

HVAC Air / Refrigerant Diagnostic Quick Sheet



HVAC SCHOOL
Air Conditioning & Refrigeration

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Fixed Metering	Suction Pressure	Head Pressure	Super Heat	Subcool	Comp. Amps	ΔT
Low Charge	↓	↓	↑	↓	↓	↓
Over Charge	↑	↑	↓	↑	↑	↑
Low Indoor Airflow/Low R/R Temp	↓	↑	↓	↓	↓	↑
Dirty Condenser	↓	↑	↓	↓	↑	↓
Liquid Line Restriction*	↓	↑	↑	↑	↓	↓
Overized Piston	↑	↑	↓	↓	↓	↑
High R/R Temp	↓	↓	↑	↓	↓	↓

TXV System	Suction Pressure	Head Pressure	Super Heat	Subcool	Comp. Amps	ΔT
Liquid Line Restriction*	↓	↑	↑	↑	↓	↓
Overfeed / Loose Bulb Bulb Insulated	↑	↓	↓	↓	↓	↓
Low Charge - Slightly	↓	↓	↓	↓	↓	↓
Over Charge - Slightly	↑	↑	↑	↑	↑	↑
Low Indoor Airflow/Low R/R Temp	↓	↑	↓	↓	↓	↑

*Restriction often in head pressure causes all the head losses of the restriction. Super-heat often greatly increased if a restriction is present. Restriction may also high head with good suction, or in systems with only small condenser or air restricted have been overcharged in addition to the restriction. In general, condenser and in the liquid line and air leak in the head after suction of line.

WB	Enthalpy
40	15.20
41	15.35
42	15.50
43	15.65
44	15.80
45	15.95
46	16.10
47	16.25
48	16.40
49	16.55
50	16.70
51	16.85
52	17.00
53	17.15
54	17.30
55	17.45
56	17.60
57	17.75
58	17.90
59	18.05
60	18.20
61	18.35
62	18.50
63	18.65
64	18.80
65	18.95
66	19.10
67	19.25
68	19.40
69	19.55
70	19.70
71	19.85
72	20.00
73	20.15
74	20.30
75	20.45
76	20.60
77	20.75
78	20.90
79	21.05
80	21.20

Electric Heat

$$CFM = \frac{\text{Volts} \times \text{Amps} \times 3.412}{\Delta T \times 1.08}$$

OR

Furnace

$$CFM = \frac{\text{Gas FL} \times \text{BTU/Gal} \times \text{Measured} \Delta T}{\Delta T \times 1.08}$$

400 CFM per ton of cooling (Nominal)
12,000 BTU per ton of cooling
BTU Sensible Output = CFM x TD x 1.08
1 Watt = 3.413 BTU/hr
1 Kilowatt = 3,413 BTU/hr
746 Watts = 1 Horsepower

Checking a Gas Meter

$$\text{Input} = \frac{3600 \times \text{Smallest dial size}}{\text{Gas FL} \times \# \text{ of seconds for one revolution}}$$

Testing Capacitors Under Load

$$\frac{2652 \times (\text{degrees of the meter winding})}{\# \text{ (Volts across the capacitor)}}$$

Total Heat = (H1-H2) x 4.5 x CFM
H1 = Return air wet bulb (converted to enthalpy)
H2 = Supply air wet bulb (converted to enthalpy)

Estimated Evaporator TD

AC at 400 CFM/Ton = 20°
Refrigeration Walk in 10°
Refrigeration Reach in 20°

Gas Appliance Output Pressure

Natural Gas 5.5" w.c. / LP = 11" w.c.

CTDA

Estimated Condensing Temp Over Ambient

4-6 SEER = 30°
10-12 SEER = 20°
13-15 SEER = 20°
16+ SEER = 10°

Hvac Troubleshooting Guide

Charles Nehme



Hvac Troubleshooting Guide:

The Complete Guide to HVAC Troubleshooting: A Homeowners Manual Tim David,2023-12-29 The Complete Guide to HVAC Troubleshooting is a definitive resource for homeowners and aspiring technicians alike offering in depth insights and practical advice on diagnosing and resolving a wide range of heating ventilation and air conditioning issues This book serves as an indispensable tool for anyone looking to understand maintain and repair their HVAC systems efficiently and effectively Structured to cater to both beginners and those with more technical experience the guide begins by introducing the fundamentals of HVAC systems It outlines the core components how they operate and the common types of HVAC systems found in homes and buildings This foundational knowledge sets the stage for more complex topics ensuring all readers are up to speed Central to the book is a comprehensive troubleshooting section detailing step by step methods to diagnose common and not so common problems From strange noises and inconsistent temperatures to complete system failures the guide provides clear concise instructions to identify issues and implement solutions It covers a range of scenarios including quick fixes that can be handled without professional help and more complex problems requiring expert intervention The guide goes beyond simple fixes delving into the nitty gritty of HVAC maintenance performance optimization and longevity It discusses preventive measures routine maintenance schedules and the signs that indicate a need for repair or replacement Additionally the book offers valuable tips on selecting the right tools safety precautions and understanding when to call in a professional With *The Complete Guide to HVAC Troubleshooting* readers will gain the confidence to tackle various HVAC issues head on ensuring their systems run smoothly and efficiently all year round This book is more than just a troubleshooting manual it s a comprehensive reference for anyone committed to understanding and caring for their HVAC system Get ready to turn the page and take control of your home s comfort and air quality

Troubleshooting Guide to Residential Construction

Steven Bliss,2005-08-26 Avoid pitfalls with these expert tips techniques for diagnosing and preventing the most common residential building defects More than 50 experts in the field describe their proven techniques for preventing building problems

AC Maintenance & Repair Manual for Diesel Engines Jean Luc Pallas,2013-08-22 The aim of this book with its detailed step by step colour photographs and diagrams is to enable every owner to fix their diesel engine with ease Troubleshooting tables help diagnose potential problems and there is advice on regular maintenance and winterising and repair Jean Luc Pallas s enthusiasm for passing on his knowledge as well as his clear explanations precise advice and step by step instructions make this a unique book

HVAC Troubleshooting John Fletcher,Building Services Research and Information Association,1999-09-30 HVAC troubleshooting guide to help facilities managers and maintenance personnel solve indoor environment and energy or water consumption problems It is a step by step guide to identifying indoor environmental quality problems that may be caused by the operation of the HVAC system It allows managers in charge of HVAC facilities particularly those without a technical background to initiate investigations follow their progress and perhaps

perform a few simple checks Also supplies a series of 14 troubleshooting procedures for use by maintenance personnel actually performing the investigations The IEQ problems covered by the procedures include too hot too cold stuffy or still air draughts odours noise from the HVAC system dry eyes throat or skin lethargy and headaches The troubleshooting procedures can be purchased separately as a set of 14 sheets

MEP Operation & Maintenance Manuals: A Comprehensive Guide Charles Nehme , In the intricate world of modern architecture and construction a building is far more than just steel glass and concrete It is a living breathing entity powered by a complex network of Mechanical Electrical and Plumbing MEP systems that dictate its comfort safety and operational efficiency While significant resources are often dedicated to the design and construction phases of a building s life the long term success sustainability and value of these structures fundamentally hinge on one often underestimated element the comprehensive Operation it is the definitive roadmap to a building s optimal performance a critical tool for ensuring the longevity of its assets and an indispensable guide for maintaining occupant health safety and comfort It bridges the gap between design intent and operational reality empowering facility managers and maintenance teams to unlock the full potential of complex MEP installations This book is born from over thirty years of hands on experience in the global HVAC and MEP consulting field spanning a diverse range of projects from industrial complexes to commercial high rises and intricate residential developments across various international markets It consolidates practical insights industry best practices and a deep understanding of the challenges faced by those tasked with operating and maintaining modern building systems Our aim is to demystify the process of creating implementing and utilizing effective O M manuals We will explore not only the what but also the why and the how guiding readers through the essential components best practices for data collection and organization and the integration of these manuals into a holistic building management strategy From the fundamental principles of each MEP discipline mechanical electrical and plumbing to the critical aspects of fire protection life safety and the role of advanced building management systems each chapter is designed to provide actionable knowledge Ultimately this guide seeks to elevate the perception and utility of MEP O M manuals from mere documentation to indispensable operational assets By investing in well structured comprehensive and accessible manuals building owners and operators can ensure optimal system performance extend equipment lifespan minimize operational costs enhance safety and contribute significantly to a building s overall sustainability and value for decades to come Charles Nehme

AC Maintenance & Repair Manual for Outboard

Motors Jean Luc Pallas,2013-08-10 The aim of this book with its detailed step by step colour photographs and diagrams is to enable every owner to fix their outboard motor with ease Troubleshooting tables help diagnose potential problems and there is advice on regular maintenance and winterising and repair Jean Luc Pallas s enthusiasm for passing on his knowledge as well as his clear explanations precise advice and step by step instructions make this a unique book

