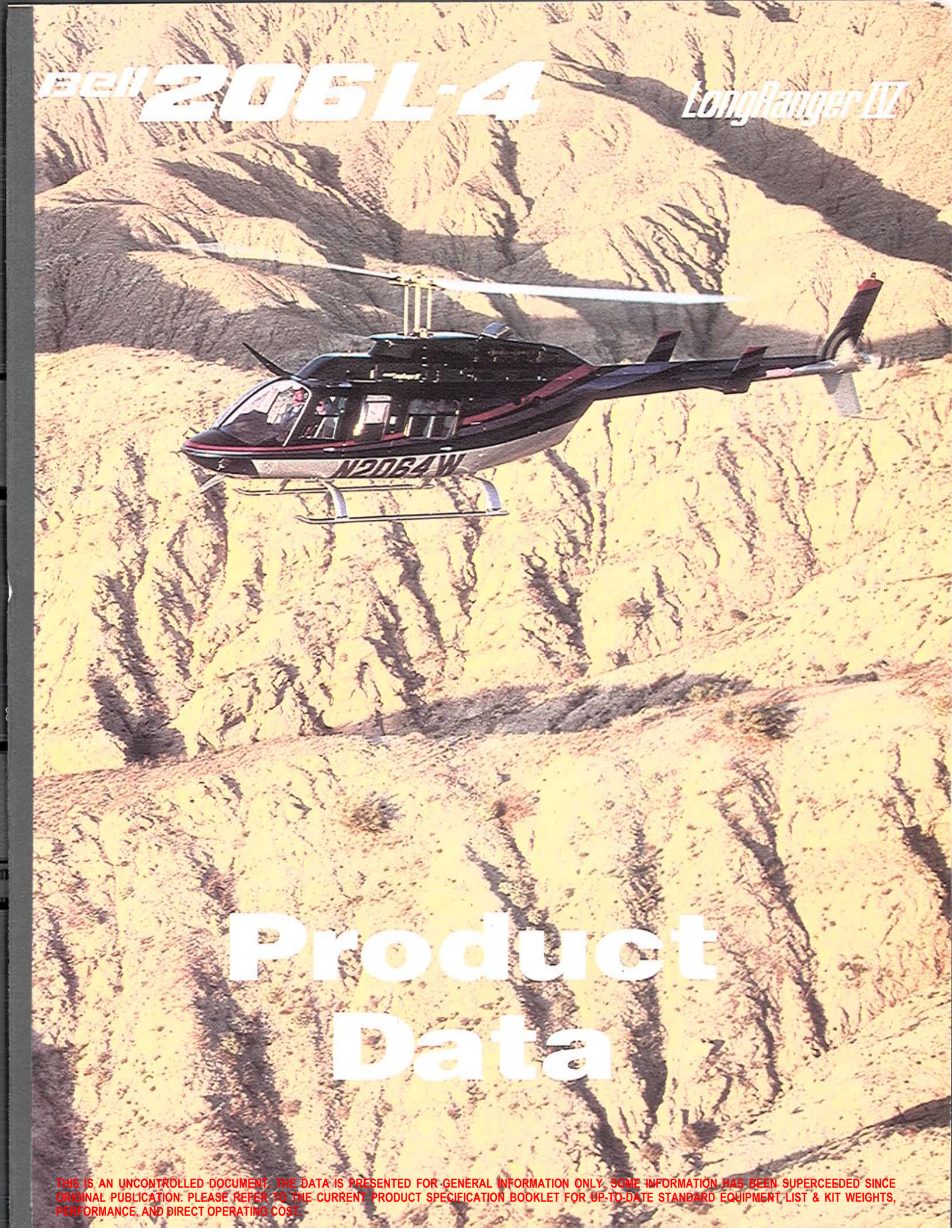
Bell 206L-4 LongRanger IV



Product Data

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This document is intended for the use of **BHTI Sales Personnel** and for **prospective customers** and an aid in defining the features and benefits of the Bell Model 206L-4.

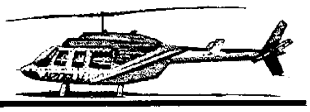
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The **WEIGHTS, DIMENSIONS AND PERFORMANCE DATA** shown in the book were correct at the time of publication; for the MOST CURRENT Model 206L-4 tabular data, performance and fuel flow charts, refer to the Bell *206L-4 Technical Information Booklet.* For performance and operational limitations for **actual mission planning**, reference and operational limitations for actual mission planning, reference must **ALWAYS** be made to the FAA Approved *Rotorcraft Flight Manual.*

For Warranty, 206L-4 Performance, Training and Direct Operating Cost (DOC) information, please refer to the appropriate Bell Helicopter manual.

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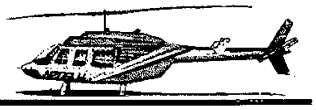


Bell 206L-4, LongRanger IV
PRODUCT DATA

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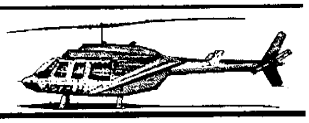


Glossary

INTERNATIONALLY APPROVED ABBREVIATIONS

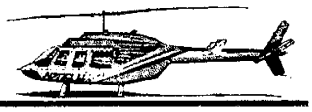
Atmosphere	C	Degrees Celsius (° is not required if meaning is clear).
	ISA	International standard atmosphere. (Standard temperature is defined as 15° C at sea level, with a lapse rate of -1° C for each 150 meters [500 feet], increase in pressure altitude.)
	ISA+20C ISA+30C	International standard temperatures increased at each altitude by constant 20 C or 30 C.
	SL	Sea level.
Rate of Climb	R/C	Rate of climb.
	ft/min	Feet per minute.
	m/s	Meters per second. (One meter per second is 3.28 ft/s.)
Speed and Distance	h	Hour/hours.
	km	Kilometer/kilometers.
	km/h	Kilometers per hour. (One kilometer per hour equals 0.54 knots or 0.62 statute miles per hour.)
	kn	Knots. (Nautical miles per hour.)
	m	Meter/meters. (One meter equals 3.28 feet.)
	mph	Statute miles per hour. (One mile per hour equals 0.87 knots.)
	nm	Nautical miles.
	sm	Statute miles.
Weights	kg	Kilogram/kilograms.
	lb	Pound/pounds. (One pound equals 0.45 kilograms.)
Performance Definitions	IGE	In ground effect. (Hovering near the ground creates a cushion of air that increases the weight carrying capability of the helicopter [the ground effect]. This effect generally is present up to one rotor diameter above the ground.)
	OGE	Out of ground effect. (Since the ground effect extends up to one rotor diameter, out of ground effect refers to flight that is higher than this height above the ground.)
	max	Maximum.
	Maximum Endurance Speed	The speed at which power required to fly is a minimum.
	Long Range Cruise Speed	The higher of the two speeds at which 99% of maximum range occurs. Cruising at this speed is a tradeoff of one percent in maximum range for 20 to 30 kilometers per hour (10 to 15 knots), higher speed.
	Pressure Altitude	The altitude indicated on an altimeter or barometer when the sea level standard pressure reading is the reference (1013 millibars [29.92 inches] of mercury).
	Service Ceiling	The altitude at which the maximum rate of climb capability is 0.5 meters per second. 100 feet per minute.

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SECTION ONE
GENERAL DESCRIPTION
OF THE
STANDARD BELL CONFIGURATION

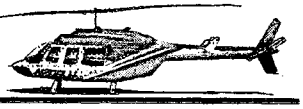
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HISTORICAL REVIEW

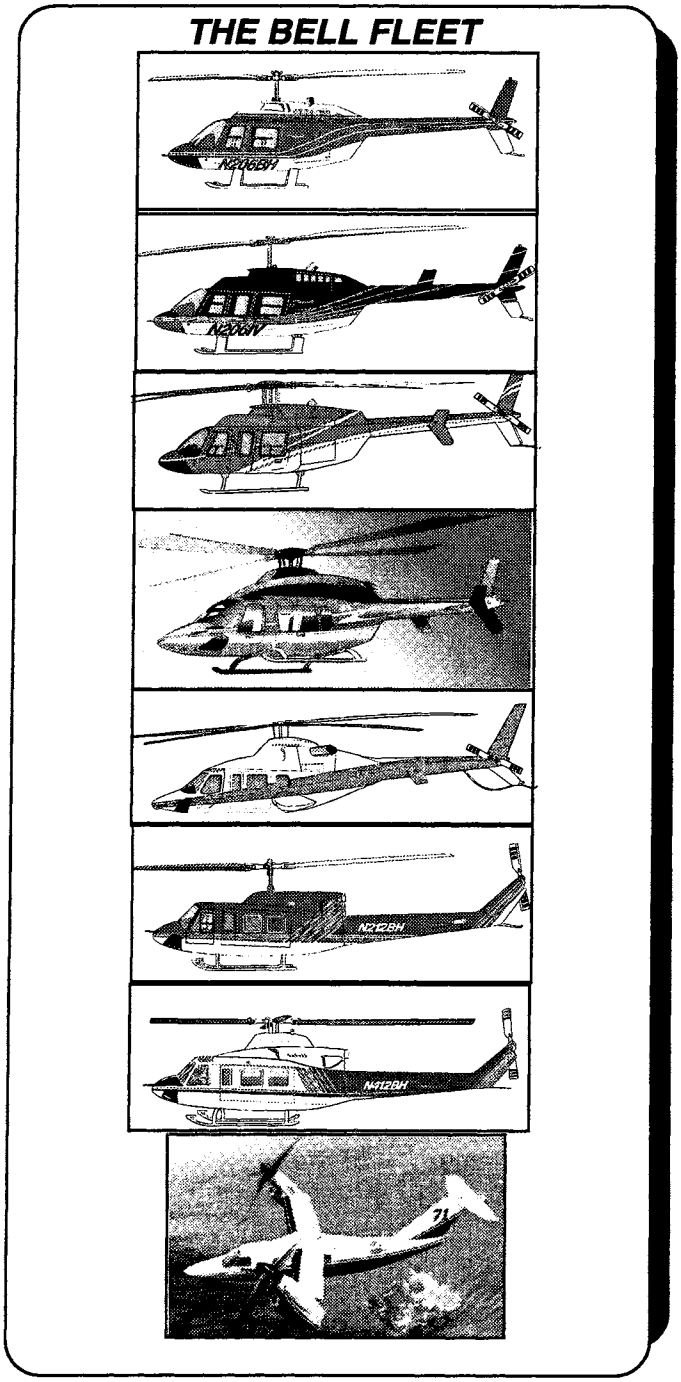
In September 1973, Bell Helicopter Textron unveiled the **LongRanger**, with size and performance designed to supplement the 5-place JetRanger in the Bell product family. The LongRanger featured a new cabin size designed to comfortably seat a **pilot** and **six passengers**, and introduced the **Nodamatic suspension system**. This unique system offered a **smoother ride** because of a substantial reduction in the rotor induced vibrations.

The LongRanger **double-door** arrangement, combined with the fold-down seat backs on the left side, made it possible to carry unusually long loads at a moment's notice. It also made it easier to load patients for medical evacuation.

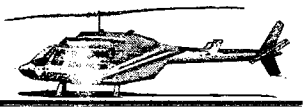
At the same time dependability was enhanced by several new items including the use of elastomeric bearings and an improved hydraulic system with redundant dual servo valves.

The LongRanger made its initial flight a year later - September 1974. And, by the following September, it received its certification. Deliveries began a month later.

In September 1977, Bell announced the **LongRanger II**. This new version was certificated in May 1978 with deliveries beginning in June. It had an internal gross weight of 1837 kilograms (4050 lb) and was powered by the **500 SHP** Allison 250-C28B, fourth generation of the popular 250 series.



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With the increased horsepower, water-alcohol, which had been added to improve the earlier C20B performance, was no longer necessary.

In December 1978, the LongRanger II was certificated for **single pilot IFR** operations. The configuration to achieve this was accomplished in conjunction with the Collins Radio Group.

In September 1980, the LongRanger II was flown 5100 miles (8207 kilometers), without escort, from Dallas to Bern Switzerland - first trans-Atlantic flight ever undertaken by a light helicopter.

As world wide experience was gained, many improvements were added:

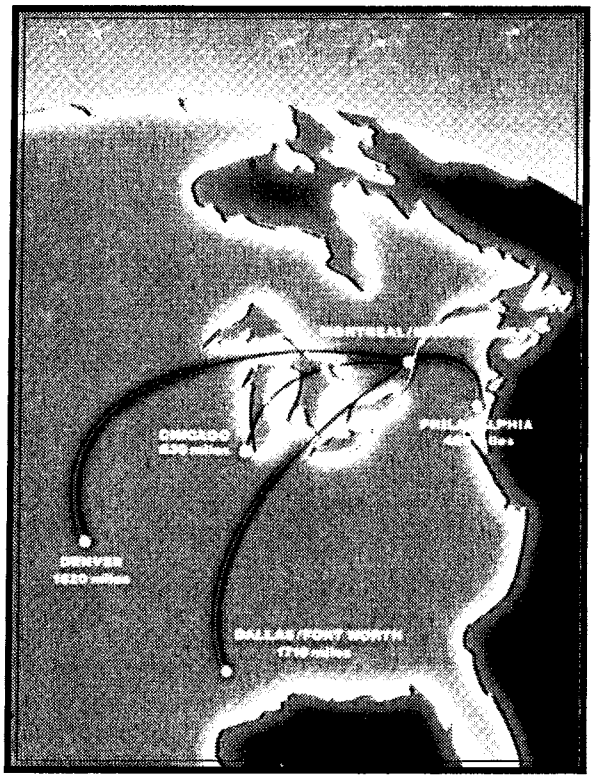
Bulged windows and the new slant radio pedestal were changes that are quickly noticeable. Not visible but very important were the engine modifications and improved battery-starter system which added to the LongRanger's dependability. An improved rotor yoke allowed the **gross weight** to increase to **4150 pounds (1882 kilograms)**.

In December 1981, Bell introduced the **LongRanger III**: **the 206L-3**. The most important change was the increase to 650 horsepower with the installation of the Allison C250-C30P engine. The **transmission** remained unchanged and so the ratings were the same: 435 horsepower at takeoff. The additional horsepower did increase the performance when the environment is hot and high. In June 1982, Bell introduced a kit which increases the transmission takeoff rating to **456 horsepower**. The performance of the LongRanger III with the kit installed is significantly improved across the whole spectrum.

In September 1982, H. Ross Perot, Jr. and Jay Coburn flew the LongRanger III around the world in 30 days.

In 1992, Bell certificated the **206L-4 LongRanger IV**. Gross weight increase from **4150 lb (1882 kilograms)** to **4450 lb (2018 kilograms)** and the takeoff rating of the transmission increases from **435 SHP to 490 SHP**. Several other product improvements are incorporated to increase durability and reduce direct maintenance.

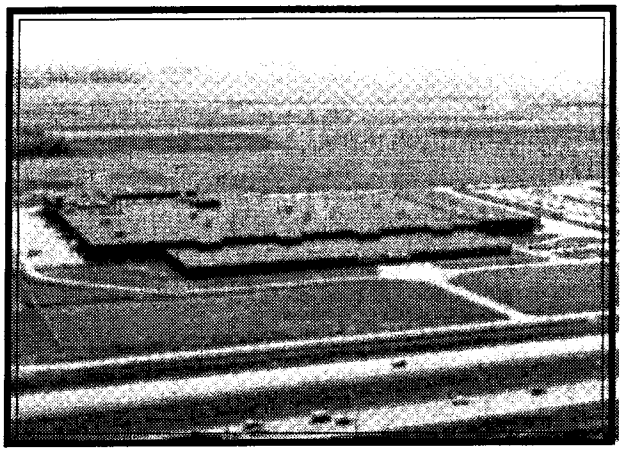
In 1986, production of the Model 206 series was transferred to Bell Helicopter Canada, a division of Textron Canada Ltd. The manufacturing facilities are situated in Mirabel, Quebec, 19 miles (30 kilometers) north of Montreal. The plant is a short drive from Dorval Airport for United States and Canadian arrivals, and only minutes from Mirabel International Airport.



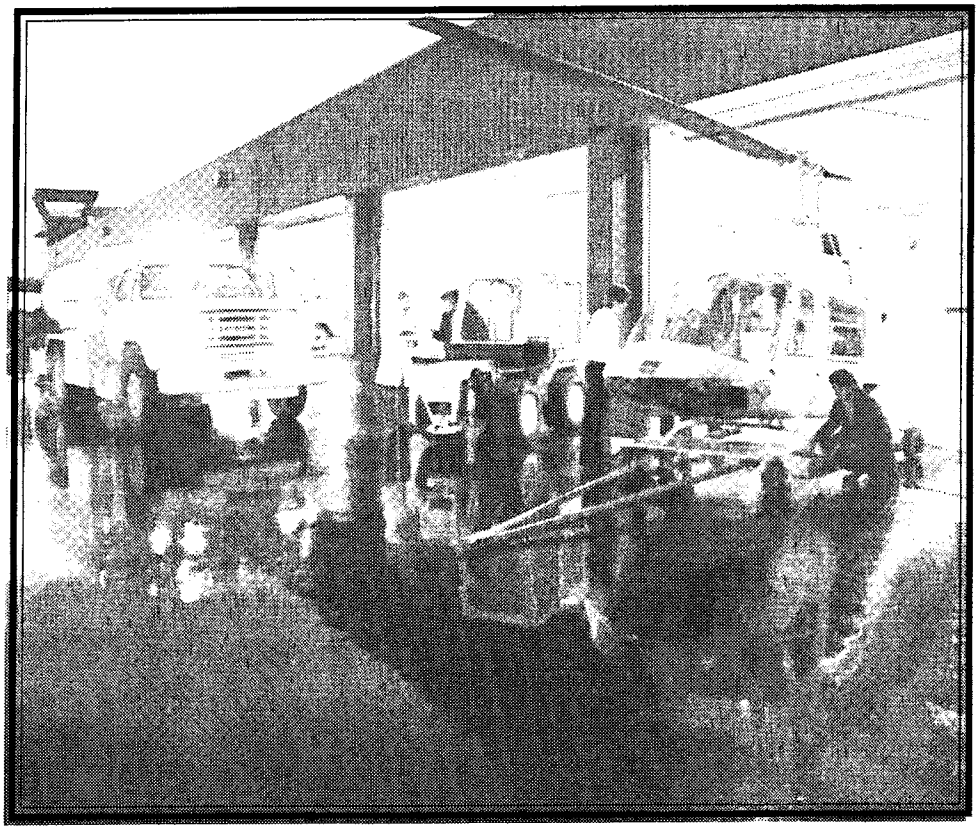
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Current production LongRanger IV helicopters are manufactured to the same high standards specified by the Federal Aviation Agency (FAA) of the United States. Design approval as a normal category rotorcraft under Civil Air Regulation (CAR) Part 6, is contained on US Type Certificate H2SW.

The corresponding certification approvals have been issued to Bell Mirabel by Transport Canada (Canada's Civil Aviation Authority) and are accepted under a bilateral agreement between the United States and Canada. They are Manufacturing Approval 1-86, and Canadian Type Approval H92.



-1



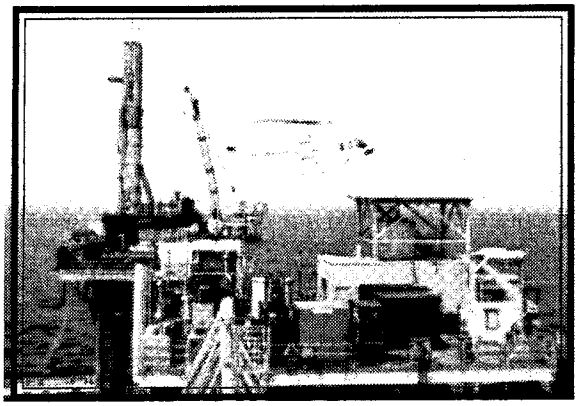
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The **LongRanger IV** is the larger of the Bell 206 series light helicopters and is designed to carry seven adults comfortably.

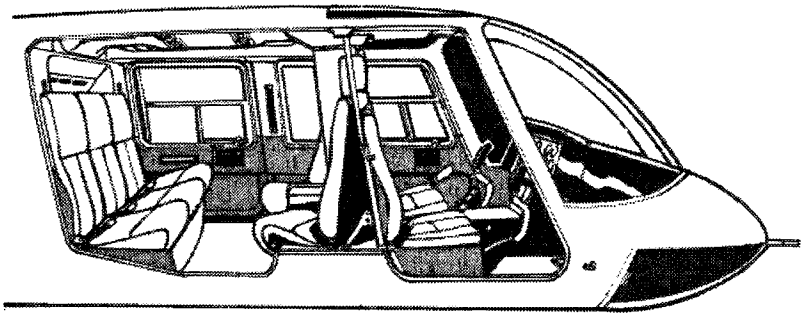
Comfort begins when you enter the roomy passenger compartment, and the LongRanger is comfortable throughout the complete flight regime because of the Nodamatic transmission suspension system. Flight in the LongRanger is one of the smoothest in the helicopter industry.

The LongRanger began its career as a stretched version of the famous JetRanger maintaining the very attractive lines of the 206 series.



-4

The overall eye appeal at first glance is aided by the sparkling **Polyurethane** paint. Not only is it durable and easy to keep clean, but it maintains and, in fact, exemplifies the high standard of Bell quality and dependability.



It is built for prolonged duty in the rugged, remote areas doing the tough jobs but it is equally at home in the sophisticated world of the business executive.

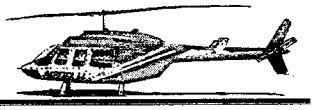
Dependability and versatility meet the demands of the police forces and intensive care staffs and its economical operation makes it cost effective in many demanding roles.

The optional kits that adapt the standard configuration of the LongRanger to meet special tasks are covered separately.



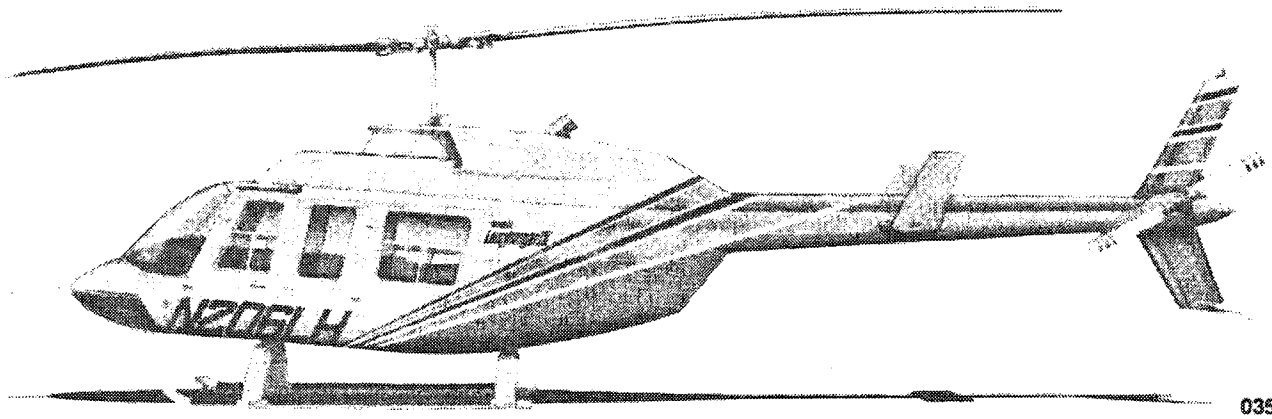
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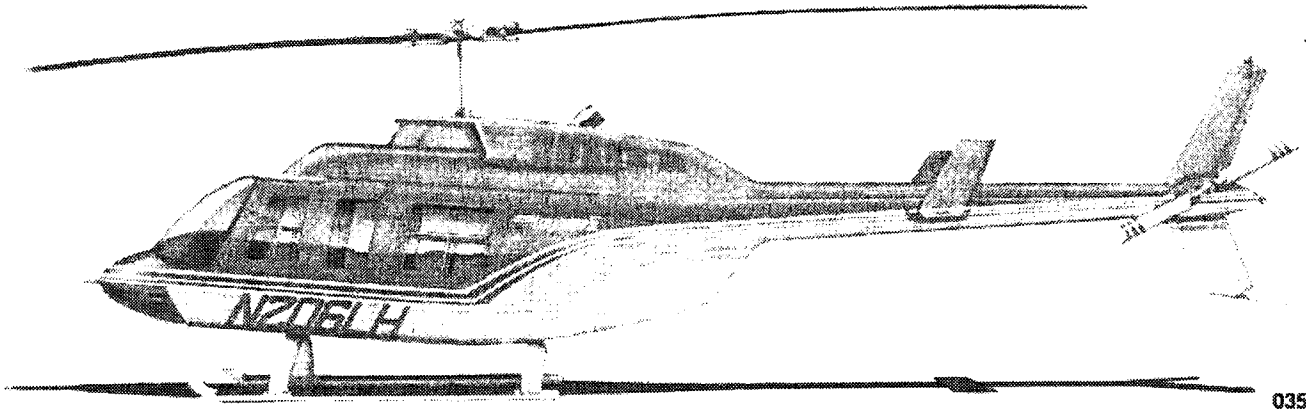


The standard LongRanger comes in three basic color scheme designs illustrated below, each in three colors.

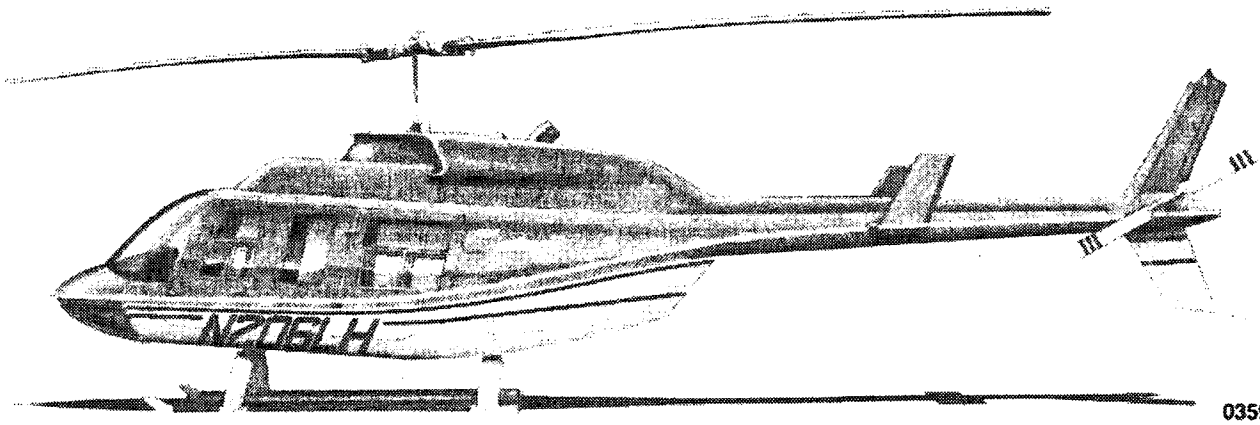
The colors are selected from the many shown in the **IMRON paint chip chart** available from the Bell representative. Special company colors, paint design, logos, etc., can be negotiated.



035984A



035984B



035984C

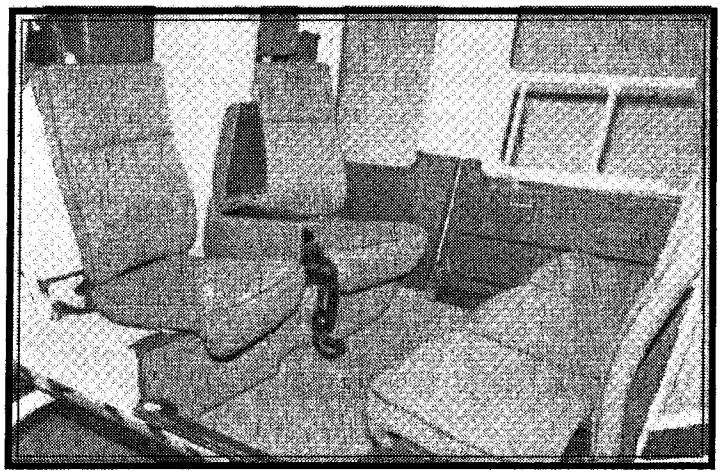
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The LongRanger is licensed for single pilot operation. The pilot occupies the right front seat. A **passenger seat** is provided on the left.

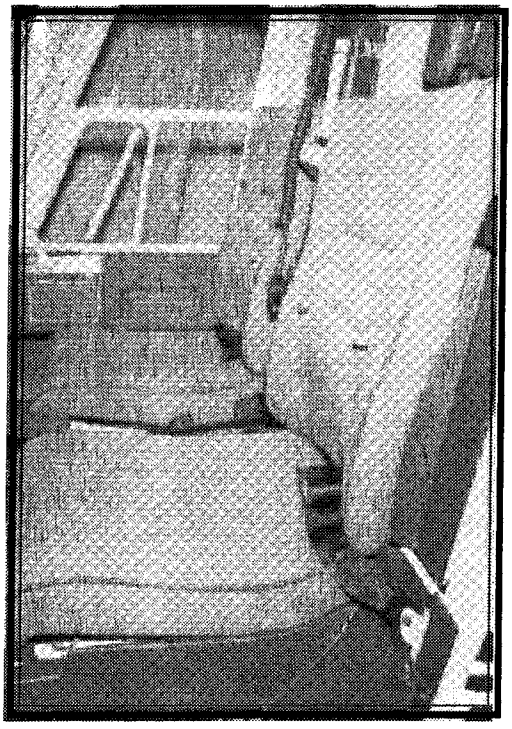


Single Pilot - 10

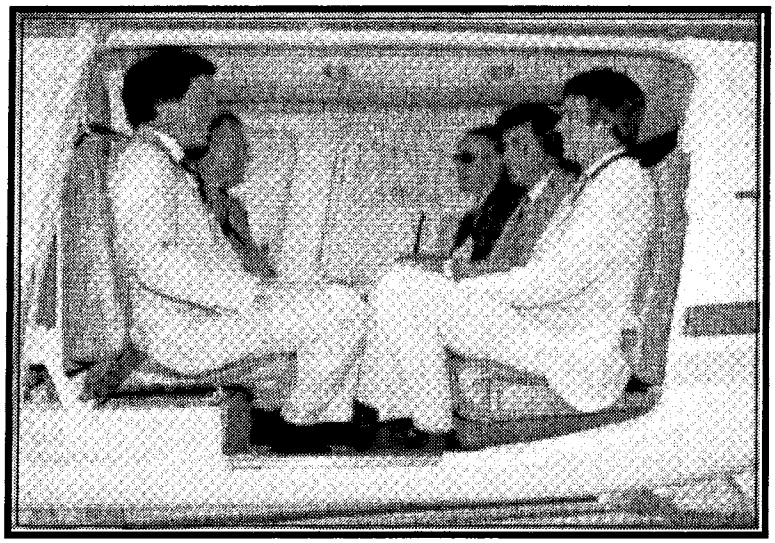
Five additional passengers can be accommodated in the spacious aft cabin. They can enter from either or both sides. Two seats, centrally located, face aft. The remaining three are in a row, facing forward, on a bench at the back of the compartment.



Five Place Cabin with Optional Phone - 12



Pilot Right, Passenger Left - 11



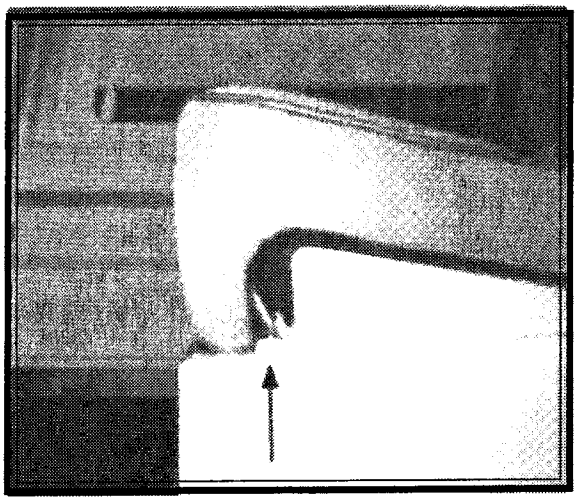
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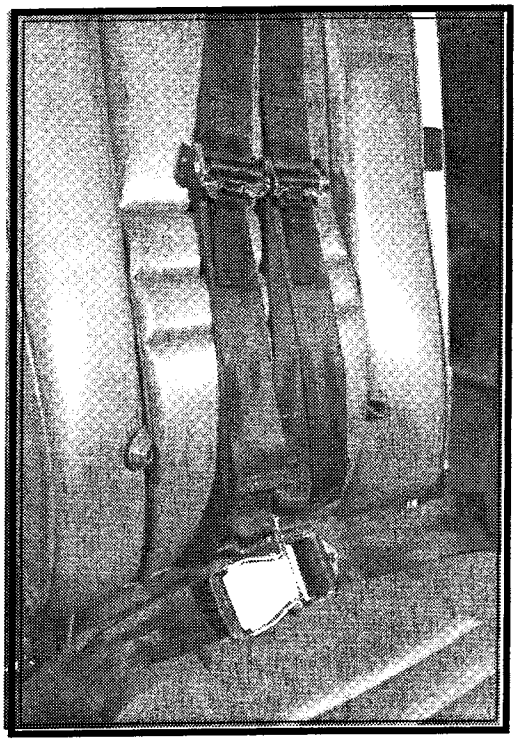
THE INTERIOR

The interior is beautifully appointed for the personnel transport role.

Each of the **seven seats** is based on a pair of tubular metal frames; one for the seat and one for the seat back. Each frame has its own cushion. These start with a neoprene membrane which provides excellent support and vibration isolation. Foam adds to the comfort and then the whole unit is finished in a fabric with a matching vinyl trim.



Securing Pin - 15



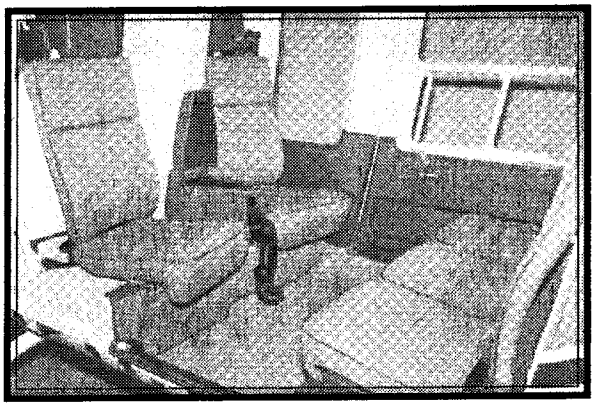
Lumbar Support - 14

There are **three attractive deluxe interiors** to choose from.

The standard configuration comes in a choice of **three fabric and vinyl color combinations**, all painstakingly tailored to ensure they are as comfortable, attractive and as safe as possible. The colors are gray, tan and blue.

Each seat back frame is shaped to provide good **lumbar support**. In addition, the position of the support can be adjusted in the two front seats by grasping a pair of tabs that are on the center section and moving the support pad up or down.

Each seat-back is pushed up into position into two pairs of metal hooks. Once in place, it is held there by the seat when it is positioned. The seat is secured by a single pin pushed through the two eyes on its forward edge.



Roomy Passenger Cabin with Rear Intercom - 16

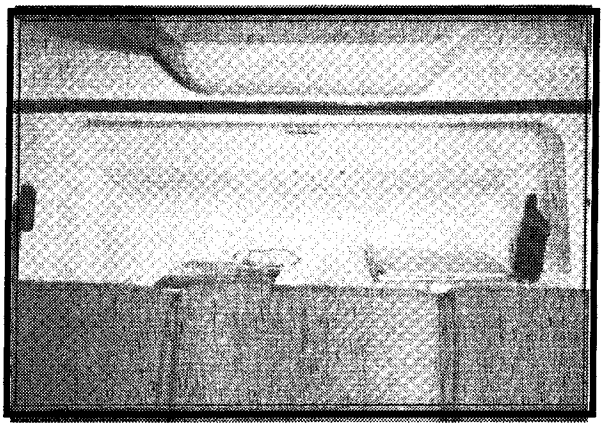
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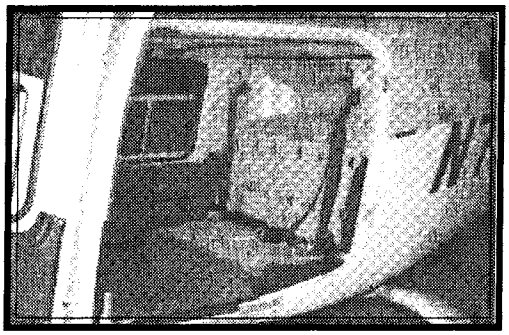
Coordinated Carpet - 17

The floor and the areas likely to be scuffed are covered with lightweight aircraft carpet — color-coordinated to complement the choice of seat material. Where the carpet is continued up the scuff panels it is finished with a vinyl edging .

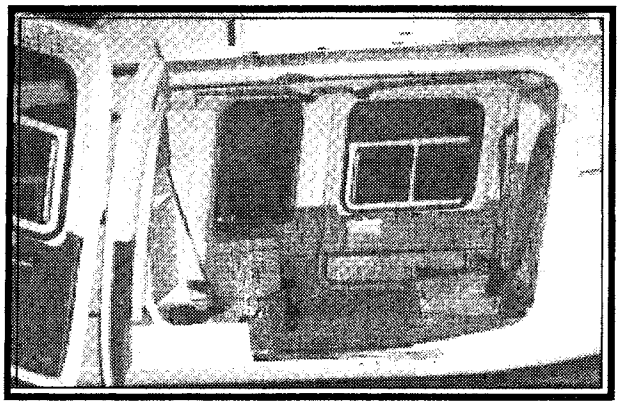
The plastic trim and the painted interior surfaces are finished in cream and brown. The trim consists of window frames, headliners for the ceiling, coverings for the vertical control tunnel, the parcel shelf and the lower part of each door.



Parcel Shelf Trim - 18



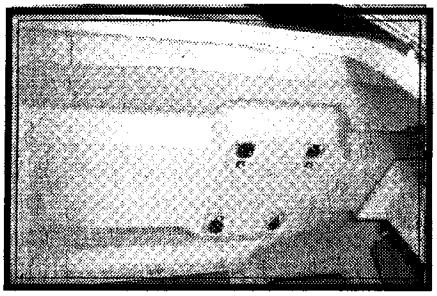
Cabin Trim - 21



Cabin Trim - 19
(Seats & Carpets Removed)

The **headliners** in both compartments and the trim on the vertical control tunnel have been nicely contoured to accept all the accessories such as the fire extinguisher and the applicable options such as the rotor brake and cabin speakers.

The headliner has a pair of attractive, full length, **fabric inserts** which give the two aft facing seats and the two outboard seats on the back bench more headroom. The ducting for the air distribution system in the LongRanger IV is close to the center providing **excellent headroom**. This is particularly useful for the persons seated next to the



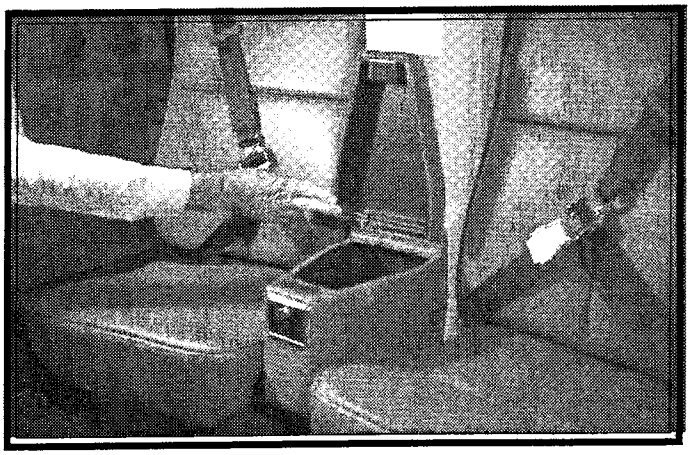
Cabin Lights - 20

Plastic trim closes out both sides of the two front seats and the outboard sides of the back row of seats. The pins that secure the seats remain accessible.

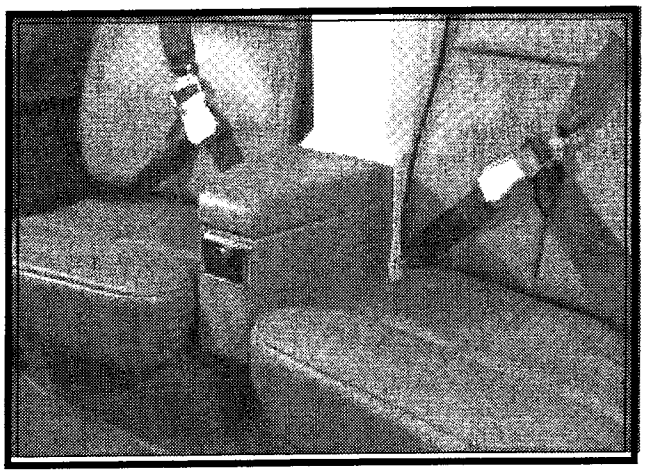
The trim for the bulged windows includes a comfortable **armrest** on the two rear doors.

The Bell representative has a book containing actual samples of the standard fabrics, vinyl, trim, and carpets.

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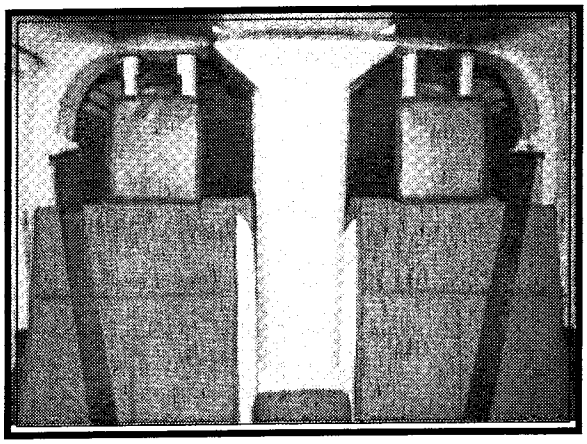


Center Armrest Open - 22



Center Armrests - 23

An **armrest** is located between the two aft-facing seats. It consists of a small box with a padded, hinged cover on top and an ashtray on the end.

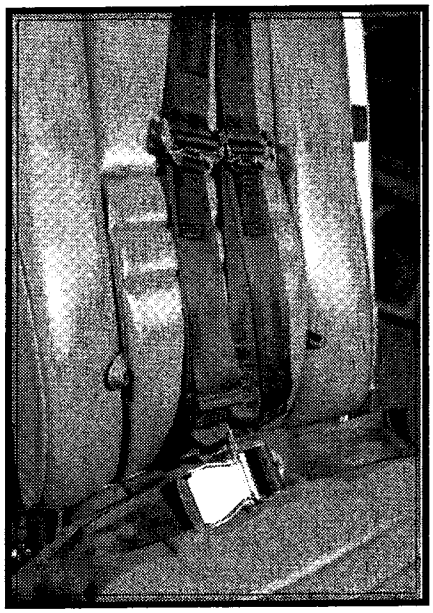


Headrests - 24

Headrests are required for the two aft facing seats. Each of these is supported by a pair of vertical bars which clip into brackets on the roof. When the supports for the left seat are released and the seat back is folded down, the headrest and its supports can be completely removed and stowed. The fasteners have small finger grips so that they can be operated easily without tools.

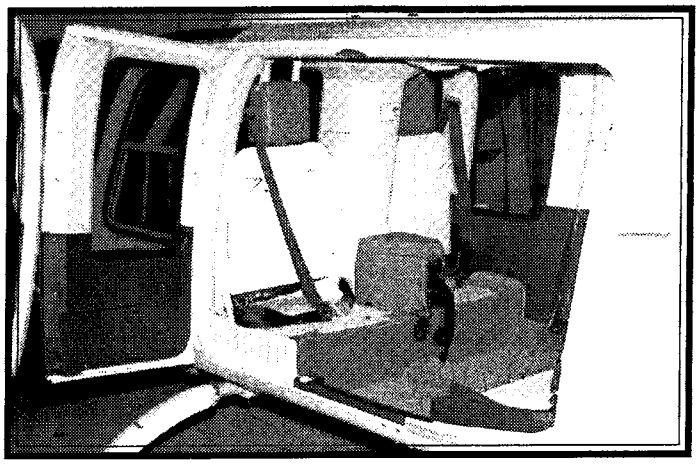
Seven **seat belts** are provided. In addition, the two front seats have dual **strap harnesses**. The remainder each have a **single shoulder strap**. All are mounted on individual inertia-reels and are in woven black nylon with chrome plated fittings. The single shoulder strap snaps onto the seat belt fastener usually after the seat is snugly in place. However, when the seat belt buckle is unfastened, the passenger is free to exit. The ends of the dual harness are fitted with clips that become an integral part of the seat belt fastener as it is being connected. Once connected, the belt and the two shoulder straps are individually snugged up.

A comfort clip is provided on each shoulder strap as it enters the inertia-reel. Each clip can be readily adjusted to keep the tension off the individual's shoulder.

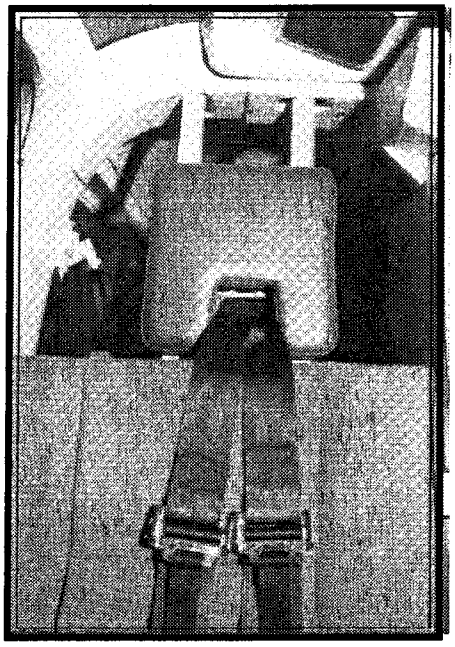


Seat Belt and Dual Strap Harness - 25

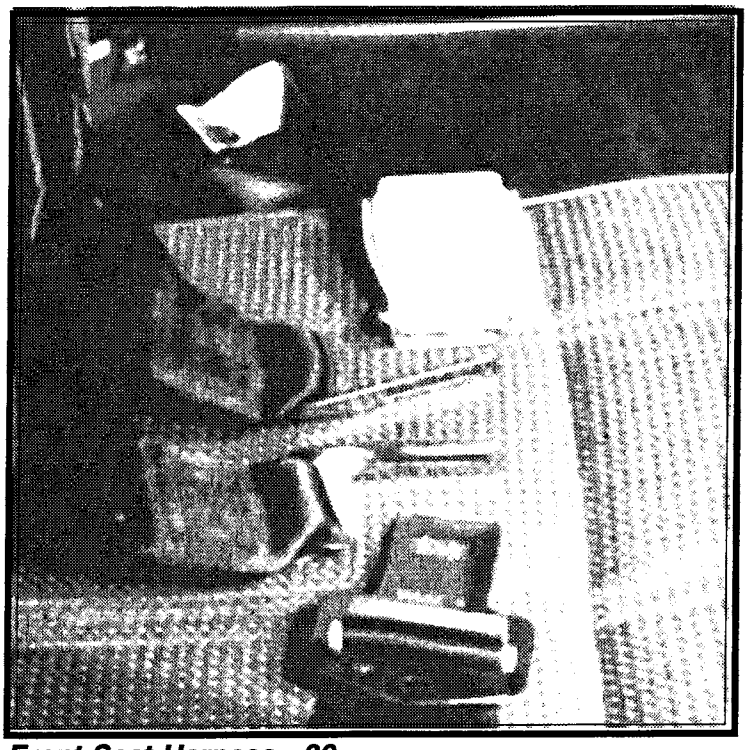
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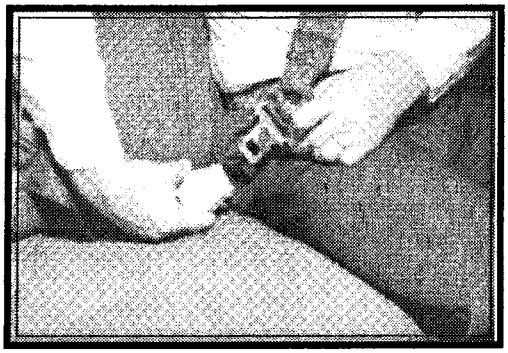
Seat Belts, Seats Removed - 27



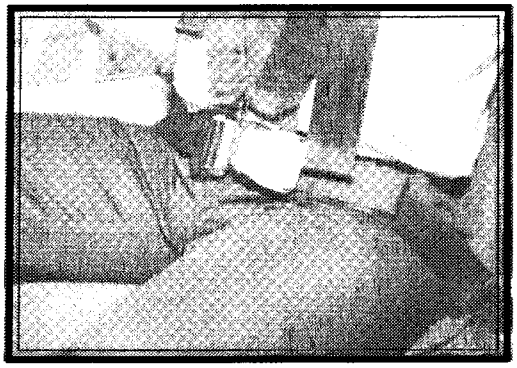
Seat Belt and Dual Shoulder Strap - 26



Front Seat Harness - 30



Releasing Seat Belt - 29

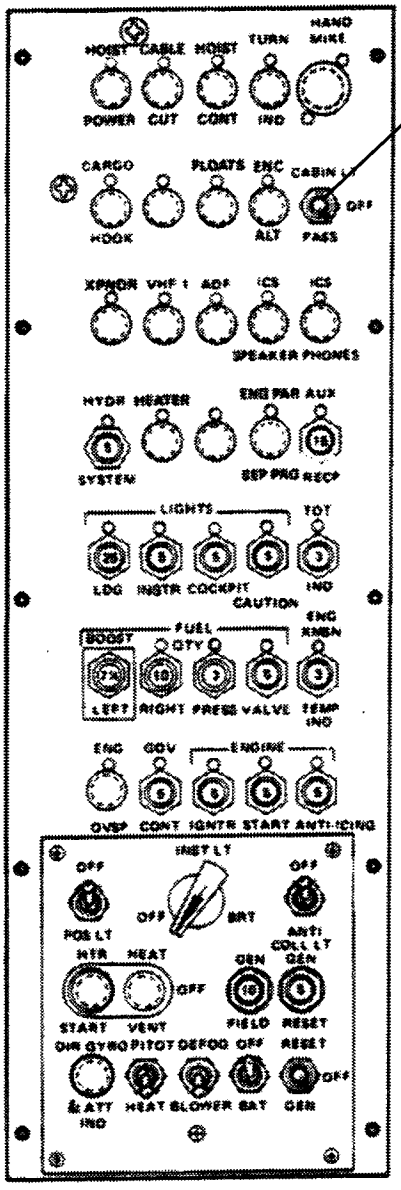


Harness Secured, - 32

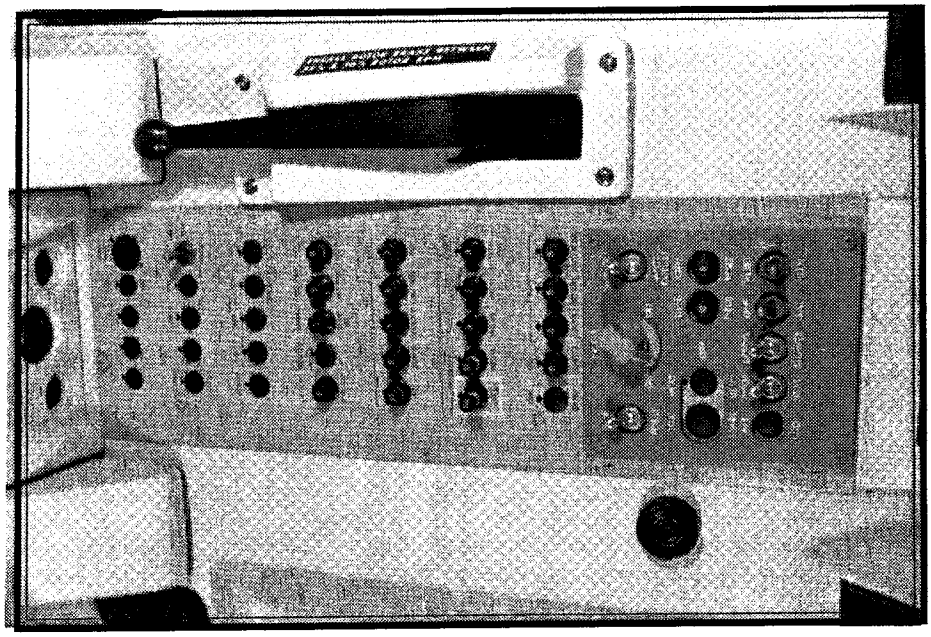
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CABIN LIGHTING. Four individual white, non-dimable, cabin lights provide illumination for the passenger compartment. They are controlled by the pilot's three-position master switch on the overhead console and by individual switches at each light.

When the master switch is in the PASS position, each light can be turned on or off individually. When it is placed in the CABIN LT position the cabin switches are bypassed and all the lights come on.

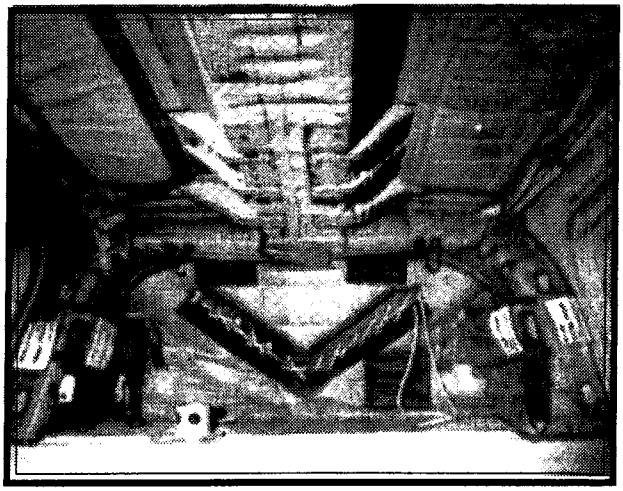


Cabin Light Switch



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SOUNDPROOFING. The parcel shelf is enclosed on all sides by a soundproofing blanket. In addition, fiberglass batting is used in the area of the aft bulkhead.



Soundproofing - 34

The soundproofing blanket consists of two layers of fiberglass with a lead vinyl filler and a quilted "duon" cover. It is sealed securely in position. The blanket is covered with plastic trim.

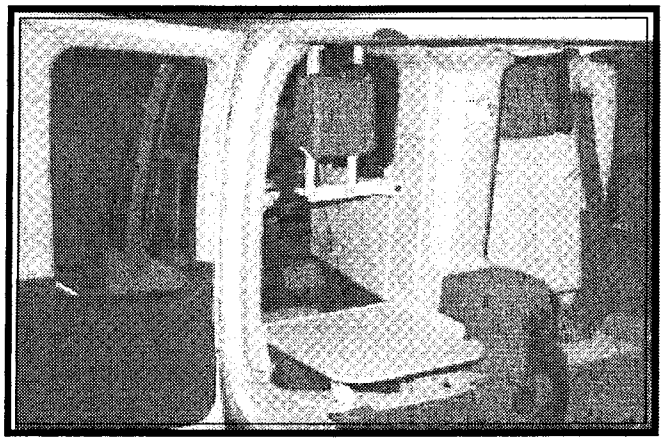
CARGO. In addition to its primary role as a passenger transport, the LongRanger can be quickly converted to carry rough cargo internally.

When the five passenger seats and seat backs are removed, the cabin offers 80 ft^3 (2.2 cubic meters) of cargo space. With the forward passenger seat removed this can be increased to 100 ft^3 (2.8 cubic meters).

It is simple to load cargo from one or both sides because of the low sills, the extra wide doors and the relatively flat benches and floor.

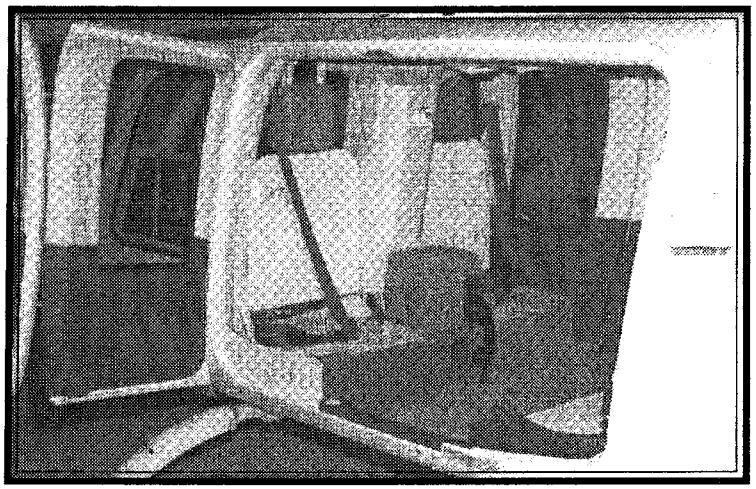
Both the floor and seat benches are capable of withstanding a loading of 75 lb/ft^2 (370 kilograms per square meter). The large doors are approximately 36 x 39 inches (91 centimeters wide and 99 centimeters high).

The panel door increases the width of the opening on the left side to 61 inches (155 centimeters).



Support Folds Down - 36

When the aft facing left seat is removed the left panel can be hinged down on top of the bench. When the front passenger seat is removed, its back panel can be hinged forward to leave a clear space right through from the aft bulkhead to the nose section.

