

1. GENERAL.

The aircraft is equipped with a conventional retractable landing gear.

The main gears are located in the engine nacelles and the nose gear in the forward fuselage. All gears retract forward into their respective wheel wells.

Each landing gear is equipped with dual wheels. The landing gear has an hydraulic actuation system which is signalled electrically via a control lever in the cockpit.

In an emergency operation the gear can be extended by use of the emergency extension system.

All main wheels have multi-disc brakes. An anti-skid system automatically modulates the brake pressure for maximum braking efficiency.

The nose gear is steerable by a wheel located on the left pilot's side panel.

A ground sensing system which incorporates weight-on-wheel switches (WOW) establishes ground or flight mode operation for various systems.

A wheel spin-up signal is also provided by the anti-skid system which is used by the propeller control system.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2.1 Landing gear extension/retraction.

The gears are retained in up or down position by locks. Manually inserted pins ensure downlocking during ground operation. The main gear doors are mechanically controlled by each gear. The main doors are closed, and the nose wheel doors are fully open, when the landing gear has been extended.

Normal extension/retraction.

The landing gear handle when moved UP/DOWN provides electrical signalling to the landing gear valve which directs hydraulic power to the actuators and down/uplocks. Landing gear retraction and extension indications are displayed on EICAS.

The landing gear operation and inboard brakes are powered hydraulically from System 2.

Emergency extension.

If normal extension of the landing gear is not successful the gear may be extended by freefall by pulling the emergency extension handle on the cockpit floor in front of the control column on the right side. The hydraulic power is supplied from System 1 which has a manually operated valve that directs hydraulic power from the main accumulator to the emergency ports of the uplock actuators.

This action will release the uplock hook and allow the gear to freefall. To make sure that airloads on doors do not prevent safe downlocking for the main landing gear, the reclosing door function is disconnected on emergency extension by explosive bolts activation.

Indications.

The landing gear extension/retraction is displayed by three indicators on the Primary EICAS Display.

2.2 Brakes.

The main landing gear wheels are fitted with self adjusting hydraulic multi-disc brakes.

There are two brake circuits— one for the outboard and one for the inboard brakes. The inboard brakes get hydraulic power from System 2 and the outboard brakes from System 1.

The different brake functions are:

- Normal braking (anti-skid)
- Parking brake.

Normal braking.

Braking is controlled by rudder pedals in the conventional manner. Each pedal is connected to one outboard and one inboard brake power valve.

An anti-skid system modulates brake pressure for maximum braking efficiency. Pressure available in each brake circuit is indicated on the Secondary EICAS Display, Hydraulic Page.

The system consists of an anti-skid control box, one wheel speed transducer on each main wheel, two anti-skid valves and an anti-skid OFF/FAULT p/b on the hydraulic panel in the cockpit.

The anti-skid system also incorporates "Touchdown protection" to avoid braking while in flight and also to avoid landing with locked wheels with consequent damage to tires.

The protection prevents brake application either until 3 seconds after main gear compression or until average wheel speed exceeds 50 kts.

In order to obtain braking with anti-skid protection the following is required:

- Anti-skid p/b on overhead panel is black indicating that the system is on.

For each circuit:

- Appropriate power lever (left–inboard, right–outboard) below Flight Idle plus 3 seconds delay.

■ **(Not applicable with Mod. No. 6236 installed).**

or

- Appropriate left or right wheel switch (inboard brakes – inboard switches, outboard brakes – outboard switches) activated to "ground" position, plus 3 seconds delay.

or

- Average wheel speed over 50 kts.

Throughout the landing roll, the wheel speed transducers send signals via the control box to the anti-skid valves to modulate the brake pressure.

When the aircraft has slowed down to about 10 kts the anti-skid system cuts out and braking must be modu-

lated manually. The anti-skid control box circuits, anti-skid valves and the wheel speed transducers are continuously monitored for proper function. If any parameter exceeds limits an OUTBD and/or INBD A-SKID FAULT caution is displayed on EICAS. Should both OUTBD and INBD indication come on, the pilot must revert to manual braking by setting the anti-skid p/b on the overhead panel to OFF.

Parking brake.

