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WARNING means to warn against hazards or unsafe conditions which COULD result in severe personal injury or CAUTION means to warn against potential hazard or unsafe practice which could result in minor personal injury, The statements listed below are applicable to the refrigeration unit and appear elsewhere in this manual. These The unit may cycle the fans and operating compressor Press OFF key on the cab command and disconnect Also check battery cable routing to ensure that clamps are secure Cab Command and external power circuit breaker is open. Do not use oxygen in or near a refrigerant system as an explosion may occur. Should a problem develop with these components, contact your nearest Carrier Transicold R134A and POE oil. For more information see Technical Procedure 985055300 Inert Gas. Brazing. Place all parts in the enclosing tube in Microprocessor components operate at different voltage levels and at extremely low current levels. Improper use of voltmeters, jumper wires, continuity testers, etc. In certain cases, the human body can have enough static electricity to cause resultant damage to the Use proper board handling techniques. See Section 4.17. Safety 3 Press OFF key on the. Cab Command and disconnect power plug. This manual contains Operating Data, Electrical Data Model 30S truck refrigeration units listed in Table 11. Additional support manuals are listed in Table 12. The condensing section see Figure 12 contains the The condenser is of the tube and fin type and acts as a Air movement over the condenser is provided by a Refrigerant leaving the receiver is passed through the. The unit Figure 11 is of the

split system type with the D Road operation the road compressor is located in The drier is a cylindrical shell containing a drying agent Table 11 Model Chart. R134a. Model No. Description Road. Compressor. Standby. Condenser Weight. Road and. Road. Evap. Wt.Kg. Table 12. Additional Support Manuals. Manual Number Supra 30S. Supra 30S. Supra 30S Parts List. Easy To Run. <http://oookub.ru/upload/fckeditor/bosch-washers-manuals.xml>

Operator's Manual Condenser Coil. Transformer TR. Oil Separator. Standby Motor. Standby Compressor See Table 11. Control Box. Filter Drier. Liquid Line Check Valve Receiver. Discharge Manifold. Hot Gas Solenoid Valve HGS1. Condenser Pressure Control Switch HP2. Frame. High Pressure Switch HP1. Condenser Pressure Control Valve HGS2. Figure 12 Top View Expansion Valve TXV Quench Valve BPV Defrost Termination Thermostat DTT. Figure 13 Rear View Evaporator The condenser pressure control valve or condenser. The oil separator is installed in the discharge line from In the cool mode, heat is With the solenoid coil energized, The pressure is such that refrigerant An overload and short cycle Figure 14 Oil Separator HGS1 is normally closed and prevents discharge gas The valve opens to allow HP1 is a normally closed switch which monitors the HP2 is a normally open switch which closes to signal the For HP2 settings see Section 1.6.2. The thermostatic expansion valve is an automatic device which controls the flow of liquid to the evaporator The thermal expansion valve Section 1.6.2. To adjust the TXV, refer to Section 4.15.2. The CPR valve is installed on the suction line of the The CPR valve is set to limit For CPR settings refer The suction pressure is controlled to avoid overloading To adjust the CPR valve, refer to Normally closed thermal switch on Standby units only. As evaporator cools to set point, the switch closes and Switch terminates defrost by opening at predetermined The quench valve is a normally closed solenoid valve The valve allows BPT settings refer to section 1.6.2. The evaporator is of the tube and fin type. The operation Air movement over the evaporator is provided by an electric fan. The low pressure switch is a normally closed switch LP settings refer to section 1.6.2. Standby Fuse F3 5 Amp. Transformer Fuse F4 5 Amp. Clutch Time Delay Relay CT Single Phase. Only. Clutch Relay CR. Motor Contactor MC. Overload Relay OL 230V Only Rectifier Bridge Assembly BR. Filter Capacitor C1.

