UNITED TECHNOLOGIES CARRIER

SERVICE BULLETIN

Title: **17/19 DM SLOW OR STUCK DIFFUSER WALL**

Number: C9012
Date: 7/17/90
Supersedes: C8704
Date: 3/18/87

Models Affected: 17/19 DM & 17/19 DR WITH DM COMPRESSOR

MACHINES AFFECTED: All 17/19 DM compressors built prior to January 1987 with compressor component serial numbers lower than 42200 or compressors mounted to 17/19 DM or 17/19 DR machines with serial numbers lower than 39320 were built with O-rings instead of the Quad-bon style. Also, all compressors built with Quad-bon seal rings shipped prior to July 1, 1990, were built with large cross section rings.

PURPOSE: This bulletin is provided to advise the field of a product improvement.

To improve diffuser wall speed of operation and reliability, the three Quad-bon seals are being superseded with Quad-bon seals of smaller widths, and the diffuser wall solenoids and piping connections have been increased in size.

BACKGROUND: The 17/19 DM movable diffuser wall is hydraulically operated by a piston utilizing oil from the compressor lube oil pump. The piston is sealed by three dynamic and two static O-rings. The dynamic rings consist of one ring to seal the volute, and two rings to seal the piston I.D. to the shroud. The two static rings seal the oil feed hole and the shroud to the volute.

Originally, the large diameter piston O-rings lacked torsional stiffness and could roll in the groove as the piston slowly moved across them. In some cases roll up progressed, twisting the O-ring until a "spiral fracture" occurred. The fractured O-ring allowed oil to pass across the piston into the discharge area, resulting in oil loss and difficulties with wall movement and control.

The dynamic seal O-rings were replaced in January of 1987 with Quad-bon rings with a rectangular shape to resist twisting. Since that time a small number of compressors with the Quad-bon rings have experienced either sticking or slow moving walls.

The root cause of stuck diffuser walls was found to be interference between the Quad rings and the piston caused by swell of the Quad rings. With the smallest groove, the largest Quad-bon ring, and full swell caused by absorption of refrigerant in the ring, extremely high pressures can bind the piston. The Quad ring widths have been reduced so that the groove fill is always less than 100%.

Since low oil pressure can also cause a very slow moving diffuser wall, a redesign has been made to the diffuser wall solenoids and the associated piping to reduce the pressure drop.

FILE: Compressor - Motor Assembly

MAIL KEYS: 2.33B, 2.33D, 2.40B, 2.45, 2.53, 5.14A

Prepared By: Donald W. Berdan

Approved By: Alan Johnson

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The new design eliminates the filter screens and increases the piping and needle valves from 1/4" to 3/8". The solenoid size is increased from 1/8" to 1/4". (Note: the junction box that holds the solenoids is too small; use a larger electrical junction box for retrofits). If the wall is moving too quickly after this change, adjust the needle valves accordingly.

TEST PROCEDURE FOR O-RING FAILURE:

With the chiller shut down, manually operate the oil pump and cycle on the wall all the way open while observing the oil level in the compressor sightglass. The oil level will drop out of the sightglass in five minutes or less if an O-ring has failed. If the oil level does not drop, cycle the wall closed and continue to observe the oil level. If oil loss is seen at only one piston position, it's possible that the O-rings are all right, but the teflon piston coating is worn or damaged in one area. Small scratches in the teflon surface of the piston are normal, but severe scoring may require teflon recoating or piston replacement.

NOTE:

(The procedures for manually cycling the diffuser wall can be found in the 19DM start-up, operating and maintenance instructions. For 32SM control machines, see 19DM-1SSM under "Check Calibration of Diffuser Feedback Potentiometer." For 32MP machines, see 17DM-1SSM or 19DM-2SSM under "Controls Tests.")

Original Quad	Replacement Quad	Replacement Kit
3 Frame Compressor		
KK74ZW245	KK74ZW246	19DM660-002
KK74ZW215	KK74ZW216	
KK74ZW169	KK74ZW170	
2 Frame Compressor		
KK74ZW195	KK74ZW196	19DM660-001
KK74ZW169	KK74ZW170	
KK74ZW135	KK74ZW136	
Solenoid (1/4")		
	EF13CU063 (Not available at this time)	
Needle Valve (3/8")		
	ER40FA061 (Not available at this time)	

A manifold retrofit kit is to be set up, but is not available at this time. Field Engineering shall notify all concerned when it becomes available.

