

REFRIGERATION AND AIR CONDITIONING TECHNICIAN

Validated DACUM

Facilitated by Mike Stuhldreier and Sandra Sukhan
 February 25th and 26th, 2003

PERFORM BASIC MAINTENANCE
A

Lubricate bearings A1	S	Follow checklist A2	S	Identify condition of coils A3	S	Change belts A4	S	Change air filters A5	S	Check pulleys for wear A6	S	Identify and explain basic unit maintenance needs/requirements A7	S																												
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c
Interpret sight glass A8	S	Clean unit A9	S	Identify condition of belts A10	S	Identify oil leaks A11	S	Change bearings A12	S	Identify and explain condition of heat exchanger A13	S	Identify condition of basic pumps A14	S	Troubleshoot basic pumps A15	S																										
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c

REPAIR HEATING/COOLING SYSTEMS
B

Read schematics - (electrical, mechanical) B1	S	Identify/explain air distribution system B2	S	Troubleshoot basic air distribution systems B3	S	Adjust thermostats B4	S	Diagnose basic problems B5	S	Explain how a variety of meters work B6	S	Use variety of meters B7	S	Use variety of hand tools B8	S																				
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c
Use variety of power tools B9	S	Use variety of welding tools/techniques B10	S	Check for leaks B11	S	Check power supply B12	S	Identify a variety of heating systems B13	S	Explain how heating systems work B14	S	Check fuses B15	S	Troubleshoot basic electrical systems B16	S																				
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c
Change relays/contactors B17	S	Change electric motor B18	S	Interpret psychometric chart B19	S	Identify various power sources (voltage, phases) B20	S	Diagnose basic problems of gas furnaces B21	S	Pump down a system B22	S																								
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c

REPAIR REFRIGERATION SYSTEM
C

Read a variety of gauges C1	S	Work with scales C2	S	Identify/explain refrigeration components C3	S	Diagnose basic problems C4	S	Follow rules/codes/guidelines (ie. Refrigerant changeover) C5	S	Use variety of leak detection devices C6	S	Gather information C7	S	Identify proper operating conditions C8	S																				
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c
Use high pressure gases C9	E	Explain basic refrigeration cycle C10	S	Identify/explain variety of refrigeration systems C11	S/E	Identify/explain storage properties of perishable items C12	S/E	Use "rules of thumb" C13	S	Use arc welding techniques C14	S																								
1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c	1	2	3	4a	4b	4c

S - denotes sustaining
 E - denotes emerging

DACUM Skill Rating Scale: Ratings on this scale are based on industrial performance standards.

- 1 - Can perform some parts of this skill satisfactorily but requires assistance and/or supervision to perform the entire skill.
- 2 - Can perform this skill satisfactorily but requires periodic assistance and/or supervision
- 3 - Can perform this skill satisfactorily without assistance and/or supervision.

- 4a - Can perform this skill satisfactorily with more than acceptance speed and quality.
- 4b - Can perform this skill satisfactorily with initiative and adaptability to special problem situations.
- 4c - Can perform this skill satisfactorily and can lead others in performing it.

 Rating revision made at March 29/03 DACUM validation

COMMUNICATE
D

Read and interpret sequence of operations D1	Listen D2	Ask questions D3	Complete service forms D4	Write D5	Follow written/oral instructions D6	Write recommendation reports D7	Be concise D8
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Apply math skills D9	Do conversions D10	Use appropriate terminology D11	Use appropriate manners D12	Read manuals D13			
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c			

BE PROFESSIONAL
E

Be organized E1	Be responsible E2	Be punctual E3	Display positive attitude E4	Display personal competence E5	Learn continuously E6	Maintain professional credentials E7	Deal with adversity E8
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Think outside the box E9	Think critically E10	Identify personal limitations E11	Identify personal strengths/weaknesses E12	Maintain professional appearance E13	Be motivated E14	Take initiative E15	Display personal integrity E16
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Be honest E17	Be adaptable E18	Read/follow workplace policies/procedures E19	Manage time E20				
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c				

INTERACT WITH CO-WORKERS/
CUSTOMERS
F

Follow sexual harassment guidelines F1	Take/follow instructions F2	Deal with conflict F3	Be a team player F4	Accept criticism F5	Show respect F6	Learn from mistakes F7	Be observant F8
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Read non-verbal cues F9							
1 2 3 4a 4b 4c							

S - denotes sustaining
E - denotes emerging
R - Retiring

DACUM Skill Rating Scale: Ratings on this scale are based on industrial performance standards.

- 1 - Can perform some parts of this skill satisfactorily but requires assistance and/or supervision to perform the entire skill.
- 2 - Can perform this skill satisfactorily but requires periodic assistance and/or supervision.
- 3 - Can perform this skill satisfactorily without assistance and/or supervision.

