Podcast 18 – Memory Items Part 1

Hello and welcome to another episode of the 737Talk where we have a couple of exciting announcements first. The first one is that this week's topic was requested by one of our listeners. Darren is a line pilot at TUI UK and got in touch to ask us whether we'd put together an episode on memory items to help with his upcoming simulator session before a hopeful return to the skies sometime in June. What we'll do is cover a bit of non-normal checklist disciplines as well as those all-important items for you. Over to Mark for the next announcement.

Hi everyone, as some of you may be aware during this extended down period Ian and I have not only been putting together these podcasts, but we have also been working hard on an online supplemental learning platform that takes you through multiple non normal events from briefing room to simulator and back for that all important debrief. We've been having really good feedback from those who have joined us, and we've decided to run our very first competition with the prize being a year's free access to the school. All you have to do for this one is follow us on any of our social media, that's Fb, Instagram or twitter @b737talk and then like and share the competition post that will be going up today. We'll then use a random name generator to decide the winner and announce them on next week's podcast.

We're doing this now as we believe the platform will be a real help to those heading back into the sims over the next month or two as well as assisting those perhaps not so fortunate, to stay in touch with the Jet. Don't worry if you've already signed up as we'll simply give you your second year on us, so please enter too. Good luck to everyone who enters but now on with today's subject.

The QRH non-normal section is grouped into sections matching the vol 2. Most correspond to a light, alert or other indication. Checklists without these indications are called unannunciated checklists and include things such as ditching or fuel leaks. If this anannunciated abnormal falls within a system section it will be located here, such as the aforementioned fuel leak being found in section 12, Fuel. If there is no associated system the checklist will be found in section 0, miscellaneous, with perhaps our most used one for the simulator here being the Emergency Descent. More on that one later.

All the QRH checklists have condition statements which briefly describes the situation that caused the alert. Even our unannunciated checklists have these to try and help us in understanding the reason for the checklist.

Some will also have objective statements which briefly describe the expected result of doing the checklist or the reason for steps in the checklist. An example would be the DUAL BLEED checklist where the objective is "To prevent possible backpressure of the APU".

Checklists can have both memory items and reference items and it is the memory items we'll focus on today. Memory items are critical steps that must be done before reading the checklist with reference items to be done when reading the checklist. The last memory item in a checklist is followed by a dashed horizontal line and these items should be verified as

done by the PM when she or he is reading the checklist and they would normally be read aloud. Item numbers do not need to be read.

As is inferred by the name we are to have these memory items deeply ingrained into our psyche so that they are available to us when under what could be quite a stressful situation. An understanding of why we are performing these items will help with their retention.

The first thing to say is that memory items do not take precedence over your primary responsibility of keeping the aircraft under control and on a safe flight path. Always do your Aviate i.e., have the aircraft under control whether that's in automatic or manual flight and your Navigate i.e., are we heading in a safe direction and is our altitude safe for the area we're in before getting to your Communicate which will involve identifying the failure together before requesting the necessary memory items.

At the direction of the PF both crew members will do their memory items according to their areas of responsibility. We'll go through how we do that but let's look at situations in which memory items are applicable first.

We'll do them in section order. So, from section 0 we have Emergency Descent and section 2 gives us Cabin Altitude warning or rapid depressurisation. Section 7 or Engines gives us a few with Memory Items for Aborted Engine Starts, Engine limit or surge or stall and loss of thrust on both engines. Our fire protection section or section 8 sees memory items for an APU fire, Engine Fire or Engine Severe Damage or Separation, Engine Overheat.

Section 9 or Flight controls has memory items for Runaway Stabiliser, section 10 for Airspeed Unreliable and section 15 for Landing and takeoff configuration warnings as well as Warning Horn Intermittent or Warning Light – cabin altitude or take-off configuration. So, there they are the 13, who says aircraft manufacturers don't have a sense of humour. Now, as they're memory items we'll assume you know them and end the podcast there… (leave a gap) Alright fine we'll go through them then as much for our own benefit as yours.

We'll assume on all these that you have the aircraft under control and on a safe flight path, have identified and confirmed the failure together and called for the relevant memory items by using the full name of the associated checklist. The way we do it and please stick to your airline SOPs here, is for the pilot whose area of responsibility it is to announce the next action they will take. To keep it simple Mark and I will act as a crew with Mark being be PF and Captain for all of them and I'll act as PM and First Officer.

So, to the Cabin Altitude warning or rapid depressurisation memory items first as these will likely precede the Emergency Descent actions:

Memory Items Cabin Altitude warning or rapid depressurisation.

