spirit®
TECH OPS TRAINING

A-320 FAMILY V2500 & PW1100G ENGINE RUN / TAXI & EMERGENCY CHECKLISTS

GMM Form: MC-01

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TOWING / ENGINE RUN-UP / TAXI CHECKLIST

EMERGENCY CHECKLIST

SUPPLEMENTAL INFORMATION

CONTROL SAFETY

- **FOLLOW LOCAL STATION ENGINE RUN SOP.**
- **USE OF THIS CHECKLIST IS REQUIRED FOR ALL ENGINE RUN / TAXI PROCEDURES.**
- **TWO QUALIFIED PERSONS ARE REQUIRED WHEN PERFORMING AIRCRAFT TAXI.**
- **PASSENGERS ARE NOT ALLOWED ON A/C WHEN PERFORMING AN ENGINE RUN / TAXI.**
- **POSITIVE GROUND PERSONNEL COMMUNICATION REQUIRED AT ALL TIMES DURING ENGINE RUN VIA HEADSET.**
- **IF HEADSET OR AIRCRAFT INTERPHONE SYSTEM IS INOPERABLE, HAND SIGNALS ARE PERMITTED WITH 100% VISUAL CONTACT WITH FLIGHT DECK AT ALL TIMES.**
- **AIRPORT DIAGRAM IS REQUIRED DURING TAXI.**
- **MAINTENANCE RUN UPS & TAXIS REQUIRE A FLT NUMBER TO BE ENTERED IN MCDU. USE "MX01" WITH ADDITIONAL RUNS ON THE SAME AIRCRAFT NUMBERED "MX02, MX03" ETC.**

AIRCRAFT WALK AROUND & LOGBOOK REVIEW.... PERFORM
WHEEL CHOCKS ..... IN PLACE
C/B PANELS ..... CHECKED
PARKING BRAKE ..... ON
ATC TRANSPONDER (FOLLOW LOCAL AIRPORT REQ).....STBY
WEATHER RADAR SYSTEM .....OFF
ENG MODE SELECTOR ..... NORM
ENG MASTER SWITCHES 1 & 2.....OFF
THRUST LEVERS..... IDLE / REVERSE STOWED
LANDING GEAR LEVER.....DOWN
GRAVITY GEAR EXTN ..... RESET / STOWED
FUEL PUMPS ..... OFF
BAT PUSH BUTTONS 1 & 2. ..... OFF / VOLTAGE ABOVE 25.5V
BUS TIE..... AUTO

PROCEED TO EXTERNAL POWER OR APU START (PG. 2)

EXTERNAL POWER

EXT PWR PUSHBUTTON .....PRESS
BAT PUSHBUTTON 1 & 2.....ON
GEN 1, 2, & APU PUSHBUTTONS..... IN
VENTILATION PANEL.....NO LIGHTS ILLUMINATED
ECAM.....ADJUST BRIGHTNESS

PROCEED WITH APU START WITH EXT POWER

APU START WITH EXT POWER

LIMIT APU FIRE TEST TO 3 SECONDS OR LESS TO PREVENT INADVERTANT DISCHARGE OF APU FIRE BOTTLE

APU FIRE PUSHBUTTON.....IN / GUARDED
APU AUTO EXTIG GND TEST C/B (L40).....PULL
APU FIRE TEST.....PERFORM
APU AUTO EXTIG GND TEST C/B (L40).....RESET
APU MASTER SWITCH.....PRESS ON
APU START PUSHBUTTON.....PRESS

PROCEED WITH COCKPIT PREPARATION (PG. 3)

APU START ON BATTERIES

LIMIT APU FIRE TEST TO 3 SECONDS OR LESS TO PREVENT INADVERTANT DISCHARGE OF APU FIRE BOTTLE

BAT PUSHBUTTON 1 & 2.....ON
APU MASTER SWITCH.....PRESS ON
APU FIRE PUSHBUTTON.....IN / GUARDED
APU AUTO EXTIG GND TEST C/B (L40).....PULL
APU FIRE TEST.....PERFORM
APU AUTO EXTIG GND TEST C/B (L40).....RESET
APU GEN PUSHBUTTON.....IN
APU START PUSHBUTTON.....PRESS
ECAM..... ADJUST BRIGHTNESS
VENTILATION PANEL .....NO LIGHTS ILLUMINATED

PROCEED WITH COCKPIT PREPARATION (PG. 3)

COCKPIT PREPARATION

RMP 1 & 2.....CHECK ON
ACP 1 & 2.....VHF 1/2 & INT
ADIRUS.....ALIGN IN NAV
MCDU 1 & 2.....ON / ADJUST BRIGHTNESS
MCDU.... (INSERT AIRPORT CODE & FLT # MX01).....SELECT "INIT"
COCKPIT LIGHTING.....AS REQUIRED
ANN LIGHT TEST.....PERFORM
EMERGENCY EXIT LIGHT SELECTOR..... AS REQUIRED
ECAM CONTROL PANEL.....SELECT "PRESS"
OUTFLOW VALVE.....VERIFY OPEN
CABIN PRESS MODE PUSHBUTTON..... MAN (MANUAL)
ECAM CONTROL PANEL..... SELECT "BLEED"
BLEED STATUS.....VERIFY BEFORE APU BLEED ON
APU BLEED PUSH BUTTON.....ON
FUEL ON BOARD..... 7,000 LBS RECOMMENDED
ECAM CONTROL PANEL.....SELECT "ENG"
FADEC GND PWR.....ON
ENGINE OIL QUANTITY – V2500.....11 QTS MINIMUM
ENGINE OIL QUANTITY – PW1100G.....14 QTS MINIMUM
OTHER ENG INDICATIONS.....NORMAL
FADEC GND PWR.....OFF
SPEED BRAKE LEVER.....RETRACTED / DISARMED
FLAP LEVER POSITION.....CORRESPOND W/ FLAP POSITION
RUDDER TRIM.....RESET / CHECK
ECAM CONTROL.....SELECT "HYD"
HYDRAULIC PAGE.....VERIFY CORRECT LEVEL / NO FAULTS
ECAM CONTROL.....DE-SELECT "HYD"
PARKING BRAKE.....ON
BEACON.....ON
NAV LIGHTS.....ON
OTHER EXTERIOR LIGHTS.....AS REQUIRED
ELEC HYD PUMP SWITCH .....AS REQUIRED
FLIGHT DECK RESPONSIBILITES.....DISCUSS & REVIEW

PROCEED TO BEFORE PUSHBACK IF TAXIING (PG. 4)
OR
BEFORE ENGINE START IF RUN-UP ONLY (PG. 5 - V2500)
(PG. 14 - PW1100G)

BEFORE PUSHBACK

NOTE 1: DISREGARD A/SKID & N/W STRG OFF WARNING

NOTE 2: USE SPIRIT MAINTENANCE AND A/C TAIL NUMBER AS CALL SIGN

COCKPIT SEATS .....ADJUST
SEAT BELTS WITH HARNESS.....ON
RUDDER PEDALS.....ADJUST
A/SKID & N/W STEERING SWITCH.....OFF
VERIFY WHEEL CHOCKS.....REMOVED
EXTERNAL POWER.....DISCONNECTED
JETWAY.....REMOVED
ATC / GROUND CONTROL CLEARANCE.....OBTAIN
GROUND CREW.....INFORM
PARKING BRAKE.....OFF

PROCEED TO AFTER PUSHBACK

AFTER PUSHBACK

PARKING BRAKE.....ON
CLEAR TO DISCONNECT AND SHOW THE PIN.....VERIFY
A/SKID & N/W STEERING SWITCH.....ON

PROCEED TO BEFORE ENGINE START (PG. 5 - V2500)
(PG. 14 - PW1100G)

BEFORE ENGINE START (V2500)