Start Relay STBR. Run Capacitor CR. Start Capacitor CS. Heat sink rectifier bridge. Figure 15 Typical Standby Control Box Standby Relay SR. Figure 16 Standby Microprocessor Module Figure 17 Road Microprocessor Module Once the set point is entered at the Cab Command, The unit may cycle the standby motor or fans unexpectedly as control requirements dictate. The control system consists of the Cab Command located in the driver's section See Figure 18 and the The Carrier Transicold Control System incorporates the Figure 18 Cab Command Model Displacement Oil Charge Approved Oil. Mobil Arctic EAL68 Automatic triggering or at preset intervals Only. Opens at Refer to Table 11. Evaporator Fan Motor EFM. Bearing Lubrication. Factory Lubricated. Horse Power Operating Amps Speed. Condenser Fan Motor CFM. Operating Amps. Speed Voltage. Type of Connection. Phase Assembly. Standby compressor platform. Standby motor platform. Standby motor pulley. Evaporator fan motor. Evaporator fan. Condenser frame. Mounting Bolts Contactor Data This is accomplished by the following fuses and safety devices. Automatic Safety Device. Device setting. Unsafe Conditions Automatic reset of low Fuse on electronic board Electronic relay Fuse F3 a Standby fuse F2 a Fuse F1 b Microprocessor Microprocessor Fuse F1 Timer 5 min. Self protected opening. Depending on Selection. See electrical wiring diagram. Self protected opening Opens at 30 A 12 V. Opens at 4 A. Opens at 1 A When cooling, the unit operates as a vapor compression The main components of the The compressor raises the pressure and temperature of When operating on the road compressor, the flow also The condenser fan circulates surrounding air over the Heat transfer is thus Liquid refrigerant flows from the The receiver stores the additional charge necessary for The refrigerant leaves the receiver and flows through a The refrigerant then flows through a check valve.

The The refrigerant then flows through the filter drier, where The refrigerant The sight glass is

fitted. The refrigerant then flows. The liquid then enters the thermostatic expansion valve. This cold air is transferred from the air to the low temperature coil. On 115v units the refrigerant then enters the condenser. The quench valve opens as required to maintain a constant pressure. When refrigerant vapor is compressed to a high pressure, the microprocessor activates heating or defrost. The main difference between heating and defrosting is when the pressure is above the setting of the microprocessor. When pressure is high, should a problem occur, the Control System consists of the microprocessor. The Cab Command includes the LCD display and the keypad. The information is accessed by keypad. The microprocessor controls the following functions. For further details on digital message display, see the Cab Command. The Cab Command is mounted in the cab and allows the operator to access the digital display. The digital display consists of 3 alphanumeric characters. The display also has a standby operation LED, a road operation LED, a unit operating LED, a D Green cycling left hand side LED, and a D Red malfunction right hand side LED. The driver can display the refrigerated compartment temperature. When the battery voltage is too low, a failsafe system is activated. The command consists of the display and the keypad. The keypad and display serve to provide user access. After an alarm has been present for 15 minutes, the red light will flash. At that point the steady green unit operating LEDs will indicate normal operation, the green LED will indicate the refrigerated compartment temperature. The keypad consists of six keys that enable the operator to: Manual defrost control key, Unit startup key, On road operation key, the unit can also be set to a setpoint differential of 1.0, Unit data and function modification keys. The display scrolls through parameters. Figure 22 Green Light Status Standby. Under normal operation, the green LED will indicate the refrigerated compartment temperature. Steady green LED indicates the refrigerated compartment temperature. Decrease key for selected data.

