valve (11) long enough so that some discharge from the compressor can flow back to the accumulator. Open oil drain valve (10) slowly and drain the oil into a measuring cup. Do not allow a complete loss of pressure in the accumulator/oil separator. When the oil stops draining, close oil drain valve (10).
8. If 15.0 mL (.50 fl oz) of compressor oil was lost during the recovery process, new oil must be added to the system. Refer to the Testing and Adjusting, "Refrigerant Compressor Oil - Check" section.
9. The system must be cleaned and the system must be flushed if any particles of metal or other foreign material from a component failure have circulated through the system. **Debris in the system can cause the compressor to fail.** Refer to Service Manual, SEN5664, "Refrigerant System - Flush".

Oil and Refrigerant Charge for the Air Conditioning System

NOTICE

The addition of oil to the air conditioning system is applicable only after the flush of the entire air conditioning system. If an air conditioning system is overcharged with oil, the result is a decrease of the cooling performance and damage to the compressor may occur.

Note: Refer to one of the tables below for your particular application.

Table 29 contains the recommended charges for the compressors that are listed below :

- 214 - 4302 Refrigerant Compressor Gp
- 217 - 4448 Refrigerant Compressor Gp
- 222 - 2276 Refrigerant Compressor Gp
- 272 - 5767 Refrigerant Compressor Gp

Note: The new compressors that are listed above contain 180 ml of oil. The total charge for the air conditioning system must equal the total amount from Table 29 and the oil that is already added in a new compressor.

Table 29

Recommended Charges for the Air Conditioning System	
Refrigerant	Oil ⁽¹⁾⁽²⁾
1.1 kg (2.5 lb)	30
1.2 kg (2.75 lb)	60
1.4 kg (3 lb)	80
1.5 kg (3.25 lb)	100
1.6 kg (3.5 lb)	120
1.7 kg (3.75 lb)	140
1.8 kg (4 lb)	160
1.9 kg (4.25 lb)	190
2.0 kg (4.5 lb)	210
2.2 kg (4.75 lb)	230
2.3 kg (5.0 lb)	250
2.4 kg (5.25 lb)	270
2.5 kg (5.5 lb)	290
2.6 kg (5.75 lb)	320
2.7 kg (6.0 lb)	340
2.8 kg (6.25 lb)	360
2.9 kg (6.5 lb)	380
3.1 kg (6.75 lb)	400
3.2 kg (7.0 lb)	420
3.3 kg (7.25 lb)	440
3.4 kg (7.5 lb)	470
3.5 kg (7.75 lb)	490
3.6 kg (8.0 lb)	510
3.7 kg (8.25 lb)	530
3.9 kg (8.5 lb)	550
4.0 kg (8.75 lb)	570
4.1 kg (9.0 lb)	600

(1) The unit is mL.

(2) Refer to the Specifications section in order to obtain the part number for the correct type of oil.

Table 30 contains the recommended charges for the compressors that are listed below:

- 3E - 1906 Refrigerant Compressor Gp
- 3E - 1908 Refrigerant Compressor Gp
- 106 - 5122 Refrigerant Compressor Gp
- 163 - 0872 Refrigerant Compressor Gp
- 178 - 9570 Refrigerant Compressor Gp

- 183-5106 Refrigerant Compressor Gp
- 218-0324 Refrigerant Compressor Gp
- 277-7245 Refrigerant Compressor Gp

Note: The new compressors that are listed above contain 300 ml of oil. The total charge for the air conditioning system must equal the total amount from Table 30 and the oil that is already added in a new compressor.

Table 30

Recommended Charges for the Air Conditioning System	
Refrigerant	Oil ⁽¹⁾
1.1 kg (2.5 lb)	0
1.2 kg (2.75 lb)	0
1.4 kg (3 lb)	0
1.5 kg (3.25 lb)	0
1.6 kg (3.5 lb)	0
1.7 kg (3.75 lb)	30
1.8 kg (4 lb)	50
1.9 kg (4.25 lb)	70
2.0 kg (4.5 lb)	90
2.2 kg (4.75 lb)	110
2.3 kg (5.0 lb)	130
2.4 kg (5.25 lb)	150
2.5 kg (5.5 lb)	170
2.6 kg (5.75 lb)	190
2.7 kg (6.0 lb)	210
2.8 kg (6.25 lb)	230
2.9 kg (6.5 lb)	260
3.1 kg (6.75 lb)	280
3.2 kg (7.0 lb)	300
3.3 kg (7.25 lb)	330
3.4 kg (7.5 lb)	350
3.5 kg (7.75 lb)	370
3.6 kg (8.0 lb)	390
3.7 kg (8.25 lb)	410
3.9 kg (8.5 lb)	430
4.0 kg (8.75 lb)	450
4.1 kg (9.0 lb)	480

⁽¹⁾ The unit is mL.

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Refrigerant System - Flush

SMCS Code: 1809-046

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

System Contamination and Flush Procedure

NOTICE

Debris in the air conditioning refrigerant circuit can cause the compressor to fail. Use the following procedure for cleaning and flushing the system.

This procedure provides a method and instructions to remove contamination from the air conditioning system refrigeration circuit and individual components. A primary instance where a system flush is necessary is any time a refrigerant compressor has had an internal failure, usually indicated by a locked or seized condition. The air conditioning system refrigeration circuit and components must be cleaned and flushed to remove any particles of metal or other foreign material. Failure to properly flush the air conditioning circuit will damage or shorten the operating life of the replacement compressor.

A general flow chart of the flush procedure is shown in Illustration 102. The detailed procedure is shown in Step 1 through Step 19 below.

1. Identify the refrigerant and then recover the refrigerant. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section.
2. Remove the compressor. Refer to the Service Manual, SENR5664, "Refrigerant Compressor - Remove and Install" section.
3. Remove the receiver-dryer or the in-line dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly. For in-line dryers, refer to the Service Manual, SENR5664, "In-Line Refrigerant Dryer - Remove and Install" section in Disassembly and Assembly.
4. Remove the accumulator. Refer to the Service Manual, SENR5664, "Air Conditioner Accumulator - Remove and Install" section in Disassembly and Assembly.
5. Remove the expansion valve or the orifice tube. Refer to the Service Manual, SENR5664, "Expansion Valve - (Air Conditioner) Remove and Install" section in disassembly and assembly. Refer to the Service Manual, SENR5664, "Orifice Tube (Air Conditioner) - Remove and Install" section in Disassembly and Assembly.
6. If necessary, remove the quick disconnect fittings from the dryer refrigerant lines.

NOTICE

In order to avoid component damage, do not flush system components with anything other than 153-8538 Refrigerant Flushing Solution.

7. Replace any other failed component such as coils, fittings, etc..

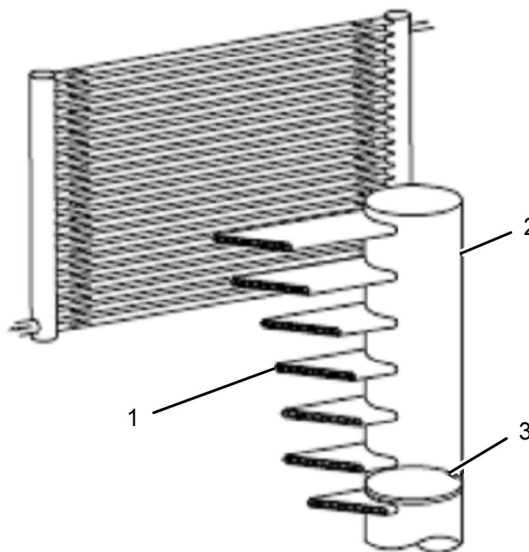


Illustration 101

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- (1) Multichannel Extruded Tube
- (2) Manifold
- (3) Manifold Baffle

8. Replace condenser coils that are parallel flow or multiple flow. Refer to Illustration 101 for a reference example. Condenser coils that are parallel flow or multiple flow have very small passages. The proper flushing out of the passages will be difficult. Failure to replace the condenser coils may reduce the cooling performance of the air conditioner and premature failure of the compressor.
9. Flush the remainder of the system. Flush the air conditioning system with a 153-8537 Air Conditioner Flushing Unit. Also, a 153-8537 Air Conditioner Flushing Unit can be used in order to flush the system. Refer to the information that is provided with the flushing unit. Flush the system with 153-8538 Refrigerant Flushing Solution.
10. Blow out the air conditioning system with clean dry shop air for 5 to 10 minutes. Follow the instructions that are provided with the flushing unit.

NOTICE

It is extremely important that all of the flushing solvent is purged from the Air Conditioning System. Failure to purge all of the solvent will result in premature compressor failure. Components should be positioned in order to ensure that no solvent is trapped in the system.

11. Install a new receiver-dryer or an in-line dryer. Refer to the Service Manual, SENR5664, "Receiver-Dryer - Remove and Install" section in Disassembly and Assembly. For in-line dryers, refer to the Service Manual, SENR5664, "In-Line Refrigerant Dryer - Remove and Install" section in Disassembly and Assembly.

12. Install a new accumulator, if necessary. Refer to the Service Manual, SENR5664, "Air Conditioner Accumulator - Remove and Install" section in Disassembly and Assembly.

13. Install a new expansion valve or an orifice tube. Clean the original quick couplers or replace the original quick couplers.

Note: If the Air Conditioning System has an in-line dryer, then the new orifice tube is already contained inside the dryer.

14. Install new quick couplers to the dryer inlet and outlet lines, if necessary.

15. Install a new compressor.

16. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.

17. Add additional oil to the air conditioning system, if necessary. Refer to "Oil Charge After System Flush".

Note: New compressors are shipped with oil in the compressors. In many instances, it is not necessary to add extra oil to the air conditioning system.

18. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.

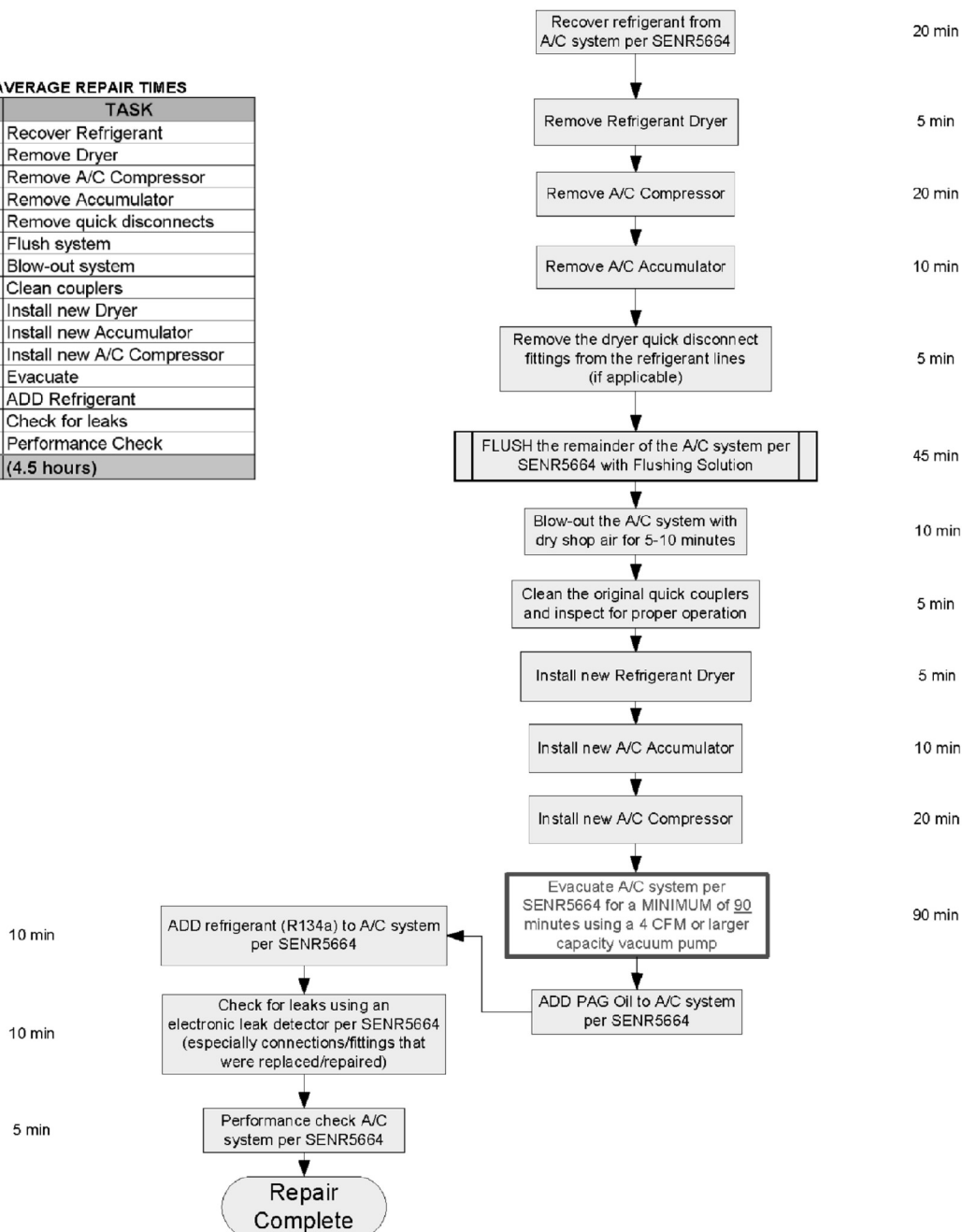
Note: Also, Refer to Specifications, SENR5664, "System Capacities for Refrigerant".

19. In order to ensure proper operation of the system, refer to the Service Manual, SENR5664, "Performance Test" section in Testing and Adjusting.

A/C SYSTEM FLUSH REPAIR FLOWCHART

AVERAGE REPAIR TIMES	
MIN	TASK
20	Recover Refrigerant
5	Remove Dryer
20	Remove A/C Compressor
10	Remove Accumulator
5	Remove quick disconnects
45	Flush system
10	Blow-out system
5	Clean couplers
5	Install new Dryer
10	Install new Accumulator
20	Install new A/C Compressor
90	Evacuate
10	ADD Refrigerant
10	Check for leaks
5	Performance Check
270	(4.5 hours)

REPAIR TIME



Oil Charge After System Flush

NOTICE

The addition of oil to the air conditioning system is applicable only after the flush of the entire air conditioning system. If an air conditioning system is over-charged with oil, the result is a decrease of the cooling performance and damage to the compressor may occur.

1. Locate the correct refrigerant charge for the machine that is being serviced. Refrigerant charge can be found on a tag inside the cab or by referencing the Service Manual, SENR5664, "System Capacities for Refrigerant" section in Specifications.
2. Locate the part number for the a/c compressor that is being serviced in the flush procedure.
3. Refer to table 31 or table 32 below for your particular application.
4. Use proper oil charging equipment. Usually, oil charge is a function that is provided by the refrigerant service unit. Refer to 208-1316 Refrigerant Service Unit for an example. A portable injection tool such as 9U-6494 Refrigerant Oil Injector can also provide the oil charge function.

Table 31 contains the recommended charges for the a/c compressors that are listed below :

- 214-4302 Refrigerant Compressor Gp
- 217-4448 Refrigerant Compressor Gp
- 218-4994 Refrigerant Compressor Gp
- 218-6833 Refrigerant Compressor Gp
- 222-2276 Refrigerant Compressor Gp
- 248-3978 Refrigerant Compressor Gp
- 272-5767 Refrigerant Compressor Gp
- 276-9875 Refrigerant Compressor Gp
- 318-4258 Refrigerant Compressor Gp

Note: The new a/c compressors that are listed above contain 150 mL (5.1 oz) to 180 mL (6.1 oz) of oil. Table 31 is only applicable for new compressors that contain 150 mL (5.1 oz) to 180 mL (6.1 oz) of oil. The total oil charge for the air conditioning system must equal the amount from Table 31 and the oil that is already contained inside the new compressor.

Table 31

Recommended Charges for the Air Conditioning System	
Refrigerant	Oil ⁽¹⁾⁽²⁾
0.5 kg (1.0 lb)	-80
0.6 kg (1.25 lb)	-60
0.7 kg (1.5 lb)	-30
0.8 kg (1.75 lb)	0
0.9 kg (2.0 lb)	0
1.0 kg (2.25 lb)	0
1.1 kg (2.5 lb)	0
1.2 kg (2.75 lb)	15
1.4 kg (3 lb)	33
1.5 kg (3.25 lb)	51
1.6 kg (3.5 lb)	69
1.7 kg (3.75 lb)	88
1.8 kg (4 lb)	107
1.9 kg (4.25 lb)	126
2.0 kg (4.5 lb)	146
2.2 kg (4.75 lb)	165
2.3 kg (5.0 lb)	185
2.4 kg (5.25 lb)	206
2.5 kg (5.5 lb)	226
2.6 kg (5.75 lb)	247
2.7 kg (6.0 lb)	268
2.8 kg (6.25 lb)	289
2.9 kg (6.5 lb)	311
3.1 kg (6.75 lb)	333
3.2 kg (7.0 lb)	355
3.3 kg (7.25 lb)	377
3.4 kg (7.5 lb)	400
3.5 kg (7.75 lb)	422
3.6 kg (8.0 lb)	446
3.7 kg (8.25 lb)	469
3.9 kg (8.5 lb)	493
4.0 kg (8.75 lb)	517
4.1 kg (9.0 lb)	541

⁽¹⁾ The unit is mL.

⁽²⁾ Refer to the Specifications section in order to obtain the part number for the correct type of oil.

Table 32 contains the recommended charges for the a/c compressors that are listed below:

- 3E-1906 Refrigerant Compressor Gp

- 3E - 1908 Refrigerant Compressor Gp
- 106 - 5122 Refrigerant Compressor Gp
- 114 - 9484 Refrigerant Compressor Gp
- 163 - 0872 Refrigerant Compressor Gp
- 178 - 9570 Refrigerant Compressor Gp
- 183 - 5106 Refrigerant Compressor Gp
- 218 - 0324 Refrigerant Compressor Gp
- 277 - 7245 Refrigerant Compressor Gp
- 299 - 2212 Refrigerant Compressor Gp

Note: The new a/c compressors that are listed above contain 300 mL (10.2 oz) of oil. Table 32 is applicable only for new compressors that contain 300 mL (10.2 oz) of oil. The total oil charge for the air conditioning system must equal the total amount from Table 32 and the oil that is already contained inside the new compressor.

Table 32

Recommended Charges for the Air Conditioning System	
Refrigerant	Oil ⁽¹⁾
0.9 kg (2.0 lb)	-100
1.0 kg (2.25 lb)	-80
1.1 kg (2.5 lb)	-50
1.2 kg (2.75 lb)	-30
1.4 kg (3 lb)	0
1.5 kg (3.25 lb)	0
1.6 kg (3.5 lb)	0
1.7 kg (3.75 lb)	0
1.8 kg (4 lb)	0
1.9 kg (4.25 lb)	0
2.0 kg (4.5 lb)	11
2.2 kg (4.75 lb)	30
2.3 kg (5.0 lb)	50
2.4 kg (5.25 lb)	71
2.5 kg (5.5 lb)	91
2.6 kg (5.75 lb)	112
2.7 kg (6.0 lb)	133
2.8 kg (6.25 lb)	154
2.9 kg (6.5 lb)	176
3.1 kg (6.75 lb)	198
3.2 kg (7.0 lb)	220
3.3 kg (7.25 lb)	242
3.4 kg (7.5 lb)	265
3.5 kg (7.75 lb)	287
3.6 kg (8.0 lb)	311
3.7 kg (8.25 lb)	334
3.9 kg (8.5 lb)	358
4.0 kg (8.75 lb)	382
4.1 kg (9.0 lb)	406

⁽¹⁾ The unit is mL.

Note: Always use new refrigerant oil and clean equipment to avoid contamination inside the air conditioning system.

Note: Make sure that the equipment for oil injection does not contain air in the supply line to the air conditioning system. This prevents air from being injected into the system which can lead to poor cooling performance and possible system damage.

Note: Oil should only be charged into the discharge service port. Failure to charge the oil correctly can cause damage to the compressor from liquid slugging with oil.

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Refrigerant Oil - Test

SMCS Code: 1809-081

Whenever the refrigerant or a component for the air conditioning unit is removed, some of the refrigerant oil is also removed. The correct amount of oil must be replaced.

Oil supplies the necessary lubrication in the refrigerant circuit for the compressor. Too little oil in the circuit can cause the compressor to seize. Too much oil decreases the amount of cooling that is supplied to the operator.

The following procedure describes a process for ensuring the appropriate concentration of oil in the refrigerant circuit when oil has been removed from the circuit. All systems are charged with oil from the factory. This process assumes that the factory fill oil amount is still in the system. This process assumes that a minimal amount of oil has been lost due to leakage of pressure relief.

Table 33

Oil Capacities for Component Replacements	
Accumulator	30 mL (1 fl. oz)
Compressor	Refer to the Service Manual, SEN5664, "Refrigerant Compressor Oil-Check" section in Testing and Adjusting
Condenser	30 mL (1 fl. oz)
Evaporator	90 mL (3 fl. oz)
In-Liner Dryer ⁽¹⁾	30 mL (1 fl. oz)
Receiver - Dryer	30 mL (1 fl. oz)

⁽¹⁾ Refer to the Service Manual, SEN5664, "In Line Refrigerant Dryer - Remove and Install" before any oil is added.

Oil is typically removed from the system in the following three ways.

In order to calculate the oil recharge quantity, use the following processes.

1. Oil that is removed from the system during refrigerant recovery. Refer to Testing and Adjusting, SEN5664, "Refrigerant Recovery" in order to see the correct procedure for recovering refrigerant.

Record the amount of oil that is collected during the recovery. Add this amount of oil back into the system when recharging the refrigerant.

2. Oil that is removed from the system due to component replacement, other than the a/c compressor. Refer to "Oil Capacities for Component Replacements". Refer to Table 33.

Add the recorded amount of oil from the recovery to the oil capacity for the component replaced. Refer to Table 33. Add this amount of oil back into the system when recharging the refrigerant.

3. Oil is removed due to replacing the a/c compressor. Refer to "Replacing the A/C Compressor".

Replacing the A/C Compressor

If the a/c compressor is being replaced, then the PAG oil must be adjusted by using the procedure that is outlined below:

- If refrigerant is still contained within the air conditioning system, then follow the steps for recovery.
- Remove the compressor from the air conditioning system and plug all lines and connections in order to prevent contamination.
- Open the oil filler plug on the old compressor and drain the oil into a clean container that allows the measurement of the quantity.
- Record the quantity of oil removed from the old compressor. This amount could be small or even zero. This amount is (3) in the formula below.

Note: The new A/C compressor will already contain oil inside. There is a possibility that an amount of oil will need to be drained from the new compressor. There is a possibility that an additional amount of oil will need to be charged into the system.

Use the following process to determine if oil must be drained from the new compressor. Use the following process to determine if an additional amount of oil will need to be charged into the A/C system.

- Determine the type and amount of oil contained inside the new compressor (New Comp Oil) by reading the value on the label. Determine the type and amount of oil contained inside by searching the compressor data in SENR by part number

NOTICE

Do not use Polyalkylene Glycol (PAG) oil in 294 - 8140 Compressor Assembly. Use Polyol Ester (POE) oil. The use of any other will cause rapid dielectric failure of the compressor.

- Next, determine the amount of oil required by the A/C system (A/C System Oil). Add the oil from recovery (1), plus the amount of oil for other components being replaced (2) (per Table 33), plus the amount of oil removed from the old compressor (3).

The sum of the following: $1+2+3 = \text{A/C System Oil}$

- Finally, take the value for New Comp Oil and subtract A/C System Oil to determine the amount of oil that must be drained. The oil must be drained from the new compressor prior to installation to prevent an oil overcharge.

New Comp Oil - A/C System Oil = Oil amount to drain from new compressor

Note: The A/C compressor has an oil drain plug that can be removed for removing oil. Reference , SENR 5664 for proper torque of the drain plug when reinstalling.

Example:

- Amount of oil from recovery (1) equals 60 ml.
- If the dryer was replaced, the amount of oil due to component replacement (2) equals 30 ml.
- Oil drained from the old compressor (3) equals 90 ml.
- Amount of oil contained inside new compressor as read from the label (New Comp Oil) equals 300 ml.

Then A/C System Oil = $1 + 2 + 3 = 60 + 30 + 90 = 180 \text{ ml}$

Finally, New Comp Oil - A/C System Oil = $300 - 180 = 120 \text{ ml}$

Therefore in the above example, 120 ml of oil should be drained from the new compressor.