COMMENTS:

JOB NAME:

LOCATION:

MODEL:

S/N: HRS:

REMARKS:

<A>,<B>,<C> USE PRESSURE DROP CHARTS

<A>-USE (06) x 2.31 + dN
<B>-USE (16) x 2.31 + dN
<C>-USE (22) x 2.31 + dN

<D>,<E>,<F>,<G> USE EQUILIBRIUM CHART

<D>-USE (03) AND (04)
<E>-USE (10) AND (12) OR (11) AND (12)
<F>-USE (11) AND (12)
<G>-USE (21) AND (27)

********** ABSORBER LOSS **********

<H> = <D> - <E>

0 - 3 DEG F = NORMAL
4 - 5 DEG F = QUESTIONABLE
6 + DEG F = TROUBLE

********** STANDARD APPROACHES **********

<I> = (2)-(3) (EVAPORATOR APPROACH)

0 - 3 DEG F = NORMAL
4 - 5 DEG F = QUESTIONABLE
5 + DEG F = TROUBLE

<J> = (10)-(8) (ABSORBER APPROACH)

8 - 12 DEG F = NORMAL
12 - 15 DEG F = QUESTIONABLE
15 + Deg F = TROUBLE

<K> = (21)-(19) (CONDENSER APPROACH)

6 - 10 DEG F = NORMAL
10 - 15 DEG F = QUESTIONABLE
15 + DEG F = TROUBLE

ABSORPTION MACHINE LOG

EVAPORATOR	CHILLED WATER IN	DEG.F	(01)						
	CHILLED WATER OUT	DEG.F	(02)						
	REFRIGERANT TEMP.	DEG.F	(03)						
	REFRIGERANT SAMPLE	S.G.	(04)						
	OVERFLOW/CYCLEGAURD	YES/NO	(05)						
	CHILLED WATER PD	PSID	(06)						
	REFRIGERANT PUMP PRESS.	PSIG	(07)						
ABSORBER	COOLING WATER IN	DEG.F	(08)						
	COOLING WATER OUT	DEG.F	(09)						
	WEAK SOLN. OUT	DEG.F	(10)						
	WEAK SOLN. SAMPLE TEMP.	DEG.F	(11)						
	WEAK SOLN. SAMPLE	S.G.	(12)						
	STRONG SOLN. OUT H.X.	DEG.F	(13)						
	SOLUTION TO SPRAYS	DEG.F	(14)						
	SOLUTION LEVEL	INCH	(15)						
	COOLING WATER PD	PSID	(16)						
	GENERATOR PUMP PRESS.	PSIG	(17)						
	ABSORBER PUMP PRESS.	PSIG	(18)						
COND.	COOLING WATER OUT	DEG.F	(19)						
	COOLING WATER TO TOWER	DEG.F	(20)						
	VAPOR CONDENSATE	DEG.F	(21)						
	COOLING WATER PD	PSID	(22)						
GENERATOR	STEAM/HOT WATER	PSIG/F	(23)						
	CONDENSATE/WATER OUT	DEG.F	(24)						
	CONTROL VALVE POSITION	% OPEN	(25)						
	WEAK SOLUTION IN	DEG.F	(26)						
	STRONG SOLUTION OUT	DEG.F	(27)						
CALCULATIONS	CHILLED WATER GPM	<A>	(28)						
	ABSORBER WATER GPM	<B>	(29)						
	CONDENSER WATER GPM	<C>	(30)						
	REFRIG. SATURATION TEMP.	<D>	(31)						
	WEAK SOLN. SAT. TEMP.	<E>	(32)						
	WEAK SOLN. CONCENTRATION	<F>	(33)						
	STRONG SOLN. CONCENTRATION	<G>	(34)						
	ABSORBER LOSS (DEG.F)	<H>	(35)						
	EVAPORATOR APPROACH (DEG.F)	<I>	(36)						
	ABSORBER APPROACH (DEG.F)	<J>	(37)						
	CONDENSER APPROACH (DEG.F)	<K>	(38)						

TAKEN BY:

DATE: / / mo. dy. yr.

