

Use of Quick Disconnect Makes ECS Maintenance Much Easier

The quick disconnects allow the removal of ECS pallets without evacuating the refrigerant. However, this prevents any maintenance on the pallet because the pallet is still pressurized. If maintenance is to be performed on the pallet, evacuate the system before disconnecting the quick disconnects and removing the pallet.

What's a quick disconnect?

These fittings are equipped with self-sealing valves so that upon disconnection, they will automatically contain the fluid in at each side of the refrigerant line. Figure 1 shows the parts of the QD. In HH-60M ECS, 4 QDs connect to the Electrical, Evaporator, and Condenser pallets.

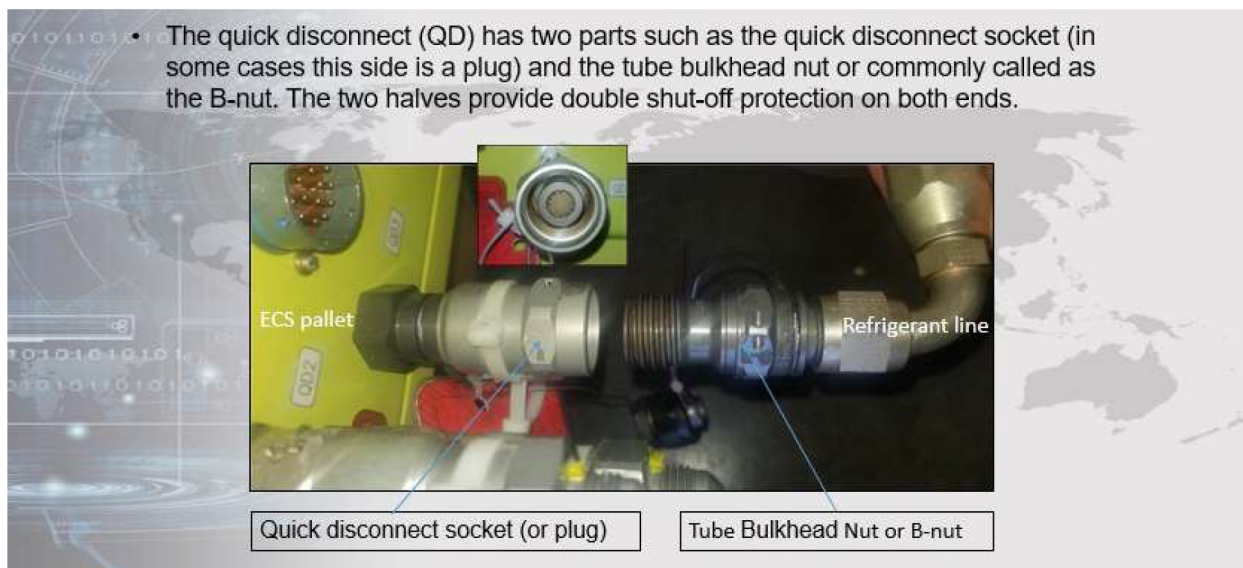


Figure 1. Parts of the quick disconnect for ECS in HH-60M

Does the use of QD help reduce maintenance tasks?

Absolutely! The standard maintenance procedure in ECS maintenance involves five steps, such as RECOVER or DE-SERVICE, RECYCLE, EVACUATE, LEAK TEST, and CHARGE or SERVICE. TM 1-1520-2809-23&P WP 2032, Refrigerant Recovery (De-service), states that you need to RECOVER and RECYCLE refrigerant using a Refrigerant Recovery and Recycling Station per the servicing unit manufacturer operating manual. Then, after reinstalling the ECS pallets in the aircraft and reconnecting all refrigerant lines, you need to EVACUATE the system to remove moisture and perform a LEAK TEST. Finally, you will CHARGE the system with the correct amount of refrigerant and ensure that it is working properly. With the use of QDs, you don't need to do all those procedures.

Where are the QDs in HH-60M ECS?

Figure 2, shows the location of QDs in the electrical pallet, Figure 3 shows the QDs to disconnect the evaporator pallet and Figure 4 shows the QDs on the condenser pallet. Figure 5 illustrates the use of provisioned dust caps to secure each half of the QD.