Note: In some instances the above calculation could yield a negative value. In these instances the amount of oil should NOT be drained from the compressor, but rather the oil should be ADDED to the A/C system!

Install the new compressor and charge A/C system with oil if required.

Refer to Testing and Adjusting, SENR5664, "Charge process" and add , "Air Conditioning System PAG Oil Charge".

New Replacement Compressor

If the A/C compressor was replaced, then drain all the oil from the new replacement compressor.

Complete Check of Compressor Oil

When the replacement of a component is necessary, follow the procedures below. The procedure determines the amount of refrigerant oil (lost oil) that is needed in the compressor.

1. Operate the engine at 1000 rpm. Set the temperature on maximum cooling setting. Move the fan speed switch to HIGH. The system will stabilize in a minimum of 10 minutes.
2. Stop the engine. Remove the refrigerant charge from the system. Install a plug in all open lines. Refer to Testing and Adjusting, "Refrigerant Recovery" for the proper procedure.
3. Remove the compressor from the machine. Place protective caps on all fittings and hoses.

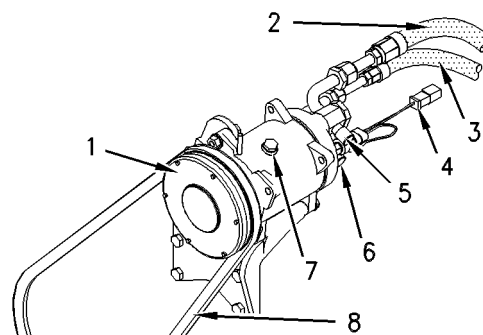


Illustration 103

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- (1) Pulley
- (2) Hose (low pressure)
- (3) Hose (high pressure)
- (4) Electrical harness
- (5) Service valve (low pressure)
- (6) Service valve (high pressure)
- (7) Plug (oil change)
- (8) Belt

4. Place the compressor in a horizontal position so oil plug (7) is facing downward. Remove oil plug (7) from the compressor. Drain the oil into a clean container. Rock the compressor back and forth in order to remove all of the oil. Also, rotate the compressor shaft in order to drain the rest of the oil that is in the oil sump. Record the volume of drained refrigerant. Inspect the oil for the following items:

- Contaminants
- Metal chips
- Rubber particles
- Foreign material

Dispose of the oil in a suitable container. Use the following list as a guide for adding oil into the compressor:

- If the amount of oil that is drained from the compressor is 177 mL (6 fl oz) to 237 mL (8 fl oz), put the same amount of new refrigerant oil in the compressor. **Never refill with more than 237 mL (8 fl oz) of oil to the compressor unless the system has been flushed.**
- If the amount of oil that is drained from the compressor is less than 177 mL (6 fl oz), add 177 mL (6 fl oz) to 237 mL (8 fl oz) of new refrigerant oil to the compressor.
- If a new compressor or a rebuilt compressor is installed, drain all of the oil from the compressor and add 177 mL (6 fl oz) to 237 mL (8.0 fl oz) of new refrigerant oil in the compressor.
- If the system was flushed do not remove the oil from a new compressor.
- Refer to 34 if individual components are replaced without charging the compressor or without flushing the system.

Table 34

Oil Capacities for Component Replacements	
Accumulator	30 mL (1 fl oz)
Compressor	Refer to the Service Manual, SENR5664, "Refrigerant Compressor Oil-Check" section in Testing and Adjusting.
Condenser	30 mL (1 fl oz)
Evaporator	90 mL (3 fl oz)
In-Line Dryer ⁽¹⁾	30 mL (1 fl oz)
Receiver-Dryer	30 mL (1 fl oz)

⁽¹⁾ Refer to the Service Manual, SENR5664, "In-Line-Refrigerant Dryer - Remove and Install" before any oil is added.

If too much oil has been added to the system and a total of more than 325 mL (11 fl oz) of oil is in the system, the cooling capacity of the system will be reduced. If too little oil has been added to the system, the compressor may fail due to a lack of lubrication.

If the failure of a component, causes particles of metal or other foreign material to be introduced into the system. flushing the system will be necessary. Refer to Troubleshooting, "Air Conditioning System Troubleshooting" for the proper diagnostics.

Note:

- a. Add oil to the compressor through opening for the oil plug (7) or inject the oil through the ports that are for charging. The compressor must be positioned so that the refrigerant oil will not flow out-of-service valves (5) and (6). Do not rest the compressor on the compressor shaft. Turn the compressor shaft by hand when you fill the compressor. The oil will slowly flow into the compressor. Only use refrigerant oil that is approved and recommended.
- b. Add oil to any components that are being installed.
- c. Inject oil into the pressurized system through the port for low pressure charging while the engine is running and the compressor is operating.
- d. After the correct amount of refrigerant oil has been added to the system, install the compressor and the drive belt. Refer to Testing and Adjusting, "Refrigerant System - Charge" for the proper procedure.

Add Air Conditioning System PAG Oil Charge

Charge the a/c system at the high-pressure service port with the total oil recharge quantity that is shown in table 33.

Follow the instructions included with the oil charging equipment. Review the MSDS, and follow all recommendations when working with PAG oil. DO NOT use PAG oil in Electric Compressors.

Note: If oil has leaked from the system prior to service, then the system oil charge cannot be accurately determined using the Table 34 method. Proper oil charge can now only be determined by flushing and using method for oil charge after system flush.

NOTICE

Do not use Polyalkylene Glycol (PAG) oil in 294 - 8140 Compressor Assembly. Use Polyol Ester (POE) oil. The use of any other will cause rapid dielectric failure of the compressor.

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Refrigerant Compressor - Test

SMCS Code: 1802-081

Identifying compressors that function is the purpose of this instruction. Compressors that function should be identified before the compressors are removed from a machine. Compressors that function should produce both high pressure and low pressure. If the compressor fails any one of Steps 3, 5, 7, or 8, then the compressor is considered to be a "failed" compressor. Please indicate the steps which were failed by the compressor in the story for a warranty claim.

Note: If the compressor fails one of the steps, then the air conditioning system should be diagnosed in order to find the root cause of the failure. The root cause of the failure should be repaired. If the compressor is considered to be "good", then additional assistance with the diagnosis of the air conditioning system can be found in Service Manual, SEN5664, "Air Conditioning and Heating R134a for all Caterpillar Machines" or by contacting your Caterpillar dealer.

Procedures

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

- 1. Check the air filters.** If the complaint of the customer is poor cooling of the cab, past experience has shown that plugged air filters can often be the cause. Most air conditioning systems have return air filters and fresh air filters. Be sure to check both the return air filters and fresh air filters.

Air Filters Checked? Yes or No.

2. **Test the voltage.** While the engine is running and the air conditioning is switched ON, check the voltage at the compressor. The voltage at the compressor should be a minimum of 11.5VDC for a 12VDC system or 23 volts for a 24VDC system. The routinely used electrical loads should be turned ON. For example, a lighting system which is added by the customer could cause available voltage to decrease below the minimum specification.

Voltage Checked? Yes or No.

Measured Voltage Level: _____ (volts)

Note: When the air conditioning is switched ON, for air conditioning systems with a Compressor Protection System (CPS), there is approximately a 30 second delay before a voltage signal is detected at the compressor. Air conditioning systems with CPS can be identified by the use of either the 169-7443 On Delay Timer As or the 212-2204 Air Conditioner Control Gp. In most applications, the electronic control group is located near the compressor.

3. **Test the resistance.** Measure resistance of the clutch coil at the compressor connector. For 12VDC models, measured resistance should be within -0.3 to +1.1 ohms of the amount which is listed in the Specifications section of Service Manual, SENR5664, "Air Conditioning and Heating R134a for all Caterpillar Machines", "Refrigerant Compressor". For 24VDC models, measured resistance should be within -1.3 to +5.5 ohms of the amount which is listed in Specification section of Service Manual, SENR5664, "Air Conditioning and Heating R134a for all Caterpillar Machines", "Refrigerant Compressor". The resistance ranges which are listed above compensate for the effect of temperature on the clutch coil. The values which are listed in the Specifications section of Service Manual, SENR5664, "Air Conditioning and Heating R134a for all Caterpillar Machines", "Refrigerant Compressor" are nominal for 20 °C (68 °F).

Resistance Checked? Yes or No.

Measured Level of Resistance: _____ (ohms)

4. **Check the belt tension.** For new belts and old belts, use the 144-0235 Belt Tension Gauge. For a new belt installation, the initial belt tension for a compressor which drives the system without an auto tensioning device should be 534 N (120 lb). For used belts, the belt tension should be 400 N (90 lb).

Belt Tension Checked? Yes or No.

Measured New Belt Tension: _____ (N) or (lbs)

Measured Old Belt Tension: _____ (N) or (lbs)

WARNING

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, turn the battery disconnect switch to the OFF position and remove the key. If the machine is not equipped with a battery disconnect switch, disconnect the battery cables from the battery and tape the battery clamps.

Place a do not operate tag at the battery disconnect switch location to inform personnel that the machine is being worked on.

Note: The electrical power supply to the compressor should be switched OFF in order to perform this test.

5. **Test the rotation.** Rotate the compressor in the direction of belt travel by turning the nut on the end of the main shaft of the compressor. Rotation should be smooth with no binding.

Rotation Checked? Yes or No.

Rotation Smooth? Yes or No.

6. **Check the charge level.** The air conditioning system must be correctly charged per Caterpillar specification or an incorrect diagnosis will occur. Recovering, evacuating, and recharging with clean refrigerant to the correct level is the best method of achieving the correct refrigerant charge for the system. Charging the air conditioning system must be conducted by weighing refrigerant with a calibrated scale in order to ensure accuracy. Also, be sure to replace the oil which was removed during refrigerant recovery with new oil. Reference Service Manual, SENR5664, "Air Conditioning and Heating R134a for all Caterpillar Machines", "Refrigerant Compressor" for procedures regarding refrigerant charging and capacity of Caterpillar air conditioning systems.

Charge Level Checked? Yes or No.

Volume of Oil that was Removed During Recovery: _____ (ml) or (oz)

Weight of Refrigerant Charge: _____ (Kg) or (lbs)

7. Test for low pressure. The test for low pressure should be performed with ambient temperatures of less than 30 °C (86 °F). Park the machine in an area that is not in direct sunlight. Close all cab doors and windows. Block the flow of fresh air into the cab. If the air conditioning system is so equipped, bypass the low pressure switch. Start the machine. Operate the machine at high idle. Turn ON the air conditioning. Set the cab blower on LOW. After 10 to 15 minutes of operation, measure the low-side pressure at the refrigerant compressor. If the pressure reading is less than 69 kPa (10 psi) then the suction valves of the compressor are operating correctly.

Low Pressure Checked? Yes or No.

Low Pressure Reading: _____ (kPa) or (Psig)

Note: If the cab temperature is above 25 °C (77 °F), then the cab blower may need to be set to HIGH in order to reduce the temperature before starting the procedure.

8. Test for high pressure. Start the engine and set the speed at approximately 1200 rpm. Turn ON the air conditioning. Place a sheet of cardboard over the condenser in order to block the flow of air. Limiting the flow of air over the condenser will cause the discharge pressure of the compressor to increase. Check if the discharge of the compressor is able to increase up to 2414 kPa (350 psi). Once the specified pressure is reached, immediately remove the cardboard. If the compressor passes the test, the discharge valves are operating correctly.

High Pressure Checked? Yes or No.

High Pressure Reading: _____ (kPa) or (Psig)

The functional test is now complete. If this test procedure results in inconclusive results, your dealership's Technical Communicator can report the problem by using the on-line Dealer Solution Network. The Dealer Solution Network will provide your Technical Communicator with additional troubleshooting support.

Illustrations 104 through 107 are provided as Good Air Conditioning System Practices and Troubleshooting Tips.

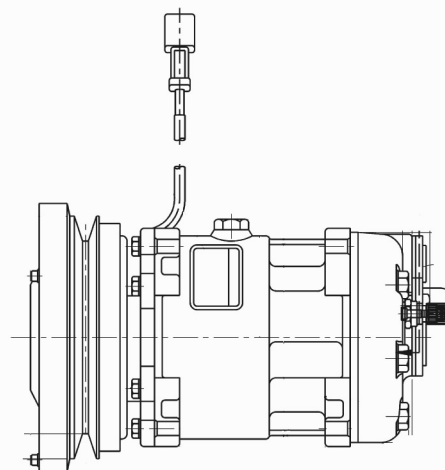


Illustration 104

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3E - 1906 Refrigerant Compressor Gp (Typical Refrigerant Compressor)

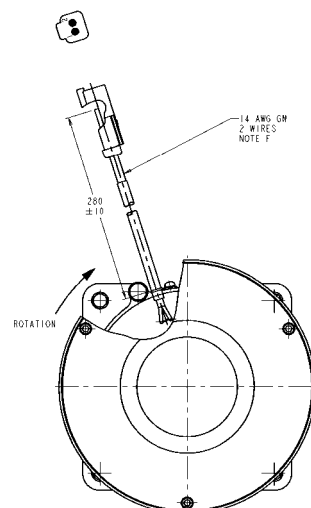


Illustration 105

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Wire lead and pin location for field coil

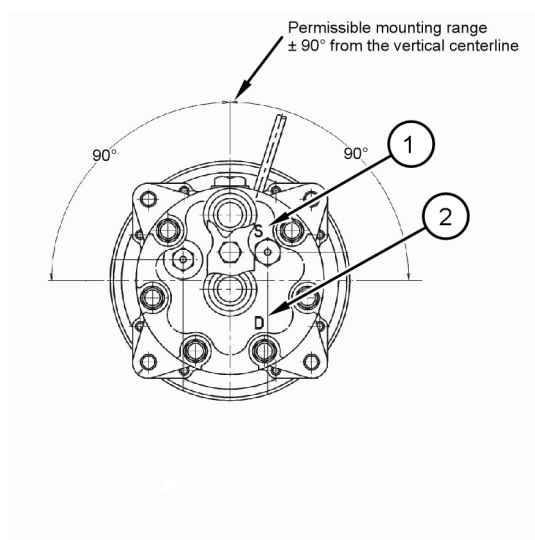


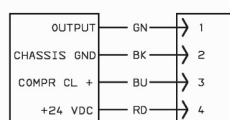
Illustration 106

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The permissible mounting location and orientation of Suction Port "S" and Discharge Port "D".

(1) Suction Port "S"

(2) Discharge Port "D"



SCHEMATIC SYMBOL

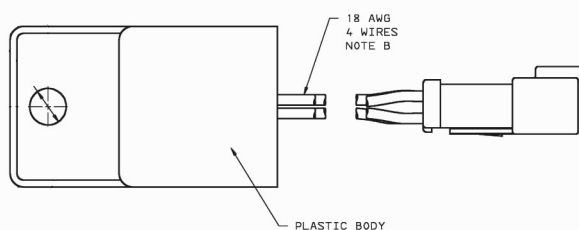


Illustration 107

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On Delay Timer Assembly (Compression Protection System)

Procedure to Test the On Delay Timer Assembly

The engine start switch must be in the ON position, and the air conditioning switch must be activated in order to diagnose a faulty on delay timer assembly for the refrigerant compressor.

Note: The on delay timer assembly will delay the power supply to the compressor clutch coil for 30 seconds after the air conditioning switch is activated.

1. Separate the four-pin connector from the wiring harness.
2. In order to check that power is getting from the on delay timer to the compressor, perform the following steps:
 - a. Set the 146-4080 Digital Multimeter Gp to DC voltage.
 - b. Connect the multimeter's positive probe to pin 4 on the wiring harness.

- c. Connect the multimeter's negative probe to a suitable ground. The multimeter should read 24VDC for 24 volt machines. The multimeter should read 12VDC for 12 volt machines.

Note: On a 24 volt system, if the voltage is below 22VDC or if the voltage is above 35VDC, the on delay timer will not supply power to the compressor. On 12 volt systems, the range is 9VDC to 24VDC.

- 3. Set the 146-4080 Digital Multimeter Gp to OHMS. Connect the multimeter's positive probe to pin location 2 on the wiring harness. Connect the multimeter's negative probe to a suitable chassis ground. The multimeter will display "OL" if the ground is not present.
- 4. Set the 146-4080 Digital Multimeter Gp to OHMS. Connect the multimeter's positive probe to pin location 1 on the wiring harness. Connect the multimeter's negative probe to a suitable chassis ground. If the multimeter displays "OL", one of the three switches is open. If an open condition occurs, check each of the switches.

Note: There must be refrigerant in the air conditioning system in order to close both of the pressure switches.

- 5. In order to check that power is getting from the on delay timer assembly to the compressor clutch coil, reconnect the on delay timer assembly to the wiring harness.
 - a. Set the 146-4080 Digital Multimeter Gp to DC voltage.
 - b. Remove the 2-pin connector from the compressor clutch coil.
 - c. Connect the negative probe to a suitable chassis ground.
 - d. Check each of the two pins on the wiring harness for voltage. On a 24 volt system, one of the pins should supply 24VDC. On a 12 volt system, one of the pins should supply 12VDC.
- 6. In order to check the ground path from the compressor clutch coil to the chassis, perform the following steps:
 - a. Turn OFF the air conditioning switch in the cab.
 - b. Set the 146-4080 Digital Multimeter Gp to Ohms.
 - c. Remove the two-pin connector from the compressor clutch coil.
 - d. Connect the negative lead to a suitable ground.

- e. Check each of the two pins on the two-pin connectors for continuity. One of the two pins should display "OL".

- 7. If both the correct ground and voltage are present, check the resistance of the compressor clutch coil. Refer to the Specifications section in Service Manual, SEN5664, "Air Conditioning and Heating R134a for all Caterpillar Machines", "Refrigerant Compressor".

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Refrigerant System - Evacuate

SMCS Code: 1809-541

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

⚠ WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

If replacement of a component is necessary or repair to a component is necessary, the refrigerant in the system must be recovered. Also, if the system has lost any charge after a long period of time, the refrigerant in the system must be recovered. It is necessary to perform the evacuating procedure in order to delete the system of all air and moisture. A complete charge must never be given to a system without first performing the evacuating procedure. Before evacuating the system, refer to the following manual.

- Testing and Adjusting, “Refrigerant Leakage - Test”
- Testing and Adjusting, “Refrigerant Recovery”
- Testing and Adjusting, “Refrigerant Compressor Oil - Check”

If the system has been left open for more than 1/2 hour, the system has been exposed to air or moisture and a new receiver-dryer, an in-line dryer or a desiccant accumulator needs to be installed. Moisture will combine with metals in the refrigerant system and this will produce highly corrosive by-products. The by-products are oxides, iron hydroxide, and aluminum hydroxide. Moisture can freeze the expansion valve and moisture can freeze the orifice tube. If there is water in the system the water must be removed. Remove the water by pumping the system with a vacuum pump and boiling the water. Refer to Table 35 that is shown below.

The time for the evacuation process will increase under the following conditions:

- The air conditioning system has been rebuilt.
- The air conditioning system has been flushed.
- The air conditioning system has new components.
- The air conditioning system has been retrofitted.

Table 35

Boiling Point of Water Under Vacuum	
Temperature of Work Area (°C (°F))	Vacuum That Is Required In Order To Boil Water In An Air Conditioning System (m bar (Hg))
38 °C (100 °F)	95 kPa (28 in Hg)
32 °C (89.6000 °F)	96.5 kPa (28.50 in Hg)
27 °C (81 °F)	97.5 kPa (28.80 in Hg)
21 °C (70 °F)	98.8 kPa (29.20 in Hg)

Note: After the leak test is completed, the system must be evacuated for a minimum of 30 minutes. In order to correctly evacuate the system, the vacuum gauge must be less than three inches away from the system port. If the gauge is more than three inches away from the system port, pull a vacuum and allow the system to equalize for ten minutes. This will ensure an accurate gauge reading.

NOTICE

All refrigerant must be recovered before the evacuating procedure is started. Never discharge the refrigerant through the vacuum pump. Never discharge the refrigerant into the atmosphere. Always use the Refrigerant Identifier tool in order to ensure that contamination of the system does not occur.

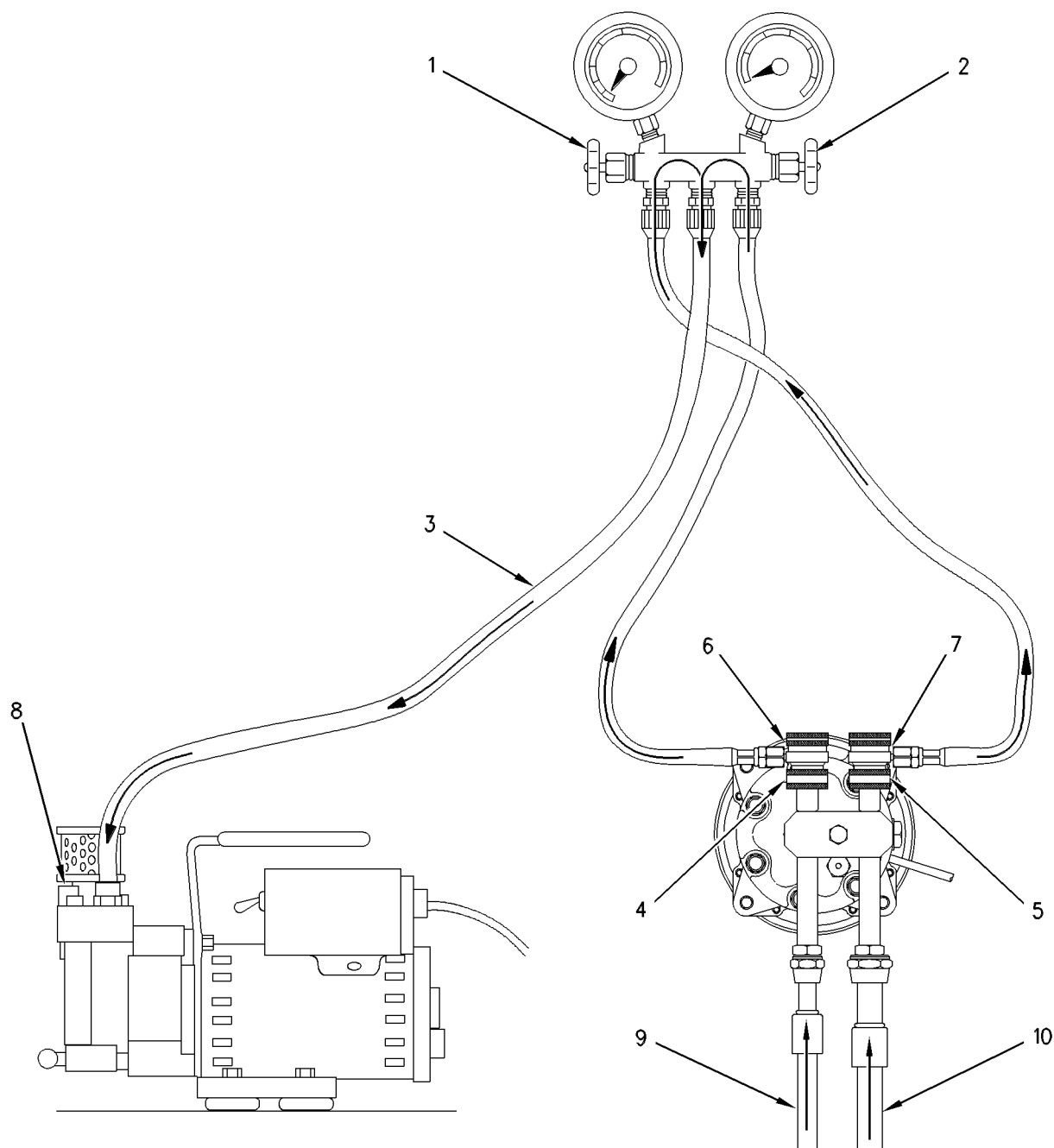


Illustration 108

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- (1) Low pressure valve
- (2) High pressure valve
- (3) Charging hose
- (4) Compressor block fitting (discharge)

- (5) Compressor block fitting (suction)
- (6) Service valve (discharge)
- (7) Service valve (suction)
- (8) Vented exhaust valve

- (9) Line from condenser
- (10) Line from evaporator

1. After the refrigerant is recovered from the system, make sure that the low pressure valve (1) and the high pressure valve (2) are closed. Disconnect the charging hose (3) of the manifold gauge set from the refrigerant service unit.
2. Check the oil level in the vacuum pump. Refer to the Testing and Adjusting, "Refrigerant Compressor Oil - Check" for the correct procedure. Add oil if oil is needed. If contamination of the system is indicated, change the oil.
3. Connect the electrical plug from the vacuum pump to an approved electrical outlet.
4. Connect the charging hose (3) to the inlet fitting on the vacuum pump. Refer to Illustration 108.
5. Open low pressure valve (1) and open high pressure valve (2) on the manifold gauge set completely. Turn the valves counterclockwise.
6. In order to start the pump motor, turn the power switch to the ON position.
7. In order to open the vented exhaust valve (8), turn the valve counterclockwise.