The parking brake consists of two parking brake valves, one for the inboard circuit and one for the outboard. When the park brake handle is pulled the parking brake valve goes to the closed position and the return flows are blocked. The parking brake is set by pulling the handle, turning it clockwise approximately 30° to lock it, and depressing the brake pedals. Turning the handle more will not set the parking brake harder. It will only cause more wear on the locking device of the parking brake handle.

The pressure switches incorporated in each valve send signals to the EICAS. If both signals are received by the EICAS, "PARK BRK" in blue is displayed on the ground status panel (SED). If only one pressure switch sends a signal, "INBD PARK BRAKE ON" or "OUTBD PARK BRAKE ON" as appropriate is displayed on the status page (SED).

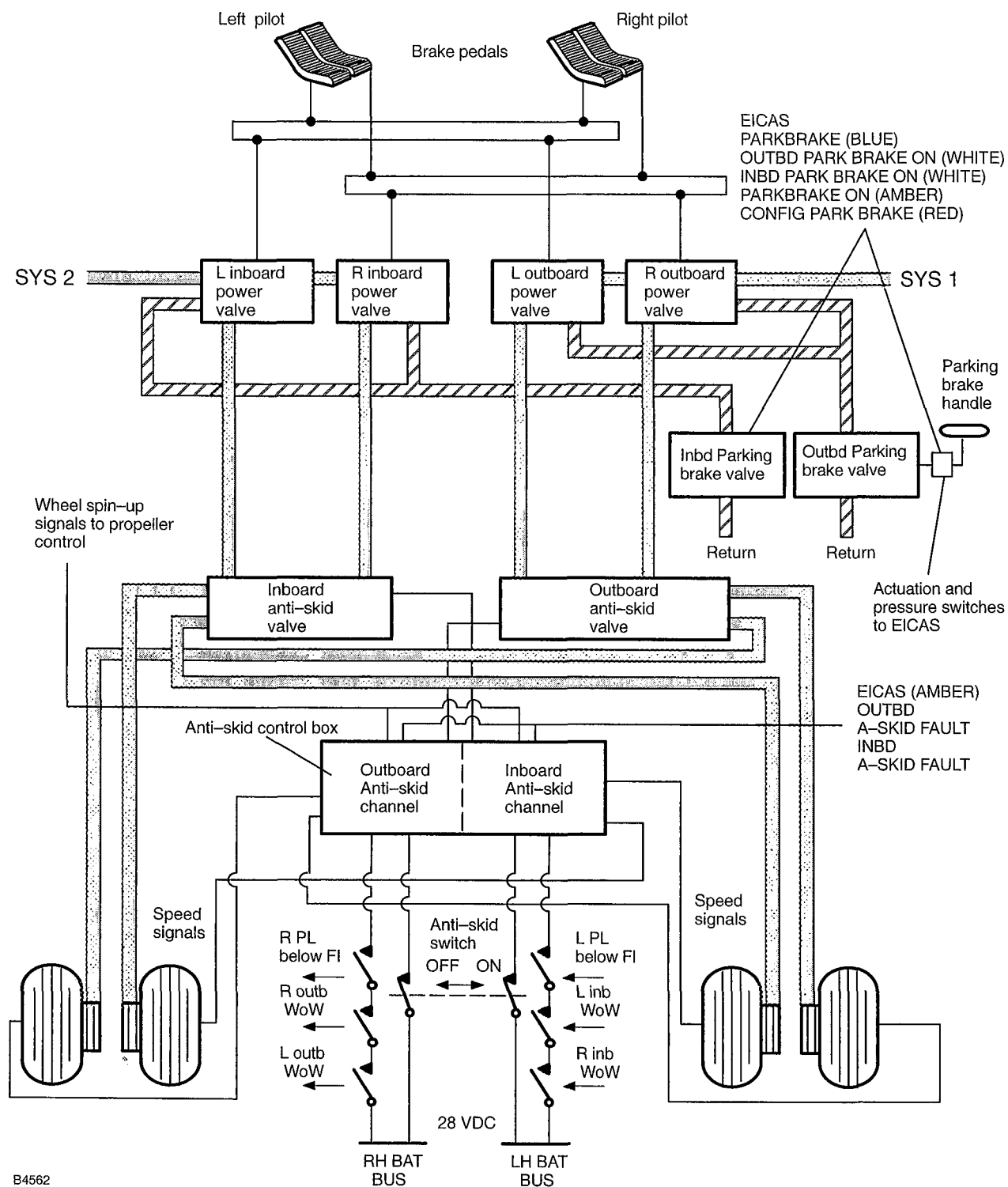
2.3 Nose wheel steering.