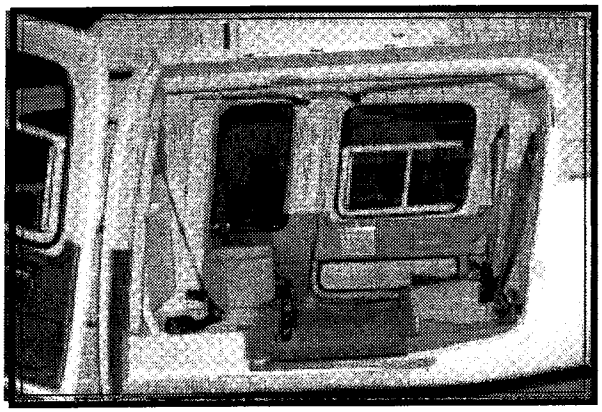


Center Seat Removed - 35

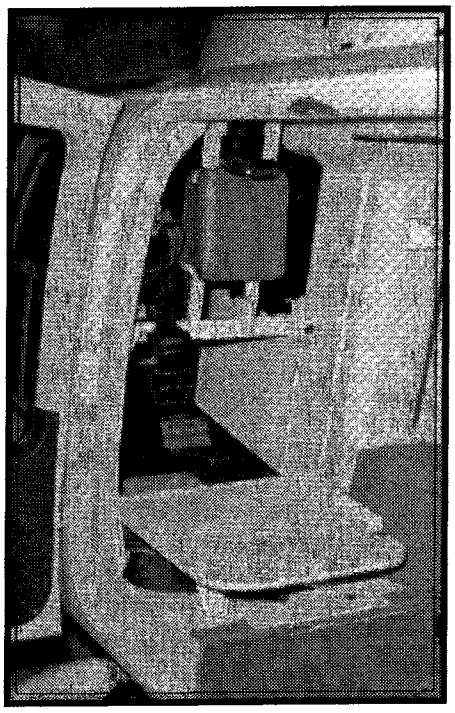
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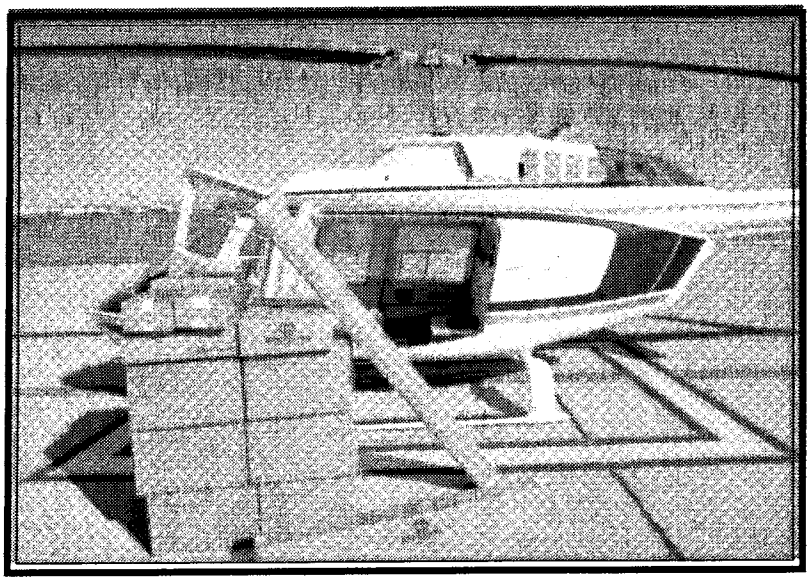
Fully Open - 39



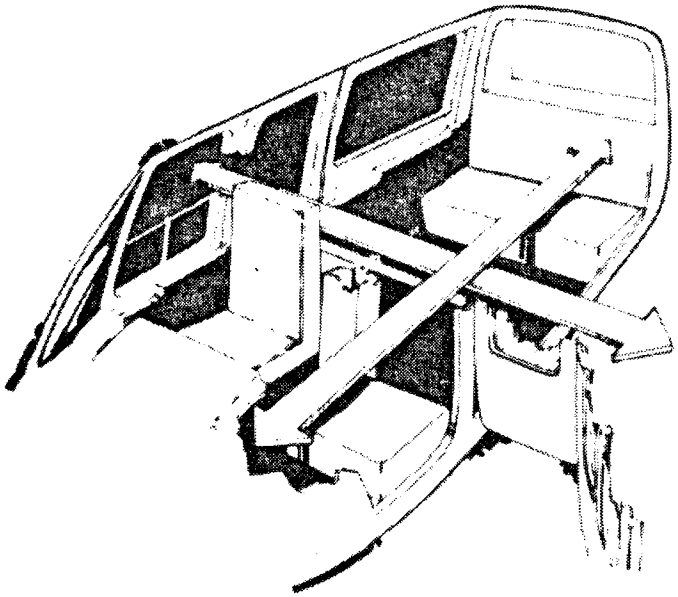
Ready For Cargo - 40



Long Load Capability - 38



Wide Cargo Doors - Easy Loading -41



Easy Loading Long Loads

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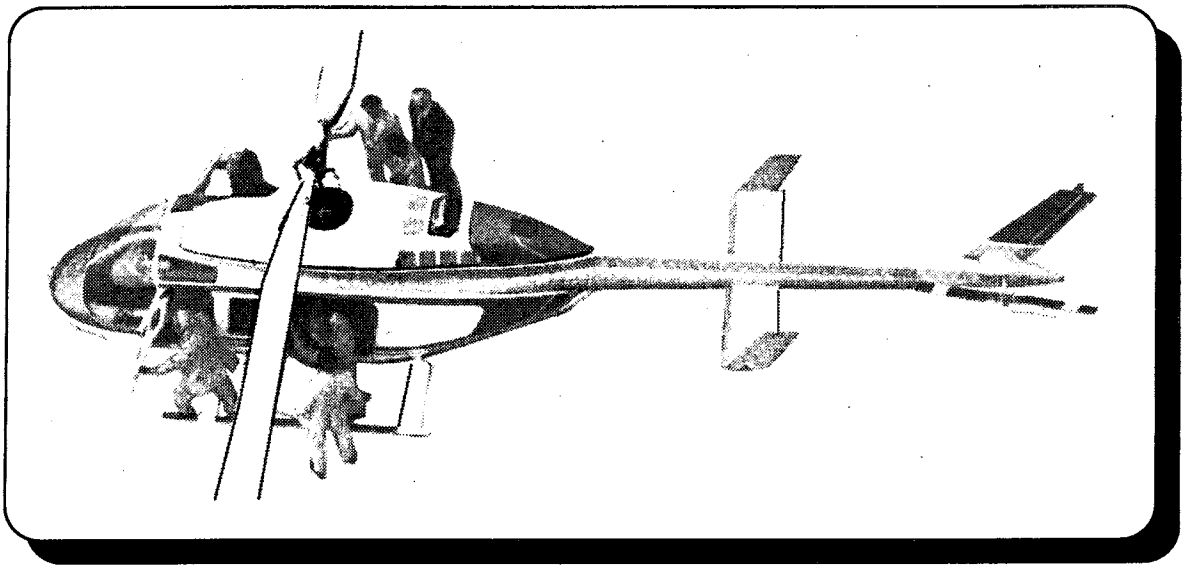
The LongRanger has five doors. The four large doors, two on each side, are hinged forward and open individually for easy access. The low door sills, 20 inches high (50 centimeters), make entry or exit comfortable without additional steps.

The four doors are reinforced aluminum-alloy. Each has a large window, the bottom half of which slides open horizontally.

The two forward doors give direct entry to the crew compartment; the pilot right, forward passenger left.

e two aft doors each give access t whole passenger compartment.

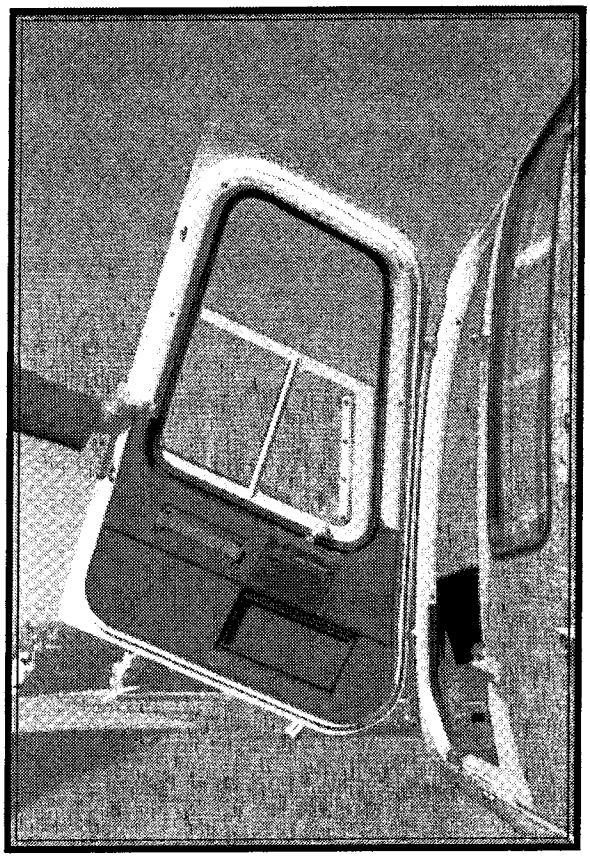
Between the doors on the right side is a p approximately 25 inches (63 centimet wide, with a large, single-pane windo Between the large doors on the left side is the fifth, narrower door. It is hinged forw and carries the hinges for the large aft doo also has a large single pane window. When the a door is open and the narrower panel door is unlatched, the two open together expos g the whole left side of the passen compartment.



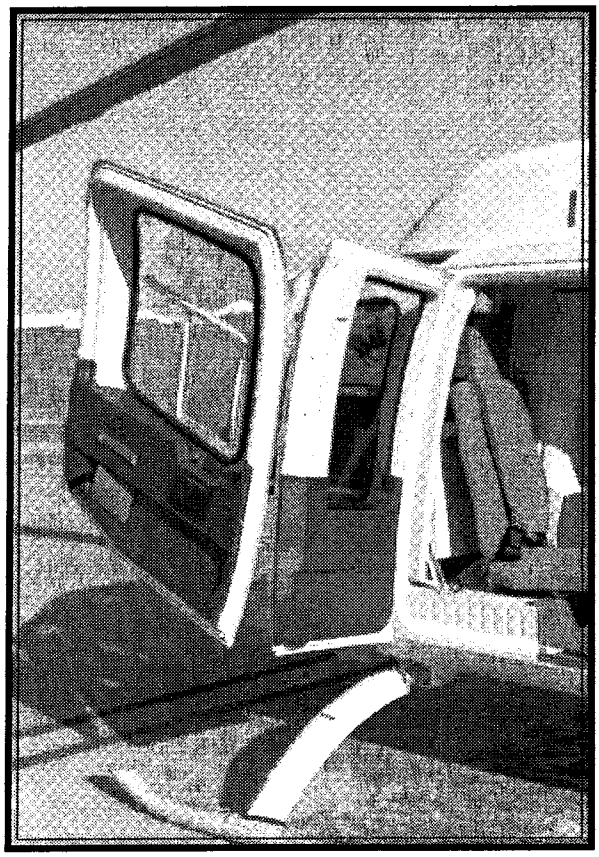
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-44

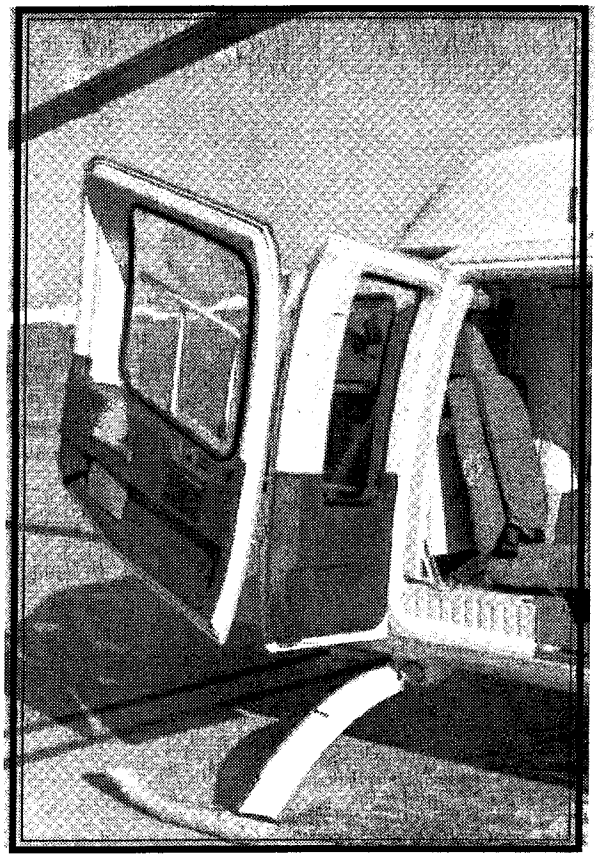


-45



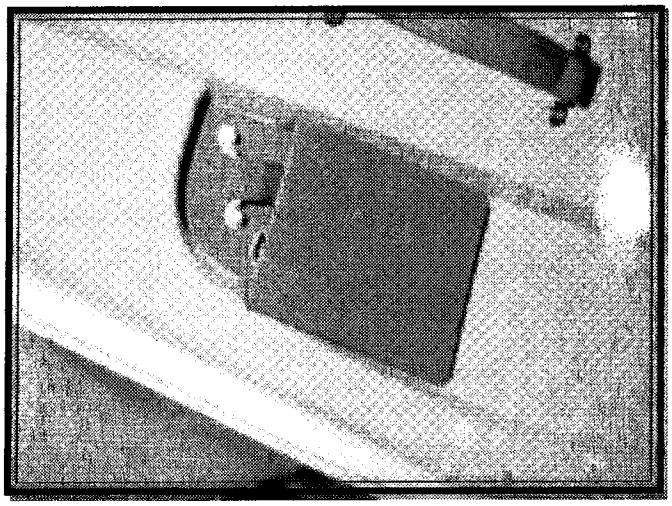
-47

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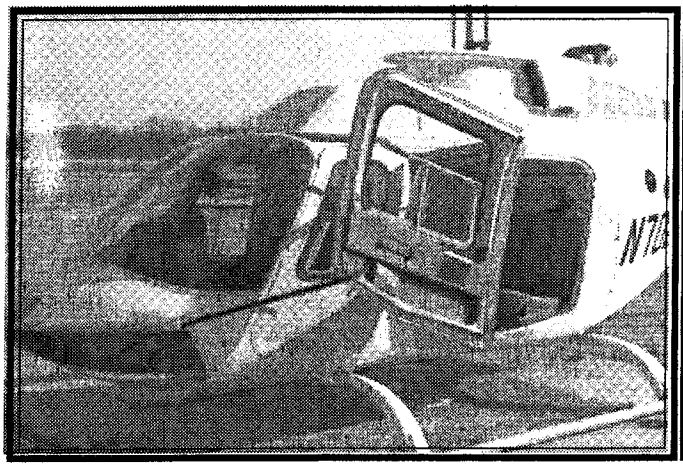


Double Door - 49

A strap is used to hold the double door open and to prevent damage by the wind. When not in use the strap is conveniently stowed in a pocket on the rear door.



Stowed Strap - 51



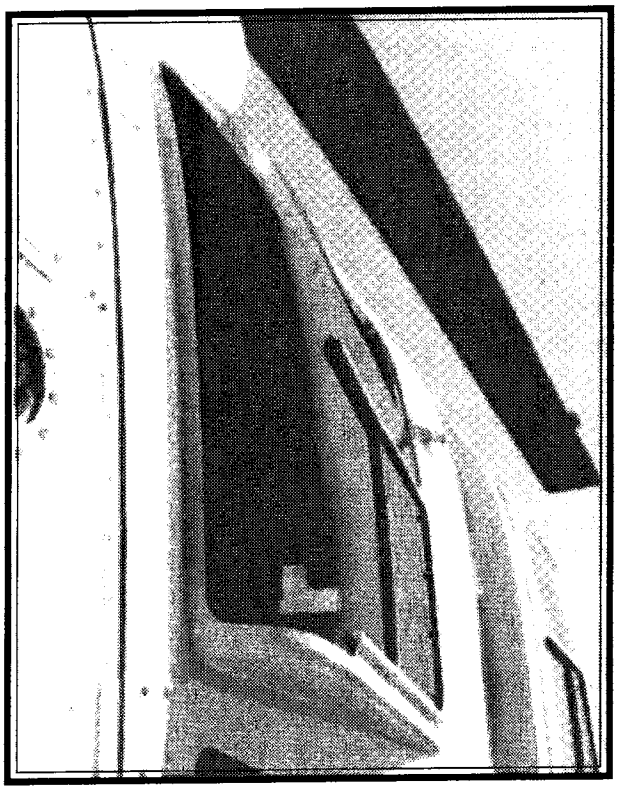
Door Held Open - 50



Any or all of the doors can be removed if mission requirements so dictate. Any flight limits imposed are detailed in the flight manual. -52

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The windows in the two aft doors are bulged. These provide approximately 4 inches (10 centimeters) of additional shoulder room on each side and a comfortable armrest on the window sill.

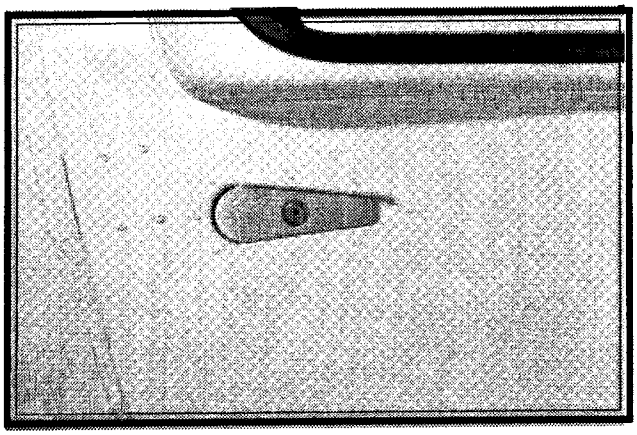


-53

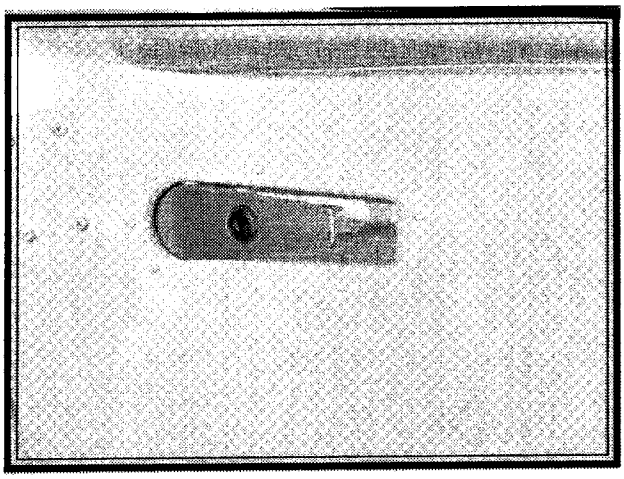
The four large doors each have a slam closing feature and a dual-point latching system.

The exterior **handles** are recessed so that they are flush with the door surface. They are long and are hinged at the aft end so that they are easy to operate.

The interior handles are set into the window sills. A pull-up motion opens the door.



Outside Handle Closed - 55



Outside Handle Open - 56

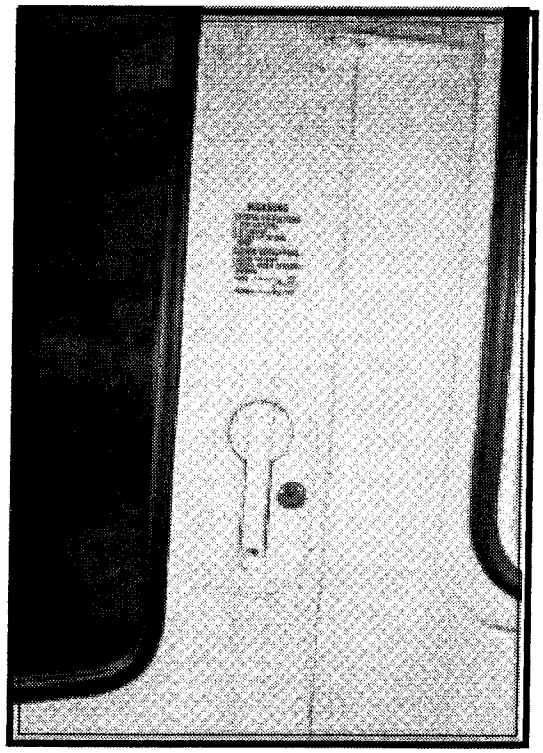


Inside Handle - 57

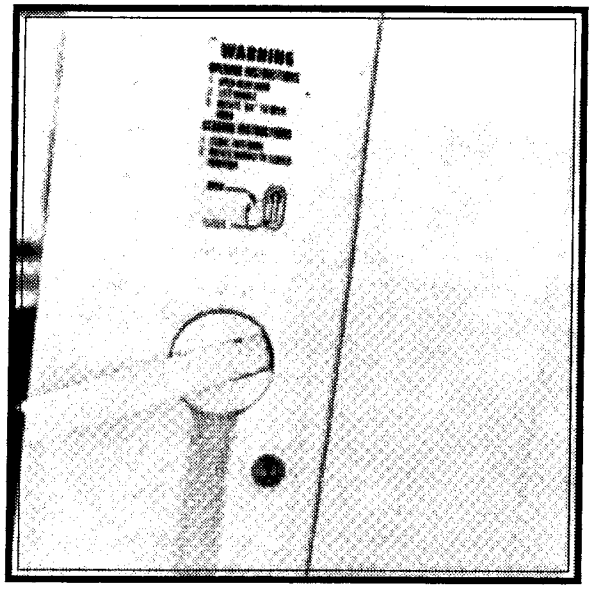
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A long horizontal vinyl strap is used to pull the door closed. A downward motion on the handle, after the door is closed, secures the system.

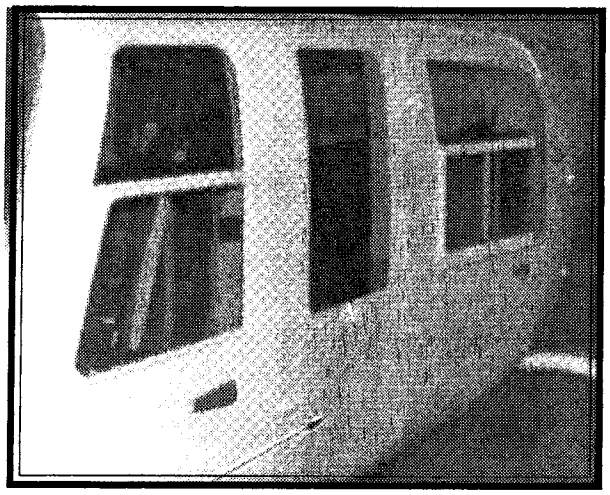
The exterior handle for the narrow door is also flush mounted. It is hinged vertically and turns 64 deg to the left to open.



Panel Door Handle - Closed - 59



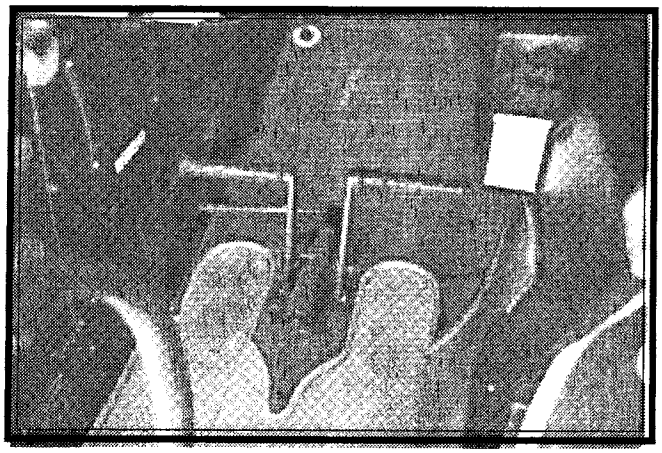
Panel Door Handle - Open - 60



Panel Door - 61

The narrow panel door cannot be opened from the inside since it has no interior handle.

All five doors can be locked from the outside with one key. The key must be used for each. Once locked, the door cannot be opened from the inside.



Metal Sills - Metal Floor Plates - 62

All **door sills** are trimmed in metal.

The door openings have effective **rain seals** and a **rain gutter** extends along the fuselage immediately above the doors on both sides.

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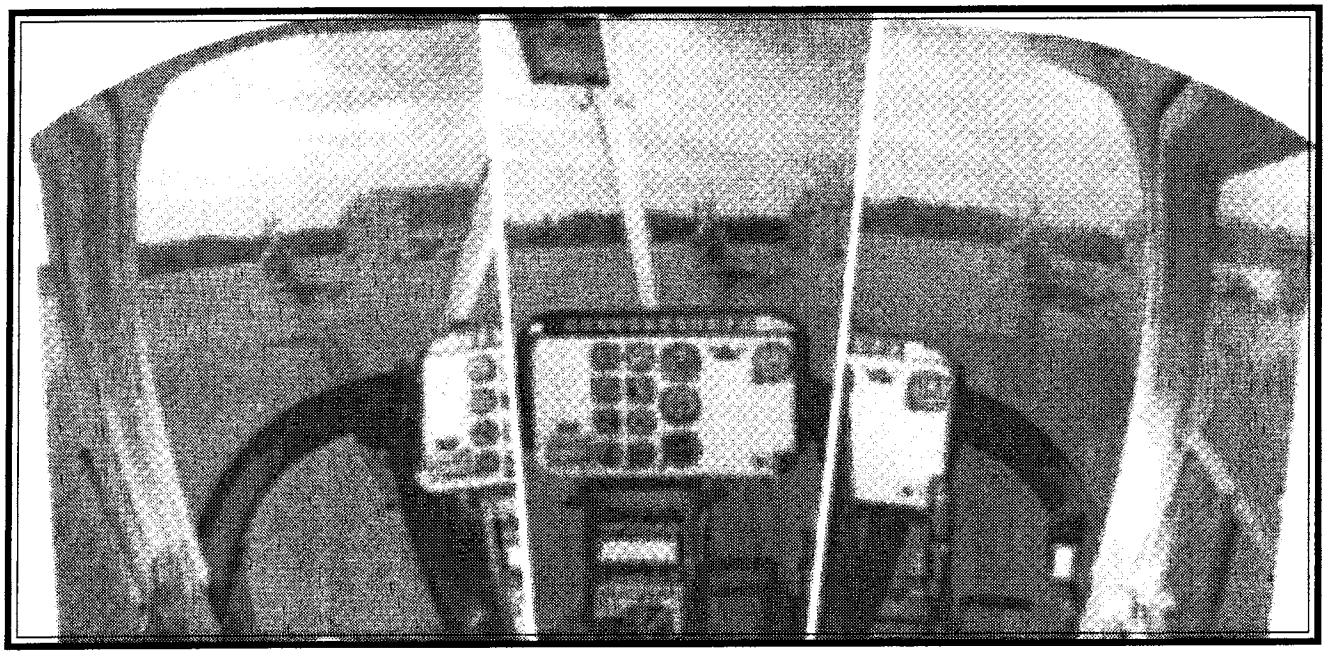
VISIBILITY is excellent. The two large windshields are separated by a very narrow center post assembly. The door window, a pair of large chin bubbles and a pair of skylights, complete the "all around" visibility. All the windows (except windshields) and chin bubbles are made of blue-tinted cast acrylic.



Excellent Visibility - 63

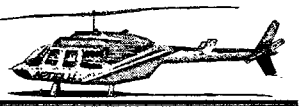
The two **skylights** are of polycarbonate and have a heavier tint. The tint provides comfortable shielding from direct sunlight without interfering with the excellent visibility from all seats.

Drain holes with rubber plugs are provided in both chin bubbles to aid in keeping the bubbles clean.



-64

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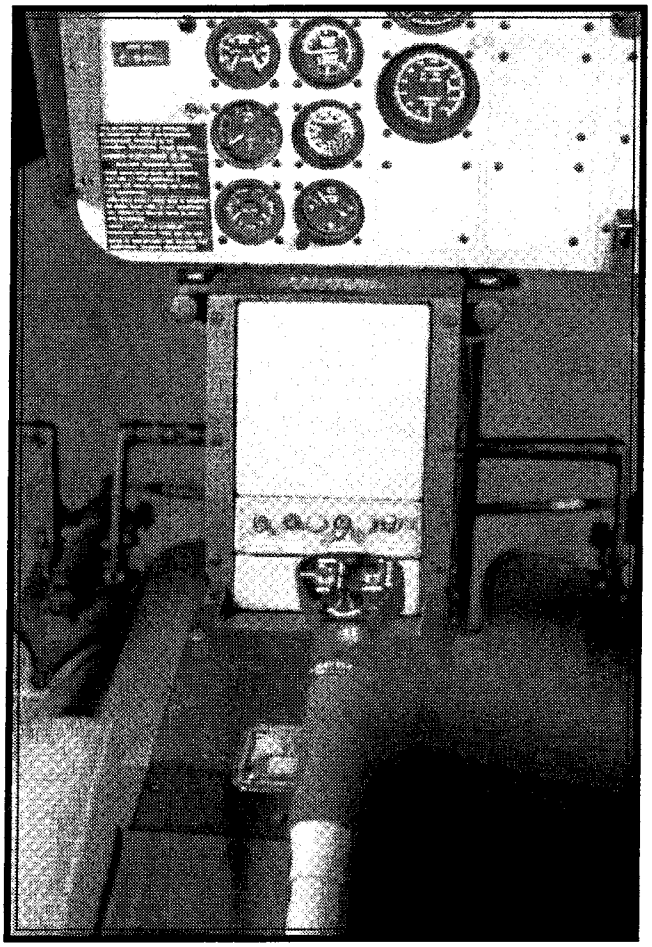


THE PILOT'S STATION

The pilot's station is on the right to permit simple access to avionics and center console. Since the pilot's right hand will be occupied with cyclic control, the pilot's left hand is free to tune avionics

The pilot enters the crew compartment by the right front door.

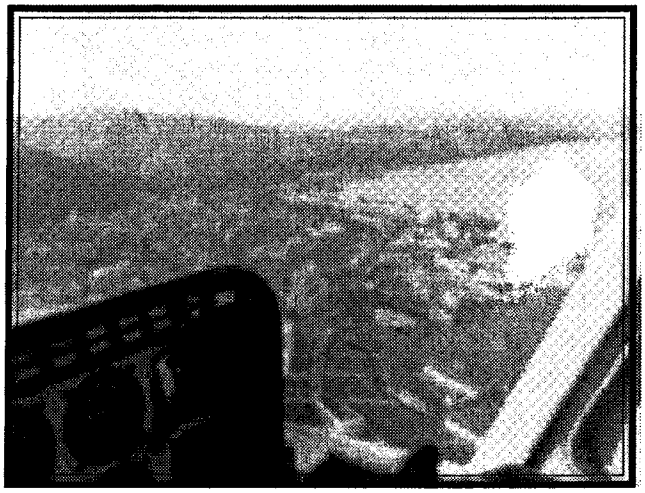
The entire pilot's work space is engineered for **efficiency and comfort**. It is roomy.



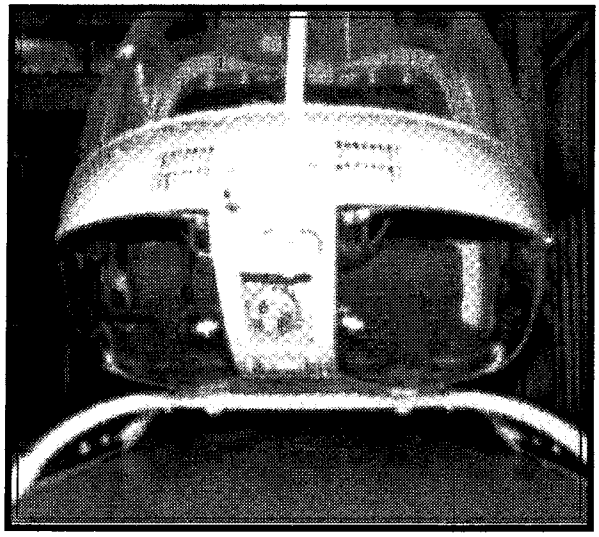
Pilot's Station with Optional Instruments and Avionics - 65

The seat is well designed. **Visibility** through the large windshields, chin bubble and door windows is excellent. In spite of the expansive curved surfaces, distortion is minimal. The flight controls are placed for optimum convenience.

Directional pedals can be adjusted for leg length and the instrument panel, radio pedestal and overhead console are centrally located: all within easy view and reach.

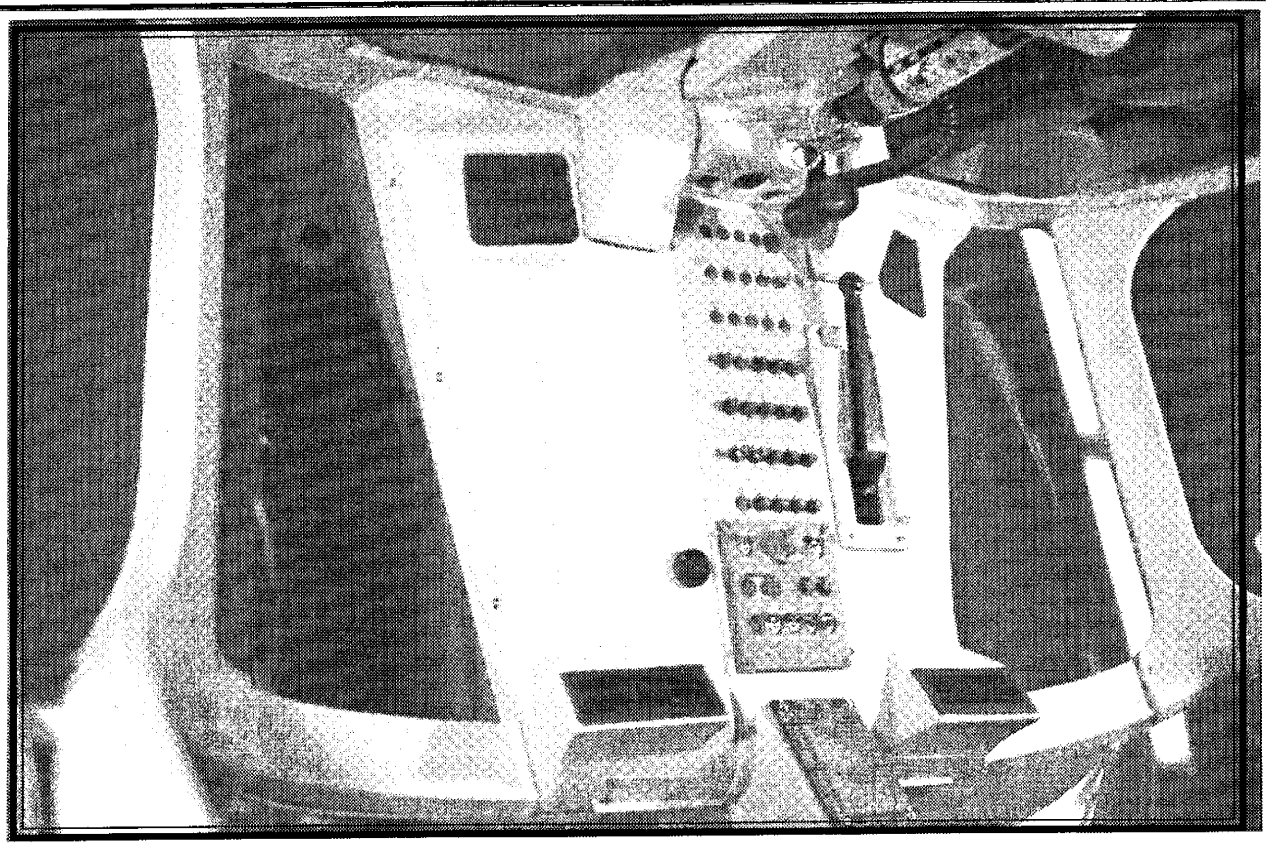


Forward Visibility - 66

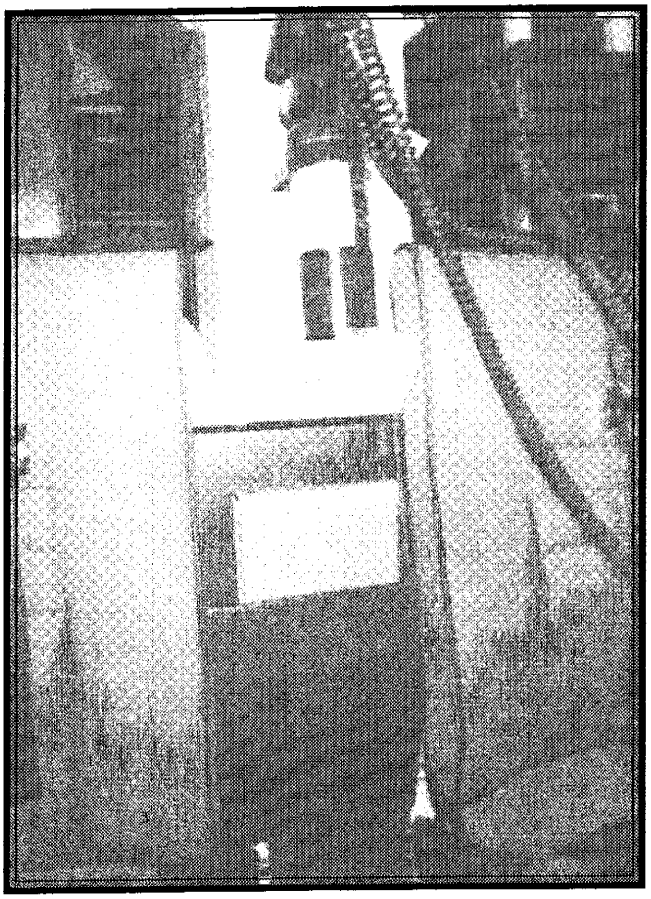


Large Chin Bubbles - 67

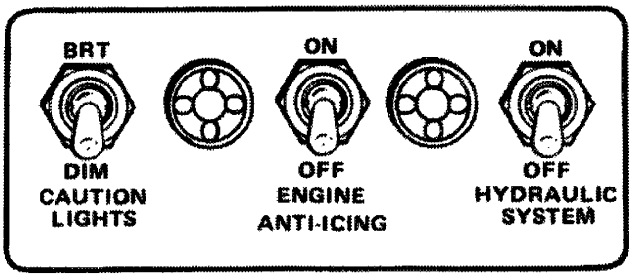
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Skylight & Overhead Console - 69

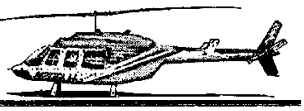


Fire Extinguisher and Map Case - 68



Miscellaneous Control Panel - 70

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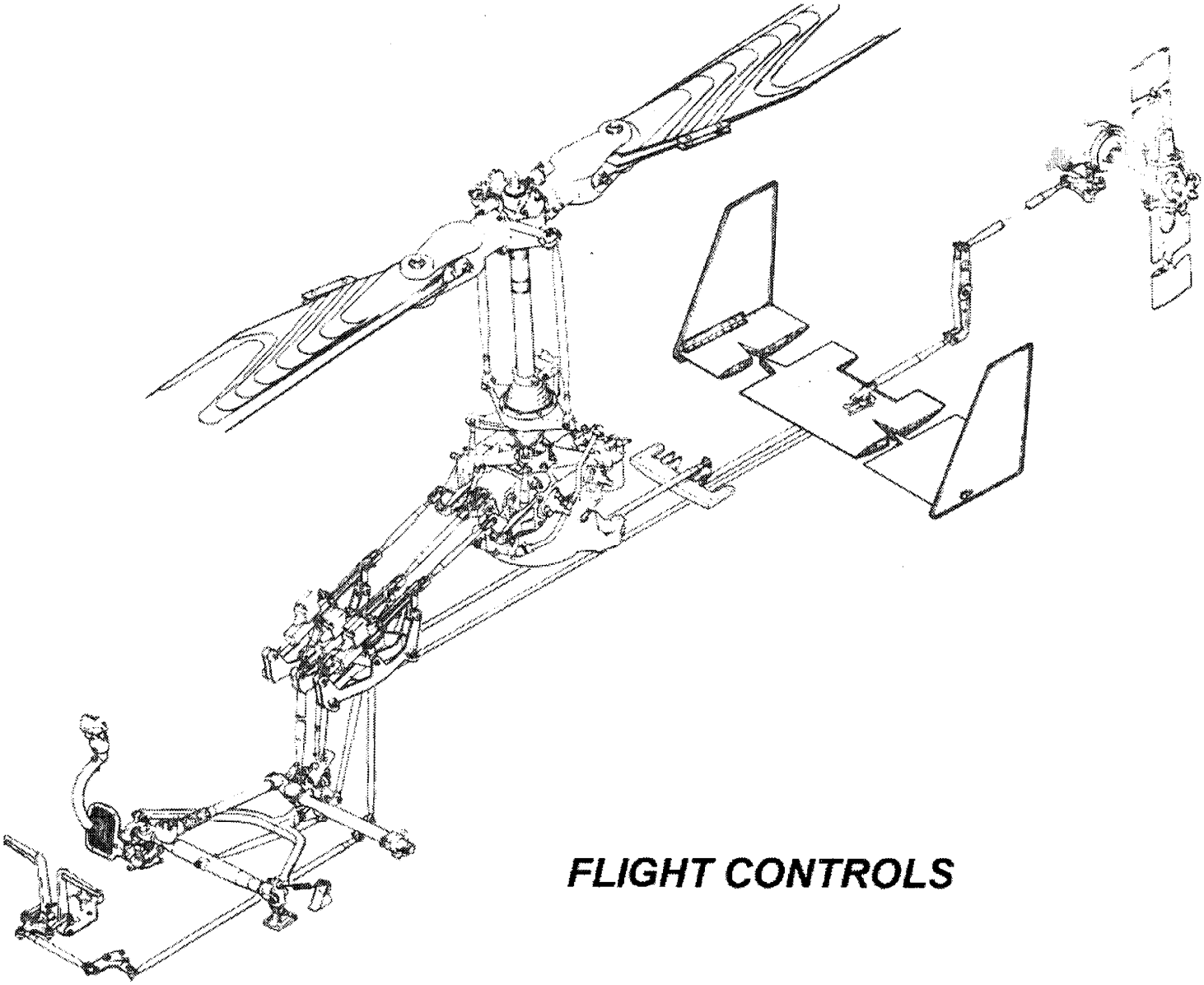


To the pilot, good flying qualities mean responsive control, good stability, ease of handling and excellent maneuverability. The LongRanger has these qualities.

Flight controls are conventional. They consist of a cyclic and a collective flight control stick and directional (antitorque) pedals.

The flight control system is a **mechanical linkage**, using push-pull control tubes and bell cranks rather than cables. When adjustments are required, they are simple, easily made and remain very stable.

Self-aligning and rod-end bearings are the spherical type and require no lubrication.



FLIGHT CONTROLS

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The cyclic control stick provides the LongRanger with fore and aft and lateral control. Fore and aft cyclic control is also synchronized through a non-boosted push-pull linkage to the elevator.

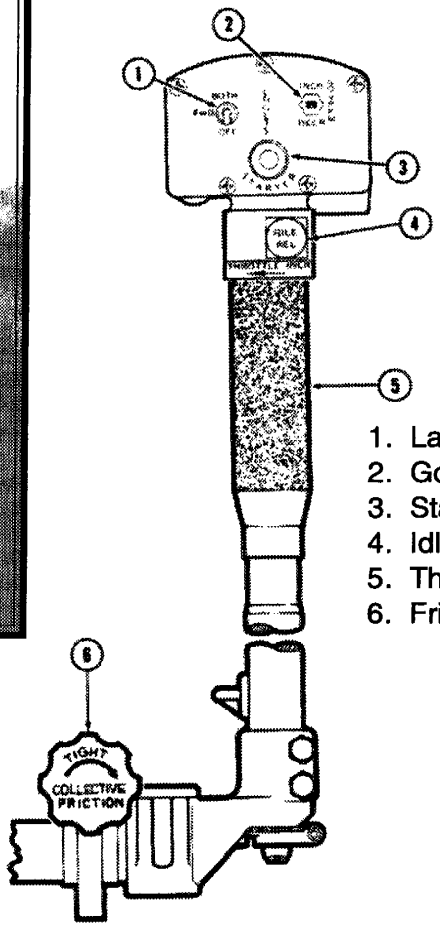


Cyclic Control - 71

The cyclic control stick is centrally located on the pivot assembly on the floor under the pilot's seat. From there, it extends upward in a forward arc through the vertical face of the seat support structure. It is of a convenient length and it has a comfortably shaped grip for the pilot's right hand.

The stick contains a two position trigger switch for radio transmission and intercommunication. The force required to move the stick can be adjusted by turning the friction knob located near the base of the stock on the left side.

The **collective control** stick gives the LongRanger up and down movement. The control stick is located at the pilot's left side. It contains the twist grip throttle and terminates in a small control panel. The panel contains the starter button, the RPM adjustment and the landing light switch and has provisions for the switches associated with the optional emergency float kit.



1. Landing Light Switch
2. Governor RPM Switch
3. Starter Switch
4. Idle Stop Release Button
5. Throttle
6. Friction Knot

Collective Stick

Both the cyclic and collective have ample space provision for switches to control optional equipment.

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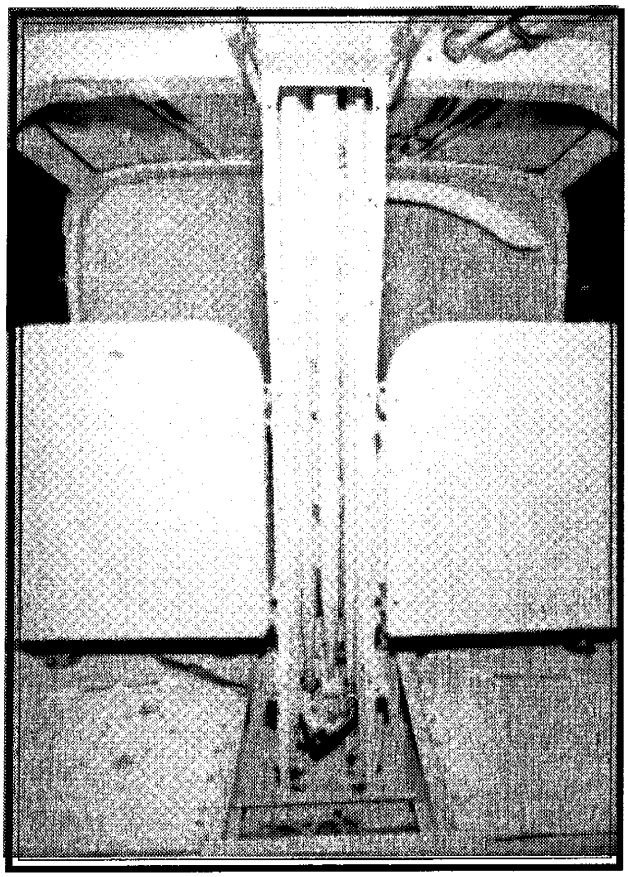
A detent prevents the throttle from being inadvertently closed beyond idle. An idle-stop release button mounted on the stick just above the throttle overrides the detent and allows the throttle to be fully closed.

Force to move the stick can be adjusted by turning the friction knob which is located at the base of the stick on the left side.

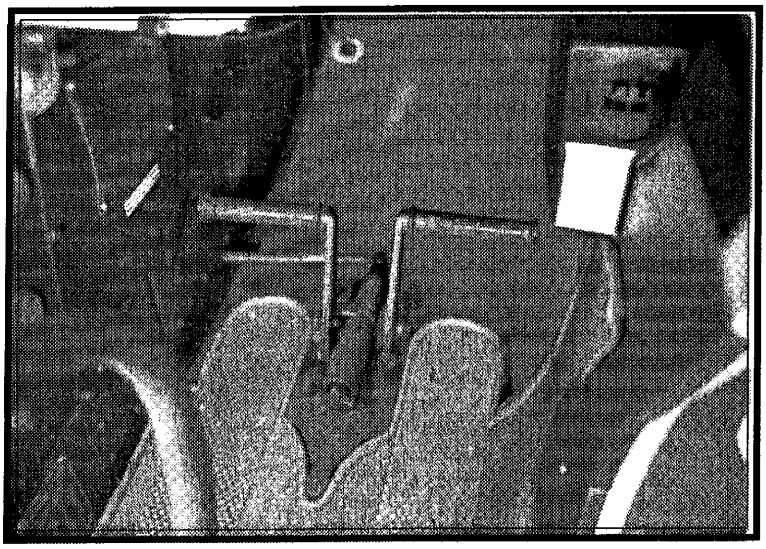
The throttle is not used during flight. Rotor speed is controlled automatically throughout all changes of power (rotor pitch changes). The RPM adjustment button enables the pilot to make fine adjustments to the rotor speed governor, up or down.

The **directional pedals** control the heading of the LongRanger. These can be adjusted for leg length by turning the knob located between them.

All the **control tubes** from the three flight controls are routed under the crew seat bench where provisions for dual controls are added.



Control Tubes Exposed - 73



Directional Pedals - 72

Five control rods continue up to the roof through the vertical control tunnel: two for the cyclic, and one each for the synchronized elevator, the collective and the directional control.

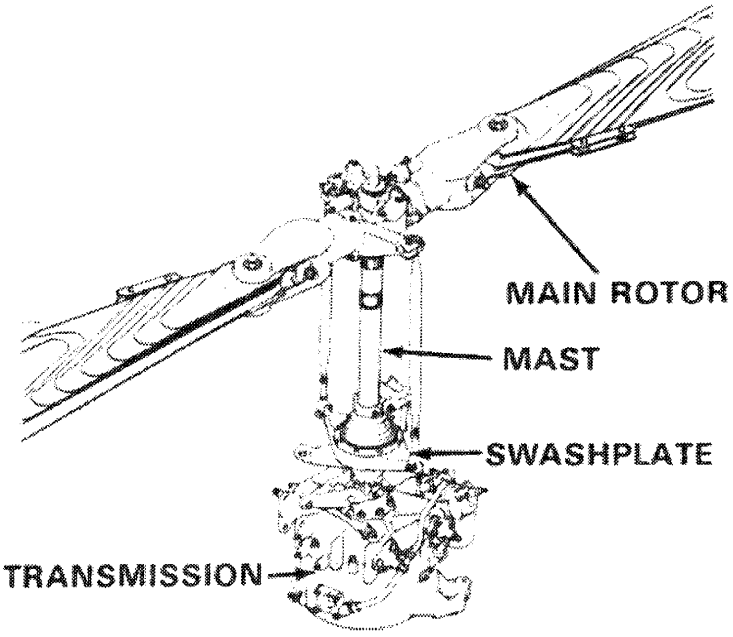
On reaching the roof, the two rods from the cyclic control and the single one from the collective control are each connected to a hydraulic servo actuator. These three servo actuators boost the pilot's input and thus reduce the effort required to fly. They also prevent forces that originate in the rotor, such as those created by gusts, from feeding back to the pilot.

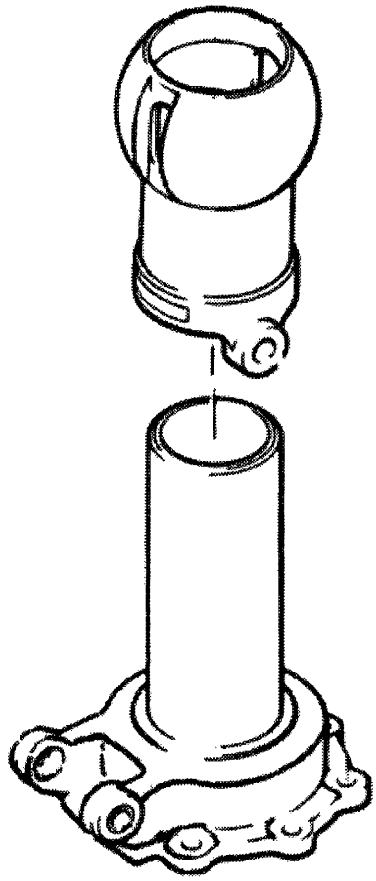
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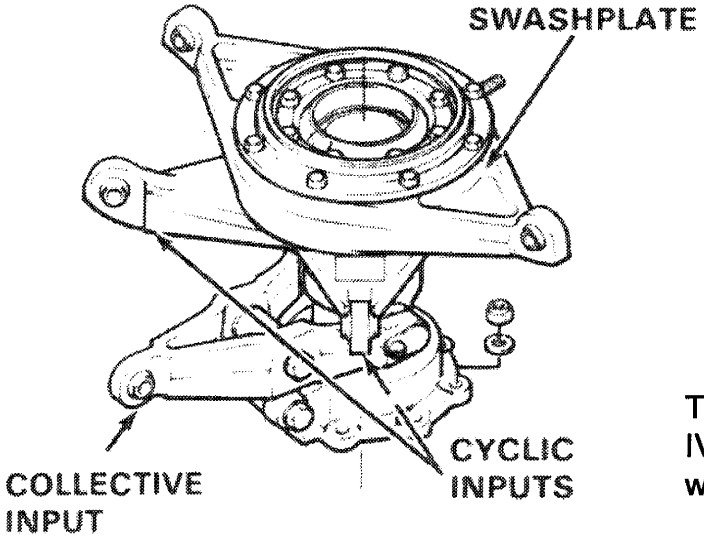
The servo actuators are mounted on the cabin roof just forward of the transmission. They transmit the boosted cyclic and collective inputs directly to the swashplate.

The **swashplate**, with its non-rotating inner ring and rotating outer ring, is the interface between the flight control systems of the cyclic and collective and the main rotor.

The swashplate can be titled in any direction by control tubes reacting to the cyclic stick input. Collective inputs are similarly transmitted to the swashplate by raising or lowering it.







The **uniball and sleeve** of the LongRanger IV is coated with tungsten carbide to reduce wear.

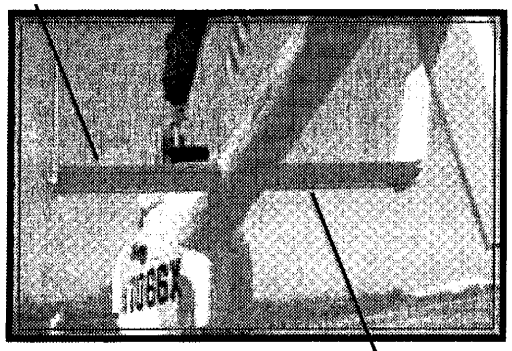
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The inputs to the swashplate are transferred to the main rotor by tubes that connect the swashplate to the pitch horns on the blade grips.

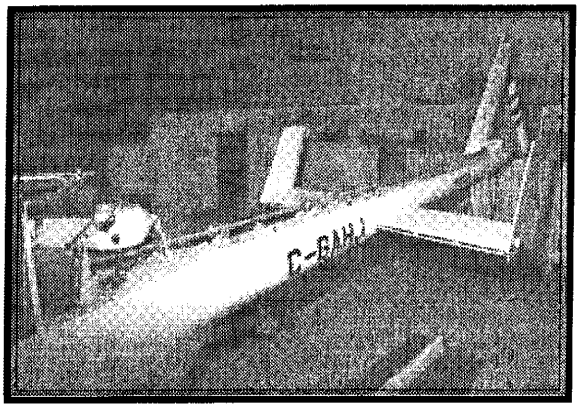
Push-pull action on the pitch horns changes the pitch of the main rotor blades.

The fixed **horizontal stabilizer** has a two-piece full-length **synchronized elevator**. The control rod linking it to the cyclic fore and aft motion is routed to the roof and then aft to the stabilizer through the tail boom. The input is not boosted. The elevator horn is on the rod that connects the two halves of the elevator and has a shear joint to safeguard the flight controls against elevator jamming.

The synchronized movement of the elevator maintains a near level fuselage throughout a wide speed range.



Horizontal Stabilizer - 78

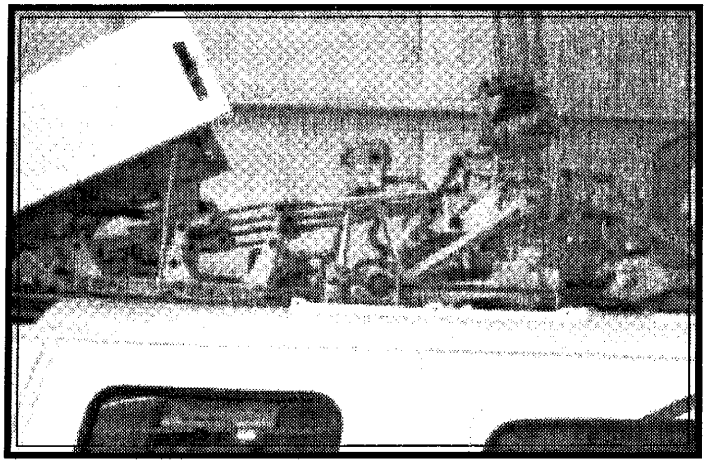


Horizontal Stabilizer Leading Edge Slat - 74

The **directional pedal input** is not boosted and feedback forces from the tail rotor are so slight that no hydraulic assist is required. The control rod from the pedals is routed to the roof and then directly back to the tail rotor. The pedals change the pitch of the tail rotor blades collectively to offset the main rotor torque and to provide directional control input to the helicopter.