JOB NO.

CONTROLS:

INITIAL CONTROL CHECKOUT AND ADJUSTMENT:	ADDITIONAL COMMENTS:	RESULTS:
CHECK SOLUTION AND REFRIG. PUMP STARTERS	OVERLOAD HEATERS REMOVED ☐ FLOW SWITCHES JUMPERED ☐	☐ GOOD ☐ BAD
CHECK CYCLE GUARD VALE	CHECK LIGHT AND AUDIBLE CLICK OF SOLENOID	☐ GOOD ☐ BAD
CHECK LOW-TEMPERATURE CUTOUT	SET DIFF @ 3 DEG F (MARK SCALE TO INDICATE SETTING)	SET AT DEG F
CHECK THERMOSWITCH TSW - 1	SET DIFF @ 3 DEG F (MARK SCALE TO INDICATE SETTING)	CLOSES @ DEG F
CHECK THERMOSWITCH TSW - 2	SET DIFF @ 3 DEG F (MARK SCALE TO INDICATE SETTING)	CLOSES @ DEG F
CHECK SOLUTION PUMP ROTATION *	REPLACE HEATERS ☐ (USE COMPOUND PRESS. GAUGE) *	PRESS. PSIG
RECORD SOLUTION PUMP AMPS	USE HIGH LEG READING T1 ☐ T2 ☐ T3 ☐	AMPS
CHECK REFRIGERANT PUMP ROTATION *	REPLACE HEATERS ☐ (USE COMPOUND PRESS. GAUGE) *	PRESS PSIG
RECORD REFRIGERANT PUMP AMPS	USE HIGH LEG READING T1 ☐ T2 ☐ T3 ☐	AMPS
CHECK FLOW SWITCHES	REMOVE JUMPERS FROM FLOW SWITCHES	☐ CH W ☐ COND W

* HIGHEST PRESSURE READING = CORRECT ROTATION

DO THESE SAFTIES SHUT DOWN MACHINE ?			PUMP INTRERLOCKS (IF USED)	YES ☐	NO ☐
			LOW-TEMP.CUTOUT	YES ☐	NO ☐
C.W. FLOW SWITCH	YES ☐	NO ☐	OTHER_____	YES ☐	NO ☐
CH.W. FLOW SWITCH	YES ☐	NO ☐	OTHER_____	YES ☐	NO ☐

INITIAL SRART UP:

ADD OCTYL ALCOHOL: GALS. START MACHINE AND CHECK ABSORBER LOSS: (A) MORE THAN 5 DEG F (B) 5 DEG F OR LESS

IF (A) USE VACUUM PUMP REDUCE LOSS TO: DEG F IF (B) OPEN CAPACITY CONTROL VALVE AND ALLOW TO OPERATE

CALIBRATION OF CONTROLS:

ELECTRONIC CONTROLS	
THROTTLING RANGE	DEG F
ADJ. SETPOINT DIAL	YES ☐ NO ☐
FINAL CONTROL POINT	DEG F

PNEUMATIC CONTROLS	
SCALE ON SETPOINT DIAL	____ TO____ F
PROPORTIONAL BAND 2.5%	YES ☐ NO ☐
FINAL CONTROL POINT	DEG F

REFRIGERANT CHARGE ADJUSTMENT:

ABSORBER LOSS: DEG F	REFRIG. SP GRAVITY S.G.	CONSENTRATION: %	% LOAD: %
GALS OF WATER: ADDED ☐ REMOVED ☐ QUAN: _____GALS.		FINAL CONSENTRATION: %	% LOAD: %

A: SHUT DOWN MACHINE SHUTDOWN OK ☐ NOT OK ☐ WHY: _____(USE LAST PAGE FOR COMMENTS)

B: CHECK LOW-LEVEL EXTENDER VALVE: OK ☐ NOT OK ☐

C: TAKE AT LEAST TWO (2) SETS OF OPERATIONAL LOG READINGS AND RECORD ON NEXT PAGE.

D: GIVE OPERATING INSTRUCTIONS TO OWNERS OPERATING PERSONEL. HRS. GIVEN: HRS.