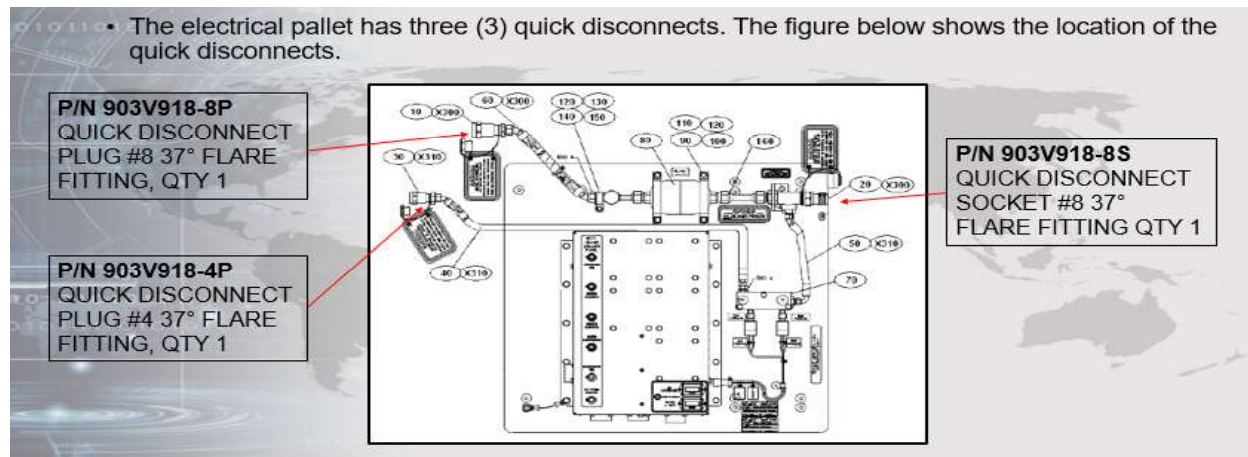


Figure 2. Location of QDs on the electrical pallet

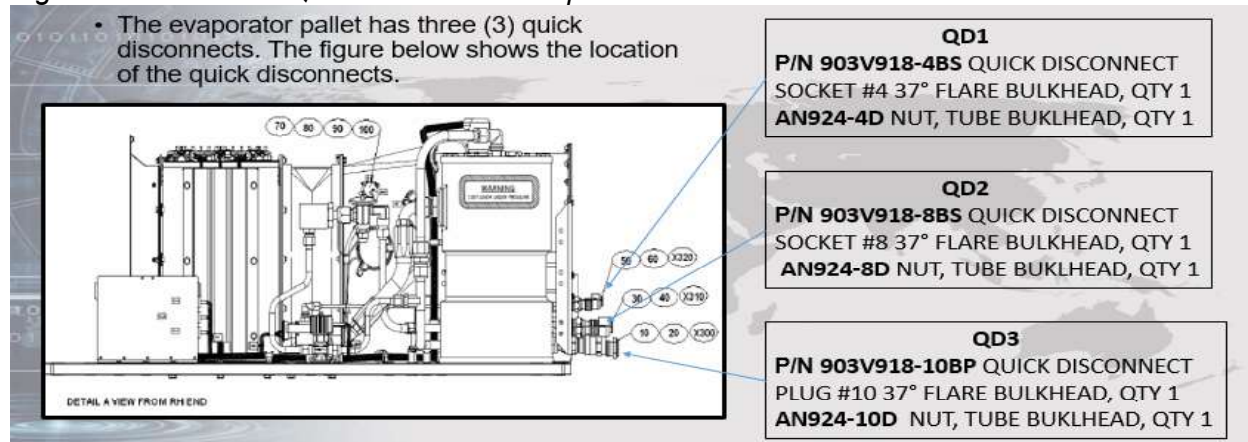


Figure 3. Location of QDs on the evaporator pallet

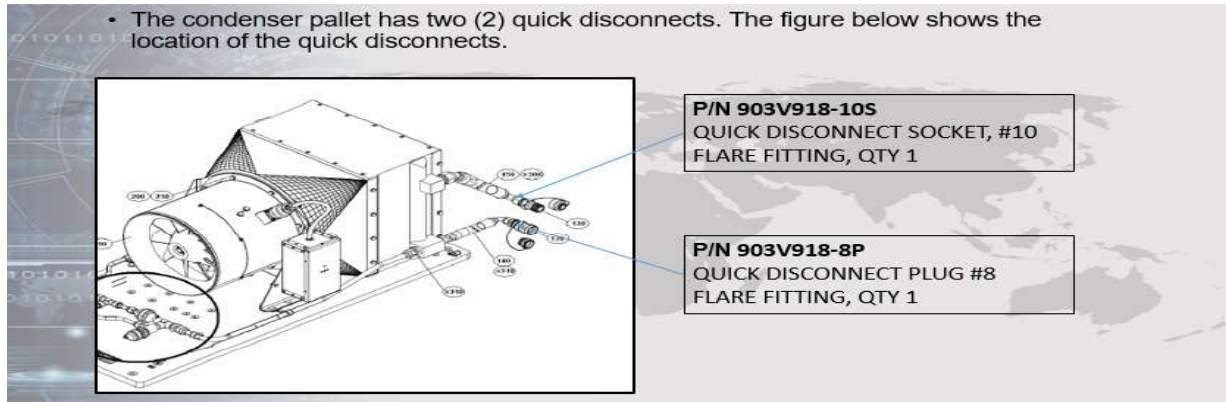


Figure 4. Location of QDs on the condenser pallet

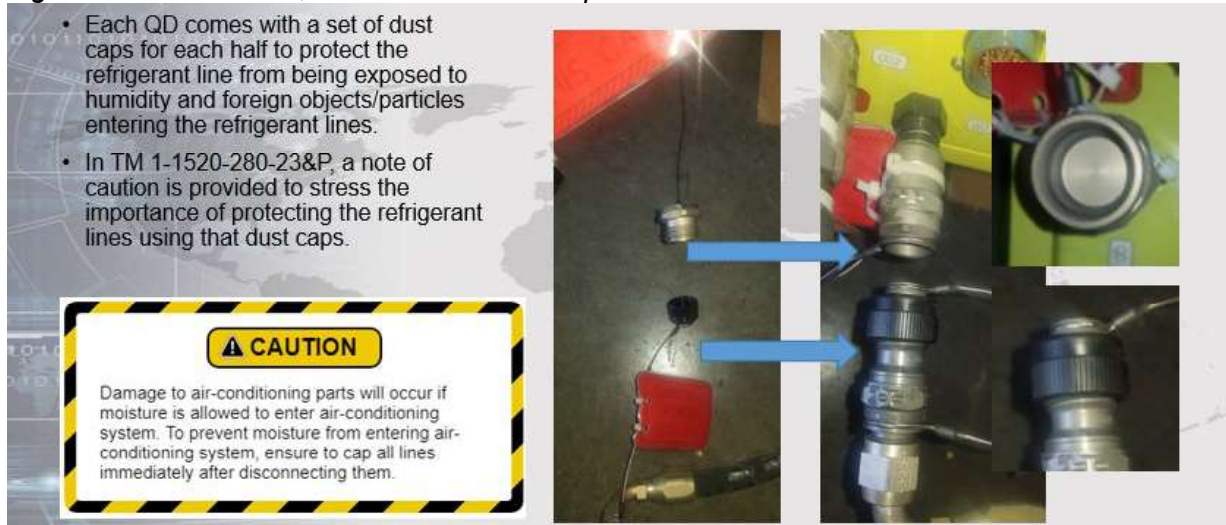


Figure 5. Provisioned dust caps for QDs

Is the use of QDs an authorized procedure in the TM?

TM 1-1520-280-23&P, dated March 09, 2020, does not include the QD procedures in the ECS maintenance work packages. The PD MEDEVAC team works closely with engineering and technical departments to develop these procedures and incorporate changes in the TM. However, in the interim, you can request engineering approval through a Maintenance Engineering Call (MEC) to use the QD procedures in the OEM Maintenance and Servicing Manual Vapor Cycle Air Conditioner and Electric Heater, 70A600-6R100 Revision F, dated DECEMBER 02, 2010, para. 12.1 Pallet Removal and 12.2 Pallet Installation.

(NOTE: Use of the following OEM procedures requires prior engineering approval)

REFERENCE:

MAINTENANCE AND SERVICING MANUAL VAPOR CYCLE AIR CONDITIONER AND ELECTRIC HEATER 70A600-6R100 Revision F, dated DECEMBER 02, 2010

PROCEDURES:

12.1 Pallet Removal Procedures

WARNING: FOLLOW THESE PROCEDURES EXACTLY OR A HAZARDOUS CONDITION MAY OCCUR.

12.1.1 Disengage all circuit breakers on electrical pallet (Condenser Fan, Heater Elements, Motor Compressor, Evaporator Fan, and DC Power Control). Be sure that nobody else will re-engage the circuit breakers until the re-installation of the pallet is completed.

12.1.2 Disconnect electrical connectors from pallet that will be removed.

12.1.3 Remove safety wire from quick disconnects on pallet that will be removed.

12.1.4 Disconnect quick disconnects and install dust cap on each half.

12.1.5 Unbolt pallet from mounting rails.

12.1.6 Remove pallet from Aircraft.

12.2 Pallet Installation Procedures

WARNING: FOLLOW THESE PROCEDURES EXACTLY OR A HAZARDOUS CONDITION MAY OCCUR.

12.2.1 Install pallet in aircraft by sliding pallet in and aligning with mounting rails.

12.2.2 Bolt pallet to mounting rail and torque to according to aircraft maintenance manual.

12.2.3 Remove dust cap from quick disconnects halves and attach quick disconnects.

12.2.4 Safety wire quick disconnects halves together.

12.2.5 Verify that circuit breakers are still disengaged before connecting electrical connectors to the pallet that is being installed.