HYDRAULIC SYSTEM

The **hydraulic system** provides the power required by the three servo actuators to boost the pilot's cyclic and collective inputs. It has no other function.

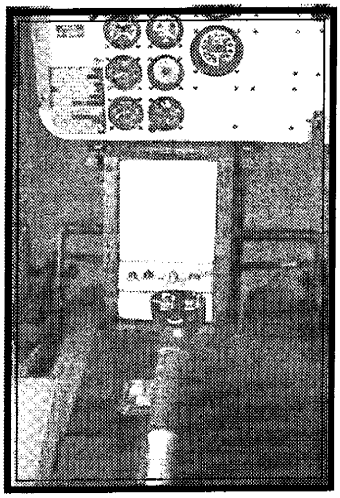


Hydraulic Actuators - 78

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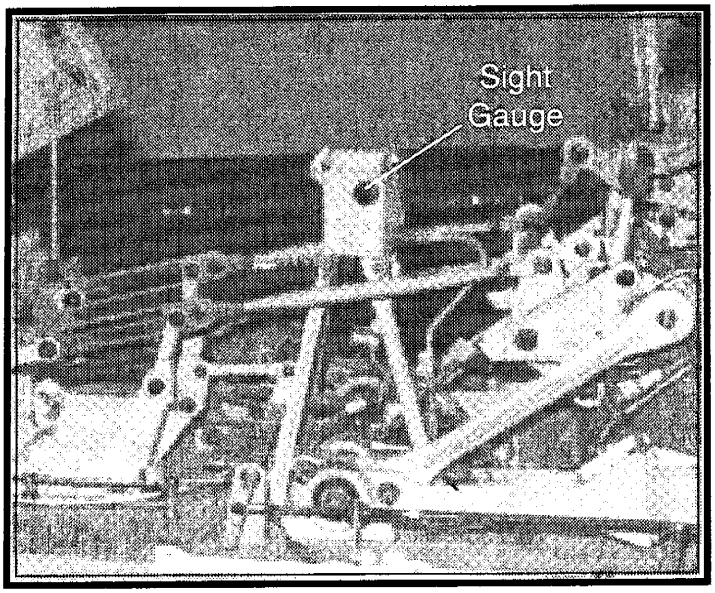
The complete system is conveniently located on the roof forward of the transmission. The pump is mounted on and driven through the rotor tachometer generator on the transmission. Since it is constantly driven it provides continuous hydraulic power to the actuators whenever the rotor is turning. Each actuator is connected to a manifold which is fed from the pump. This permits the other two to continue functioning if a total blockage should occur in one.

In addition, when the hydraulic system switch on the radio pedestal is turned off, a solenoid is electrically energized which stops the hydraulic pressure to all the actuators and reroutes the fluid back to the reservoir. Thus, if a hydraulic malfunction occurs, the pilot can isolate the actuators from the system.



Hydraulic ON-OFF Switch - 80

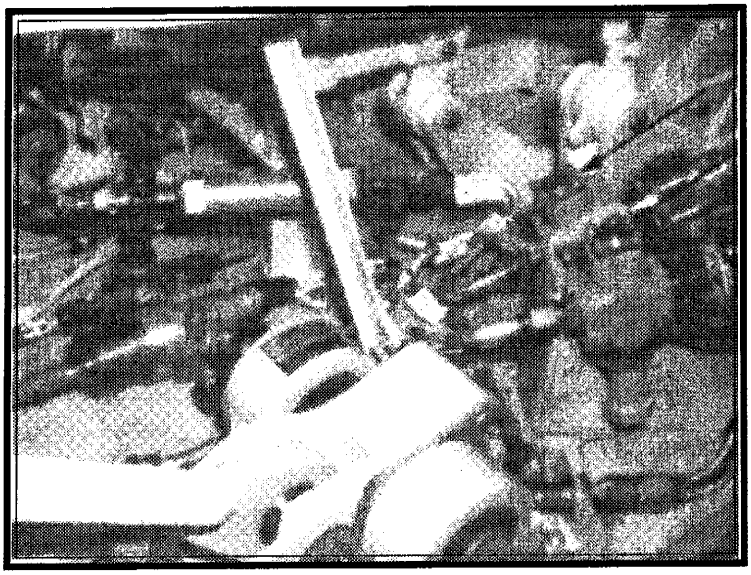
With the system turned off the flight controls can still function effectively. The motions remain the same, the rate at which they can be changed decreases slightly, however, the force required by the pilot increases. The flight can be continued, regardless of duration because the feedback through the controls is not excessive. For this reason a backup system is not required.



Hydraulic Reservoir - 81

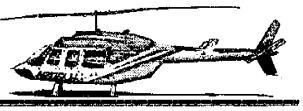
If, for any reason, pressures build up too high, a relief valve opens to allow the excess to bypass the actuators, thus preventing pressure damage.

Two filters are installed: one on the pressure line and one on the return. Both have a red "pop-up" button to visually indicate clogging. When clogging occurs a valve opens in the return filter assembly to allow the fluid to bypass and return directly to the reservoir.



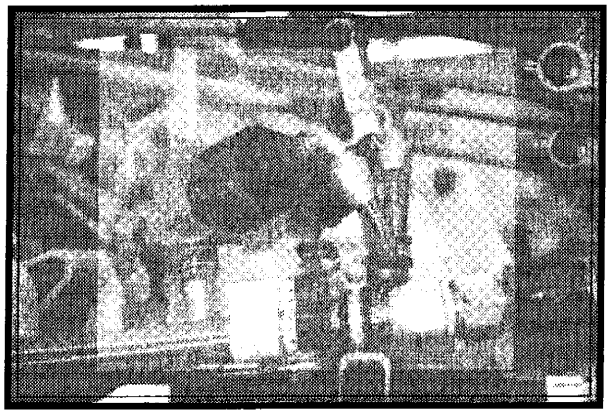
Hydraulic Filters - 82

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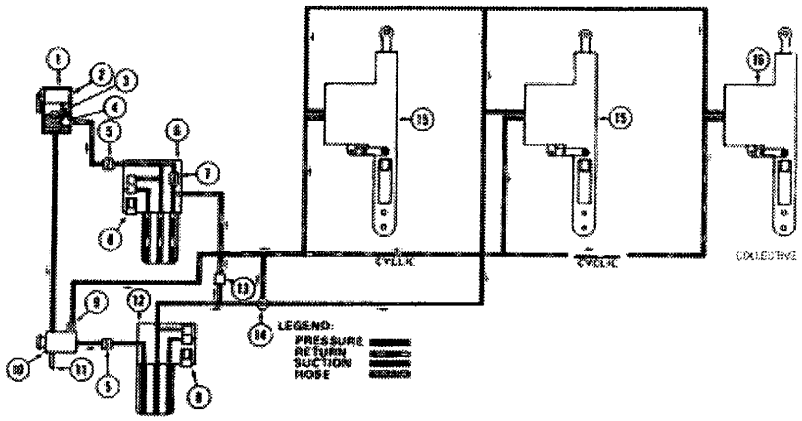


The small magnesium-alloy reservoir is mounted on a bracket forward of and just above the pump. It has a convenient full-size strainer in the lid to make filling easier and it has a sight glass to allow a quick visual check of the hydraulic fluid level.

Two quick-disconnect couplings are provided, on the side of each filter farthest from the actuators, so that a hydraulic auxiliary power cart can quickly and easily be connected to replace the pump and reservoir for ground maintenance. The couplings automatically prevent loss of fluid when they are disconnected.



Quick Disconnects - 83



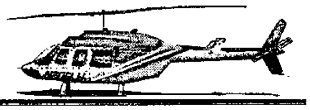
HYDRAULIC SCHEMATIC

1. Reservoir
2. Screen Vent
3. Sight Glass
4. Internal Baffle
5. Quick Disconnect Coupling
6. Return Filter
7. Filter Bypass Relief Valve
8. Differential Pressure Indicator
9. Check Valve
10. Pump
11. Pump Seal Drain
12. Pressure Filter
13. Relief Valve
14. Solenoid Valve
15. Cyclic Servo Actuators
16. Collective Servo Actuator

HYDRAULIC SYSTEM

System Pressure	Normal	1000 ± 25 psi (6895±172 kilo-pascals)
System Capacity		65 in^3 (1065 cm^3)
Reservoir Capacity		40 in^3 (655 cm^3)

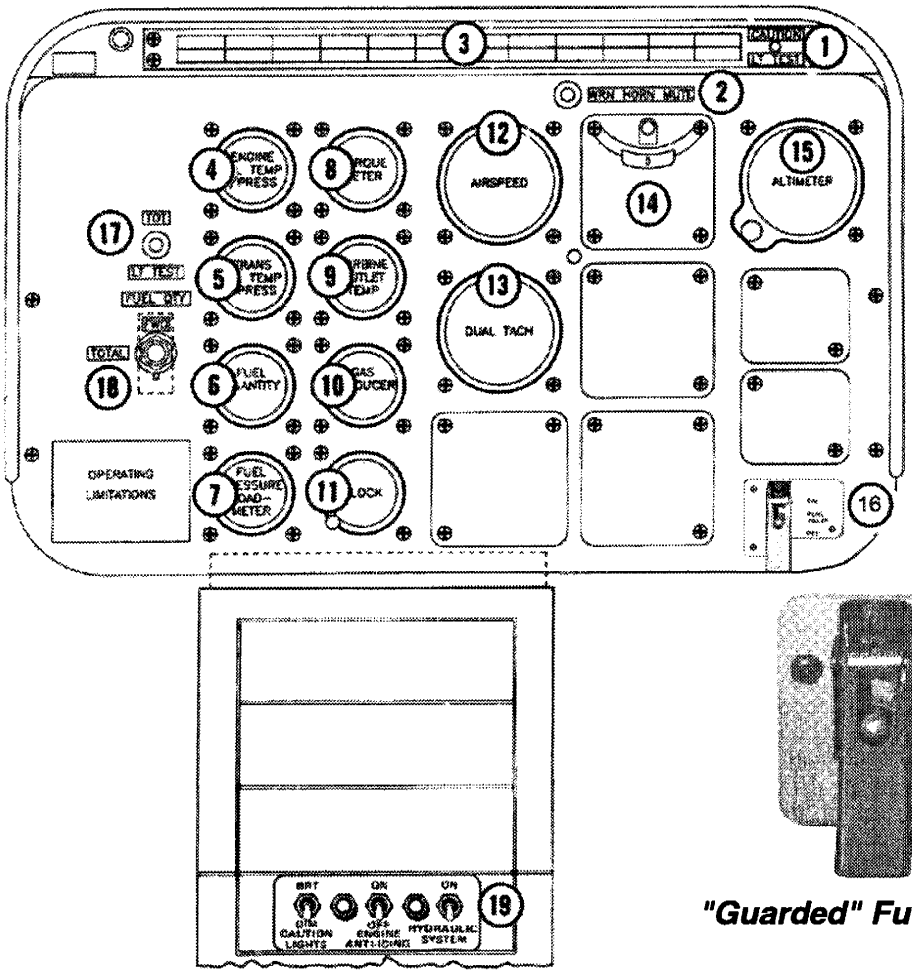
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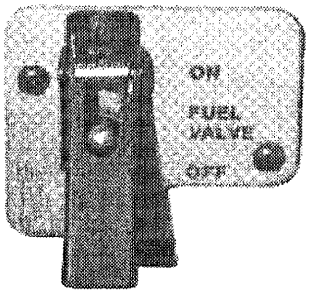


THE INSTRUMENT PANEL

The **instrument panel** in the standard LongRanger has the basic flight and engine instruments with ample space to add a wide selection of options. Visibility forward and to the side is excellent due to the panel's low, compact design.

Space saving in the panel is obtained by using small gauges for the engine and transmission, by combining instruments, and by substituting caution lights for gauges.





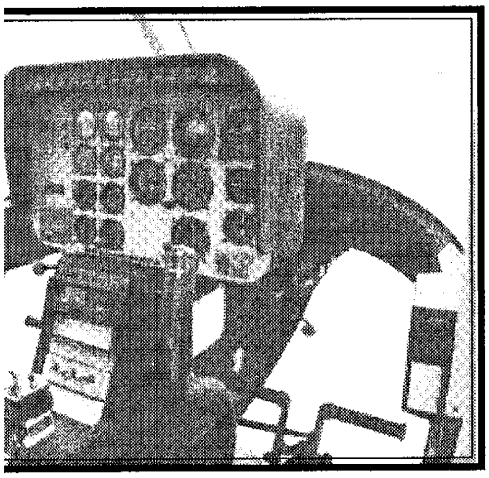
"Guarded" Fuel Valve Switch

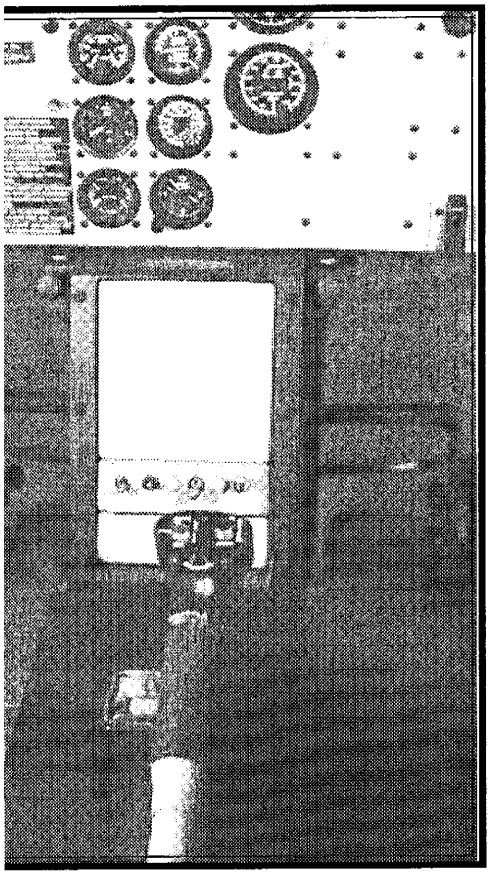
INSTRUMENT PANEL AND CONSOLE (BASIC PANEL)

1. Caution light test button
2. RPM warning horn muting switch
3. Caution/warning panel
4. Engine oil temperature/pressure gauge
5. Transmission oil temperature/pressure gauge
6. Fuel quantity gauge
7. Fuel pressure/DC loadmeter
8. Torquemeter
9. Turbine outlet temperature gauge
10. Gas producer tachometer
11. Clock
12. Airspeed indicator
13. Dual tachometer
14. Inclinometer
15. Altimeter
16. "Guarded" fuel valve switch
17. TOT light test button
18. FWD (forward) qty switch
19. Miscellaneous control panel

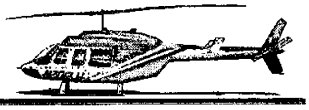
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a console shroud to reduce glare.
nts on both sides permit air
The panel is hinged along the
so that the whole instrument
can easily be opened for inspection
e. Three studs remove the console
re studs let the panel hinge down.

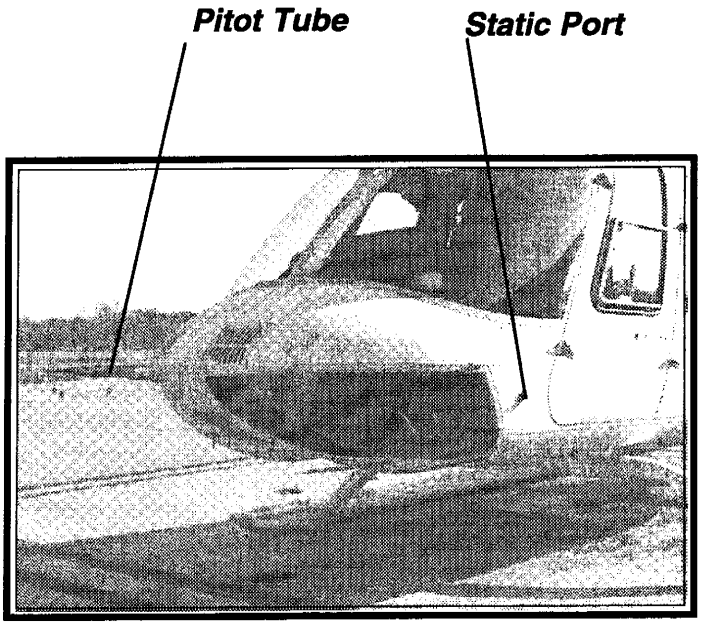




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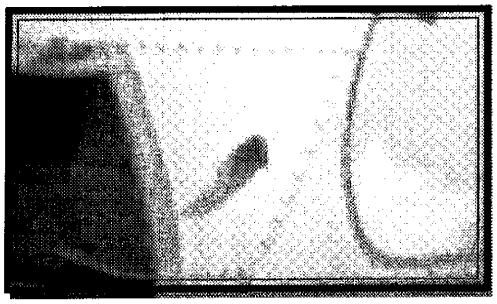


Integral **white instrument lighting** and the edge-lit switch panels can be controlled by a dimming switch in the overhead console.

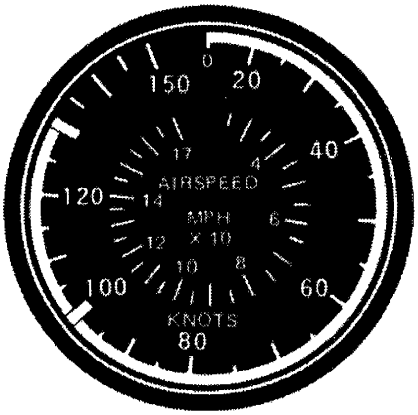


-93

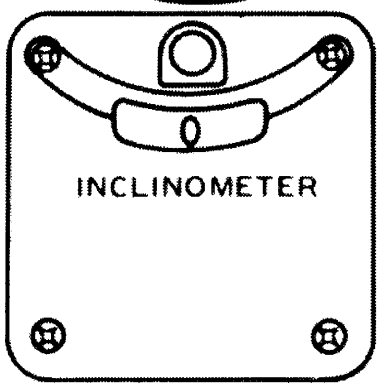
The **pitot tube** is mounted externally on the forward part of the nose section just to the right of the helicopter centerline. It supplies impact air to the airspeed indicator. Two **static ports** are mounted, one on each side of the fuselage, just forward of the crew doors. They provide static air pressure for the altitude and airspeed indicators.



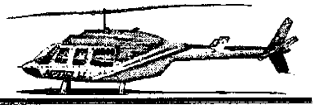
The **airspeed indicator** is a standard 3 inch (7.6 cm) instrument indicating in knots and miles per hour, up to 150 knots, 170 m.p.h..



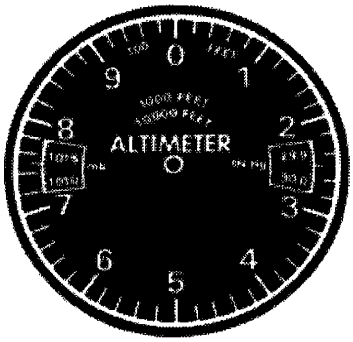
The **inclinometer** is a curved glass tube and ball indicating level flight and coordinated turns. The centered ball indicates directional balance either in a turn or in straight and level flight. If the helicopter is yawing or slipping the ball will be off center.



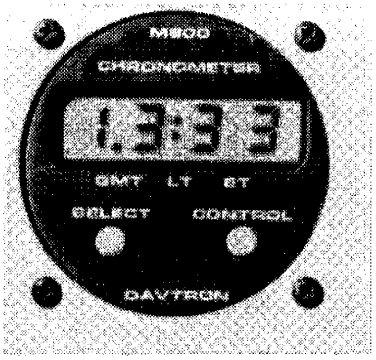
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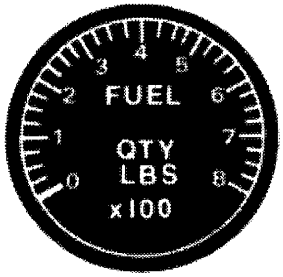
The **altimeter** is a static air vented system indicating altitude of the helicopter in feet above sea level from minus 1000 to plus 20,000 feet. It is calibrated in both inches of mercury and millibars and is 3 inches (7.6 cm) in size. An external knob is provided to make compensation for variations of barometric pressure.



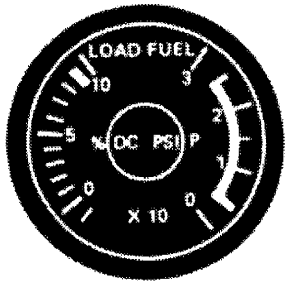
The **pilot's clock** is a multi-function, digital display, quartz crystal chronometer. Functions available include: Greenwich Mean Time (GMT), Local Time (LT), and three Elapsed Time (ET) counters. When the helicopter power is de-energized, timing reference is maintained by a 1.5 volt (AA type) battery on the back of the clock case.



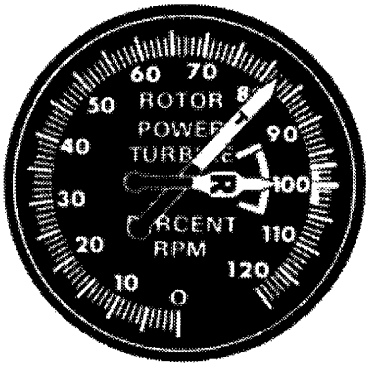
The **fuel quantity gauge** indicates the amount of fuel in pounds. The normal gauge indication is the total of all fuel cells. When the FWD (forward) fuel quantity switch is held closed, the gauge indicates only *the two forward* fuel cells.



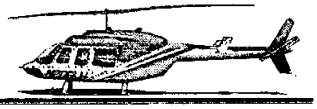
The **fuel pressure and loadmeter** gauge indicates the fuel pressure to the engine in pounds per square inch and the electrical output of the dc generator in percentage of its rated load of 180 amperes.



The **dual tachometer** indicates engine power turbine RPM and main rotor RPM, in percentage. The two needles use the same scale. Electrical AC power to operate the instrument comes from the rotor and power-turbine tachometer generators.

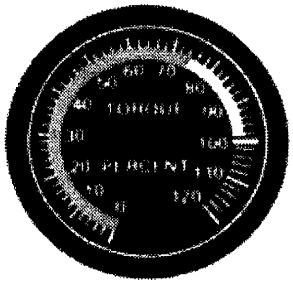


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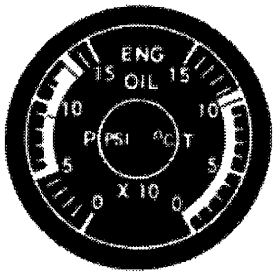


The **engine instruments** are grouped down the center of the panel.

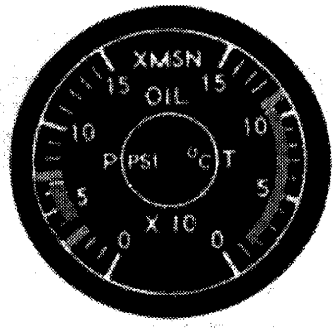
The **torquemeter** is a wet-line type displaying the torque output of the engine in percentage of maximum allowable torque.



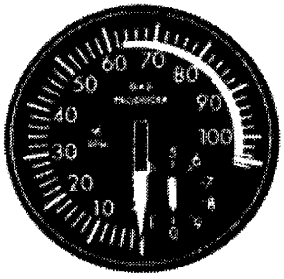
The **engine oil pressure and temperature gauge** is a dual, wet-line type which indicates the engine oil pressure in pounds per square inch on one side and the temperature in degrees Celsius on the other.



The **transmission oil pressure and temperature gauge** is a dual, wet-line type which indicates the pressure in pounds per square inch on one side and the temperature of transmission oil in degrees Celsius on the other.



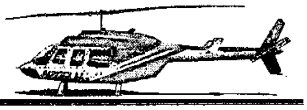
The **turbine outlet temperature (TOT) gauge** is a servo type with an expanded scale. It indicates the turbine outlet temperature in degrees Celsius sensed by thermocouples mounted at the gas producer turbine outlet of the engine. The needle goes to zero when power is shut off. A red warning light is incorporated on the face of the TOT indicator. It will illuminate if the turbine outlet temperature is between 828 and 927°C for 10-12 seconds or exceeds 927° C longer than 1-1/2 seconds. It will remain illuminated until power is removed or the circuit is reset by the technician. If not reset, the light will come on any time power is applied. The TOT LT TEST button on the left side of the instrument panel confirms the sensing circuit is functional.



The **gas producer tachometer** indicates the gas producer speed (N_1) in percentage of RPM. A second needle with its own scale reads in tenths of a percent.

Electrical AC power to operate the instrument comes from the gas-producer tachometer generator.

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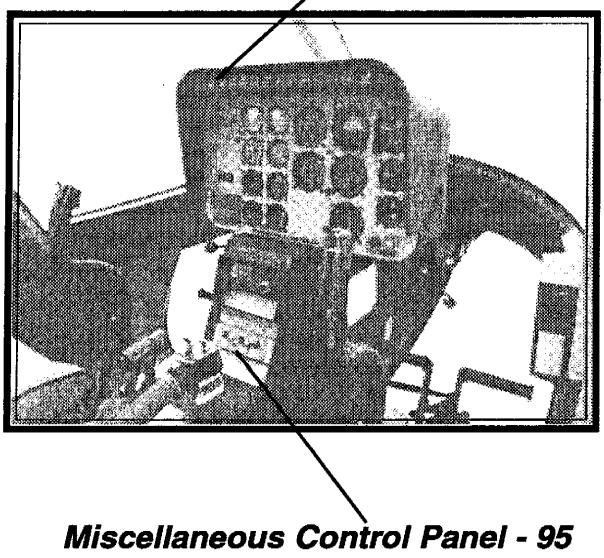


CAUTION PANEL

The **caution panel** is located across the top of the instrument panel. It contains twenty-four modules, each containing a light which illuminates individually when a fault occurs. Each module is clearly identified with easy-to-read lettering. Fifteen are monitor circuits. Nine are spares.

⊕	SPARE	FUEL LOW	SPARE	LITTER DOOR OPEN	SPARE	GEN FAIL	R/FUEL PUMP	FUEL FILTER	ENG CHIP	BATTERY HOT	TRANS OIL PRESS	ENG OUT	CAUTION
⊕	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	L/FUEL PUMP	T/R CHIP	TRANS CHIP	BATTERY RLY	TRANS OIL TEMP	ROTOR LOW RPM	LT TEST ⊕

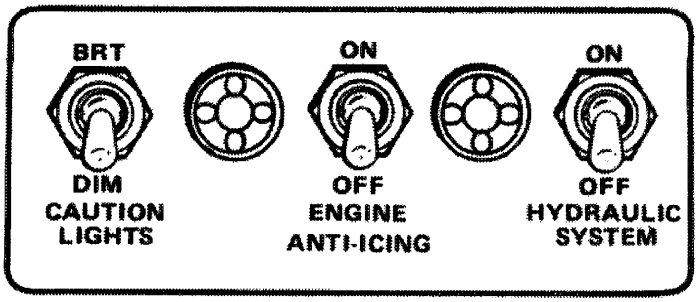
INDICATES RED WARNING LIGHT



Miscellaneous Control Panel - 95

Six of the lights illuminate when the battery is turned on: Eng Out, Rotor Low RPM, Trans Oil Press, R/Fuel Pump, L/Fuel Pump, Gen Fail. (Boost pump circuit breakers must be in the pulled position.) The others are tested by depressing one caution light test button at the right end of the caution panel.

The light intensity of all the standard indicators can be controlled by means of a DIM/BRIGHT switch on the radio pedestal and a rheostat in the overhead console. The rheostat adjusts the intensity of all instrument lighting, but affects the caution lights only if the DIM/BRIGHT switch is on DIM. A reset capability ensures that the DIM/BRIGHT switch will automatically be set to BRIGHT each time the electrical power is turned on.



Miscellaneous Control Panel

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Caution panel indications are as follows from left to right:

FUEL LOW. An amber caution light to indicate that only about 10 U.S. gal (38 liters) of usable fuel remains. It is independent of the fuel quantity system.

LITTER DOOR OPEN. A red warning light to indicate that the narrow panel door on the left side has not been securely latched. GEN FAIL. An amber caution light to indicate that the starter generator has failed or the starter relay is energized.

R/FUEL PUMP. An amber caution light to indicate that a malfunction has occurred in the right boost pump or fuel flow switch to the ejector pump.

L/FUEL PUMP. An amber caution light to indicate that a malfunction has occurred in the left boost pump or fuel flow switch to the ejector pump.

FUEL FILTER. An amber caution light to indicate that the airframe-mounted fuel filter has clogged and is in pending bypass.

T/R CHIP. An amber caution light to indicate that metal particles are on the tail rotor gearbox chip detector.

ENG CHIP. An amber caution light to indicate that metal particles are on one or both magnetic, drain-plug chip detectors in the engine.

TRANS CHIP. An amber caution light to indicate that metal particles are on either of the two transmission chip detectors or on the one in the freewheeling unit.

BATTERY HOT. A red warning light to indicate that the battery temperature is excessively high, 60°C (140°F).

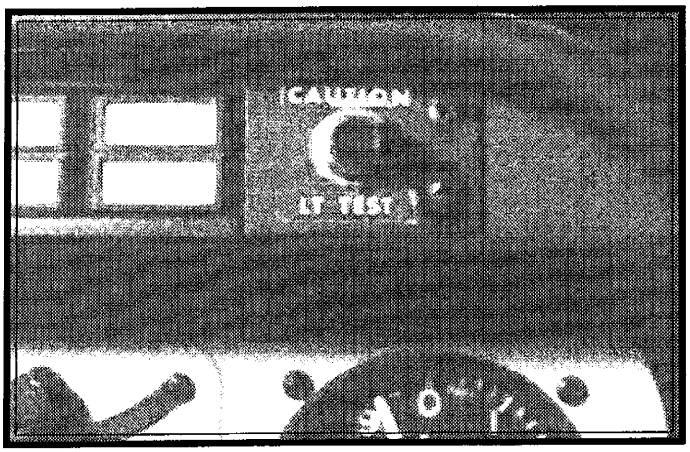
BATTERY RLY. An amber caution light to indicate that the battery relay remains energized when the battery switch is off.

TRANS OIL PRESS. An amber caution light to indicate that the transmission oil pressure is too low—below 30 + 2 pounds per square inch.

TRANS OIL TEMP. An amber caution light to indicate that the transmission oil temperature is too high.

ENG OUT. A red warning light to indicate that the RPM of the gas producer tachometer is too low—below 55 + 3%. A pulsating audio signal is also energized .

ROTOR LOW RPM. An amber caution light to indicate the rotor RPM is below 90 + 3% on the rotor tachometer generator. A steady audio signal is also energized. The warning horn mute button deactivates the audio signal when operating on the ground below 90% rotor RPM.

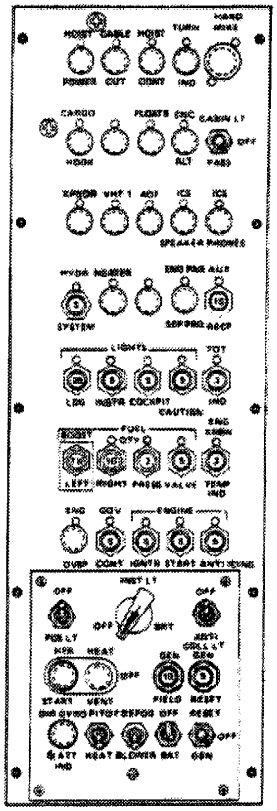


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OVERHEAD CONSOLE



Overhead Console

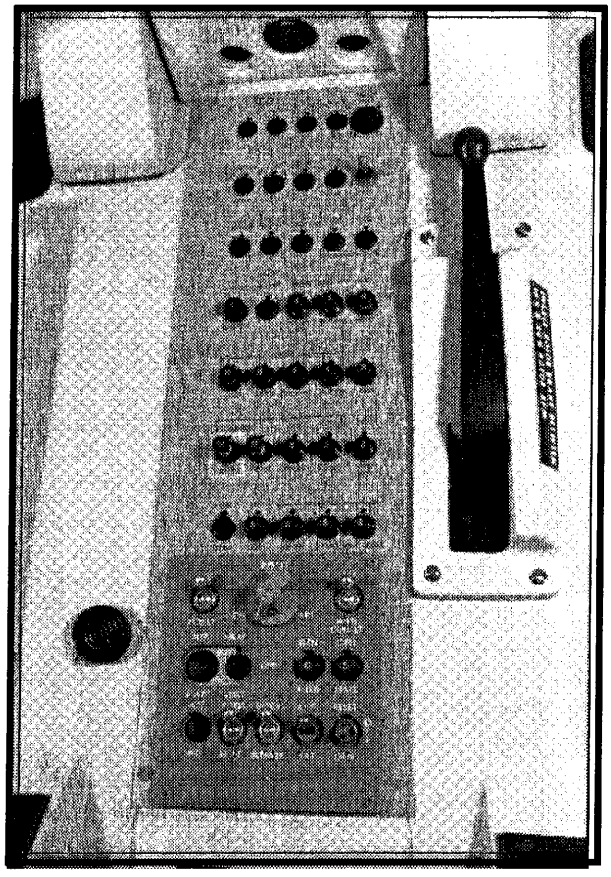
The **overhead console** groups most of the electrical switches and controls in one convenient easy-to-reach panel. It contains:

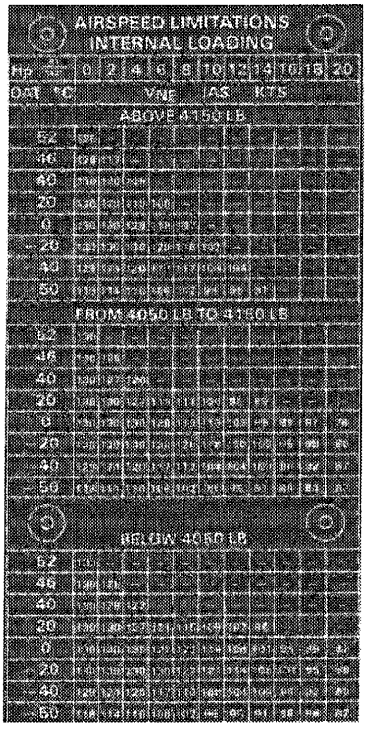
— Switches for interior and exterior lights, defog blowers, battery and generator.

— Breakers for all the standard electrical circuits. They are all the trip-free type which cannot be overridden.

— Space for circuit breakers and switches for optional kits.

There is an **airspeed limitation placard** in knots mounted between the console and the windshield. Just behind the overhead console, on the forward face of the vertical control tunnel, are two **headset** outlets and the loud speaker for the pulsating **engine out warning**. The speaker for the steady low rotor **RPM warning** is mounted on the ceiling.

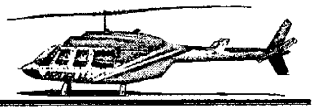




AIRSPEED LIMITATION PLACARD

Example: When flying at a gross weight below 4050 pounds (1837 kg) at 10,000 feet pressure altitude, an outside temperature of minus 20° C, the indicated not-to-exceed speed is 121 knots.

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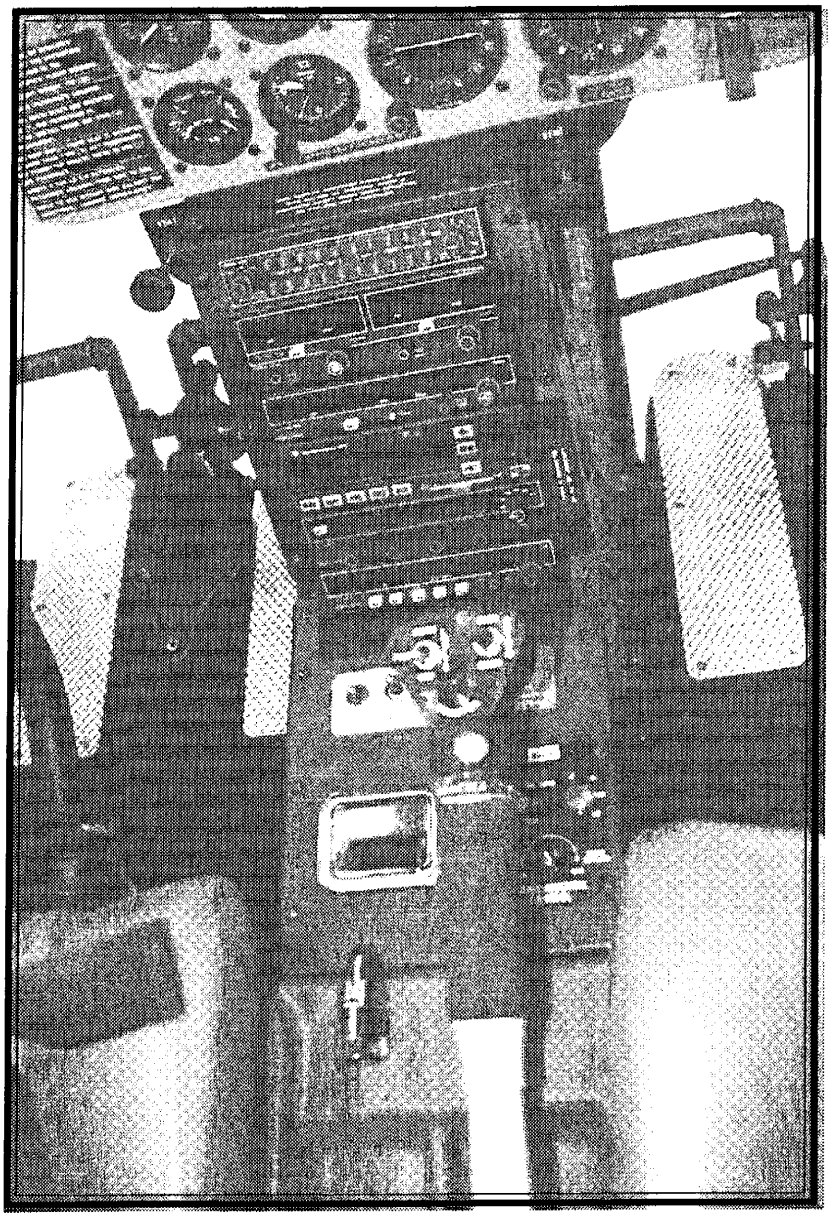
RADIO PEDESTAL

The **radio pedestal** slopes down from the instrument panel and extends horizontally to the seat bench. The standard LongRanger has no radios, however, it can accept the standard width radio boxes in both the sloping and horizontal surfaces (159 centimeters (6.25 inches) in width). The design gives the pilot the best view of all the radio controls.

The pedestal also includes an **ashtray**, a **cockpit utility light**, and switching panel for:

-- dimming the caution-lights
-- turning on the anti-icing system
-- turning off the flight control boost

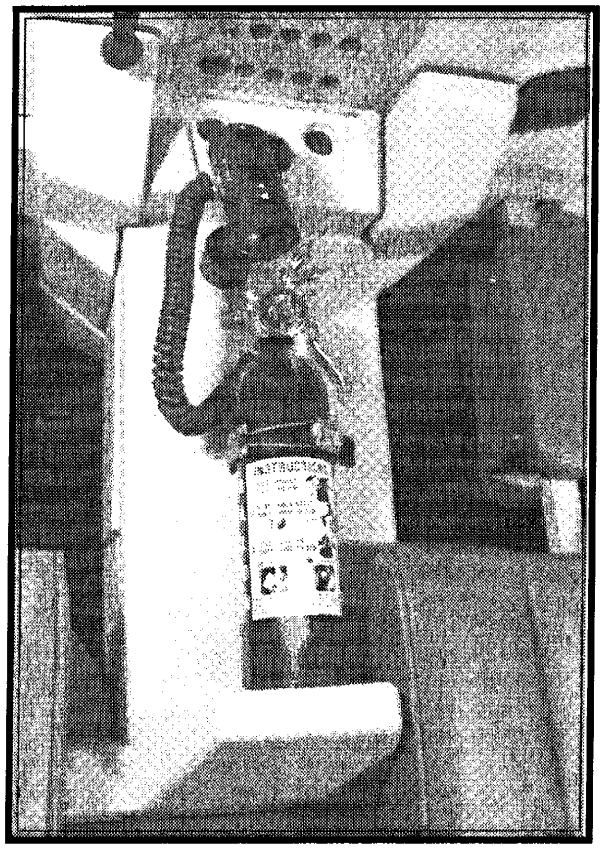
A case for the airworthiness and registration certificate is riveted to the right forward side of the pedestal.



Radio Pedestal with Avionics Installed - 100

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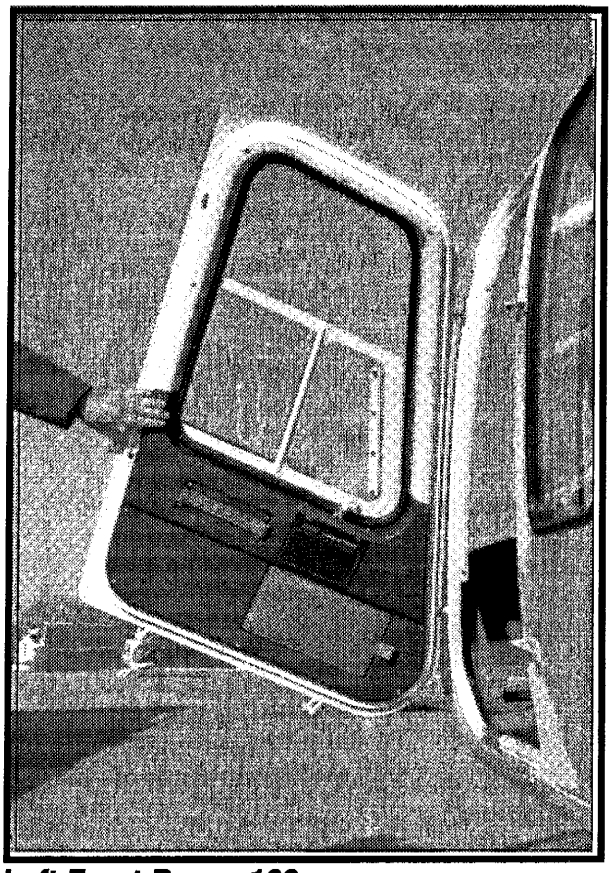
A portable **fire extinguisher** is mounted on the forward face of the vertical control tunnel. It is held in place by one metal quick-release strap.



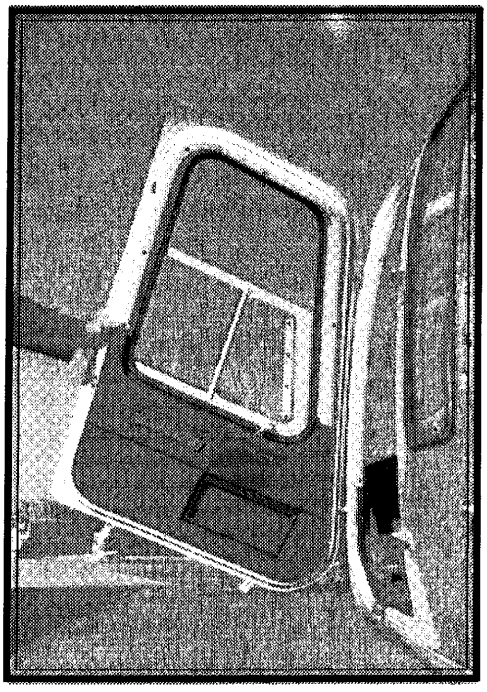
Control Tunnel - 101

A **map case** is built into the bottom part of the pilot's door and another is on the forward face of the control tunnel just below the fire extinguisher.

A pocket for the **first aid kit** is in the left front door with a cover secured by velcro tape.



Left Front Door - 103



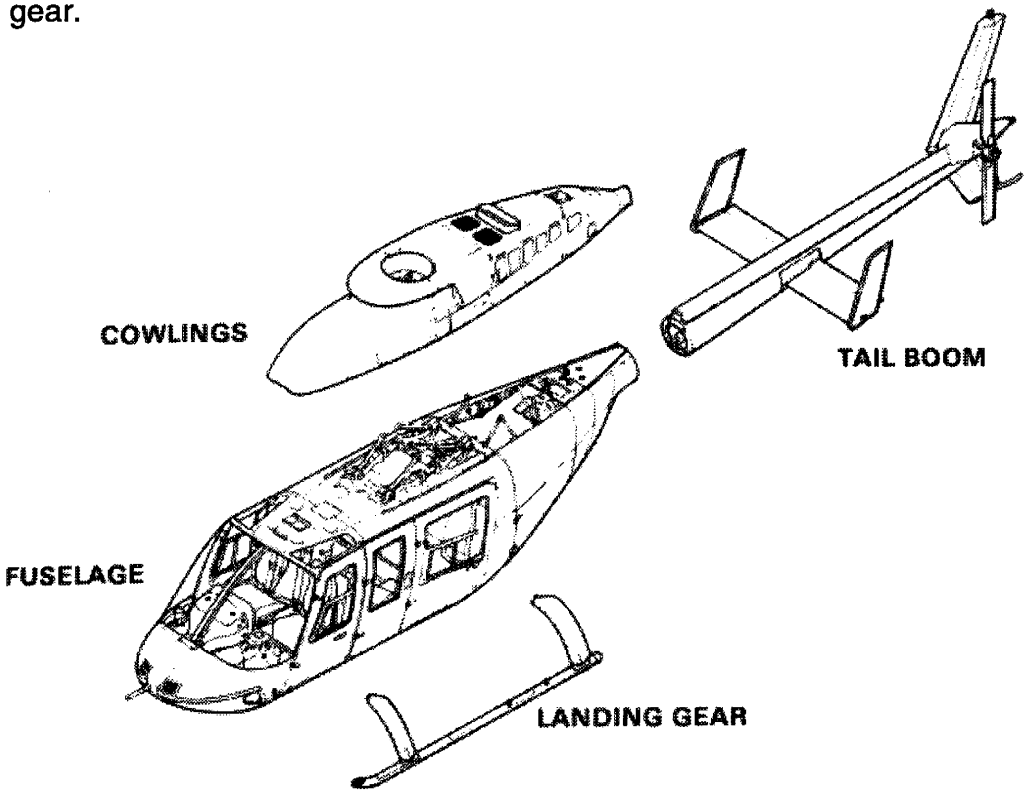
First Aid Pocket - Open 104

A case for the Rotorcraft Flight Manual and Log book is mounted just forward of the left front door, below the windshield.

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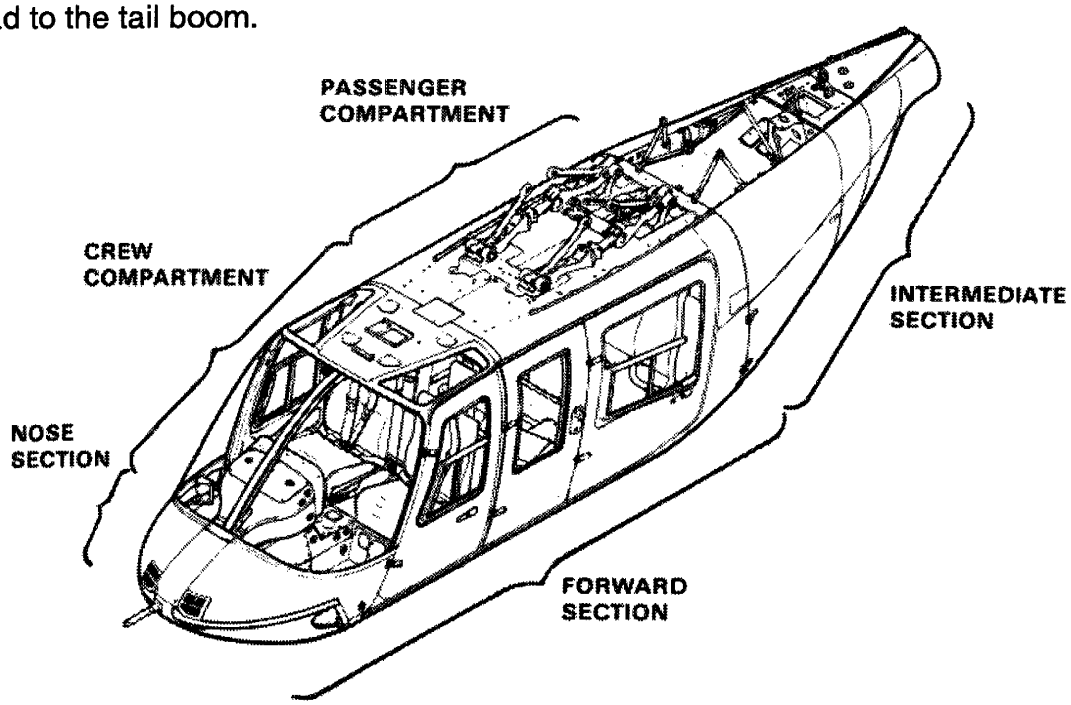
AIRFRAME

The **airframe** consists of four main sections; the fuselage, the tail boom, the cowlings, and the landing gear.

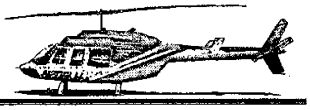


FUSELAGE

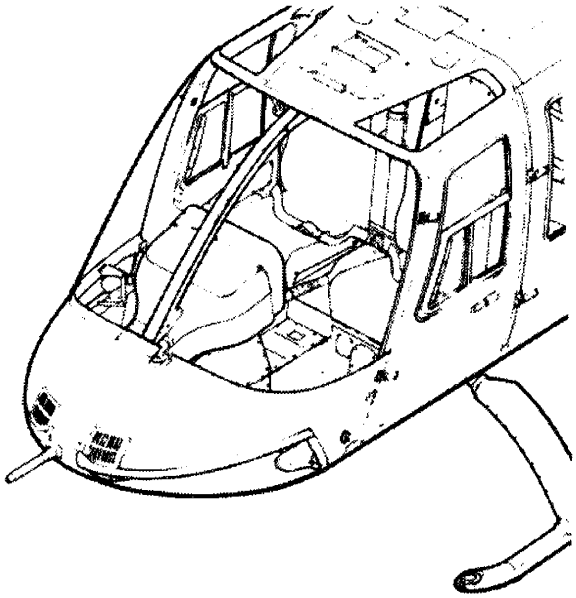
The **fuselage** consists of two sections; the forward section extends from the cabin nose to the bulkhead aft of the passenger com partment, and the intermediate section extends from that bulkhead to the tail boom.

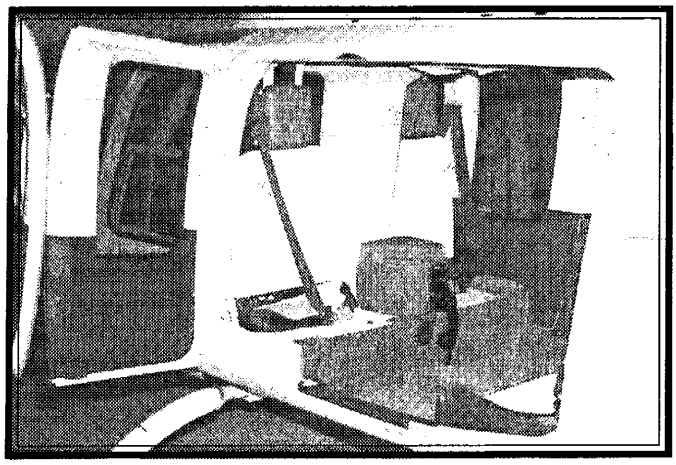


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FORWARD SECTION





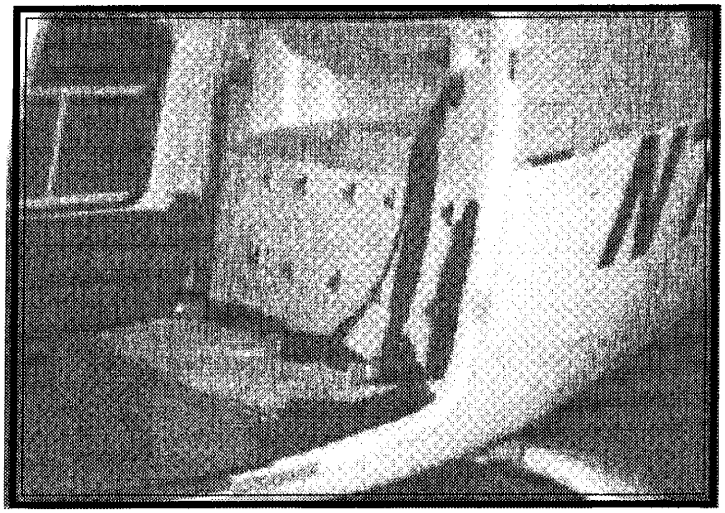
-106

The **forward section** of the fuselage includes the nose section and the crew and passenger compartments. It is often referred to as the cabin.

The forward section is basically an aluminum honeycomb structure using one-inch thick honeycomb and a combination of fiberglass and sheet metal skins.

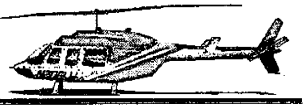
This construction technique provides a rugged, live-in-the-field durability. Its strength-to-weight ratio is superior to conventional aircraft construction techniques and it affords high impact strength as a result of a combination of multiple load paths and structural rigidity.

The seat benches for both the crew and passengers are of aluminum honeycomb and are a major part of the structure. The two passenger seat benches are strongly built to form the enclosures for and to protect the fuel cells. The aft cell enclosure has a space above it which forms a parcel shelf.



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Two rugged bulkheads are built into the cabin, one behind the crew seat bench and one behind the aft passenger bench. A hollow vertical control tunnel is from floor to roof immediately behind the forward bulkhead. These all add structural integrity to the cabin and provide rollover protection to the occupants.

A pair of longitudinal beams in the cabin roof provide strength for the support of the nodal beam and transmission.

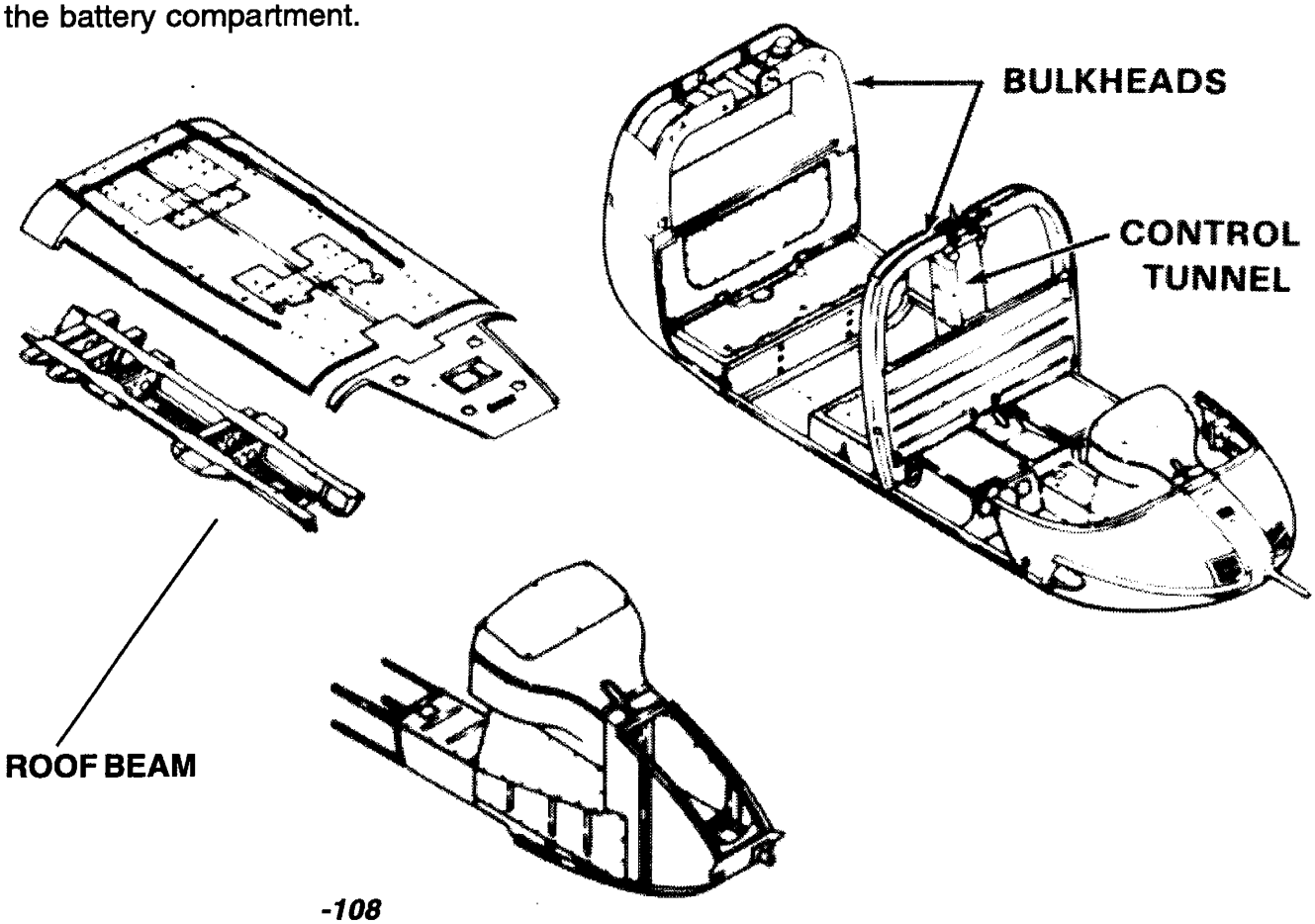
The **cabin structure** extends forward, up through the nose section to the windshields, forming a compartment for the landing lights and one for the battery. The external power receptacle and pitot tube are mounted between the two compartments. Ventilation grilles are low on the nose; one on each side of the battery compartment.