ENG FIRE PUSHBUTTONS.....IN / GUARDED
ENG 1 (2) FIRE TEST.....PERFORM
THRUST LEVERS.....IDLE
BEACON.....ON
FUEL PUMPS.....ON
GROUND CLEARANCE (CALL RAMP IF REQUIRED).....OBTAIN

STARTER DUTY-CYCLE LIMITATIONS (V2500)

DO NOT ENGAGE STARTER AGAIN WITH ENGINE MOTORING ABOVE 10% N2 – DOING SO WILL DAMAGE THE STARTER SHAFT

A) THREE ENGINE STARTING ATTEMPTS – STARTUP TO IDLE

- 1ST START ATTEMPT – IF FAIL, 15 SEC COOL DOWN
- 2ND START ATTEMPT – IF FAIL, 15 SEC COOL DOWN
- 3RD START ATTEMPT – IF FAIL, 30 MIN COOL DOWN

B) THREE ENGINE CRANKING SESSIONS – CRANKING ONLY

- 2 MINUTE CRANK – 15 SECOND COOL DOWN AFTER N2 = 0%
- 2 MINUTE CRANK – 15 SECOND COOL DOWN AFTER N2 = 0 %
- 1 MINUTE CRANK – 30 MINUTE COOL DOWN

C) ONE ENGINE CRANKING SESSION – CRANKING ONLY

- 4 MINUTE CRANK – 30 MIN COOL DOWN

PROCEED TO ENGINE START (PG. 6)

ENGINE AUTO START (V2500)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 5

EEC STARTUP PROTECTIONS DISABLED AT 50% N2 WHEN IN AUTOMATIC START – MONITOR ALL PARAMETERS

ENGINE MODE SELECTOR……IGN START
AIR PRESSURE AT START VALVE……BETWEEN 30 & 40 PSI
ENGINE MASTER SWITCH 1(2)……ON
CHRONO……START WHEN VALVE OPENS
N2 INDICATION……OBSERVE AN INCREASE
OIL PRESSURE…… OBSERVE AN INCREASE
N1 INDICATION…….OBSERVE AN INCREASE AT 25 - 30 SECs
FUEL FLOW……OBSERVE AN INCREASE AT 24 - 26% N2
ENGINE 1(2) IGNITER A or B…… OBSERVE AT 30 SECs
EGT RISE……..OBSERVE AN INCREASE (MAX 635°)
IGNITION / STARTER CUT-OUT……OBSERVE AT 43% N2

AT IDLE CHECK FOR:

- **EPR = 1.01**
- **N1 = 23%**
- **EGT = 410° C**
- **N2 = 58%**
- **FF = 880 LBS / HR**

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED TO AFTER ENGINE START (PG. 10)

ENGINE MANUAL START (V2500)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 5

EEC STARTUP PROTECTIONS DISABLED ENTIRELY WHEN IN MANUAL STARTING MODE – MONITOR ALL PARAMETERS

ABORT START IF ANY OF THE FOLLOWING OCCUR

- **The Oil pressure does not increase**
- **No N1 indication when N2 is greater than 34%**
- **Ignition System and/or Fuel Flow does not come online**
- **No increase in EGT 20 seconds after Fuel Flow increase**
- **More than 90 seconds after fuel flow to achieve Idle N2**
- **Fuel Flow or Ignition is stopped**
- **EGT approaches the startup limit / Loss of EGT indication**
- **Sluggish N2 acceleration with a fast increase in EGT**
- **Abnormal vibrations detected / Engine surge observed**

ABORTED START MUST BE FOLLOWED UP BY A DRY-MOTOR FOR 30 SECONDS OR UNTIL EGT IS LESS THAN 250° C

ENGINE MODE SELECTOR……IGN START
AIR PRESSURE AT START VALVE……BETWEEN 30 & 40 PSI
ENGINE MANUAL START PUSHBUTTON 1(2)……ON
CHRONO……START WHEN VALVE OPENS
ENGINE DRY CRANK……30 SECONDS
OIL PRESSURE……OBSERVE AN INCREASE
ENGINE MASTER SWITCH 1(2)……ON
FUEL FLOW……OBSERVE AN INCREASE
ENGINE 1(2) IGNITER A+B…… ON
EGT RISE……OBSERVE AN INCREASE (MAX 635°)
IGNITION / STARTER CUT-OUT……OBSERVE AT 43% N2
ENGINE MANUAL START PUSHBUTTON 1(2) ……OFF

AT IDLE CHECK FOR:

- **EPR = 1.01**
- **N1 = 23%**
- **EGT = 410° C**
- **N2 = 58%**
- **FF = 880 LBS / HR**

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED TO AFTER ENGINE START (PG. 10)

ENGINE CROSSBLEED START (V2500)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 5

ENGINE MODE SELECTOR .....IGN START
PACK 1 & 2.....OFF
APU BLEED.....OFF
X-BLEED VALVE SELECTOR.....OPEN
ENGINE BLEED (RUNNING ENGINE).....ON
ENGINE BLEED (OTHER ENGINE) .....OFF
AIR PRESSURE AT START VALVE..... .....BETWEEN 30 & 40 PSI

NOTE: IT MAY BE NEEDED TO INCREASE POWER ON THE OPPOSITE ENGINE TO OBTAIN 30 TO 40 PSI

GROUND CLEARANCE (CALL RAMP / ATC IF REQUIRED).....OBTAIN
ENGINE MASTER SWITCH 1(2).....ON
CHRONO.....START WHEN VALVE OPENS
N2 INDICATION.....OBSERVE AN INCREASE
OIL PRESSURE..... OBSERVE AN INCREASE
N1 INDICATION.....OBSERVE AT 25 – 30 SECs
FUEL FLOW.....OBSERVE AN INCREASE AT 24 - 26% N2 RPM
ENGINE 1(2) IGNITER A or B..... OBSERVE AT 30 SECs
EGT RISE.....OBSERVE AN INCREASE (MAX 635°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 43% N2
THRUST LEVERS .....IDLE
X-BLEED VALVE SELECTOR.....AUTO
ENGINE BLEED (STARTED ENGINE).....ON

AT IDLE CHECK FOR:

- EPR = 1.01
- N1 = 23%
- EGT = 410° C
- N2 = 58%
- FF = 880 LBS / HR

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED TO AFTER ENGINE START (PG. 10)

ENGINE START WITH EXT PNEU POWER (V2500)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 5

ECAM CONTROL PANEL..... .....SELECT “BLEED”
X-BLEED VALVE SELECTOR.....AS REQUIRED
APU BLEED PUSHBUTTON.....OFF
PACKS 1 & 2.....OFF
ENGINE BLEED.....OFF
EXT PNEUMATIC POWER.....ESTABLISH
GROUND CLEARANCE.....OBTAIN
BEACON.....ON
ENGINE MODE SELECTOR.....IGN START
ENGINE MASTER SWITCH 1(2).....ON
CHRONO.....START WHEN VALVE OPENS
N2 INDICATION.....OBSERVE AN INCREASE
OIL PRESSURE..... OBSERVE AN INCREASE
N1 INDICATION.....OBSERVE AT 25 – 30 SECs
FUEL FLOW.....OBSERVE AN INCREASE AT 24 - 26% N2 RPM
ENGINE 1(2) IGNITER A or B..... OBSERVE AT 30 SECs
EGT RISE.....OBSERVE AN INCREASE (MAX 635°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 43% N2

AT IDLE CHECK FOR:

- EPR = 1.01
- N1 = 23%
- EGT = 410° C
- N2 = 58%
- FF = 880 LBS / HR

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED WITH CROSSBLEED ENGINE START (PG. 8)
OR
PROCEED WITH AFTER ENGINE START (PG. 10)

AFTER ENGINE START (V2500)