CARRIER SERVICE TECHNICIAN: (SIGNATURE) DATE

CUSTOMER REPRESENTATIVE: (SIGNATURE) DATE

ABSORPTION CHILLER INITIAL START UP

UNITED TECHNOLOGIES CARRIER

* MACHINE INFORMATION: (TO BE FILLED IN BY OFFICE) *

OFFICE: DIVREG:

AME:

ADDRESS:

CITY: STATE: ZIP:

JOB NO: S/U(T) NO:

MODEL: S/N:

DESIGN CONDITIONS	TONS	E.W.T. DEG F	L.W.T. DEG F	FLOW GPM	PRESS DROP (PSIG)	NO. OF PASSES	NOZZEL ARRGT.	FOULING FACTOR	WORKING PRESS.	FLUID TYPE	% CONC. BY WT.
COOLER										☐ FW ☐____	
CONDENSER										☐ FW ☐____	
ABSORBER										☐ FW ☐____	
GENERATOR										☐ FW ☐____	

GEN. (HOT WATER) PRESSURE ____ PSIG STEAM PRESS. @ GEN. INLET: ____ PSIG STEAM CONSUMPTION: ____ LB/HR

SOLUTION PUMP:

VAC.
RLA.
HZ.
PH.

REFRIGERANT PUMP:

VAC.
RLA.
HZ.
PH.

CARRIER OBLIGATIONS:

LEAK TEST ---------- YES ☐ NO ☐
EVACUATE ---------- YES ☐ NO ☐
CHARGING ---------- YES ☐ NO ☐

OPERATING INSTRUCTIONS: ____ HRS.

/ALVE SIZE: ____ CONTROL TYPE: PNEUMATIC ☐ ELECTRONIC ☐

ALL ITEMS ON THIS FORM WILL NOT APPLY TO THE MACHINE LISTED ABOVE. IT IS IMPORTANT THAT THIS FORM BE FILLED IN COMPLETELY. FOR THOSE ITEMS THAT DO NOT APPLY USE [N/A]. THIS DOCUMENT WILL BE RETAINED IN THE BRANCH OFFICE FOR FUTURE REFERANCE.

START UP TO BE PERFORMED IN ACCORDANCE WITH APPROPRIATE MACHINE START UP INSTRUCTIONS:
JOB DATA REQUIRED:

1. MACHINE INSTALLATION INSTRUCTIONS ---------- YES ☐ NO ☐
2. MACHINE ASSEMBLY, WIRING AND PIPING DIAGRAMS ----- YES ☐ NO ☐
3. STARTING EQUIPMENT DETAILS AND WIRING DIAGRAMS --- YES ☐ NO ☐
4. APPLICABLE DESIGN DATA (SEE ABOVE) ---------- YES ☐ NO ☐
5. DIAGRAMS AND INSTRUCTIONS FOR SPECIAL CONTROLS --- YES ☐ NO ☐

INSPECT FIELD PIPING: ☐ OK ☐ NOT OK

IF NOT OK INFORM CONTRACTOR & YOUR OFFICE.

PURGE:
INSTALL TUBING AND BRACKET FOR EXHAUST BOTTLE.
COMPLETED ☐

USING WET BULB INDICATOR RECORD MACHINE VACUUM: ____ "HG. WAS STANDING VACUUM TEST PERFORMED? YES ☐ NO ☐

IF YES LONG ☐ or SHORT ☐ INTERVAL TEST

1st READING => ____ "HG	2nd READING => ____ "HG
TIME __:__ DATE __-__-__	TIME __:__ DATE __-__-__
AMBIENT TEMP ____ DEG F	AMBIENT TEMP ____ DEG F
COMMENTS:	

	YES	NO
WAS MACHINE TIGHT ?		
IF NOT WERE LEAKS CORRECTED ?		
DESCRIBE LEAKS:		
RECORD MACHINE VACUUM AFTER REPAIRS	____ "HG	

ECORD PRESSURE DROPS: COOLER: ____ PSID. CONDENSER: ____ PSID. ABSORBER: ____ PSID.