The structure for the two front seats has been "scooped out" to provide maximum headroom.

The structure for the aft facing passenger seats includes two hinged, bonded panels, one on each side of the vertical control tunnel, that are vertically mounted at an angle to the bench face. They conform to the 10° cant of the seats and support the seat backs.

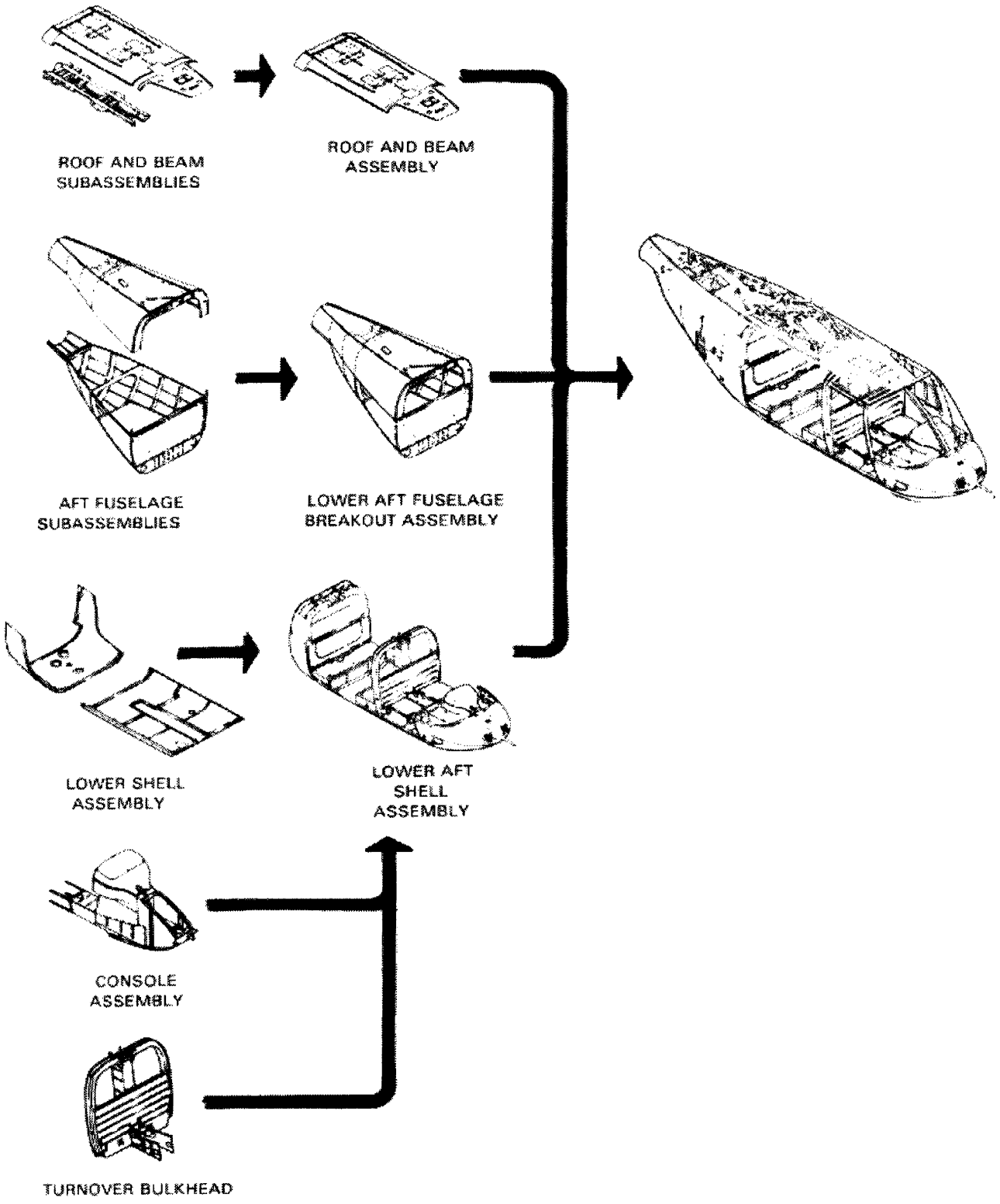
The **fuselage structure** is easy to repair. It has the best inside dimensions for the most compact external size and it has attractive curved surfaces that are difficult to achieve with the more conventional methods.

Structural provisions to support the optional cargo hook are included in the standard fuselage.

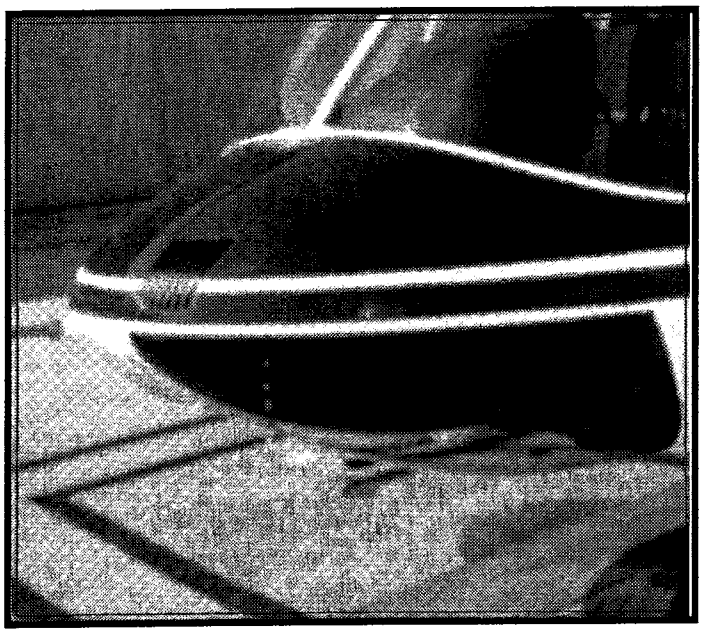


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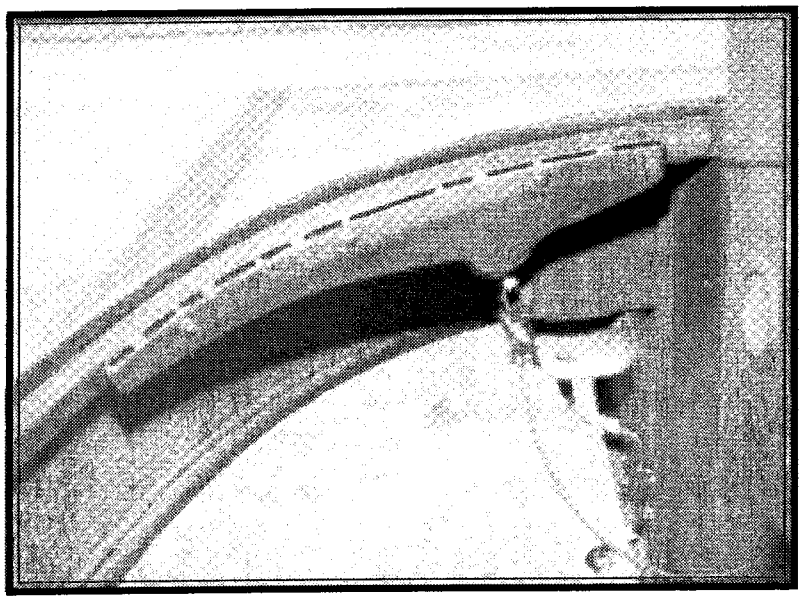


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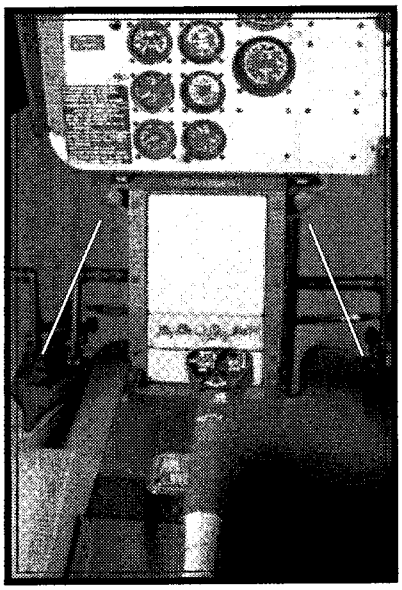


Ventilation Grilles - 110

Cabin **fresh air ventilation** is provided by sliding windows in the crew and passenger compartments and by a ram air/defog system installed in the nose section. During flight, ram-air enters through two large grilles located in the nose. Two separate subsystems, one connected to each grille, direct the air flow to the windshields. Each has its own nozzle, curved to fit the windshield contour, and each has its own air volume control. The control knobs are mounted one on each side of the radio pedestal just below the instrument panel. The volume of air entering either or both subsystems is increased by pulling on one or both control knobs which lock automatically whenever they are released. To decrease the volume, the release button in the center of the control knob must be pressed and the knob pushed forward.



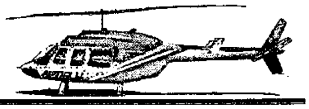
Defog Nozzle, Left Side - 111



Vent Controls - 112

When on the ground, ample flow of air for **defogging** is provided by electric blowers, one in each system. The one Defog Blower switch to activate them is mounted on the overhead console.

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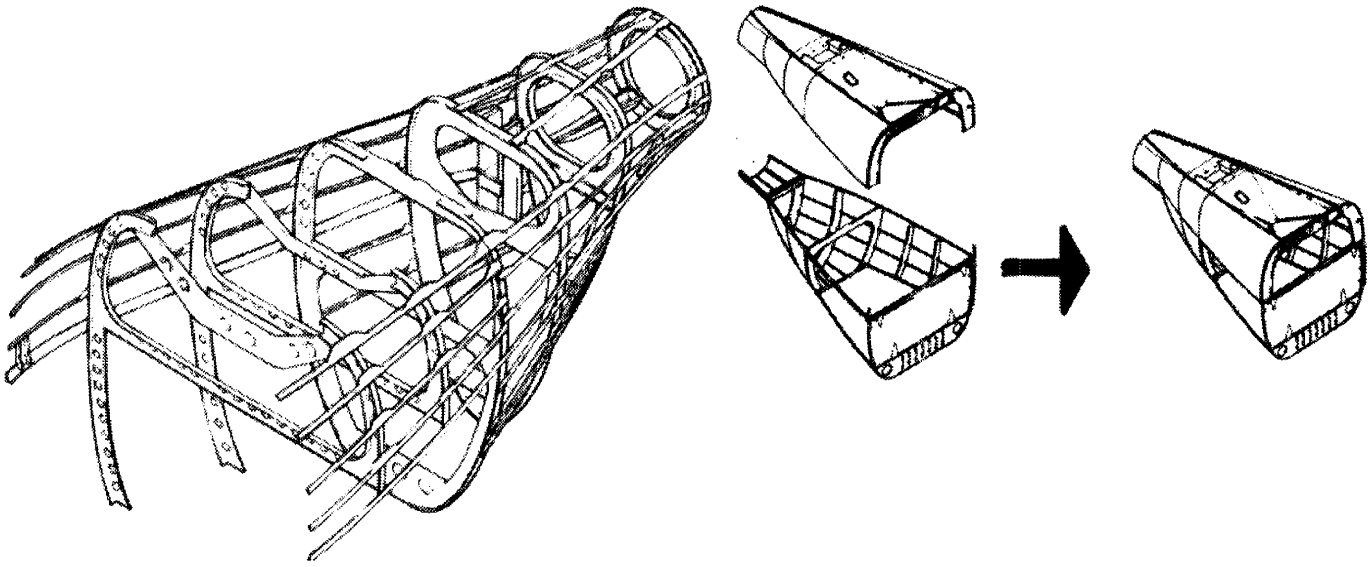


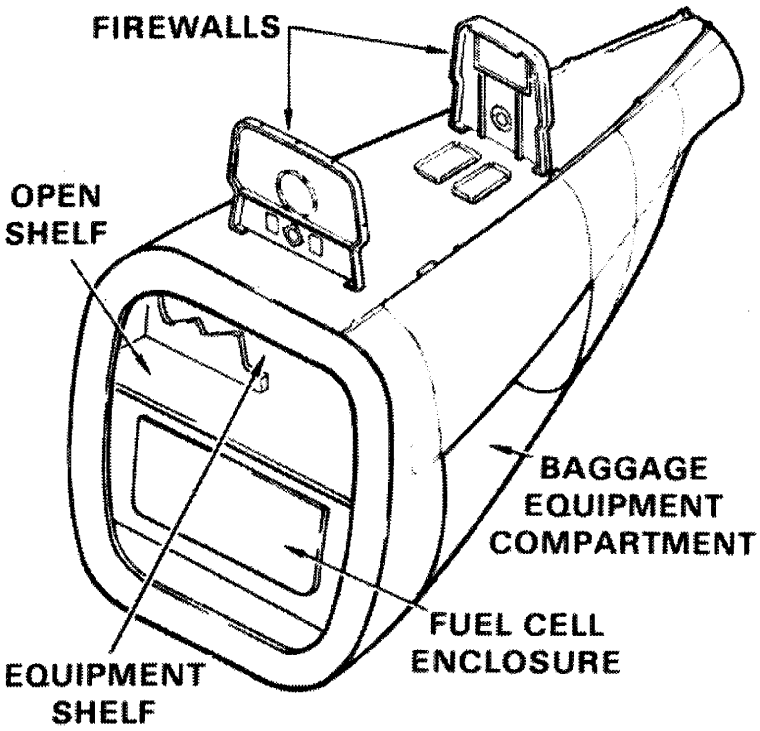
INTERMEDIATE SECTION

The **intermediate section** of the fuselage is a semimonocoque structure that provides an engine deck, a **baggage compartment** and an **equipment compartment**. There is space aft of these, some of which can be used for mounting antennas and installing selected items of equipment.

The intermediate section is enclosed by aluminum-alloy skins and a fiberglass fairing at the lower aft end.

The titanium engine pan and firewalls are fitted to the top of the intermediate section to form an engine compartment.



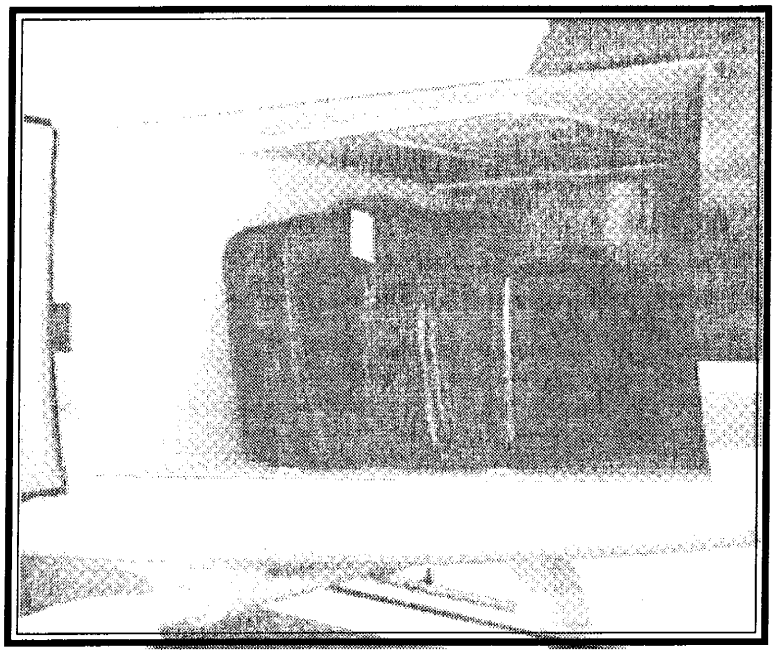


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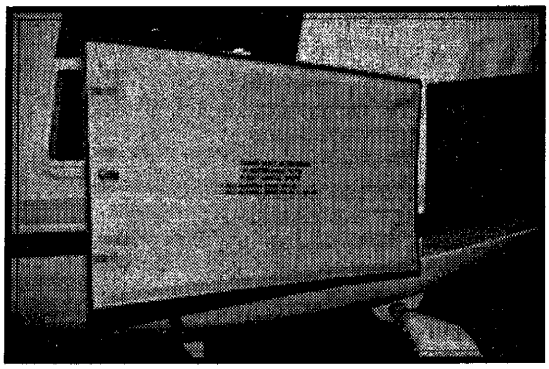
The **baggage compartment** is located in the intermediate section. It has a volume of 16 ft³ (0.45 cubic meters) and can carry a load of 250 lb (113.4 kilograms) up to 86 lb/ft² (420 kilograms per square meter).

The composite door is on the left side and opens the full width and height of the compartment. It is hinged at the forward end and secured by two push-button latches and a keyed lock—the same key as the one for the doors.

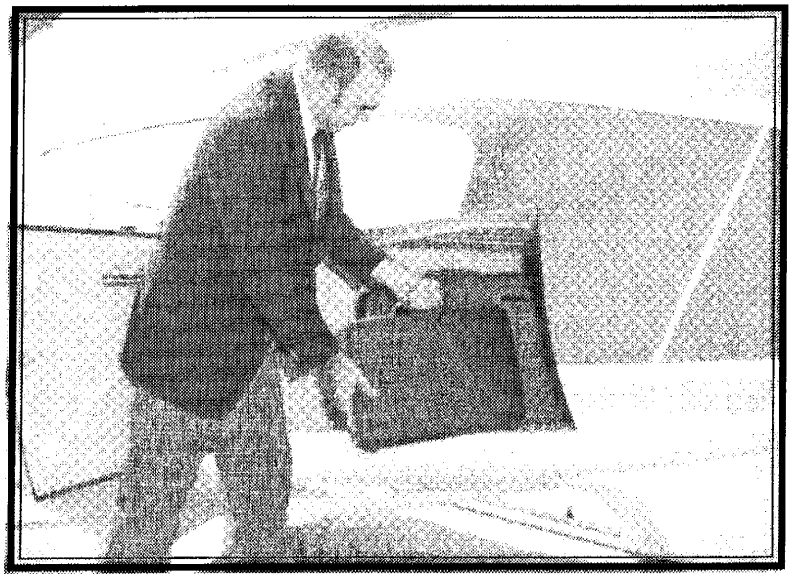
Ten tie-down loops are provided inside the compartment.



Baggage Compartment - 115



Composite Baggage Door

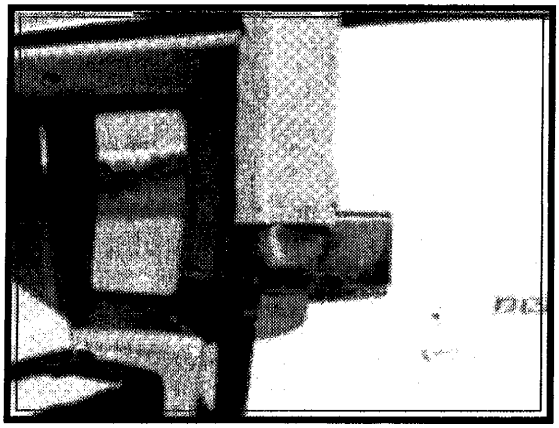


-114

There is space for additional equipment immediately behind the baggage compartment. Carefully selected items can be installed there without interfering with the baggage area.

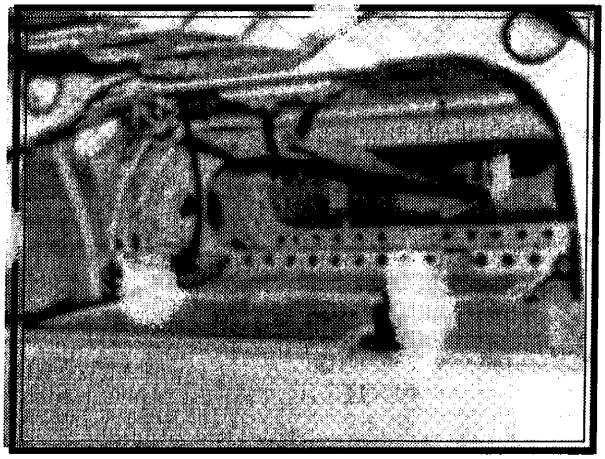
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A **kick-in** step is provided aft of the left passenger door for access to the roof.



Kick-In Step - 116

The hydraulic system, the transmission and the engine are mounted on the fuselage roof, easily accessible, well clear of the passenger cabin and as far as possible from the fuel cells.



-117

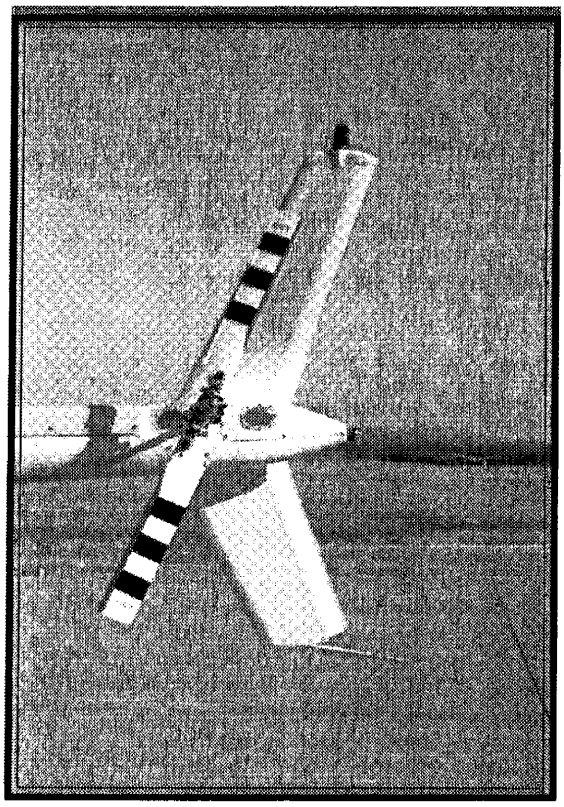
The **equipment compartment** is an area immediately behind the parcel shelf and above the baggage compartment. To gain access, the trim and soundproofing must be removed from the parcel shelf.

The compartment contains the electrical relays and regulators and has space for the optional heater or environmental control unit -- a convenient location near the source of bleed air.

TAIL BOOM

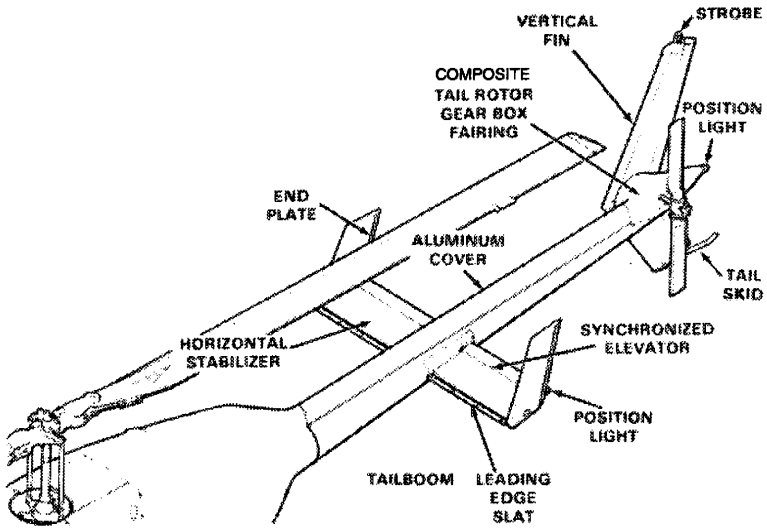
The **tail boom** is an aluminum-alloy monocoque structure that supports the tail fin, the horizontal stabilizer, the tail rotor and the tail rotor drive train.

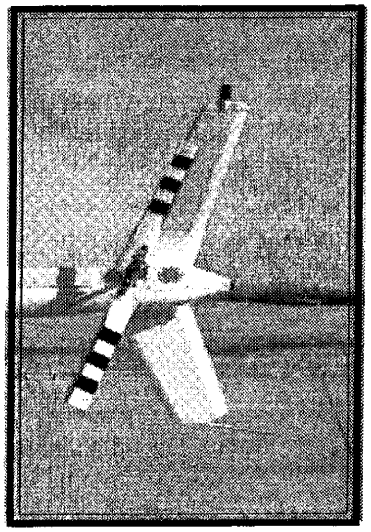
The **tail fin** provides directional stability. It sweeps back, both above and below the end of the tail boom, on the right side. The leading edge is canted outboard to conserve tail rotor thrust during forward flight at cruise speed. It has an aluminum-alloy honeycomb core.



Tail Fin - 118

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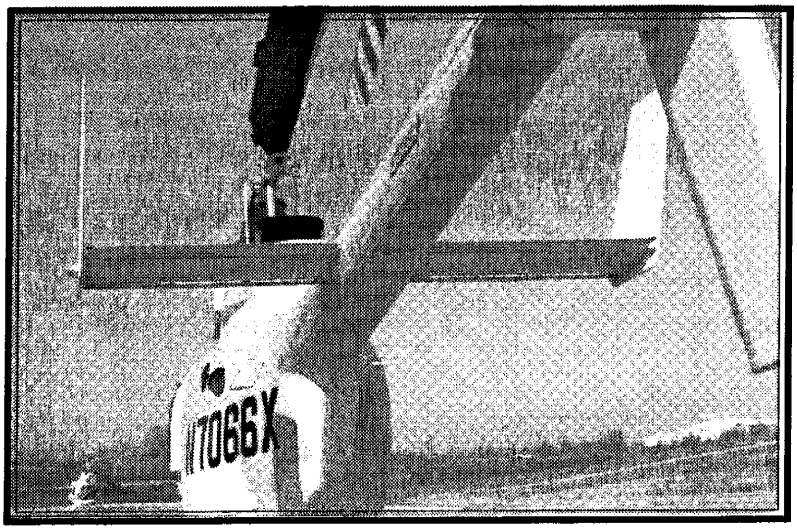




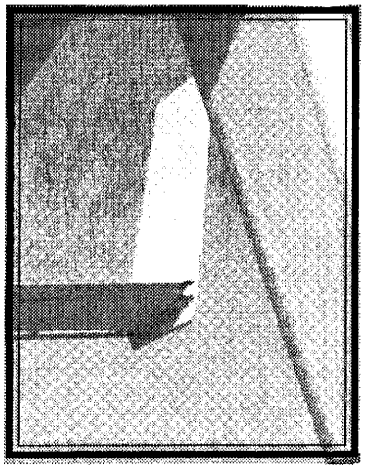
Tail Rotor and Skid - 120

A tubular steel tail skid attached to the bottom of the fin acts as a bumper to protect the fin and tail rotor in the event of a tail-low landing.

The fixed **horizontal stabilizer** has an aluminum-alloy honeycomb core, two vertical end plates, a fixed leading edge slat and a synchronized elevator. The end plates, both canted to the left, and the slat, aid in achieving excellent flight handling qualities. The elevator maintains a near level fuselage trim throughout the full speed range.



Synchronized Elevator - 121



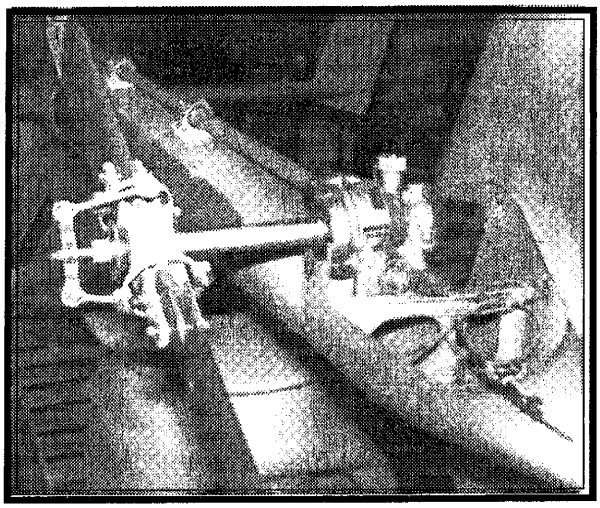
End Plate - 122

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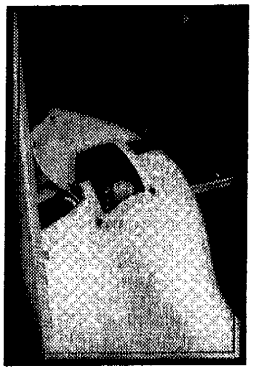
An easily removable **cover** extends along the top of the tail boom and protects the tail rotor driveshaft from the elements. Fairings enclose the tail rotor gearbox and incorporate screened air vents. The oil level sight gauge can be viewed through the rear one. Both the cover and fairing are easily removed for maintenance.

Hinged doors on the top and bottom allow oil sourcing and chip plug access.

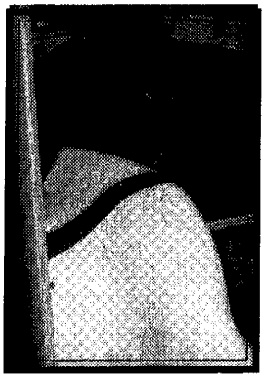
A stainless steel and fireproof composite fire seal is installed around the tail rotor driveshaft, where it passes through the aft engine firewall.



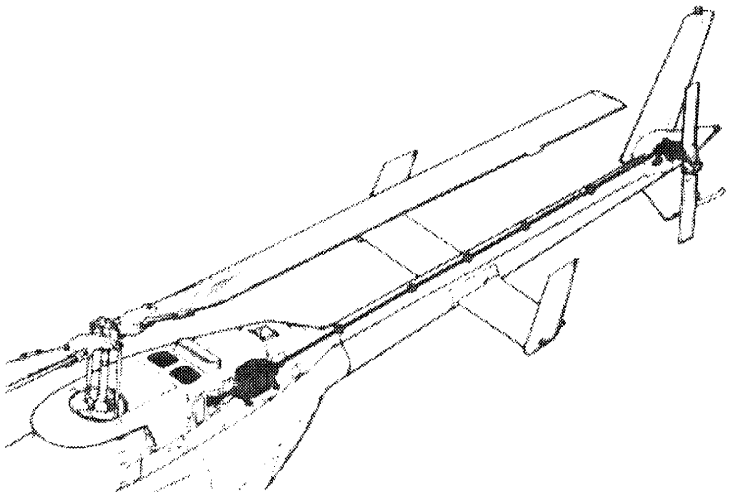
Tail Rotor Gearbox - 123

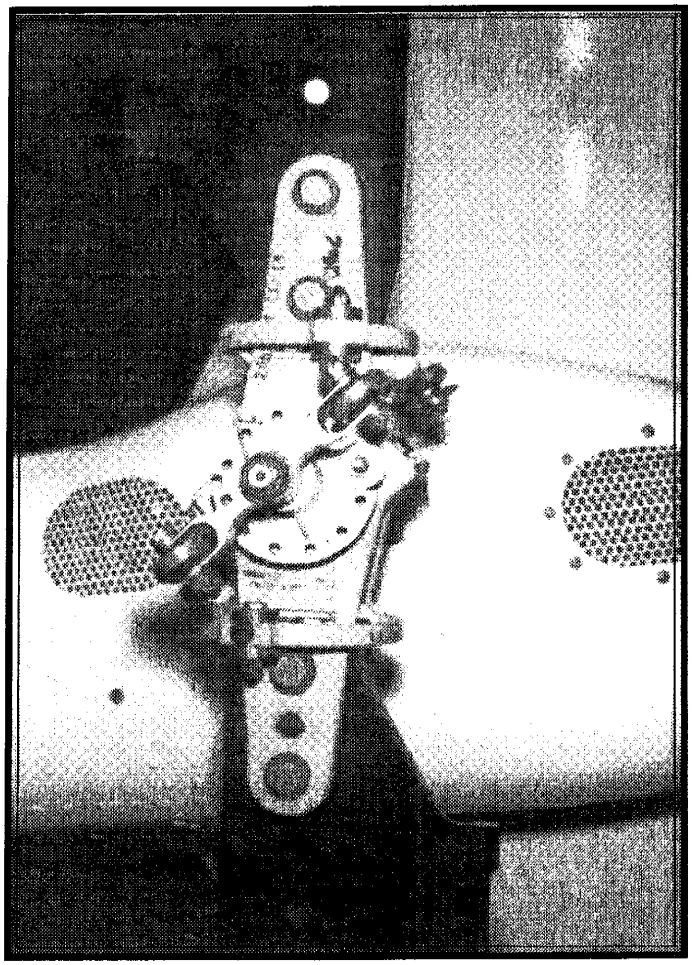


Hinged Door Open



Hinged Door Closed

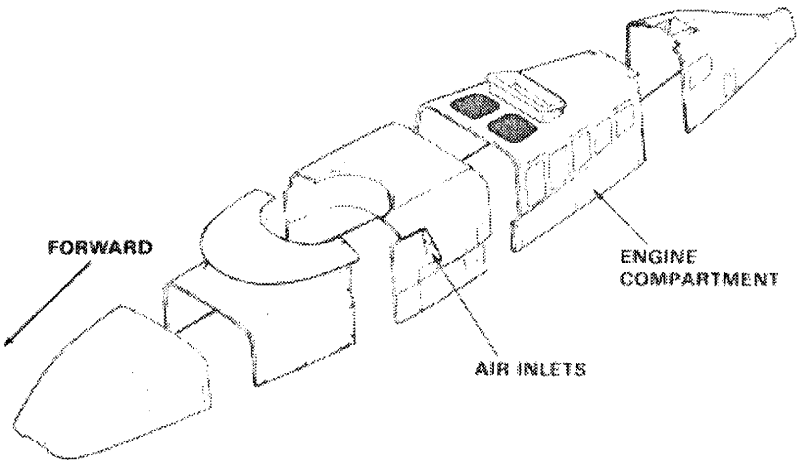


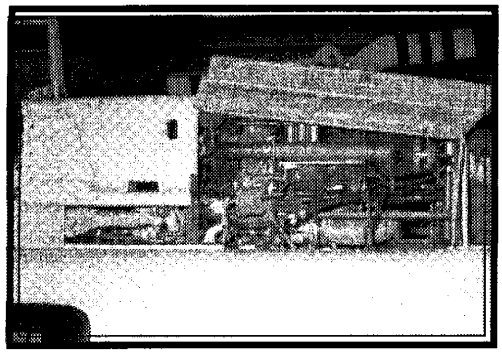


Tail Rotor Hub - 124

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COWLINGS AND FAIRINGS

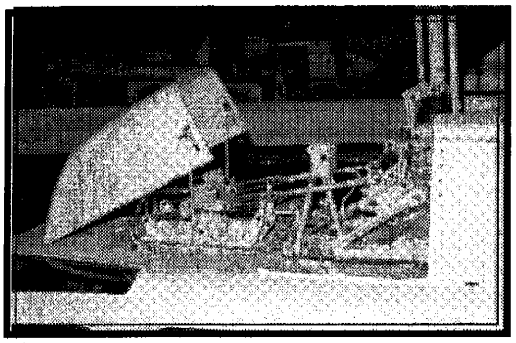




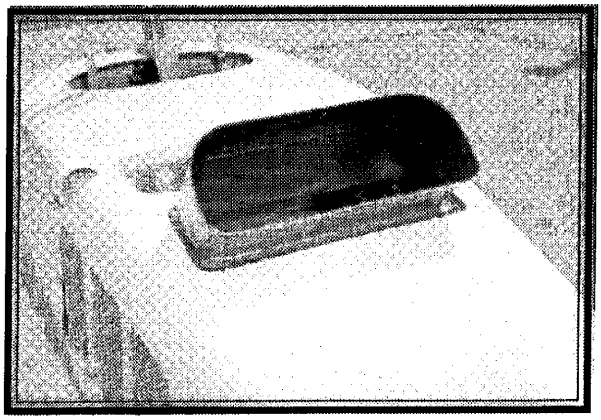
-125

All components mounted on the LongRanger roof are protected from the elements by aerodynamically shaped **cowlings and fairings.**

There are five of them. From front to back — they are the forward fairing, transmission cowling, air inlet cowling, engine cowling and the aft fairing.



-126



-129

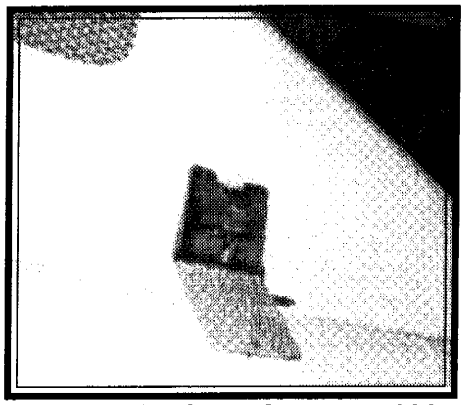
The **engine cowling** has a full-length hinged door on each side, each with a rod that supports the door when it is in the raised position.

The **forward fairing** is hinged on the forward edge to expose all the hydraulic components. It too has rods to keep it in the open position.

The other cowlings have hinged doors for access to components requiring inspection and servicing. Ports in the cowlings allow quick inspection of oil levels and large screens are installed wherever ventilation is required.

No tools are required to open any of the doors.

The cowlings are individually removable.

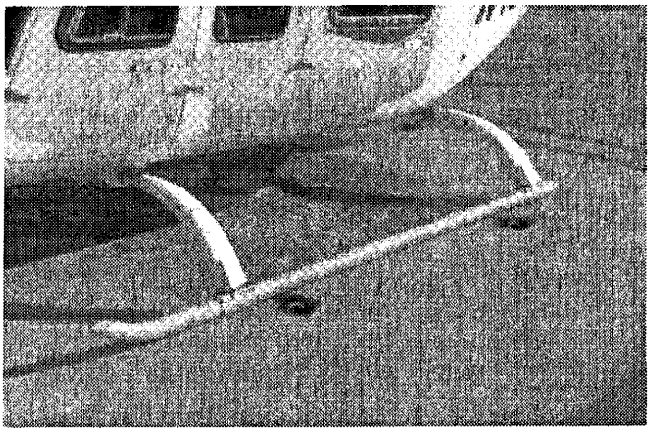


Engine Oil Direct Access - 130

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LANDING GEAR

The **landing gear** for the LongRanger is the tubular skid type made of aluminum alloy. Each of the two arched crosstubes is attached to the fuselage with a pair of straps. This allows the gear to be attached or removed easily so that alternate types of landing gear may be installed. Fairings, available as an optional kit, are made of thermoplastic with aluminum-alloy stiffeners and supports and are fitted to the crosstubes to reduce the drag.



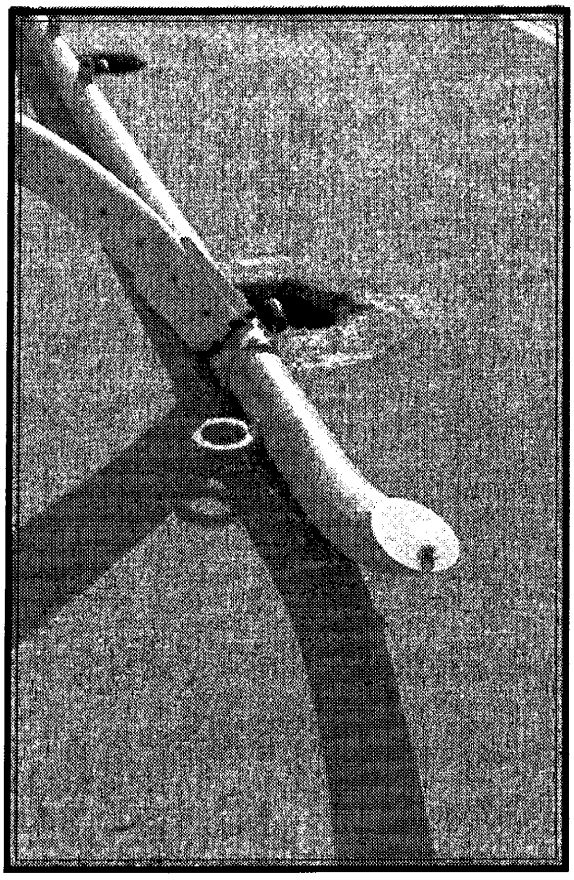
Landing Gear - 131

The **skid landing gear** is simple, rugged, and practically maintenance free.

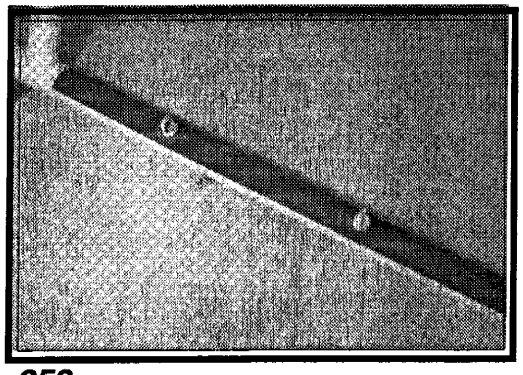
It is particularly adept for landing on rough, uneven surfaces.

The landing gear is designed to absorb energy and to prevent extensive damage to the helicopter in the event of a hard impact landing.

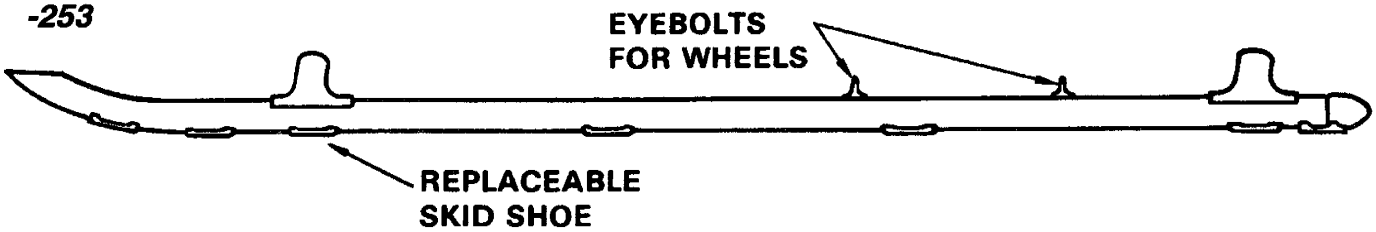
The landing gear is designated to absorb energy, protecting the fuselage for touchdown vertical speeds up to 8 feet/second (2.44 meters/second).



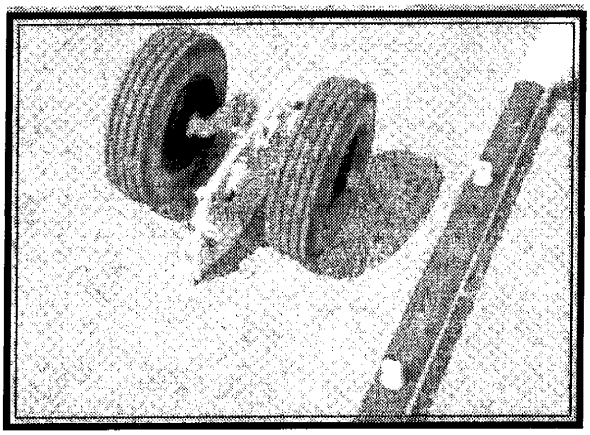
Tow Ring - 132



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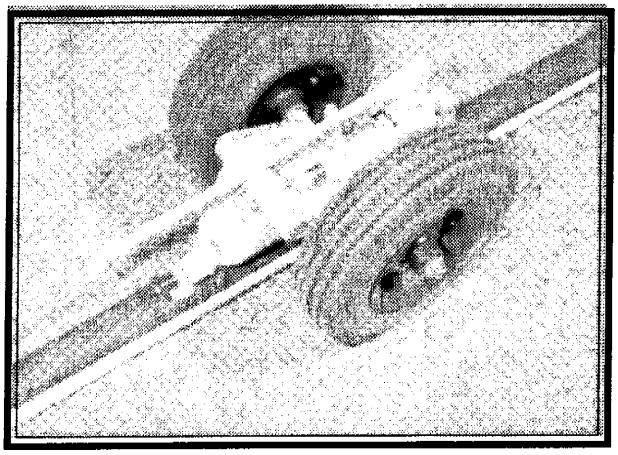
Ground Handling Wheels -133

The skid tubes each have a pair of eyebolt fittings for the **ground handling wheels**. To move the LongRanger on the ground, two sets of wheels are provided as loose equipment. The wheels are snapped and pinned in place at the rear of each skid near the center of gravity. The wheels are then extended or retracted manually using a builtin bar which activates a small hydraulic mechanism. The wheels weigh a total of 90 pounds (40.8 kilograms) and must be removed for flight.

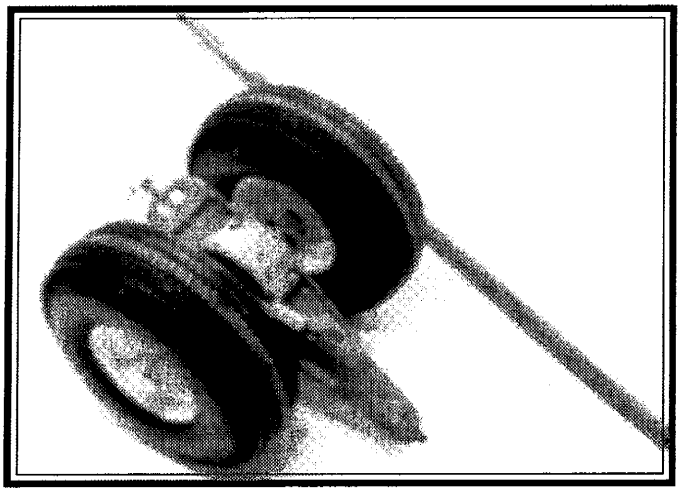
Two tow rings are supplied. One is mounted on the toe of each skid.

Each skid is fitted with seven steel **replaceable skid shoes** to absorb the wear caused by normal ground contact.

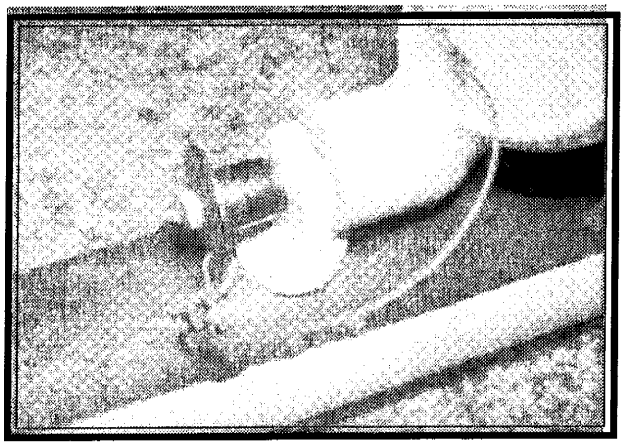
The customer may choose alternate non-hydraulic manually activated ground handling wheels.



Wheels Installed - 134



Alternate Manual Wheels - 136



Securing Pin -135

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FINAL ASSEMBLY

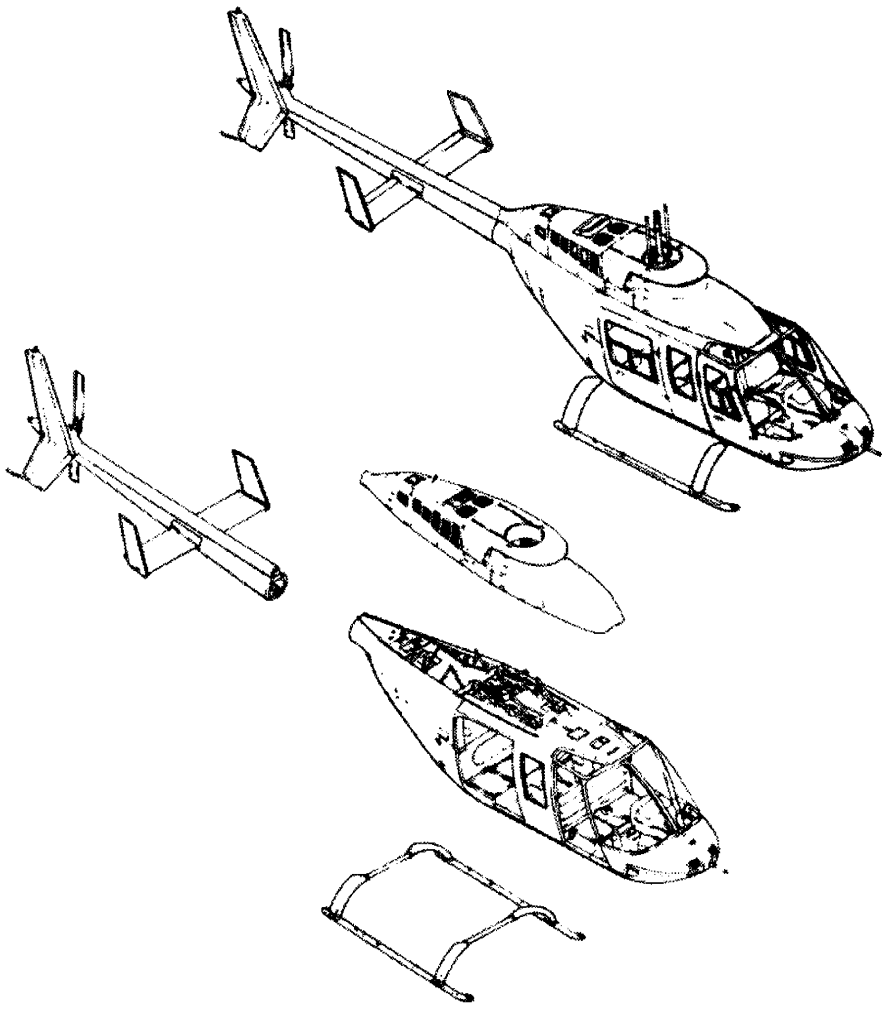
When the four sections of the airframe as described are assembled, the LongRanger begins to take shape.

All areas where moisture may collect have drain holes.

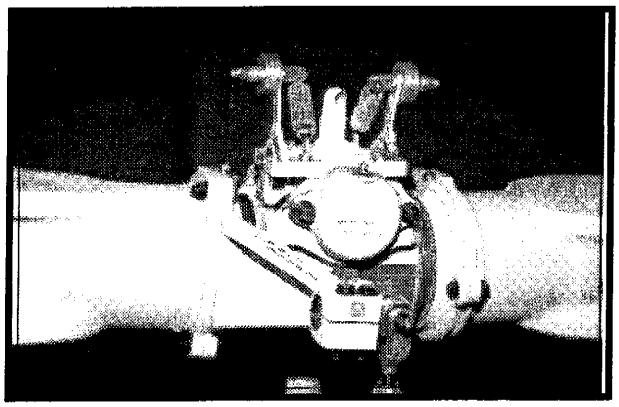
Three tie down fittings are provided. These are also used as jacking points.

The complete LongRanger can be hoisted from a single point —the main mast nut.

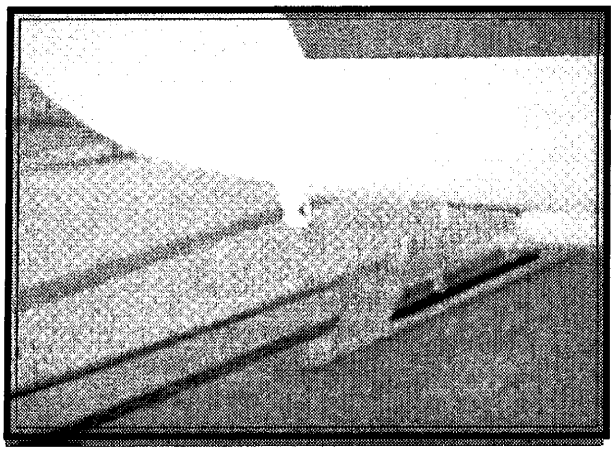
Two plates are installed in the cabin for leveling, one in the ceiling and one in the floor. A plumb bob suspended from the upper plate will point to a special mark on the lower plate when the helicopter is level. Alternately, a spirit level may be placed on the lower plate for leveling indication.