Don oxygen masks and set regulators to 100%, establish crew communications, pressurisation mode selector to MAN, Outflow valve switch Hold in close until the Valve indication shows fully closed. If cabin altitude in uncontrollable Passenger Signs ON, Passenger Oxygen switch ON and Go to the Emergency Descent Checklist on page 0.1.

This Checklist instructs us to go to the Emergency Descent checklist which itself has Memory items so…

Memory Items Emergency Descent

Announce the emergency descent and advise the cabin crew with company SOP call, on the PA.

Advise ATC and obtain the area altimeter setting. Passenger signs ON

Without delay, descend to the lowest safe altitude or 10,000ft, whichever is higher.

Engine Start Switches (both) to CONT

Thrust levers (both) reduce thrust to minimum or as needed for anti-ice

Speedbrake FLIGHT DETENT.

If structural integrity is in doubt, limit speed as much as possible and avoid high manoeuvring loads

Set Target Speed to Mmo/Vmo

On to section 7 with the first being the Abnormal engine start. Now you'll be pleased to hear there's just the one action here and that's to move the engine start lever on the affected engine to cutoff. What's worth mentioning here is that this action is unlikely to be announced by the Captain as if they were to do so system limitations may be exceeded by the time the action was done. This is the one case where crew identification and confirmation are forgone, however as a conscientious First Officer I'm sure we'd be in the picture as to why the action was taken and would then expect to hear the call of "Abnormal Engine Start QRH".

On to Engine Limit or surge or stall which incidentally is also called for in the event of a lack of thrust lever response or abnormal response. This memory item procedure also has a "Confirm" in it which is added when both crew members must verbally agree before an action is taken. During an inflight non-normal situation, verbal confirmation is required for:

- an engine thrust lever
- an engine start lever
- an engine, APU or cargo fire switch
- a generator drive disconnect switch
- an IRS mode selector, when only one IRS is failed
- a flight control switch

This does not apply to the Loss of Thrust on Both Engines checklist. Anyway, we'll say our problem here is on engine 1.

Memory Items Engine Limit or Surge or Stall

Autothrottle (if engaged) Disengage, thrust lever number 1 confirm

Confirm

Retard until engine indications stay within limits or the thrust lever is closed.

This next one, loss of thrust on both engines, is worth a little exploration. Purely in the sense that if the FO was pilot flying at the time there will need to be a handover of control due to loss of data on the first officer's side and the fact that as mentioned above engine start lever movement doesn't need confirmation in the first part in this case. As it happens Mark is Captain and PF so we can continue as we were.

Memory Items Loss of Thrust on both engines

Engine Start switches (both) FLT, Engine start levers (both) CUTOFF. When EGT decreases Engine start levers (both) IDLE DETENT. If EGT reaches redline or there is no increase in EGT within 30 seconds. Engine start lever on affected engine

Confirm

CUTOFF, then IDLE DETENT. IF EGT again reaches a redline or there is no increase in EGT within 30 seconds, repeat as needed

We now move into fire protection with the first on the list the APU Fire. Likely done on the ground but that may not be the case should you be using it when airborne of course so we'll look at this case for interest.

Memory Items APU Fire

APU fire switch confirm

Confirm

Pull, rotate to the stop and hold for 1 second

APU switch OFF

On to an old friend, Engine Fire or Engine Severe Damage or Separation, who has seen a makeover in the latest Flight Ops Technical Bulletin 737-21-01 issued 10 Feb 2021. Before we talk about that just a note on a new checklist, the "Engine Fire on the Ground" checklist

which is due to be located just before the evacuation checklist in a QRH near you imminently. We haven't seen it yet, but it was designed after several on-ground fire events with a view to prevent passenger-initiated evacuations and provide guidance for unannunciated engine fire. Once we've seen it we'll give it a mention in future emergency based podcasts.

The update to the Engine Fire or Engine Severe Damage or Separation should be in all QRH's between now and May and put basically the need to fire the second bottle has now been moved to the reference part of the checklist rather than in the memory items and there will be a new "in flight or on ground?" "Choose one" step added. That all said let's get to those often seen in the simulator memory Items using engine number 2 as the problem engine. We'll do this as if we're airborne. A slight gotcha on this one when it's done on the ground, is that the engine start lever would be in the Captains area of responsibility (PF on the ground) as opposed to the PM when airborne. One to remember when you're doing those RTO's due to engine fire.