HVAC

Troubleshooting Guide Rex Miller,2009-02-10 A Practical On the Job HVAC Guide Applicable to residential commercial and

industrial jobs this essential handbook puts a wealth of real world information at your fingertips HVAC Troubleshooting Guide shows you how to read interpret and prepare schedules mechanical plans and electrical schematics This handy resource will aid you in your everyday tasks and keep you up to date with the latest facts figures and devices The book includes numerous illustrations tables and charts troubleshooting tips safety precautions resource directories and a glossary of terms HVAC Troubleshooting Guide helps you Identify and safely use tools and equipment both new and old Use heat pumps and hot air furnaces Calculate ventilation requirements Work with refrigeration equipment and the new refrigerants Utilize control devices including solenoids and relays Operate select and repair electric motors Work with condensers compressors and evaporators Monitor the flow of refrigerant with valves tubing and filters Comply with the Section 608 refrigerant recycling rule Program thermostats Insulate with batts sheet tubing covers and foam Work with solid state controls Understand electrical and electronic symbols used in schematics

Nissan Sentra and Pulsar Total Repair Manual: Complete Step-by-Step Guide for Cars from 1982 to 1992 Pasquale De Marco, 2025-04-16 Welcome to the ultimate guide to Nissan Sentra and Pulsar vehicles the Nissan Sentra and Pulsar Total Repair Manual This comprehensive manual is your go to resource for everything related to these iconic vehicles whether you re a professional mechanic a car enthusiast or a savvy car owner With this guide in hand you ll embark on a journey of understanding and mastery over your Nissan Sentra or Pulsar Dive into the depths of its engine transmission drivetrain steering suspension brakes tires electrical system body interior HVAC and safety systems We ve got you covered from basic maintenance to advanced troubleshooting and repairs Our team of expert mechanics has meticulously crafted this manual to provide you with step by step instructions detailed illustrations and expert troubleshooting advice We ve left no stone unturned ensuring that you have everything you need to keep your Nissan Sentra or Pulsar running smoothly and efficiently Gone are the days of expensive repair bills and the frustration of not knowing how to tackle car problems With the Nissan Sentra and Pulsar Total Repair Manual you ll become a confident and capable car owner equipped with the knowledge and skills to handle any repair or maintenance challenge that comes your way But that s not all This manual is more than just a repair guide it s a gateway to a deeper understanding of your Nissan Sentra or Pulsar Learn about its history different models and trim levels common problems and essential maintenance tips With this knowledge you ll be able to make informed decisions about your vehicle and keep it in top condition for years to come So whether you re a seasoned mechanic looking to expand your expertise or a car enthusiast eager to learn more about your Nissan Sentra or Pulsar this manual is your perfect companion Embrace the satisfaction of knowing that you can maintain and repair your vehicle like a true professional Get your copy of the Nissan Sentra and Pulsar Total Repair Manual today and unlock the secrets of these remarkable vehicles If you like this book write a review on google books

Illustrated Guide to the 1999 National Electrical Code John E. Traister, 1999 This fully illustrated guide offers a quick and easy visual reference for installing electrical systems Whether you re installing a new system or repairing an old

one you'll appreciate the simple explanations written by a code expert and the detailed intricately drawn and labeled diagrams A real time saver when it comes to deciphering the current NEC

Building Performance Analysis Pieter de Wilde, 2018-07-23 Explores and brings together the existent body of knowledge on building performance analysis Shortlisted in the CIBSE 2020 Building Performance Awards Building performance is an important yet surprisingly complex concept This book presents a comprehensive and systematic overview of the subject It provides a working definition of building performance and an in depth discussion of the role building performance plays throughout the building life cycle The book also explores the perspectives of various stakeholders the functions of buildings performance requirements performance quantification both predicted and measured criteria for success and the challenges of using performance analysis in practice Building Performance Analysis starts by introducing the subject of building performance its key terms definitions history and challenges It then develops a theoretical foundation for the subject explores the complexity of performance assessment and the way that performance analysis impacts on actual buildings In doing so it attempts to answer the following questions What is building performance How can building performance be measured and analyzed How does the analysis of building performance guide the improvement of buildings And what can the building domain learn from the way performance is handled in other disciplines Assembles the current body of knowledge on building performance analysis in one unique resource Offers deep insights into the complexity of using building performance analysis throughout the entire building life cycle including design operation and management Contributes an emergent theory of building performance and its analysis Building Performance Analysis will appeal to the building science community both from industry and academia It specifically targets advanced students in architectural engineering building services design building performance simulation and similar fields who hold an interest in ensuring that buildings meet the needs of their stakeholders