Nose wheel steering is operated by an hydraulic motor. Maximum steering deflection is approx. plus minus 60 degrees, and a free casting mode of plus minus 20 degrees. If the nose wheels are moved more than 20 degrees left or right by an external force the steering is automatically energized to prevent further nosewheel movement.

Steering is possible by first depressing the hand wheel to complete the electrical circuit to open the steering shutoff valve.

2.4 Landing gear switches.

There are two air/ground switches (WoW) located on each main gear and one downlock and one uplock switch on each gear. These switches are used to control various air/ground functions in different systems.



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FIG.1. Brake system – schematic.

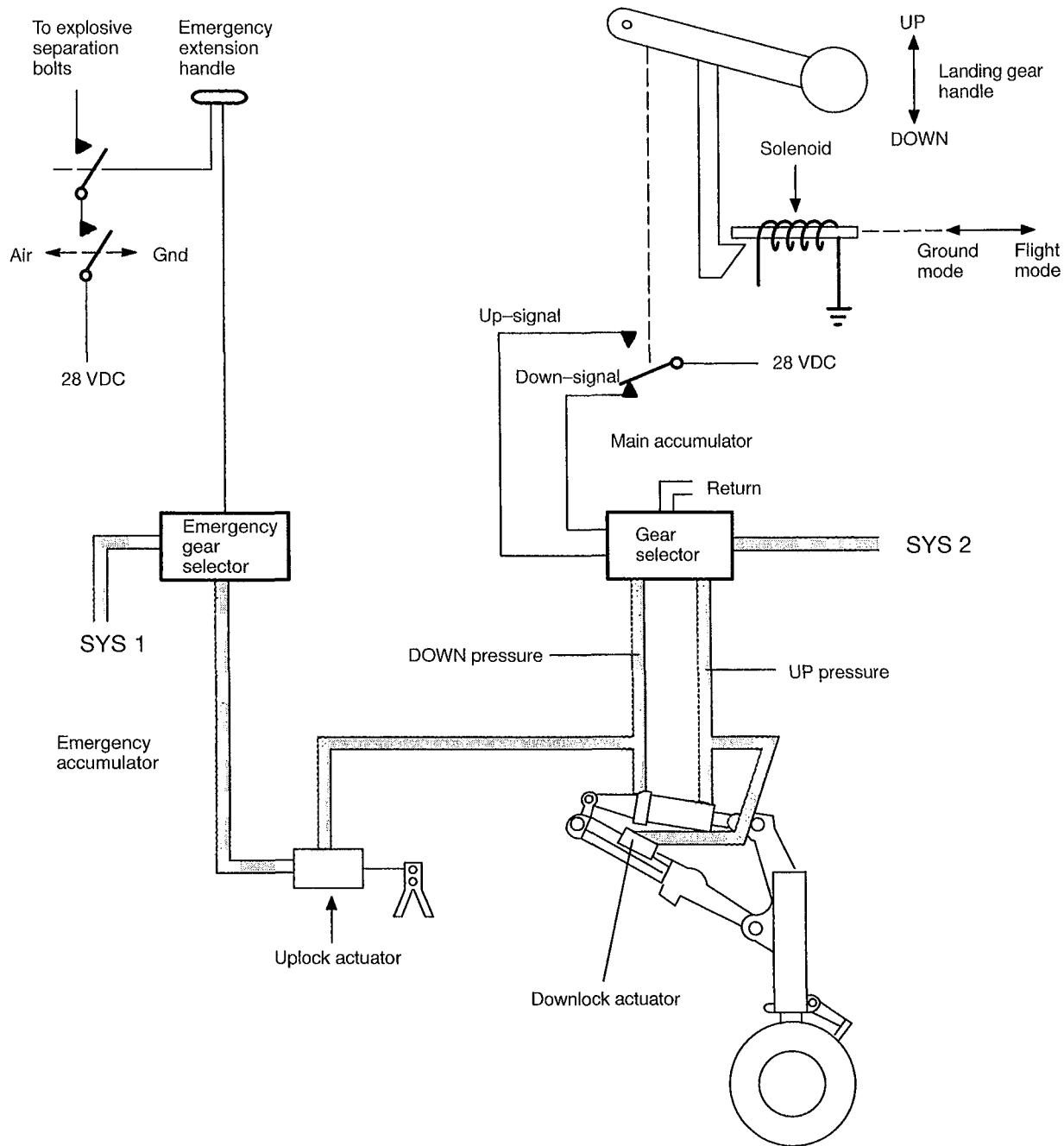
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S1