Note: The vented exhaust valve (8) must be closed until the vacuum pump has started.

8. Operate the vacuum pump until the low pressure gauge indicates a pressure that is between 95 kPa (28 in hg) and 98 kPa (29 in hg). After the vacuum in the system reaches a value that is between 95 kPa (28 in hg) and 98 kPa (29 in hg), close the vented exhaust valve (8). Operate the vacuum pump for a minimum of 90 minutes after the vented exhaust valve is closed. Use a 113 L/min (4 cfm) pump. Make allowances for pumps that are smaller than 113 L/min (4 cfm) cfm.

Note: 95 kPa (28 in hg) to 98 kPa (29 in hg) is the required specification at sea level. For every 305 m (1000 ft) above sea level, decrease the required specification by 3 kPa (1 in hg). At high elevations, less vacuum is required.

9. If the specific vacuum cannot be reached, the system may have a leak. Refer to the Testing and Adjusting, "Refrigerant Leakage - Test" section. Perform the procedures that are indicated. Repair all leaks and repeat Step 1 of the evacuating procedure.

Note: The evacuating procedure removes air and moisture from the system. Do not use the vacuum pump primarily to indicate a system leak.

10. After 95 kPa (28 in hg) to 98 kPa (29 in hg) vacuum has been reached and held for an additional 90 minutes, close valve (1) and close valve (2) completely. Turn the power switch on the vacuum pump to the OFF position. The maximum amount of vacuum loss in five minutes must not be more than 7 kPa (2 in hg). Excessive vacuum loss is an indication of a possible leak in the system. Refer to the Testing and Adjusting, "Refrigerant Leakage - Test" section. Perform the procedures that are indicated. Repair all leaks and repeat Step 1 of the evacuating procedure.
11. If the vacuum loss does not exceed 7 kPa (2 in hg) in five minutes, the system is then ready for a complete charge. Refer to the Testing and Adjusting, "Refrigerant System - Charge" section. Perform the procedures that are indicated.

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Refrigerant System - Charge

SMCS Code: 1809-045

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Table 36

Required Tools		
Part Number	Part Description	Quantity
4C-4874	Heater Blanket As	1

Relationship Between Temperature and Pressure (R-134a Refrigerant)

Table 37 can be used in order to determine the pressure level and contamination level of a container of refrigerant. Table 37 can also be used for an air conditioning system that is not operating. This same system must be stabilized to the ambient temperature. In order to stabilize an air conditioning system at the ambient temperature, the machine must not operate for 10 to 12 hours. The machine must not be stored in direct sunlight.

If the measured pressure at any specific temperature does not match the pressure that is given in the chart, the following problems may exist:

- Contaminants in the system
- Incorrect refrigerant
- Incorrect refrigerant charge

Table 37

Relationship Between Temperature and Pressure (R-134a Refrigerant)	
Temperature °C (°F)	Pressure kPa (psi) ⁽¹⁾
-18 °C (0.0 °F)	44 kPa (6.4 psi)
-17° C (2.0 °F)	51 kPa (7.4 psi)
-16 °C (4.0 °F)	59 kPa (8.5 psi)
-14 °C (6.0 °F)	66 kPa (9.6 psi)
-13 °C (8.0 °F)	74 kPa (10.7 psi)
-12 °C (10.0 °F)	82 kPa (11.9 psi)
-11 °C (12.0 °F)	90 kPa (13.1 psi)
-10 °C (14.0 °F)	99 kPa (14.3 psi)
-9 °C (16.0 °F)	108 kPa (15.6 psi)
-8 °C (18.0 °F)	117 kPa (17.0 psi)
-7 °C (20.0 °F)	127 kPa (18.4 psi)
-6 °C (21.0 °F)	132 kPa (19.1 psi)
-6 °C (22.0 °F)	137 kPa (19.8 psi)
-5 °C (23.0 °F)	141 kPa (20.5 psi)
-4 °C (24.0 °F)	147 kPa (21.3 psi)
-4 °C (25.0 °F)	152 kPa (22.0 psi)
-3 °C (26.0 °F)	157 kPa (22.8 psi)
-3 °C (27.0 °F)	163 kPa (23.6 psi)
-2 °C (28.0 °F)	168 kPa (24.4 psi)
-2 °C (29.0 °F)	174 kPa (25.2 psi)
-1 °C (30.0 °F)	179 kPa (26.0 psi)
-1 °C (31.0 °F)	185 kPa (26.8 psi)

(continued)

(Table 37, contd)

Relationship Between Temperature and Pressure (R-134a Refrigerant)	
Temperature °C (°F)	Pressure kPa (psi) ⁽¹⁾
0 °C (32.0 °F)	191 kPa (27.7 psi)
1 °C (33.0 °F)	197 kPa (28.5 psi)
1 °C (34.0 °F)	203 kPa (29.4 psi)
2 °C (35.0 °F)	209 kPa (30.3 psi)
2 °C (36.0 °F)	215 kPa (31.2 psi)
3 °C (37.0 °F)	221 kPa (32.1 psi)
3 °C (38.0 °F)	228 kPa (33.0 psi)
4 °C (39.0 °F)	234 kPa (34.0 psi)
4 °C (40.0 °F)	241 kPa (34.9 psi)
5 °C (41.0 °F)	248 kPa (35.9 psi)
6 °C (42.0 °F)	254 kPa (36.9 psi)
6 °C (43.0 °F)	261 kPa (37.9 psi)
7 °C (44.0 °F)	263 kPa (38.9 psi)
7 °C (45.0 °F)	275 kPa (39.9 psi)
8 °C (46.0 °F)	283 kPa (41.0 psi)
8 °C (47.0 °F)	290 kPa (42.0 psi)
9 °C (48.0 °F)	297 kPa (43.1 psi)
9 °C (49.0 °F)	305 kPa (44.2 psi)
10 °C (50.0 °F)	312 kPa (45.3 psi)
11 °C (51.0 °F)	320 kPa (46.4 psi)
11 °C (52.0 °F)	328 kPa (47.5 psi)
12 °C (53.0 °F)	336 kPa (48.7 psi)
12 °C (54.0 °F)	344 kPa (49.9 psi)
13 °C (55.0 °F)	352 kPa (51.0 psi)
13 °C (56.0 °F)	360 kPa (52.2 psi)
14 °C (57.0 °F)	369 kPa (53.5 psi)
14 °C (58.0 °F)	377 kPa (54.7 psi)
15 °C (59.0 °F)	385 kPa (55.9 psi)
16 °C (60.0 °F)	394 kPa (57.2 psi)
16 °C (61.0 °F)	403 kPa (58.2 psi)
17 °C (62.0 °F)	412 kPa (59.8 psi)
17 °C (63.0 °F)	421 kPa (61.1 psi)
18 °C (64.0 °F)	430 kPa (62.4 psi)
18 °C (65.0 °F)	440 kPa (63.8 psi)
19 °C (66.0 °F)	450 kPa (65.2 psi)
19 °C (67.0 °F)	459 kPa (66.8 psi)
20 °C (68.0 °F)	469 kPa (68.0 psi)
21 °C (69.0 °F)	478 kPa (69.4 psi)

(continued)

(Table 37, contd)

Relationship Between Temperature and Pressure (R-134a Refrigerant)	
Temperature °C (°F)	Pressure kPa (psi) ⁽¹⁾
21 °C (70.0 °F)	488 kPa (70.8 psi)
22 °C (71.0 °F)	498 kPa (72.3 psi)
22 °C (72.0 °F)	509 kPa (73.8 psi)
23 °C (73.0 °F)	519 kPa (75.3 psi)
23 °C (74.0 °F)	530 kPa (76.8 psi)
24 °C (75.0 °F)	540 kPa (78.3 psi)
24 °C (76.0 °F)	551 kPa (79.9 psi)
25 °C (77.0 °F)	562 kPa (81.5 psi)
26 °C (78.0 °F)	573 kPa (83.1 psi)
26 °C (79.0 °F)	584 kPa (84.7 psi)
27 °C (80.0 °F)	595 kPa (86.3 psi)
27 °C (81.0 °F)	607 kPa (88.0 psi)
28 °C (82.0 °F)	618 kPa (89.7 psi)
28 °C (83.0 °F)	630 kPa (91.4 psi)
29 °C (84.0 °F)	642 kPa (93.1 psi)
29 °C (85.0 °F)	654 kPa (94.8 psi)
30 °C (86.0 °F)	666 kPa (96.6 psi)
31 °C (87.0 °F)	678 kPa (98.4 psi)
31 °C (88.0 °F)	691 kPa (100.2 psi)
32 °C (89.0 °F)	703 kPa (102.0 psi)
32 °C (90.0 °F)	716 kPa (103.8 psi)
33 °C (91.0 °F)	729 kPa (105.7 psi)
33 °C (92.0 °F)	742 kPa (107.6 psi)
34 °C (93.0 °F)	755 kPa (109.5 psi)
34 °C (94.0 °F)	768 kPa (111.4 psi)
35 °C (95.0 °F)	782 kPa (113.4 psi)
36 °C (96.0 °F)	796 kPa (115.4 psi)
36 °C (97.0 °F)	809 kPa (117.4 psi)
37 °C (98.0 °F)	823 kPa (119.4 psi)
37 °C (99.0 °F)	838 kPa (121.5 psi)
38 °C (100.0 °F)	852 kPa (123.5 psi)
38 °C (101.0 °F)	866 kPa (125.6 psi)
39 °C (102.0 °F)	881 kPa (127.8 psi)
39 °C (103.0 °F)	896 kPa (129.9 psi)
40 °C (104.0 °F)	911 kPa (132.1 psi)
41 °C (105.0 °F)	926 kPa (134.3 psi)
41 °C (106.0 °F)	941 kPa (136.5 psi)
42 °C (107.0 °F)	956 kPa (138.7 psi)

(continued)

(Table 37, contd)

Relationship Between Temperature and Pressure (R-134a Refrigerant)	
Temperature °C (°F)	Pressure kPa (psi) ⁽¹⁾
42 °C (108.0 °F)	972 kPa (141.0 psi)
43 °C (109.0 °F)	988 kPa (143.3 psi)
43 °C (110.0 °F)	1004 kPa (145.6 psi)
44 °C (111.0 °F)	1020 kPa (147.9 psi)
44 °C (112.0 °F)	1036 kPa (150.3 psi)
45 °C (113.0 °F)	1053 kPa (152.7 psi)
46 °C (114.0 °F)	1069 kPa (155.1 psi)
46 °C (115.0 °F)	1087 kPa (157.6 psi)
47 °C (116.0 °F)	1103 kPa (160.0 psi)
47 °C (117.0 °F)	1120 kPa (162.5 psi)
48 °C (118.0 °F)	1138 kPa (165.1 psi)
48 °C (119.0 °F)	1156 kPa (167.6 psi)
49 °C (120.0 °F)	1173 kPa (170.2 psi)
49 °C (121.0 °F)	1191 kPa (172.8 psi)
50 °C (122.0 °F)	1209 kPa (175.4 psi)
51 °C (123.0 °F)	1228 kPa (178.1 psi)
51 °C (124.0 °F)	1247 kPa (180.8 psi)
52 °C (125.0 °F)	1265 kPa (183.5 psi)
52 °C (126.0 °F)	1285 kPa (186.3 psi)
53 °C (127.0 °F)	1304 kPa (189.1 psi)
53 °C (128.0 °F)	1323 kPa (191.9 psi)
54 °C (129.0 °F)	1342 kPa (194.7 psi)
54 °C (130.0 °F)	1362 kPa (197.6 psi)
55 °C (131.0 °F)	1382 kPa (200.5 psi)
56 °C (132.0 °F)	1402 kPa (203.4 psi)
56 °C (133.0 °F)	1422 kPa (206.3 psi)
57 °C (134.0 °F)	1443 kPa (209.3 psi)

⁽¹⁾ All pressures in this table are gauge pressures.

Procedure for Labeling

Attach a label to the air conditioning system that indicates the system charge. Attaching a label to the system will allow easy identification of the system. Refer to Table 38 for the part number of the appropriate label. A 8L - 8413 Cable Strap may be used in order to secure the tag to the air conditioning system.

Table 38

System Capacity	Part Number for Label
9U-7551 Air Conditioner Oil	

(continued)

(Table 38, contd)

System Capacity	Part Number for Label
1.5 kg (3.31 lb)	130-4677
1.8 kg (3.97 lb)	114-0050
1.9 kg (4.19 lb)	114-0051
2.0 kg (4.41 lb)	114-0052
2.1 kg (4.63 lb)	114-0053
2.2 kg (4.85 lb)	114-0054
2.3 kg (5.07 lb)	114-0055
2.5 kg (5.51 lb)	114-0056
2.7 kg (5.95 lb)	114-0057
3.0 kg (6.61 lb)	114-0058
3.1 kg (6.83 lb)	140-7484
4C-2959 Air Conditioner Oil	
1.6 kg (3.54 lb)	114-0059
1.7 kg (3.75 lb)	114-0060
1.8 kg (3.97 lb)	114-0061
1.9 kg (4.19 lb)	114-0062
2.0 kg (4.41 lb)	114-0063
2.1 kg (4.63 lb)	114-0064
2.2 kg (4.85 lb)	114-0065
2.3 kg (5.07 lb)	114-0066
2.4 kg (5.29 lb)	114-0067
2.5 kg (5.51 lb)	114-0068
2.6 kg (5.73 lb)	114-0048
2.7 kg (5.95 lb)	114-0069
3.0 kg (6.61 lb)	114-0070
3.8 kg (8.38 lb)	114-0071
4C-2960 Air Conditioner Oil	
1.1 kg (2.42 lb)	122-3300
1.4 kg (3.09 lb)	114-0072
1.5 kg (3.31 lb)	114-0073
1.6 kg (3.53 lb)	114-0074
1.7 kg (3.75 lb)	114-0075
1.8 kg (3.97 lb)	114-0076
1.9 kg (4.19 lb)	114-0077
2.0 kg (4.41 lb)	114-0078
2.1 kg (4.63 lb)	114-0079
2.2 kg (4.85 lb)	114-0080
2.3 kg (5.07 lb)	114-0081
2.4 kg (5.29 lb)	114-0082

(continued)

(Table 38, contd)

System Capacity	Part Number for Label
2.5 kg (5.51 lb)	114-0083
2.6 kg (5.73 lb)	114-0084
2.7 kg (5.95 lb)	122-3301
2.8 kg (6.17 lb)	114-0085
3.0 kg (6.61 lb)	122-3302

Charging the System

Pressure cannot accurately be used to charge the air conditioning system

An accurate refrigerant charge may only be determined by weight. Several variables affect the pressure and the variables cause the system to be incorrectly charged.

Compressor Speed –

- The rate of refrigerant that is pumped by the compressor will affect the pressure that is built by the compressor.

Air Flow and Air Temperatures Through the Condenser and Evaporator –

- The amount of air flow and the temperature of the air that is moving through the condenser or evaporator will affect the pressures that are seen at the compressor. Blockages in the stream of air flow will affect the amount of heat that is rejected from the refrigerant or absorbed into the refrigerant. This process affects the working pressures.

Ambient Temperature –

- Pressures are affected by ambient air temperature and solar load to the cab.
- Temperature that is around hoses and other components affect the ambient temperature. As the engine heats up, some of the heat is absorbed into the refrigerant during the refrigerant ride through the hoses and components. The pressure in the compressor can be greatly affected by the heat that is absorbed in many locations.
- Ambient temperatures will change throughout the operation of the AC, resulting in constant pressure fluctuations.

Internal Blockages –

- Blockages that are at different locations in the refrigerant circuit will affect the pressures and the blockages will cause various concerns with pressure and fluctuations.

Note: Do not add or remove part of the refrigerant.

Note: Never charge liquid or gas through the discharge side (high side) of the system when the engine is in operation.

NOTICE

In an expansion valve system which uses poly alkaline glycol (PAG), the sight glass is not a reliable way to determine the system charge.

Note: For expansion valve systems that contain PAG oil, the sight glass cannot be used for charging the system. In order to achieve a full charge for the system, the refrigerant must be recovered from the system and the system must be evacuated. After the system has been recovered and the system has been evacuated, charge the system with the correct amount of refrigerant. This process is the only procedure that is recommended. Refer to the Specifications, “System Capacities for Refrigerant” section for the proper capacity. Also, refer to the Service Manual, SENR5664, “Identifying the Air Conditioning System” section.

Note: Before you charge the system, these important items should be checked.

1. Condenser and evaporator

- Inspect the condenser and inspect the evaporator for foreign material such as dirt, insects, plastic bags, and so on, that would inhibit air flow.
- With condensers that are mounted on the roof and with remote mounted condensers, always check that both fan motors are running. Check for restrictions. A clean condenser will lead to improved life for the compressor.

2. Check for a loose belt on the compressor.

3. Clean the fresh air filter and clean the recirculation filter.

4. Check the moisture indicator on either the receiver-dryer or the in-line dryer. If the moisture indicator is pink or white, there is moisture in the system. Replace the receiver-dryer or the in-line dryer. Refer to the Service Manual, SENR5664, “Machine Preparation for Disassembly and Assembly” section. If the moisture indicator is blue, the system is normal.

5. Check the condensate tube on the evaporator. Make sure that the tube is not plugged and that the valve is properly in place.

Note: Before an accurate reading for moisture can be attained, a new receiver-dryer requires 2 to 3 hours of operation.

Refer to the Troubleshooting, "Machine Preparation for Troubleshooting" section in Testing and Adjusting before service work is performed on the air conditioning system.

Note: The preferred method for charging the air conditioning system is listed below.

- Recover the refrigerant.
- Evacuate the system.
- Charge the system with the correct amount of refrigerant. Measure the refrigerant by weight.

Note: After the system has been recovered and the system has been evacuated, charge the system with the correct amount of refrigerant. Measure the refrigerant by weight. Refer to the Specifications, "System Capacities for Refrigerant" section for the proper capacity. Also, refer to the Service Manual, SEN5664, "Identifying the Air Conditioning System" section.

Complete Charge of the System from a Refrigerant Tank with a Scale

The use of a refrigerant tank, heat blanket, and a scale is necessary in order to charge the system. Use the procedure that follows to charge the system.

Note: Ensure that you have enough refrigerant in the tank for a complete charge. Do not use multiple cans of refrigerant, using multiple cans of refrigerant leads to incorrect charge amounts.

NOTICE

Evacuate the system before charging any Refrigerant system. Refer to Service Manual, SEN5664, "Refrigerant System - Evacuate".

In order to find the refrigerant capacity for the system that needs a refrigerant charge, refer to the Specifications, "System Capacities for Refrigerant" section. Also, refer to the Service Manual, SEN5664, "Identifying the Air Conditioning System" section.

Engine OFF

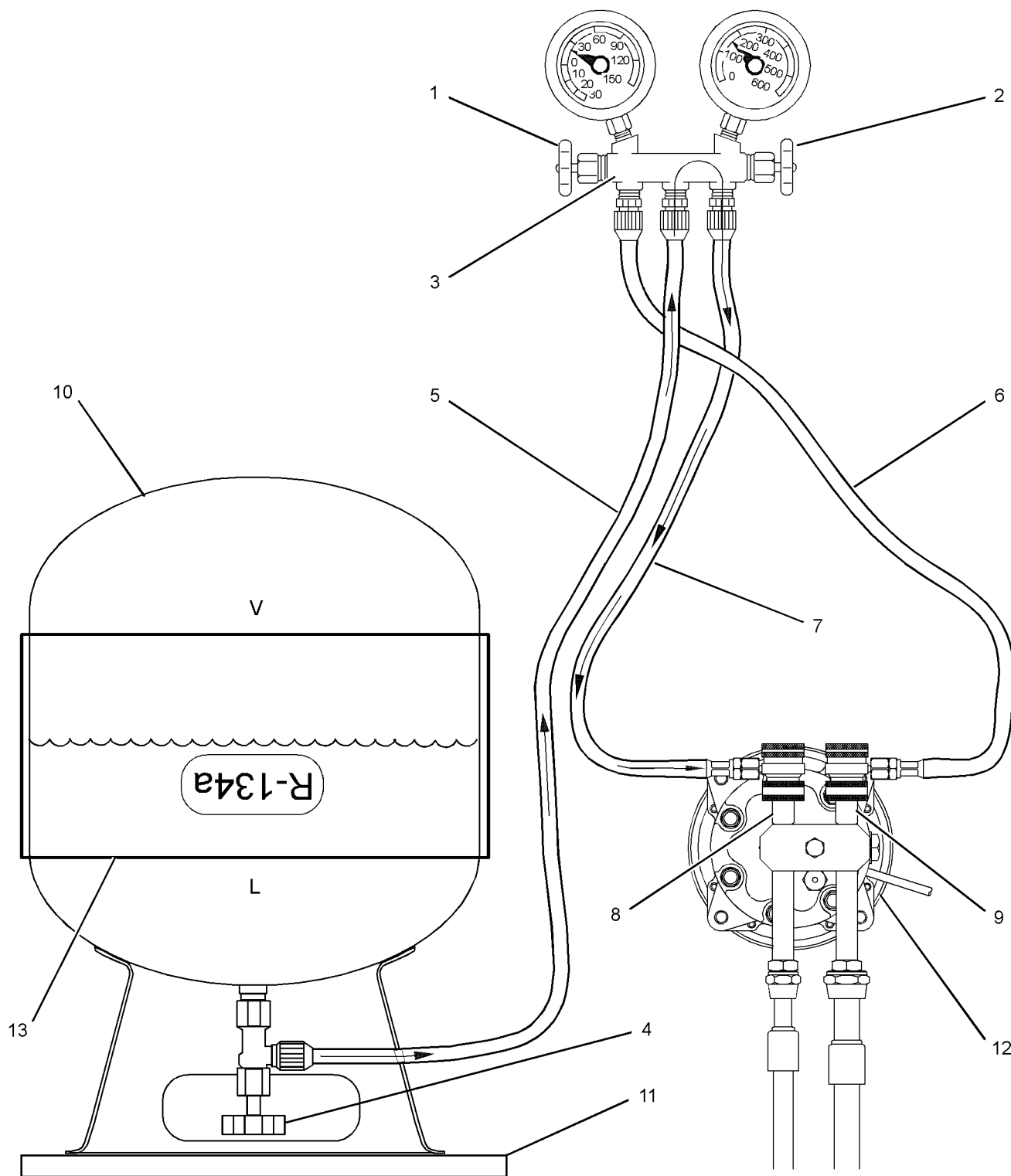


Illustration 109

Refrigerant tank inverted for liquid charging

- (1) Low-pressure valve
- (2) High-pressure valve
- (3) Manifold gauge set
- (4) Valve on top of refrigerant tank
- (5) Charging hose

- (6) Low-pressure hose
- (7) High-pressure hose
- (8) Service valve (discharge)
- (9) Service valve (suction)
- (10) Refrigerant tank

- (11) Scale
- (12) Compressor
- (13) Heat blanket
- (V) Vapor
- (L) Liquid

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1. Hand tighten charging hose (5) from the manifold gauge set directly to the valve (4) on refrigerant tank (10). Open the valve (4) on top side of refrigerant tank (10).
2. Turn the tank over so that the tank is resting on handles of tank. This procedure allows the flow of liquid refrigerant through the charging hose (5) to the manifold gauge set (3).

Place the refrigerant tank (10) on the scale (11) so that the valve (4) is at the bottom. Check and record the weight of the tank.
3. Loosen the hose (5) at the manifold gauge set (3) for 2 to 3 seconds. Then tighten the connection. This procedure will purge the air from the line.
4. Open the high-pressure valve (2) on the manifold gauge set (3). This action allows the refrigerant liquid to charge the system through the high-pressure side of the compressor.
5. Check the weight of the refrigerant tank (10) often. The weight will decrease as the refrigerant leaves the tank and the refrigerant enters the system. When the required amount of refrigerant (system capacity) has entered the system, close the valve (4) on the tank and close the high-pressure valve (2). Closing the valves stops the flow of the refrigerant. For example, 1.8 kg (4 lb) of refrigerant has entered a system with 1.8 kg (4 lb) capacity.