Memory Items Engine Fire or Engine Severe Damage or Separation

Autothrottle (if engaged) Disengage, Thrust lever Engine number 2 Confirm

Confirm

Close

Engine start lever number 2 confirm

Confirm

CUTOFF. Engine fire switch number 2, confirm

Confirm

Pull, to manually unlock the engine fire switch, press the override and pull

If the engine fire switch or overheat light is illuminated

Engine Fire switch number 2 rotate to stop and hold for one second

Another Engine checklist with memory items that could lead us to the Engine Fire or Engine Severe Damage or Separation checklist is the Engine Overheat. We'll use engine 2 again here.

Memory items engine overheat

Autothrottle (if engaged) Disengage
Thrust lever number 2 engine confirm

Confirm

Close

If the Engine Overheat light stays illuminated go to the Engine Fire or Engine Severe Damage or Separation checklist.

Right, that's us done on section 8. We're heading towards the home straight so bear with us and remember this is all Darren's fault! On to section 9 and 10 with the checklists and memory items that have got so much attention of late. First to Runaway Stabiliser. We'll leave you to read the new FCTM advice but here are those memory items although an important point to stay is that although the steps are sequential they can be done simultaneously.

Memory Items Runaway Stabiliser
Control column, Hold firmly; Autopilot if engaged, Disengage; Autothrottle if engaged, Disengage; Control column and thrust levers, control airplane pitch attitude and airspeed; Main Electric Stabiliser Trim, Reduce control column forces.

If the runaway stops after the autopilot is disengaged: Do not re-engage autopilot or autothrottle.

End of Memory items unless…

If the runaway continues after the autopilot is disengaged.

Stab Trim cutout switches both, CUTOUT

If the runaway still continues:

Stabiliser Trim wheel, Grasp and hold

As mentioned the other non normal that has received a lot of press recently is the airspeed unreliable event. This checklist lives in section 10 and again we'll leave you to read the FCTM advice but suffice to say early recognition and good crew coordination are vital for a safe outcome here.

Memory Items Airspeed Unreliable

Autopilot if engaged, Disengage; Autothrottle if engaged, Disengage

F/D switches both, OFF

Set the following pitch atitude and thrust:
Flaps extended, 10° and 80% N1
Flaps up, 4° and 75%N1

Finally for this episode we'll take a look at section 15 which you'll be pleased to hear aren't particularly involved memory items so shouldn't take too long. I can hear you thinking, what about the manoeuvre section items? Don't worry we haven't forgotten; we're going to give Darren value for his money and dedicate 2 podcasts to him. We thought both your and our brains would suffer from total overload if we put them all in to the one episode so yep, you guessed it we'll bring you those in their own dedicated show next week.

Anyway, back to the three items is section 15; Landing and takeoff configuration warnings as well as Warning Horn Intermittent or Warning Light – cabin altitude or take-off configuration.

Simply put for both the landing and takeoff configuration memory items we just need to assure correct airplane configuration.

The Warning Horn Intermittent or Warning Light – cabin altitude or take-off configuration checklist reinforces why we are hearing the horn or seeing the lights and the actions required. The two scenarios are in flight above 10,000ft MSL or on the ground when advancing the thrust levers.

If the intermittent warning horn sounds or a CABIN ALTITUDE light (if installed and operative) illuminates at an airplane flight altitude above 10,000ft MSL:

Don the oxygen masks and set the regulators to 100%; Establish crew communications; Go to the CABIN ALTITUDE WARNING or Rapid Depressurisation checklist on page 2.1, and of course the associated memory items

If the intermittent warning horn or a TAKEOFF CONFIG light (if installed and operative) illuminates on the ground when advancing the thrust levers to takeoff thrust:

Assure correct airplane takeoff configuration.

Ok, so we'll be back next week with a look at that manoeuvres section and of course announcing the competition winner so head over to the social media pages @b737talk and get sharing. For those who don't win we have the online supplemental learning platform on offer at 25% off until May 20th to help with getting back into the seat, be it through a company simulator or hopefully interviews that will start appearing soon. We currently have over 7hrs of subject briefs and simulator videos on there covering items such as EFATOs, SE Approaches and Landing, RTOs, Hydraulic and Electric system failures, airspeed unreliable, runaway stabiliser, TCAS and a decision-making presentation as well as more and with plenty of material scheduled to be added over the coming months.

Thanks again to Darren for the subject choice and we hope it's useful, perhaps we can keep you company during those long car journeys to the simulator location. For now though, from us both, fly well and be safe.