- 4a - Can perform this skill satisfactorily with more than acceptable speed and quality.
- 4b - Can perform this skill satisfactorily with initiative and adaptability to special problem situations.
- 4c - Can perform this skill satisfactorily and can lead others in performing it.

■ Rating revision made at March 29/03 DACUM validation

DOCUMENT
G

Complete work order G1 S	Complete time sheets G2 S	Obtain customer consent G3 S	Complete accident reports G4 S	Fill out warranty forms G5 S	Complete O.D.P. G6 S	Identify/explain government regulatory forms G7 S	Complete maintenance forms G8 S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Maintain W.H.M.I.S. sheets G9 S	Maintain/update inventory sheets G10 S	Maintain personal daily log G11 S	Complete MSDS form G12 S				
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c				

WORK WITH REFRIGERANTS
H

Identify refrigerants/properties H1 E/S	Explain refrigerant properties H2 E/S	Perform pressure tests H3 E/S	Evacuate systems H4 E/S	Reclaim/recover/recycle refrigerants H5 E/S	Charge refrigerants H6 E/S	Identify/explain refrigeration oil properties H7 E/S	Identify/explain super heat sub-cooling H8 S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c

WORK SAFELY
I

Identify dangers I1 E/S	Identify ventilation restrictions I2 E/S	Provide appropriate ventilation I3 E/S	Store refrigerants properly I4 E/S	Handle refrigerants safely I5 E/S	Wear appropriate protective clothing/gear I6 E/S	Use ladder safely I7 S	Handle chemicals I8 E/S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Identify dangerous situation and act accordingly I9 E/S	Dispose chemicals/refrigerants safely I10 E/S	Read/interpret M.S.D.S. / W.H.M.I.S. I11 S	Drive a vehicle I12	Apply variety of rigging techniques I13 E/S	Lift heavy objects I14 S	Apply basic first aid I15 S	Identify/explain personal worker rights
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Work safely with gas I17 S	Identify hazardous roof conditions I18 S						
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c						

INSTALL PIPES
J

Hang/support pipes J1 S	Make flares J2 S	Perform nitrogen purge J3 S	Apply standard piping practices J4 S	Install/identify appropriate piping J5 S	Use appropriate compounds J6 S	Thread, cut, fit pipe J7 S	Perform basic piping techniques J8 S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Pipe in basic heating systems J9 S	Calculate water pressure drops J10 S						
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c						

S - denotes sustaining
E - denotes emerging

DACUM Skill Rating Scale: Ratings on this scale are based on industrial performance standards.

- 1 - Can perform some part of this skill satisfactorily but requires assistance and/or supervision to perform the entire skill.
- 2 - Can perform this skill satisfactorily but requires periodic assistance and/or supervision.
- 3 - Can perform this skill satisfactorily without assistance and/or supervision.

- 4a - Can perform this skill satisfactorily with more than acceptance speed and quality.
- 4b - Can perform this skill satisfactorily with initiative and adaptability to special problem situations.
- 4c - Can perform this skill satisfactorily and can lead others in performing it.

 Rating revision made at March 29/03 DACUM validation

USE TECHNOLOGY
K

Use word processor K1	Access computer data K2	Change operating settings electronically K3	Read/interpret diagnostic data K4	Communicate effectively with radio K5	Identify/explain building automation systems K6
E	E	E	S	S	E
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c

PERFORM BASIC SHEET METAL SKILLS
L

Calculate air flow L1	Identify/explain air flow characteristics L2	Suspend ducts L3	Cut ducts L4	Remove ducts L5	Install ducts L6	Identify air flow problems L7	Identify/explain fan laws L8
S	S	S	S	S	S	S	S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c

PERFORM BASIC MACHINING SKILLS
M

Use Caliper M1	Use micrometer M2	Identify/explain metals specific to trade M3	Apply variety of metal filing techniques M4	Sharpen drill bits M5	Use hacksaw M6	Drill and tap M7	Use a punch M8
S	S	S	S	R	S	S	S
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c	1 2 3 4a 4b 4c
Use a feeler gauge M9	Use dial indicator M10						
S	S						
1 2 3 4a 4b 4c	1 2 3 4a 4b 4c						

S - denotes sustaining
E - denotes emerging

DACUM Skill Rating Scale: Ratings on this scale are based on industrial performance standards.

- 1 - Can perform some parts of this skill satisfactorily but requires assistance and/or supervision to perform the entire skill.
- 2 - Can perform this skill satisfactorily but requires periodic assistance and/or supervision.
- 3 - Can perform this skill satisfactorily without assistance and/or supervision .

- 4a - Can perform this skill satisfactorily with more than acceptable speed and quality.
- 4b - Can perform this skill satisfactorily with initiative and adaptability to special problem situations.
- 4c - Can perform this skill satisfactorily and can lead others in performing it.

 Rating revision made at March 29/03 DACUM validation