Note: Heater blanket (13) is required when you charge an air conditioning system.

6. Record the following information in the "SIMS" ticket.
 - Record the amount of refrigerant you recovered from the "HVAC" system.
 - Record the amount of oil that you recovered from the "HVAC" system or removed from the "HVAC" components.
 - Record the amount of refrigerant you charged back into the system.
 - Record the amount of oil you replenished into the system. Refer to Service Manual, SEN5664, "Refrigerant Oil-Test" to determine the correct amount of oil to replace.
7. In order to ensure correct system operation, disconnect charging hose (5) and conduct a performance check. Refer to the Service Manual, SEN5664, "Performance Checks for the Air Conditioning System" section.

Manifold Gauge Set (Refrigerant) - Remove

SMCS Code: 7465-011

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Remove charging hoses properly. A low system charge will result from charging hoses that are not removed correctly. In order to ensure accuracy of the refrigerant charge, the refrigerant should be removed from the charging hoses. Refer to the following steps in order to remove the refrigerant from the charging hoses:

1. Allow the compressor to continue operating. Close the valve on the high pressure side. The valve is located near the charging ports on the compressor. Disconnect the high pressure hose from the air conditioning system.
2. Open the high pressure valve and open the low pressure valve at the gauge set. The refrigerant that is in the hoses will be removed by the compressor through the low pressure hose.
3. Close the valve on the low pressure side. This valve is located near the charging ports on the compressor. Disconnect the low pressure hose from the air conditioning system. The system is now charged.

Note: After the manifold gauge set is removed, it is necessary to cap the charging valves.

i03863034

Compressor Protection System - Test

SMCS Code: 1802-081

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

The air conditioning systems on Caterpillar machines use pressure switches in order to protect the air conditioning system. Some air conditioning systems on Caterpillar machines use pressure switches and the on delay timer assembly for the refrigerant compressor in order to protect the air conditioning system. Arc suppressors protect other electrical components in the air conditioning system. Arc suppressors are applied in order to discharge electrical inductance when the compressor disengages. Failure of the arc suppressor can affect the reliability of the pressure switch. Failure of the arc suppressor may cause failure of the pressure switch.

The following procedures are for the testing of the on delay timer assembly, pressure switches, and components of the arc suppressor.

Table 39

Required Tools	
Part Number	Part Description
146-4080	Digital Multimeter (RS-232)

On Delay Timer Assembly for the Refrigerant Compressor Tests

In order to diagnose a faulty on delay timer assembly for the refrigerant compressor, the engine start switch must be in the ON position and the air conditioning switch activated.

Note: The on delay timer assembly will delay the power supply to the compressor clutch coil for 30 seconds after the air conditioning switch is activated.

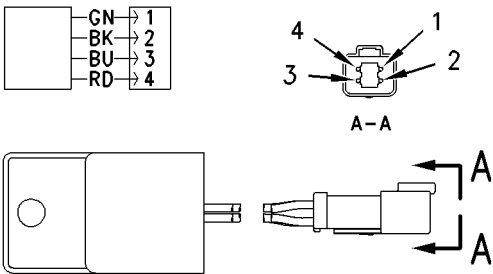


Illustration 110

g00754249

- (1) Output (signal voltage)
- (2) Chassis ground
- (3) Compressor clutch
- (4) Power supply

1. Separate the four pin connectors from the wiring harness.

2. Set the 146-4080 Digital Multimeter to DC voltage. Connect the positive probe to pin (4) on the wiring harness and connect the negative probe to a suitable ground. The multimeter should read 12 volts for a 12 volt system or the multimeter should read 24 volts for a 24 volt system.

Note: If the voltage is below 9 volts or the voltage is above 24 volts for a 12 volt system the on delay timer assembly will not supply power to the compressor.

Note: If the voltage is below 18 volts or the voltage is above 32 volts for a 24 volt system the on delay timer assembly will not supply power to the compressor.

3. Set the 146-4080 Digital Multimeter to OHMS. Connect the positive probe to pin location (2) on the wiring harness and connect the negative probe to a suitable chassis ground. The multimeter will display OL if the ground is not present.

4. Set the 146-4080 Digital Multimeter OHMS. Connect the positive probe to pin location (1) on the wiring harness and connect the negative probe to a suitable chassis ground. If the multimeter displays OL one of the three switches are open. Check each of the switches if an open condition occurs.

Note: There must be refrigerant in the air conditioning system in order to close both of the pressure switches.

5. In order to check that power is getting from the on delay timer assembly to the compressor clutch coil, reconnect the on delay timer assembly to the wiring harness. Set the 146-4080 Digital Multimeter to DC voltage. Remove the 2-pin connector from the compressor clutch coil. Connect the negative probe to a suitable chassis ground. Check each one of the two pins on the wiring harness for voltage. One of the two pins should supply 12 volts for a 12 volt system or 24 volts for a 24 volt system.

6. In order to check the ground path from the compressor clutch coil to the chassis, turn off the air conditioning switch in the cab. Set the 146-4080 Digital Multimeter OHMS. Remove the 2-pin connector from the compressor clutch coil. Connect the negative lead to a suitable ground. Check each of the two pins on the two pin connectors for continuity. One of the two pins should display OL.

7. If both the correct voltage and ground are present check the resistance of the compressor clutch coil. Refer to the Service Manual, SENR 5664, "Refrigerant Compressor" section in Specifications.

Pressure Switch Tests

Test Procedure for 114-5333 Pressure Switch and 114-5334 Pressure Switch (NORMALLY OPEN)

Pressure switches are used in order to protect the a/c compressor. The two most commonly used pressure switches are the 114-5333 Pressure Switch and the 114-5334 Pressure Switch. The only difference between the two switches is the connector. Only one of these switches is used per machine. The high pressure and low pressure switches have three possible switch positions which are given below:

OPEN – System pressure is low.

CLOSED – System pressure is correct.

OPEN – System pressure is high.

The two OPEN positions of the pressure switch protect the air conditioning system. The OPEN position prevents the compressor from actuating when potentially harmful pressures exist in the system. The CLOSED position is the normal operating switch position. The following table contains the logic for the pressure switches:

Table 40

Pressure	Range	Contact Position (Pressure Rise)	Contact Position (Falling Pressure)
High Position 3	Above 2800 kPa (406 psi)	OPEN	OPEN
Hysteresis Band ⁽¹⁾	1750 kPa (254 psi) to 2800 kPa (406 psi)	CLOSED	OPEN
Middle (Position 2)	275 kPa (40 psi) to 1750 kPa (254 psi)	CLOSED	CLOSED
Hysteresis Band ⁽¹⁾	170 kPa (25.0 psi) to 275 kPa (40 psi)	OPEN	CLOSED
Low Position 1	0 kPa (0 psi) to 170 kPa (25.0 psi)	OPEN	OPEN

⁽¹⁾ Pressure must pass through the hysteresis band in order to provide the correct conditions for the switch contact.



Illustration 111

g00651406

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146-4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is between 275 kPa (40 psi) and 1750 kPa (254 psi), the multimeter will display a value that is less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is within acceptable limits, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

8T - 8639 Low Pressure Switch (NORMALLY OPEN)

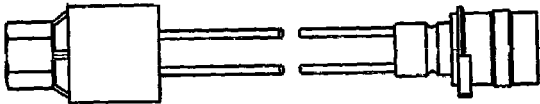


Illustration 112

g00651418

Table 41

Specifications for Pressure Switch	
Actuation Pressure ⁽²⁾	344 ± 34 kPa (50 ± 5 psi)
Deactuation Pressure ⁽³⁾	172 ± 21 kPa (25 ± 3 psi)

- (2) Close when pressure increases.
(3) Open when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146 - 4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is above 344 ± 34 kPa (50 ± 5 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not below the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

149 - 6371 Low Pressure Switch (NORMALLY OPEN)

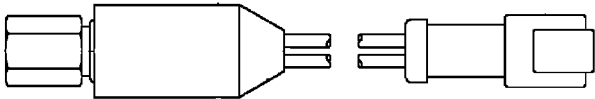


Illustration 113

g00651452

Table 42

Specifications for Pressure Switch	
Actuation Pressure ⁽²⁾	103 ± 14 kPa (15 ± 2 psi)
Deactuation Pressure ⁽³⁾	35 ± 7 kPa (5 ± 1 psi)

- (2) Close when pressure increases.
(3) Open when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146 - 4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is above 103 ± 14 kPa (15 ± 2 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not below the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

3E-6462 High Pressure Switch (NORMALLY CLOSED)



Illustration 114

g00651464

Table 43

Specifications for Pressure Switch	
Actuation Pressure ⁽⁴⁾	2400 ± 140 kPa (348 ± 20 psi)
Deactuation Pressure ⁽⁵⁾	1725 ± 100 kPa (250 ± 15 psi)

⁽⁴⁾ Open when pressure increases.

⁽⁵⁾ Close when pressure decreases.

Note: A pressure switch that is NORMALLY CLOSED will open when the system pressure increases. The pressure switch will close when the system pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146-4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is below 2400 ± 140 kPa (348 ± 20 psi), the multimeter will display less than 1 ohm.
5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not above the acceptable limit, replace the pressure switch.

6. When the pressure switch fails, test the arc suppressor for proper operation.

7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

7X-1076 High Pressure Switch (NORMALLY CLOSED)

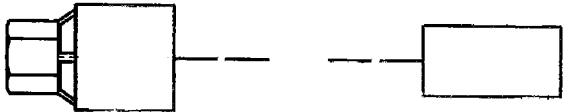


Illustration 115

g00651571

Table 44

Specifications for Pressure Switch	
Actuation Pressure ⁽⁴⁾	2412 ± 140 kPa (350 ± 20 psi)
Deactuation Pressure ⁽⁵⁾	1723 ± 100 kPa (250 ± 15 psi)

⁽⁴⁾ Open when pressure increases.

⁽⁵⁾ Close when pressure decreases.

Use the following procedures in order to test the pressure switch:

1. Disconnect the pressure switch from the machine harness.
2. Connect the 146-4080 Digital Multimeter to the two connector pins. Set the multimeter to the OHMS test mode.
3. Measure the resistance of the pressure switch.
4. If the system pressure is below 2412 ± 140 kPa (350 ± 20 psi), the multimeter will display less than 1 ohm.

5. If the resistance that is displayed is a value of OL (high resistance), and the system pressure is not above the acceptable limit, replace the pressure switch.
6. When the pressure switch fails, test the arc suppressor for proper operation.
7. If the pressure switch is removed, make sure that the wires on the new pressure switch are tie-wrapped. Securing the pressure switch prevents damage that may be caused by vibration.

Note: The multimeter may display OL if the contacts on the pressure switch are dirty. The contacts on the pressure switch can become dirty if the arc suppressor is no longer functioning.

Note: The multimeter will display OL if the pressure switch is not threaded into the air conditioning system.

Test Procedures for Arc Suppressors:

106-8704 Arc Suppressor

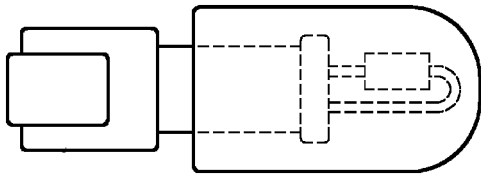


Illustration 116

g00651378

106-8704 Arc Suppressor

1. Place the multimeter in the DIODE test mode.
2. Place the red probe in the red terminal (positive terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 2 of the connector on the arc suppressor. Place the black probe on Pin 1 of the connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.
6. Place the red probe on Pin 1 of the connector on the arc suppressor. Place the black probe on Pin 2 of the connector on the arc suppressor.
7. The multimeter should display OL.

8. If the above conditions do not exist, the component should be considered faulty. The component will not provide adequate protection if the above conditions do not exist.
9. Replace the component if the component has failed.

3E-9169 Arc Suppressor and 130-8134 Arc Suppressor

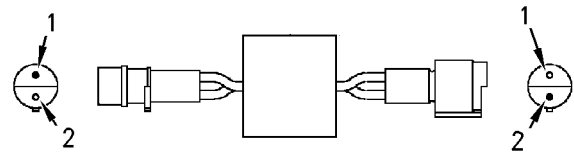


Illustration 117

g00651923

Arc Suppressor with Sure Seal Connectors

- (1) Pin 1
- (2) Pin 2

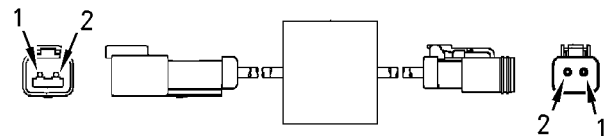


Illustration 118

g00651621

Arc Suppressor with DT Connectors

- (1) Pin 1
- (2) Pin 2

1. Place the multimeter in the DIODE test mode.
2. Place the red probe in the red terminal (positive terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 1 of either connector on the arc suppressor. Place the black probe on Pin 2 of either connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.

6. Place the red probe on Pin 2 of either connector of arc suppressor. Place the black probe on Pin 1 of either connector on the arc suppressor.
7. The multimeter should display OFL or OL.
8. Place the red probe on pin 1 of the female connector. Place the black probe on pin 1 of the male connector.
9. The multimeter should have a reading of less than 0.01 VDC.
10. Place the red probe on Pin 2 of the female connector. Place the black probe on Pin 2 of the male connector.
11. The multimeter should have a reading of less than 0.01 VDC.
12. The component is faulty if any of the conditions do not exist.
13. If the component is faulty, replace the component.

105-8827 Arc Suppressor and 130-0956 Arc Suppressor

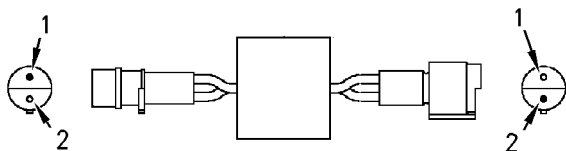


Illustration 119
Arc Suppressor with Sure Seal Connectors
(1) Pin 1
(2) Pin 2

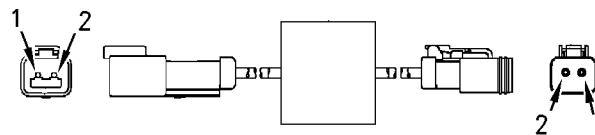


Illustration 120
Arc Suppressor with DT Connectors
(1) Pin 1
(2) Pin 2

1. Place the multimeter in the DIODE test mode.
2. Place the red probe in the red terminal (plus terminal) of the multimeter.
3. Place the black probe in the black terminal (negative terminal) of the multimeter.
4. Place the red probe on Pin 1 of either connector on the arc suppressor. Place the black probe on Pin 2 of either connector.
5. The multimeter should display a value between 0.5 VDC and 1.0 VDC.
6. Place the red probe on pin 2 of either connector of arc suppressor. Place the black probe on pin 1 of either connector on the arc suppressor.
7. The multimeter should display OFL or OL.
8. Place the red probe on pin 1 of the female connector. Place the black probe on pin 1 of the male connector.
9. The multimeter should have a reading of less than 0.01 VDC.
10. Place the red probe on pin 2 of the female connector. Place the black probe on pin 2 of the male connector.
11. The multimeter should have a reading of less than 0.01 VDC.
12. The component is faulty if any of the conditions do not exist.
13. If the component is faulty, replace the component.

Correct Mounting of Arc Suppressors

Certain arc suppressors may experience failure of the wire leads due to vibration if the arc suppressor is not properly supported.

Use a 2U-4497 Strap to tie-wrap the arc suppressor. The arc suppressor should be securely tie-wrapped to a stationary support in order to prevent any motion of the body of the arc suppressor. Additionally, the connectors on both ends of the arc suppressor should be secured.

A suitable bracket for supporting an arc suppressor is the 116-6100 Plate. The addition of a 9R-2926 Plate should permit the mounting of the 116-6100 Plate around obstacles. Use the 9R-2926 Plate if the 116-6100 Plate cannot be installed directly in an existing application.

The Sure Seal connectors on the 3E-9169 Arc Suppressor and the 105-8827 Arc Suppressor should be secured with two 9G-9150 Clips in order to prevent movement of the connectors relative to the body of the arc suppressor. The DT connectors on the 130-0956 Arc Suppressor and 130-8134 Arc Suppressor should be secured with two 9U-2297 Clips. The clips should be bolted through the slotted holes on the 116-6100 Plate.

The 106-8704 Arc Suppressor is an integral arc suppressor. The integral arc suppressor can be found on the newer machines. The 106-8704 Arc Suppressor is lighter than the other arc suppressors. The 106-8704 Arc Suppressor can be strapped directly to the wiring harnesses that are connected to the arc suppressor.

Table 45

Required Tools		
Part Number	Description	Quantity
146-4080	Digital Multimeter (RS-232)	1

i02998053

Electronic Heat Control - Test

SMCS Code: 7304-081-VL; 7309-081-VL

Type 1 - Electronic Water Valve Only

Type 1A - Electronic Heat control Circuit for Water Valve using External Control Assembly, Nominal System Voltage

Note: An electronic heat control that only has an electronic water valve is classified as a Type 1 electronic heat control.

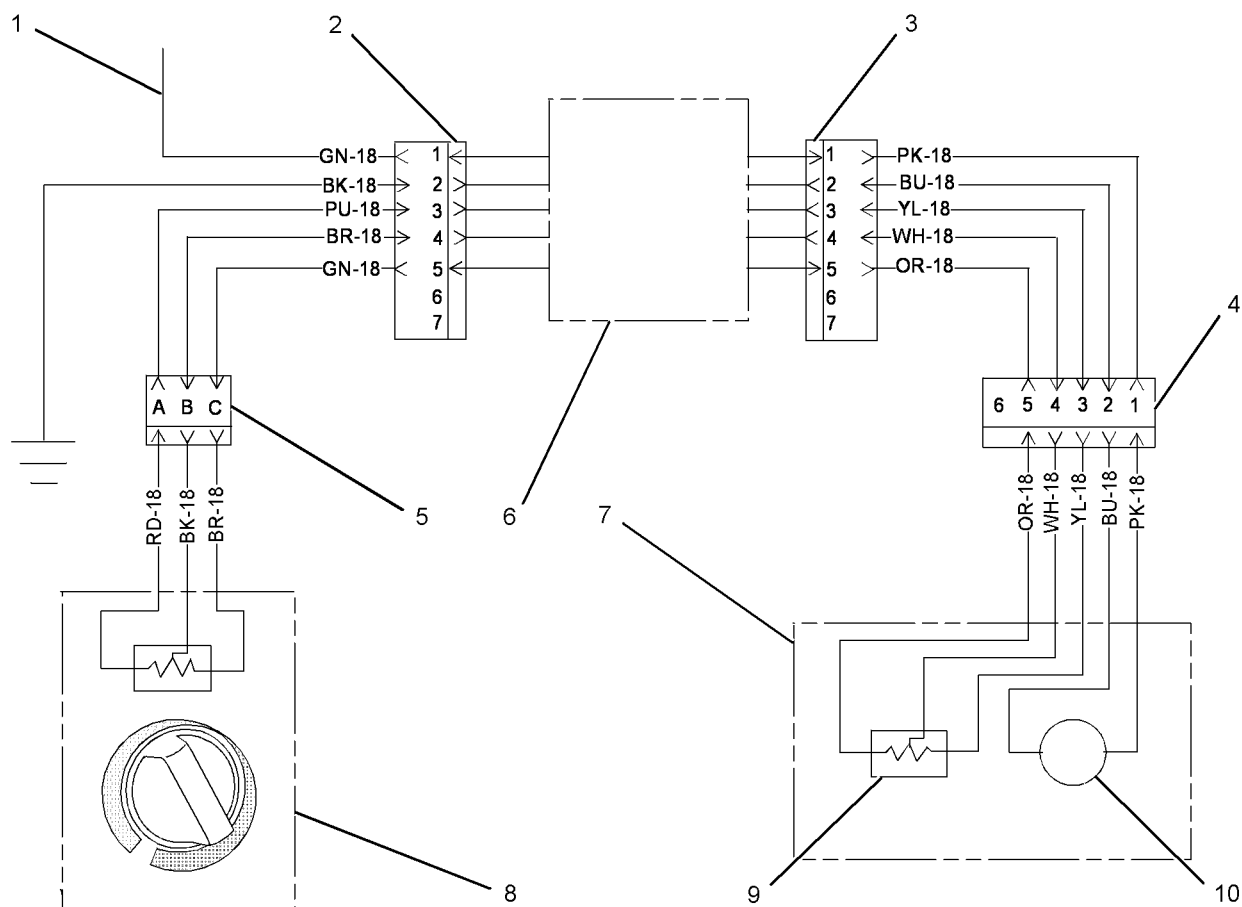


Illustration 121

g01371347

Typical Electronic Control Circuit for the Heater Valve

(1) 24 VDC power supply from blower motor breaker	(5) Sure seal connector (3 pin)	(9) Feedback potentiometer for the electronic water valve assembly
(2) Sure seal connector (7 pin)	(6) Board Control Assembly	(10) Motor for the electronic water valve assembly
(3) Sure seal connector (7 pin)	(7) Electronic water valve assembly	
(4) Sure seal connector (6 pin)	(8) Potentiometer assembly (temperature control)	

1. Turn off the power supply.
2. Disconnect the sure seal connector (2).
3. Hook the multimeter leads to pin (1) and pin (2). Set the multimeter to DC voltage.
4. Turn on the power supply. The multimeter should read approximately 24 VDC.
5. Turn off the power supply.
6. Reconnect the sure seal connector (2).
7. Disconnect the sure seal connector (5).
8. Connect the multimeter leads to pin (A) and pin (C) on the sure seal connector that is on potentiometer assembly (6). Set the multimeter to read ohms. The multimeter should read 5000 ± 500 ohms.
9. Connect the multimeter leads to pin (A) and pin (B) on the sure seal connector that is on potentiometer assembly (6). Turn the knob on the potentiometer assembly (6). The resistance should vary smoothly.
10. Reconnect sure seal connector (5).
11. Disconnect sure seal connector (4).
12. Connect the multimeter leads to pin (3) and pin (5) on the sure seal connector that is on electronic water valve assembly (8). Set the multimeter to read ohms. The multimeter should read 5000 ± 500 ohms.
13. Connect the multimeter leads to pin (1) and pin (2) on the sure seal connector that is on board control assembly (7). Set the multimeter to DC voltage.
14. Turn on the power supply.

15. Turn the knob on the potentiometer assembly (6).
The multimeter should read either 9 to 10 VDC or
the multimeter should read -9 to -10 VDC.

16. Turn off the power supply.

17. Connect two wires to a remote 12 volt DC power
supply.

Note: Do not use a power supply higher than 12 volts
DC. If you use a power supply higher than 12 volts
DC, you may damage the water valve assembly.

18. Connect one wire to pin (2) on the sure seal
connector that is on the electronic water valve
assembly (8).

19. Touch the other wire to pin (1) on the sure
seal connector that is on electronic water valve
assembly (8) in order to pulse motor (10). The
motor should turn clockwise or counterclockwise.
The polarity of the power supply determines the
direction of rotation.

Note: Do not pulse motor (10) for more than a fraction
of a second. If you supply power for a longer period
of time you may damage the water valve assembly.

20. Disconnect the test equipment and reconnect
sure seal connector (4).

**Type 1B - Electronic Heat Control
Circuit for Water Valve using a
Potentiometer and Series Resistor,
Regulated Supply Voltage**

Note: An electronic heat control that only has an
electronic water valve is classified as a Type 1
electronic heat control.