HVAC Fundamentals Samuel C. Sugarman, 2005

Token Ring Troubleshooting Guide Daniel J. Nassar, 1998-12 Daniel J Nassar is the author of the best selling book Token Ring Troubleshooting Guide which provides the clear and in depth understanding necessary for working in the token ring environment This book is designed for LAN system engineers and technical support engineers LAN designers and consultants LAN managers users on token ring LANs and students of computer science and electronic engineering Use and installation of Local Area Networks LANs has increased dramatically in the past decade and growth in this areas continues If you are a professional network installer or technician you will find Token Ring Troubleshooting Guide indispensable

Air Conditioning Maintenance and Troubleshooting: A Comprehensive Guide to Efficient and Safe HVAC Care Charles Nehme, The importance of air conditioning in our daily lives cannot be overstated From the comfort of our homes to the productivity of our workplaces air conditioning systems play a critical role in maintaining an optimal environment However like all mechanical systems air conditioners require regular maintenance and occasional troubleshooting to function efficiently and prolong their lifespan This book Air Conditioning Maintenance and

Troubleshooting Guide aims to serve as a comprehensive resource for homeowners technicians and HVAC professionals alike Whether you are a novice looking to understand the basics of your home air conditioning system or a seasoned technician seeking advanced troubleshooting tips this guide is designed to meet your needs Why This Guide Air conditioning systems are complex and involve various components including compressors evaporators condensers and various electrical parts Proper maintenance can prevent many common issues and save on costly repairs This guide covers the essential aspects of air conditioning maintenance providing step by step instructions and detailed explanations to ensure your system runs smoothly Key Features Comprehensive Maintenance Tips Learn about the routine tasks necessary to keep your air conditioning system in top condition from cleaning filters to checking refrigerant levels Troubleshooting Techniques Diagnose and resolve common problems with clear practical solutions This section includes troubleshooting flowcharts and checklists to simplify the process Safety Precautions Understand the safety measures you need to take while working with air conditioning systems to prevent accidents and injuries Technical Insights Gain deeper knowledge of the components and workings of different types of air conditioning systems including central air conditioners split systems and window units Environmental Considerations Learn about the environmental impact of air conditioning systems and how to adopt practices that are both efficient and eco friendly Who Should Read This Book Homeowners Equip yourself with the knowledge to maintain your home air conditioning system identify problems early and possibly avoid expensive service calls HVAC Students Use this guide as a supplementary resource to enhance your understanding of air conditioning systems and prepare for a career in HVAC maintenance and repair Professional Technicians Update your skills with the latest maintenance and troubleshooting techniques and use this book as a quick reference on the job Acknowledgments This book would not have been possible without the valuable input and feedback from HVAC professionals and industry experts who have generously shared their knowledge and experience I am also grateful to the publishers and technical reviewers whose efforts have ensured the accuracy and clarity of this guide Conclusion Maintaining and troubleshooting air conditioning systems can seem daunting but with the right knowledge and tools it becomes manageable and rewarding This guide is intended to empower you with the confidence and skills necessary to keep your air conditioning system running efficiently and reliably Thank you for choosing this guide I hope it serves as a valuable resource and enhances your understanding and enjoyment of air conditioning maintenance and troubleshooting

Your Personal Hvac Troubleshoot Guide johnnie thomas,2024-08-01

Whether you re a DIY enthusiast a curious homeowner or just someone tired of paying exorbitant repair bills this book offers a refreshing take on home maintenance It s packed with smooth easy to follow instructions that feel more like a conversation with an old friend than a technical lecture You ll uncover impractical yet charming tidbits about HVAC systems that will make you the star of your next dinner party

Builder's Guide to Accounting Michael C. Thomsett,2001-07 This book includes self test section at the end of each chapter Test yourself then check answers in the back of the book to see how you score CD

ROM included Aviation Mechanic General, Airframe, and Powerplant Knowledge Test Guide United States. Flight Standards Service, 1995 **Operator's, Organizational, Direct Support and General Support Maintenance Manual (including Repair Parts and Special Tools List) for Voltmeter ME-510/U (Dana Model 5900) (NSN 6625-00-045-4643).**, 1990 Aviation Electrician's Mate's Manual, AE. United States. Office of the Chief of Naval Operations, 1956 Direct Support, General Support, and Depot Maintenance Manual, 1991 The 1984 Guide to the Evaluation of Educational Experiences in the Armed Services: Air Force American Council on Education, 1984

Reviewing **Hvac Troubleshooting Guide**: Unlocking the Spellbinding Force of Linguistics

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