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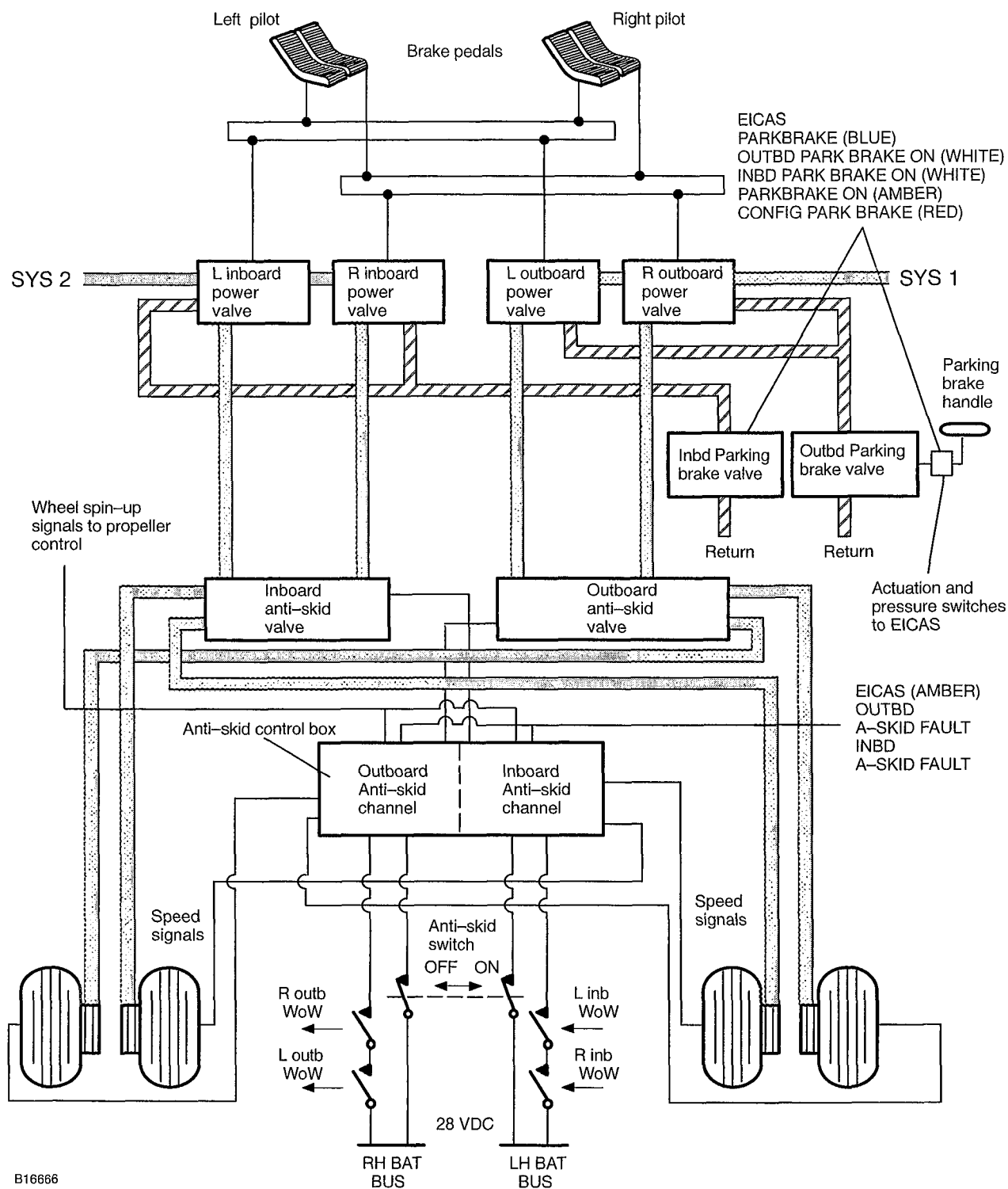
Applicable to aircraft without Mod. No. 6236



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FIG.2. Landing gear extension/retraction – schematic.