Table 46

Required Tools		
Part Number	Description	Quantity
146-4080	Digital Multimeter (RS-232)	1

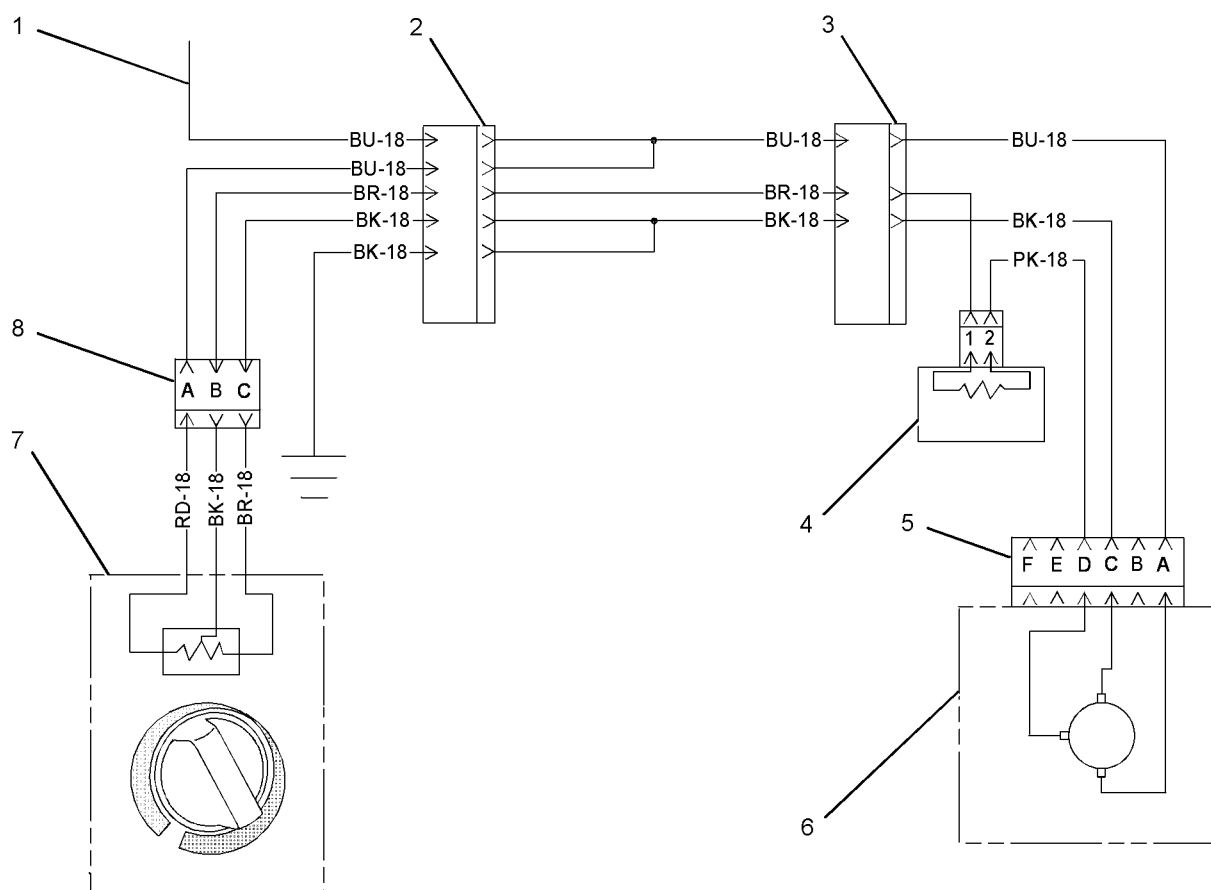


Illustration 122

g01365822

Typical view of the Electronic water valve control system with a potentiometer and a 12 volt regulated power supply

(1) 12 VDC from DC to DC converter	(3) Deutschconnector (pin number will vary depending on the application)	(6) Electronic rotational actuator
(2) Deutsch connector (pin number will vary depending on the application)	(4) In-line resistor	(7) Potentiometer assembly (temperature control)
	(5) Packard six pin connector	(8) Deutsch three pin connector

1. Turn off the power supply.
2. Disconnect Packard connector (5).
3. Connect the leads of the multimeter to pin (A) and pin (C) of Packard connector (5). Select the DC voltage setting of the multimeter.
4. Turn on the power supply. The multimeter should read approximately 12 VDC.
5. Connect the leads of the multimeter to pin (C) and pin (D) of Packard connector (5). In a counterclockwise direction, fully rotate the dial of potentiometer assembly (7). In a clockwise direction, fully rotate the dial on potentiometer assembly (7). The amount of voltage that is measured from pin (D) should vary between the power supply and the ground ± 0.5 volts.

Note: When Packard connector (5) is connected to rotational actuator (6) the measured voltage will be different from the previous measured voltage. When actuator (6) is connected to the system the voltage drop across in-line resistor (4) will limit the control signal to 10% of the supply voltage on the low limit and 90% of the supply voltage on the upper limit. The following is an example. A power supply of 14 volts will produce approximately 1.4 to 12.6 VDC when the potentiometer assembly is rotated from a clockwise position to a counterclockwise position.

6. Turn off the power supply.
7. Reconnect Packard connector (5).
8. Disconnect in-line resistor (4) from the harness.
9. Connect the leads of the multimeter to pin (1) and pin (2) of in-line resistor (4). Select the setting of the multimeter to ohms. The multimeter should read $27,000 \pm 300$ ohms.

10. Reconnect in-line resistor (4) to the harness.
11. Disconnect Deutsch connector (8).
12. Connect the leads of the multimeter to pin (A) and pin (C) of the Deutsch connector that is located on potentiometer assembly (7). Select the setting of the multimeter to ohms. The multimeter should read $5,000 \pm 500$ ohms.
13. Connect the leads of the multimeter to pin (A) and pin (B) of the Deutsch connector that is located on potentiometer assembly (7). Turn the knob on potentiometer assembly (7). The resistance should vary smoothly.
14. Reconnect Deutsch connector (8).

NOTICE

Do not use a power supply higher than 12 volts DC. A power supply higher than 12 volts DC may damage the water valve assembly.

15. Connect two wires to a remote 12 volt DC power supply.
 16. Disconnect Packard connector (5) from rotational actuator (6).
 17. Connect the Positive wire to pin (A) and the Negative wire to pin (C) of rotational actuator (6).
- Note:** If necessary, use a 241 - 7691 Heater and Air Conditioner Harness As in order to create the temporary connection.
18. Turn on the remote 12 volt power supply.
 19. Obtain a third wire. Short pin (D) of rotational actuator (6) to ground. Next, short pin (D) of rotational actuator (6) to the battery. The actuator should move fully to the clockwise position. Next, the actuator should move completely to a counterclockwise position. The movement of the actuator is dependent on the voltage that is going to pin (D) of rotational actuator (6).

Note: When pin (D) is in an open circuit condition the actuator will default to a center rotational position. This condition is normal operation for this type of actuator. Refer to 245 - 1596 Actuator.

20. Disconnect all of the test equipment and reconnect Packard connector (5).

Type 1C - Electronic Heat Control Circuit for Water Valve using a HVAC Panel, Regulated Supply Voltage

Note: An electronic heat control that only has an electronic water valve is classified as a Type 1 electronic heat control.

Table 47

Required Tools		
Part Number	Description	Quantity
146 - 4080	Digital Multimeter (RS-232)	1

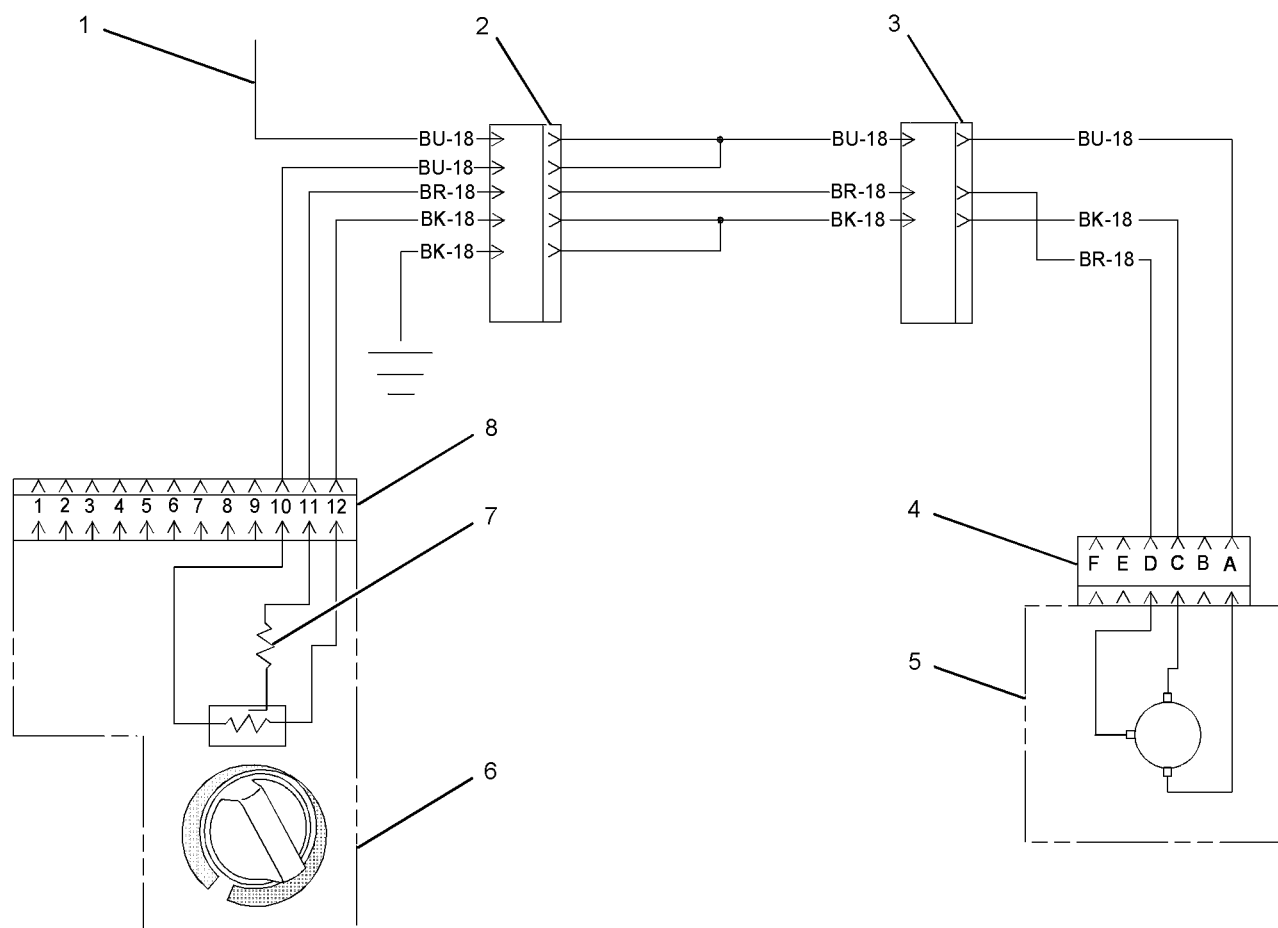


Illustration 123

g01366758

Typical view of the Electronic water valve control system with a HVAC panel and a 12 volt regulated power supply

(1) 12 VDC from DC to DC converter	(3) Deutschconnector (pin number will vary depending on the application)	(6) HVAC panel assembly
(2) Deutsch connector (pin number will vary depending on the application)	(4) Packard six pin connector	(7) In-line series resistor
	(5) Electronic rotational actuator	(8) 12 pin Deutsch connector

1. Turn off the power supply.
2. Disconnect Packard connector (4).
3. Connect the leads of the multimeter to pin (A) and pin (C) of Packard connector (4). Select the DC voltage setting of the multimeter.
4. Turn on the power supply. The multimeter should read approximately 12 VDC.
5. Connect the leads of the multimeter to pin (C) and pin (D) of Packard connector (4). In a counterclockwise direction, fully rotate the dial of HVAC panel assembly (6). In a clockwise direction, fully rotate the dial on HVAC panel assembly (6). The amount of voltage that is measured from pin (D) should vary between the power supply and the ground ± 0.5 volts.

Note: When Packard connector (4) is connected to rotational actuator (5) the measured voltage will be different from the previous measured voltage. When actuator (5) is connected to the system the voltage drop across in-line resistor (7) will limit the control signal to 10% of the supply voltage on the low limit and 90% of the supply voltage on the upper limit. The following is an example. A power supply of 14 volts will produce approximately 1.4 to 12.6 VDC when the HVAC panel assembly is rotated from a clockwise position to a counterclockwise position.

6. Turn off the power supply.
7. Reconnect Packard connector (4).
8. Disconnect Deutsch connector (8).

9. Connect the leads of the multimeter to pin (10) and pin (12) of the Deutsch connector that is located on HVAC panel assembly (6). Select the setting of the multimeter to ohms. The multimeter should read 10000 ± 1000 ohms.
10. Connect the leads of the multimeter to pin (11) and pin (12) of the Deutsch connector that is located on HVAC panel assembly (6). Turn the knob on HVAC panel assembly (6). The resistance should vary smoothly. The multimeter should display a range from 27000 to 37000 ± 1300 ohms.
11. Reconnect Deutsch connector (8).

NOTICE

Do not use a power supply higher than 12 volts DC. A power supply higher than 12 volts DC may damage the water valve assembly.

12. Connect two wires to a remote 12 volt DC power supply.
13. Disconnect Packard connector (4) from rotational actuator (5).
14. Connect the Positive wire to pin (A) and the Negative wire to pin (C) of rotational actuator (5).
- Note:** If necessary, use a 241 - 7691 Heater and Air Conditioner Harness As in order to create the temporary connection.
15. Turn on the remote 12 volt power supply.
16. Obtain a third wire. Short pin (2) of rotational actuator (5) to ground. Next, short pin (2) of rotational actuator (5) to the battery. The actuator should move fully to the clockwise position. Next, the actuator should move completely to a counterclockwise position. The movement of the actuator is dependent on the voltage that is going to pin (D) of rotational actuator (5).
- Note:** When pin (D) is in an open circuit condition the actuator will default to a center rotational position. This condition is normal operation for this type of actuator. Refer to 245 - 1596 Actuator.
17. Disconnect all of the test equipment and reconnect Packard connector (4).

**Type 1D - Electronic Heat Control
Circuit for Water Valve using a
Nominal System Voltage, HVAC
Panel**

Note:

An electronic heat control that only has an electronic water valve is classified as a Type 1 electronic heat control.

Table 48

Required Tools		
Part Number	Description	Quantity
146 - 4080	Digital Multimeter (RS-232)	1

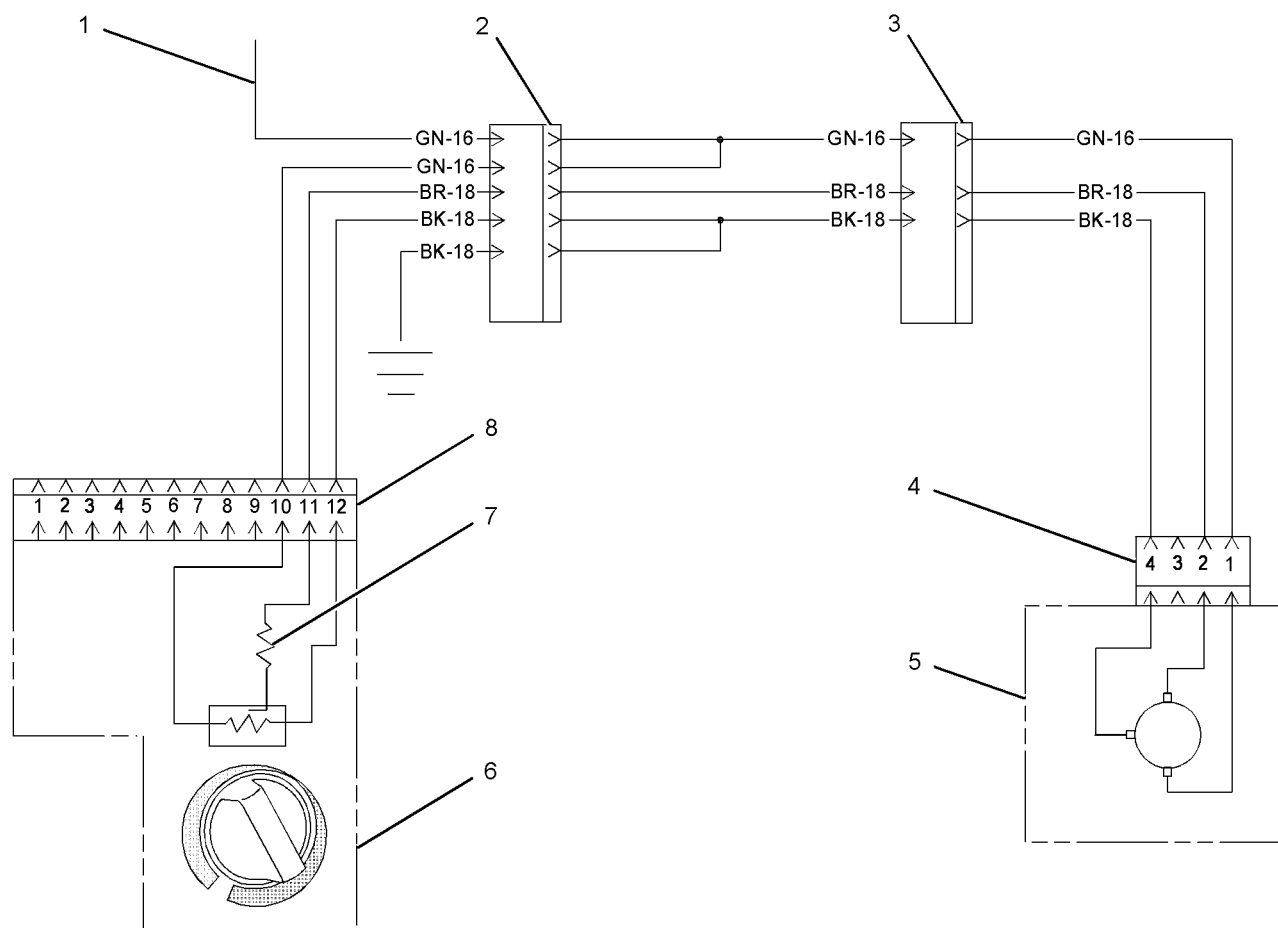


Illustration 124

g01366857

Typical view of the Electronic water valve control system with a HVAC panel and nominal vehicle system voltage

(1) +12/24 VDC from HVAC circuit	(3) Deutschconnector (pin number will vary depending on the application)	(6) HVAC panel assembly
(2) Deutsch connector (pin number will vary depending on the application)	(4) Deutsch four pin connector	(7) In-line series resistor
	(5) Electronic rotational actuator	(8) 12 pin Deutsch connector

1. Turn off the power supply.
2. Disconnect Deutsch connector (4).
3. Connect the leads of the multimeter to pin (1) and pin (4) of Deutsch connector (4). Select the DC voltage setting of the multimeter.
4. Turn on the power supply. The multimeter should read approximately 24 VDC.

Note: Some 24 volt machine applications may run an actuator with a 12 volt supply. Verify the correct voltage signal with the schematic of the machine before conducting this test.

5. Connect the leads of the multimeter to pin (2) and pin (4) of Deutsch connector (4). In a counterclockwise direction, fully rotate the dial of HVAC panel assembly (6). In a clockwise direction, fully rotate the dial on HVAC panel assembly (6). The amount of voltage that is measured from pin (2) should vary between the power supply and the ground ± 0.5 volts.

Note: When Deutsch connector (4) is connected to rotational actuator (5) the measured voltage will be different from the previous measured voltage. When actuator (5) is connected to the system the voltage drop across in-line resistor (7) will limit the control signal to 0% of the supply voltage on the low limit and 75% of the supply voltage on the upper limit. The following is an example. A power supply of 24 volts will produce approximately 0 to 18 VDC when the HVAC panel assembly is rotated from a clockwise position to a counterclockwise position.

6. Turn off the power supply.

7. Reconnect Deutsch connector (4).
 8. Disconnect Deutsch connector (8).
 9. Connect the leads of the multimeter to pin (10) and pin (12) of the Deutsch connector that is located on HVAC panel assembly (6). Select the setting of the multimeter to ohms. The multimeter should read 10000 ± 1000 ohms.
 10. Connect the leads of the multimeter to pin (11) and pin (12) of the Deutsch connector that is located on HVAC panel assembly (6). Turn the knob on HVAC panel assembly (6). The resistance should vary smoothly. The multimeter should display a range from 27000 to 37000 ± 1300 ohms.
 11. Reconnect Deutsch connector (8).
 12. Connect two wires to a remote 12/24 volt DC power supply.
 13. Disconnect Deutsch connector (4) from rotational actuator (5).
 14. Connect the Positive wire to pin (1) and the Negative wire to pin (4) of rotational actuator (5).
 15. Turn on the remote 12/24 volt power supply.
 16. Obtain a third wire. Short pin (2) of rotational actuator (5) to ground. Next, short pin (2) of rotational actuator (5) to the battery. The actuator should move fully to the clockwise position. Next, the actuator should move completely to a counterclockwise position. The movement of the actuator is dependent on the voltage that is going to pin (2) of rotational actuator (5).
- Note:** When the actuator and signal pin (2) is in an open circuit condition, it is normal for the actuator to default travel to an end of travel position. This condition is similar if pin (2) for the control signal is shorted to ground. This condition is normal operation for this type of actuator. Refer to 265 - 9620 Actuator.
17. Disconnect all of the test equipment and reconnect Deutsch connector (4).

Table 49

Required Tools		
Part Number	Description	Quantity
146 - 4080	Digital Multimeter (RS-232)	1

Type 1E - Electronic Heat Control Circuit for Water Valve using a Potentiometer, Nominal System Voltage

Note: An electronic heat control that only has an electronic water valve is classified as a Type 1 electronic heat control.

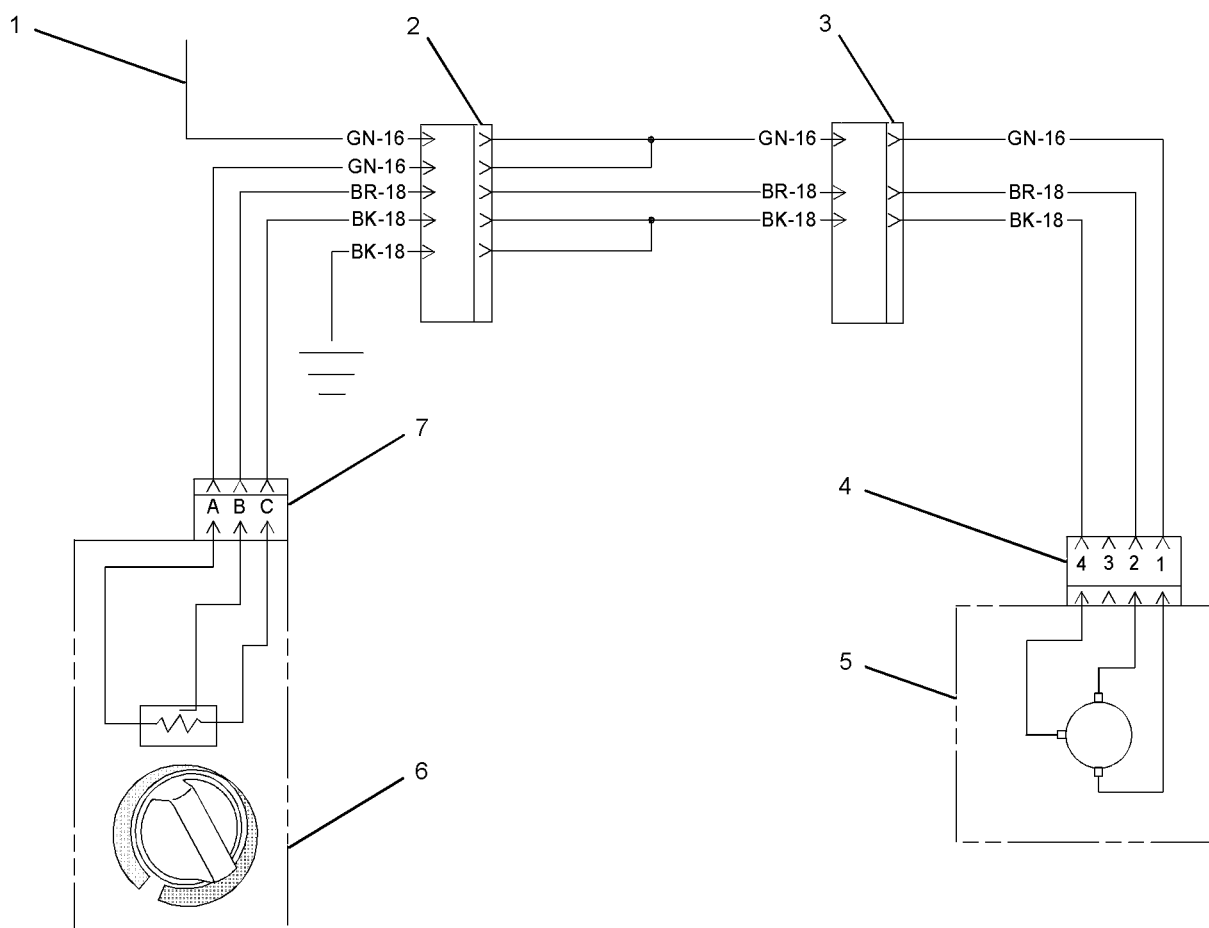


Illustration 125

g01520264

Typical view of the Electronic water valve control system with a potentiometer and nominal vehicle system voltage

(1) +12/24 VDC from HVAC circuit	(3) Deutschconnector (pin number will vary depending on the application)	(6) Potentiometer assembly (Temperature control)
(2) Deutsch connector (pin number will vary depending on the application)	(4) Deutsch four pin connector	(7) Deutsch three pin connector
	(5) Electronic rotational actuator	

1. Turn off the power supply.
2. Disconnect Deutsch connector (4).
3. Connect the leads of the multimeter to pin (1) and pin (4) of Deutsch connector (4). Select the DC voltage setting of the multimeter.
4. Turn on the power supply. The voltage that is measured by the multimeter should be approximately the same voltage as the system voltage.
5. Connect the leads of the multimeter to pin (2) and pin (4) of Deutsch connector (4). In a counterclockwise direction, fully rotate the dial of potentiometer assembly (6). In a clockwise direction, fully rotate the dial on HVAC panel assembly (6). The amount of voltage that is measured from pin (2) should vary between the power supply and the ground ± 0.5 volts.
6. Turn off the power supply.
7. Reconnect Deutsch connector (4).
8. Disconnect Deutsch connector (7).
9. Connect the leads of the multimeter to pin (A) and pin (C) of the Deutsch connector that is located on potentiometer assembly (6). Select the setting of the multimeter to ohms. The multimeter should read 5000 ± 500 ohms.