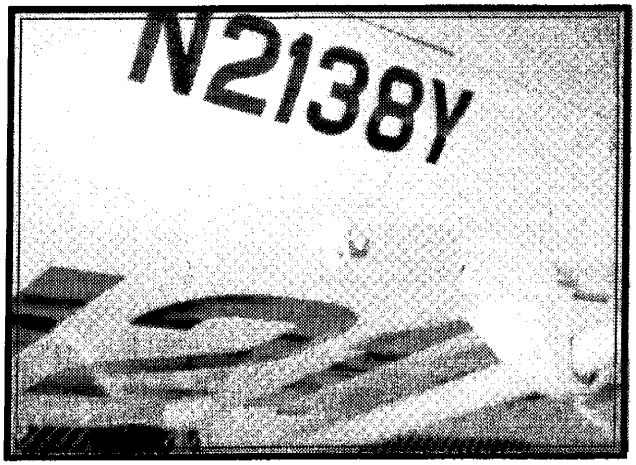
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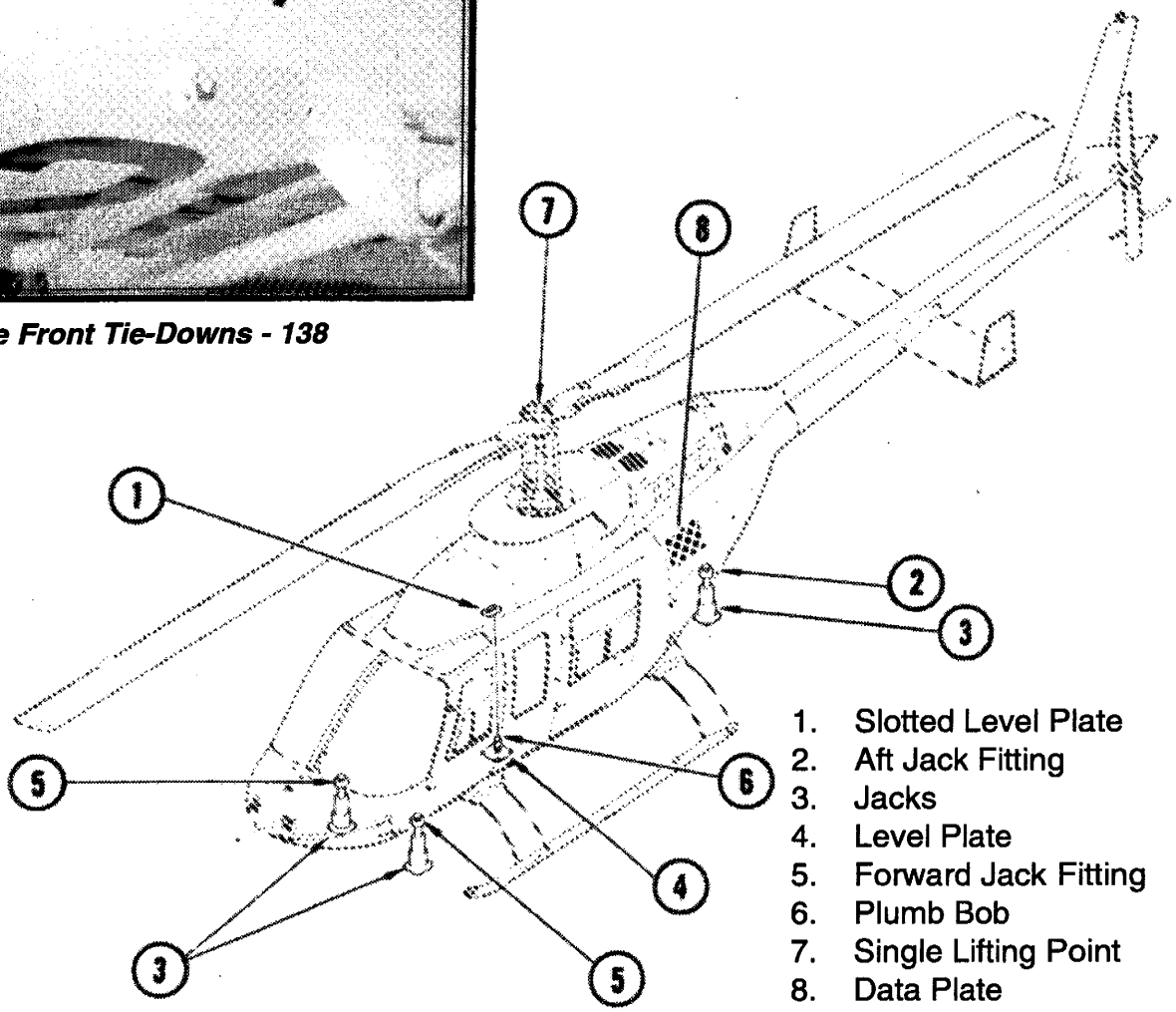
Single Lifting Point - 137



Rear Tie-Down -139

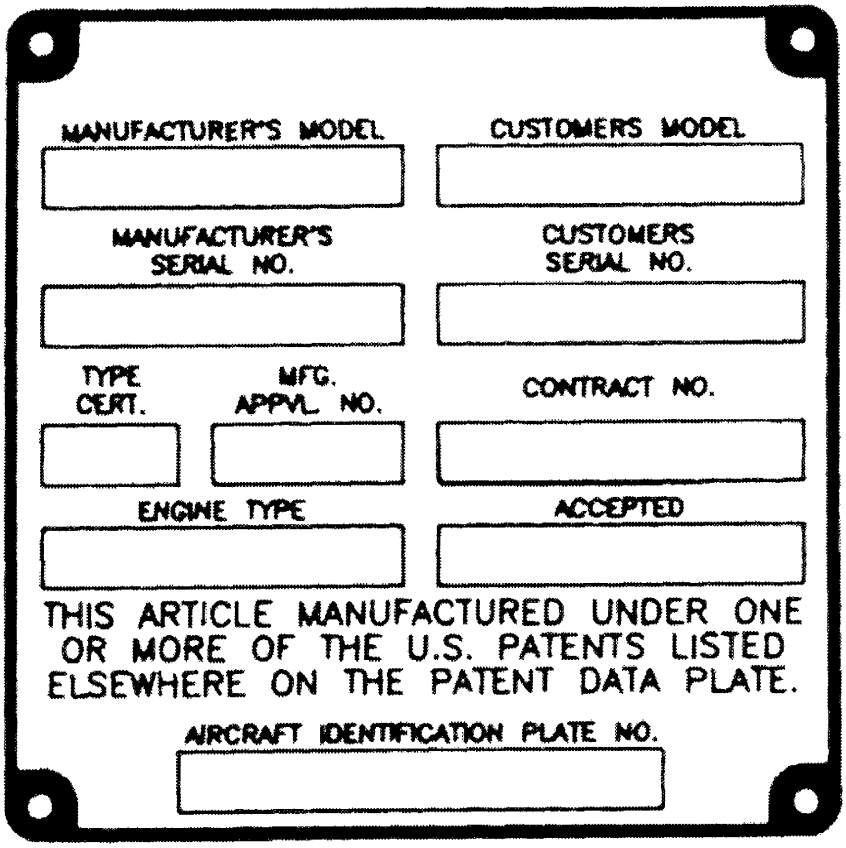


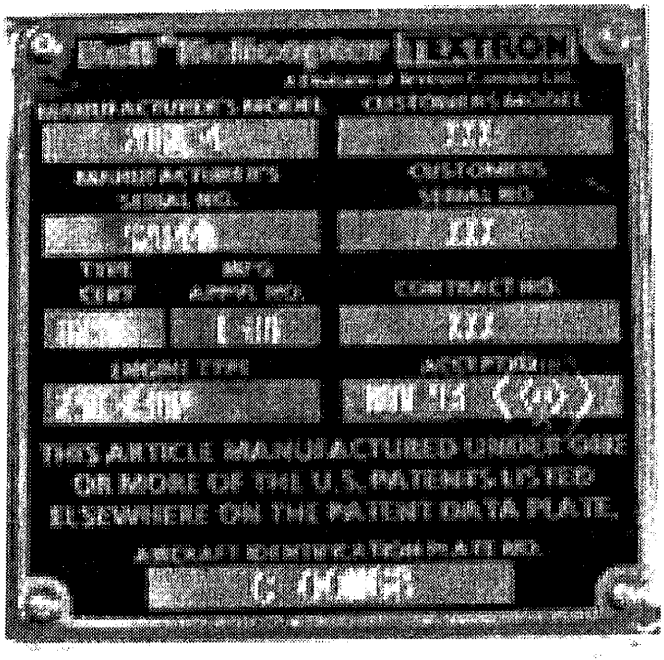
One of the Front Tie-Downs - 138



1. Slotted Level Plate
2. Aft Jack Fitting
3. Jacks
4. Level Plate
5. Forward Jack Fitting
6. Plumb Bob
7. Single Lifting Point
8. Data Plate

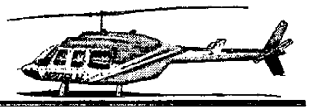
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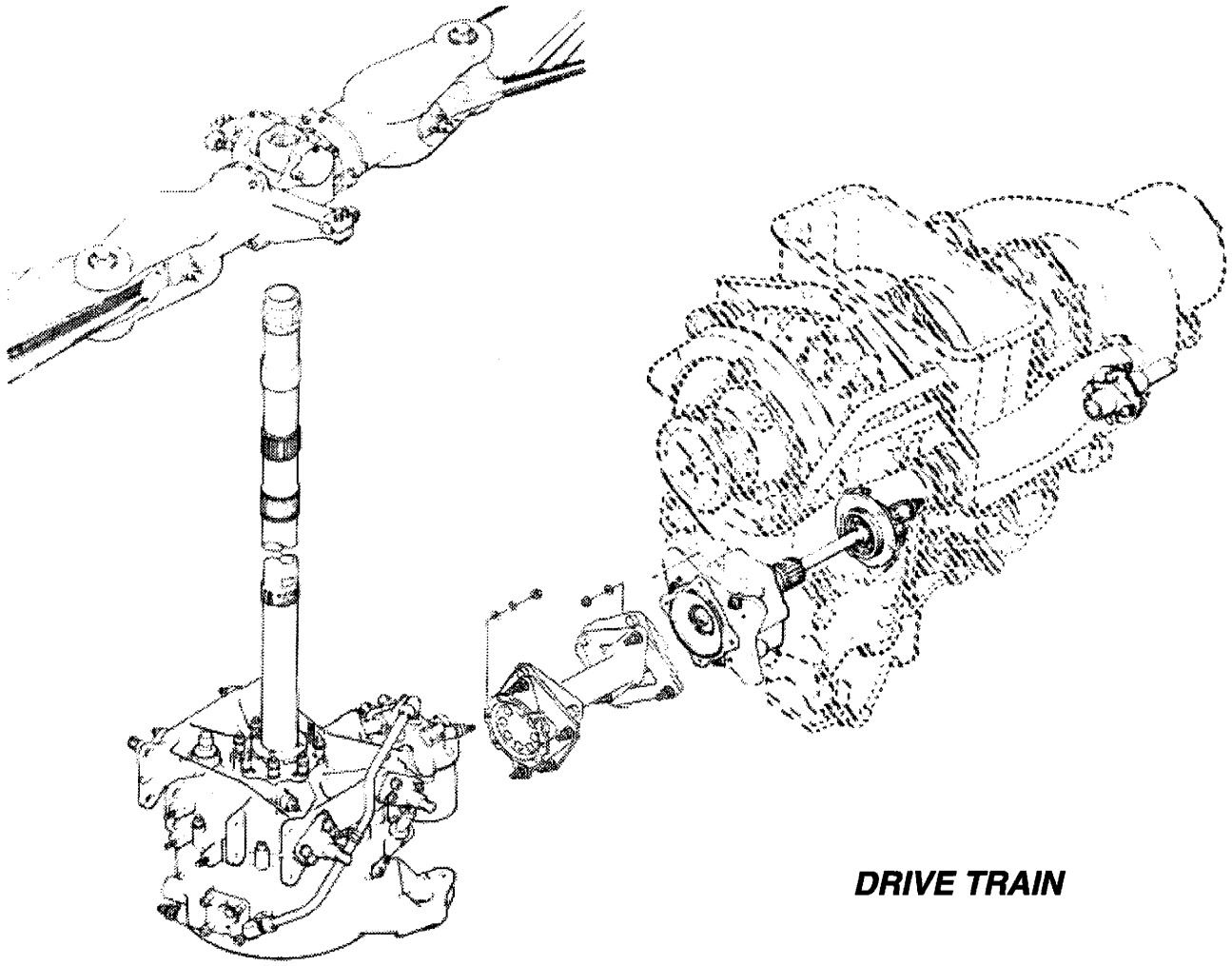
The manufacturer's data plate is located on the right side of the intermediate section near the fuel filler cap.

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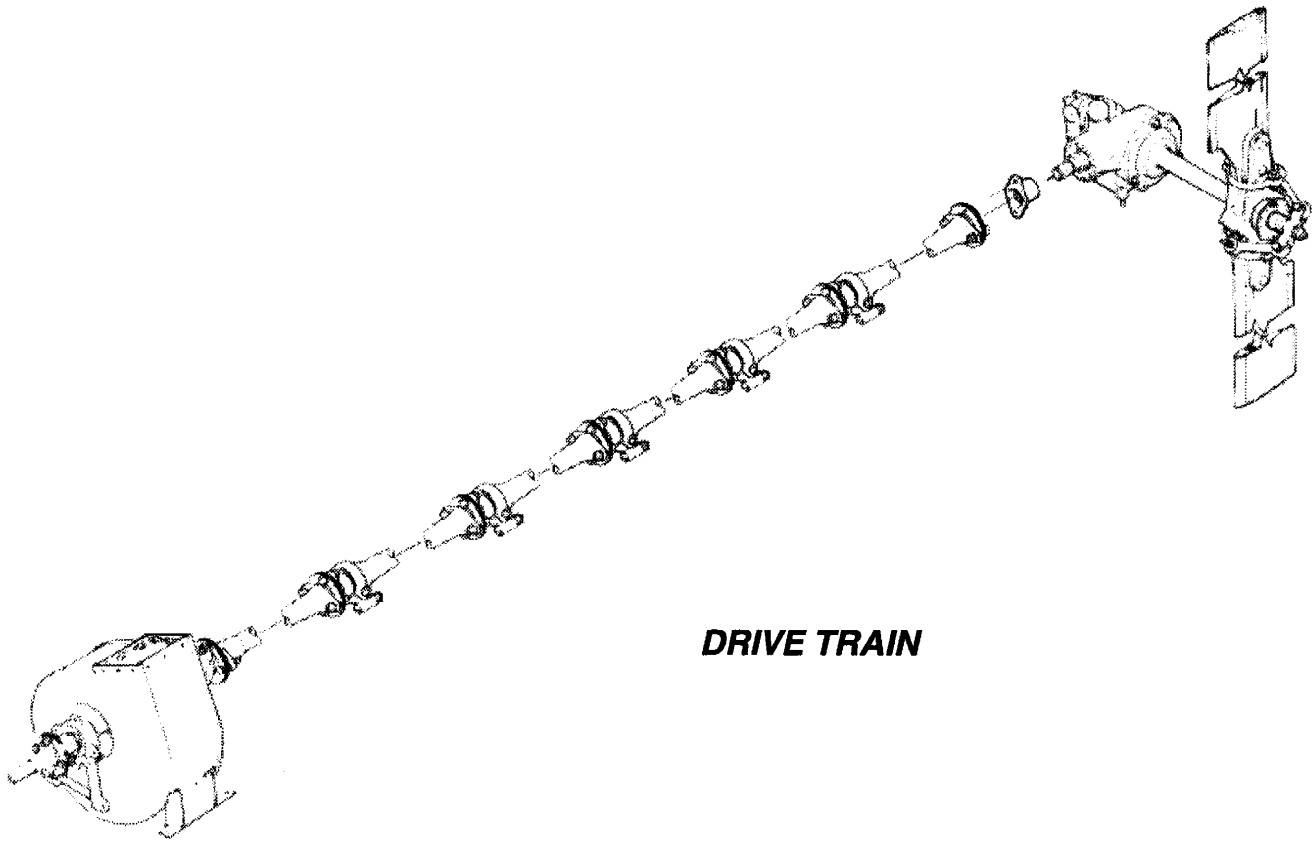
DYNAMIC COMPONENTS

The **dynamic components** of the LongRanger consist of the Allison 250-C30P engine, the drive train and the main and tail rotors. The drive train includes the main drive shaft, the free wheeling unit, the transmission, the tail rotor drive shaft and the tail rotor gearbox.

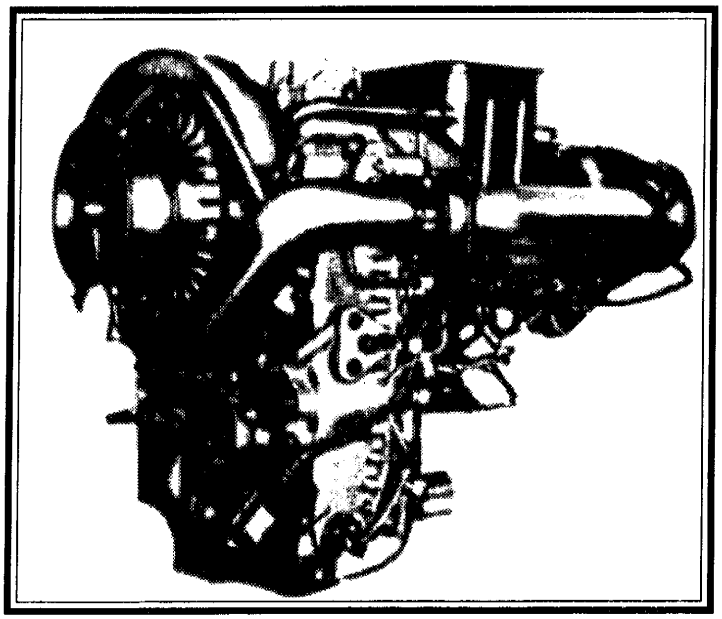


DRIVE TRAIN

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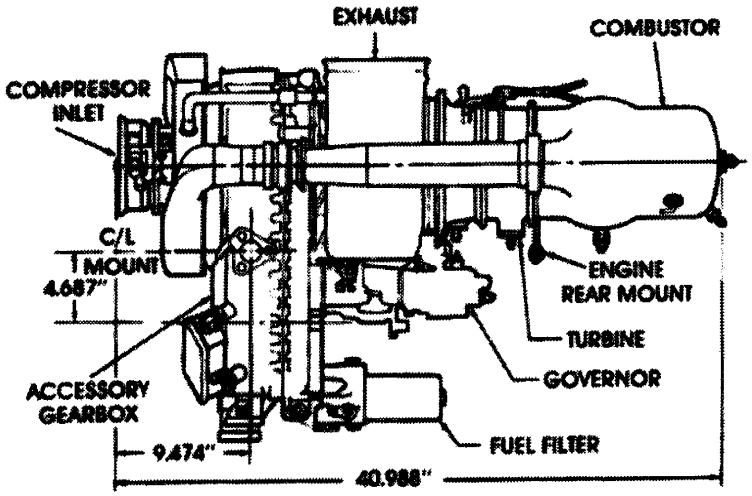
DRIVE TRAIN

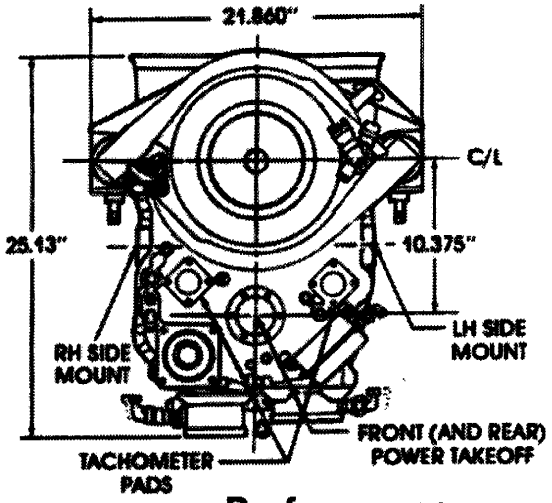


An **Allison Model 250-C30P gas turbine engine** powers the LongRanger IV. Optimized for performance under hot day, high altitude conditions, the C30P packs a lot of power into a 245 pound package.

The Allison rating is 650 SHP (485 kw) for takeoff power.

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Performance

250-C30P Ratings (SLSS)

(Sea Level Static) Rating	Minimum Thermodynamic Shaft Horsepower	Rated SHP	SFC lb/shp-hr
Takeoff			
(5 Minute)	726	650	0.592
Maximum Cruise	630	600	0.599
Cruise A (90%)	630	540	0.611
Cruise B (75%)	630	450	0.647
4000 Feet, 95°F			
Takeoff			
(5 Minute)	518	518	0.618
Normal Cruise	419	419	0.654

Takeoff power is the power developed at the measured gas temperature and rotor speeds approved for use during takeoff, and limited in use to a maximum continuous period of 5 minutes. In addition, takeoff power is limited to that power which produces the maximum allowable output shaft torque specified. Takeoff rated power is the takeoff power developed under standard static sea level conditions.

Normal Cruise rating is the highest power authorized by the engine manufacturer for normal continuous operation.

Cruise A and Cruise B are the power level positions that provide for 90% and 75% (respectively) of rated normal cruise power at standard sea level static conditions.

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The performance section in this manual uses this engine power and presents it in a form that can be applied to the required task.

The graphs cover the capability of the LongRanger in standard configuration throughout the full range of temperature and altitude.

The LongRanger is a mature, fully experienced aircraft. It is being operated in many countries around the world and is successfully fulfilling tasks of every conceivable type in every possible environment.

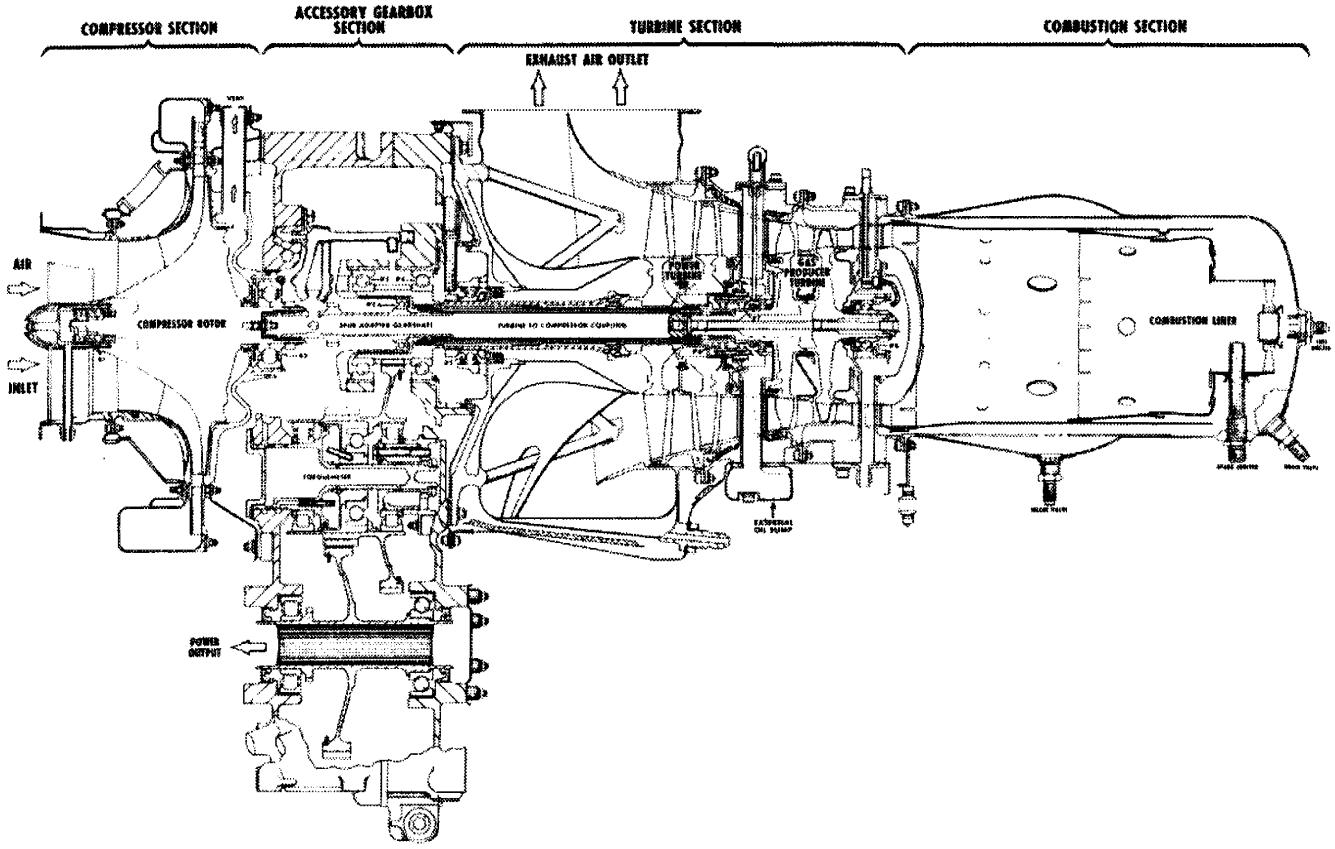
Its power plant, the C30P, was certificated by Allison Engine Company/Rolls Royce the latest in an evolutionary Model 250 series which had amassed over 14 million engine flight hours.

During this evolution many improvements have been incorporated and the efforts to further improve it will continue.

The engine is light in weight and minimum in size. It is easy to maintain.

All engine adjustments and almost all maintenance can be easily performed from ground level.

ENGINE CUTAWAY SCHEMATIC

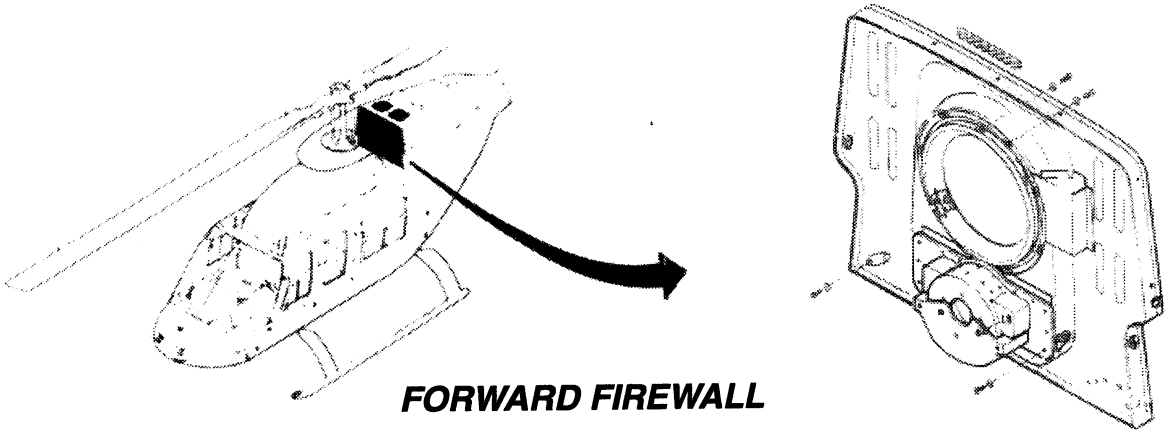


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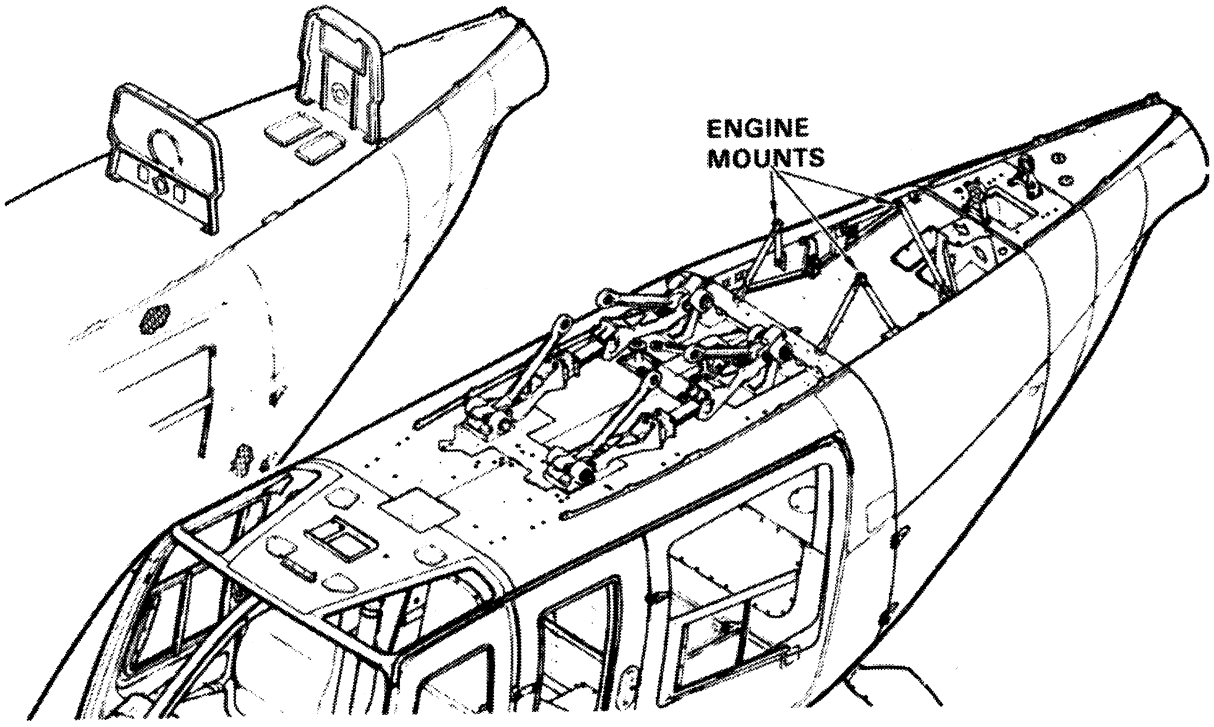
The engine is installed on the roof of the intermediate section of the fuselage. This places it in the best position in relation to the passenger compartment and it also simplifies the drive train and the exhaust system.

The forward and aft firewalls have fire seals where they join the cowling. The forward firewall has a titanium liner, a fire seal around the main driveshaft and provisions for the rotor brake.

The **titanium engine deck** acts as a drip pan. The engine is secured above it by three steel bipod supports. Sufficient clearance is provided to allow maintenance or removal of accessories that are located on the bottom of the engine without removing the engine.



FORWARD FIREWALL



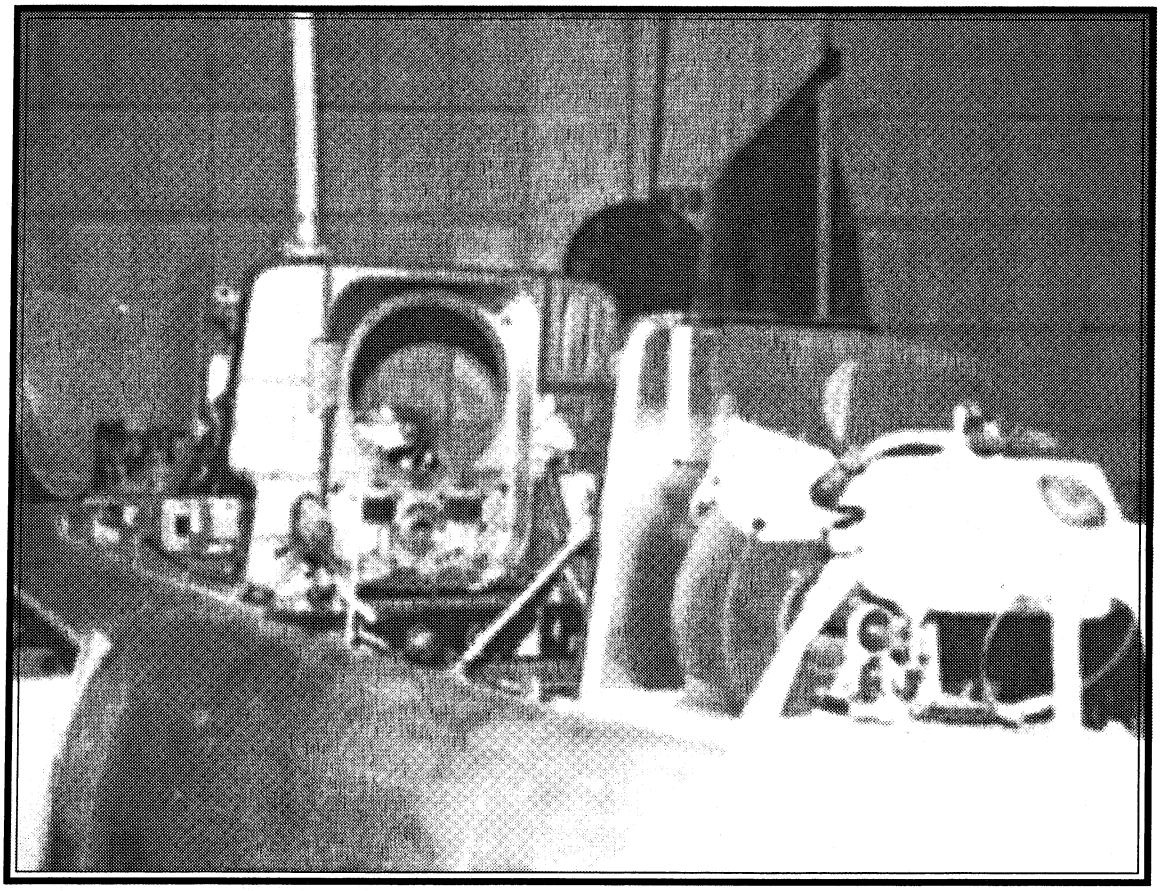
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The hinged cowling doors running the length of the engine, one on each side, may be opened individually or the whole engine cowling can be removed.

The engine consists of four major components or modules:

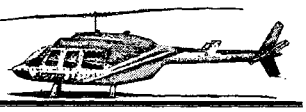
— compressor
— combustion section
— turbine
— power and accessories gear train

It features modular design for easy access to the engine components. One component can be replaced quickly without disturbing the others. The modular design offers substantial direct operating cost advantages because maintenance or overhaul of a single module can be accomplished independently. The compressor, for instance, may be removed from the engine for repair or incorporation of the latest technical improvements while the engine remains in service using a replacement compressor.



Firewalls - 140

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COMPRESSOR MODULE

- Ready for overhaul or repair by removing six gearbox mounting bolts
- Simple single stage impeller.

TURBINE MODULE

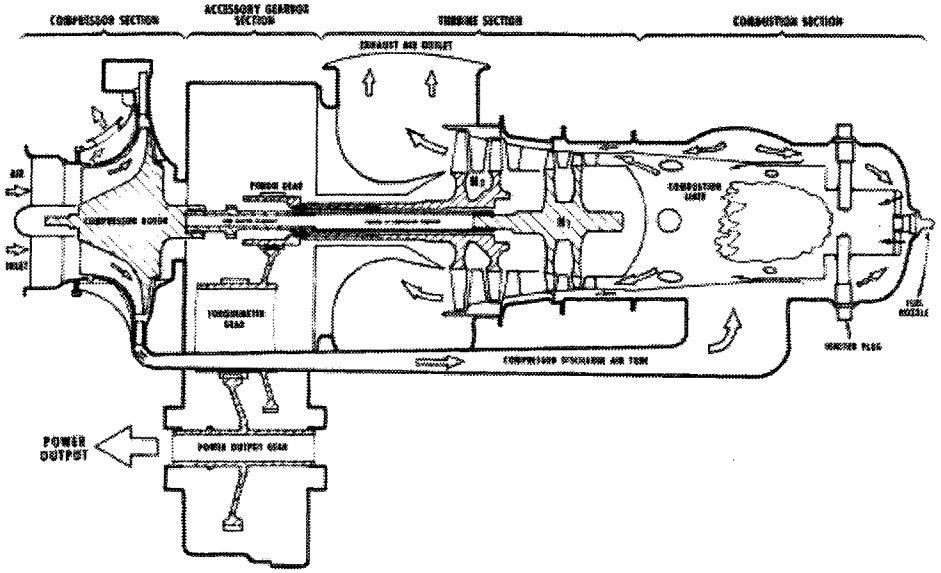
- Mounted to the rear of the gearbox with five nuts.
- First stage turbine accessible by removing combustor module. All accessories and shafting remain in place.

GEARBOX MODULE

- Rugged construction, common mounting pads for all Model 250
- All lip seals changed externally.
- Rotating accessories use common nuts.
- Both front and rear drive.
- Easy access to the accessories for quick removal and replacement.

COMBUSTOR MODULE

- Simple one piece outer combustor, single combustion liner.
- Single fuel nozzle.
- Single split line for removal from turbine.
- Complete combustor removal from turbine.
- Complete combustor system hardware can be inspected by removal of combustor module.



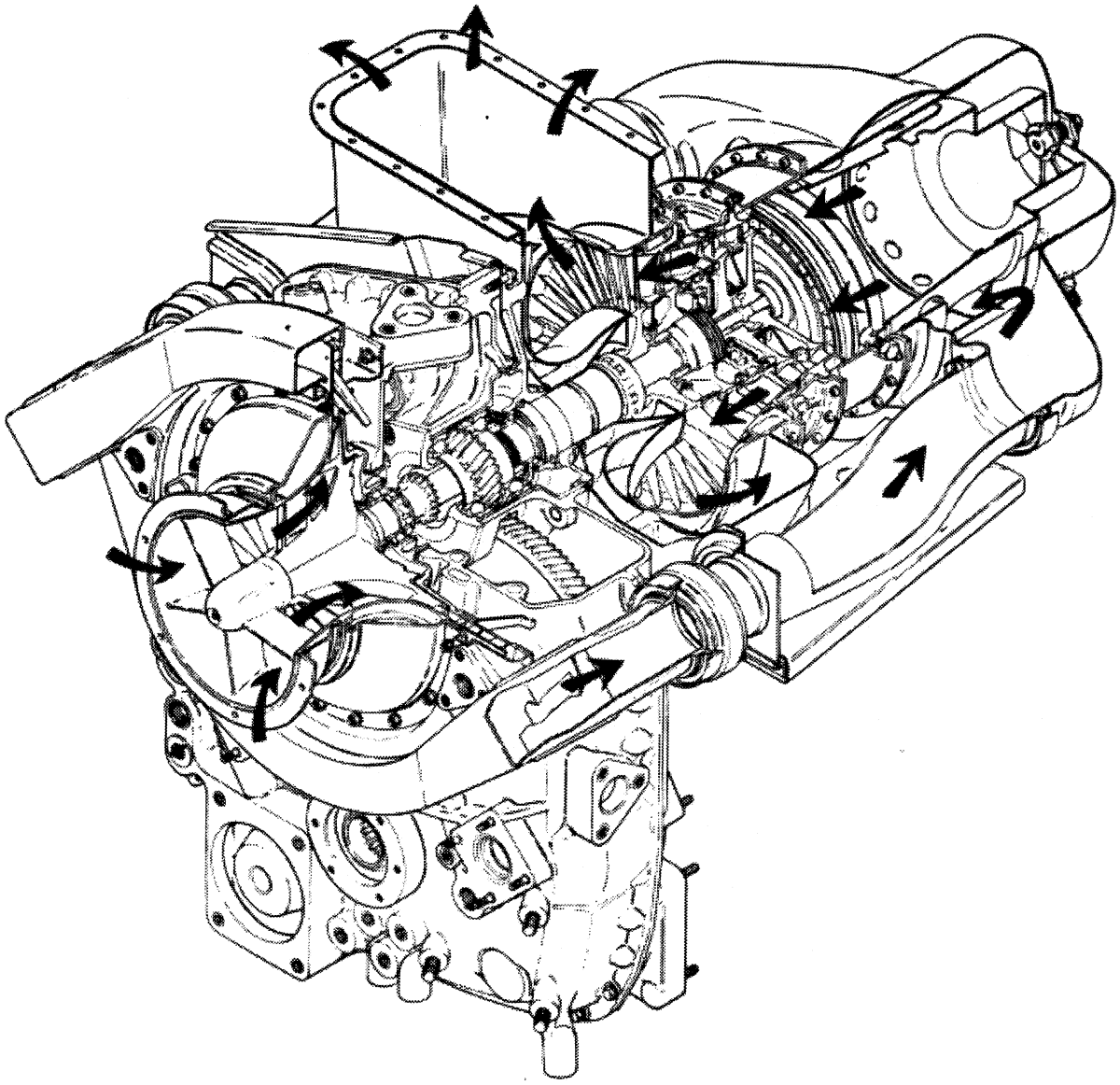
AIR FLOW SCHEMATIC

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The basic principle of the C30P engine is quite simple—continuous combustion that produces a steady flow of efficient power.

Air is supplied to the engine through airscoops on either side of the fuselage immediately aft of the transmission cowling. (Airflow at takeoff is approximately 5.5 lb/sec [2.5 kilograms per second]).

Before the air reaches the engine, it passes through a protective screen to prevent the injestion of large foreign matter.



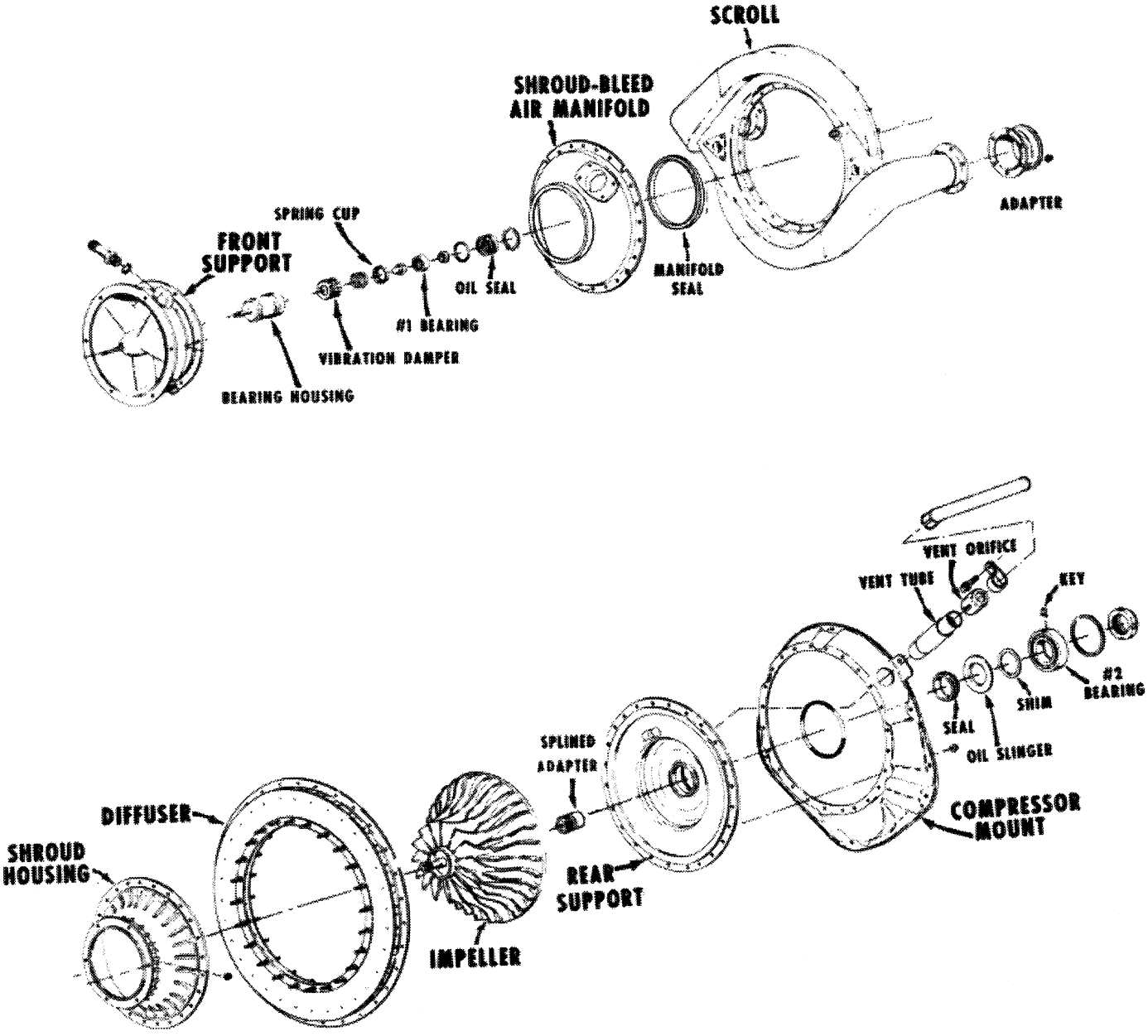
ENGINE AIR FLOW

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Clean air enters the compressor. The compressor in the C30P is a titanium, single-stage centrifugal unit which compresses the incoming air and discharges it into a pair of external ducts. The ducts carry it directly to the combustion section at the aft end of the engine.

An automatic bleed air system is incorporated in the compressor. It allows some of the air to escape during the start cycle. As the compressor speeds up, the pneumatically controlled valve gradually closes. The C30P system does not include a temperature switch in the valve.

COMPRESSOR SECTION



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The combustion section consists of an outer case and liner, a spark igniter and a fuel injector.

It is a prechamber combustion system designed to burn fuel at peak efficiency and to minimize emissions.

Fuel is sprayed into the chamber at a precisely controlled rate. The single igniter produces a constant spark when energized and the mixture ignites.

Combustion is even and continuous as long as the proper air/fuel mixture is maintained.

Combustion gases move forward out of the combustion liner to the first-stage gas producer turbine nozzle.

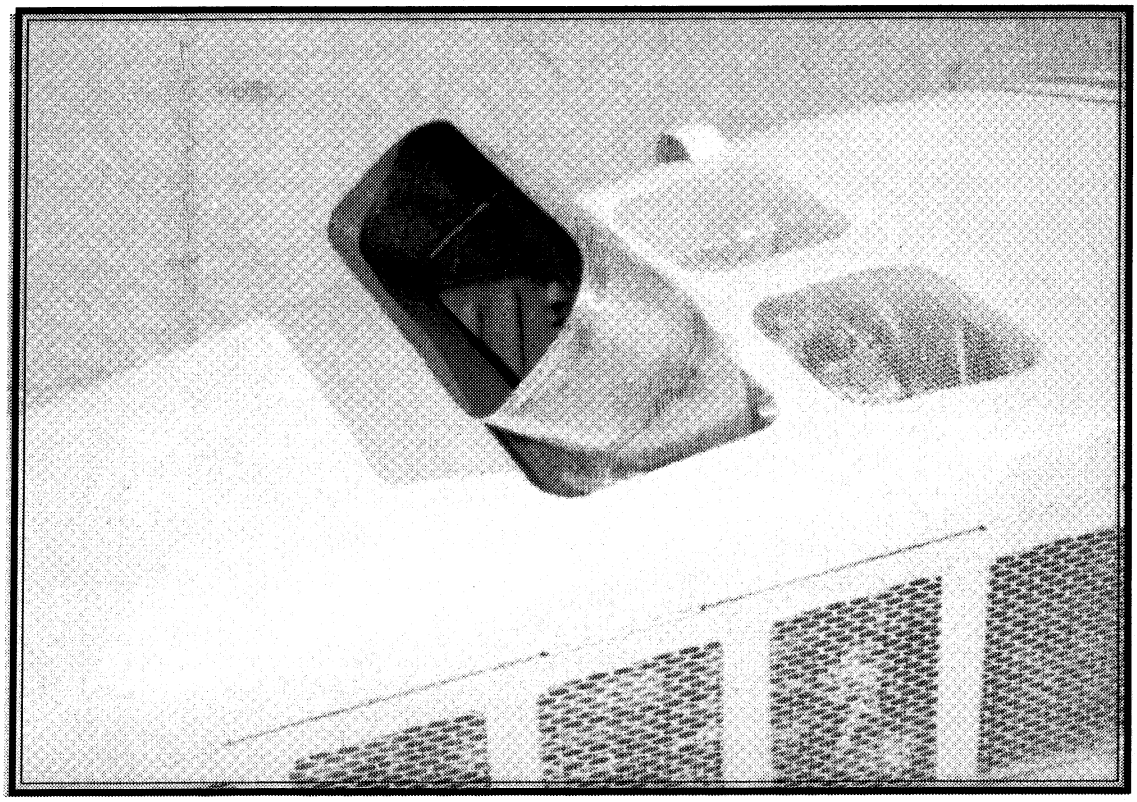
The prechamber combustor provides reliable high altitude/cold weather starting: with Jet A (JP-5) at -32° C (-25° F) and Jet B (JP-4) at -55° C (-65° F).

The turbine includes a two-stage gas producer turbine and a two-stage power turbine. These two units are free to revolve independently of one another. The first, driven by the combustion gases, drives the compressor. At 100% it rotates at 51,000 RPM. Its RPM is referred to as N_1.

Having passed through both stages of the gas producer turbine, the combustion gases then drive the two stages of the power turbine and finally exit through the single exhaust stack.

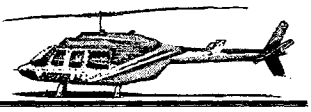
The power turbine rotates at 30,650 RPM. It furnishes the output power of the engine. Its RPM is referred to as N_2.

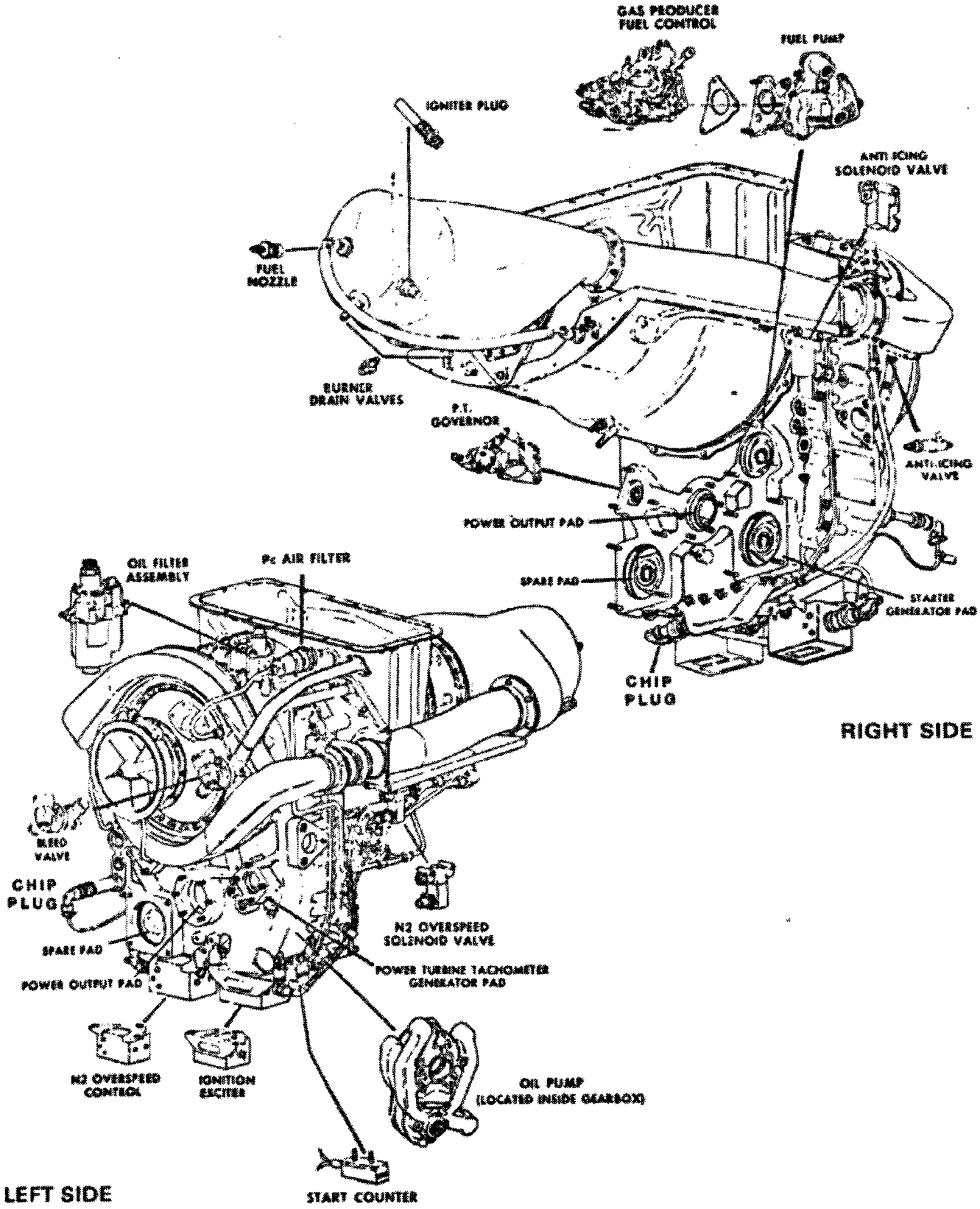
The exhaust stack directs the exhaust gases upward well clear of the fuselage surface.



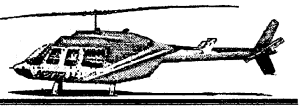
Exhaust Stack - 143

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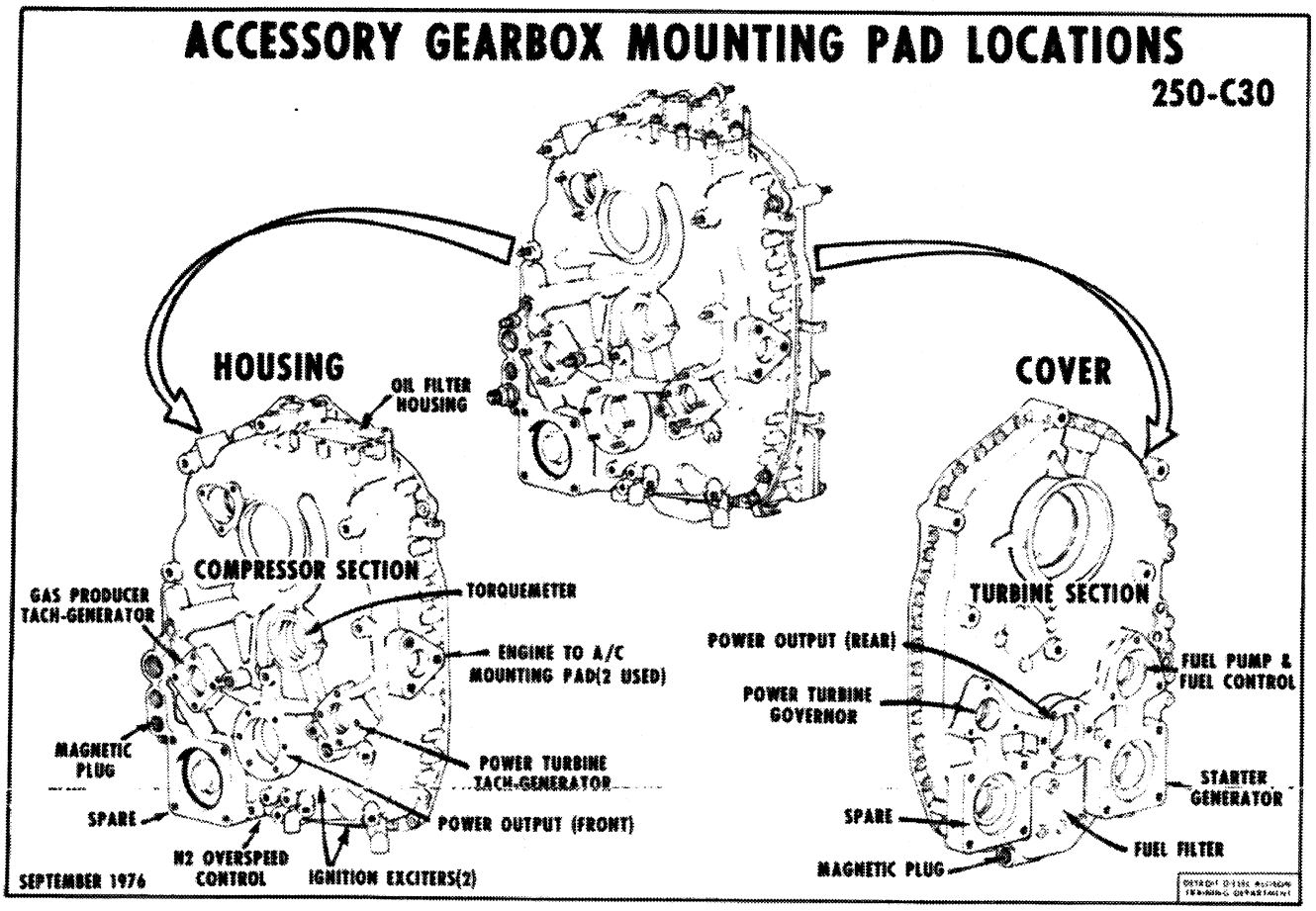
The **Power and Accessories Gearbox** encloses two gear trains. One consists of the gears which provide the output power from the engine at 6,016 RPM. It is driven by the power turbine. The same gear train also drives the tachometer generator and the power turbine governor. A spare accessories drive pad is available. This is used in the IFR configured LongRanger to drive the standby generator.

The other is the accessories gear train. It is also mounted in the gearbox but it is driven by the gas producer turbine. Its function is to drive the starter generator, fuel pump, gas producer fuel control, the engine oil pump, and the gas producer tachometer/generator.

The power turbine and gas producer **tachometer generators** are mounted on the front of the engine on the left (port) and right (starboard) sides, respectively.

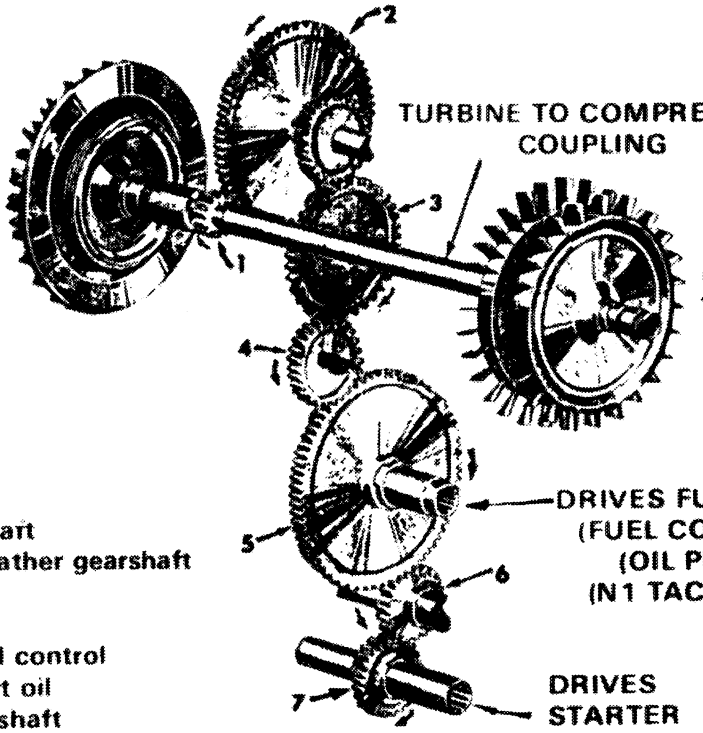
The **starter/generator** is located on the rear face of the accessories gear train on the right side. The spare pad is on the I eft.

The Power and Accessories Gearbox is mounted on the front of the engine and forms the major structural support for the engine.