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FIG.1. Brake system – schematic.

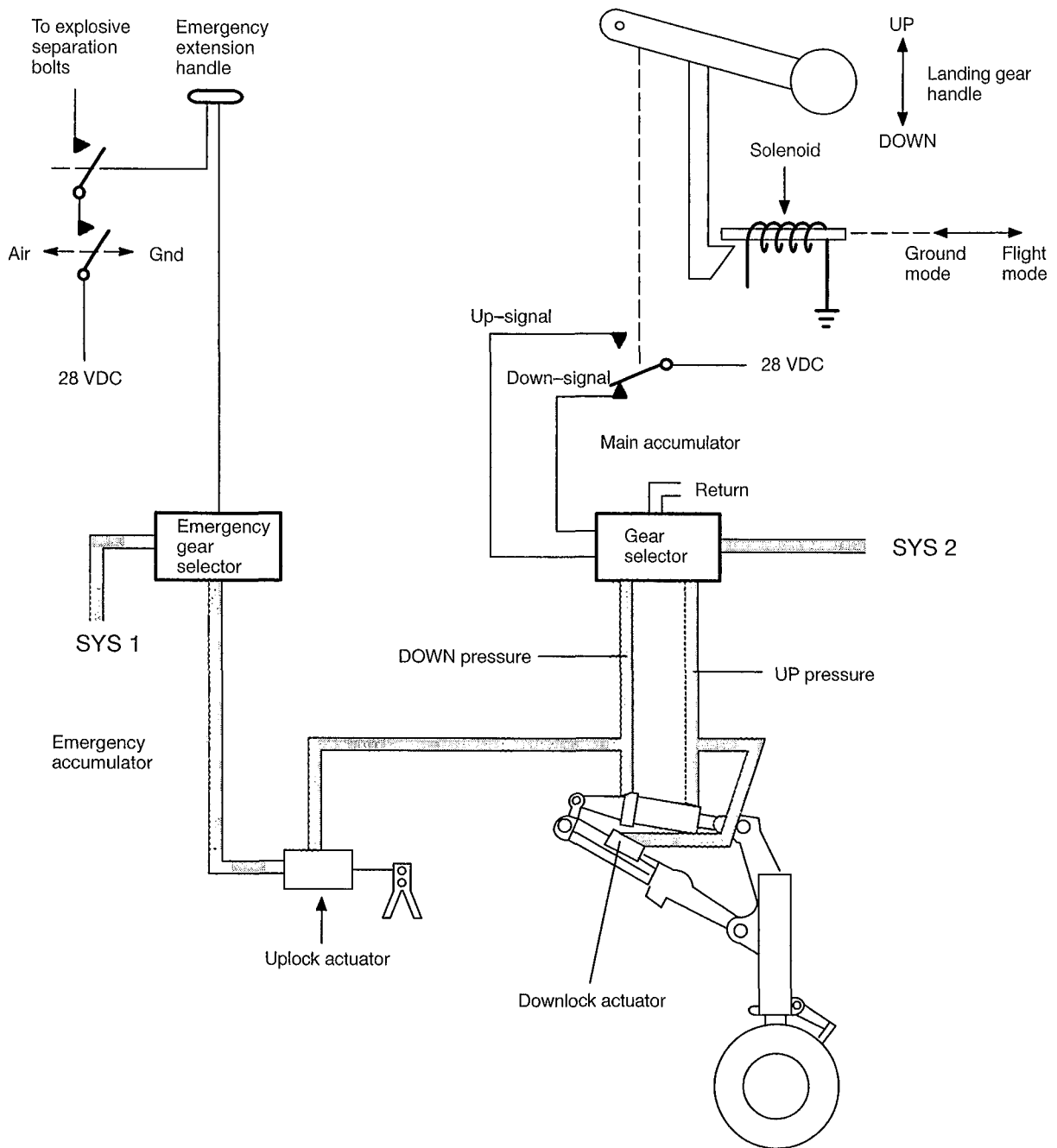
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S2