CHARGE SOLUTION: LIBR: ____ GALS WATER: ____ GALS INHIBITOR: ☐ CHROMATE ☐ NITRATE ____ GRMS

S-5409

3200 MP CONFIGURATION DIP SWITCH SETTINGS

ALL 3200 MP CENTRIFIGAL CHILLERS

SWITCH NUMBER	FACT.SET OFF	FACT.SET ON	START UP OFF	START UP ON	NEW #1 OFF	NEW #1 ON	NEW #2 OFF	NEW #2 ON
1-1	0	0	0	0	0	0	0	0
1-2	0	0	0	0	0	0	0	0
1-3	0	0	0	0	0	0	0	0
1-4	0	0	0	0	0	0	0	0
1-5	0	0	0	0	0	0	0	0
1-6	0	0	0	0	0	0	0	0
1-7	0	0	0	0	0	0	0	0
1-8	0	0	0	0	0	0	0	0
2-1	0	0	0	0	0	0	0	0
2-2	0	0	0	0	0	0	0	0
2-3	0	0	0	0	0	0	0	0
2-4	0	0	0	0	0	0	0	0
2-5	0	0	0	0	0	0	0	0
2-6	0	0	0	0	0	0	0	0
2-7	0	0	0	0	0	0	0	0
2-8	0	0	0	0	0	0	0	0
3-1	0	0	0	0	0	0	0	0
3-2	0	0	0	0	0	0	0	0
3-3	0	0	0	0	0	0	0	0
3-4	0	0	0	0	0	0	0	0
3-5	0	0	0	0	0	0	0	0
3-6	0	0	0	0	0	0	0	0
3-7	0	0	0	0	0	0	0	0
3-8	0	0	0	0	0	0	0	0
4-1	0	0	0	0	0	0	0	0
4-2	0	0	0	0	0	0	0	0
4-3	0	0	0	0	0	0	0	0
4-4	0	0	0	0	0	0	0	0
4-5	0	0	0	0	0	0	0	0
4-6	0	0	0	0	0	0	0	0
4-7	0	0	0	0	0	0	0	0
4-8	0	0	0	0	0	0	0	0

17 AND 19 DR ONLY

SWITCH NUMBER	FACT.SET OFF	FACT.SET ON	START UP OFF	START UP ON	NEW #1 OFF	NEW #1 ON	NEW #2 OFF	NEW #2 ON
5-1	0	0	0	0	0	0	0	0
5-2	0	0	0	0	0	0	0	0
5-3	0	0	0	0	0	0	0	0
5-4	0	0	0	0	0	0	0	0
5-5	0	0	0	0	0	0	0	0
5-6	0	0	0	0	0	0	0	0
5-7	0	0	0	0	0	0	0	0
5-8	0	0	0	0	0	0	0	0
6-1	0	0	0	0	0	0	0	0
6-2	0	0	0	0	0	0	0	0
6-3	0	0	0	0	0	0	0	0
6-4	0	0	0	0	0	0	0	0
6-5	0	0	0	0	0	0	0	0
6-6	0	0	0	0	0	0	0	0
6-7	0	0	0	0	0	0	0	0
6-8	0	0	0	0	0	0	0	0
7-1	0	0	0	0	0	0	0	0
7-2	0	0	0	0	0	0	0	0
7-3	0	0	0	0	0	0	0	0
7-4	0	0	0	0	0	0	0	0
7-5	0	0	0	0	0	0	0	0
7-6	0	0	0	0	0	0	0	0
7-7	0	0	0	0	0	0	0	0
7-8	0	0	0	0	0	0	0	0

****** FILL IN APPROPRIATE BLANKS FOR SWITCH SETTINGS ********

EPROM PART NUMBERS
PB: HK98EZ-
MX: HK98EZ-
ESP: HK98EZ-

IS ESP PRESENT? YES 0 NO 0	
MACHINE MOUNT 0	REMOTE 0
COMPRESSOR MAP SECTOR	
A:	B:
MOTOR AMP CORRECTION FACTOR	
A:	B:

REMARKS :

JOB NAME:

LOCATION:

MODEL:

S/N:

OPERATING HRS.:

REMARKS:

** CENTRIFUGAL CALCULATIONS **

1) COOLER OR COND.TONS = $\frac{GPM \times TD}{24}$

2) KW = .00156 x VOLTS x AMPS

3) POWER TONS = .284 x KW

4) HEAT BALANCE = $\frac{(CNT-CLT-PT)}{CNT}$

CLT = COOLER TONS
CNT = CONDENSER TONS
PT = POWER TONS

COOLER LTD <A> = (2)-(5)	COOLER TONS:
CONDENSER LTD <B> = (12)-(9)	CONDENSER TONS:

WATS:

ER TONS:

HEAT BALANCE:

FOR 3200 MP INFORMATION SEE REVERSE SIDE OF FORM

HERMETIC CENTRIFUGAL LOG

COOLER	CHILLED WATER/BRINE IN TEMP.	DEG.F	(01)						
	CHILLED WATER/BRINE OUT TEMP.	DEG.F	(02)						
	CHILLED WATER/BRINE FLOW (PD)	GPM/PSID	(03)						
	CHILLED WATER/BRINE PUMP PD	PSID	(04)						
	REFRIGERANT TEMP.	DEG.F	(05)						
	PRESSURE	PSIG	(06)						
	COOLER LTD	<A>	(07)						
CONDENSER	CONDENSER WATER IN TEMP.	DEG.F	(08)						
	CONDENSER WATER OUT TEMP.	DEG.F	(09)						
	CONDENSER WATER FLOW (PD)	GPM/PSID	(10)						
	CONDENSER WATER PUMP PD	PSID	(11)						
	REFRIGERANT TEMP.	DEG.F	(12)						
	PRESSURE	PSIG	(13)						
	SUBCOOLER TEMP.	DEG.F	(14)						
	CONDENSER LTD	<B>	(15)						
HT PMP	HOT WATER IN TEMP	DEG.F	(16)						
	HOT WATER OUT TEMP.	DEG.F	(17)						
	HOT WATER FLOW (PD)	GPM/PSID	(18)						
	HOT WATER PUMP PD	PSID	(19)						
LOAD	VANE POSITION	%	(20)						
	MOTOR AMPERAGE	L1	(21)						
		L2	(22)						
		L3	(23)						
LUBE	OIL LEVEL	%	(24)						
	OIL PUMP CURRENT	AMPS	(25)						
	SUMP TEMP.	DEG.F	(26)						
	SUMP PRESSURE	IN./PSIG	(27)						
	BEARING TEMP.	DEG.F	(28)						
	OIL SUPPLY PRESSURE	IN./PSIG	(29)						
PURGE	TYPE-L SUCTION PRESSURE	IN./PSIG	(30)						
	TYPE-L DISCH. PRESSURE	PSIG	(31)						
	THERMAL-CHAMBER PRESS.	IN./PSIG	(32)						
	EXHAUST FREQUENCY (COUNTS)	TIME (#)	(33)						
	WATER INDICATION	YES / NO	(34)						
ELEC	LINE VOLTAGE	VOLTS	(35)						
	TRANSFER TIME	SEC.	(36)						
	START/CONTROL SEQUENCE	OK,NG,NA	(37)						
	START COUNTS	NO.	(38)						

TAKEN BY:

DATE: / / (mo. dy. yr.)

JOB NO.

STARTER: ELECTRO-MECHANICAL ☐ SOLID STATE ☐

MOTOR LOAD CT RATIO: : SIGNAL RESISTOR SIZE: OHMS TRANSITION TIMER TIME: SEC.

CHECK MAGNETIC OVERLOADS: ADD DASH POT OIL: YES ☐ NO ☐ SOLID STATE OVERLOADS: YES ☐ NO ☐

*NOTE: IF STARTER IS NOT STANDARD AND IN SOME WAY SPECIAL [i.e. SOLID STATE, INVERTER, ETC.] CONTACT OFFICE BEFORE PROCEEDING. ALSO IF CAPACITORS ARE USED, DETERMINE SIZE, LOCATION (LINE OR MOTOR SIDE) AND ALSO CONTACT OFFICE.

SOLID STATE STARTER: TORQUE SETTING O'CLOCK RAMP SETTING SEC.

CONTROLS: SAFTEY, OPERATING, ETC.