ENGINE MODE SELECTOR..... NORM
APU BLEED PUSHBUTTON.....AS REQUIRED
ANTI-ICE...(BELOW 40° F & VISIBLE MOISTURE) .....AS REQUIRED
X-BLEED SELECTOR.....AUTO
PACKS 1 & 2..... AS REQUIRED
PARKING BRAKE PRESSURE ..... CHECK

PROCEED TO TAXI (PG. 23)
OR
ENGINE SHUT DOWN (PG. 11)

ENGINE SHUTDOWN (V2500)

OBEY 3 MINUTE MINIMUM IDLE-RUN TIME BEFORE ENGINE SHUT DOWN

OBEY 15 MINUTE MINIMUM IDLE-RUN TIME IF OPERATED AT MORE THAN 1.33 EPR FOR 5 MINUTES OR LONGER

MONITOR ALL PARAMETERS WHILE ENGINE IS SPOOLING DOWN

THRUST LEVERS.....IDLE
PARKING BRAKE.....ON
ANTI-ICE.....OFF
APU / EXT POWER.....AS REQUIRED
GROUND CONTACT.....AS REQUIRED
ENGINE MASTER SWITCH 1 (2).....OFF
YELLOW ELEC PUMP (IF SINGLE ENGINE TAXI).....OFF

PROCEED WITH LEAVING THE AIRCRAFT (PG. 26)

ENGINE DRY MOTORING (V2500)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 5

MONITOR ALL PARAMETERS

ENGINE HPSOV C/B (ENG #1 A01) (ENG #2 A02).....PULL
ECAM CONTROL PANEL.....SELECT "FUEL"
FUEL PAGE.....VERIFY LP FUEL VALVE 1(2) INLINE / OPEN
FUEL PUMPS .....ON
PACKS 1 & 2.....OFF
ECAM CONTROL PANEL.....SELECT "ENG"
GROUND CLEARANCE.....OBTAIN
ENGINE MODE SELECTOR.....CRANK
ENG MANUAL START PUSHBUTTON 1(2).....ON
CHRONO.....START WHEN VALVE OPENS

WHEN DRY-MOTORING COMPLETE:

ENGINE MANUAL START PUSHBUTTON 1(2).....OFF
ENGINE MODE SELECTOR.....NORM
ENGINE 1(2) HPSOV C/B (ENG #1 A01) (ENG#2 A02).....RESET
ECAM CONTROL PANEL.....SELECT "FUEL"
FUEL PAGE.....VERIFY LP FUEL VALVE 1(2) CLOSED
ECAM CONTROL PANEL.....DE-SELECT "FUEL"
FUEL PUMPS.....OFF
PACKS 1 & 2.....AS REQUIRED

Verify LP fuel valve 1(2) OPEN fault is NOT on upper ECAM

ENGINE DRY-MOTORING CHECKLIST COMPLETE

ENGINE WET MOTORING (V2500)

2 CHRONOS ARE NEEDED FOR THE WET MOTOR PROCESS:
1ST TO MONITOR STARTER DUTY TIME
2ND TO MONITOR ACTIVE FUEL-FLOW

ENG IGNITION C/B (ENG #1 A03 / P39 / P41) (ENG #2 A03 / P40 / P42).PULL
FUEL PUMPS.....ON
PACKS 1 & 2.....OFF
ENG MODE SELECTOR.....CRANK
GROUND CLEARANCE.....OBTAIN
ENG MANUAL START PUSHBUTTON 1(2).....ON
1st CHRONO.....START WHEN VALVE OPENS

WHEN N2 IS GREATER THAN 15%:
ENGINE MASTER SWITCH 1(2).....ON
2nd CHRONO.....START WHEN FUEL FLOW ON

ON ECAM CHECK:

- **FUEL FLOW**
- **OIL PRESSURE / QUANTITY**

AFTER 20 SECONDS ON SECOND CHRONO:
ENGINE MASTER SWITCH 1(2).....OFF
FUEL FLOW.....OBSERVE IMMEDIATE DECREASE

THE EEC RE-ENGAGES STARTER VALVE AUTOMATICALLY WHEN N2 SPEED IS BELOW 10% FOR ENGINE FUEL DRYING

1ST CHRONO.....MONITOR STARTER DUTY LIMITS
90 SECONDS ON 1ST CHRONO.....MAN START P/BS 1(2) OFF
ENGINE MODE SELECTOR.....NORM
ENGINE 1(2) IGNITION C/B'S.....RESET
FUEL PUMPS.....OFF
PACKS 1 & 2.....AS REQUIRED
1ST CHRONO & 2ND CHRONO.....RESET

ENGINE WET-MOTORING CHECKLIST COMPLETE

BEFORE ENGINE START (PW1100G)

ENG FIRE PUSHBUTTONS.....IN / GUARDED
ENG 1 (2) FIRE TEST.....PERFORM
THRUST LEVERS.....IDLE
BEACON.....ON
FUEL PUMPS .....ON
DUAL COOLING PUSHBUTTON.....OFF
GROUND CLEARANCE (CALL RAMP IF REQUIRED).....OBTAIN

STARTER DUTY-CYCLE LIMITATIONS (PW1100G)

DO NOT ENGAGE STARTER AGAIN WITH ENGINE MOTORING ABOVE 1 % N2 – MUST REACH 0% N2

EEC WILL COMMAND STARTER AIR VALVE CLOSED IF DUTY CYCLE IS EXCEEDED

STARTER DUTY CYCLE:

- 3 START ATTEMPTS - 35 SECONDS COOLING PERIOD BETWEEN EACH, FOLLOWED BY A 15 MINUTE COOL DOWN
- 1 CONTINUOUS CRANK UP TO 15 MINUTES, FOLLOWED BY A 15 MINUTE COOL DOWN

ENGINE BOWED ROTOR PROTECTION (PW1100G)

COOLING TIME IS DISPLAYED ON UPPER ECAM IF EEC DETERMINES ENGINE MOTORING IS REQUIRED FOR BOWED ROTOR PROTECTION. ENGINE MOTORS FOR DISPLAYED TIME BEFORE START SEQUENCE BEGINS (APPROX 8 - 10% N2)

PROCEED TO ENGINE START (PG. 15)

ENGINE AUTO START (PW1100G)

OBSERVE STARTER OPERATION AND ENGINE BOWED ROTOR PROTECTION GUIDELINES ON PAGE 14

EEC STARTUP PROTECTIONS ARE ENABLED DURING AUTOMATIC START

MONITOR ALL PARAMETERS

ENGINE MODE SELECTOR.....IGN START
AIR PRESSURE AT START VALVE.....BETWEEN 30 & 40 PSI
ENGINE MASTER SWITCH 1 (2).....ON
ENGINE START VALVE 1 (2).....OPENED
N2 INDICATION.....OBSERVE AN INCREASE
OIL PRESSURE..... OBSERVE AN INCREASE
ENGINE 1 (2) IGNITER A or B..... AT 18% N2
FUEL FLOW.....OBSERVE AN INCREASE
EGT RISE.....OBSERVE AN INCREASE (MAX 1084°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 55% N2

AT IDLE CHECK FOR:

- **N1 = 19%**
- **EGT = 440° C**
- **N2 = 59%**
- **FF = 600 LBS / HR**

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED TO AFTER ENGINE START (PG. 19)

ENGINE MANUAL START (PW1100G)

OBSERVE STARTER OPERATION AND ENGINE BOWED ROTOR PROTECTION GUIDELINES ON PAGE 14

EEC STARTUP PROTECTIONS DISABLED DURING MANUAL STARTING MODE – MONITOR ALL PARAMETERS AND ABORT START IF ANY OF THE FOLLOWING OCCUR:

- The oil pressure does not increase
- N1 does not increase when N2 is greater than 48%
- Ignition system and/or Fuel Flow does not come online
- No increase in EGT 20 seconds after Fuel Flow increase
- More than 90 seconds after fuel flow to achieve Idle N2
- Fuel or Ignition is accidently stopped
- Loss of EGT indication / EGT approaches startup limit
- Sluggish N2 acceleration with a fast increase in EGT
- Abnormal vibrations detected / Engine surge observed

ABORTED START MUST BE FOLLOWED UP BY A DRY-MOTOR FOR 30 SECONDS OR UNTIL EGT IS LESS THAN 250°C

ENGINE MODE SELECTOR.....IGN START
AIR PRESSURE AT START VALVE.....BETWEEN 30 & 40 PSI
ENGINE MANUAL START PUSHBUTTONS 1(2).....ON
CHRONO.....START WHEN START VALVE OPENS
ENGINE DRY CRANK.....30+ SECONDS
COOLING TIME (IF REQUIRED).....MONITOR
OIL PRESSURE.....OBSERVE AN INCREASE
N2 INDICATION.....MAX MOTORING (MIN 18%)
ENGINE MASTER SWITCH 1(2).....ON
FUEL FLOW.....OBSERVE AN INCREASE
ENGINE 1 (2) IGNITER A+B.....ON
EGT RISE.....OBSERVE AN INCREASE (MAX 1084°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 55% N2
ENGINE MANUAL START PUSHBUTTONS 1(2) .....OFF

AT IDLE CHECK FOR:

- **N1 = 19%**
- **EGT = 440° C**
- **N2 = 59%**
- **FF = 600 LBS / HR**

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED TO AFTER ENGINE START (PG. 19)

ENGINE CROSSBLEED START (PW1100G)

OBSERVE STARTER OPERATION AND ENGINE BOWED ROTOR PROTECTION GUIDELINES ON PAGE 14

ENGINE MODE SELECTOR.....IGN START
PACK 1 & 2.....OFF
APU BLEED.....OFF
X-BLEED VALVE SELECTOR.....OPEN
ENGINE BLEED (RUNNING ENGINE).....ON
ENGINE BLEED (OTHER ENGINE).....OFF
AIR PRESSURE AT START VALVE.....BETWEEN 30 & 40 PSI

NOTE: **IT MAY BE NEEDED TO INCREASE POWER ON THE OPPOSITE ENGINE TO OBTAIN 30 TO 40 PSI**

GROUND CLEARANCE (CALL RAMP / ATC IF REQUIRED).....OBTAIN
ENGINE MASTER SWITCH 1 (2).....ON
CHRONO.....START WHEN VALVE OPENS
N2 INDICATION.....OBSERVE AN INCREASE
OIL PRESSURE..... OBSERVE AN INCREASE
FUEL FLOW.....OBSERVE AN INCREASE
ENGINE 1(2) IGNITER A or B..... AT 18% N2
EGT RISE.....OBSERVE AN INCREASE (MAX 1084°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 55% N2
THRUST LEVERS.....IDLE
X-BLEED VALVE SELECTOR.....AUTO
ENGINE BLEED (STARTED ENGINE).....ON

AT IDLE CHECK FOR:

- **N1 = 19%**
- **EGT = 440° C**
- **N2 = 59%**
- **FF = 600 LBS / HR**

NOTE: **THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE**

PROCEED TO AFTER ENGINE START (PG. 19)

ENGINE START WITH EXT PNEU POWER (PW1100G)

OBSERVE STARTER OPERATION AND ENGINE BOWED ROTOR PROTECTION GUIDELINES ON PAGE 14

ECAM CONTROL PANEL .....SELECT "BLEED"
X-BLEED VALVE SELECTOR.....AS REQUIRED
APU BLEED PUSHBUTTON.....OFF
PACKS 1 & 2.....OFF
ENGINE BLEED.....OFF
EXT PNEUMATIC POWER.....ESTABLISH
GROUND CLEARANCE.....OBTAIN
BEACON.....ON
ENGINE MODE SELECTOR.....IGN START
ENGINE MASTER SWITCH 1 (2).....ON
N2 INDICATION.....OBSERVE AN INCREASE
OIL PRESSURE..... OBSERVE AN INCREASE
FUEL FLOW.....OBSERVE AN INCREASE
ENGINE 1(2) IGNITER A or B..... AT 18% N2
EGT RISE.....OBSERVE AN INCREASE (MAX 1084°)
IGNITION / STARTER CUT-OUT.....OBSERVE AT 55% N2

AT IDLE CHECK FOR:

- **N1 = 19%**
- **EGT = 440° C**
- **N2 = 59%**
- **FF = 600 LBS / HR**

NOTE: THESE VALUES ARE APPROXIMATE AND CAN VARY DUE TO AGE OF ENGINE

PROCEED WITH CROSSBLEED ENGINE START (PG.17)
OR
PROCEED WITH AFTER ENGINE START (PG. 19)

AFTER ENGINE START (PW1100G)

ENGINE MODE SELECTOR.....NORM
APU BLEED PUSHBUTTON.....AS REQUIRED
ANTI-ICE....(BELOW 40° F & VISIBLE MOISTURE).....AS REQUIRED
X-BLEED SELECTOR.....AUTO
PACKS 1 & 2.....AS REQUIRED
PARKING BRAKE PRESSURE.....CHECK

PROCEED TO TAXI (PG. 23)
OR
ENGINE SHUT DOWN (PG. 20)

ENGINE SHUTDOWN (PW1100G)

OBEY 10 MINUTE MINIMUM IDLE-RUN TIME BEFORE ENGINE SHUT DOWN

MONITOR ALL PARAMETERS WHILE ENGINE IS SPOOLING DOWN

THRUST LEVERS.....IDLE
PARKING BRAKE.....ON
ANTI-ICE.....OFF
APU / EXT POWER.....AS REQUIRED
GROUND CONTACT.....AS REQUIRED
ENGINE MASTER SWITCH 1 (2).....OFF
YELLOW ELEC PUMP (IF SINGLE ENGINE TAXI).....OFF

PROCEED WITH LEAVING THE AIRCRAFT (PG. 26)

ENGINE DRY MOTORING (PW1100G)

OBSERVE STARTER OPERATION GUIDELINES ON PAGE 14

MONITOR ALL PARAMETERS

ENGINE HPSOV C/B (ENG #1 A01) (ENG #2 A02).....PULL
ECAM CONTROL PANEL.....SELECT "FUEL"
FUEL PAGE.....VERIFY LP FUEL VALVE 1(2) INLINE / OPEN
FUEL PUMPS .....ON
PACKS 1 & 2.....OFF
ECAM CONTROL PANEL.....SELECT "ENG"
GROUND CLEARANCE.....OBTAIN
ENGINE MODE SELECTOR.....CRANK
ENG MANUAL START PUSHBUTTON 1(2).....ON
CHRONO.....START WHEN VALVE OPENS

WHEN DRY-MOTORING COMPLETE:

ENGINE MANUAL START PUSHBUTTON 1(2).....OFF
ENGINE MODE SELECTOR.....NORM
ENGINE HPSOV C/B (ENG #1 A01) (ENG #2 A02).....RESET
ECAM CONTROL PANEL.....SELECT "FUEL"
FUEL PAGE.....VERIFY LP FUEL VALVE 1(2) CLOSED
ECAM CONTROL PANEL.....DE-SELECT "FUEL"
FUEL PUMPS.....OFF
PACKS 1 & 2.....AS REQUIRED

Verify LP fuel valve 1(2) OPEN fault is NOT on upper ECAM

ENGINE DRY-MOTORING CHECKLIST COMPLETE

ENGINE WET MOTORING (PW1100G)