Note: Some 24 volt machine applications may run an actuator with a 12 volt supply. Verify the correct voltage signal with the schematic of the machine before conducting this test.

10. Connect the leads of the multimeter to pin (A) and pin (B) of the Deutsch connector that is located on potentiometer assembly (6). Turn the knob on potentiometer assembly (6). The resistance should vary smoothly.
11. Reconnect Deutsch connector (7).
12. Connect two wires to a remote 12/24 volt DC power supply.
13. Disconnect Deutsch connector (4) from rotational actuator (5).
14. Connect the Positive wire to pin (1) and the Negative wire to pin (4) of rotational actuator (5).
15. Turn on the remote 12/24 volt power supply.
16. Obtain a third wire. Short pin (2) of rotational actuator (5) to ground. Next, short pin (2) of rotational actuator (5) to the battery. The actuator should move fully to the clockwise position. Next, the actuator should move completely to a counterclockwise position. The movement of the actuator is dependent on the voltage that is going to pin (2) of rotational actuator (5).

Note: When the actuator and signal pin (2) is in an open circuit condition, it is normal for the actuator to default travel to an end of travel position. This condition is similar if pin (2) for the control signal is shorted to ground. This condition is normal operation for this type of actuator. Refer to 279 - 0850 Actuator.

17. Disconnect all of the test equipment and reconnect Deutsch connector (4).

Type 2 - Electronic Heat Control Circuit for Water Valve and Blend Door HVAC System using External Control Assembly

Electronic heat controls that have a blend door actuator and an electronic water valve are classified as a type 2 electronic heat control.

Table 50

Required Tools		
Part Number	Description	Quantity
146-4080	Digital Multimeter(RS-232)	1

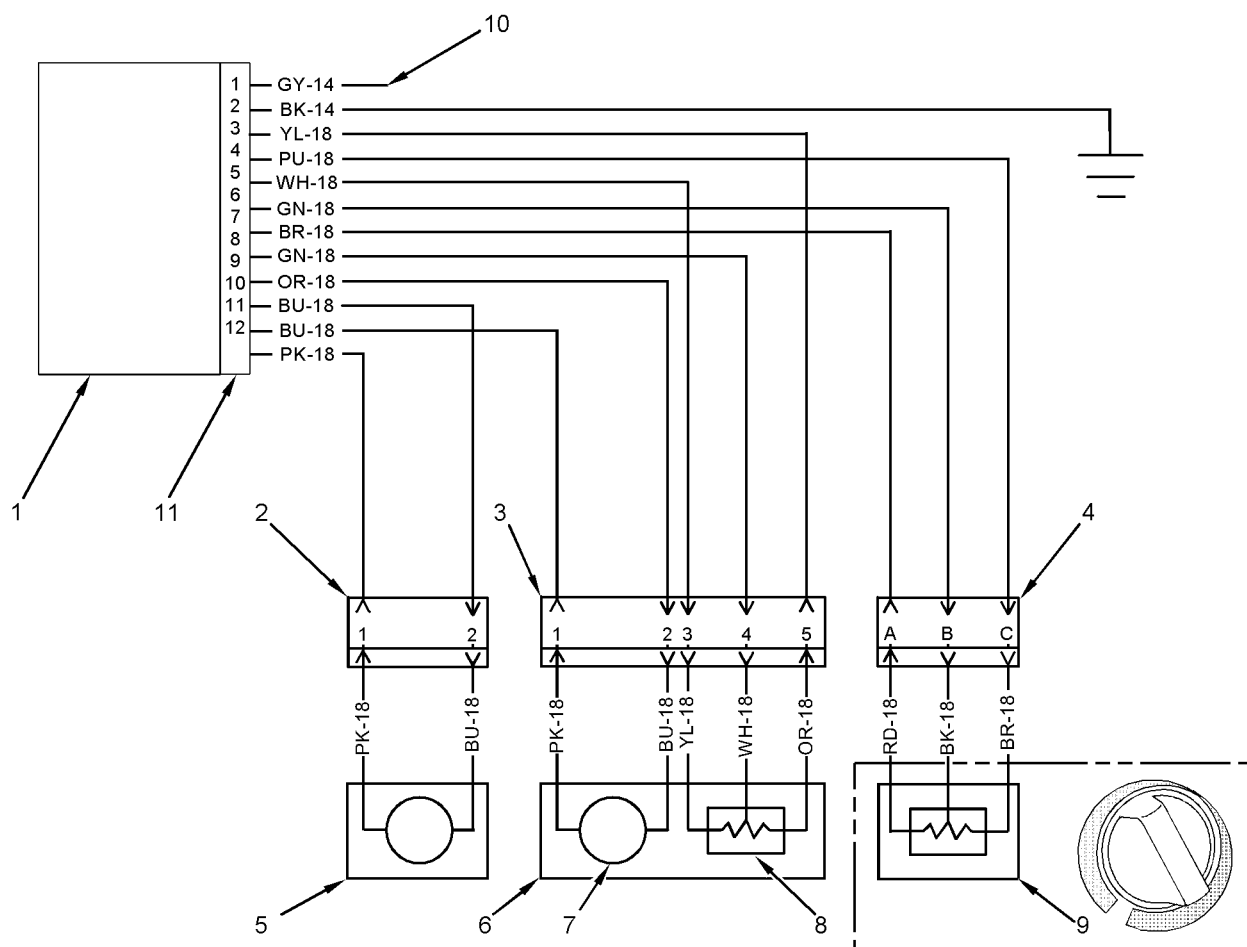


Illustration 126

g01069275

Typical Electronic Control Circuit for the Heater Valve

(1) Electronic controller	(6) Electronic blend door actuator	(9) Potentiometer assembly (temperature control)
(2) Deutsch connector (2 pin)	(7) Motor for the electronic blend door actuator	(10) 24 VDC power supply from blower motor breaker
(3) Deutsch connector (6 pin)	(8) Feedback potentiometer for the electronic blend door actuator	(11) Deutsch connector (12 pin)
1. Turn off the power supply.
 2. Disconnect Deutsch connector (11).
 3. Hook the multimeter leads to pin (1) and pin (2). Set the multimeter to DC voltage.
 4. Turn on the power supply. The multimeter should read approximately 24 VDC.
 5. Turn off the power supply.
 6. Reconnect the Deutsch connector (11) at electronic controller (1).
 7. Disconnect Deutsch connector (4).
 8. Connect the multimeter leads to pin (A) and pin (C) on the Deutsch connector that is on potentiometer assembly (9). Set the multimeter to read ohms. The multimeter should read 5000 ± 500 ohms.
 9. Connect the multimeter leads to pin (A) and pin (B) on the Deutsch connector that is on potentiometer assembly (9). Turn the knob on the potentiometer assembly (9). The resistance should vary smoothly.
 10. Reconnect Deutsch connector (4).
 11. Disconnect Deutsch connector (3).
 12. Connect the multimeter leads to pin (3) and pin (5) on the Deutsch connector that is on electronic blend door actuator (6). Set the multimeter to read ohms. The multimeter should read 10000 ± 1000 ohms.
 13. Connect the multimeter leads to pin (1) and pin (2) on the Deutsch connector that is on electronic blend door actuator (6). Set the multimeter to DC voltage.

14. Turn on the power supply.
15. Turn the knob on the potentiometer assembly (9). The multimeter should read either -11 to -12 VDC or the multimeter should read 11 to 12 VDC while the actuator is rotating. The multimeter should read 0 VDC after the motor has stopped rotating.
16. Turn off the power supply.
17. Connect two wires to a remote 12 volt DC power supply.
18. Connect one wire to pin (2) on the Deutsch connector that is on the electronic blend door actuator (6).
19. Touch the other wire to pin (1) on the Deutsch connector that is on electronic blend door actuator (6) in order to pulse motor (7). The motor should turn clockwise or counterclockwise. The polarity of the motor determines the direction of rotation.

Note: Do not pulse motor (7) for more than a fraction of a second. If you supply power for a longer period of time you may damage the actuator.

20. Disconnect the test equipment and reconnect Deutsch connector (3).
 21. Disconnect Deutsch connector (2).
 22. Rotate the potentiometer assembly (9) to full cooling.
- Note:** The actuators must be given 60 seconds in order to completely stroke.
23. Connect the multimeter leads to pin (1) and pin (2) on the Deutsch connector that is on the electronic water valve assembly (5). Set the multimeter to read DC voltage.
 24. Turn on the power supply.
 25. Turn the knob on potentiometer assembly (9). The multimeter should read -11 to -12 VDC or the multimeter should read 11 to 12 VDC while the actuator is rotating. The multimeter should read 0 VDC, after the motor has completed rotating.
 26. Turn the knob to full cooling on the potentiometer assembly (9). The multimeter should read -11 to -12 VDC or the multimeter should read 11 to 12 VDC while the actuator is rotating. The multimeter should read 0 VDC after the motor has completed rotating.
 27. Turn off the power supply.
 28. Connect two wires to a remote 12 volt DC power supply.

29. Connect one wire to pin (1) on Deutsch connector (2) that is on the electronic water valve assembly.
30. Touch the other wire to pin (2) on the Deutsch connector (2) that is on electronic water valve assembly in order to pulse motor (5). The motor should turn clockwise or counterclockwise. The polarity of the motor determines the direction of rotation.

Note: Do not pulse motor (5) for more than a fraction of a second. If you supply power for a longer period of time you may damage the actuator.

31. Disconnect the test equipment and reconnect the Deutsch connector (2).

Type 3 - Electronic Heat Control Circuit for Blend Door Only HVAC System using Two Series Resistors and a Potentiometer

Electronic heat controls that have a blend air door are classified as a Type 3 electronic heat control.

Table 51

Required Tools		
Part Number	Description	Quantity
146-4080	Digital Multimeter(RS-232)	1

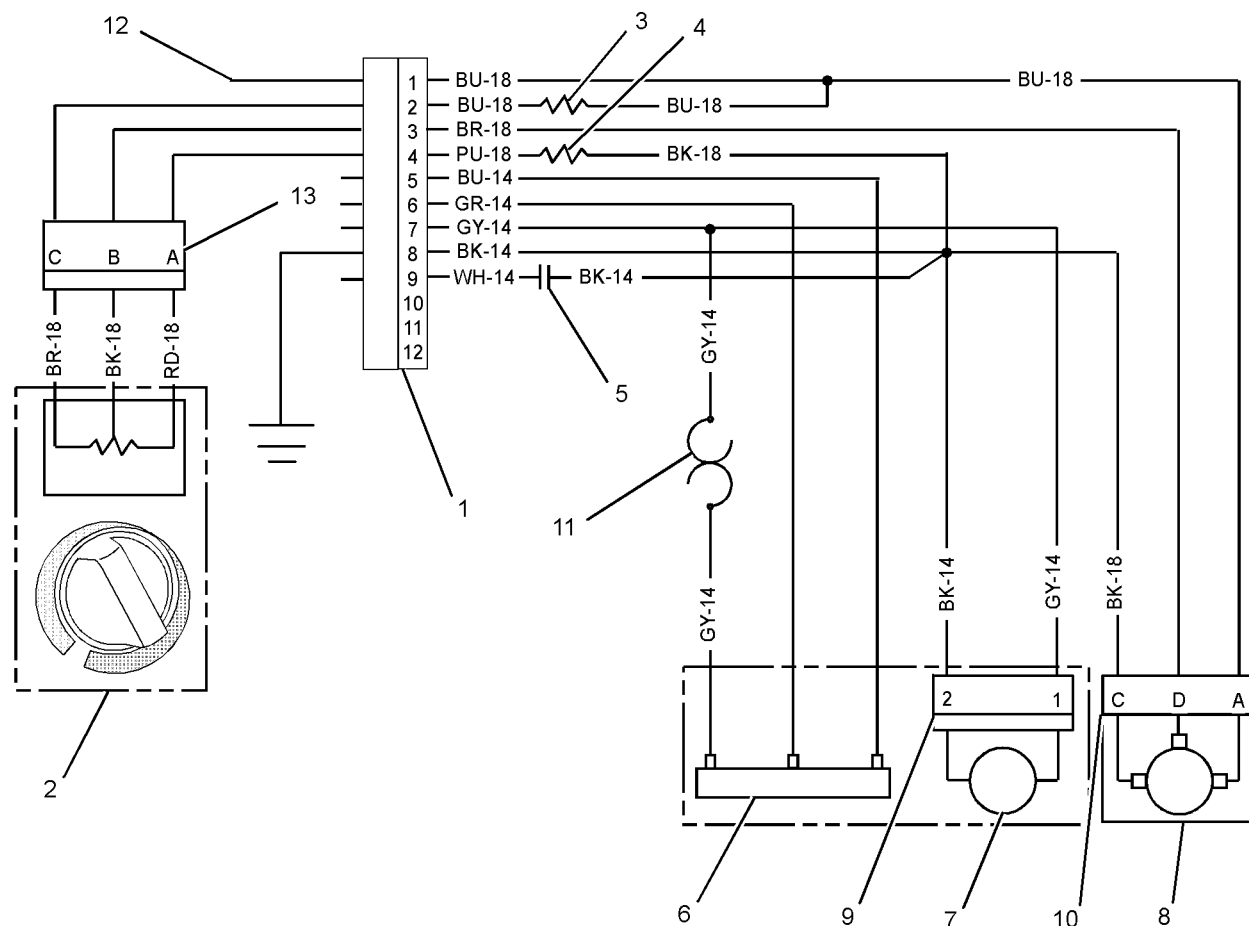


Illustration 127

g01191792

Typical Electronic Control Circuit for the blend air door

(1) Deutsch connector (12 pin)	(5) Freeze switch	(10) Packard connector (3 pin)
(2) Potentiometer assembly (temperature control)	(6) Blower resistor	(11) Thermal fuse
(3) Resistor 6.2 kΩ	(7) Blower motor	(12) 12 VDC power supply (converter)
(4) Resistor 3.3 kΩ	(8) Electronic blend door actuator	(13) Deutsch connector (3 pin)
	(9) Deutsch connector (2 pin)	

1. Turn off the power supply.
2. Disconnect Deutsch connector (1).
3. Hook the multimeter leads to pin (1) and pin (8). Set the multimeter to DC voltage.
4. Turn on the power supply. The multimeter should read approximately 12 VDC.
5. Turn off the power supply.
6. Reconnect the Deutsch connector (1).
7. Disconnect Deutsch connector (13).
8. Connect the multimeter leads to pin (A) and pin (C) on the Deutsch connector that is on potentiometer assembly (2). Set the multimeter to read ohms. The multimeter should read 5000 ± 500 ohms.
9. Connect the multimeter leads to pin (A) and pin (B) on the Deutsch connector that is on potentiometer assembly (2). Turn the knob on the potentiometer assembly (2). The resistance should vary smoothly.
10. Reconnect Deutsch connector (13).
11. Disconnect Packard connector (10) that is located on electronic blend door actuator (8).
12. Disconnect Deutsch connector (1) again.
13. Connect the multimeter leads to pin (1) and pin (2) on the Deutsch connector. Set the multimeter to read ohms. The multimeter should read 6200 ± 500 ohms for the value of resistor (3).
14. Disconnect Deutsch connector (9) that is located on blower motor (7).

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15. Connect the multimeter leads to pin (4) and pin (8) on the Deutsch connector (1). Set the multimeter to read ohms. The multimeter should read 3300 ± 500 ohms for the value of resistor (4).
16. Reconnect Deutsch connector (9).
17. Reconnect Deutsch connector (1).
18. Reconnect Packard connector (10) that is located on electronic blend door actuator (8).
19. Attach the positive multimeter leads to pin (D) and pin (C) on the Packard connector (10). Set the multimeter to DC voltage.
20. Turn on the power supply.
21. Turn the knob on potentiometer assembly (2) to full heat. The electronic blend door actuator (8) should rotate counterclockwise. The multimeter should read either -2.7 VDC or the multimeter should read 2.7 VDC.
22. Turn the knob on potentiometer assembly (2) to full cold. The electronic blend door actuator (8) should rotate clockwise. The multimeter should read either -7.0 VDC or the multimeter should read 7.0 VDC.
23. Turn off the power supply.

Heater Performance - Test

SMCS Code: 7309-081

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

In order to conduct a performance of the heating system, perform the following procedure.

1. Run the engine at 1000 rpm (low idle speed) until the engine coolant temperature is in the normal operating range.

2. Adjust the temperature control knob to the hottest position.
3. Put the fan switch in the HIGH position on heat.
4. Check the system for normal operating conditions.
 - The temperature of the air that is flowing from the louvers (air ducts) should be warm.
 - The temperature of the air should be easily controllable by the control panel in the dash.
 - There should not be a smell of coolant that is present in the cab.

If any of the three items are not working properly, refer to Service Manual, SENR5664, "Heating System Troubleshooting".

Reference Information Section

i03607159

Heating and Air Conditioning Service Publications

SMCS Code: 7000; 7320

Table 52

Publication Number	Products	Title of Publication
Data Sheets		
PEHJ0092	All Products	"Cat Cabin Air Filters"
PEHJ0148	All Products	"Cat Air Conditioning Kits"
Information Release Memo		
PELJ0374	All Products	"Air Conditioning Kits for Caterpillar Equipment"
PELM0992	Integrated Toolcarrier Wheel Loader Motor Grader Track-Type Tractor	"CAT Field Installed Air Conditioning Kits (R134a)"
Special Instructions		
REHS1692	D10R, D11R	"Procedure to Replace the Water Valve for the Climate Control System"
REHS1715	Articulated Trucks	"Procedure to Replace the Control Assembly and Water Valve Assembly in the Air Conditioner Group"
REHS1716	Wheel Tractor-Scrapers	"Procedure to Replace the Water Valve for the Climate Control System"
REHS1717	Wheel Dozer Wheel Loader	"Installation Procedure for the New Water Valve for the Climate Control System"
REHS1798	Multi Terrain Loader	"Installing the 233-5870 Installation Arrangement (Air Conditioner Conversion)(Kit)"
REHS1799	Multi Terrain Loader	"Installing the 233-5873 Installation Arrangement (Air Conditioner, Heater)(Kit)"
REHS1801	Skid Steer Loader	"Installing the 218-6747 Installation Arrangement (Air Conditioner, Heater)(Kit)"
REHS1802	Skid Steer Loader	"Installing the 218-6749 Installation Arrangement (Air Conditioner Conversion)(Kit)"
REHS2488	All Products	"Refrigerant Compressor Functional Test for All Caterpillar Machines"
REHS3093	Large Track-Type Tractor	"Improving the Cab Environment for the Operator of Track-Type Tractors"
REHS3678	All Products	"Refrigerant Dryer Functional Test"
REHS4025	Wheel Loader Integrated Toolcarriers	"Replacement of the Blower Assembly on Certain Wheel Loaders"
REHS4100	D10T, D9T, D8T	"Improvement to the Case of the Air Cleaner"

(continued)

(Table 52, contd)

REHS4138	Integrated Toolcarriers Wheel Loader Excavator Industrial Tractor Track Feller Buncher Wheel Feller Buncher	"Assembly Instructions for Installing The Air Mix Door"
REHS4499	All Products	"Testing the Refrigerant Compressor Protection Module"
SEHS9088	Earthmoving Compactor Excavator Motor Grader Track-Type Loader Track-Type Tractor Wheel Loader Wheel Tractor-Scraper	"Installation Instructions for the 174-1508 Electric Motor"
SEHS9098	Track-Type Loader Articulated Truck Excavator Track-Type Tractor Wheel Loader Wheel Tractor-Scraper	"Instructions for the Installation of the 174-1508 Electric Motor"
SEHS9734	All Products	"Retrofitting Caterpillar R-12 Air Conditioning Systems to R134a Refrigerant"
SMHS7059	D7G, D8K, D9H	"Installation of 9P4752, 9P4753, and 9P4754 Air Conditioner Arrangements"
Specifications, Systems Operation, Testing and Adjusting, Disassembly and Assembly		
SEN3334	All Products	"Air Conditioning and Heating R-12 All Caterpillar Machines"
SEN5664	All Products	"Air Conditioning and Heating R-134a for All Caterpillar Products"
Service Magazine		
SEPD0306	Challenger	"Improvements to Challenger Agricultural Tractors Air Conditioning Available"
SEPD0353	Wheel Loader Soil Compactor Landfill Compactor	"New Heating Ventilation and Air Conditioning (HVAC) Electronic Control Troubleshooting Procedure Available"
SEPD0418	D5M, D6M Track-Type Tractor	"New, Air Conditioner Tubes Increase Service Life of Condenser Coil"
SEPD0473	All Products	"Air Conditioner Service Tips"
SEPD0559	All Products	"Material for Sound Suppression in the Cab is Available"
SEPD0559	All Products	"Part Numbers for Electric Motors that are Used in HVAC Have Changed"
SEPD0653	Off-Highway Truck	"New Components Improve the Air Conditioning System on Certain Off-Highway Truck/Tractor"
SEPD0665	Combine Excavator Track Feller Buncher Integrated Toolcarrier Paving Compactor Road Reclaimer	"Checking the Motor Rotation after Replacing the Blower Motor Can Increase Service Life"
SEPD0723	Off-Highway Truck Wheel Loader	"The Fan Drive Groups Have Changed"
SEPD0730	Off-Highway Truck	"New Mounting Brackets for the Air Conditioner Compressor are Now Available"

Disassembly and Assembly Section

i03863074

General Information

SMCS Code: 1808; 7309

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

- All refrigerant lines that are metal or flexible hose must be free of sharp bends. Also, do not use a refrigerant line that is kinked. Sharp bends will cause a restriction in the refrigerant flow. Restrictions in the refrigerant lines are identified by cold spots or frost on the line at the location of the restriction. Restrictions in the lines reduce the performance and the efficiency of the system.
- The radius of bends in the flexible hose must never be less than 10 times the outside diameter of the hose.
- Do not allow the flexible hoses to come within 63.5 mm (2.50 inch) of the exhaust manifold.
- The hoses need to be inspected yearly for leaks and for hardness. Conduct a leak test on all the hoses and the lines. Refer to the Service Manual, SENR5664, "Refrigerant Leakage - Test" section in testing and adjusting. Replace hoses if leaks or hardness are in the hoses. Replace hoses with new hose that is sealed and free of contaminants.
- The correct use of wrenches is very important when connections are made. The type of wrench that is used is also important. Only use wrenches that are made for use with tube-type fittings. When a hose is connected or disconnected from the system, use a wrench on the fitting and use a wrench on the nut. When a metal line is connected or disconnected from the system, use a wrench on the fitting and use a wrench on the nut.
- Install protective plugs or protective caps on all components and hoses that are disconnected or removed.
- O-ring seals and O-ring seats must be in good condition. Small cuts, scratches, or particles of dirt will cause a leak in the system. Put new refrigerant oil on all new O-ring seals at the time of installation. Do not use any kind of sealant on connections.
- Dust caps on the compressor block fittings are the primary seals on the air conditioning system.
- All machines should have an identification tag that specifies the refrigerant charge for the machine. The tag should be located in the operator compartment.
- If water is in the vents check the non-return valve. If water leaks from the air conditioning system, check the non-return valve. The non-return valve should have the proper position and the proper direction.
- If engine coolant is leaking into the operator compartment, check for loose clamps on the heater hoses.

i03863078

Machine Preparation for Disassembly and Assembly

SMCS Code: 7320-017

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

Note: Before you conduct a performance check, refer to the Service Manual, SENR5664, "Visual Inspection" section.