12.2.6 Verify that all quick disconnects are attached and have safety wire installed on them.

12.2.7 Engage all circuit breakers on electrical pallet (Condenser Fan, Heater Elements, Motor Compressor, Evaporator Fan, and DC Power Control).

How does QD prevent damage to ECS equipment?

Removing refrigerant lines at various connections instead of using the QDs can damage the conical seals of sockets or B-nut threads. Also, without proper protection, the refrigerant lines will be exposed to humidity that can damage the system. Figure 6 shows some photos of improperly disconnected refrigerant lines. TM 1-1520-280-23&P, dated March 09, 2020, provides the following caution:

"Damage to air-conditioning parts will occur if moisture is allowed to enter air-conditioning system. To prevent the moisture from entering the system, ensure to cap all lines immediately after disconnecting them. Damage to filter/dryer will if moisture is allowed to enter. Filter/dryer is extremely sensitive to moisture and humidity. Replace filter/dryer if inlet and/or outlet connections are left uncapped for more than 10 minutes."

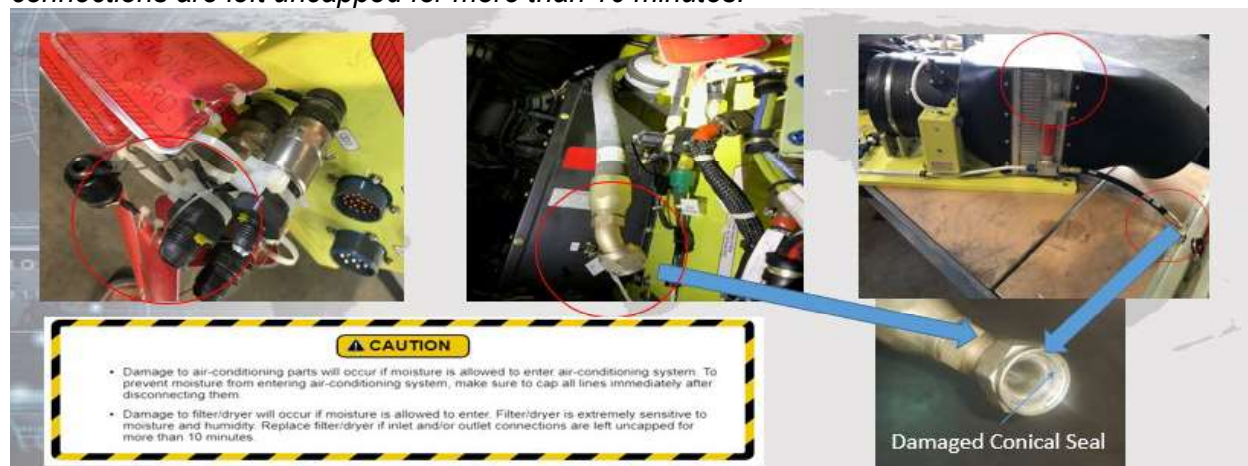


Figure 6. Improperly disconnected refrigerant lines

How can you fix the improperly disconnected refrigerant lines?

When you disconnect the refrigerant lines at the B-nut shown in Figures 6 and 7, there is a set of OEM procedures that you can use to fix it. You can request engineering approval through a Maintenance Engineering Call (MEC) to use the following.

(NOTE: Use of the following OEM procedures requires prior engineering approval)

REFERENCE: 70A600-6R100 MAINTENANCE AND SERVICING MANUAL VAPOR CYCLE AIR CONDITIONER AND ELECTRIC HEATER Revision F DECEMBER 02,2010, Page 21 of 47, Para 9.1.4 Installation of Quick Disconnects.

PROCEDURES:

9.1.4 Installation of Quick Disconnects


9.1.4.1 Using a soft wire bristle brush, remove old thread sealant.

9.1.4.2 Install new conical seal on male side of fitting

CAUTION: WHEN APPLYING THREAD SEALANT, USE EXTREME CARE TO KEEP SEALANT OFF FIRST 2 OR 3 THREADS.

9.1.4.3 Apply a thin layer of thread sealant primer to fitting threads. Apply thread sealant to male fitting threads sparingly.

9.1.4.4 Install Quick disconnect to hose and torque to APS 136



4.1 Flared Hose and Tube Fittings
All Flared Hose and Tube Fittings with any component made of aluminum

OD Thread Size-tpi	Fitting Size	Torque Inch lbs.	FFFT*
5/16-24	-2	75	2
7/16-20	-4	130	2
9/16-18	-6	185	1-1/4
5/8-18	N/A	205	1
3/4-16	-8	330	1
7/8-14	-10	405	1
1-1/16-12	-12	520	1

SEE EXAMPLE BELOW

REFERENCE:
APS 136: TORQUE REQUIREMENTS FOR THREADED FITTINGS

Figure 7. Installation of quick disconnect and APS 136 torque requirements

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