Increase key for selected data. Before starting the truck engine or connecting standby, if starting unit for the first time after installation, the compressor pressure regulating valve should be inspected for signs of wear. Also check battery cable routing to ensure that clamps are secure and that the power plug is clean and dry. Press the ON key to start the unit. For Road units, start up is time. The digital display of the Cab Command displays the refrigerated compartment temperature. Check that temperature set point. It is possible to increase or decrease the set point by 1.0. If display stays highlighted, the set point displayed has been validated by pressing the SET key. If the unit is to be operated in the standby mode, connect the unit to the power source. Press the OFF key on Cab Command and external display. Displays the set point temperature. Decrease the set point by 1.0. Make sure the power plug is clean and dry. Validate set point temperature. Return to display of refrigerated compartment temperature. Press manual defrost key to adjust the defrost duration. If standby power is present, the unit will start. To access the alarm messages, shutdown unit. Press SET for 5 seconds enables access to alarm messages. Modify parameters. Validate modified settings. Return to display of refrigerated compartment temperature. Only validated changes are recorded. Table 21 Alarms For Road Only Units. Malfunction Codes. No malfunction. Programming error on part of operator. Malfunction. Codes. No malfunction. Unit in operation. Programming error on part of operator. Units. There is a 40 second time delay during startup. After startup, Cab Command will display the message "bAt". Unit will start. If the battery voltage has not reached the minimum level, the unit will not start. Press the SET key to display the alarm list. The alarm list provides information on current alarms. Press the OFF key or turn the ignition off. Unit startup. Units are configured for Celsius. See Figure 16. The differential can be selected by scrolling through. Factory setting is 1.0. This feature determines whether the evaporator fan is on or off when the unit is in standby. The factory setting is 1.0. Press the SET key. Shutdown unit. Modify parameters. See a. Validate modified settings.

Cab Command reverts to refrigerated compartment temperature display and the configuration. This setting determines the length of time in minutes the unit will operate in defrost mode. The defrost duration can be selected by scrolling through the menu. Selection MUST be validated by pressing the SET key. The procedure for adjusting the functional parameters is as follows: Units are configured for Celsius. Modify parameters. Figure 24 Temperature Selection Jumper. The differential can be selected by scrolling through. Factory setting is 1.0. This feature determines whether the evaporator fan is on or off when the unit is in standby. The factory setting is 1.0. Press the SET key. Since all 30S units covered by this manual have a microprocessor, the unit will start. Units are configured for Celsius. Modify parameters. See a. Validate modified settings. Cab Command reverts to refrigerated compartment temperature display and the configuration. This setting determines the time between defrosts in hours. The defrost interval can be selected by scrolling through the menu. Selection MUST be validated by pressing the SET key.

scrollingSettings are for either automatic defrost AUT or fixed time intervals betweenSelection MUST be validated byPress OFF key on the. The next steps must be performed with the unit ONThe unit operates in the perishable mode with set pointsFigure 31 Operating Sequence Perishable. ModeThe unit operates in the frozen mode with set points at orThis will allow liquid into the suction line in order to cool compressor. Once the discharge temperature decreasesDEenergizing the PP.If the continuous air flow parameter is set to ON, the evaporator fans will continueIf the continuous air flow parameter is OFF, the evaporatorA 5 minute delay is required before restart is allowed.The condenser fan andFigure 32 Operating Sequence Frozen ModeSection 1.8.2 for a description of the refrigeration circuitThis prevents the unitDefrost may be initiated bySection 1.6.2 for settings. In defrost mode, theThe unit may cycle the fans and operating compressorPress OFF key on the cab command and disconnectR134A and POE oil. For more information see Technical Procedure 985055300 Inert Gas. Brazing.

Table 42 Service Category DescriptionsRegular servicing is required in order to optimize the lifeThe recommended scheduledTable 41 while descriptions of the service proceduresTable 42Table 41 Maintenance SchedulesDCutin. Refrigerant Type R134a. DFan shutdown. DCutout. Road compressor oil type The road compressors are. DDefrost water drainService C 1. Check the operation of the evaporatorPAG type are strictly incompatible with the operationRefer to paragraph 1.6.1. Service D 1. Change the removable relays, fusesBeware of Vbelt and beltdriven components as the unit may start automatically. A belt tension gauge provides an accurate and easyProperly adjusted belts give long lasting and efficientThe Belt Tension gauge can be used to adjust all belts. The readings which we specify for Carrier TransicoldWhen using this gauge, itNew Install. TensionRunning. TensionNmFigure 43. To perform service using the manifoldR134a cylinder. Figure 41 Belt Tension GaugeBelt tension depends on each kit. Refer to Installation. Instructions provided with the kit for belt tensionWhen installing a new Vbelt the tension should beStandbyThe gauge set is nowCompressorFigure 42 Layout of VbeltThis returnsMVS115FLCT 115V or MVS240FLCTCompressor.Backseat bothLow Pressure. Gauge. To remove the refrigerant from a compressor that is notHigh Pressure. GaugeHand Valve. OpenedHand ValveAccess ValveTo High Side. Access ValveTesting jointsManifold Gauge Set. Hose Fitting 0.516 Acme. High Side Field Service Coupler. Low Side Field Service CouplerEvacuate and dehydrateFigure 43 Manifold Gauge Set R134aInstallation of a new filterdrier may be performedHeat lamps or alternate sources of heat may be used to raise systemMoisture can seriously damage refrigerant systems. The presence of moisture in a refrigeration system canThe most common areRefrigerant Recovery Unit. Refrigerant Cylinder.