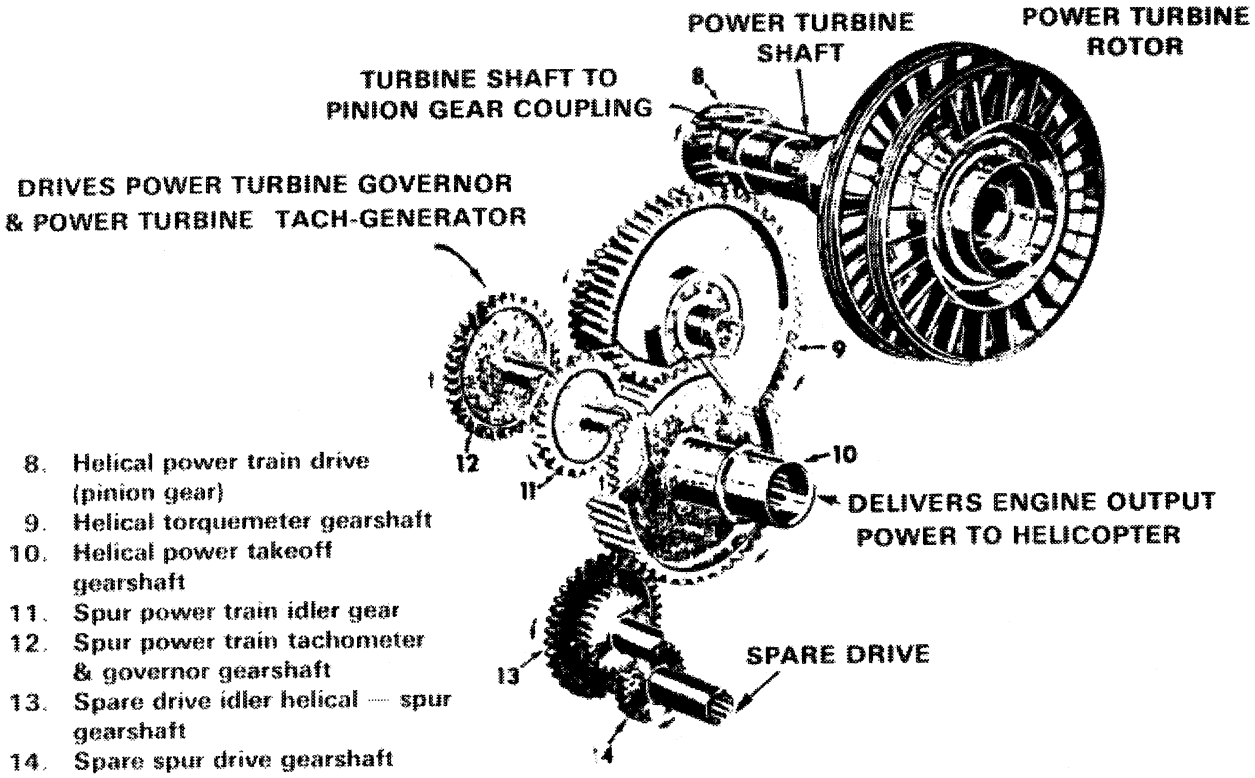
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GAS PRODUCER GEARTRAIN



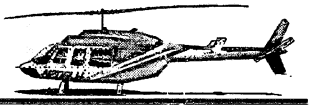
1. Spur adapter gearshaft
2. Spur centrifugal breather gearshaft
3. Spur idler gearshaft
4. Spur idler gearshaft
5. Spur fuel pump, fuel control & oil pump gearshaft oil
6. Generator idler gearshaft
7. Starter generator gearshaft

POWER TURBINE GEARTRAIN



8. Helical power train drive (pinion gear)
9. Helical torquemeter gearshaft
10. Helical power takeoff gearshaft
11. Spur power train idler gear
12. Spur power train tachometer & governor gearshaft
13. Spare drive idler helical — spur gearshaft
14. Spare spur drive gearshaft

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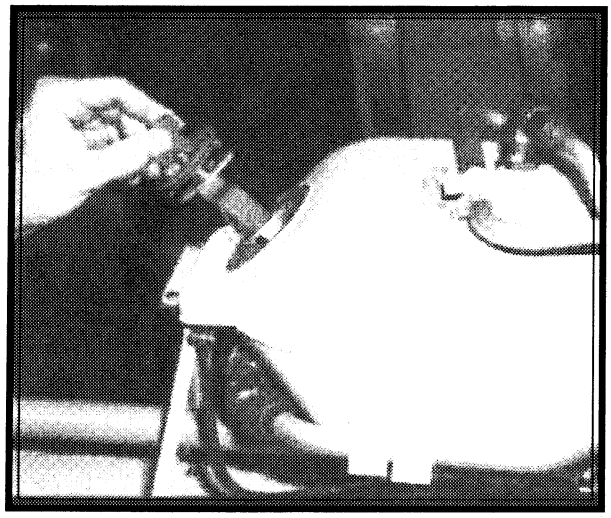


ENGINE OIL SYSTEM

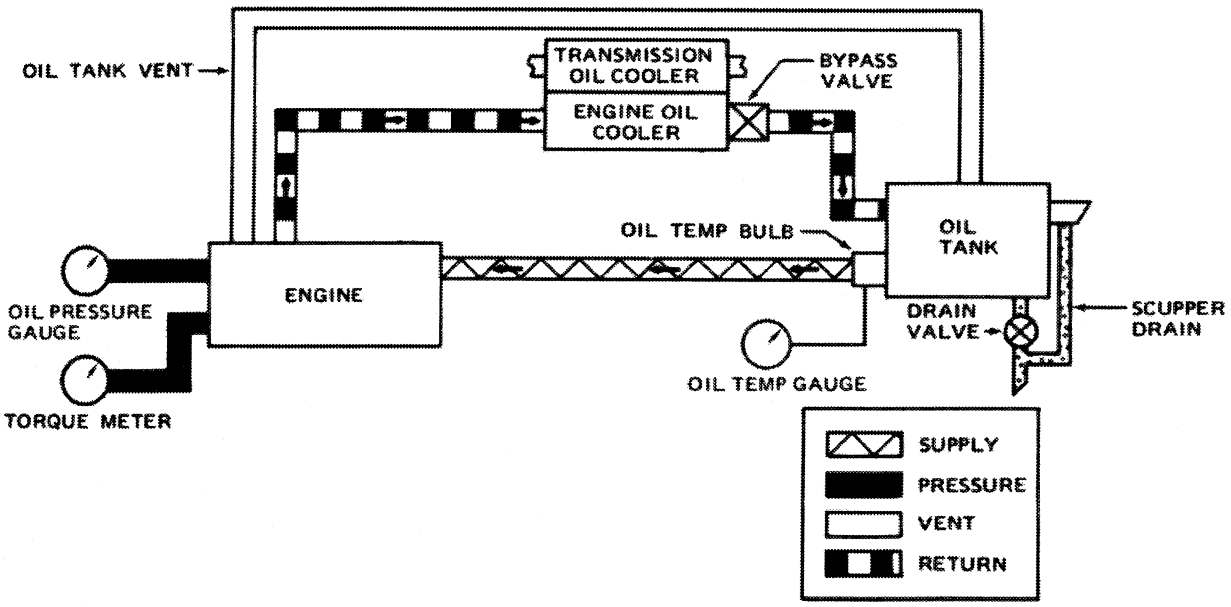
Engine **lubrication** is a completely separate system. It is a circulating, dry sump system with an external reservoir and an oil cooler.

The gear-type pressure and scavenge pump is mounted in and at the bottom of the power and accessories gearbox. Most of the engine oil lines are inside the engine.

The system has a capacity of 6 U.S. quarts (5.7 liters).



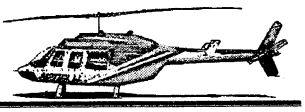
Oil Filler/Dip Stick - 144



Two **magnetic chip detector/drain plugs** are provided: one at the bottom of the gearbox and one at the engine oil outlet.

When metal particles are detected on either, the ENG CHIP light on the caution panel illuminates.

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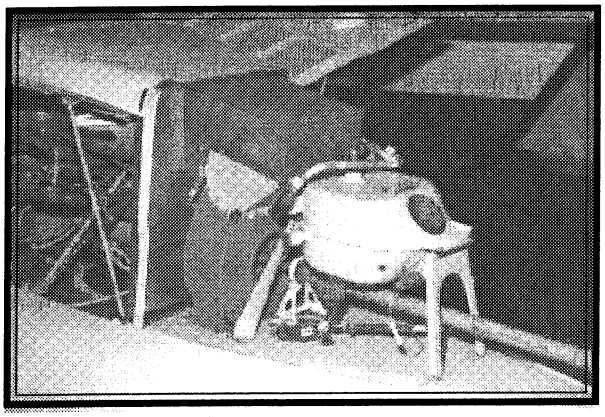


The **oil reservoir** and the oil cooler are mounted behind the engine. The metal reservoir has a large filler cap with a dip stick to indicate the quantity. A blower, driven by the tail rotor drive shaft, provides the cooling air. The blower shaft is connected to the forward and aft short shafts and becomes part of the tail rotor drive system.

A thermal bypass valve mounted on the reservoir allows the engine oil to bypass the cooler until it is warm enough for efficient flow.

The **oil cooler** handles the transmission oil as well. The two independent cooling cores are welded together. The aft one carries the engine oil.

A convenient hinged door is built into the aft fairing for easy servicing.



Engine Oil Tank - 146

IGNITION SYSTEM

The **ignition system** has one spark igniter. It is a gap type with a low-tension capacitor discharge exciter producing a high temperature, high amperage arc.

Each time the ignition system is energized, the **start counter**, mounted on the power and accessories gearbox, records it.

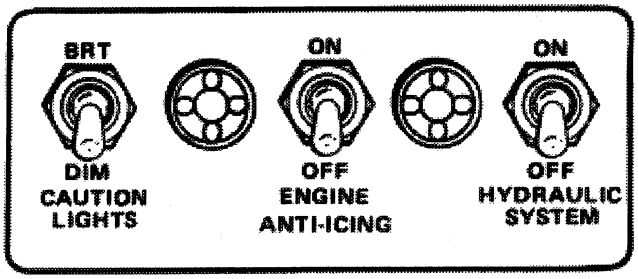
The C30P engine includes electrically actuated bleed-air anti-icing and provisions to make it easy to wash the compressor.

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The **anti-icing system** directs hot compressor discharge air through the inlet guide vanes, and No. 1 bearing support.

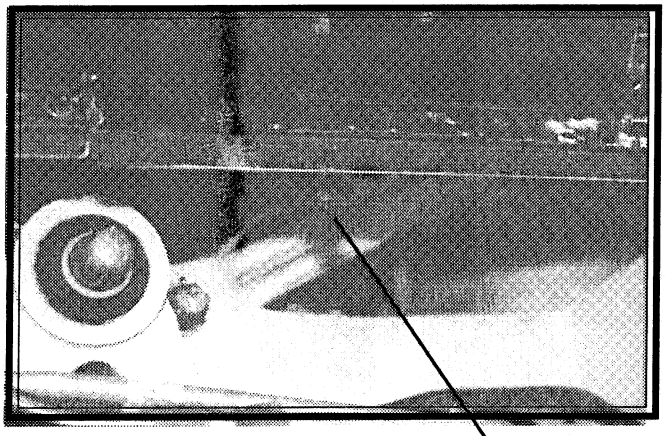
It aids in preventing ice formation on the hollow inlet guide vanes.

An electrically operated valve is mounted on the compressor scroll to control the flow of anti-icing air. The switch to activate it is on the radio pedestal.



Miscellaneous Control Panel

Anti-icing is recommended when flying into visible moisture at temperatures below 4.5°C (40°F).



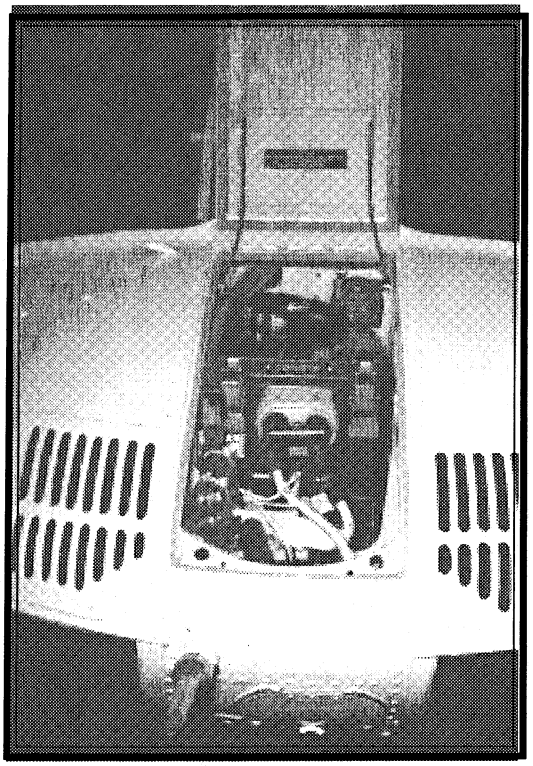
-147

Wash Fitting

The **compressor wash system** provides the piping to direct a spray of water into the engine bellmouth. The spray nozzle is mounted on the right side of the engine bellmouth and the tubing is routed to the right side of the helicopter for easy access to an outside source of water.

Compressor wash/rinse is important when the LongRanger is subjected to salt water environment. It should be completed right after the last flight of the day.

An **hour meter**, mounted in the battery compartment operates in conjunction with the engine RPM sensor. It registers an accumulative total of the engine running time. The circuit breaker for the circuit is located beside the meter.



Engine Hour Meter - 148

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FUEL SYSTEM

The LongRanger Fuel System consists of:

— Three interconnected bladder type fuel cells made of rubberized fabric. The two forward cells are located under the aft facing passenger seats.

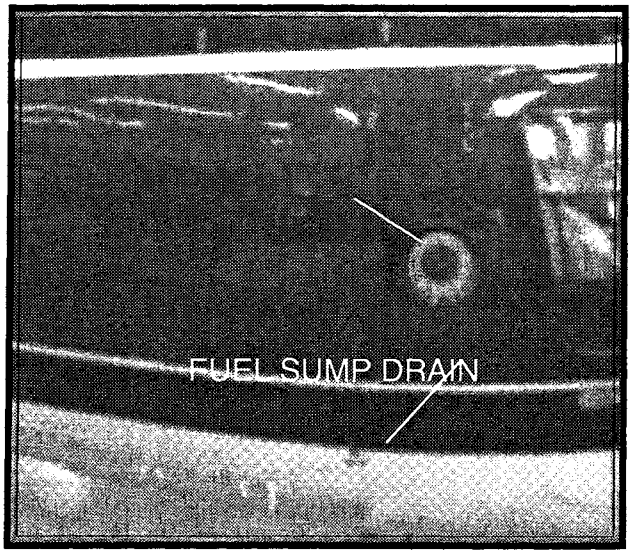
The main cell is under and behind the rear seat bench. The cells contain approximately 111 U.S. gallons (419 liters) of usable fuel. The total capacity is approximately 112 U.S. gallons (424 liters).

— An engine driven fuel pump.

— A **dual**, electric, submerged, fuel **boost pump**. It not only provides fuel under pressure to the engine pump, it provides volume and pressure flow at the ejector pumps to cause fuel to flow from the forward cells to the aft cell. Fuel will be transferred even if one of the pump elements fails.

Because each of the two elements in the dual pump has a separate circuit breaker, each can be checked individually. The left hand element can be operated directly from the battery. Either or both elements of the dual pump can be removed for repair or replacement without draining the cell.

— A low pressure **fuel filter** with a replaceable element. It is mounted clear of the plane of rotation of the turbine rotor blades on the right front firewall. It includes a switch to activate the fuel filter caution light in the event of impending bypass.



-149

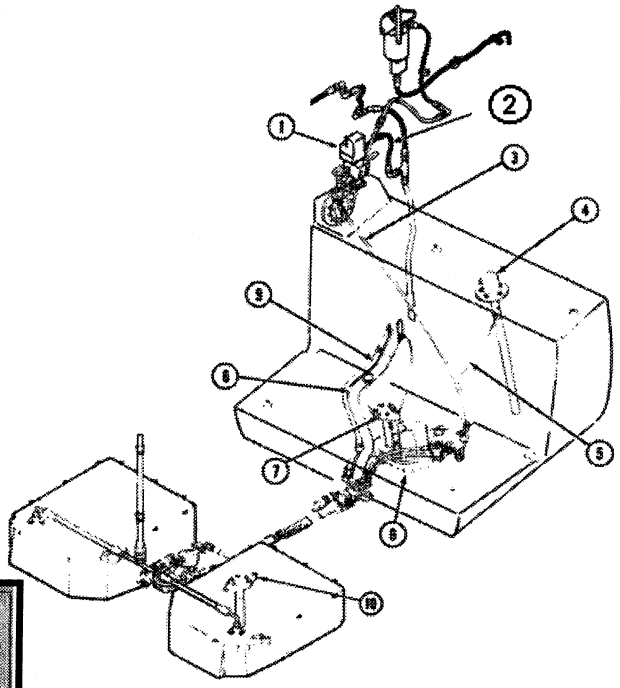
— **A dual-element ejector pump** located between the forward cells to move the fuel to the aft cell. This movement commences as soon as the level of the main cell is as low as the level in the forward cells.

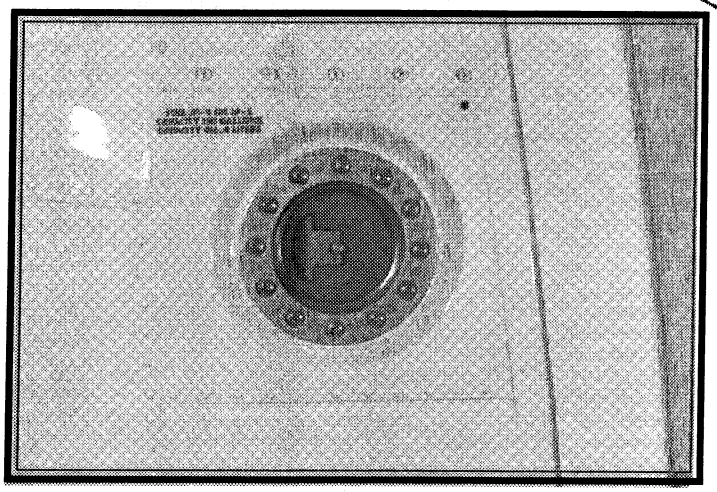
— Two fuel flow switches between the two forward cells to monitor the flow from the forward cells to the aft cell.

— Two **fuel pump caution lights** to indicate malfunctions in either of the boost pump elements. They are activated by the fuel flow switches.

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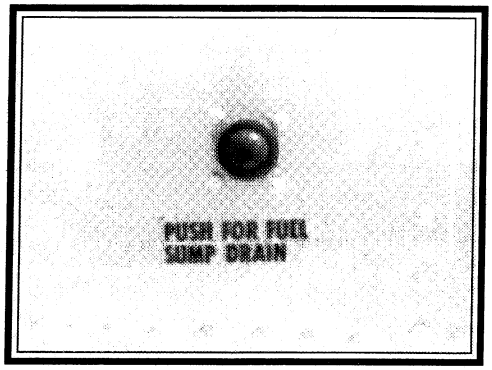
1. Fuel Shut Off Valve
2. Vent Hose
3. Fuel Supply Hose
4. Upper Fuel Quantity Transmitter
5. Fuel Quantity Probe Harness
6. Fuel Boost Pump Assembly
7. Aft Fuel Quantity Probe
8. Interconnect Tube
9. Ejector Pump Tube
10. Forward Fuel Quantity Transmitter





Fuel Filter - 150

— Three **fuel quantity probes** and a transmitter connected to one indicator, on the instrument panel. It reads in pounds. One probe is in the left forward cell, the others are mounted in the aft cell: one high, one low. The transmitter is mounted in the top of the aft cell.

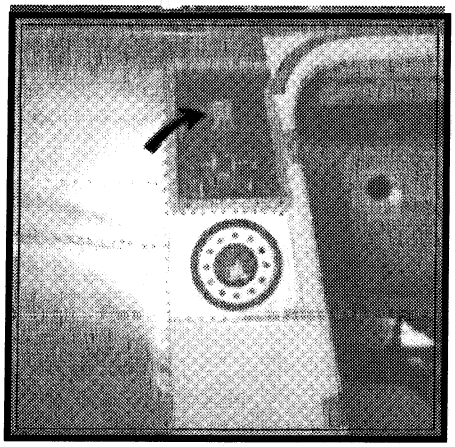


Fuel Sump Drain - 151

— A **single filler cap** located on the right side of the helicopter just aft of the passenger door. A grounding plug is located nearby.

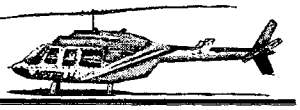
— An electric fuel-sump drain valve on the aft cell operated by a push-button just below the filler cap.

— A fuel **shut-off valve** electrically operated by a switch on the instrument panel. A guard is provided on this switch to prevent inadvertent activation. The valve is mounted in the assembly just above the filler cap and is accessible from the outside.



Fuel Shut-Off Valve - 152

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— A transducer to activate the **fuel pressure gauge**, mounted in the assembly with the shut-off valve.

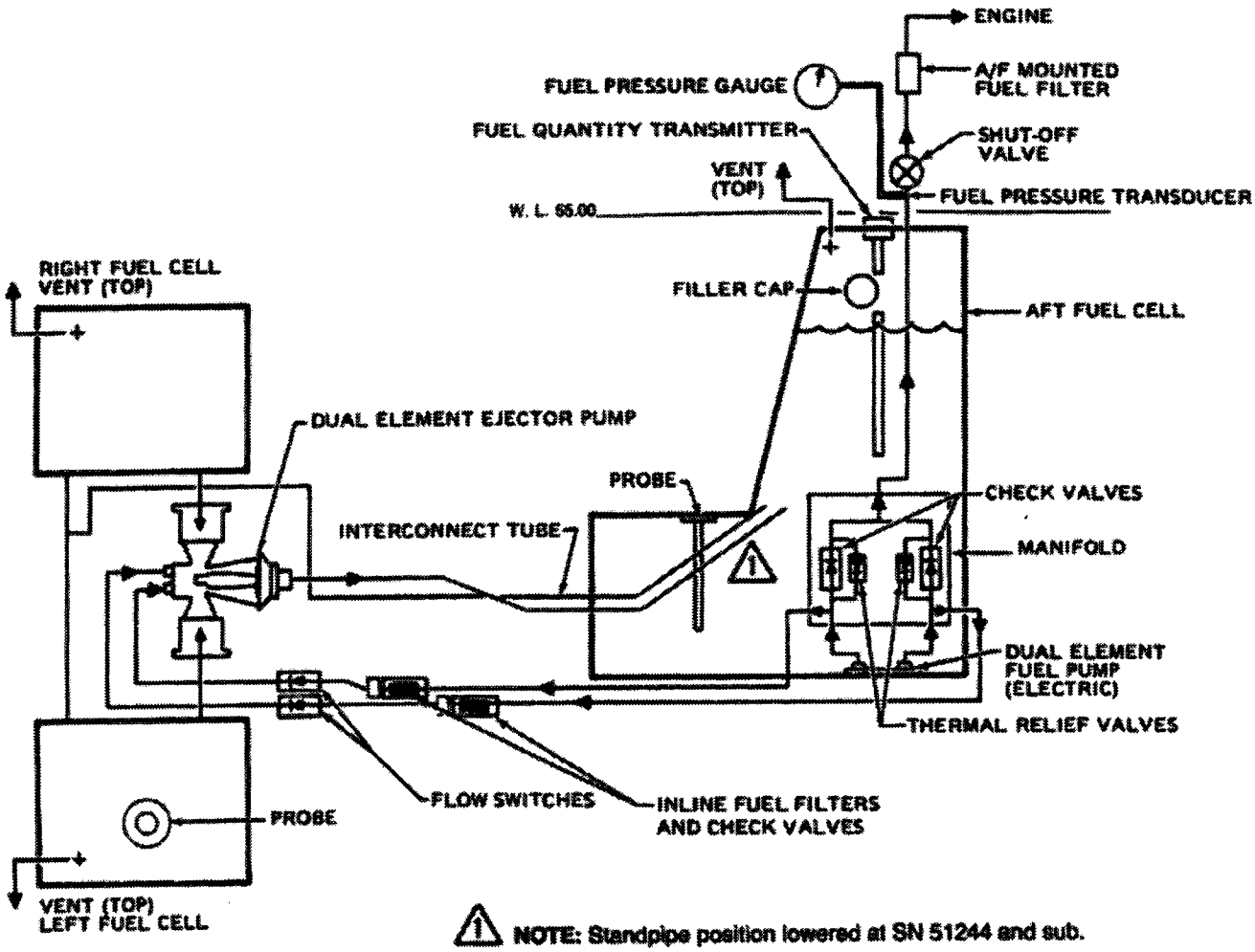
— A switch in the aft cell to activate the **low-level caution light**.

— Common ventilation point for the three cells.

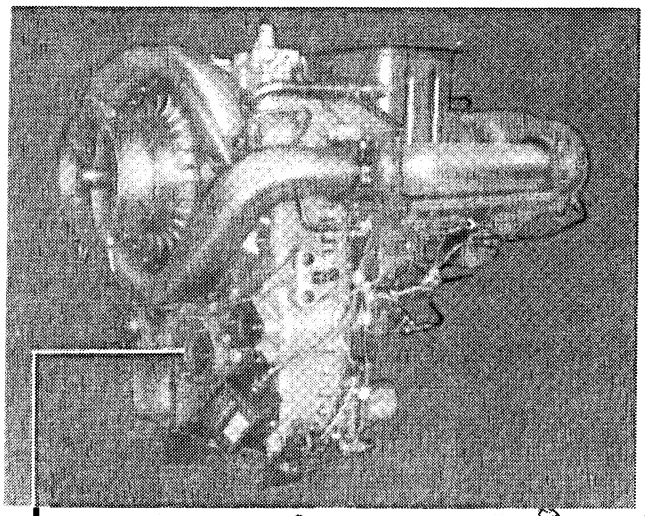
Usable fuels are: JP-4, JP-5, ASTM1655, and Types A, A1 and B. Limitations are included in the flight manual. Fuel management is automatic.

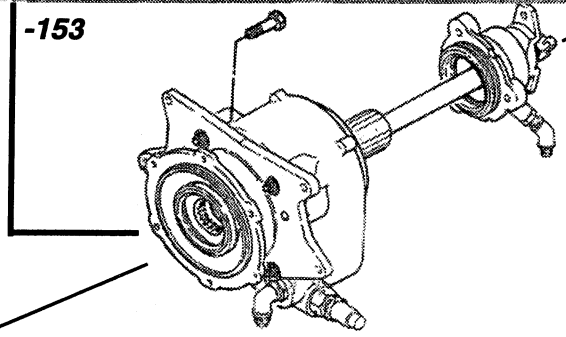
The honeycomb box structures which form the passenger seat benches are designed to protect the fuel cells from damage resulting from a hard landing. The smooth fiberglass inner surface further reduces risk of cell rupture, thus reducing the fire hazard.

All three cells are made of a heavy, **rupture resistant** material and have passed the 50-foot free fall test. The flexible interconnecting fuel lines make the whole system very resistant to fire in the event of an accident.



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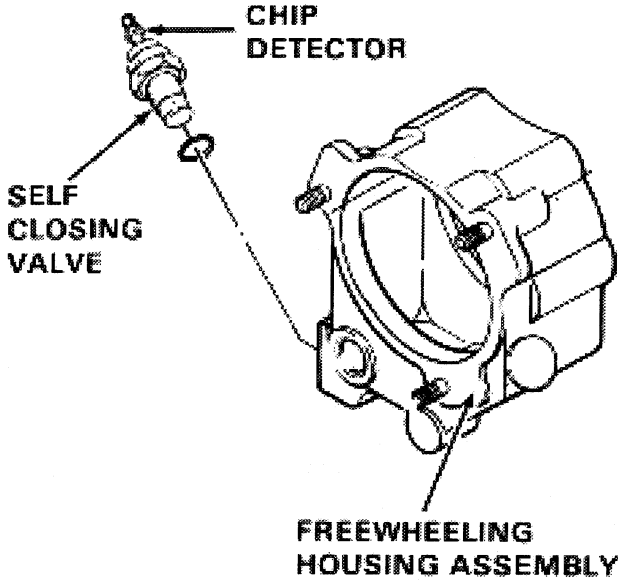




FREEWHEELING UNIT

The engine is coupled to the transmission through the freewheeling unit and the main driveshaft.

The sprag type free-wheeling unit is mounted on the engine gearbox. During autorotation, it permits a disconnect from the engine and allows autorotation forces of the main rotor to drive the tail rotor and all transmission accessories.

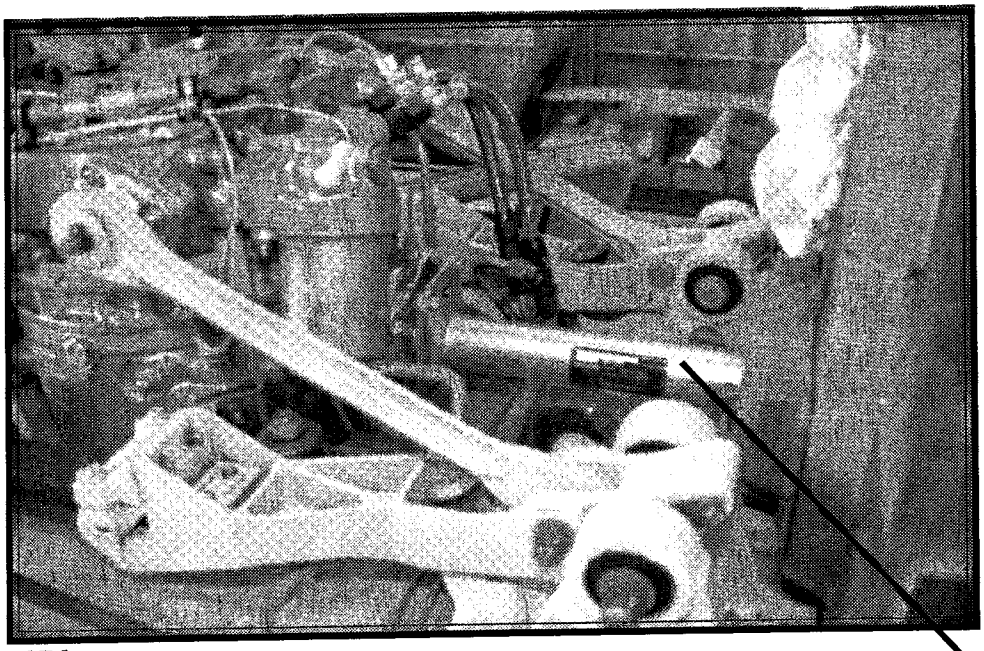


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MAIN DRIVESHAFT (Kaflex)

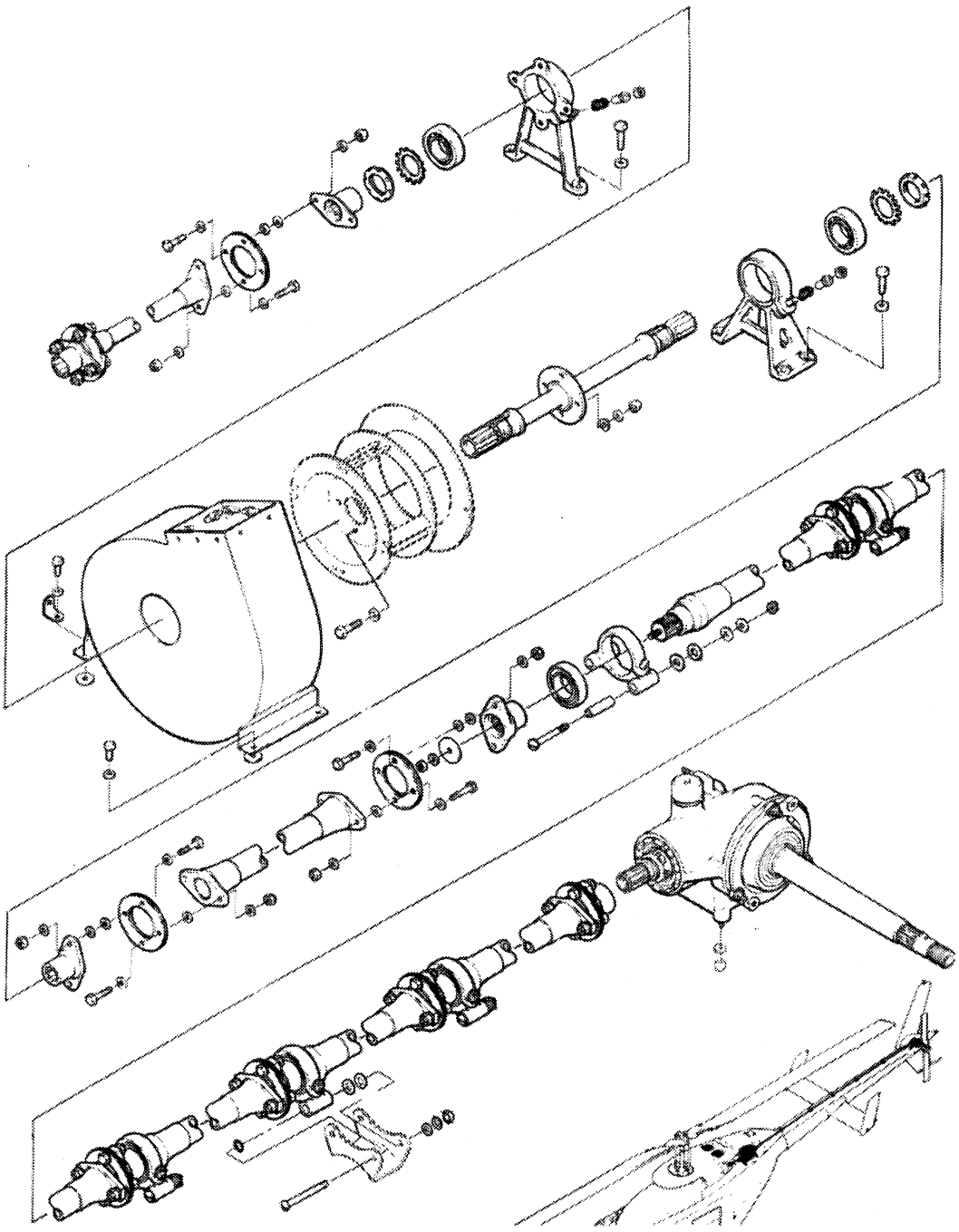
The engine to transmission Kaflex drive shaft provides a flexible drive connection between the freewheeling unit and the transmission. This flexible shaft allows smooth transfer of torque even though the transmission and freewheeling unit are not always in perfect alignment. Flexibility of the shaft is provided by rectangular plates, three in each coupling.

Each plate flexes providing both angular misalignment and length changes to accommodate movement of the transmission on its mounts. Each coupling can be considered a truss work in which torque loads are carried as axial loads in straight members of each plate. A fail-safe feature exits which enables uninterrupted drive of the shaft after a failure has occurred in one of the dual load paths provided by the plate couplings. The kaflex drive shaft does not require any lubrication.



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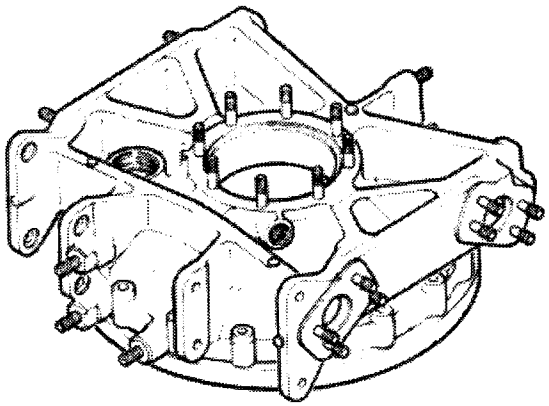


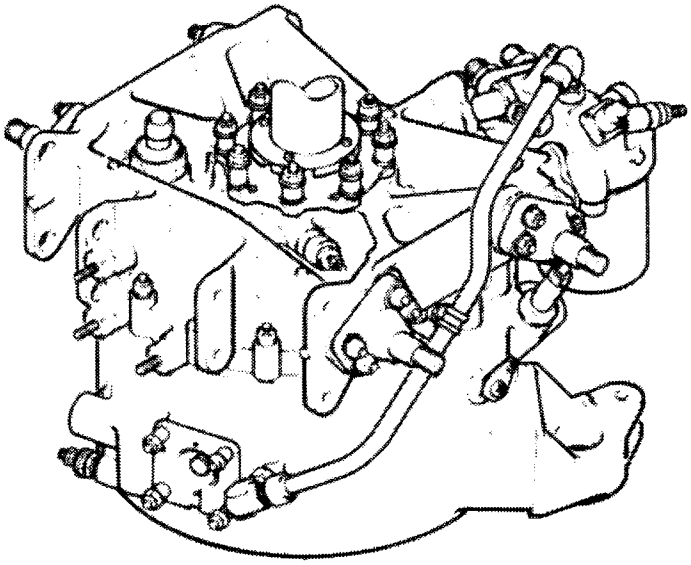
DRIVE SYSTEM CONTINUED AFT TO THE TAIL ROTOR

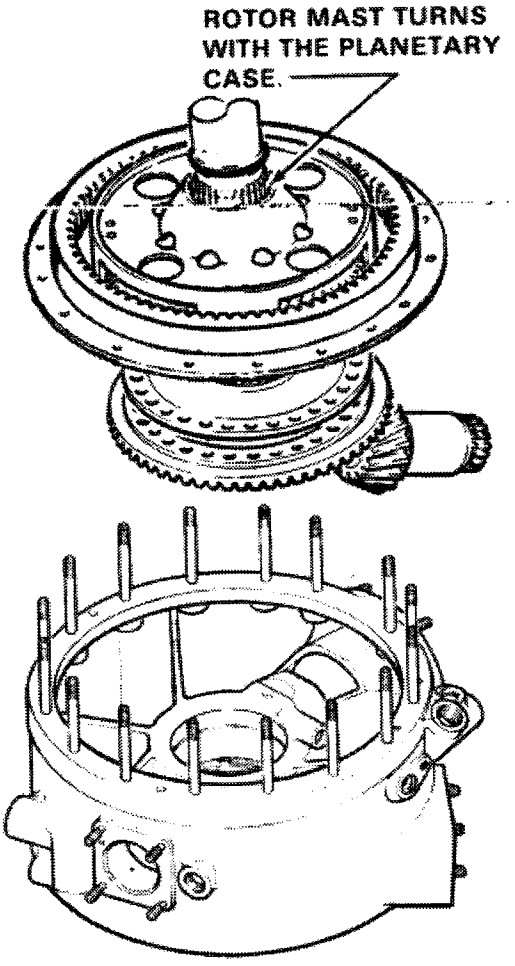
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TRANSMISSION

The transmission is a reduction gearbox which transmits engine power to the main rotor at reduced RPM. A spiral bevel gear and a planetary gear provide the reduction. The rotor mast is splined to the output of the planetary gear set. The transmission, with its total of eight precision gears, reduces engine output of 6016 RPM to the rotor RPM of 395.



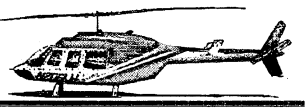


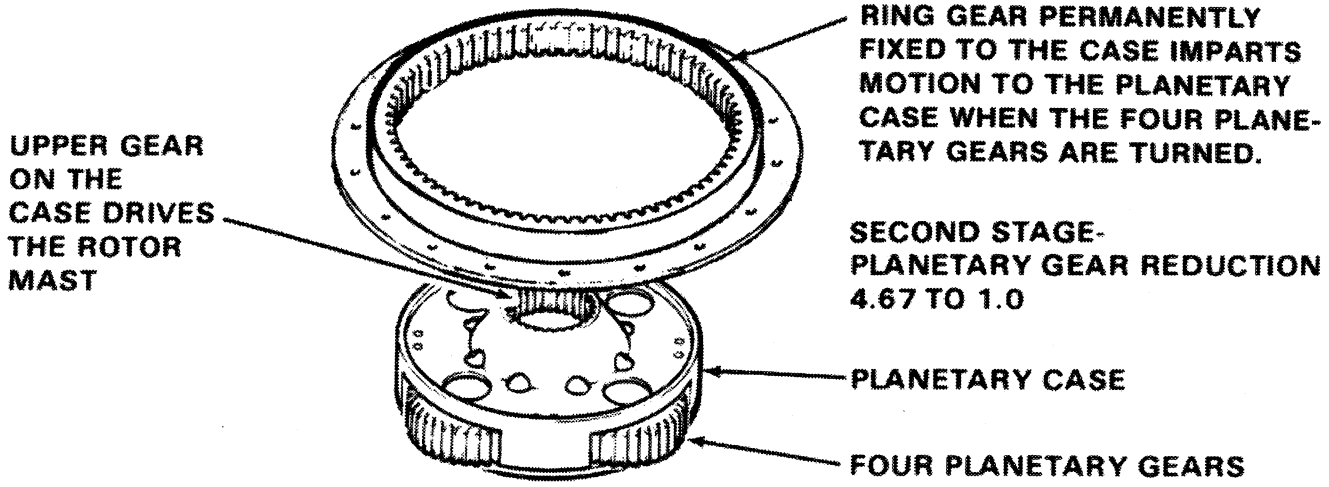


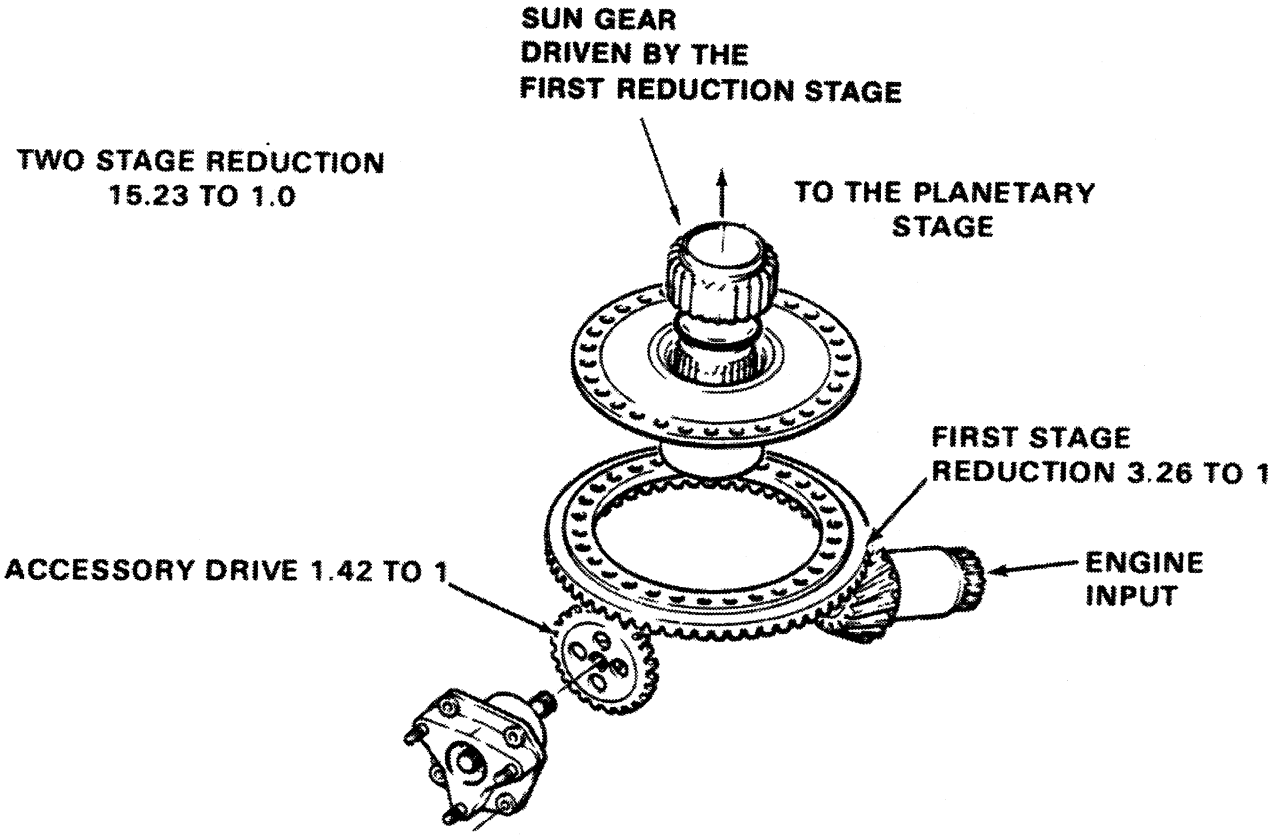
The transmission is mounted on the cabin roof forward of the engine.

The mounting is unique. It isolates the fuselage from those vibrations of the main rotor that occur twice per rotor revolution.

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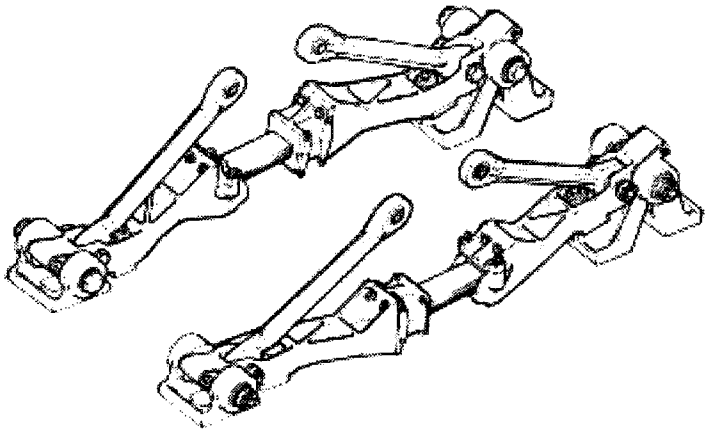




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The inplane isolation is controlled by the geometry of the four links that support the transmission and the spring rate that has been established between the transmission and the support assembly. The support assembly, bolted to the cabin roof keeps the rocking movement of the transmission within reasonable bounds. Neither the geometry nor the spring rate is adjustable.

Most of the vibration is vertical. This vibration is alleviated by the **nodal beams**.



Nodal Beam

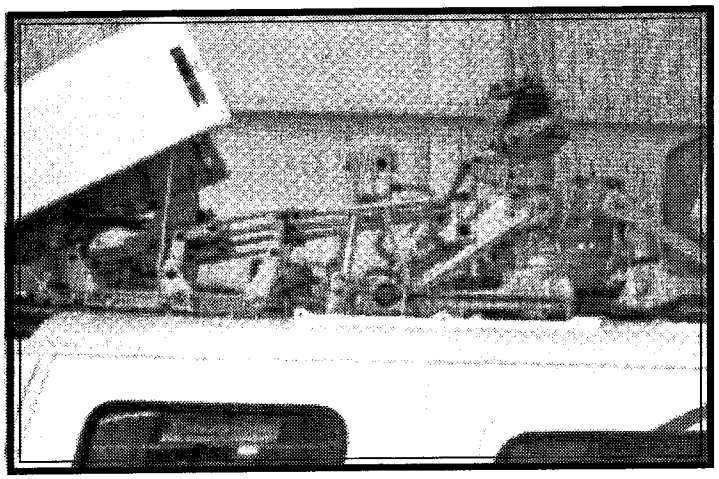
Two beams are mounted on the cabin roof, fore and aft, one on each side of the transmission. Each beam has a laminated elastomer flexible assembly in its center and elastomeric bearings at each end. The beams are free to flex up and down.

The four links that support the transmission are mounted on the beams, again using elastomeric bearings.

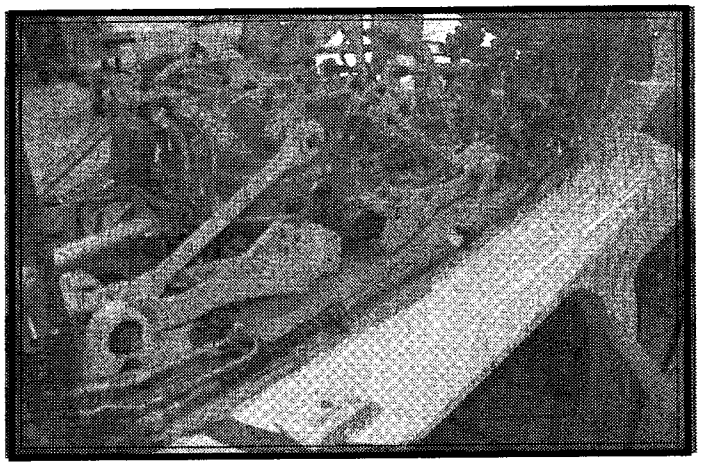
As the rotor and transmission vibrate vertically, the motion causes the beam to flex. However, every flexing beam has nodal points which have little or no vertical motion. The bearings that fix the fuselage to the beams are installed on these nodal points. As a result, the vertical motion does not get transmitted to the fuselage.

Before delivery, the beams are tested and tuned by adding weights to each beam arm.

This forms the Nodamatic suspension system which provides a smooth ride through the full speed range.



Left Nodal Beam - 155



Right Nodal Beam - 156

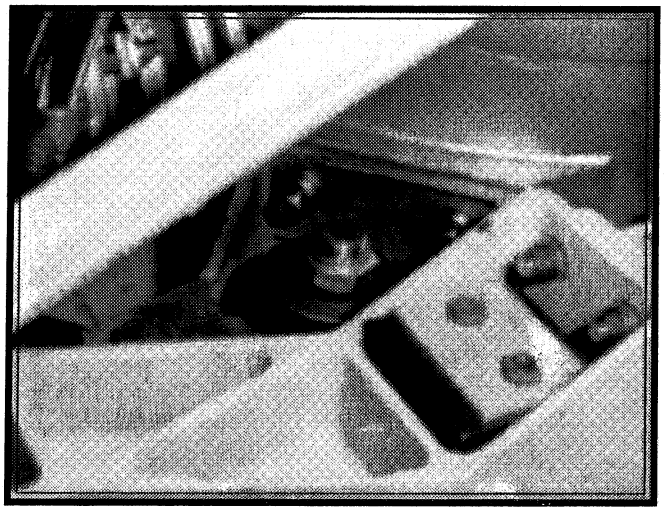
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The reduction in vibration not only makes all LongRanger flights more comfortable, it permits higher flight speeds without compromising that comfort or the fatigue life of the airframe and dynamic parts. It makes it easier on instruments and radios as well.

A self-contained **lubrication system** for the transmission and the freewheeling unit is incorporated.

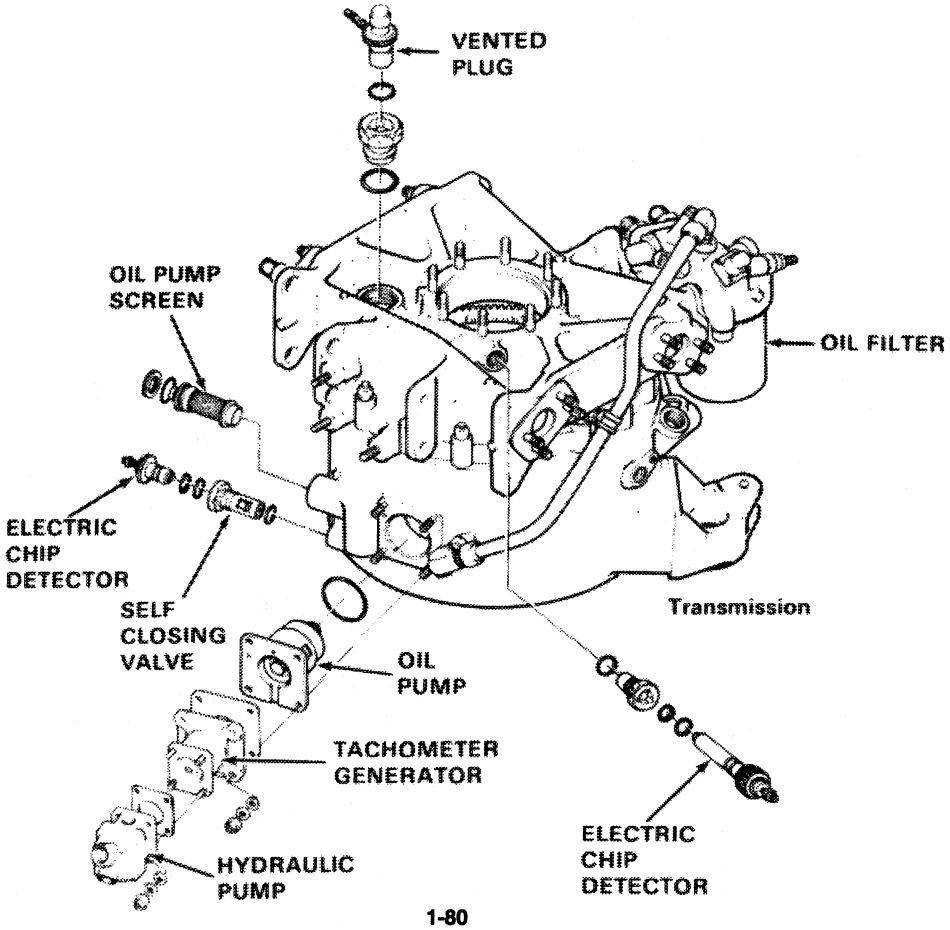
An accessory-drive bevel gear on the forward left side of the transmission drives the transmission oil pump. It, in turn, is equipped with a pad on which the **tachometer generator** is installed, and the tachometer generator is equipped with a pad on which the hydraulic pump is installed.

The tachometer generator drives the main rotor RPM indicator.



Nodal Beam Tuning Weight - 157

The transmission **oil pump** is a constant-volume submersed type that forces oil out of the sump to a filter on the left side and on to the oil cooler. The oil cooler uses the same fan as the engine oil cooler. It is the forward core of the dual assembly. From the cooler, the oil is circulated to the oil jets in the transmission and freewheeling unit.

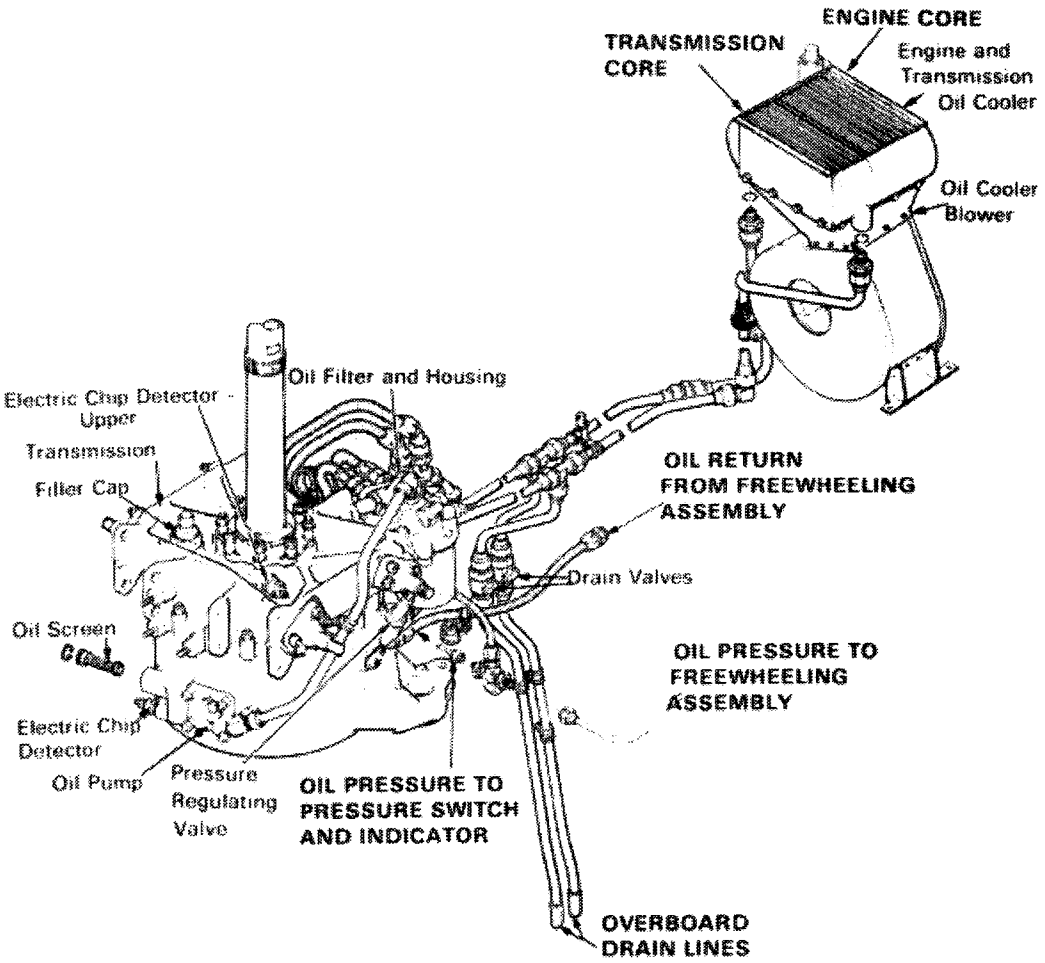


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The oil filter assembly is mounted on the transmission. It contains a bypass valve, a high-temperature warning switch, a thermobulb, and a replaceable filter element.

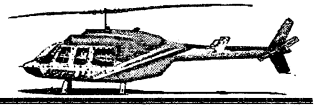
The oil cooler contains a thermal valve that allows oil to bypass until it warms up.

The self-contained transmission lubrication system has a capacity of 7 U.S. quarts (6.6 liters). The pump capacity is 4.5 to 5 gal/min (17 to 19 liters per minute).



TRANSMISSION OIL SYSTEM

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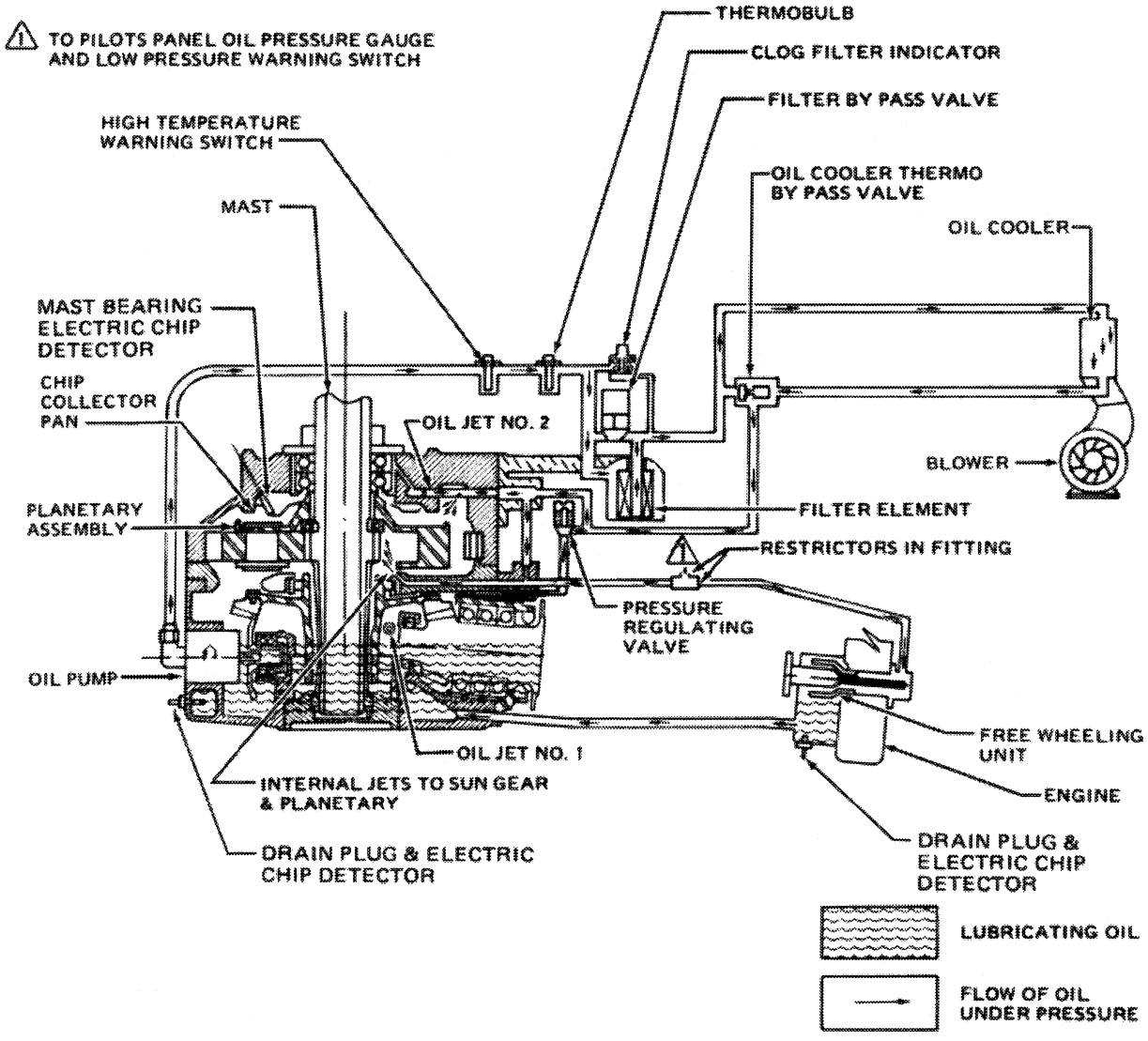


Lights on the caution panel warn the pilot of **loss of oil pressure** and/or **excessive oil temperature**.