Note: Refer to the Service Manual, SENR5664, "Machine Preparation for Troubleshooting" section before service work is performed on the air conditioning system.

When the service work is done on the air conditioning system, the service work must keep the system clean and free from contamination. Plugs and caps must be used in order to close the components and hoses when the components and hoses are open. The plugs and caps protect the system from dirt and air (moisture). Only new refrigerant oil of the correct viscosity and new refrigerant can be added to the system. Refer to the Service Manual, SENR5664, "Refrigerant Compressor" section in this manual for the correct oil. Any other material or any other substance is considered non-condensable and the material will contaminate the system. Keep the work area clean.

- Dust caps on the refrigerant compressor block fitting are the primary seal on the air conditioning system.
- All machines should have an identification tag in the cab that specifies the proper refrigerant charge for the machine.

When replacement or repair of components and hoses are required, perform the following procedure:

1. Remove the refrigerant charge. Measure the amount of oil recovered. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" and , , "Refrigerant Oil-Test" section in Testing and Adjusting, for proper procedures.
2. Remove the component or remove the hose that is being repaired or replaced. Install protective plugs on components or hoses that are left exposed to the air.
3. Replace any damaged component or hose.
4. Use the following table in order to determine the amount of oil that is lost during individual replacements of components. Follow the process provided in Service Manual, SENR5664, "Refrigerant Oil-Test" to calculate the correct amount of oil needed for the system.

Table 53

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Oil Capacities for Component Replacements	
Accumulator	30 mL (1 fl oz)
Compressor	Refer to the Service Manual, SENR5664, "Refrigerant Compressor Oil-Check" section in Testing and Adjusting.
Condenser	30 mL (1 fl oz)
Evaporator	90 mL (3 fl oz)
In-Line Dryer ⁽¹⁾ before any oil is installed	30 mL (1 fl oz)
Receiver-Dryer	30 mL (1 fl oz)

⁽¹⁾ Refer to the Service Manual, "In Line Refrigerant Dryer - Remove and Install"

5. Refer to the Service Manual, SENR5664, "Refrigerant System-Evacuate" section in testing and adjusting.
6. Refer to the Service Manual, SENR5664, "Refrigerant System-Charge" section in Testing and Adjusting.

Air Conditioner Lines - Remove and Install

SMCS Code: 1808-010

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

Care must be taken during removal of air conditioner lines. Before disconnecting any tube fittings, refer to Testing and Adjusting, SENR5664, "Refrigerant Recovery" in order to recover all refrigerant from the system.

Place dust caps on all hoses and fittings upon disconnecting.

Do not fold or twist hoses when you are routing the new hoses onto the machine. Damage can occur to the inner layers of the hoses and damage can cause premature failure.

Reassemble fittings by using the correct torque values for assembly of the air conditioning unit. Refer to Specifications, SENR3130, "Torque Specifications" in order to find the correct torque value.

Use the following procedure to reassemble the connections.

Proper Technique for Assembly

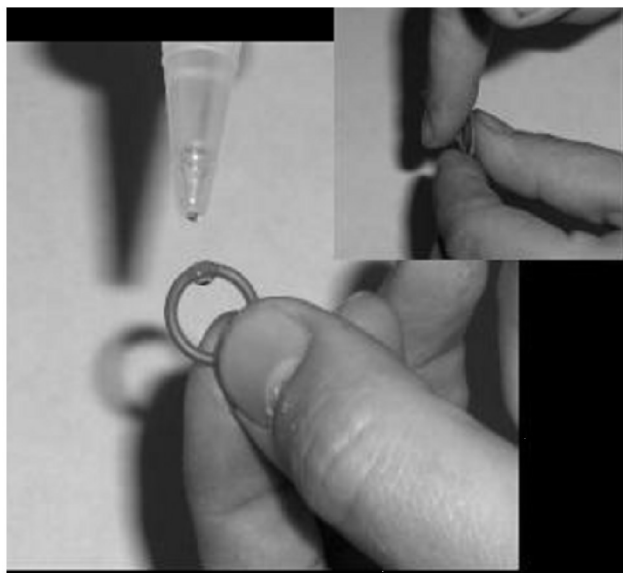


Illustration 128

g01519272

1. Drip clean mineral oil onto the clean O-ring.



Illustration 129

g01519286

2. Place the O-ring on fitting.



Illustration 130

g01519288

3. Oil the O-ring again.

i02998483



Illustration 131

g01519290

4. Align fittings and ensure that the seal is seated correctly. Hand tighten the fittings together.

Note: DO NOT CROSS THREAD.



Illustration 132

g01519291

5. Tighten the connection with proper torque. Use a wrench to avoid twisting parts.

Refrigerant Compressor - Remove and Install

SMCS Code: 1802-010

Removal

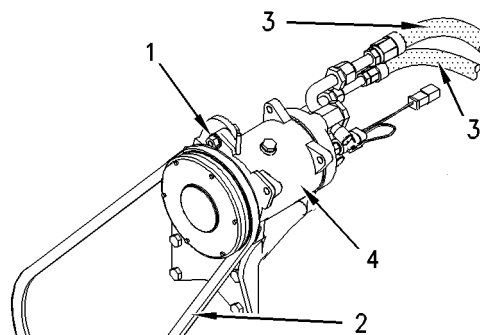


Illustration 133

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- (1) Bolt
- (2) Drive belt
- (3) Suction and discharge hoses
- (4) Compressor

1. Remove the refrigerant charge. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.
2. Disconnect electrical wires from the magnetic clutch.
3. Loosen all the mounting bolts and loosen the belt tightener (if equipped). Remove drive belt (2).
4. Disconnect hoses (3) and put plugs or caps on the hoses. Put plugs or caps on the fittings of the compressor. Put identification marks on the hoses. The marks will ensure that the hoses will be connected correctly at a later time.
5. Remove all the mounting bolts and remove the compressor (4). The weight of the compressor is approximately 18 kg (40 lb).

Installation

1. Check the amount and condition of the oil in the compressor (4). Refer to the Service Manual, SENR5664, "Refrigerant Compressor Oil-Test" section in Testing and Adjusting.
2. Inspect the drive belt (2). If the drive belt (2) is damaged or worn replace the belt.
3. Install the compressor (4). Do not tighten the mounting bolts until drive belt (2) is installed and adjusted.

i02998486

4. Connect the discharge and the suction hoses (3) to the discharge and suction ports on the compressor.
5. Connect the electrical wires to the magnetic clutch.
6. Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting.
7. Charge the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.
8. For the correct system operation, refer to the Service Manual, SENR5664, "Troubleshooting Heating and Air Conditioning Control System" section in Testing and Adjusting.

Note: Refer to the Service Manual, SENR5664, "Refrigerant Compressor" in the Specifications Section for the correct belt tension.

9. For the oil level in the system, refer to Service Manual, SENR5664, "Refrigerant Compressor Oil - Check".

i02998485

Refrigerant Accumulator - Remove and Install

SMCS Code: 1808-010-ZJ; 7320-010-ZJ

The refrigerant must be recovered before the accumulator is removed. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting.

Refer to the Service Manual, SENR5664, "Machine Preparation for troubleshooting" section in Testing and Adjusting before service work is performed.

Remove the accumulator. The accumulator has an internal oil drain hole which could become plugged. The oil could be trapped inside the accumulator. It is necessary to check for excessive oil when the accumulator is changed. Add the same amount of oil that was drained from the old accumulator. Add an additional 30 mL (1 fl oz) to the new accumulator before the new accumulator is installed. Do not add oil if the compressor was changed also. Evacuate the system and recharge the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in Testing and Adjusting. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in Testing and Adjusting.

Note: If the accumulator has frost on the outside, the air conditioning system still contains refrigerant.

Refrigerant Expansion Valve - Remove and Install

SMCS Code: 7320-010-EV

To replace the expansion valve, use the procedure that follows. Refer to Service Manual, SENR5664, "Troubleshooting Heating and Air Conditioning Control System" before service work is performed on the air conditioning system.

1. Recover the refrigerant.

Note: Cap all disconnected lines and hoses.

2. Remove the insulation and the clip. The insulation and the clip hold the sensing bulb to the evaporator outlet pipe.
3. Disconnect the sensing line for pressure from the evaporator outlet pipe.
4. Loosen and remove the two connections at the expansion valve. Remove the expansion valve.

Note: Check the O-ring seals. The seals must be in good condition and the seals must be properly lubricated with the correct refrigerant oil before assembly.

5. Install the expansion valve for replacement and tighten the two connections.
6. Tighten the pressure sensing connection on the evaporator outlet pipe.
7. Use a 8P-6355 Clip to hold the sensing bulb onto the evaporator outlet pipe. The sensing bulb should be as close to the coil as possible. The bulb should be upstream of the pressure sensing connection on the evaporator outlet pipe. The 5P-7070 Insulation should be wrapped tightly around the clip, the sensing bulb and the outlet pipe. There should be no insulation between the bulb and the outlet pipe.
8. Tighten all the connections correctly.
9. Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in testing and adjusting.
10. Charge the system with the correct amount of refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in testing and adjusting.

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Refrigerant Receiver-Dryer - Remove and Install

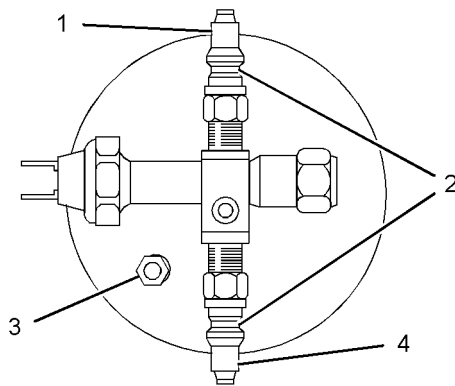
SMCS Code: 7322-010

Illustration 134

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Top View of Receiver-Dryer

- (1) Inlet
- (2) Quick Disconnect Fittings
- (3) Moisture Indicator
- (4) Outlet

NOTICE

If the receiver-dryer does not have air conditioner quick disconnects, the system must be completely recovered, evacuated, and recharged after the receiver-dryer has been replaced.

The refrigerant that is in the system must be recovered if the receiver-dryer does not have air conditioner quick disconnects (2). Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in Testing and Adjusting before you remove the receiver-dryer. If the receiver-dryer has air conditioner quick disconnects (2) use the procedure that follows.

Refer to Safety Requirements before service is performed on the air conditioning system.

1. Stop the engine for five minutes. This allows the air conditioning system to equalize the pressure.
2. Disconnect the inlet hose (1) from the old receiver-dryer at the air conditioner quick disconnects.
3. Connect the hose that was disconnected in Step 2 to the inlet on the new receiver-dryer.
4. Disconnect the electrical connections on the old receiver-dryer. Connect the electrical connections to the new receiver-dryer.

Note: If the receiver-dryer has quick disconnects, do not add additional oil or refrigerant to the system.

5. Start the engine. Operate the air conditioning system for one minute.
6. With the air conditioning system in operation, disconnect the outlet hose (4) from the old receiver-dryer. Disconnect the old receiver-dryer at the air conditioner quick disconnects.
7. Stop the engine for five minutes. This allows the air conditioning system to equalize pressure.
8. Connect the outlet hose (4) that was disconnected in step 6 to the new receiver-dryer.

Note: The receiver-dryer must be replaced annually. The receiver-dryer must also be replaced whenever the system is opened. The receiver-dryer should be replaced if moisture indicator (3) is filled with moisture. Moisture indicator (3) will display a pink color or white color if the receiver-dryer is full of moisture.

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In-Line Refrigerant Dryer - Remove and Install

SMCS Code: 7322-010-QT

Dryer Installation

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

NOTICE

Never weld or solder any charged components.

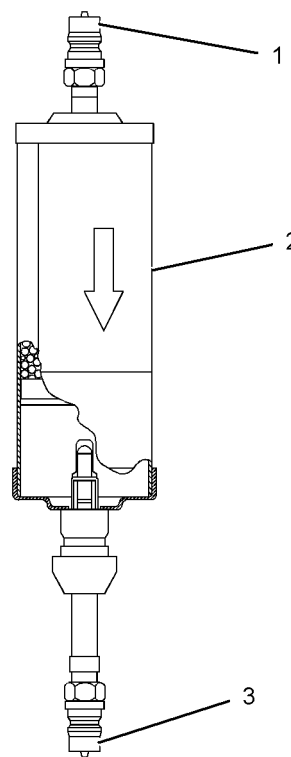


Illustration 135

g01520430

Typical In-Line Dryer with quick disconnects

- (1) Inlet hose with air conditioner quick disconnect
- (2) Dryer
- (3) Outlet hose with air conditioner quick disconnect

Note: Replace dryer (2) annually. Dryer (2) should also be replaced whenever the system is opened.

Disassembly and Assembly

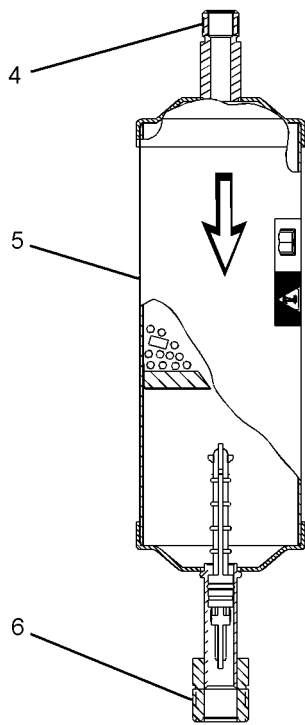


Illustration 136 g01520434
In-line dryer without quick disconnects
(4) Inlet hose without air conditioner quick disconnect
(5) Dryer
(6) Outlet hose without air conditioner quick disconnects

Note: Every two years replace dryer (5). Dryer (5) should also be replaced whenever the system is opened.

Before any service work is performed on the air conditioning system, refer to the Service Manual, SENR5664, “Machine Preparation for Troubleshooting” section in Testing and Adjusting.

Before removing the dryer, perform the following steps in order to properly diagnose the problem

1. Check the following components for blockages:
 - Condenser
 - Evaporator
 - Fresh air filters
2. Check the condition and the tension of the compressor drive belt.
3. Connect a manifold gauge set to the compressor. Refer to Service Manual, SENR5664, “Manifold Gauge Set – Install”.
4. Operate the Air conditioning.

- Operate the engine at 1400 rpm.
 - Place the air conditioning switch in the ON position.
 - Set the blower switch to the HIGH position.
 - Open all of the louvers in the cab.
 - Close the cab doors and close all of the cab windows.
5. Compare the pressures for the manifold gauge to the pressure ranges in Table 54 in order to ensure that the pressures are normal for the current ambient air temperature.

Table 54

Pressure Range ⁽¹⁾		
Ambient Air Temperature C° (F°)	High Pressure Test Fitting kPa (psi) ⁽²⁾	Low Pressure Test Fitting kPa (psi) ⁽³⁾
21°C (70°F)	820 to 1300 kPa (120 to 190 psi)	70 to 138 kPa (10 to 20 psi)
27°C (80°F)	950 to 1450 kPa (140 to 210 psi)	70 to 173 kPa (10 to 25 psi)
32°C (90°F)	1175 to 1650 kPa (170 to 240 psi)	105 to 210 kPa (15 to 30 psi)
38°C (100°F)	1300 to 1850 kPa (190 to 270 psi)	105 to 210 kPa (15 to 30 psi)
43°C (110°F)	1450 to 2075 kPa (210 to 300 psi)	105 to 210 kPa (15 to 30 psi)

(1) This table is only for reference.
(2) Pressure may be slightly higher in very humid conditions and lower in very dry conditions.
(3) Pressure before clutch disengagement

6. Check for frost at the dryer outlet.
Note: Moisture on the drier outlet tube after the orifice is normal and this moisture does not indicate a failure with the dryer. Frost on the drier outlet tube after the orifice is an indicator of a low refrigerant charge.
7. If frost is indicated at the dryer outlet or if pressures are low proceed to Step 8. Otherwise, proceed to Step 15.
8. Recover the refrigerant charge from the machine. Refer to Service Manual, SENR5664, “Refrigerant System Recovery”.
9. Record the amount of refrigerant and oil that is recovered from the Air Conditioner system.

These values will be needed in order to calculate the amount of oil that is needed. Refer to Service Manual, SENR5664, “Refrigerant Compressor Oil - Test” in the Testing and Adjusting Section.

10. If the charge was low, check the system for leaks.

- a. Use an Ultraviolet light and use an electronic leak detector. Ensure that the following items are checked:
 - Quick disconnects which are on the dryer
 - Check the drier swivel nut and tighten the nut to 27 ± 4 N·m (20 ± 3 lb ft).
 - All the connections in the circuit that are O-ring
 - Hoses for rubbing, bulging, and wet spots (oil leaks)

Note: In order to help reveal leaks, simulate the vibrations which are made by the machine by moving the connections.

11. Recharge the refrigerant. Refer to Service Manual, SENR5664, "Refrigerant System - Charge" in the Testing and Adjusting Section.

12. Retest the system with the engine at 1400 rpm and check for frost at the dryer outlet.

13. Ensure that the pressures are normal for the current ambient temperature.

14. Refer to Table 54 for the pressures which are normal for the current ambient air temperature.

15. If a component is leaking, bill the claim against the leaking component and provide details in the description.

Dryer Removal

If the dryer does not have air conditioner quick Disconnects the refrigerant that is in the system must be recovered. Refer to the Service Manual, SENR5664, "Refrigerant System Recovery" section in Testing and Adjusting before you remove the dryer.

If the dryer has air conditioner quick disconnects use the procedure that follows.

Refer to Service Manual, SENR5664, "Machine Preparation for Disassembly and Assembly" before service is performed on the air conditioning system.

1. Stop the engine for five minutes. This allows the air conditioning system to equalize the pressure.
2. Disconnect the inlet hose from the old dryer.
3. Connect the hose that was disconnected in Step 2 to the inlet on the new dryer.

Note: For a dryer that has air conditioner quick disconnects, do not add additional oil or refrigerant to the system.

4. Start the engine. Operate the air conditioning system for one minute.
5. With the air conditioning system in operation, disconnect the outlet hose from the old dryer. Disconnect the old dryer.
6. Stop the engine for five minutes. This allows the air conditioning system to equalize pressure.
7. Connect the outlet hose that was disconnected in Step 6 to the new dryer.
8. Mark the new dryer in permanent marker Installed mm/dd/yy. This will assist in future maintenance of the in-line dryer.

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Refrigerant Orifice Tube Assembly - Remove and Install

SMCS Code: 7320-010-QT

The orifice tube may be located in the refrigerant line near the evaporator inlet, or in the in-line dryer.

If the orifice tube is located in the refrigerant line near the evaporator inlet use the procedure that follows. If the orifice tube is located in the in-line dryer, refer to Dryer Replacement.

Removing the Orifice Tube

Refer to Safety Requirements before service work is performed on the air conditioning system.

The refrigerant must be recovered before removing the accumulator. Refer to the Service Manual, SENR5664, "Refrigerant Recovery" section in testing and adjusting.

NOTICE

Do not attempt to remove the orifice tube with pliers. Do not twist or rotate the orifice tube in the tube assembly.

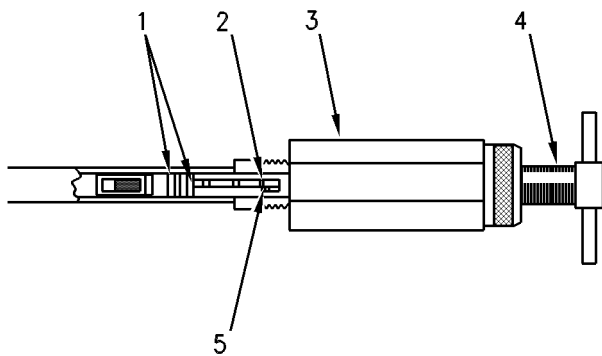


Illustration 137

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Orifice tube

- (1) O-Ring seals
- (2) Lugs
- (3) Body
- (4) Drive screw
- (5) Finger lock

1. Disconnect the high side line at the enlarged section of the evaporator inlet port. This will expose the orifice tube for removal.
2. Align the short fingers of the 1U-9890 Orifice Removal Tool with the ribs of the orifice tube. Insert the tool onto the tube until the tool bottoms out.
3. Turn drive screw (4) clockwise. Turn far enough to engage the lugs (2) on the orifice tube in the finger lock (5). The finger lock (5) is part of the removal tool.
4. Hold the drive screw (4) stationary. Thread the body (3) forward until the body makes contact with the inlet port.
5. Continue holding the drive screw stationary, and thread the body forward until the orifice tube becomes free.

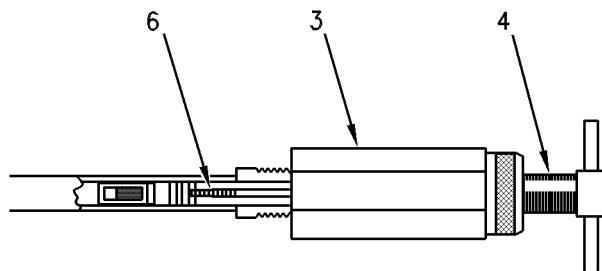


Illustration 138

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Removing the broken orifice tube

- (3) Body
- (4) Drive screw
- (6) Extractor tip

6. For the removal of the orifice tube assembly, use the extractor tip (6) on 1U-9890 Orifice Removal Tool. Insert the tool into the evaporator inlet tube and thread the tool into the brass center of the orifice tube.

7. Repeat steps 3 and 4.

8. If only the brass center of the orifice tube is removed, thread the tool into the plastic body and repeat step 3 and 4.

Orifice Tube Installation

1. Lubricate the O-Ring on the orifice tube with the proper clean refrigerant oil.
2. Place the orifice tube into the 1U-9890 Orifice Removal Tool. Insert the orifice tube straight into the evaporator inlet tube without twisting until the tube is seated.
3. Disengage the removal tool from the orifice tube.
4. Use a new O-Ring that is lubricated with clean refrigerant oil. Reconnect the high side line at the enlarged section of the evaporator inlet port.
5. Do a leak test. Evacuate the system and recharge the system. Refer to the Service Manual, SENR5664, "Refrigerant Systems-Evacuate" section in testing and adjusting. Also, refer to the Service Manual, SENR5664, "Refrigerant Systems-Charge" section in testing and adjusting.