Evacuation ManifoldFigure 44 Vacuum Pump ConnectionAlso, as shown, connect a evacuation manifold, withFigure 44 to the vacuum pump and refrigeration unit.Close the electronic vacuumShut off the vacuumRaise system pressure to approximately 2 psig 0.14 Bar.Close off vacuumWait five minutes to see ifThe correct amount of refrigerantCorrect charge willCheck for any obstruction of the filterdrier by feeling theRemove refrigerant charge See section 4.4. RemoveFollowing drier replacement, evacuate and rechargeSlowly open the plug on the suction andRemove the compressor from chassis.Do not use a nitrogen cylinder without aRefer to section 1.6.4 for torque values.Ohmmeter will indicate resistance if switch is closed HP1Figure 45.Pressure switch settingsWhile observing meter, slowlySlowly openCompressor oil type The road compressors areEnsure compressor is marked with a factory stickerOils of PAGOpen pressure onReassemble the motor. Install new brushes and replace cap.It is not necessary to remove the refrigerant charge toDisconnect leads and remove coil junction box ifThis information appears on the coil voltage plate and the coilPressure regulator. Nitrogen cylinder. Bleedoff valveSwitches HP1 And HP2Remove the enclosing tube.If oring is toFigure 47 Hot Gas or Condenser Pressure. Control SolenoidVoltage plate. Coil assembly. Enclosing tubeFigure 46 Fan Motor Brushes. To check brushes proceed as followsSee Figure 46Place all parts in the enclosing tube in proper sequence in order toThis dust

couldDo not use abrasiveSee Sections 4.6 and 4.7.Figure 49. Figure 48 Compressor Pressure Regulating ValveThis will ensure a suctionTo adjust the. CPR valve, proceed as followsRefer to paragraph 1.6.2 for CPR valveThis will preventStep f. from the average temperature measured in. Step g. The difference is the superheat of the suctionFigure 49 Thermostatic Expansion Valve Bulb. And ThermocoupleMUST be disconnected.

When welding is performed onThe recycled cardboard cartons create much more fiberThe fiber dustIf the coil is notDue to the "washing" action ofAs each circuitCardboard fiber particles after being wetted and driedReverse flush opposite normal air flow with cleanA garden hose with sprayMake sure drain lines areRinse coil with fresh water if a detergent is used. Under no circumstances should anyone attempt to repair the microprocessor moduleAlthough there is less danger of electrical staticThis not onlyAlthough the microprocessorBar. PsigThe unit may cycle the fans and operating compressorPress OFF key on the cab command, turn vehicle engine off or disconnect power plug and open circuit breaker.Should a problem develop with the control system, contact your nearest Carrier TransicoldTable 51 Alarm IndicationsHigh Pressure Switch HP1. Open RoadUnit undercharged. Liquid line filterdrier restricted. TXV malfunction. Verify operation of evaporator fans. Failed switch. Unit overchargedHigh Pressure Switch HP1. Open. Verify operation of condenser fan. Noncondensibles in system. Discharge check valve failed closed standby only. Failed switchElectric motor overload. Units. Road Compressor ClutchThermal overload open in motor windings.Units. Contactor coil either high or low 0.2A for 3 phase;Verify plunger moves freely. Replace contactor. Verify motor rotates freelyReference. ParagraphVerify line voltage. Current draw of road clutch coil either high or low. Verify condition of brushes. Replace motor. Verify motor rotates freely. Replace motorUnits. DescriptionParagraph. Heating option control Either Verify coil resistanceCheck wiring to controls. Current draw of coil high or low approx 1.6 amp. Hot Gas Solenoid ValveReplace coil. Current draw of coil high or low approx 1.2 amp. Quench. ValveReplace coil. Condenser Pressure ControlUnit out of range for 15 minutesUnits. Hot gas solenoid open. Unit out of range for more than 15 minutesUnits.