Two electric **chip detectors** are located in the **transmission** and **one** in the **freewheeling unit**. These detectors have a permanent nonconducting magnet surrounding an electric probe.

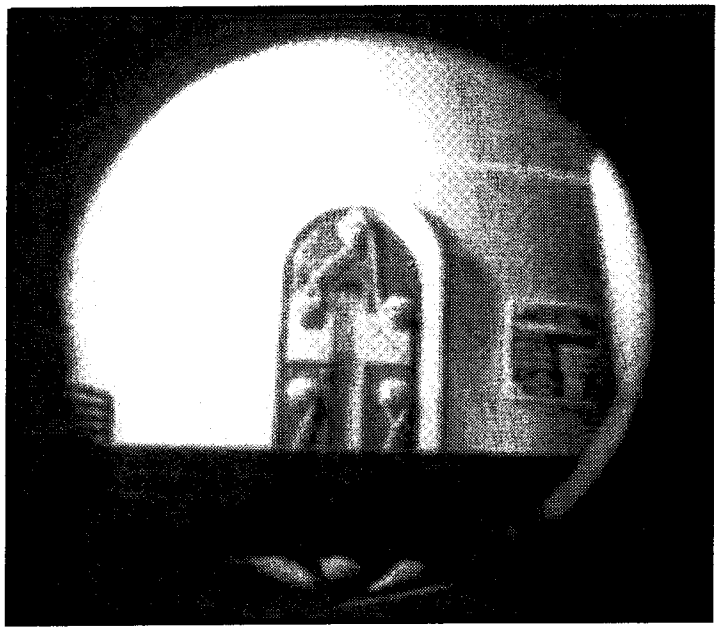
When a sufficient number of metal particles accumulate to complete the circuit, on any of the three, the TRANS CHIP light on the caution panel illuminates.

Each detector has a self-closing valve, which also serves as a drain plug.

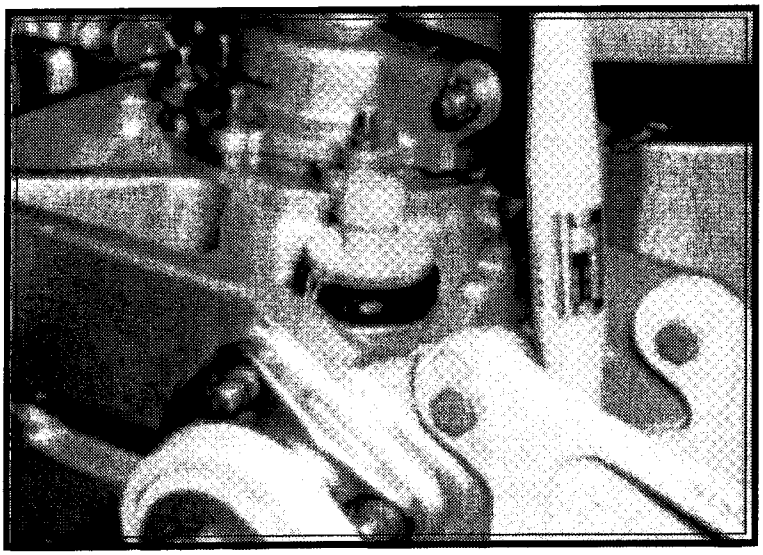


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A breather-type **filler cap** and an oil **level sight gauge** are located on the transmission top case and the right side of the lower case, respectively.



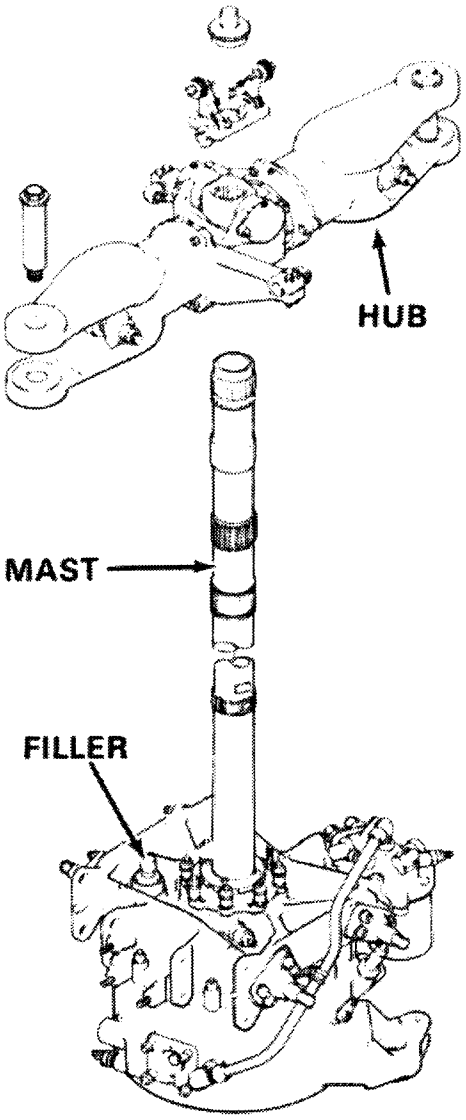
Transmission Oil Sight Gauge - 159



Oil Filler Cap - 160

MAIN ROTOR

The **main rotor mast** is a hollow steel shaft that transmits torque to the main rotor. Splines on the lower portion mate with those of the transmission planetary gear. Splines on the top mate with the hub.



The LongRanger uses an underslung feathering-axis (UFA) hub. The UFA hub, with only six bearings that require lubrication, is mechanically simple and provides good stability and quick control response.

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The hub assembly consists primarily of a yoke fitted onto a splined trunnion and secured with pillow blocks, a pitch horn and grip assembly attached to each arm of the yoke with a tension-torsion strap, and a blade-latch mechanism located between the upper and lower tangs of each grip assembly.

The main rotor is a semirigid, teetering type with two interchangeable blades.

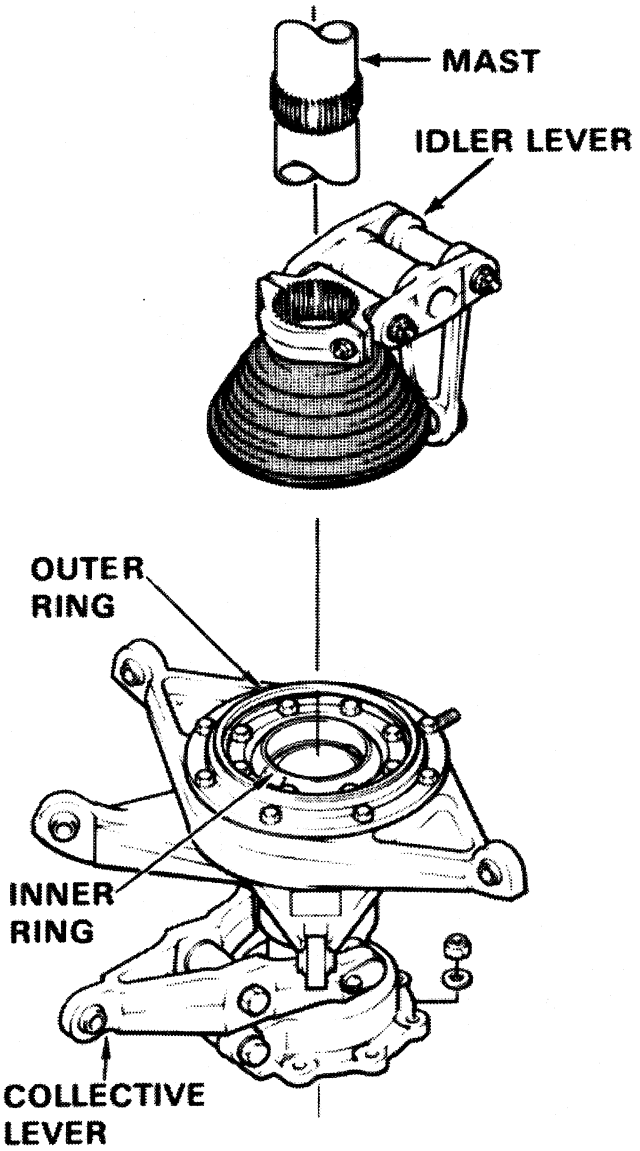
It has high inertia which provides a forgiving rotor. Additional weight in each blade increases dynamic stability and assures high blade energy for safe, easy autorotations. Safety and survivability are the pilot's inheritance in the LongRanger where high inertia permits zero speed touchdowns under most conditions even at the maximum gross weight.

For the pilot, additional significant advantages of the LongRanger's two bladed, semirigid rotor include:

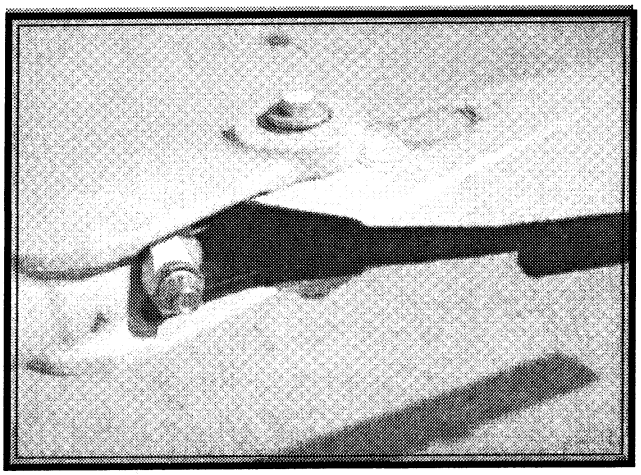
— No Control Loss With Stall: The onset of retreating blade stall does not induce pitching moments as in articulated rotors.

— Low Gust Sensitivity: High kinetic energy reduces the effect of turbulence.

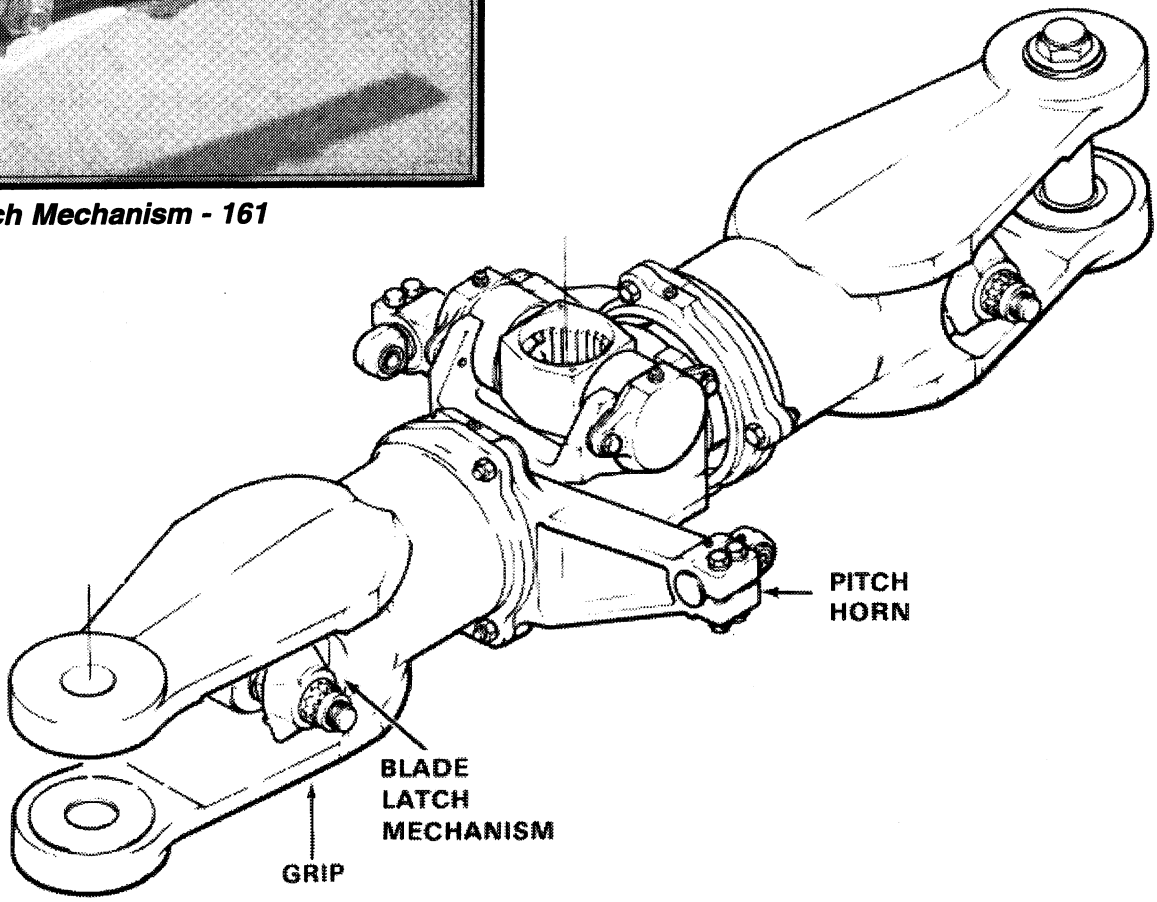
The root end of the blade, reinforced with doublers and grip plates, is secured to the blade grips by a retaining bolt. The bolts have hollow shanks for installation of weights to balance the hub. The grip plates extend inboard beyond the retaining bolt to a blade latch mechanism. This mechanism constrains the lead-lag motion of the blade and provides sweep adjustment of the blade alignment.

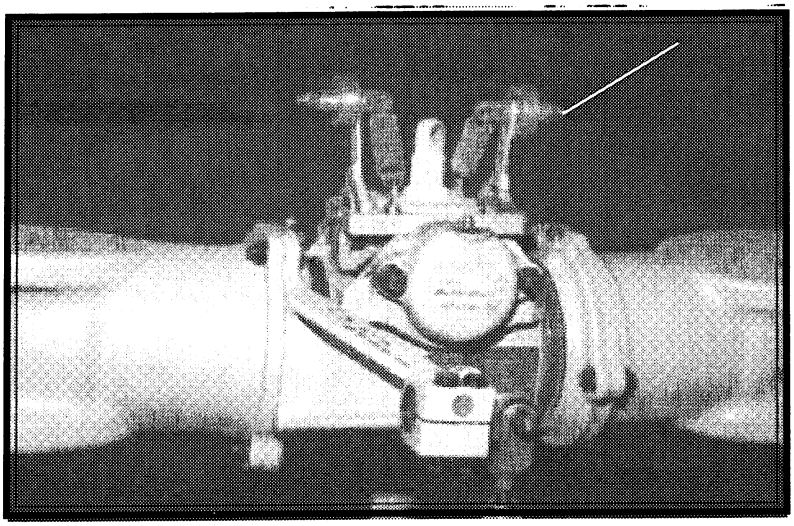


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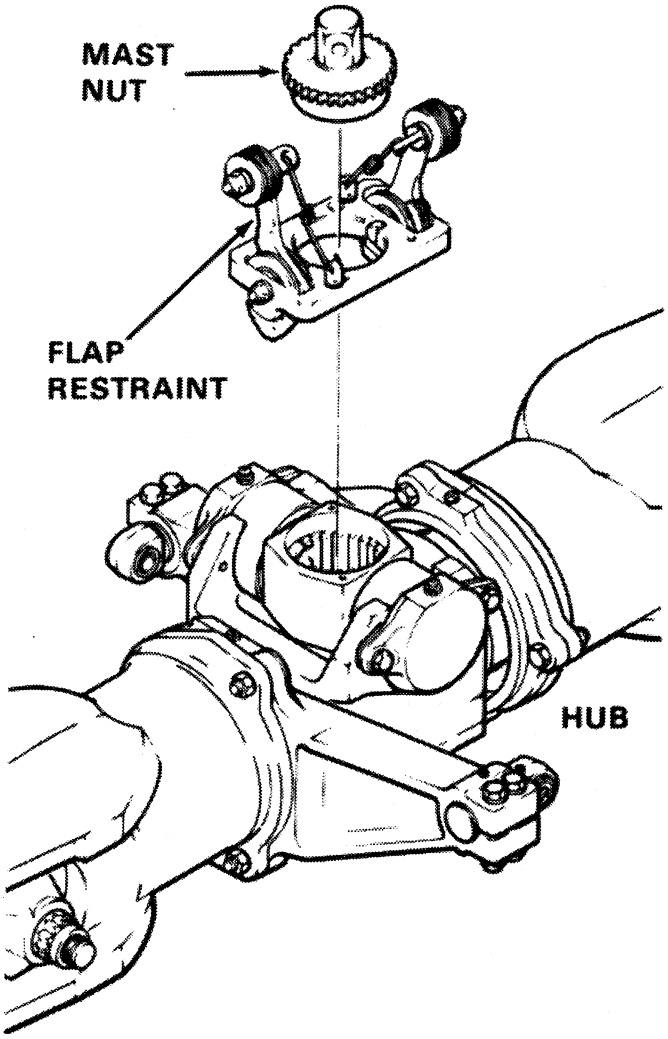
Blade Latch Mechanism - 161





Flap Restraint - 162

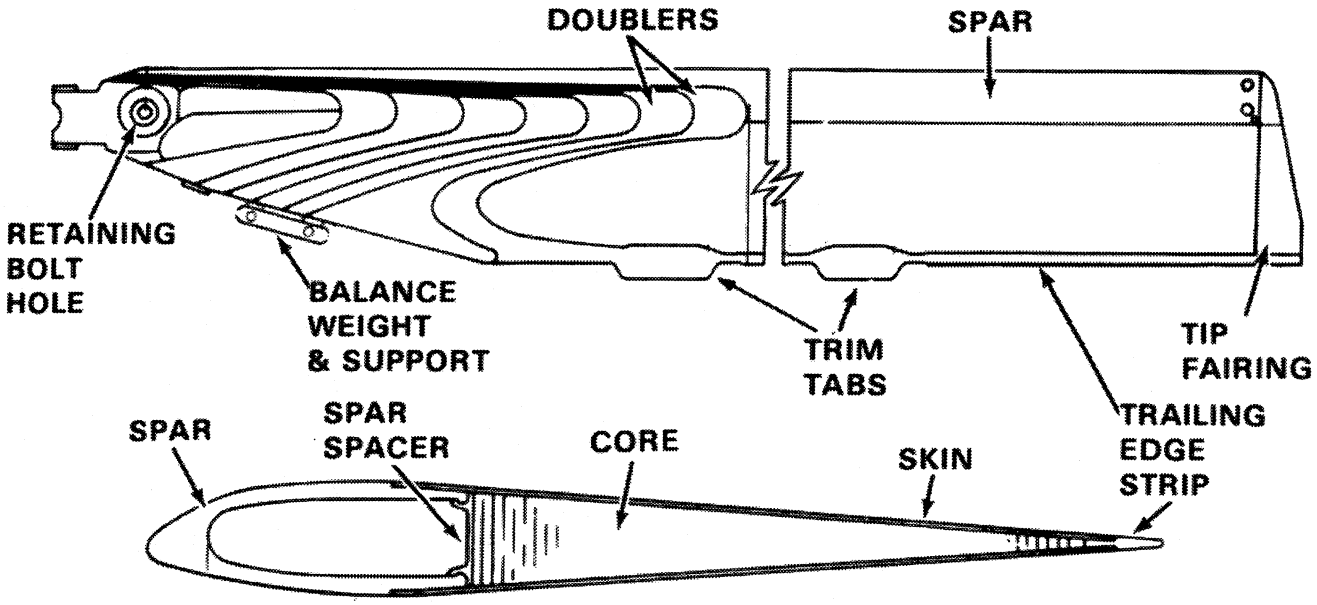
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A pair of **trim tabs** is located on the outboard trailing edge of each blade for tracking adjustment.

The **flap restraint** mounted on the top of the hub prevents excessive flapping of the main rotor blades that may occur during start-up and shutdown under gusty wind conditions. The flap restraint is activated by centrifugal force and engages when rotor speed drops below approximately 125 RPM.

The main rotor blade has qualities of advanced aerodynamic efficiency, ruggedness, and simplicity blended in a design to provide good performance and a margin of safety for the pilot.



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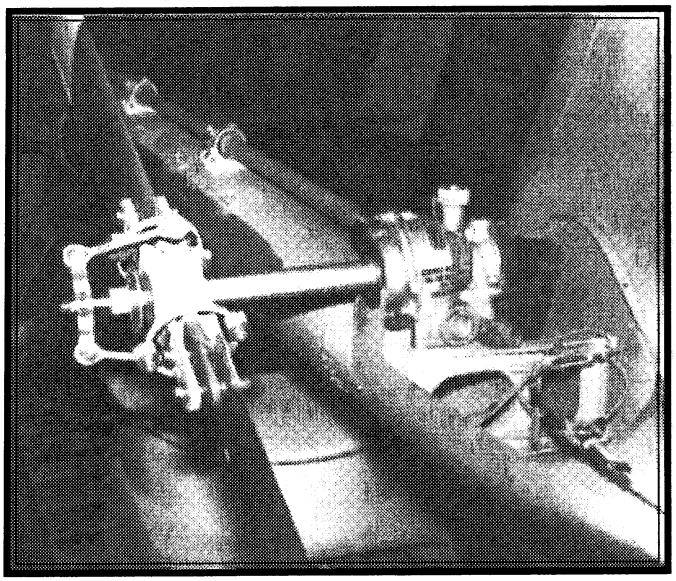
The LongRanger uses a **droop-snoot airfoil section**. Rotor blade efficiency is significantly improved compared to symmetrical blade shapes. A wide thrust margin for maneuverability and high efficiency in a hover, particularly under adverse conditions of gross weight, temperature and altitude, are, in part, the result of this airfoil design.

The blades have **swept tips** which reduce the adverse effects of the high mach numbers on the advancing blade tip thus reducing noise.

The all-metal blade is bonded, using six basic parts: an extruded aluminum-alloy spar, a trailing edge strip, a honeycomb core and two aluminum skins. The bonded aluminum honeycomb core provides a rugged, light structure and retains the airfoil shape.

TAIL ROTOR

The **tail rotor drive train** extends from the freewheeling unit to the tail rotor gearbox. The drive train is made up of **eight individual drive shafts** from the freewheeling unit to the tail rotor. They are the forward short shaft, the oil cooler blower shaft, the aft short shaft and five interchangeable tail rotor driveshaft segments. The engine oil **cooler blower** is installed on and driven by the second shaft from the freewheeling unit. The first two shafts are steel and the remainder are aluminum alloy.

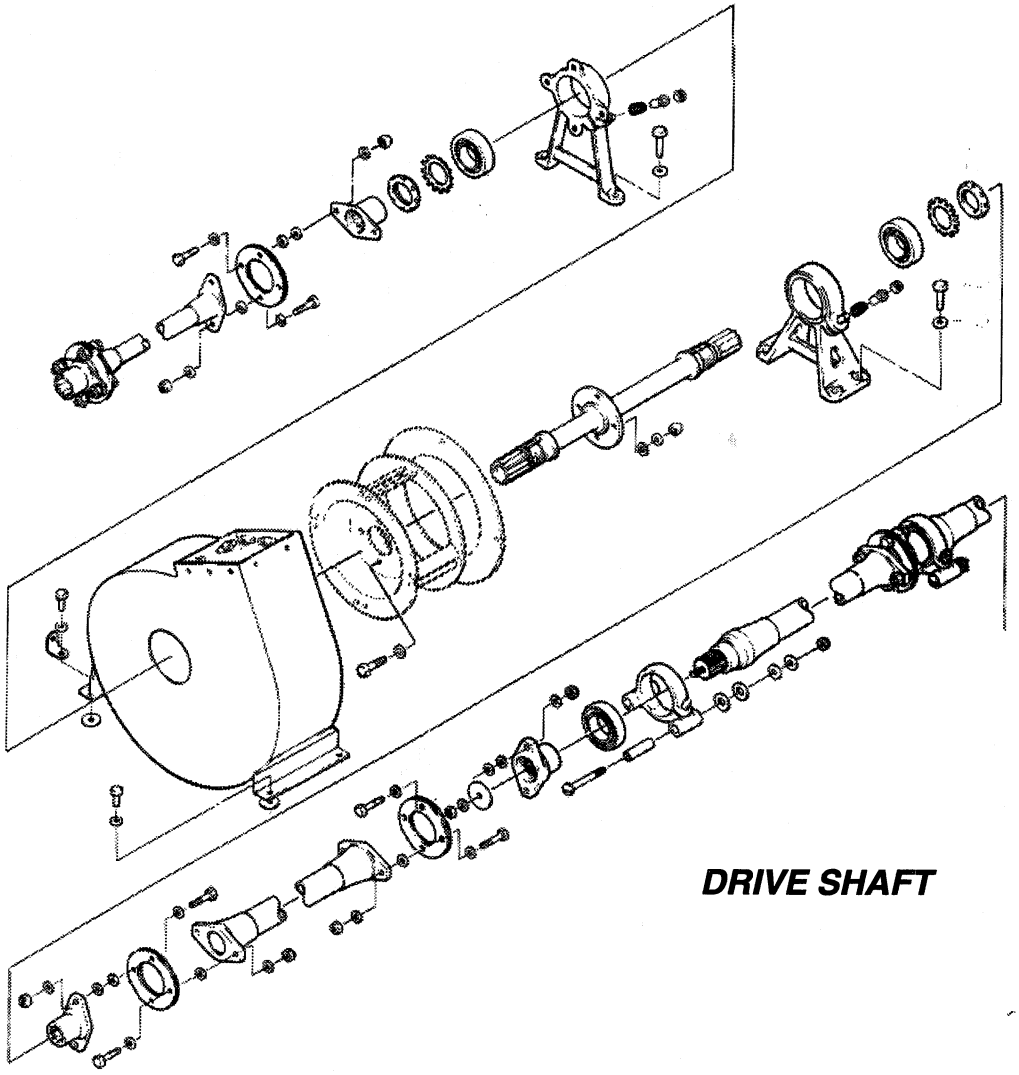


Tail Rotor Gearbox - 163

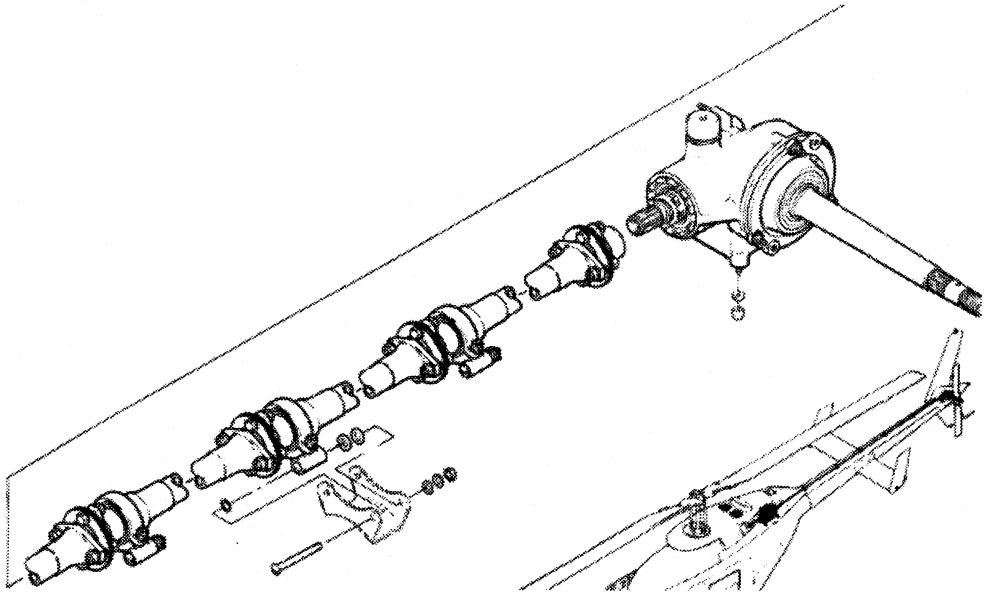
Steel laminated flexible couplings, requiring no lubrication, are used to connect the individual shafts to each other and to the tail rotor gearbox. Bearing hangers support and maintain the drive shaft alignment.

The magnesium **tail rotor gearbox** contains two spiral bevel gears which change the direction of drive 90° and provide a speed reduction of 2.35 to 1.0. It has its own, self-contained lubrication system with a capacity of 0.4 U.S. pints (0.1 liter). The gearbox assembly includes a breather-type filler cap, an **oil level sight gauge**, and a combination electrical chip detector, self-closing valve and drain plug. The self-closing valve makes it possible to check the electric **chip detector** for metal particles without draining the oil.

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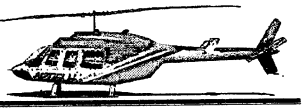


DRIVE SHAFT



TAIL ROTOR DRIVE

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Quick, sure, directional control is provided by the **two bladed, semirigid tail rotor** mounted on the left side of the tail boom.

The tail rotor has a delta-hinge type hub with two interchangeable blades and a changeable pitch controlled by the directional pedals.

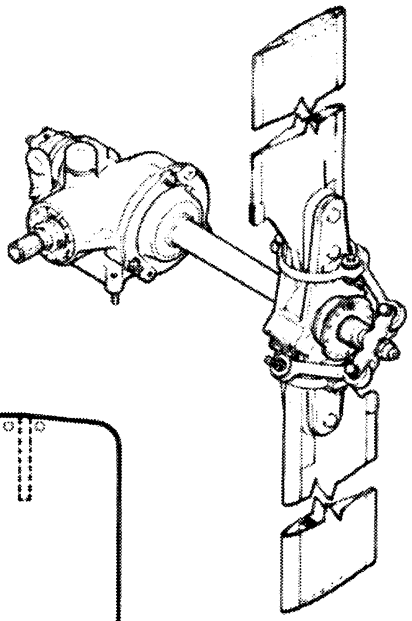
To cater to the increased horsepower of the C30P the tail rotor has been modified with a new yoke. A four degree twist in the yoke provides that extra thrust to accommodate the increased power of the C30P engine. It results in four degrees more tail rotor pitch at full left pedal.

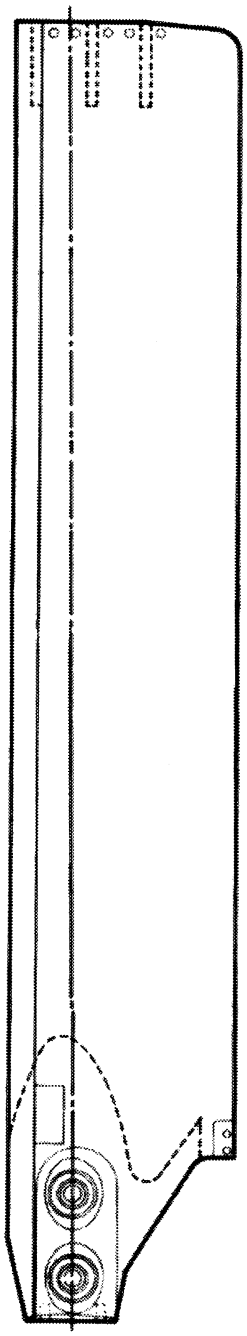
The push-pull control rod is routed through the tail boom and transmits control motion to the tail rotor through the hollow tail rotor gearbox shaft.

The **tail rotor blade** is an all-metal bonded assembly composed of stainless steel skins over a honeycomb core and a stainless steel abrasion strip over the leading edge. Two spherical bearings permit the pitch changes.

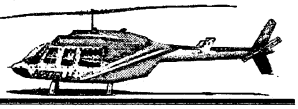
The **tail rotor hub** has an aluminum alloy yoke and a stainless steel trunnion. Each rotor blade is retained by two bolts. The pitch horn is a ring with a center crosspiece that bolts onto the root end of the blade. A pitch link connects the pitch horn to a crosshead assembly mounted on the tail rotor control tube outboard of the hub.

The pitch links are nonadjustable and use non-lubrication bearings.





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ELECTRICAL SYSTEM

The **electrical system** is 28-volt dc, single-conductor. All circuits are single wire with a common "negative" ground. Primary electrical power is supplied by a 30-volt, 200-ampere air cooled starter/ generator (derated to 180 amperes).

It serves the dual function of starter and main generator.

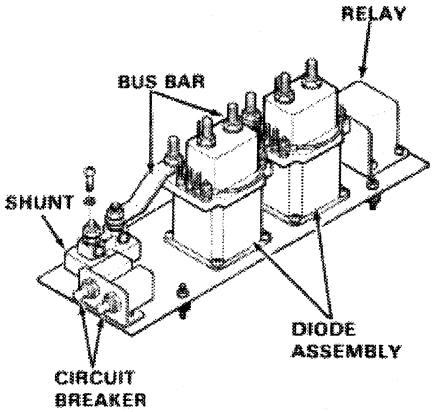
It is vented with a cooling duct made of glass fabric cloth, opening at the right engine compartment door.

A static type solid state voltage regulator, generator reset switch, generator shunt and a line control relay are included in the system.

The voltage regulator prevents the generator from going on line until operating voltage is attained. It operates the line control relay to control current to the main bus bar. It prevents reverse current flow and regulates the generator voltage to protect against under or over voltages in the system. It is adjustable from 26 to 29 volts. The generator can be reset by means of the momentary Generator Reset Switch in the overhead console.

The generator shunt with the voltage regulator in the equipment shelf, provides a voltage drop proportional to the current to operate the loadmeter.

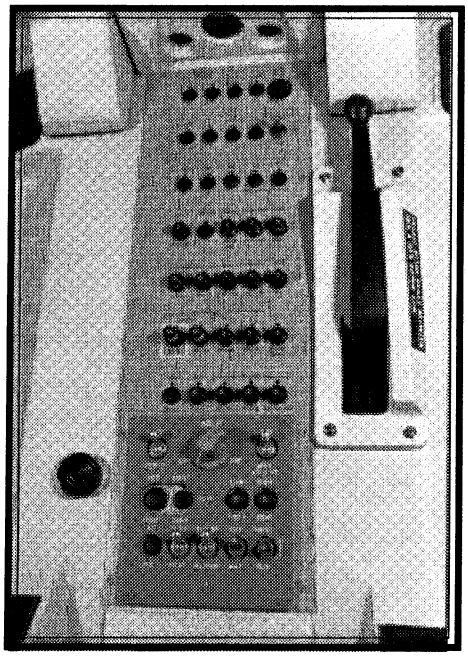
In the event of failure of the starter/ generator, a caution light illuminates and the essential dc loads are automatically supplied by the secondary system —a 24-volt, 17-ampere-hour, nickel-cadmium **battery**.



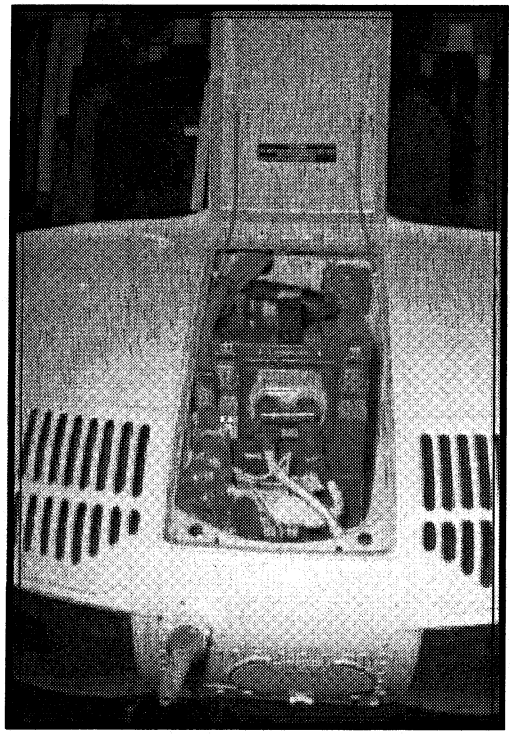
EQUIPMENT PANEL ASSEMBLY
Located on Equipment Shelf

The battery is installed in the nose section and is cooled by ram air. The capacity of the battery is 17 ampere hours at the one-hour discharge rate.

The battery switch is in the overhead console.

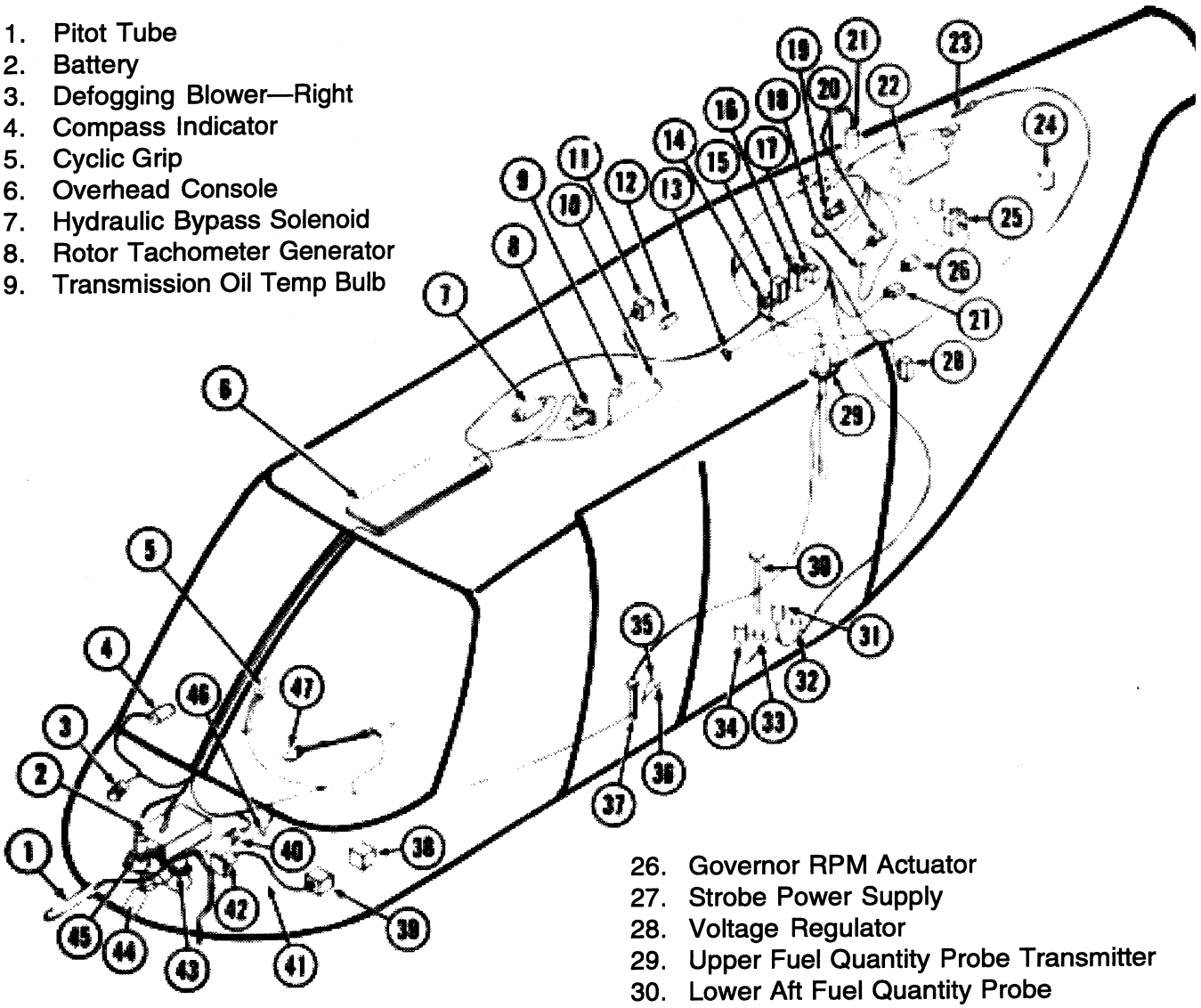


-164



Battery - 166

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1. Pitot Tube
2. Battery
3. Defogging Blower—Right
4. Compass Indicator
5. Cyclic Grip
6. Overhead Console
7. Hydraulic Bypass Solenoid
8. Rotor Tachometer Generator
9. Transmission Oil Temp Bulb
10. Transmission Oil Temp Switch
11. Fuel Shut off Valve
12. Fuel Pressure Transmitter
13. Fuel Dump Switch
14. Shunt Resistor
15. Line Control Relay
16. Starter Relay
17. Field/igniter Relay
18. Freewheeling Chip Detector
19. Gas Producer Tachometer Generator
20. Power Turbine Tachometer Generator
21. Engine Anti-Ice Solenoid
22. Starter Generator
23. Engine Oil Temperature Bulb
24. Airframe Fuel Filter
25. Igniter
26. Governor RPM Actuator
27. Strobe Power Supply
28. Voltage Regulator
29. Upper Fuel Quantity Probe Transmitter
30. Lower Aft Fuel Quantity Probe
31. Aft Fuel Pump (Left)
32. Fuel Low Level Switch
33. Fuel Dump Valve
34. Forward Fuel Pump (Right)
35. Right Fuel Flow Switch
36. Left Fuel Flow Switch
37. Lower Forward Fuel Quantity Probe
38. Sensor—Rotor RPM
39. Sensor—Engine RPM
40. Defogging Blower—Left
41. Internal Power Auxiliary Receptacle
42. Landing Light Relays
43. External Power Relay
44. External Power Receptacle
45. Battery Relay
46. Transmission Oil Pressure Switch
47. Collective Stick Switch Box

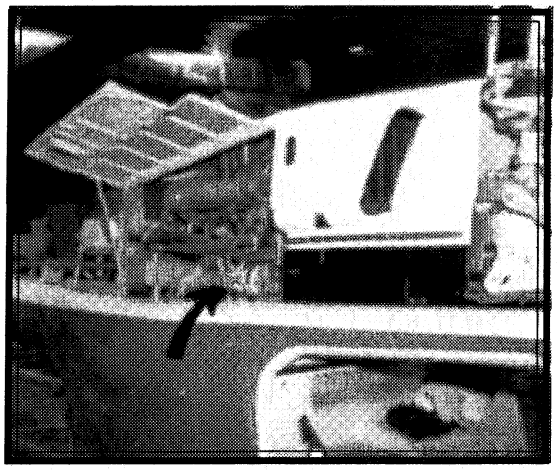
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The engine may be started from battery power or by connecting an external 28 volt dc power source to the power receptacle in the nose.

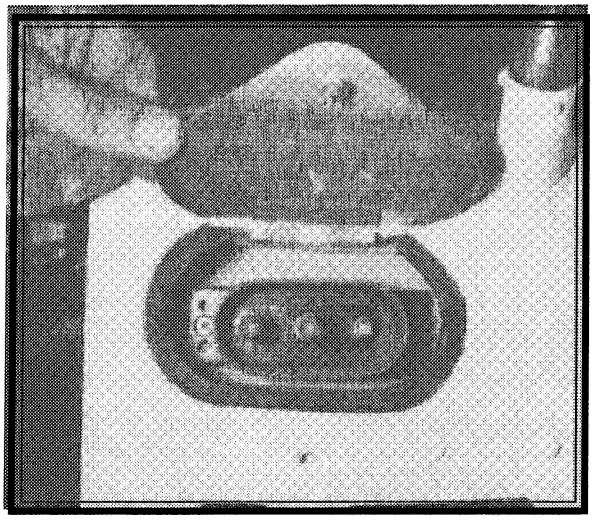
The start cycle of the LongRanger is quick and simple. The pilots' modulation of the throttle makes starts possible across a wide range of ambient temperatures and altitudes, without adjustments to the fuel control.

A relay is included to protect the external power circuit. The external power input should be 350 to 400 amperes and should not exceed 1000 amperes.

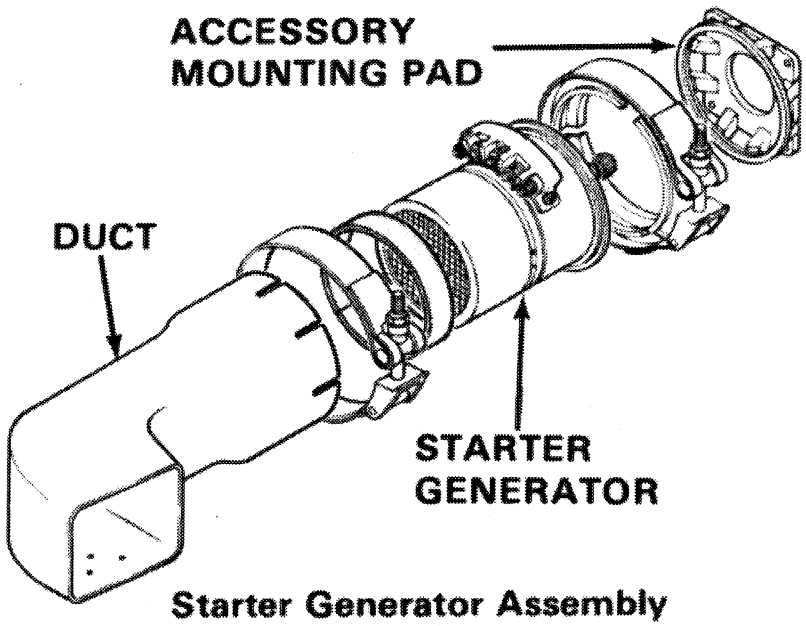
The **ignition system** consists of the starter portion of the starter-generator, starter relay, field igniter relay, a single igniter plug, a starter switch, and an ignition exciter box. The engine starter switch is located on the pilot's collective control stick. When activated, the starter relay energizes the starter generator to start the engine. At the same time the field igniter relay supplies direct current to the igniter and the "start field suppress" section of the voltage regulator.



Starter Generator -167



External Power Receptacle - 168



Starter Generator Assembly
Right Side Engine Compartment

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The exciter box provides a continuous ignition arc during the engine start cycle.

The battery temperature is monitored by a thermal switch built into the battery. A caution light indicating that the battery is hot is provided in the caution panel. The pilot, warned of a battery malfunction, can disconnect the battery from the electrical system.

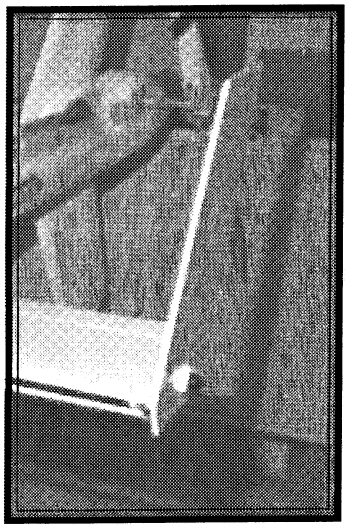
The standard LongRanger includes complete **internal** and **external** lighting, all supplied by 28-volt dc power.

All instruments on the instrument panel have integral white lights. Switch panels are edge lit.

A rheostat in the roof panel controls the light intensity. The outside air temperature gauge is not illuminated.

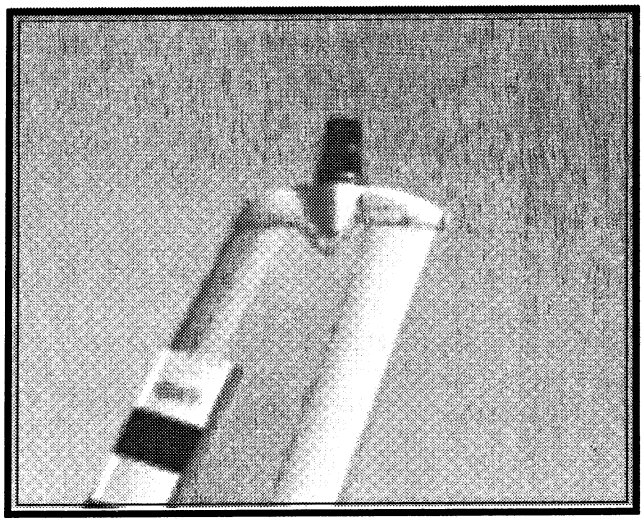
Five **position lights** are installed: one on either side of the horizontal stabilizer, one on either side under the cabin, and one on the end of the tail boom.

Those on the left are red. Those on the right are green. The one on the tail boom is white.



Position Light - 169

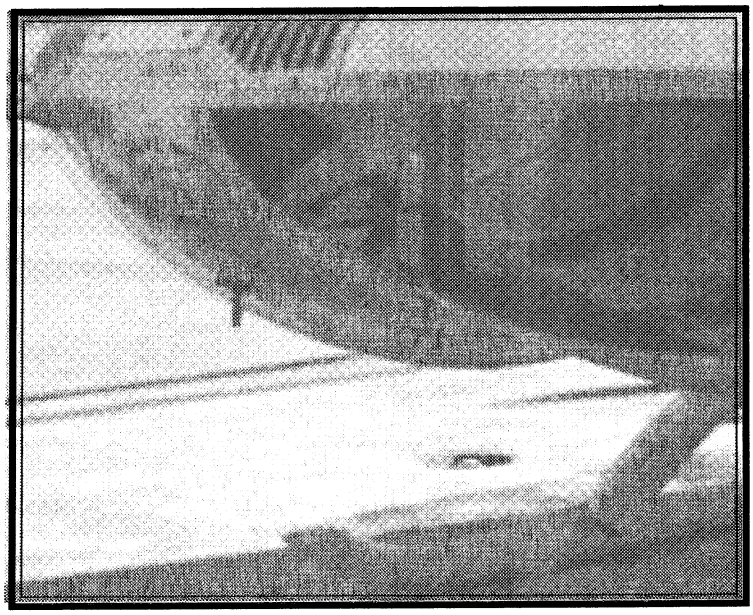
A red anticollision strobe light is located on top of the tail fin. It flashes 42 to 45 times a minute.



Strobe - 170

Switches for the position lights and anticollision light are located in the overhead console.

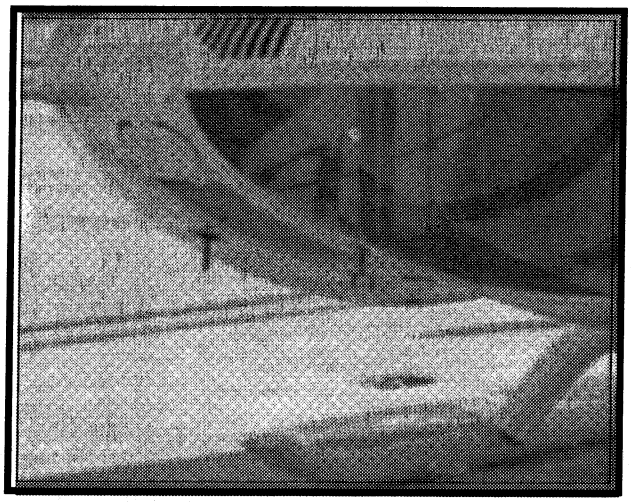
Electrical power to drive the tachometer indicators is provided by their own tachometer generators.



Landing Lights - 171

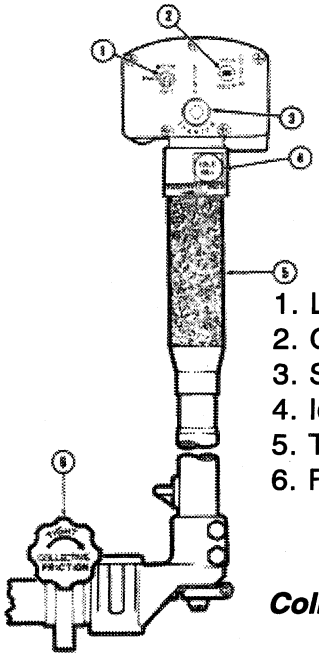
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Two 250-watt ground-adjustable landing lights are mounted in the nose section.



Landing Lights - 172

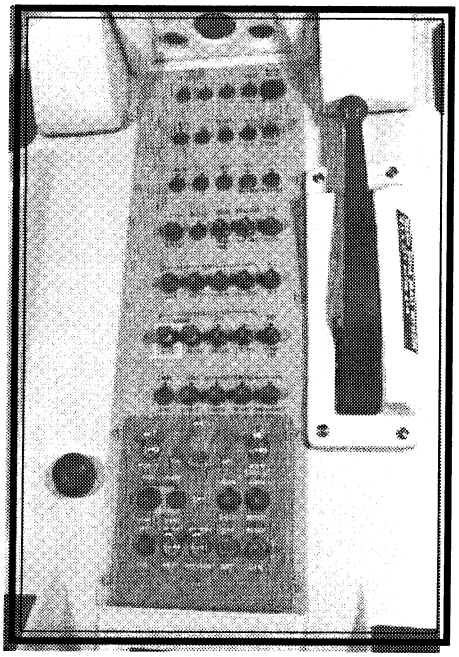
The landing light "ON-OFF" switch is installed on the pilot's collective control stick. The pilot can illuminate the top landing light alone or both lights. The top light is aimed for the best distance straight ahead during landing or takeoff.



1. Landing Light Switch
2. Governor RPM Switch
3. Starter Switch
4. Idle Stop Release Button
5. Throttle
6. Friction Knob

Collective Function

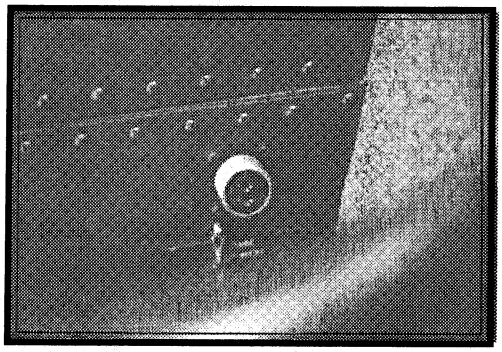
A **cockpit light** is mounted at the rear of the overhead console. The light can be directionally adjusted in its mounting or it can be removed and held by hand. A coiled electrical cord allows the light to be moved anywhere in the crew compartment. Controls for ON/OFF, DIM/BRIGHT, and SPOT/FLOOD are incorporated into the cockpit light body.



Cockpit Light - 173

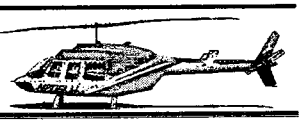
Caution light bulb replacement is simplified by rocker-type holders that swing out to expose the bulb.

An **auxiliary 28-volt dc receptacle** is located on the left side of the pedestal just forward of the seat. Its prime use is for the technicians to power the blade tracking equipment.



28 Volt Auxiliary Power Receptacle - 174

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NOISE

The LongRanger IV is certified as a Stage 2 helicopter as prescribed in FAR Part 36, Subpart H, for gross weights up to and including the certificated maximum takeoff and landing weight of 4450 pounds (2018 kilograms). There are no operating limitations in meeting takeoff, flyover, or approach noise requirements.

The following noise levels comply with FAR Part 36, Appendix H, Stage 2 noise level requirements. They were obtained by analysis of approved data from noise tests conducted under the provisions of FAR Part 36, Amendment 36-14.

The certified noise levels for the Model 206L-4, in the standard configuration are:

FLIGHT CONDITIONS	EPNL (EPN dB)
Takeoff	88.4
Flyover	85.2
Approach	90.7

Note:

No determination has been made by the Federal Aviation Administration that the noise levels of the aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

V_H is defined as the airspeed in level flight obtained using the minimum specification engine torque corresponding to maximum continuous power available for sea level 25 deg C (77 deg F) ambient conditions at the relevant maximum certified weight. The value of V_H thus defined for this aircraft is 110 KTAS in the standard configuration.

MAIN ROTOR & TAIL ROTOR PARAMETERS

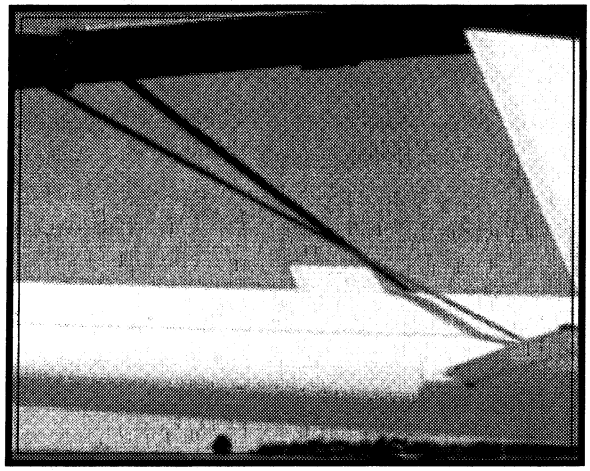
Main Rotor					Tail Rotor				
Dia (Ft)	Chord (In)	RPM	Tip Speed (Ft/Sec)	XMSN Rating (HP)	Dia (Ft)	Chord (In)	RPM	Tip Speed (Ft/Sec)	XMSN Rating (HP)
37.0	13.0	394	763	435	5.42	5.27	2553	722	80
					Optional High Altitude Tail Rotor Kit				
					5.17	6.35	2553	689	80

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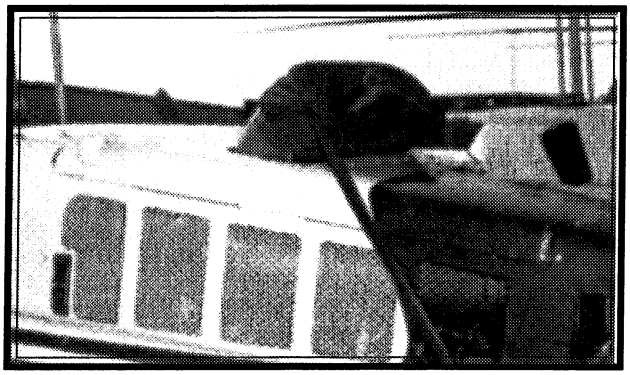
IN SUMMARY

On delivery, the LongRanger will contain the appropriate manuals, covers for turbine exhausts, turbine air inlets and the pitot tube, a first aid kit, keys, a flight manual bag, a pair of ground handling wheels and a main rotor tie down.