32SM ☐ 32MP ☐ PIC ☐

PERFORM CONTROLS TEST 32MP OR PIC ☐

[32MP/PIC CAUTION]

COMPRESSOR MOTOR AND CONTROL PANEL "MUST" BE PROPERLY AND INDIVIDUALLY CONNECTED BACK TO THE EARTH GROUND IN THE STARTER. (IN ACCORDANCE WITH BULLETIN C-8912.) CONTROL PANEL GROUND 14 GAUGE MIN. YES ☐

TWISTED SHIELDED PAIR CABLE "MUST" BE USED BETWEEN SIGNAL RESISTOR IN STARTER AND CONTROL PANEL. SHIELD GROUNDED ON ONE END.

DRY RUN MACHINE:

DO THESE SAFETIES SHUT DOWN MACHINE ?

CH.W. LOW TEMP CUT OUT	YES ☐	NO ☐	*32MP/PIC ☐
C.W. FLOW SWITCH	YES ☐	NO ☐	*32MP/PIC ☐
CH.W. FLOW SWITCH	YES ☐	NO ☐	*32MP/PIC ☐
PUMP INTRERLOCKS	YES ☐	NO ☐	*32MP/PIC ☐
RECYCLE SWITCH	YES ☐	NO ☐	*32MP/PIC ☐
BEARING CUT OUT	YES ☐	NO ☐	*32MP/PIC ☐
MTR WINDING CUT OUT	YES ☐	NO ☐	*32MP/PIC ☐

* IF CANNOT BE CHECKED DUE TO 32MP/PIC, MARK THIS BLOCK.

* IF 3200MP CONTROL BE SURE TO FILL IN LAST PAGE *

CONTROL	SETTING
LEAVING CHILL WATER TEMP.	
COND.HP CUT OUT	
LOW OIL PRESS. CUT OUT	
COOLER LOW PRESS. CUT OUT	
REFRIG. LOW TEMP. CUT OUT	
LOAD RECYCLE TEMP.SETTING	
MOTOR AMPS LIMIT	
SHUT DOWN OIL TEMP. SETTING	

INITIAL START:

LINE UP ALL VALVES IN ACCORDANCE WITH INSTRUCTION MANUAL: ☐ START WATER PUMPS AND ESTABLISH WATER FLOW: ☐

OIL LEVEL OK AND OIL TEMP. OK (32MP/SM 145 DEG.): ☐ CHECK OIL PUMP ROTATION-PRESSURE: ☐ WATER THRU OIL COOLER: ☐

CHECK COMPRESSOR(s) MOTOR ROTATION (MOTOR END SIGHT GLASS) AND RECORD: CLOCKWISE ☐ COUNTERCLOCKWISE ☐
(CHECK FOR DISCHARGE CHECK VALVE OPERATION ON DUAL 19DR)

RESTART COMPRESSOR(s) BRING UP TO SPEED. SHUT DOWN. ANY ABNORMAL COAST DOWN NOISE? (A) YES* ☐ NO ☐ (B) YES* ☐ NO ☐

* IF YES DETERMINE CAUSE AND CALL OFFICE BEFORE PROCEEDING ANY FURTHER.

START MACHINE AND OPERATE. COMPLETE THE FOLLOWING:

A: TRIM CHARGE AND RECORD UNDER CHARGE REFRIG. SECTION
B: COMPLETE ANY REMAINING CONTROL CALIBRATION AND RECORD UNDER CONTROL SECTION.
C: TAKE AT LEAST TWO (2) SETS OF OPERATIONAL LOG READINGS AND RECORD ON NEXT PAGE.
E: AFTER MACHINE HAS BEEN SUCESSFULY RUN AND SET UP SHUT DOWN AND MARK SHUT DOWN OIL AND REFRIGERANT LEVELS.

F: GIVE OPERATING INSTRUCTIONS TO OWNERS OPERATING PERSONEL. HRS. GIVEN: HRS.