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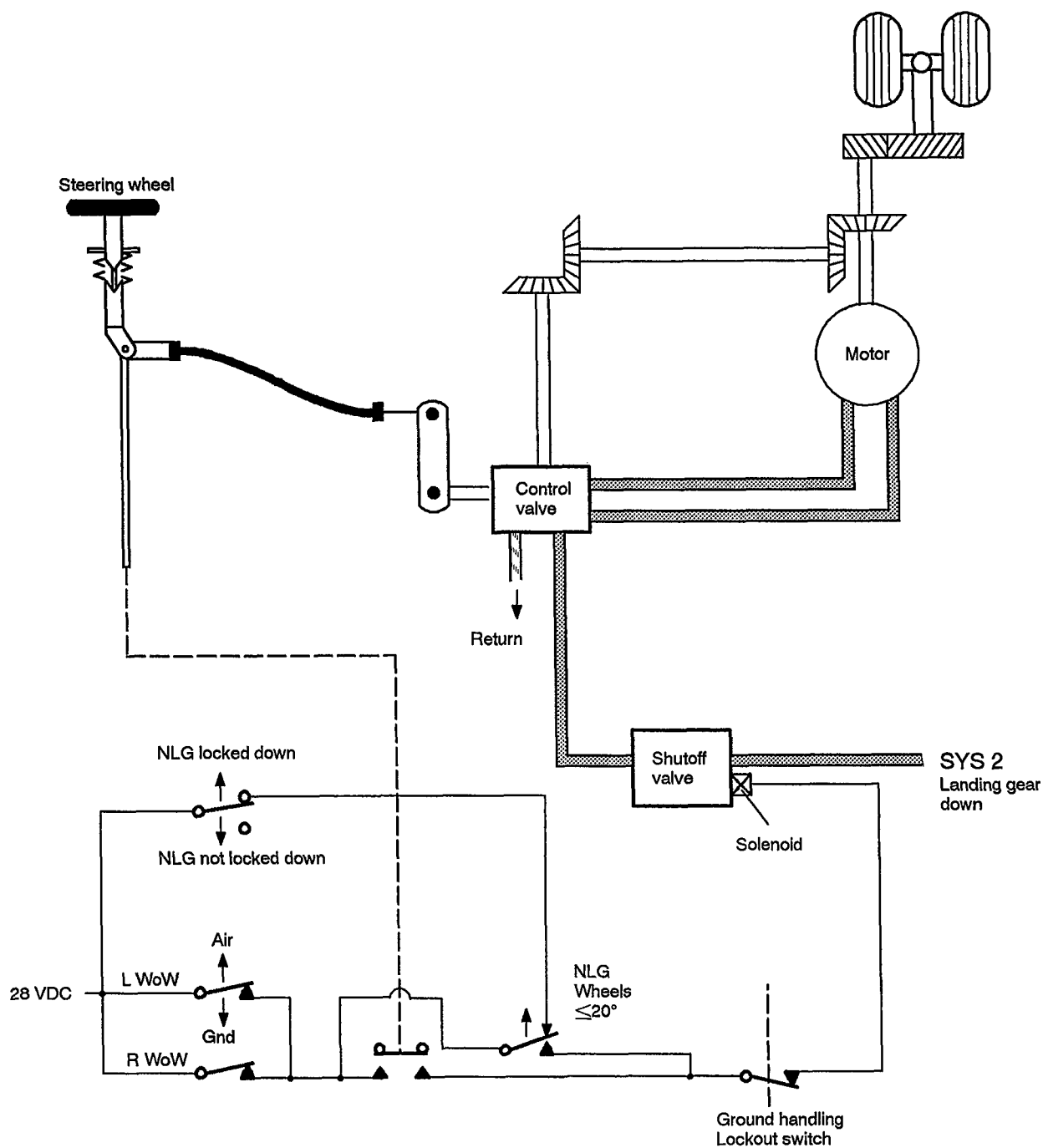
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FIG.2. Landing gear extension/retraction – schematic.