Index

A

Air Conditioner Lines - Remove and Install	313
Air Conditioning Performance - Test.....	255
Air Conditioning System Troubleshooting	225
Additional Refrigerant Circuit Problems for Orifice Tube System	235
False Seizure of the Compressor	236
Indications from the Compressor Pressures	226
Problem Solving	226
Red Dot Automatic Temperature Control (ATC) - Fault Codes: (only for 584 Forwarders and 584HD Forwarders).....	236
Refrigerant Circuit Problems.....	227

C

Cab Pressurization and Filtration System	215
Cab Air Filters	215
Compressor Protection System - Test	286–287
Condensate Drainage System.....	216

D

Disassembly and Assembly Section.....	311

E

Electronic Heat Control - Test.....	293
Type 1 - Electronic Water Valve Only.....	293
Type 1A - Electronic Heat control Circuit for Water Valve using External Control Assembly, Nominal System Voltage	293
Type 1B - Electronic Heat Control Circuit for Water Valve using a Potentiometer and Series Resistor, Regulated Supply Voltage.....	295
Type 1C - Electronic Heat Control Circuit for Water Valve using a HVAC Panel, Regulated Supply Voltage	297
Type 1D - Electronic Heat Control Circuit for Water Valve using a Nominal System Voltage, HVAC Panel	299
Type 1E - Electronic Heat Control Circuit for Water Valve using a Potentiometer, Nominal System Voltage	301
Type 2 - Electronic Heat Control Circuit for Water Valve and Blend Door HVAC System using External Control Assembly.....	303
Type 3 - Electronic Heat Control Circuit for Blend Door Only HVAC System using Two Series Resistors and a Potentiometer.....	305
Evaporator Coil.....	208

G

General Information.....	197, 311

General Troubleshooting Information	224
Glossary of Terms.....	220

H

Heater Performance - Test	307
Heating and Air Conditioning Service Publications	309
Heating System Troubleshooting	238
Symptom: The heat that is within the cab is uncontrollable.....	239
Symptom: There is a coolant smell that is present within the cab.	240
Symptom: There is little or no warm air that is flowing to the cab when the heater control knob is set to the position of maximum heat.	238
Symptom: There is no flow of air to the operators compartment. The evaporator blower motors do not operate when the fan switch is activated...	240

I

Identifying the Air Conditioning System.....	198
Identifying the Heating System.....	199
Identifying the Heating System	199
Identifying the Refrigerant	197
Important Safety Information	2
In-line Refrigerant Dryer	207
In-Line Refrigerant Dryer - Remove and Install...	318
Dryer Installation	318

M

Machine Preparation for Disassembly and Assembly	312
Machine Preparation for Testing and Adjusting ...	254
Lockout/Tagout Procedure	254
Machine Preparation for Troubleshooting	223
Lockout/Tagout Procedure	223
Manifold Gauge Set (Refrigerant) - Install.....	258
Manifold Gauge Set (Refrigerant) - Remove	285

P

Pressure Switch (Refrigerant)	214
Air Conditioning High Low Pressure Switch.....	214
Air Conditioning Low Pressure Switch	214

R

Reference Information Section	309
Refrigerant Accumulator.....	209
Refrigerant Accumulator - Remove and Install....	316

Refrigerant Compressor	5, 22, 26, 28, 30, 33–36, 38–41, 44, 47–50, 52–55, 57, 59, 64–71, 75, 77–82, 84, 87–88, 90–94, 204
Compressor	36, 45, 48, 51, 54, 57, 59, 66
Magnetic Clutch	6, 27, 35, 71, 79–81, 90
R-134a Refrigerant	5, 27, 35, 71, 78, 80, 90, 92
Refrigerant Oil.....	5, 27, 35, 71, 79–81, 90, 92
Specifications for the Clutch	81
Specifications for the Compressor	81
V-belt.....	52
Refrigerant Compressor - Remove and Install	315
Refrigerant Compressor - Test	271
Procedures.....	271
Refrigerant Compressor Protection System	210
Refrigerant Condenser	205
Refrigerant Expansion Valve	206
Refrigerant Expansion Valve - Remove and Install	316
Refrigerant Expansion Valve System	201
Refrigerant Leakage - Test	256
Dye.....	256
Leak Detector.....	257
Refrigerant Oil - Test.....	268
Add Air Conditioning System PAG Oil Charge..	270
Complete Check of Compressor Oil	269
New Replacement Compressor	269
Replacing the A/C Compressor	268
Refrigerant Orifice Tube Assembly.....	208
Refrigerant Orifice Tube Assembly - Remove and Install	320
Refrigerant Orifice Tube System	203
Refrigerant Receiver-Dryer.....	205
Refrigerant Receiver-Dryer - Remove and Install	317
Refrigerant Recovery.....	259
Oil and Refrigerant Charge for the Air Conditioning System	261
Refrigerant System - Charge.....	279
Charging the System	282
Complete Charge of the System from a Refrigerant Tank with a Scale	283
Procedure for Labeling.....	281
Relationship Between Temperature and Pressure (R-134a Refrigerant)	279
Refrigerant System - Evacuate.....	275
Refrigerant System - Flush.....	262
Oil Charge After System Flush	266
System Contamination and Flush Procedure ..	263
Required Tools.....	222
S	
Service Intervals	216
Air Filters-Clean	218
Coil Cleaning.....	219
Heating and A/C Maintenance Checklist	217
Specifications Section	5
System Capacities for Refrigerant (Agricultural Tractors)	95
Challenger 35 Refrigerant Capacities	95
Challenger 45 Refrigerant Capacities	95
Challenger 55 Refrigerant Capacities	96
Challenger 65 Refrigerant Capacities	96
Challenger 70C Refrigerant Capacities	96
Challenger 75 Refrigerant Capacities	96
Challenger 85 Refrigerant Capacities	96
Challenger 95E Refrigerant Capacities.....	96
DV87 Refrigerant Capacities	95
System Capacities for Refrigerant (Articulated Trucks).....	97
725 Refrigerant Capacities	98
730 Refrigerant Capacities	98
735 Refrigerant Capacities	98
740 Refrigerant Capacities	98
D20 Refrigerant Capacities.....	97
D25 Refrigerant Capacities.....	97
D250 Refrigerant Capacities.....	97
D30 Refrigerant Capacities.....	97
D300 Refrigerant Capacities.....	97
D350 Refrigerant Capacities.....	97
D40 Refrigerant Capacities.....	97
D400 Refrigerant Capacities.....	98
System Capacities for Refrigerant (Articulated Trucks) (OEM)	98
725 Refrigerant Capacities	98
730 Refrigerant Capacities	98
735 Refrigerant Capacities	99
740 Refrigerant Capacities	99
System Capacities for Refrigerant (Backhoe Loaders).....	101
414 Refrigerant Capacities	101
416 Refrigerant Capacities	101
420 Refrigerant Capacities	102
422 Refrigerant Capacities	102
424 Refrigerant Capacities	102
426 Refrigerant Capacities	102
428 Refrigerant Capacities	102
430 Refrigerant Capacities	103
432 Refrigerant Capacities	103
434 Refrigerant Capacities	103
436 Refrigerant Capacities	103
438 Refrigerant Capacities	103
442 Refrigerant Capacities	104
444 Refrigerant Capacities	104
446 Refrigerant Capacities	104
450 Refrigerant Capacities	104
System Capacities for Refrigerant (Compact Track Loaders).....	104
259 Refrigerant Capacities	104
279 Refrigerant Capacities	104
289 Refrigerant Capacities	104
299 Refrigerant Capacities	105
System Capacities for Refrigerant (Compact Wheel Loaders).....	105
904 Refrigerant Capacities	105
906 Refrigerant Capacities	105
907 Refrigerant Capacities	105
908 Refrigerant Capacities	105

System Capacities for Refrigerant (Compactors).....	106
Landfill Compactors	106
Soil Compactors.....	106
System Capacities for Refrigerant (Excavators) (302.5-5080)	109
302.5C Refrigerant Capacities.....	109
303.5C CR Refrigerant Capacities.....	109
303.5D CR Refrigerant Capacities.....	109
303.5E CR Refrigerant Capacities.....	109
303C CR Refrigerant Capacities.....	109
304C CR Refrigerant Capacities.....	109
304D CR Refrigerant Capacities.....	109
304E CR Refrigerant Capacities.....	109
305.5 Refrigerant Capacities	109
305.5D CR Refrigerant Capacities.....	109
305.5E CR Refrigerant Capacities.....	109
305C CR Refrigerant Capacities.....	109
305D CR Refrigerant Capacities.....	109
305E CR Refrigerant Capacities.....	109
306 Refrigerant Capacities	109
307 Refrigerant Capacities	109
308E CR Refrigerant Capacities.....	110
311 Refrigerant Capacities.....	110
312 Refrigerant Capacities	110
315 Refrigerant Capacities	110
317 Refrigerant Capacities	110
320 Refrigerant Capacities	110
322 Refrigerant Capacities	110
325 Refrigerant Capacities	110
330 Refrigerant Capacities	110
350 Refrigerant Capacities	110
375 Refrigerant Capacities	111
5080 Refrigerant Capacities	111
System Capacities for Refrigerant (Excavators) (304 CR, 305 CR, 313B CR, 321B CR)	111
304 CR Refrigerant Capacities	111
305 CR Refrigerant Capacities	111
313B CR Refrigerant Capacities.....	111
321B LCR Refrigerant Capacities.....	111
System Capacities for Refrigerant (Excavators) (307B).....	111
307B Refrigerant Capacities.....	111
System Capacities for Refrigerant (Excavators) (307C, 311C, 320C).....	112
307C Refrigerant Capacities.....	112
311C Refrigerant Capacities.....	112
320C Refrigerant Capacities.....	112

System Capacities for Refrigerant (Excavators) (307D-390D).....	117
307D Refrigerant Capacities.....	117
311D Refrigerant Capacities.....	117
312D Refrigerant Capacities.....	117
313D Refrigerant Capacities.....	117
315D Refrigerant Capacities.....	117
318D Refrigerant Capacities.....	118
319D Refrigerant Capacities.....	118
320D Refrigerant Capacities.....	118
320D RR Refrigerant Capacities.....	118
323D Refrigerant Capacities.....	118
324D Refrigerant Capacities.....	119
325D Refrigerant Capacities.....	119
326D Refrigerant Capacities.....	119
328D LCR Refrigerant Capacities.....	119
329D Refrigerant Capacities.....	119
330D Refrigerant Capacities.....	119
336D Refrigerant Capacities.....	120
340D Refrigerant Capacities.....	120
345D Refrigerant Capacities.....	120
349D Refrigerant Capacities.....	120
374D Refrigerant Capacities.....	120
390D Refrigerant Capacities.....	120
M325D Refrigerant Capacities.....	119
System Capacities for Refrigerant (Excavators) (308C CR-321C CR).....	122
308C CR Refrigerant Capacities.....	122
314C CR Refrigerant Capacities.....	122
321C CR Refrigerant Capacities.....	122
System Capacities for Refrigerant (Excavators) (308D CR-328D CR).....	123
308D CR Refrigerant Capacities.....	123
314D CR Refrigerant Capacities.....	123
321D LCR Refrigerant Capacities.....	123
328D LCR Refrigerant Capacities.....	123
System Capacities for Refrigerant (Excavators) (311B-330B).....	124
311B Refrigerant Capacities	124
312B Refrigerant Capacities	124
315B Refrigerant Capacities.....	124
320B Refrigerant Capacities.....	124
322B Refrigerant Capacities	124
325B Refrigerant Capacities.....	125
330B Refrigerant Capacities.....	125
System Capacities for Refrigerant (Excavators) (311B-385B).....	126
311B Refrigerant Capacities	126
312B Refrigerant Capacities	126
315B Refrigerant Capacities.....	126
318B Refrigerant Capacities.....	126
320B Refrigerant Capacities.....	126
322B Refrigerant Capacities.....	126
325B Refrigerant Capacities.....	126
330B Refrigerant Capacities.....	127
345B Refrigerant Capacities.....	127
365B Refrigerant Capacities.....	127
385B Refrigerant Capacities.....	127

System Capacities for Refrigerant (Excavators)	System Capacities for Refrigerant (Excavators)
(312B-5090B).....	(M313C - M325C).....
312B Refrigerant Capacities.....	M313C Refrigerant Capacities.....
315B Refrigerant Capacities.....	M315C Refrigerant Capacities.....
317B Refrigerant Capacities.....	M316C Refrigerant Capacities.....
318B Refrigerant Capacities.....	M318C Refrigerant Capacities.....
320B Refrigerant Capacities.....	M322C Refrigerant Capacities.....
322B Refrigerant Capacities.....	M325C Refrigerant Capacities.....
325B Refrigerant Capacities.....	System Capacities for Refrigerant (Excavators)
330B Refrigerant Capacities.....	(M313D - M322D).....
345B Refrigerant Capacities.....	M313D Refrigerant Capacities.....
345B Series II Refrigerant Capacities.....	M315D Refrigerant Capacities.....
365B Refrigerant Capacities.....	M316D Refrigerant Capacities.....
365B Series II Refrigerant Capacities.....	M318D Refrigerant Capacities.....
385B Refrigerant Capacities.....	M322D Refrigerant Capacities.....
5090B Refrigerant Capacities.....	System Capacities for Refrigerant (Excavators)
M325B Refrigerant Capacities.....	(OEM MHPU).....
W345B Series II Refrigerant Capacities.....	323D Refrigerant Capacities.....
System Capacities for Refrigerant (Excavators)	324D LN Refrigerant Capacities.....
(312C, 322C-330C, TK1051).....	325C Refrigerant Capacities.....
312C Refrigerant Capacities.....	325D Refrigerant Capacities.....
322C Refrigerant Capacities.....	330C Refrigerant Capacities.....
325C Refrigerant Capacities.....	330D Refrigerant Capacities.....
330C Refrigerant Capacities.....	336D Refrigerant Capacities.....
TK1051 Refrigerant Capacities.....	345C Refrigerant Capacities.....
System Capacities for Refrigerant (Excavators)	345D Refrigerant Capacities.....
(312C-330C).....	365C L Refrigerant Capacities.....
312C Refrigerant Capacities.....	385C Refrigerant Capacities.....
315C Refrigerant Capacities.....	System Capacities for Refrigerant (Forest
318C Refrigerant Capacities.....	Products).....
319C Refrigerant Capacities.....	Forwarders.....
320C Refrigerant Capacities.....	Knuckleboom Loaders.....
322C Refrigerant Capacities.....	Track Feller Bunchers.....
325C Refrigerant Capacities.....	Track Skidders.....
330C Refrigerant Capacities.....	Wheel Feller Bunchers.....
System Capacities for Refrigerant (Excavators)	Wheel Harvesters.....
(312E - 349E).....	Wheel Skidders.....
312E Refrigerant Capacities.....	System Capacities for Refrigerant (Integrated
316E Refrigerant Capacities.....	Toolcarriers).....
318E Refrigerant Capacities.....	Medium Integrated Toolcarriers.....
320E Refrigerant Capacities.....	Small Integrated Toolcarriers.....
323E Refrigerant Capacities.....	System Capacities for Refrigerant (Large Wheel
324E Refrigerant Capacities.....	Loaders).....
329E Refrigerant Capacities.....	986 Refrigerant Capacities.....
336E Refrigerant Capacities.....	988 Refrigerant Capacities.....
349E Refrigerant Capacities.....	990 Refrigerant Capacities.....
System Capacities for Refrigerant (Excavators)	992 Refrigerant Capacities.....
(324D FM, 325D FM, 330D FM, 568 FM).....	993 Refrigerant Capacities.....
324D FM Refrigerant Capacities.....	994 Refrigerant Capacities.....
325D FM Refrigerant Capacities.....	System Capacities for Refrigerant (Load Haul
330D FM Refrigerant Capacities.....	Dump).....
568 Refrigerant Capacities.....	R1300 Refrigerant Capacities.....
System Capacities for Refrigerant (Excavators)	R1600 Refrigerant Capacities.....
(345C-385C).....	R1700 Refrigerant Capacities.....
345C Refrigerant Capacities.....	R2900 Refrigerant Capacities.....
365C Refrigerant Capacities.....	
385C Refrigerant Capacities.....	
System Capacities for Refrigerant (Excavators)	
(M312 - M320).....	
M312 Refrigerant Capacities.....	
M315 Refrigerant Capacities.....	
M318 Refrigerant Capacities.....	
M320 Refrigerant Capacities.....	

System Capacities for Refrigerant (Medium Wheel Loaders).....		154
936F Refrigerant Capacities		154
938 Refrigerant Capacities		154
950 Refrigerant Capacities		154
960F Refrigerant Capacities		154
962 Refrigerant Capacities		154
966 Refrigerant Capacities		155
970F Refrigerant Capacities		155
972 Refrigerant Capacities		155
980 Refrigerant Capacities		155
System Capacities for Refrigerant (Mining Excavators).....		156
5110 Refrigerant Capacities.....		156
5130 Refrigerant Capacities		156
5230 Refrigerant Capacities		156
System Capacities for Refrigerant (Motor Graders).....		159
12 Refrigerant Capacities		159
120 Refrigerant Capacities		159
130 Refrigerant Capacities		159
135 Refrigerant Capacities		159
14 Refrigerant Capacities		159
140 Refrigerant Capacities		160
143 Refrigerant Capacities		160
16 Refrigerant Capacities		160
160 Refrigerant Capacities		160
163 Refrigerant Capacities		160
24 Refrigerant Capacities		161
System Capacities for Refrigerant (Multi-Terrain Loaders).....		161
247 Refrigerant Capacities		161
257 Refrigerant Capacities		161
267 Refrigerant Capacities		161
277 Refrigerant Capacities		162
279 Refrigerant Capacities		162
287 Refrigerant Capacities		162
289 Refrigerant Capacities		162
297 Refrigerant Capacities		162
299 Refrigerant Capacities		162
System Capacities for Refrigerant (Off-Highway Trucks).....		164
69 Refrigerant Capacities		164
73 Refrigerant Capacities		164
768 Refrigerant Capacities		164
769 Refrigerant Capacities		164
770 Refrigerant Capacities		164
771 Refrigerant Capacities		164
772 Refrigerant Capacities		164
773 Refrigerant capacities		164
775 Refrigerant Capacities		164
776 Refrigerant Capacities		164
777 Refrigerant Capacities		165
784 Refrigerant Capacities		165
785 Refrigerant Capacities		165
789 Refrigerant Capacities		165
793 Refrigerant Capacities		165
795 Refrigerant Capacities		165
797 Refrigerant Capacities		165

System Capacities for Refrigerant (Off-Highway Trucks) (OEM)		166
773F Refrigerant capacities		166
775F Refrigerant Capacities		166
777F Refrigerant Capacities		166
785D Refrigerant Capacities		166
System Capacities for Refrigerant (Paving Products)		168
CB-434 Refrigerant Capacities		169
CB-534 Refrigerant Capacities		169
CB44B Refrigerant Capacities		169
CB54B Refrigerant Capacities		169
CD44B Refrigerant Capacities		169
CD54B Refrigerant Capacities		169
CP-633 Refrigerant Capacities		171
CP-64 Refrigerant Capacities		171
CP-74 Refrigerant Capacities		171
CP-76 Refrigerant Capacities		172
CP/CS-423 Refrigerant Capacities		169
CP/CS-433 Refrigerant Capacities		169
CP/CS-533 Refrigerant Capacities		170
CP/CS-563 Refrigerant Capacities		170
CP/CS-663 Refrigerant Capacities		171
CP54B Refrigerant Capacities		170
CP56B Refrigerant Capacities		170
CP68B Refrigerant Capacities		170
CP74B Refrigerant Capacities		170
CS-531 Refrigerant Capacities		169
CS-573 Refrigerant Capacities		170
CS-583 Refrigerant Capacities		170
CS-64 Refrigerant Capacities		171
CS-683 Refrigerant Capacities		171
CS-74 Refrigerant Capacities		171
CS-76 Refrigerant Capacities		172
CS54B Refrigerant Capacities		171
CS56B Refrigerant Capacities		171
CS64B Refrigerant Capacities		171
CS66B Refrigerant Capacities		171
CS68B Refrigerant Capacities		171
CS74B Refrigerant Capacities		171
CS76B Refrigerant Capacities		171
CS78B Refrigerant Capacities		171
RM-300 Refrigerant Capacities.....		168
RM-350 Refrigerant Capacities.....		169
RM-500 Refrigerant Capacities.....		169
RR-250 Refrigerant Capacities		168
SS-250 Refrigerant Capacities		168
System Capacities for Refrigerant (Skid Steer Loaders).....		172
216 Refrigerant Capacities		172
226 Refrigerant Capacities		172
232		173
236 Refrigerant Capacities		173
242 Refrigerant Capacities		173
246 Refrigerant Capacities		173
248 Refrigerant Capacities		173
252 Refrigerant Capacities		173
256 Refrigerant Capacities		173
262 Refrigerant Capacities		173
268 Refrigerant Capacities		173
272 Refrigerant Capacities		173

System Capacities for Refrigerant (Small Wheel Loaders).....	175
910 Refrigerant Capacities	175
914 Refrigerant Capacities	175
918 Refrigerant Capacities	175
924 Refrigerant Capacities	175
928 Refrigerant Capacities	175
930 Refrigerant Capacities	176
System Capacities for Refrigerant (Telehandlers).....	176
TH210 Refrigerant Capacities.....	176
TH215 Refrigerant Capacities.....	176
TH220 Refrigerant Capacities.....	176
TH330 Refrigerant Capacities.....	177
TH340 Refrigerant Capacities.....	177
TH350 Refrigerant Capacities.....	177
TH355 Refrigerant Capacities.....	177
TH360 Refrigerant Capacities.....	177
TH460 Refrigerant Capacities.....	177
TH560 Refrigerant Capacities.....	177
TH580 Refrigerant Capacities.....	177
System Capacities for Refrigerant (Track-Type Loaders).....	177
933 Refrigerant Capacities	177
939 Refrigerant Capacities	178
953 Refrigerant Capacities	178
963 Refrigerant Capacities	178
973 Refrigerant Capacities	178

System Capacities for Refrigerant (Track-Type Tractors)	185
583T Pipelayer Refrigerant Capacities	191
587T Pipelayer Refrigerant Capacities	191
D10N Refrigerant Capacities	190
D10R Refrigerant Capacities	191
D10T Refrigerant Capacities.....	191
D11N Refrigerant Capacities	191
D11R Refrigerant Capacities	191
D3C Series III Refrigerant Capacities	185
D3G Refrigerant Capacities	186
D3K Refrigerant Capacities	186
D3K2 Refrigerant Capacities	186
D4C series III Refrigerant Capacities.....	186
D4G Refrigerant Capacities	186
D4H Series II Refrigerant Capacities	186
D4H TSK Series III Refrigerant Capacities	186
D4K Refrigerant Capacities	186
D4K2 Refrigerant Capacities	186
D5C Series III Refrigerant Capacities	186
D5G Refrigerant Capacities	187
D5H Series II Refrigerant Capacities	187
D5K Refrigerant Capacities	187
D5K2 Refrigerant Capacities	187
D5M Refrigerant Capacities.....	187
D5N Refrigerant Capacities	187
D5R Refrigerant Capacities	187
D6C Refrigerant Capacities	187
D6G Refrigerant Capacities	187
D6H Series II Refrigerant Capacities	187
D6K Refrigerant Capacities	188
D6K2 Refrigerant Capacities	188
D6M Refrigerant Capacities.....	188
D6N Refrigerant Capacities	188
D6R Refrigerant Capacities	188
D6R Series II Refrigerant Capacities	188
D6R Series III Refrigerant Capacities	189
D6T Refrigerant Capacities.....	189
D7E Refrigerant Capacities	189
D7G Refrigerant Capacities.....	189
D7H Series II Refrigerant Capacities	189
D7R Refrigerant Capacities	190
D7R Series II Refrigerant Capacities	189
D8N Refrigerant Capacities	190
D8R Refrigerant Capacities	190
D8T Refrigerant Capacities.....	190
D9N Refrigerant Capacities	190
D9R Refrigerant Capacities	190
D9T Refrigerant Capacities.....	190
PL61 Pipelayer Refrigerant Capacities	191
PL83 Pipelayer Refrigerant Capacities	191
PL87 Pipelayer Refrigerant Capacities	192
System Capacities for Refrigerant (Underground Articulated Truck).....	192
AD30 Refrigerant Capacities	192
AD40 and AE40 Refrigerant Capacities.....	192
AD45 Refrigerant Capacities	192
AD55 Refrigerant Capacities	192

System Capacities for Refrigerant (Wheel Dozers)	193
814 Refrigerant Capacities	193
824 Refrigerant Capacities	193
834 Refrigerant Capacities	193
844 Refrigerant Capacities	193
854 Refrigerant Capacities	194
System Capacities for Refrigerant (Wheel Tractor-Scrapers).....	195
611 Refrigerant Capacities.....	195
613 Refrigerant Capacities	195
615 Refrigerant Capacities	195
621 Refrigerant Capacities	195
623 Refrigerant Capacities	196
627 Refrigerant Capacities	196
631 Refrigerant Capacities	196
633 Refrigerant Capacities	196
637 Refrigerant Capacities	196
651 Refrigerant Capacities	196
657 Refrigerant Capacities	196
Systems Operation Section	197

T

Table of Contents.....	3
Temperature Control.....	211
Adjustable Thermostat.....	211
ATC System Operation	213
Nonadjustable Thermostat (Freeze Control System).....	212
Testing and Adjusting	254
Testing and Adjusting Section	254
Troubleshooting	222
Troubleshooting Condensate Drainage System..	252
Troubleshooting Heating and Air Conditioning Control System.....	241
Automatic Temperature Control Troubleshooting	250
Electrical System	242
Heating System.....	241
Red Dot Automatic Temperature Control (ATC) - Fault Codes: (only for 584 Forwarders and 584HD Forwarders).....	248
Symptom Troubleshooting	251
Test Procedure for Testing Electrical Components in the Air Conditioning System	242
Troubleshooting Section	222

V

Visual Inspection (Troubleshooting)	225