CARRIER SERVICE TECHNICIAN: (SIGNATURE) DATE

CUSTOMER REPRESENTATIVE: (SIGNATURE) DATE

CENTRIFUGAL CHILLER INITIAL START UP

UNITED TECHNOLOGIES CARRIER

* MACHINE INFORMATION: (TO BE FILLED IN BY OFFICE) *

OFFICE: DIVREG:

NAME:

ADDRESS:

CITY: STATE: ZIP:

JOB NO: S/U(T) NO:

MODEL: S/N:

DESIGN CONDITIONS	TONS	BRINE	GPM	TEMP.F IN	TEMP.F OUT	PD (PSID)	PASS	SUCT.TEMP.	COND.TEMP.
COOLER									******
CONDENSER								******	

COMPRESSOR A: VOLTS: RLA: OLTA: COMPRESSOR B: VOLTS: RLA: OLTA:

STARTER: MFG: TYPE:

OIL PUMP: VOLTS: RLA: OLTA:

REFRIGERANT: TYPE: R- CHARGE: LBS

COMPR. MAP SECTOR OR COMPR. SELECTION FACTOR (ZONE) —19DM— A: —19DM— B: MOTOR AMP CORR. FACTOR A: B:

CARRIER OBLIGATIONS:

ASSEMBLE ---------- YES ☐ NO ☐
LEAK TEST ---------- YES ☐ NO ☐
DEHYDRATE ---------- YES ☐ NO ☐
CHARGING ---------- YES ☐ NO ☐

OPERATING INSTRUCTIONS ____ HRS.

ALL ITEMS ON THIS FORM MAY NOT APPLY TO THE MACHINE LISTED ABOVE. IT IS IMPORTANT THAT THIS FORM BE FILLED IN COMPLETELY. FOR THOSE ITEMS THAT DO NOT APPLY USE (N/A). THIS DOCUMENT WILL BE RETAINED IN THE BRANCH OFFICE FOR FUTURE REFERANCE.

START UP TO BE PERFORMED IN ACCORDANCE WITH APPROPRIATE MACHINE START UP INSTRUCTIONS

OB DATA REQUIRED:

1. MACHINE INSTALLATION INSTRUCTIONS ---------- YES ☐ NO ☐
2. MACHINE ASSEMBLY, WIRING AND PIPING DIAGRAMS ----- YES ☐ NO ☐
3. STARTING EQUIPMENT DETAILS AND WIRING DIAGRAMS --- YES ☐ NO ☐
4. APPLICABLE DESIGN DATA (SEE ABOVE) ---------- YES ☐ NO ☐
5. DIAGRAMS AND INSTRUCTIONS FOR SPECIAL CONTROLS --- YES ☐ NO ☐

INITIAL MACHINE PRESS (VAC): ____

	YES	NO
WAS MACHINE TIGHT		
IF NOT WERE LEAKS CORRECTED		
WAS MACHINE DEHYDRATED AFTER REPAIRS		

CHECK OIL LEVEL AND RECORD: A: E ☐☐☐☐☐☐☐☐☐☐ F B: E ☐☐☐☐☐☐☐☐☐☐ F

ADD OIL: YES ☐ NO ☐ AMOUNT: ____ GALS.

RECORD PRESSURE DROPS: COOLER: ____ PSID. CONDENSER: ____ PSID.

CHARGE REFRIGERANT: INITIAL CHARGE: ____ LBS FINAL CHARGE AFTER TRIM: ____ LBS

INSPECT WIRING AND RECORD ELECTRICAL DATA:

RATINGS: MTR(s)VAC: ____ MTR(s)AMPS: (A:) ____ (B:) ____ OIL PUMP VAC: ____ STARTER AMPS: ____

LINE VOLTAGES: MOTOR(s): ____ OIL PUMP: ____ OIL HEATER: ____

(ENERGIZE HEATER)
32 MP/SM = (145 DEG F)
PICS = (NON ADJUSTABLE)

CHECK CONTINUITY T1 to T1, ETC. (MOTOR TO STARTER. DISCONECT MOTOR LEADS T4, T5, T6.)

"EGGER MOTOR(s)

A:COMP->"PHASE TO PHASE" AND "PHASE TO GROUND"

) SECOND READINGS:	T1-T2	T1-T3	T2-T3	T1-G	T2-G	T3-G
60 SECOND READINGS:						
POLARIZATION RATIO:						

B:COMP->"PHASE TO PHASE" AND "GROUND TO GROUND"

	T1-T2	T1-T3	T2-T3	T1-G	T2-G	T3-G