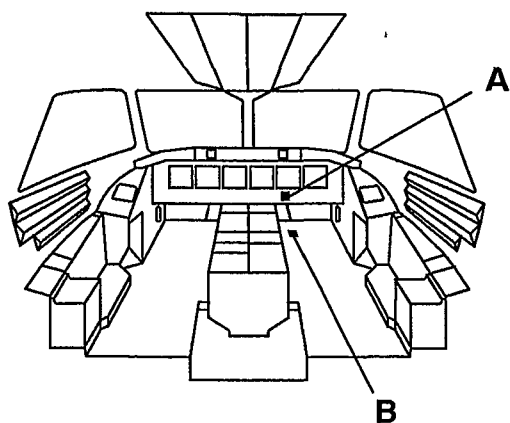
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FIG.3. Nose wheel steering – schematic.

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3. LANDING GEAR OPERATION.

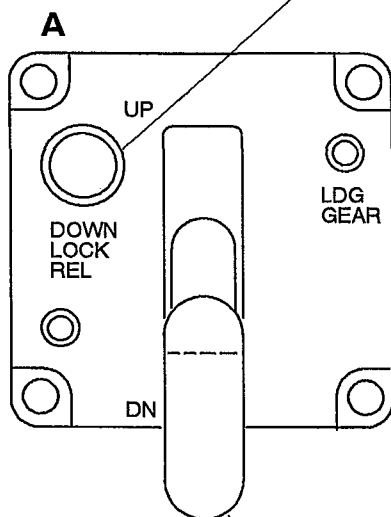


DOWN LOCK REL button.

Disengages landing gear handle solenoid in case of solenoid failure.

WARNING

Pressing the button with a/c on ground disengages the mechanical landing gear control handle lock allowing gear retraction on the ground.

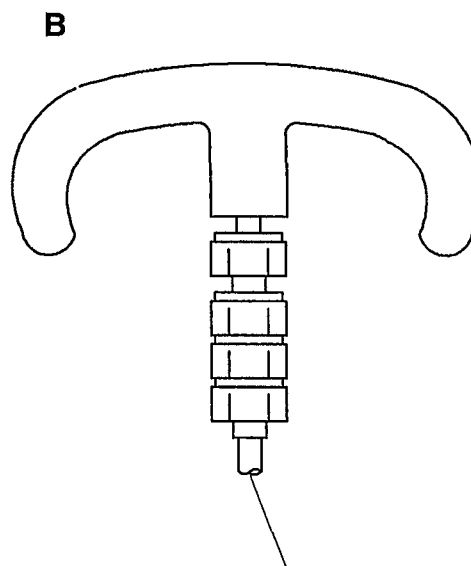


Landing gear handle

UP – When moved to up position, all gears will retract and lock in retracted position

DN – When moved to DN position all gears will extend and lock in extended position

Gear indications are displayed on EICAS.

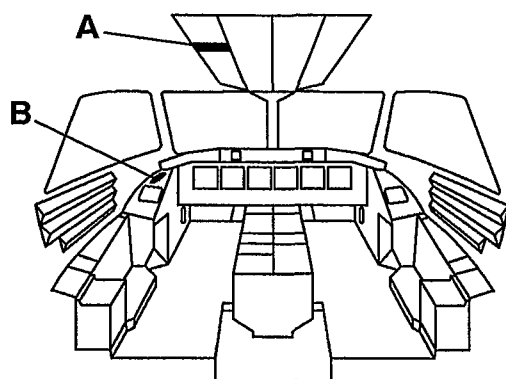


EMERG LDG handle

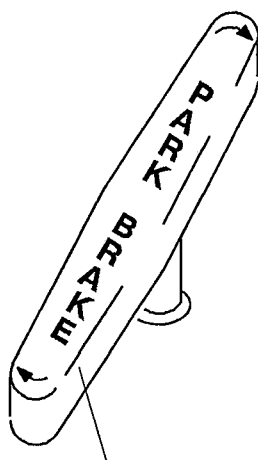
When the emergency extension handle is pulled emergency accumulator pressure releases all landing gear uplocks and activates the explosive separation bolts on the main landing gear. Extension of the gear is by freefall. Gear handle position has no effect on emergency extension.

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FIG.4. Gear extension/retraction controls.