2 CHRONOS ARE NEEDED FOR THE WET MOTOR PROCESS:
1ST TO MONITOR STARTER DUTY TIME
2ND TO MONITOR ACTIVE FUEL-FLOW

ENG IGNITION C/B (#1 A03 / P41) (#2 A03 / P42) ..... PULL
FUEL PUMPS..... ON
PACKS 1 & 2.....OFF
ENG MODE SELECTOR ..... CRANK
GROUND CLEARANCE .....OBTAIN
ENG MANUAL START PUSHBUTTON 1(2).....ON
1st CHRONO..... START WHEN VALVE OPENS

WHEN N2 STABILIZES:

ENGINE MASTER SWITCH 1(2) .....ON
2nd CHRONO..... START WHEN FUEL FLOW ON

ON ECAM CHECK:

- FUEL FLOW
- OIL PRESSURE / QUANTITY

AFTER 15 SECONDS ON SECOND CHRONO:

ENGINE MASTER SWITCH 1(2)... .....OFF
FUEL FLOW.....OBSERVE IMMEDIATE DECREASE
2nd CHRONO ..... RESTART WHEN FUEL FLOW SHOWS ZERO

CONTINUE TO OPERATE STARTER FOR 30 SECONDS
TO REMOVE ALL FUEL VAPORS

1ST CHRONO.....MONITOR STARTER DUTY LIMITS
30 SECONDS ON 2ND CHRONO..... MANUAL P/BS 1(2) OFF
ENGINE MODE SELECTOR..... NORM
ENGINE 1(2) IGNITION C/B'S ..... RESET
FUEL PUMPS..... OFF
PACKS 1 & 2..... AS REQUIRED
1ST CHRONO & 2ND CHRONO..... RESET

ENGINE WET-MOTORING CHECKLIST COMPLETE

TAXI

IF BRAKES FAIL DURING GROUND OPERATION, IMMEDIATELY SET A/SKID & N/W STRG SWITCH OFF AND OPERATE BRAKE PEDALS TO STOP AIRCRAFT

APPROXIMATELY 7 BRAKE APPLICATIONS AVAILABLE WITH EMERGENCY BRAKE ACCUMULATOR
IN EMERGENCY BRAKING SITUATIONS, THRUST REVERSERS CAN BE USED TO SLOW AIRCRAFT IF NEEDED PRIOR TO SETTING PARKING BRAKE

IN EXTREME EMERGENCIES AND ONLY IF PEDALS ARE INEFFECTIVE WITH A/SKID SELECTED OFF, AIRCRAFT MAY BE STOPPED USING PARKING BRAKE – NOTE: IMMEDIATE FULL BRAKE PEDAL APPLICATION WILL OCCUR

APU MUST BE RUNNING FOR SINGLE ENGINE TAXI. GOOD JUDGMENT MUST BE EXERCISED. USE CAUTION TO AVOID EXCESSIVE GENERATION OF JET BLAST. SINGLE ENGINE TAXI NOT PERMITTED IN ICE & SNOW.

PTU (IF SINGLE ENGINE TAXI)……AUTO
YELLOW ELEC PUMP (IF SINGLE ENGINE TAXI)……ON
ECAM CONTROL PANEL ……SELECT "DOORS"
ECAM DOOR PAGE…… DOORS CLOSED
ECAM CONTROL PANEL ……DE-SELECT "DOORS"
NOSE LIGHT……TAXI
OTHER LIGHTS……AS REQUIRED
ATC / GROUND CONTROL CLEARANCE……OBTAIN
PARKING BRAKE……OFF
BRAKE EFFICIENCY……CHECK
STEERING EFFICIENCY……CHECK

FOLLOW ATC INSTRUCTION & PROCEED WITH TAXI

PRE-TOWING (WITHOUT ENGINE RUN)

NOTE 1: C/W CONTROL SAFETY CHECKLIST

NOTE 2: MAX TOWING SPEED 6 MPH WITH DOORS FULLY OPEN

NOTE 3: DO NOT TOW / MOVE AIRCRAFT WITH COWLS OPEN

NOTE 4: WITH DOORS CLOSED AND LOCKED, MAXIMUM TOWING SPEED: TOWBAR & TUG ..... 15 MPH
TOWBARLESS TUG .... 20 MPH

NOTE 5: DISREGARD A/SKID & N/W STRG OFF WARNING

YELLOW BRAKE PRESSURE .....VERIFY 3000PSI
A/SKID & N/W SWITCH .....OFF
BYPASS PIN.....INSTALL
TOW BAR AND TUG.....CONNECTED
CHOCKS.....REMOVED
EXTERNAL POWER.....DISCONNECT
BEACON.....ON
GROUND CREW.....INFORM
PARKING BRAKE.....OFF

AIRCRAFT READY TO TOW

POST-TOWING (WITHOUT ENGINE RUN)

YELLOW BRAKE PRESSURE.....VERIFY 3000 PSI
PARKING BRAKE.....ON
CHOCKS.....INSTALL
BEACON.....OFF
TOW BAR AND TUG..... DISCONNECTED
BYPASS PIN.....REMOVED
A/SKID & N/W SWITCH.....ON

PROCEED TO LEAVING THE AIRCRAFT (PG. 26)

PRE-TOWING (WITH BATT PWR ONLY)

NOTE 1: C/W CONTROL SAFETY CHECKLIST

NOTE 2: MAX TOWING SPEED 6 MPH WITH DOORS FULLY OPEN

NOTE 3: DO NOT TOW / MOVE AIRCRAFT WITH COWLS OPEN

NOTE 4: MAX TOWING TIME IS 1 HR WITH BATTERY POWER

NOTE 5: VHF 1 ONLY AVAILABLE ON BATTERY POWER

NOTE 6: WHEN TOWING IS COMPLETE, ATTACH GPU & BRING BATTERIES BACK TO FULL POWER

BAT PUSHBUTTONS.....ON
YELLOW BRAKE PRESSURE .....VERIFY 3000 PSI
RMP 1.....CHECK ON / FREQ SET
ACP 1 .....VHF 1
BYPASS PIN.....INSTALL
TOW BAR AND PUSHBACK.....CONNECTED
CHOCKS.....REMOVED
EXTERNAL POWER.....DISCONNECT
GROUND CREW.....INFORM
PARKING BRAKE.....OFF

AIRCRAFT READY TO TOW

POST-TOWING (WITH BATT PWR ONLY)

YELLOW BRAKE PRESSURE.....VERIFY APPROX 2100 PSI
PARKING BRAKE.....ON
CHOCKS.....INSTALL
TOW BAR AND TUG..... DISCONNECTED
BYPASS PIN.....REMOVED
BAT PUSHBUTTONS.....OFF

PROCEED TO LEAVING THE AIRCRAFT (PG. 26)

LEAVING THE AIRCRAFT

WHEEL CHOCKS ..... IN PLACE
YELLOW BRAKE PRESSURE..... VERIFY 3000 PSI
PARKING BRAKE (IF BRAKE TEMPS BELOW 300°C)..... ON
(IF BRAKE TEMPS ABOVE 300°C)..... OFF
CREW O2 SUPPLY .....OFF
ADIRS ROTARY SELECTORS .....OFF
EXTERIOR LIGHTS..... OFF
EMERGENCY EXIT LIGHT ..... OFF
CABIN PRESS MODE PUSHBUTTON ..... AUTO
EXT POWER.....AS REQUIRED
FUEL PUMPS ..... OFF
APU BLEED PUSHBUTTON ..... OFF
MCDU..... FULL DIM
APU MASTER SWITCH .....OFF

AFTER APU SHUTDOWN:

ECAM..... FULL DIM
RMP 1 & 2.... ..... OFF
ACP 1 & 2..... OFF
BAT PUSHBUTTONS ..... **OFF WHEN APU FLAP CLOSES**
EXT POWER .....OFF