Heating option not active Set configuration. Unit terminated defrost after 45 minutesUnits. Set point adjusted out of theReturn air sensor defective. Vehicle battery voltage lowLow Battery Voltage. Check alternator systemIf operating on standby, shut down vehicle engine. Err. Set point error. Programming error. Reset.CorrectCompressor drive clutch defective. Compressor defective. Defrost cycle has not terminated. Abnormal pressure. Refrigeration system. Hot gas solenoid malfunction HGS1Compressor. Expansion valve malfunction. Nonexistent or restricted evaporator airflow. Compressor malfunctionHot Load. Refrigerated compartment. Defective refrigerated compartment insulation or air leak. Temperature microprocessor malfunction. DefectiveAbnormal pressure. Refrigeration. Hot gas solenoid malfunction HGS1. Compressor drive clutch defective. Compressor defectiveDefrost thermostat DTT open or defective. Hot gas solenoid valve malfunction. Automatic defrost will not initiate. Defrost disabled through cab command. Microprocessor defective. Manual defrost will not initiate. Defrost thermostat DTT open or defective. Defrost cycle initiates but does. Hot gas solenoid malfunction HGS1Condenser Pressure Control valve malfunction HGS2. Wet load. Frequent defrost. Defrost settings set to low. Does not terminate or cycles on. Defrost thermostats DTT shorted closedCondenser coil dirty. High discharge pressure. Refrigerant overcharge. Low discharge pressure. High suction pressure. Low suction pressure. Suction and discharge pressuresHigh discharge pressure. Hot gas solenoid malfunction. Low refrigerant charge. Compressor pressure regulator misadjusted CPR. No evaporator air flow or restricted air flow. Excessive frost on coil. Hot gas solenoid malfunctionCorrectReplaceCondenser fan or HP2 pressure switch defective. Noncondensibles in systemHot gas solenoid valve malfunction. Compressor pressure regulating valve misadjusted CPR. Condenser Pressure Regulating valve fault HGS2Compressor.

Condenser or evaporator fan. Loose mounting bolts. Worn bearings. Worn or broken valves. Liquid slugging. Insufficient oil. Loose shroud. Bearings defective. Fan loose on shaft. Bent shaft. Tighten. Check. Check. Check Fuse open. Microprocessor malfunction. Replace. Check Heavy frost on coil. Evaporator coil blocked. Coil dirty. Evaporator fan loose or defective. Evaporator fan rotating backwards. No or partial evaporator air flow. Evaporator air flow blocked in refrigerated compartment. Fan motors malfunction. Check. Check. Replace Low suction pressure with high Low refrigerant charge. External equalizer line plugged. Broken capillary. Superheat setting too high Repair Superheat setting too low. Pin and seat of expansion valve eroded or held open by Insulation missing from sensing bulb. Low superheat setting. High superheat. Expansion valve setting No power to valve. Improper wiring or loose connections. Valve improperly assembled. Coil or coil sleeve improperly assembled. Valve does not function properly. Movement of plunger restricted due to Valve shifts but refrigerant. Foreign material lodged under seat Defective seat Motor contactor defective. Motor Overload open. Standby compressor fails to start Improper power supply. Fluctuating suction pressure. Standby motor starts, then stops Check. Check. Correct. Check The unit may cycle the fans and operating compressor Press OFF key on the cab command and disconnect Command! Should a problem develop with these components, contact your nearest Carrier.