B PARKING BRAKE HANDLE



PARKING BRAKE handle

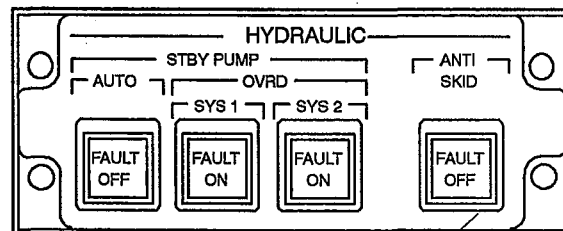
To engage parking brake, pull the parking brake handle and turn approximately 30° clockwise to lock. Apply brake pressure with the brake pedals.

To disengage parking brake, turn the handle approximately 30° counter clockwise and push down.

NOTE

Turning the handle more than approximately 30° will not set the parking brake harder. It will only cause more wear of the locking device of the parking brake handle.

A ANTI SKID



ANTI SKID p/b

Normal (blank)

– Anti skid on

OFF (white)

– Anti skid selected off

FAULT (amber)

– Anti skid fault or selected off.

NOTE

"FAULT" is also displayed when Anti-skid selected off.

B4706

FIG.5. Anti-skid control and parking brake.

SYMBOLS	COLOR	LOGIC
	GREEN	NLG AND MLGs ARE DOWN AND LOCKED AND GEAR HANDLE IS IN DOWN POS OR EMER REL HANDLE IS PULLED
	AMBER	NLG AND MLGs ARE DOWN AND LOCKED AND GEAR HANDLE HAS BEEN IN UP POS FOR MORE THAN 20 SEC AND EMER REL HANDLE IS <u>NOT</u> PULLED
	WHITE	NLG AND MLGs ARE IN TRANSIT AND GEAR HANDLE IS IN DOWN POS OR EMER REL HANDLE IS PULLED
	AMBER	NLG AND MLGs ARE IN TRANSIT AND GEAR HANDLE HAS BEEN IN DOWN POS FOR MORE THAN 20 SEC OR EMER REL HANDLE HAS BEEN PULLED FOR MORE THAN 20 SEC
	WHITE	NLG AND MLGs ARE IN TRANSIT AND GEAR HANDLE IS IN UP POS
	AMBER	NLG AND MLGs ARE IN TRANSIT AND GEAR HANDLE HAS BEEN IN UP POS FOR MORE THAN 20 SEC
UP UP UP	WHITE	NLG AND MLGs ARE UP AND LOCKED AND GEAR HANDLE IS IN UP POS AND EMER REL HANDLE IS <u>NOT</u> PULLED
UP UP UP	AMBER	NLG AND MLGs ARE UP AND LOCKED AND GEAR HANDLE HAS BEEN IN DOWN POS FOR MORE THAN 20 SEC OR EMER REL HANDLE HAS BEEN PULLED FOR MORE THAN 20 SEC
	WHITE	NLG AND MLGs ARE IN TRANSIT AND GEAR HANDLE POS IN UNKNOWN AND EMER REL HANDLE IS <u>NOT</u> PULLED (OR UNKNOWN)
-- -- --	AMBER	NLG AND MLGs ARE INDICATED UP AND LOCKED AND DOWN AND LOCKED AT THE SAME TIME
CONFIG GEAR	RED	RADIO ALTITUDE LESS THAN 500 FT FLAPS MORE THAN 20° GEARS <u>NOT</u> DOWN AND LOCKED

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FIG.6. Gear indication logic.

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4. ELECTRICAL POWER SUPPLY

L Landing gear control	EMERGENCY BUS	F-11	HYDRAULIC L LDG CTL
R Landing gear control	EMERGENCY BUS	M-9	HYDRAULIC R LDG CTL
L LDG emergency extension + R backup .	L BAT BUS	E-13	L LDG EMER RELEAS
R LDG emergency extension + L backup .	R BAT BUS	L-11	R LDG EMER RELEAS
Anti-skid inboard	L BAT BUS	F-10	HYDRAULIC A SKID INBD
Anti-skid outboard	R BAT BUS	M-8	HYDRAULIC A SKID OUTBD
Nose wheel steering	L BAT BUS	F-9	HYDRAULIC NOSE WL STEER