YOU MUST WAIT 90 SECONDS BEFORE TURNING OFF BATTERY PUSHBUTTONS TO ALLOW PROPER TIME FOR APU INLET TO CLOSE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

ENGINE FIRE ON GROUND

THRUST LEVERS.....**IDLE**
AIRCRAFT.....**STOP / HOLD POSITION**
PARKING BRAKE.....**ON**
MASTER WARNING PUSHBUTTON.....**PRESS**
ENG MASTER SWITCH (AFFECTED ENGINE) .....**OFF**
ENG FIRE PUSHBUTTON (AFFECTED ENGINE).....**RELEASE**
WAIT 10 SECs FOR FIRE TO EXTINGUISH.....**OBSERVE**

IF ENGINE FIRE CONTINUES:

AGENT 1.....**DISCH**
ATC / GROUND CONTROL.....**NOTIFY**
WAIT 30 SECs FOR FIRE TO EXTINGUISH.....**OBSERVE**

IF ENGINE FIRE CONTINUES:

AGENT 2.....**DISCH**
WAIT 30 SECs FOR FIRE TO EXTINGUISH.....**OBSERVE**

IF ENGINE FIRE IS UNEXTINGUISHABLE, AND AIRCRAFT EVACUATION REQUIRED:

ATC / GROUND CONTROL..... **NOTIFY**
ENGINE MASTER SWITCH (OPPOSITE SIDE).....**OFF**
FUEL PUMPS.....**OFF**
APU MASTER SWITCH.....**OFF**
BAT PUSHBUTTONS 1+2 (IF TIME PERMITS).....**OFF**
EVACUTION PROCEDURES.....**INITIATE**

CHECKLIST COMPLETE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

ENGINE TAILPIPE FIRE

THRUST LEVERS.....IDLE
AIRCRAFT.....STOP / HOLD POSITION
PARKING BRAKE.....ON
ENG MASTER SWITCH (AFFECTED ENG).....OFF
ATC / GROUND CONTROL..... NOTIFY

IF APU AVAILABLE:

APU BLEED.....ON
ENG MODE SELECTOR.....CRANK
ENG MAN START PUSHBUTTON (AFFECTED ENG).....ON

AFTER CONFIRMATION OF FIRE EXTINGUISHED:

ENG MAN START PUSHBUTTON (AFFECTED ENG).....OFF

IF APU NOT AVAILABLE:

X-BLEED VALVE SELECTOR.....OPEN
ENGINE BLEED (RUNNING ENGINE).....VERIFY ON
ENG MODE SELECTOR.....CRANK
ENG MAN START PUSHBUTTON (AFFECTED ENG).....ON

AFTER CONFIRMATION OF FIRE EXTINGUISHED:

ENG MAN START PUSHBUTTON (AFFECTED ENG).....OFF

IF FIRE WILL NOT EXTINGUISH WITH MOTORING ENGINE, OR IF MOTORING IS NOT POSSIBLE:

ENGINE FIRE 1(2) PUSHBUTTON.....RELEASE
ECAM CONTROL PANEL.....SELECT "FUEL"
FUEL PAGE.....VERIFY LP FUEL VALVE 1(2) CLOSED
GROUND.....EXTINGUISH FIRE WITH GROUND EQUIPMENT

CHECKLIST COMPLETE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

APU FIRE

EVEN THOUGH AUTOMATIC SYSTEM WILL OPERATE IN CASE OF AN APU FIRE ON GROUND, ALL ACTIONS MUST BE PERFORMED

THRUST LEVERS.....IDLE
AIRCRAFT.....STOP / HOLD POSITION
PARKING BRAKE.....ON
MASTER WARNING PUSHBUTTON.....PRESS
APU FIRE PUSHBUTTON.....RELEASE
AGENT PUSHBUTTON.....PRESS
ATC / GROUND CONTROL..... NOTIFY

IF APU FIRE CONTIUES:

ATC / GROUND CONTROL..... NOTIFY
ENGINE MASTER SWITCH (BOTH – ONE AT A TIME).....OFF
APU MASTER SWITCH.....OFF
EXT POWER PUSHBUTTON.....OFF
BATTERY PUSHBUTTONS.....OFF
EVACUTION PROCEDURES.....INITIATE

CHECKLIST COMPLETE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

LOSS OF BRAKING

IF BRAKES FAIL DURING GROUND OPERATION, IMMEDIATELY SET A/SKID & N/W STRG SWITCH TO OFF AND OPERATE BRAKE PEDALS TO STOP AIRCRAFT

APPROXIMATELY 7 BRAKE APPLICATIONS AVAILABLE WITH EMERGENCY BRAKE ACCUMULATOR

IN EMERGENCY BRAKING SITUATIONS, THRUST REVERSERS CAN BE USED TO SLOW AIRCRAFT IF NEEDED PRIOR TO SETTING PARKING BRAKE

IN EXTREME EMERGENCIES AND ONLY IF PEDALS ARE INEFFECTIVE WITH A/SKID SELECTED OFF, AIRCRAFT MAY BE STOPPED USING PARKING BRAKE – NOTE: IMMEDIATE FULL BRAKE PEDAL APPLICATION WILL OCCUR

BRAKE PEDALS.....RELEASE
A/SKID & N/W.....OFF
BRAKE PEDALS.....APPLY

IF STILL NO BRAKING:

THRUST REVERSERS.....AS REQUIRED
PARKING BRAKE.....ON

CHECKLIST COMPLETE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

SMOKE / AVIONICS SMOKE

THRUST LEVERS.....IDLE
AIRCRAFT.....STOP / HOLD POSITION
PARKING BRAKE.....ON
ATC / GROUND CONTROL..... NOTIFY
ENGINE MASTER SWITCH (BOTH – ONE AT A TIME).....OFF
ADIRS ROTARY SWITCHES.....OFF
APU BLEED PUSHBUTTONS.....OFF
APU GEN SWITCH.....OFF
APU MASTER SWITCH.....OFF
EXT POWER PUSHBUTTON.....OFF
BATTERY PUSHBUTTONS.....OFF

CHECKLIST COMPLETE

MECHANICS A320 FAMILY EMERGENCY QUICK REFERENCE CHECKLIST

CARGO SMOKE

THRUST LEVERS.....IDLE
AIRCRAFT.....STOP / HOLD POSITION
PARKING BRAKE.....ON
MASTER WARNING PUSHBUTTON.....PRESS
AGENT (AFFECTED COMPARTMENT).....PRESS
ATC / GROUND CONTROL..... NOTIFY

NOTE 1: FWD & AFT LIGHTS ILLUMINATE WHEN DISCHARGE IS COMPLETE

NOTE 2: SMOKE WARNINGS WILL REMAIN ON UNTIL SMOKE AND EXTINGUSHING AGENT ARE NO LONGER PRESENT

ENGINE MASTER SWITCH (BOTH – ONE AT A TIME).....OFF
ADIRS ROTARY SWITCHES.....OFF
APU BLEED PUSHBUTTON.....OFF
APU GEN SWITCH.....OFF
APU MASTER SWITCH.....OFF
EXT POWER PUSHBUTTON.....OFF
BATTERY PUSHBUTTONS.....OFF

CHECKLIST COMPLETE

SUPPLEMENTAL INFORMATION

MARSHALLING HAND SIGNALS

PAGE 36 - 40

AIRPORT LIGHTS, SIGNS, & MARKINGS

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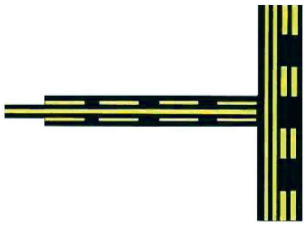

FUTURE USE

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NOTES

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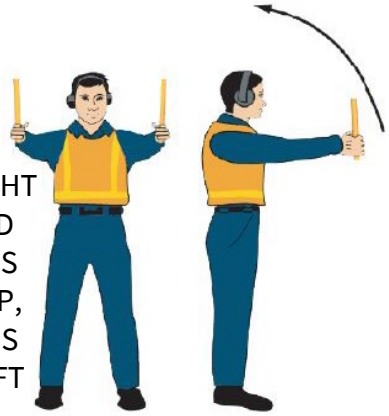
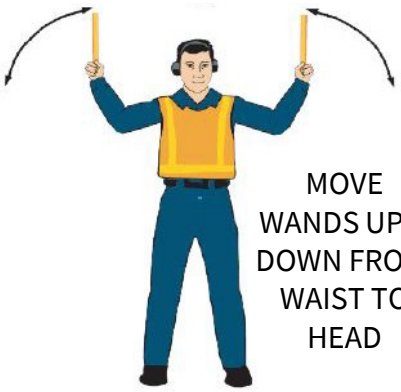
MARSHALLING HANDSIGNALS

AIRCRAFT ALIGNMENT



ARMS STRAIGHT ABOVE HEAD WITH WANDS POINTING UP, MOVE HANDS FORE AND AFT

STRAIGHT AHEAD



MOVE WANDS UP & DOWN FROM WAIST TO HEAD

TURN LEFT
(PILOT'S POV)

RIGHT ARM EXTENDED WHILE LEFT HAND MAKES "COME AHEAD" SIGNAL

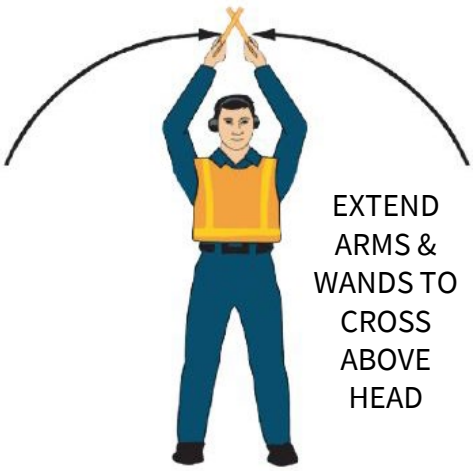
TURN RIGHT
(PILOT'S POV)

LEFT ARM EXTENDED WHILE LEFT HAND MAKES "COME AHEAD" SIGNAL

SLOW DOWN

MOVE WANDS UP & DOWN FROM WAIST TO KNEES IN A "PATTING" GESTURE

STOP



EXTEND ARMS & WANDS TO CROSS ABOVE HEAD

ONLY TO BE USED WHEN HEADSET OR INTERPHONE IS INOPERABLE

MARSHALLING HANDSIGNALS

CHOCKS IN

WANDS ABOVE HEAD & THEN MOVE INWARD IN A "JABBING" MOTION

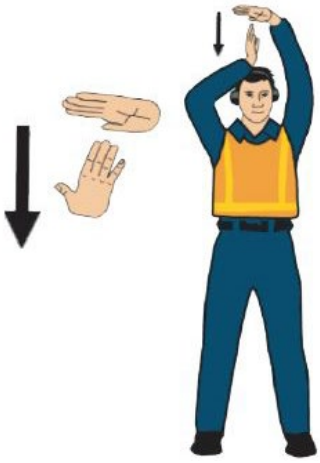
CHOCKS REMOVED

WANDS ABOVE HEAD & THEN MOVE OUTWARD IN A "JABBING" MOTION

GPU CONNECT

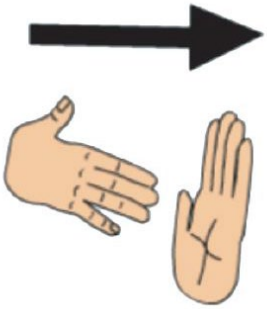
LEFT HAND OPENED ABOVE HEAD & MOVE RIGHT HAND UP TO CREATE A "T"

GPU DISCONNECT



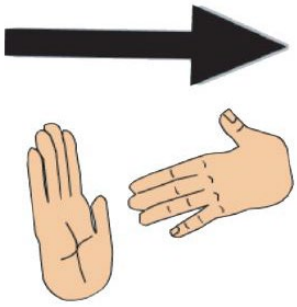
LEFT & RIGHT HANDS ABOVE HEAD MAKING A "T", THEN MOVE HANDS AWAY FROM EACH OTHER

AIR START CONNECT



LEFT HAND OPENED ABOVE HEAD & MOVE RIGHT HAND INWARDS TO CREATE A "SIDEWAYS T"

AIR START DISCONNECT



LEFT & RIGHT HANDS ABOVE HEAD MAKING A SIDEWAYS T", MOVE HANDS AWAY FROM EACH OTHER

ONLY TO BE USED WHEN HEADSET OR INTERPHONE IS INOPERABLE

MARSHALLING HANDSIGNALS

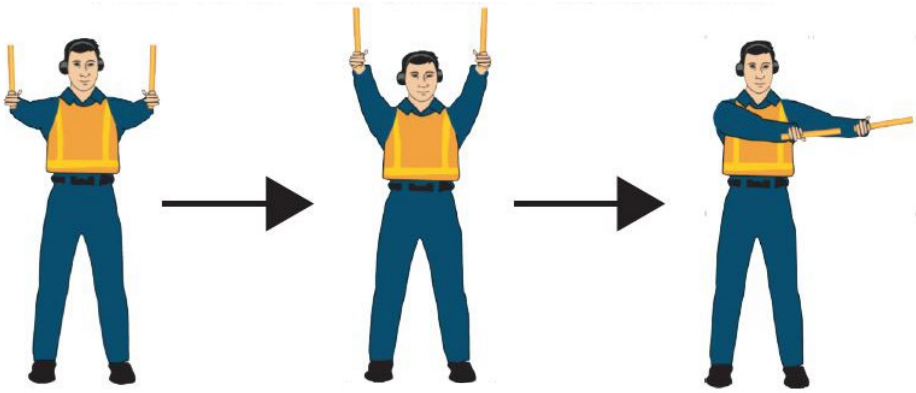
WING WALKER – LEFT WING CLEAR

RIGHT ARM EXTENDED UPWARDS, WHILE LEFT ARM POINTS 45° DOWN

WING WALKER – RIGHT WING CLEAR

LEFT ARM EXTENDED UPWARDS, WHILE RIGHT ARM POINTS 45° DOWN

TRANSFER TO NEXT MARSHALLER



ARMS STRAIGHT ABOVE HEAD WITH WANDS POINTING UP, THEN DIRECT WANDS TO MARSHALLER TAKING OVER

HOLD

ARMS EXTENDED DOWN

END MARSHALLING

RIGHT HAND TO EYEBROW & FORM A SALUTE

ONLY TO BE USED WHEN HEADSET OR INTERPHONE IS INOPERABLE

MARSHALLING HANDSIGNALS

SHUT DOWN ENGINE

EXTEND LEFT ARM UP AND THEN USING RIGHT HAND OR WAND MAKE A "SLICING MOTION" ACROSS THROAT

CLEAR TO START ENGINE

CIRCULAR MOTION OF RIGHT HAND @ HEAD LEVEL WITH LEFT ARM POINTING TO ENGINE

BRAKES SET

WITH RIGHT HAND, OPEN PALM, THEN CLOSE INTO FIST

BRAKES OFF

RIGHT HAND CLOSED FIST, THEN OPEN PALM

INTERPHONE

CUP EARS WITH HANDS

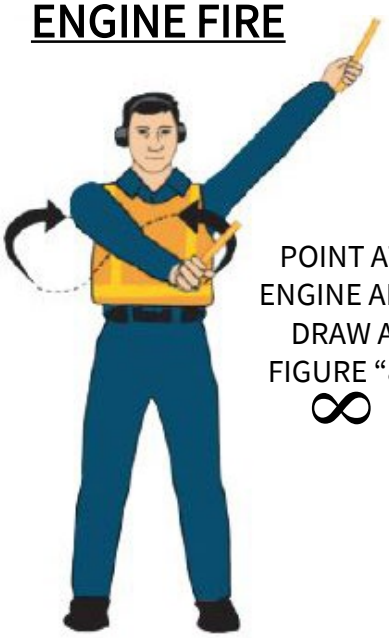
CLEAR FOR TAXI

RIGHT WAND & ARM POINTED UP & LEFT POINTED DOWN

ONLY TO BE USED WHEN HEADSET OR INTERPHONE IS INOPERABLE

EMERGENCY HANDSIGNALS

ENGINE FIRE



POINT AT ENGINE AND DRAW A FIGURE “8”

∞

TAILPIPE FIRE

POINT AT REAR END AND DRAW A FIGURE “8”

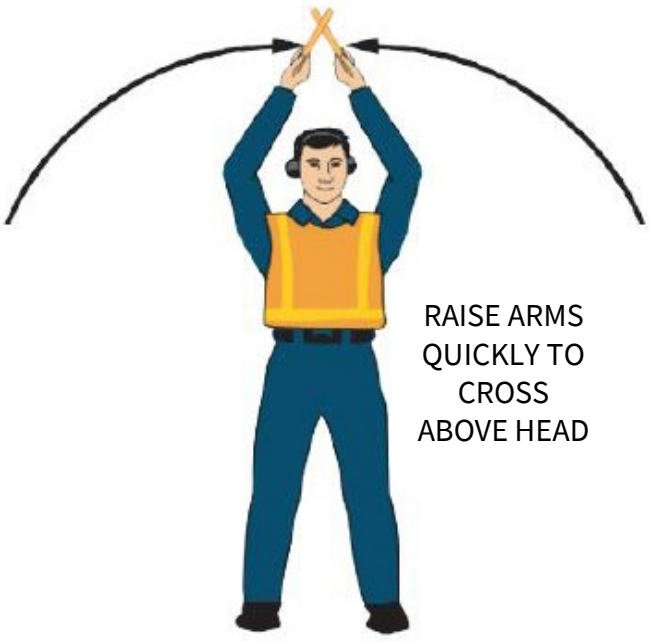
∞

BRAKE FIRE

POINT AT BRAKE AND DRAW A FIGURE “8”

∞

EMERGENCY STOP



RAISE ARMS QUICKLY TO CROSS ABOVE HEAD

ONLY TO BE USED WHEN HEADSET OR INTERPHONE IS INOPERABLE

AIRFIELD LIGHTING

TAXIWAY EDGE

BLUE LIGHT INDICATES THE EDGE OF THE TAXIWAY

TAXIWAY CENTERLINE

GREEN LIGHT INDICATES TAXIWAY CENTERLINE (NOT ON ALL TAXIWAYS)

RUNWAY EDGE

WHITE OR WHITE & YELLOW LIGHT INDICATE THE EDGE OF THE RUNWAY

RUNWAY CENTERLINE

RED, RED & WHITE, OR WHITE LIGHT INDICATES THE RUNWAY CENTERLINE

RUNWAY GUARD LIGHT

YELLOW ALTERNATING FLASHING LIGHT INDICATE A RUNWAY AHEAD (MAY BE INSTALLED IN, AND/OR AOVE GROUND)

RUNWAY THRESHOLD

RED & GREEN LIGHT MARKS THE END OR BEGINNING OF RUNWAY

AIRPORT SIGNS

TWY/RWY HOLDING POSITION: Hold short of intersecting runway

RWY/RWY HOLD POSITION: Hold short of intersecting runway

RWY APCH HOLD POSITION: Hold short of protected area when instructed by ATC

ILS HOLD POSITION: Hold short of ILS critical area when instructed by ATC

NO ENTRY: Identifies paved areas where aircraft entry is prohibited

TAXIWAY LOCATION: Identifies taxiway on which aircraft is located

RUNWAY LOCATION: Identifies runway on which aircraft is located

RUNWAY DISTANCE REMAINING: Identifies runway length remaining

RUNWAY BOUNDARY: Exit boundary from rwy protected area

ILS CRITICAL AREA BOUNDARY: Exit boundary of ILS critical area

RUNWAY EXIT: Defines direction & designation of exit twy from rwy

TWY DIRECTION: Defines direction & designation of intersecting taxiway(s)

OUTBOUND DESTINATION: Defines direction to take-off runway

INBOUND DESTINATION: Indicates direction of destination, i.e. terminal or military area

TAXIWAY ENDING MARKER: Indicates that twy does not continue beyond this point

DIRECTION SIGN ARRAY: Identifies location in conjunction with multiple intersecting taxiways

Line Up and Wait has replaced *"Taxi Into Position and Hold"*. The new language permits entry onto the runway to await further instructions, but is not a take-off clearance.

If ever in doubt about a clearance or taxi instruction, do not hesitate to ASK FOR HELP!

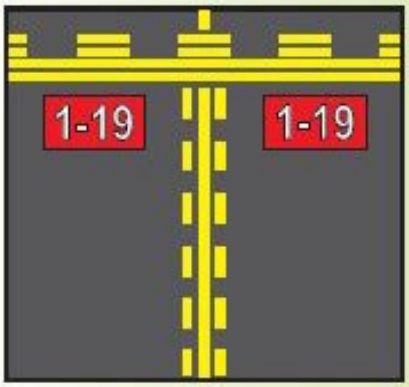
ATCT LIGHT GUN SIGNALS

Color and Type of Signal	Aircraft on the Ground
STEADY GREEN	Cleared for Takeoff
FLASHING GREEN	Cleared to Taxi
STEADY RED	STOP
FLASHING RED	Taxi Clear of the Runway in Use
FLASHING WHITE	Return to Starting Point on Airport
ALTERNATING RED/GREEN	Exercise Extreme Caution

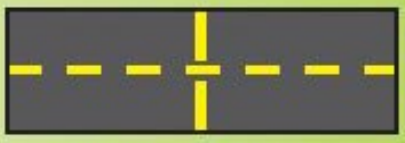
AIRFIELD MARKINGS

HOLDING POSITION:
Hold short of intersecting rwy; also a land-and-hold-short marking

MOVEMENT AREA BOUNDARY:
Defines boundary of movement area and non-movement area



HOLDING POSITION WITH ENHANCED TAXIWAY CENTERLINE: Alerts of an approaching runway

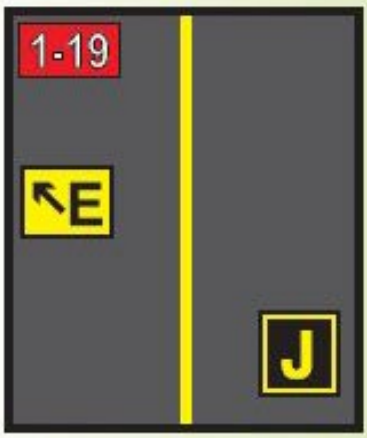


TAXIWAY/TAXIWAY HOLDING POSITION: Hold short of intersecting taxiway when directed by ATC

SOLID TAXIWAY EDGE: Defines edge of usable, full-strength taxiway pavement; adjoining pavement NOT usable

ILS CRITICAL AREA: Hold short when instructed by ATC

DASHED TAXIWAY EDGE: Defines edge of taxiway where adjoining pavement or apron IS available for taxi



SURFACE PAINTED HOLDING POSITION: Designates runway ahead in conjunction with yellow holding position marking

SURFACE PAINTED TAXIWAY DIRECTION: Direction & designation of intersecting twy

SURFACE PAINTED TAXIWAY LOCATION: Identifies twy on which aircraft is located

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