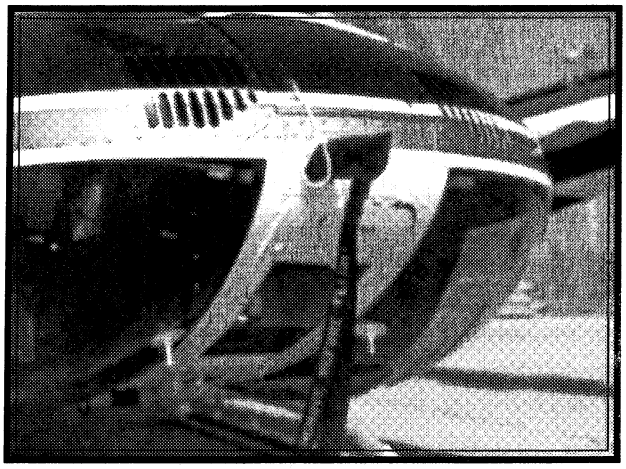
Add fuel, a radio and a pilot, and it is ready to go!



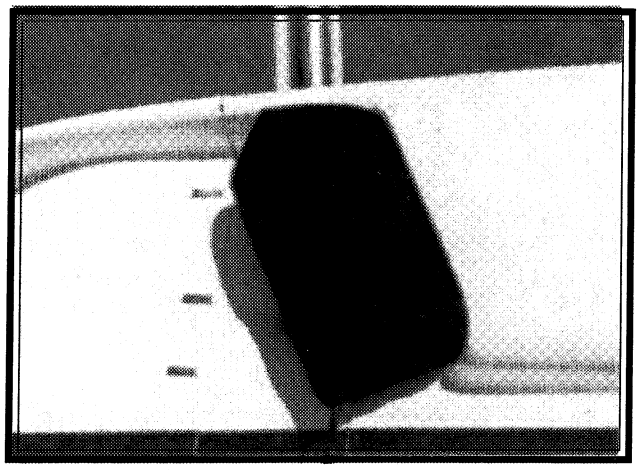
Rotor Tie-Down - 256



Engine Exhaust Cover - 255

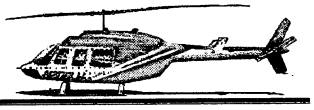


Pitot Tube Cover - 257



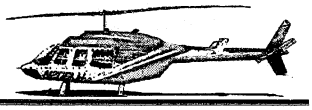
Engine Inlet Cover - 259

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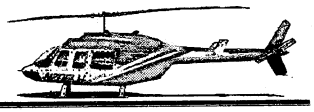


SECTION TWO
DESCRIPTIVE SUMMARY
OF THE
STANDARD CONFIGURATION

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DESCRIPTIVE SUMMARY OF THE STANDARD CONFIGURATION

GENERAL DESCRIPTION

Seven place 1-1
Nodamatic suspension 1-1
Polyurethane finish 1-4
3 Basic designs in 3 colors 1-5
Single pilot 1-6
Six passengers 1-7

INTERIOR

Comfortable personnel transport 1-7
Individual seats 1-7
Lumbar support adjustable
on front seats 1-7
Deluxe interiors 1-7
Fabric/vinyl
—Gray, tan or blue
Carpeted 1-8
Plastic trim 1-8
Headliner with fabric inserts 1-8
Armrests on rear doors 1-9
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Ashtray 1-9
Headrests 1-9
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Five inertia-reel shoulder straps 1-9
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—4 large 1-14
—1 narrow 1-14
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2 smaller single-pane windows 1-14
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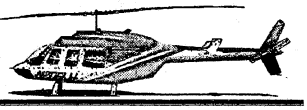
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Hinged panel for maintenance 1-30
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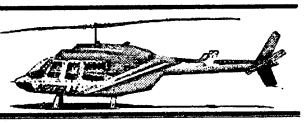
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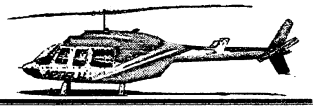
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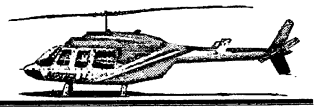
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All items described in sections 1 and 2 are included in the list price of the helicopter.

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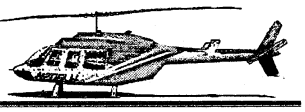


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SECTION THREE
OPTIONAL EQUIPMENT
FACTORY INSTALLED
BHTI AND VENDOR KITS

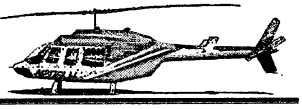
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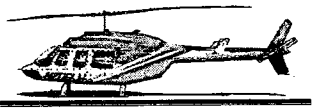
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For the MOST CURRENT Model 206B3 tabular data, standard equipment list, optional equipment kits, and performance and fuel flow charts refer to the Bell 206B3 Technical Information Booklet. For performance and operational limitations for **actual mission planing** reference must ALWAYS be made to the FAA Approved Rotorcraft Flight Manual.

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INTRODUCTION

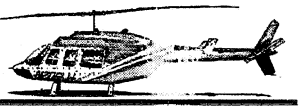
Bell maintains a wide variety of optional equipment for the LongRanger. Many of these kits are suitable for installation either at the factory or at the customer's facility.

Bell also provides factory installation of selected STC approved vendor kits.



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HIGH SKIDS
BELL KIT NO. 206-706-064-105

The **high skid landing gear** is an optional kit which provides greater clearance to facilitate operations in rough terrain, tall grass, and other adverse ground conditions. It also provides more space to carry underslung loads.

The gear is similar in design to the standard skids with replaceable skid shoes, etc.

But, it provides approximately 10 inches (0.25 meters) of **additional ground clearance**. The kit consists of fore and aft cross tubes, skid tubes, four fixed **fuselage-mounted steps** and the attaching hardware. A **towing ring** is fitted on the inside of each skid forward of the forward crosstube.



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The high skids use the same ground handling wheels as the standard gear.

Aerodynamic fairings are not included in the kit.

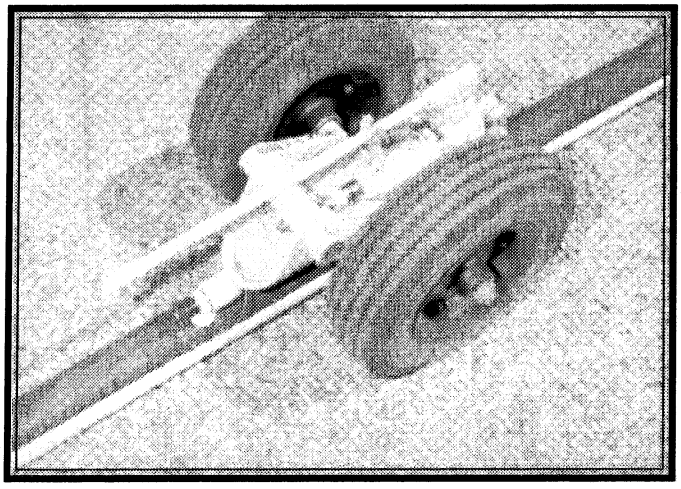
This kit is approved for the IFR configuration.

The kit fits the standard attachment points and can be installed and removed with ease. The attachments for the high skids have springs which isolate vibration of the skids from the fuselage.

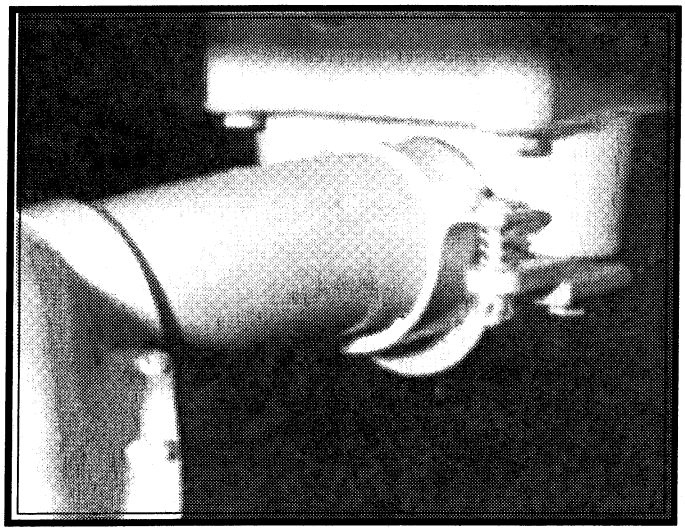
The high skids are qualified for gross weights up to 4450 pounds (2018 kilograms) within the limits outlined in the Flight Manual Supplement BHT-206L3-FMS-9. The supplement also includes hover ceiling data.

The complete high skid assembly adds 33.8 pounds (15.3 kilograms) to the standard configuration weight.

For installation and maintenance instruction, see Bell Service Instruction 206-2013.



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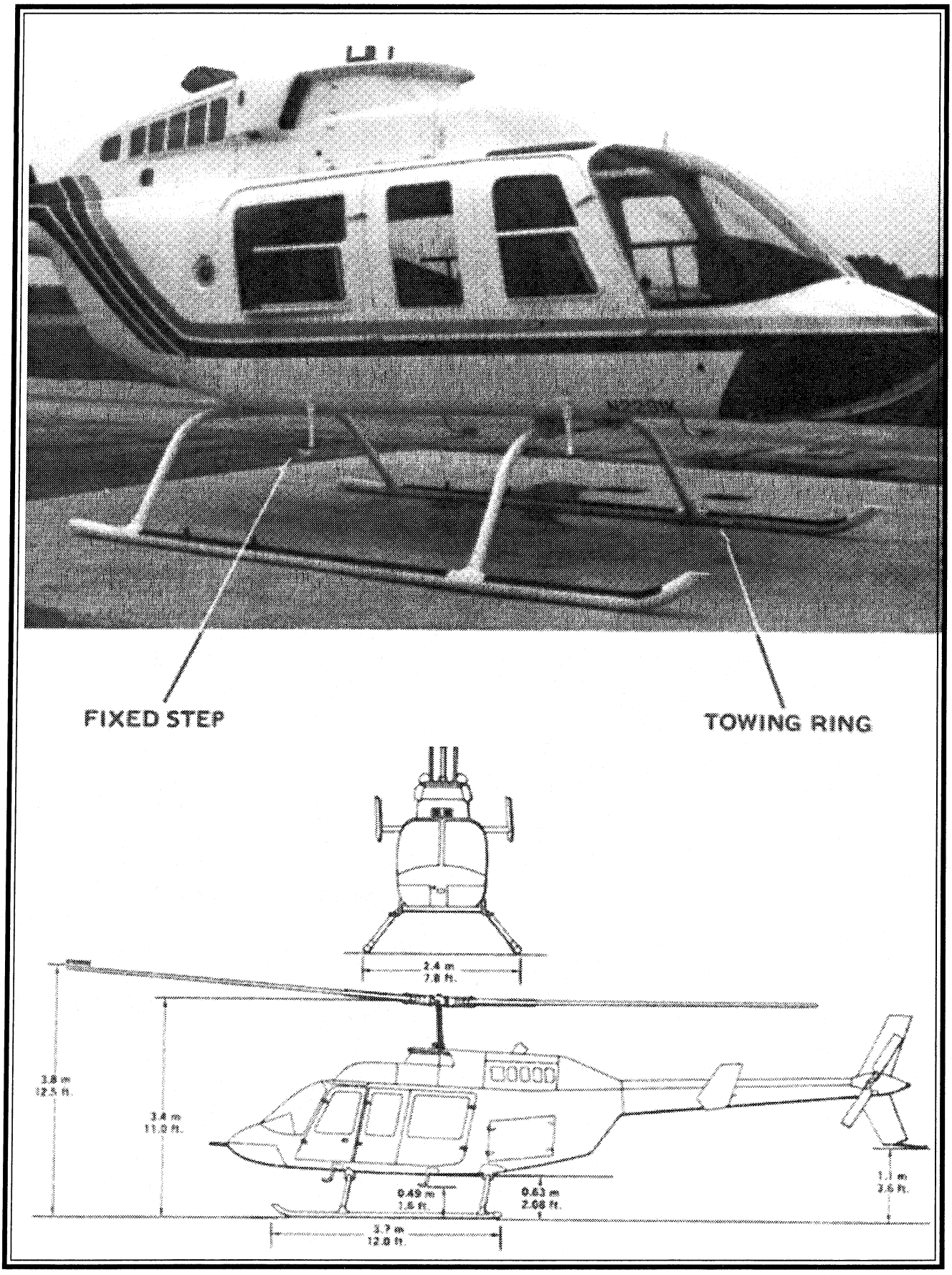


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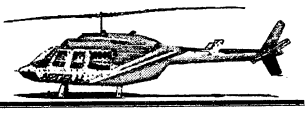


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EMERGENCY FLOATS
BELL KIT NO. 206-706-210-113

The **emergency floats** are available when operations are over land and water, but water landings are not normally anticipated. The kit consists of high skids, emergency floats, **inflation system** using compressed nitrogen, electrical components to activate the system, **four hinged fuselage-mounted steps**, attaching hardware, and a **preflight test feature.**

The six floats are made of nylon. The two forward floats each have a single cell. The remaining four each have two cells.

One cylindrical nitrogen bottle at 2461 kg/cm^2 (3500 psig), is aligned fore and aft, centrally, under the fuselage immediately behind the forward cross tube of the landing gear.

The cross tubes fit the standard gear attachment points enabling the kit to be installed and removed with ease. The four attachments have **springs** which isolate vibration of the skids from the fuselage.

The emergency floats are qualified for gross weights up to 4450 pounds (2018 kilograms) within the limits outlined in the Flight Manual Supplement BHT-206L-3-FMS-1.



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The floats are capable of supporting the maximum gross weight of the helicopter four seconds after actuation.

There are no flight restrictions when the floats are stowed. The flight restrictions during and after an emergency are listed in the Flight Manual Supplement.

The standard LongRanger already has two sets of position lights. This prevents any change of blockage of lights when the floats are installed and inflated.

The four steps can swing up individually as the floats inflate.

A Float Test/Float Arm switch is on the collective and two indicator lights are mounted on the instrument panel. The lights indicate circuit continuity during a test and when the arming circuit is closed. The Float Test Caution Light does not dim.

Once armed, the pressure system is electrically activated from a trigger on the pilot's collective stick. Operation instructions are in the Flight Manual Supplement.

The standard ground handling wheels are used.

The hoist kit can be modified to be compatible with the stowed emergency floats.

For flight with doors on and off, the restrictions are the same for the standard configuration.

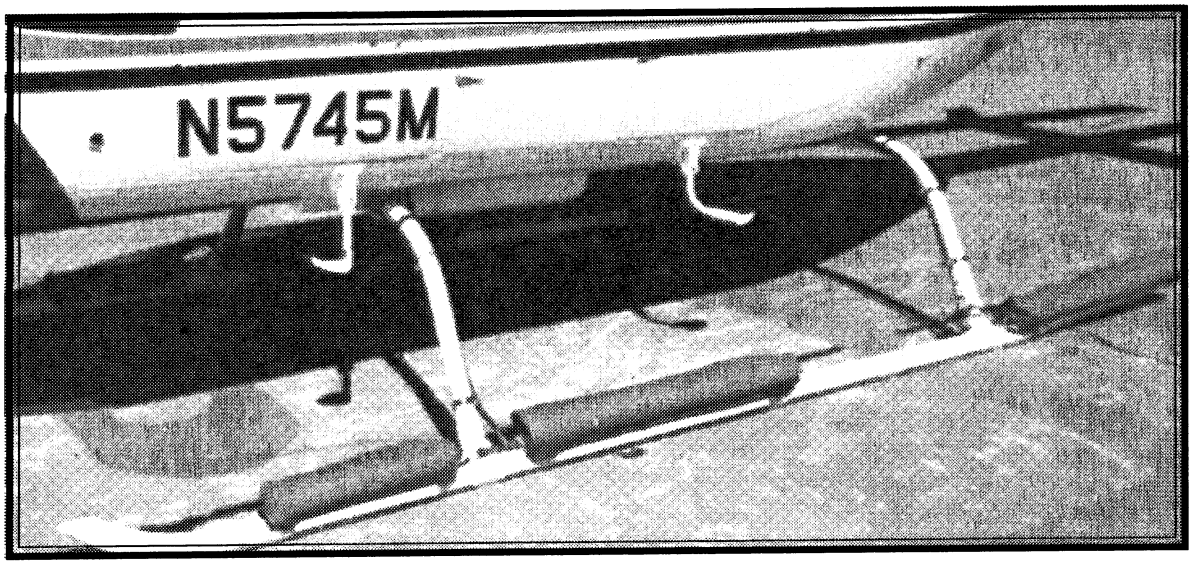
The system adds 160.4 pounds (72.8 kilograms).

Installation, maintenance and testing instructions for the Emergency Floats are contained in Bell Service instruction 206-2033.

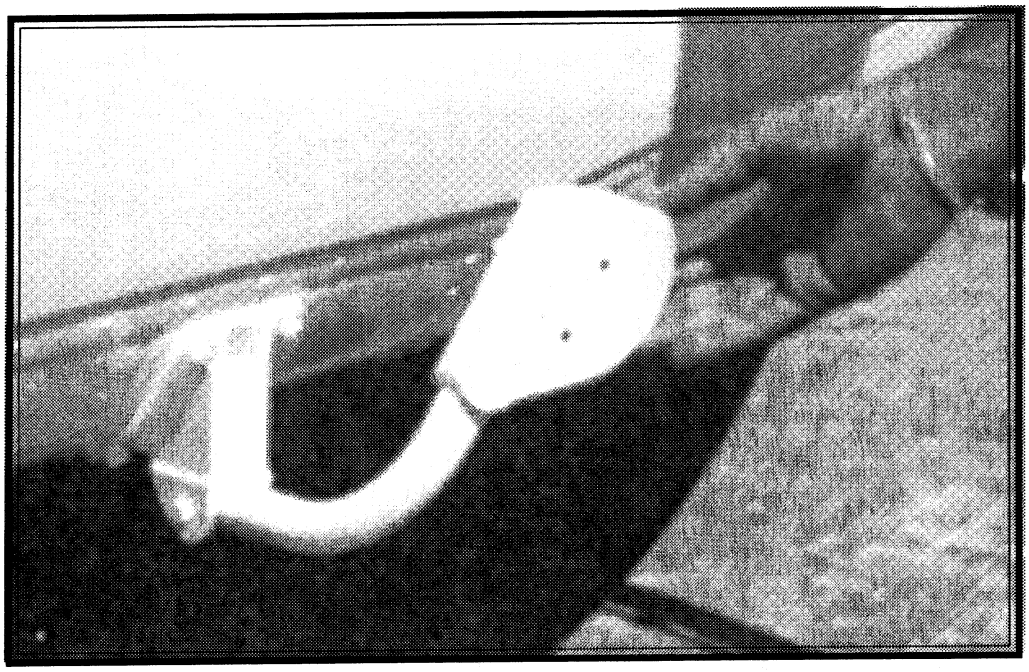


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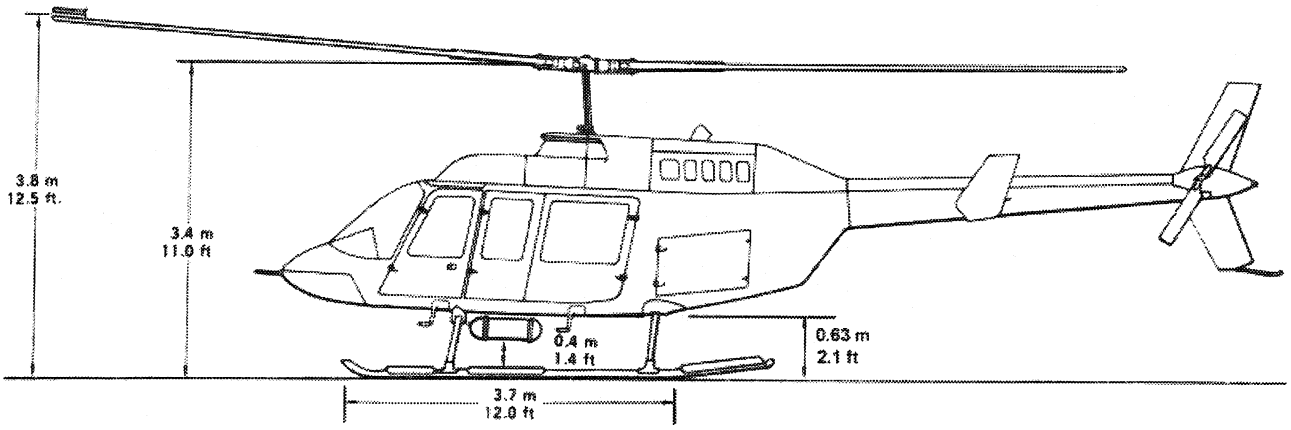


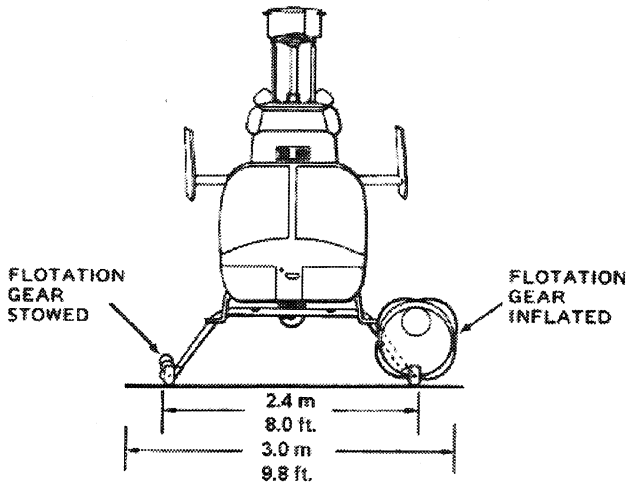
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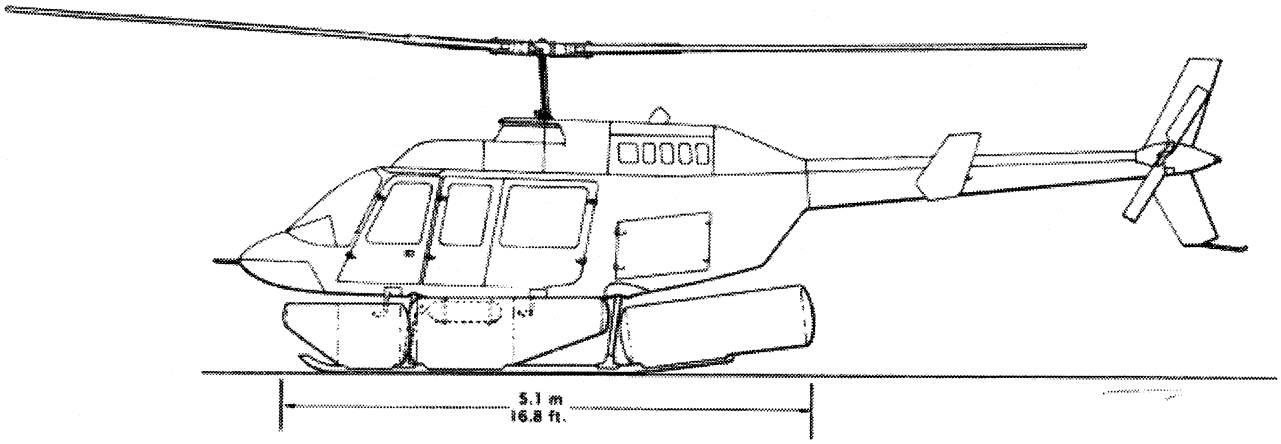


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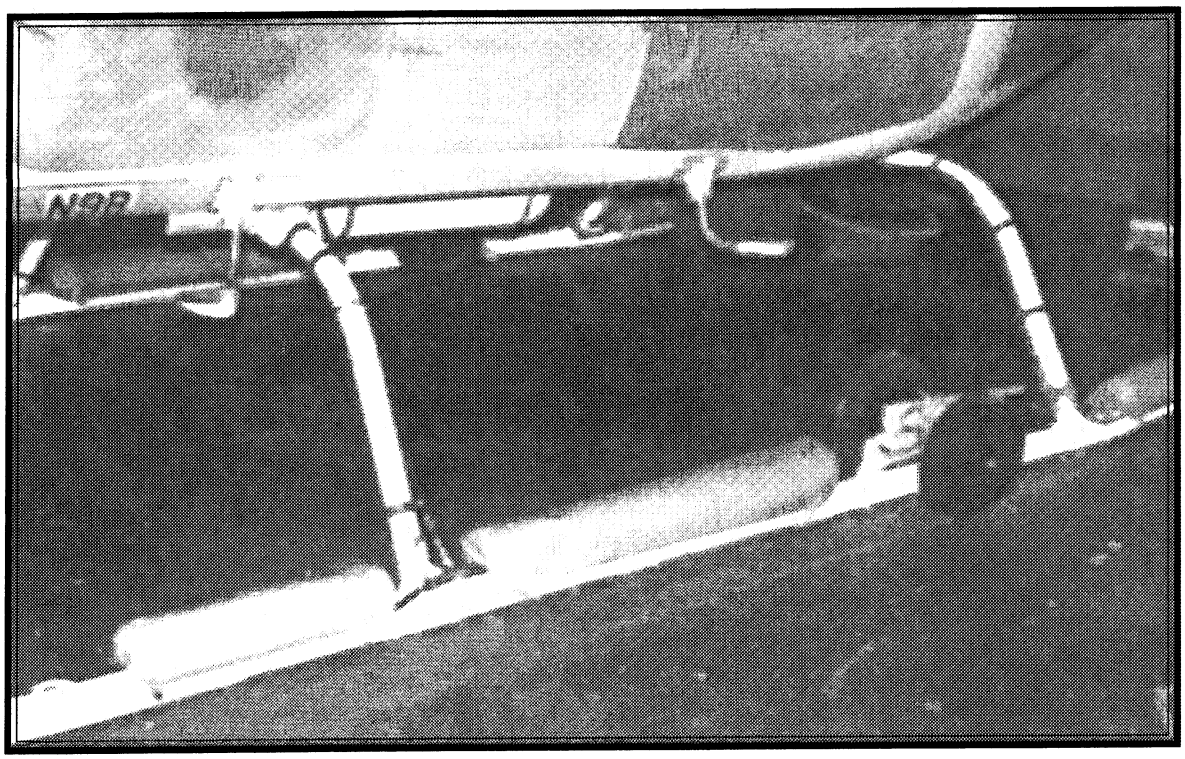
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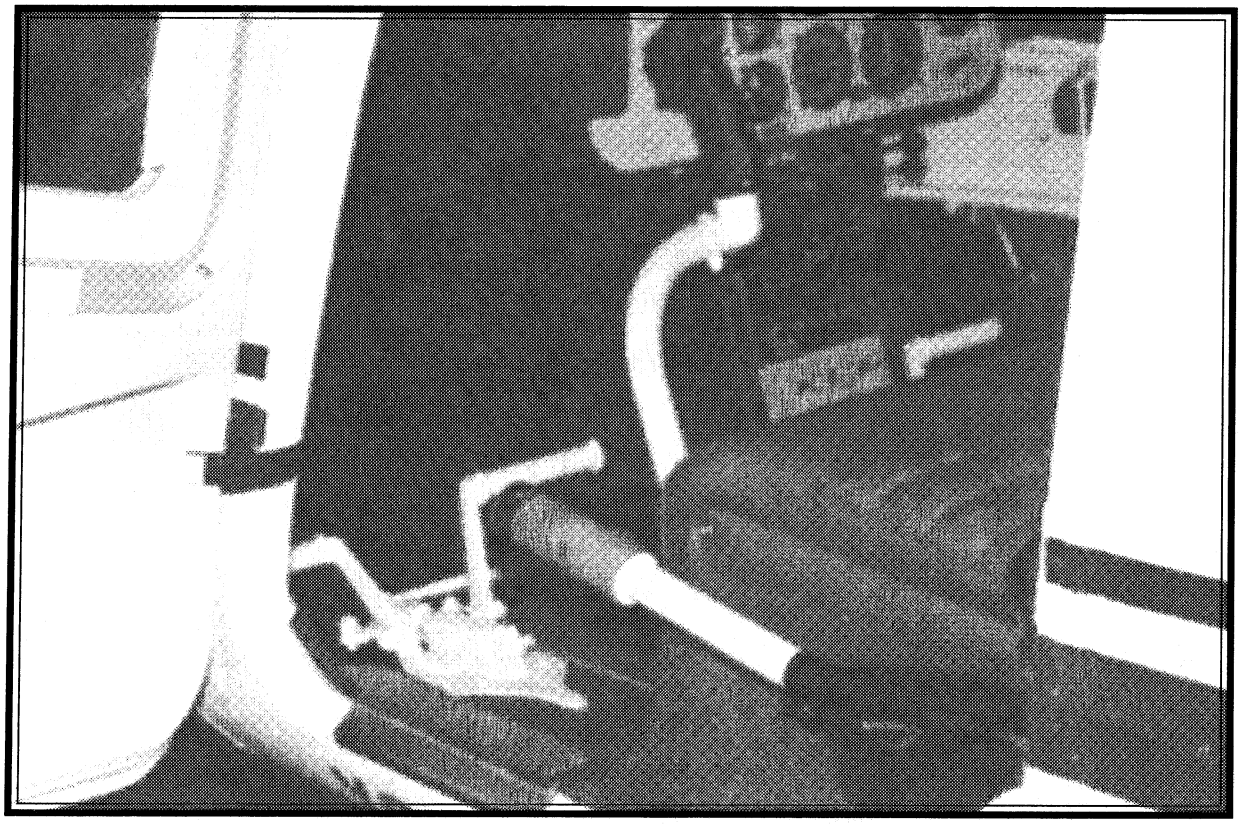
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DUAL CONTROLS
BELL KIT NO. 206-706-127-113

The **dual controls kit** provides dual flight control capability either for operations requiring a two-man flight crew or for pilot training.

The kit adds cyclic and collective sticks and anti-torque pedals for the left front seats. Similar to the main controls in appearance and relative position, they provide all the major functions as well as identical control "feel." The collective stick includes a fully functioning twist-trip throttle control. The directional pedals can be adjusted for leg length. Friction controls are not duplicated.

All LongRanger airframes have provisions for the dual controls kit. With the dual controls installed, there is no change in the number of usable seats. Since the instrument panel, radio pedestal, overhead console, fire extinguisher, cockpit light, etc., are all centrally located and within easy sight and reach of both crew positions, there is no need to relocate anything in the cockpit.



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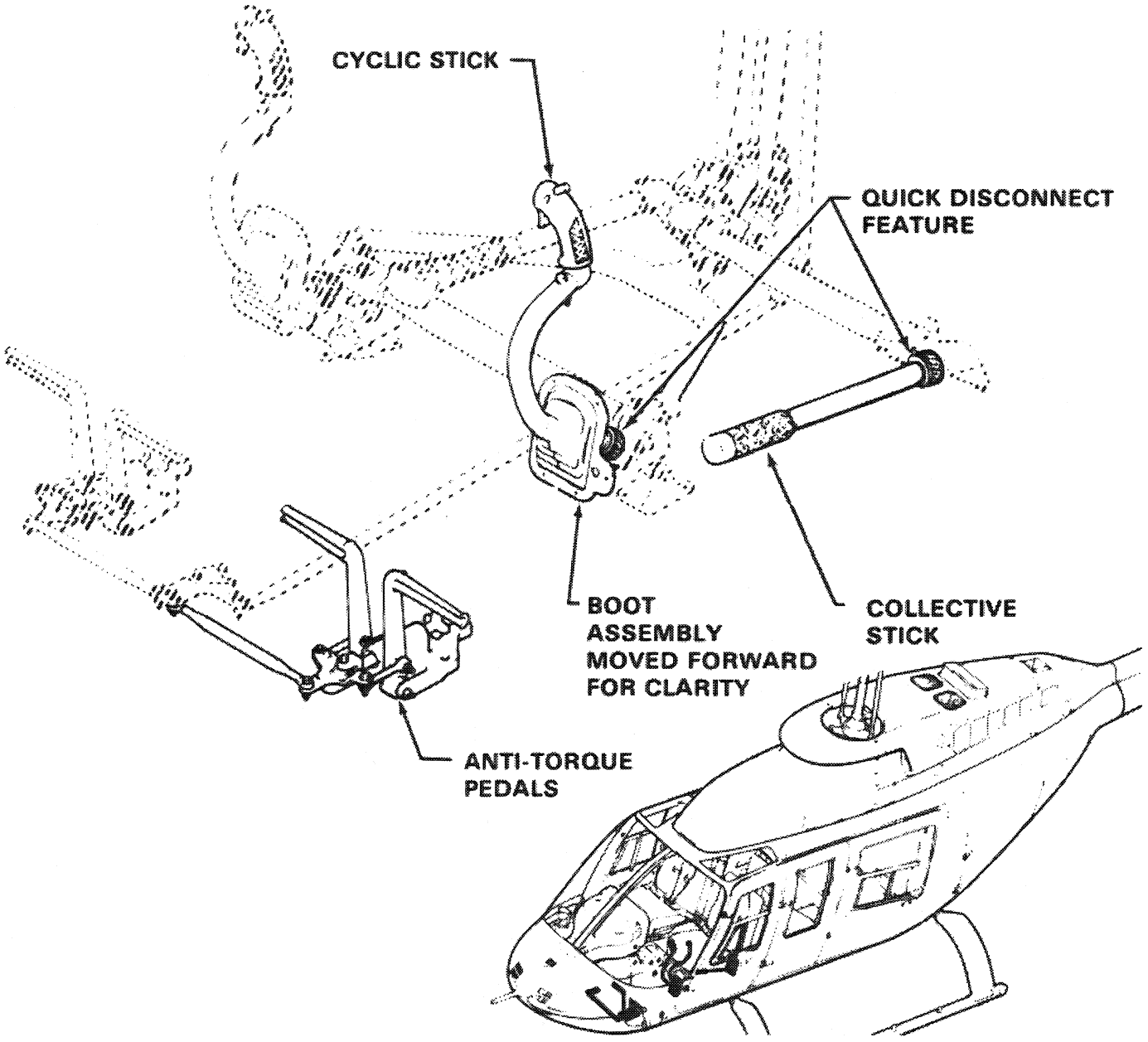
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The **quick disconnect feature** means that the cyclic and collective sticks are rapidly removable without tools. Because the cyclic electrical plug must remain connected to provide circuit continuity, both sticks are either stowed in the cockpit after removal or the adapter supplied with the kit must be inserted in the cyclic stick electrical connector, to close the circuits.

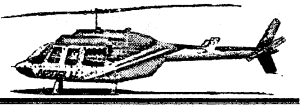
The installation of the litters kit requires the removal of the dual controls.

The kit adds 11.5 pounds (5.2 kilograms).

For installation and maintenance instructions, see Bell Service Instruction 206-2024.



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ROTOR BRAKE
BELL KIT NO. 206-706-502-101
FOR USE WITHOUT PARTICLE SEPARATOR

BELL KIT NO. 206-706-502-101
FOR USE WITH PARTICLE SEPARATOR

The **rotor brake kit** stops the main and tail rotors rapidly after engine shutdown. After the dynamic system stops rotating, the kit is particularly useful in preventing the windmilling action of the main rotor in high and gusty wind conditions.

The kit is a completely self-contained hydraulic system consisting of a brake disk, dual brake assembly, master cylinder and operating handle, hose and tube assemblies and the required fittings and hardware to complete the installation.

The **brake disk** is bolted between the aft flexplate of the MDS and the forward face of the freewheeling unit output drive adapter. The stationary face of the free-wheeling housing assembly is modified to accept the dual-puck assembly, which is then bolted to it. The assembly encloses **two pair of pucks** in caliper configuration, horizontally located on either side of the two calipers are also opposite each other so that when hydraulic pressure is applied, they squeeze the disk.

The **operating handle and the master cylinder unit** are mounted in the ceiling of the crew compartment, immediately to the right of the overhead panel. The handle is convenient to either pilot or copilot.

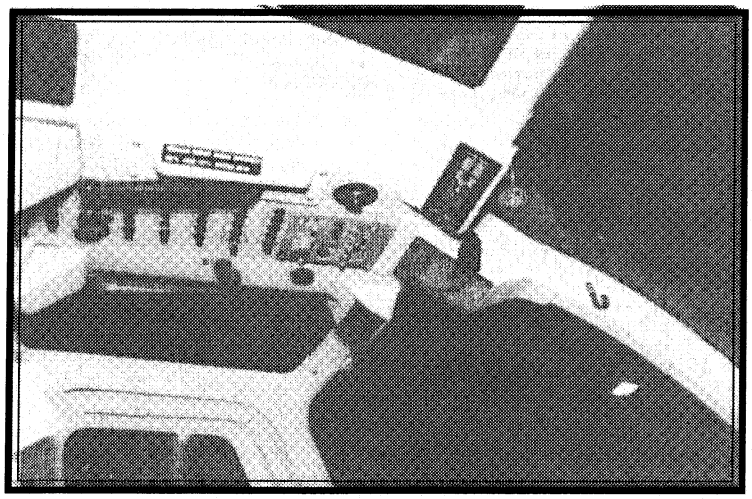
Pressure is applied to the system manually by pulling down on the operating handle when the rotor RPM is between 38 and 25 percent.

When the rotor is stopped, and positioned for parking, the handle can be pulled fully down into the parking brake position. This locks the dynamic components.

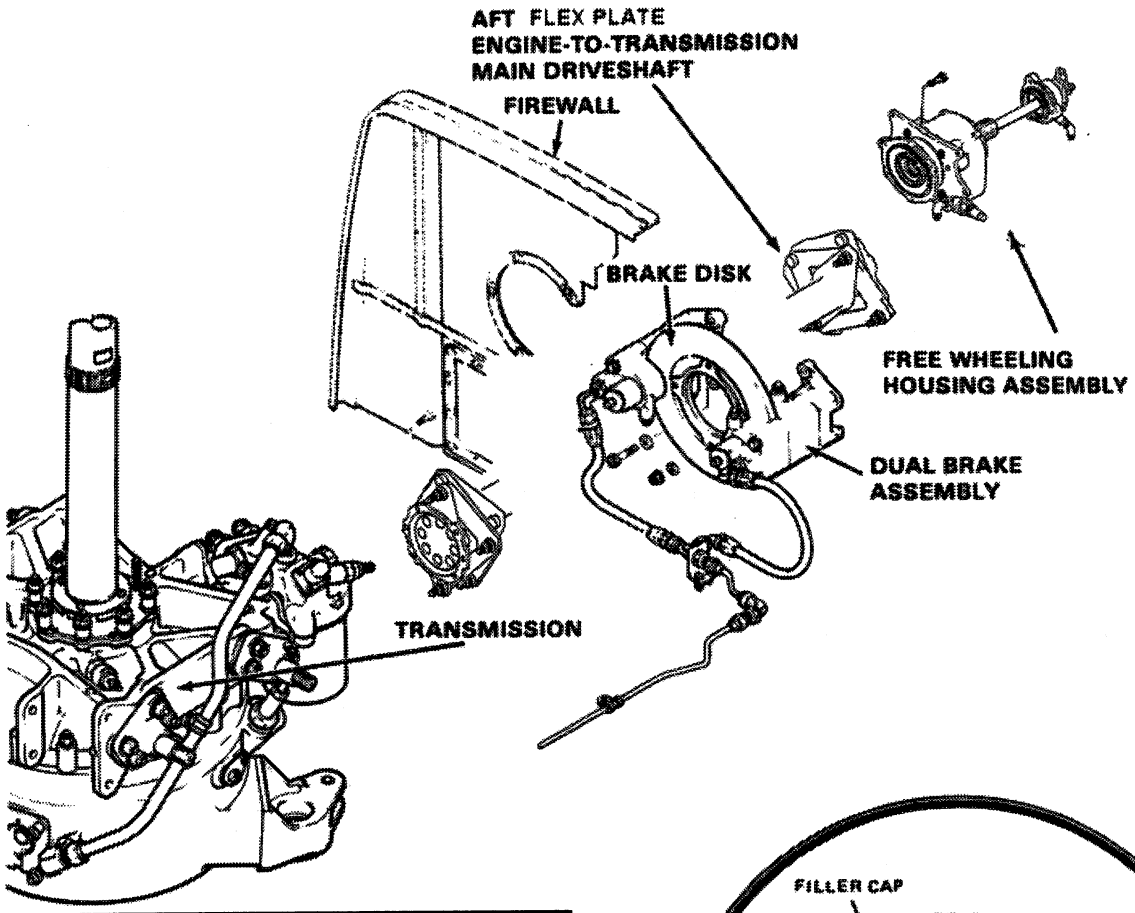
Spring loaded catches hold the handle in either the full off position or the parking position.

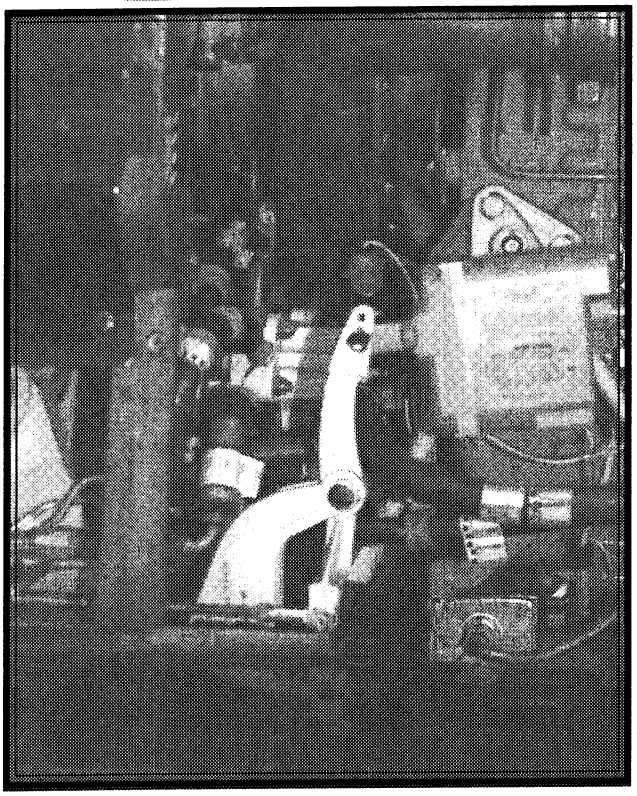
The end of the handle is painted red as a warning if it is inadvertently left in the parking mode during start-up procedures.

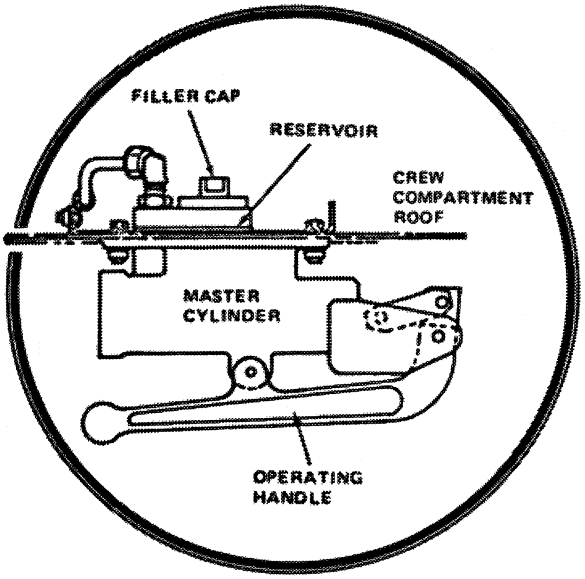
This kit adds 13.3 pounds (6.0 kilograms).



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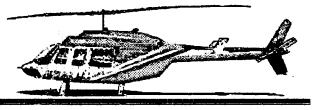






Rotor Brake Disk - 192

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SNOW BAFFLES
(ENGINE INTAKE BAFFLES)
BELL KIT NO. 206-706-208-101

The **snow baffles** are reverse flow baffles (engine air induction system deflectors) which are required to permit flight in falling or blowing snow, when visibility exceeds a half mile (0.8 kilometers). *Hovering* up to 20 minutes in blowing snow conditions is also permitted.

The deflectors reduce the quantity of heavy snow entering the engine air intakes by forcing the air to reverse its flow into the inlet.

The kit consists of a matching pair of deflectors that mount, one on each side of the transmission cowling, just forward of the engine air inlets, and all hardware necessary to complete the installation.

After first installation, the kit can be removed or replaced quickly and easily.

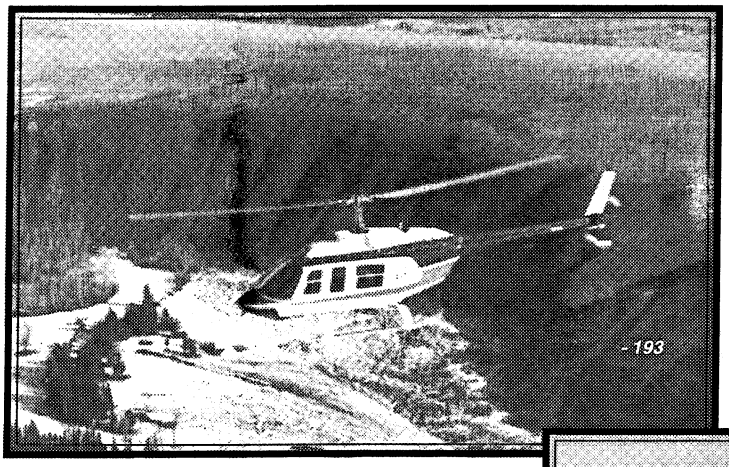
The deflectors are compatible with either basic inlet or the particle separators.

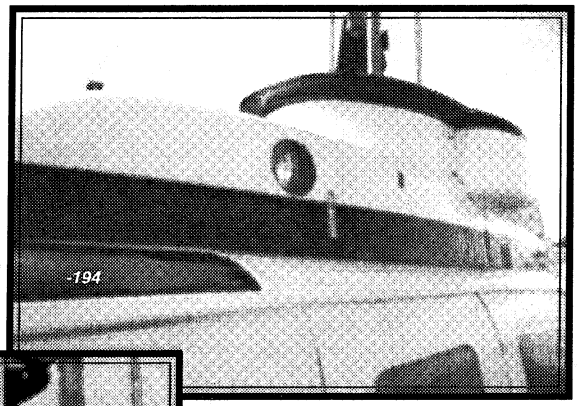
Performance limitations are listed in the Flight Manual Supplement: BHT-206L3-FMS-7.

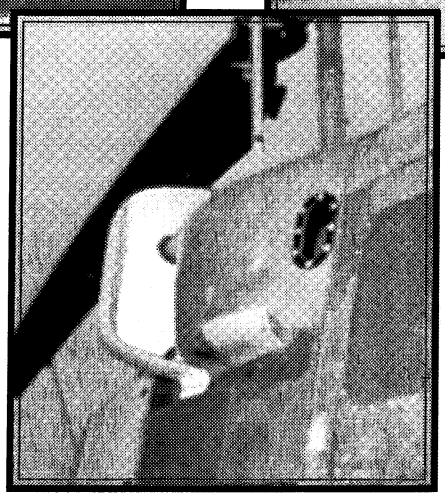
The deflectors are removed in temperatures above 30°C (86°F).

The kit adds 4.9 pounds (2.2 kilograms).

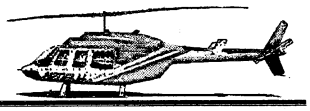
For installation instructions, see Bell Service Instruction 206-2029.







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PARTICLE SEPARATOR
BELL KIT NO. 206-706-212-123
FOR USE WITHOUT ECS OR HEATER

BELL KIT NO. 206-706-212-121
WHEN ECS IS INSTALLED

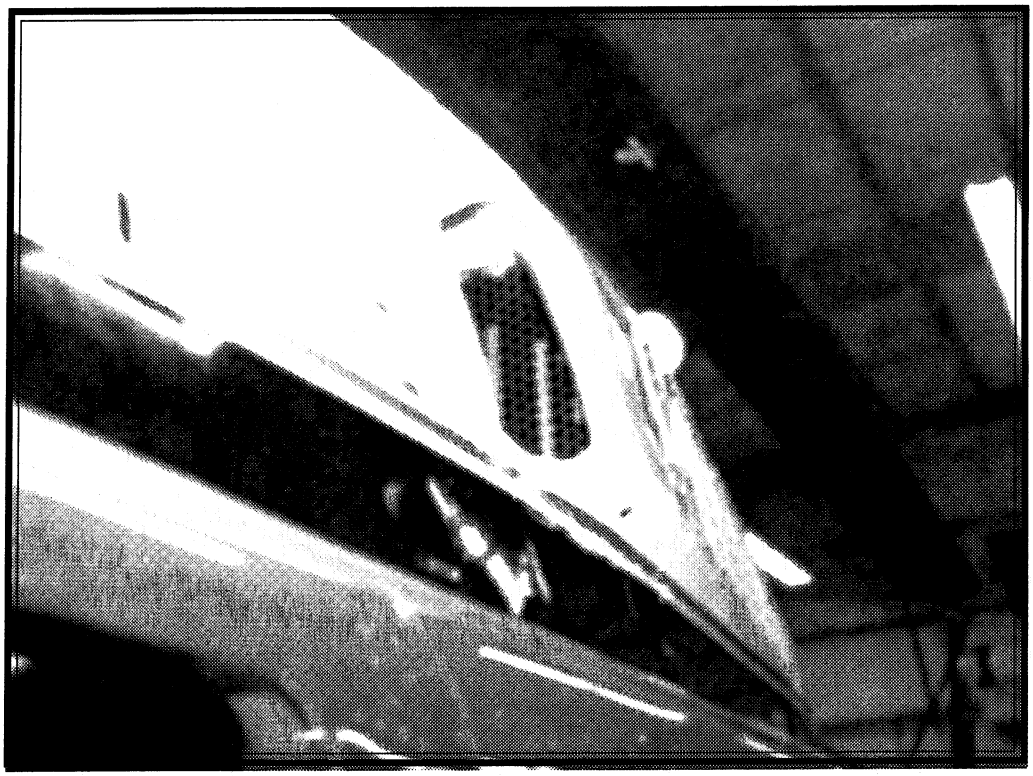
The **particle separator** provides continuous protection of the engine against damage from the ingestion of sand, dust, and other foreign debris. With the separator installed, operations can be carried out in severe environmental conditions, for long periods of time.

Two kits are available. They vary only in the method of connecting the separator's purge system to the bleed air source.

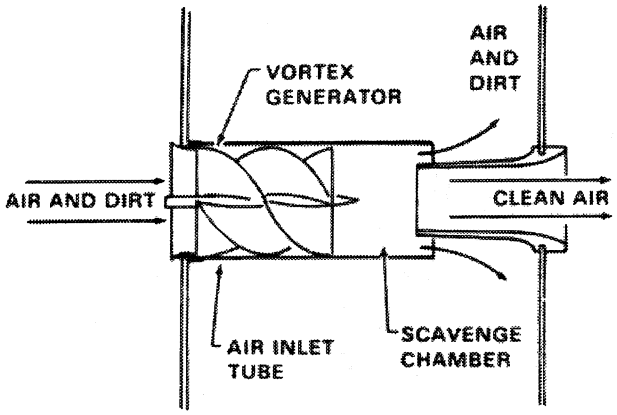
The kit consists of the separator, bleed air tubing and hoses, compressor wash fittings, and other hardware required to complete the installation. It is installed forward of the engine air inlet just aft of the transmission fairing.

The separator has 281 **filter elements** and is positioned so that all inlet air must pass through the filter elements before entering the engine.

Each of the 281 filter elements or tube assemblies in the separator consists of a vortex generator bonded into an inlet tube and a small-mounted inlet tube which forms a scavenge chamber.

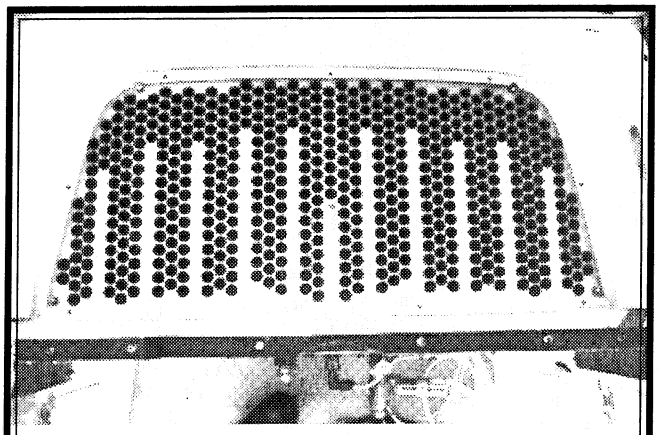


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Foreign particles such as dust, dirt or sand that enter the filter elements are spun in the vortex generator and hurled centrifugally into the scavenge chamber, thereby allowing only the remaining cleaned air to enter the engine.

The debris which collects in the scavenge chambers can be ejected overboard by a vacuum cleaner effect created by engine bleed air. When environmental conditions indicate the need, the pilot activates the bleed air by turning on the particle separator purge switch mounted on the radio pedestal. When the need disappears, the switch can be turned off and full engine power regained.



*Rear (Engine Side) of Particle Separator Showing Wash Spray Nozzle - **197***

A **window** is installed on each side of the cowling to permit visual inspection of the separator's plenum chamber.

Ejector tubes are mounted on each side, just below the windows.

Compressor wash fittings permit the introduction of wash water directly into the engine's inlet.

Installation imposes no aerodynamic restrictions and has no effect on the maximum gross weights on any of the 206L configurations. Because of the pressure drop in the inlet, there is a slight reduction of power available. This amounts to a 1% torque loss. When the bleed air purge system is turned ON, there is a total loss of 4%. These are covered in the Flight Manual Supplement: BHT-206L4-FMS-3.

When operations do not require the added protection, the separator can be removed and the engine air intake screens installed.

The particle separator has a tested efficiency of 85% by weight of for AC coarse particles (27 micron nominal). Due to its inertial (centrifugal) action, the separator is more efficient for particles larger than 27 microns, and less efficient for particles smaller than 27 microns.

Foreign debris such as hay, leaves, etc., which are too large to enter the filter elements, are stopped at the face of the separator. However, the numerous filter elements are so placed that there is sufficient air flow, bypassing the blockage, even for prolonged periods of flight in such conditions.

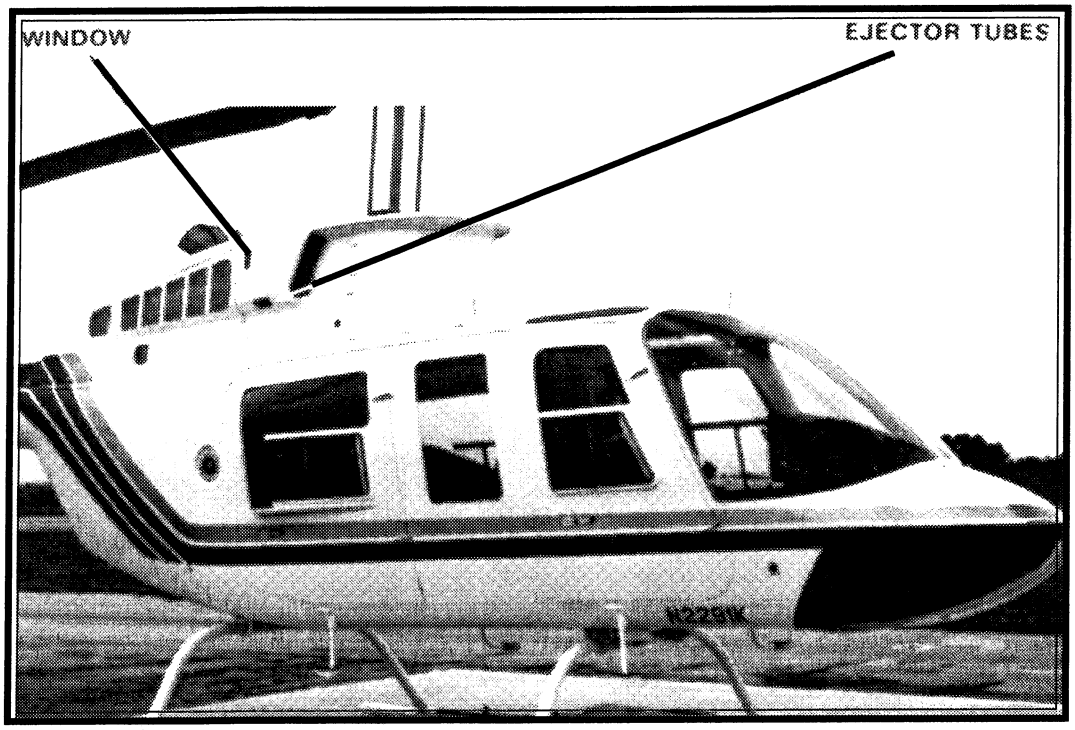
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Compatibility of the particle separator with the snow baffles (Kit No. 206-706-208-001) is covered in their Flight Manual Supplements.

The particle separator is *not* approved for flight in falling or blowing snow without the baffles.

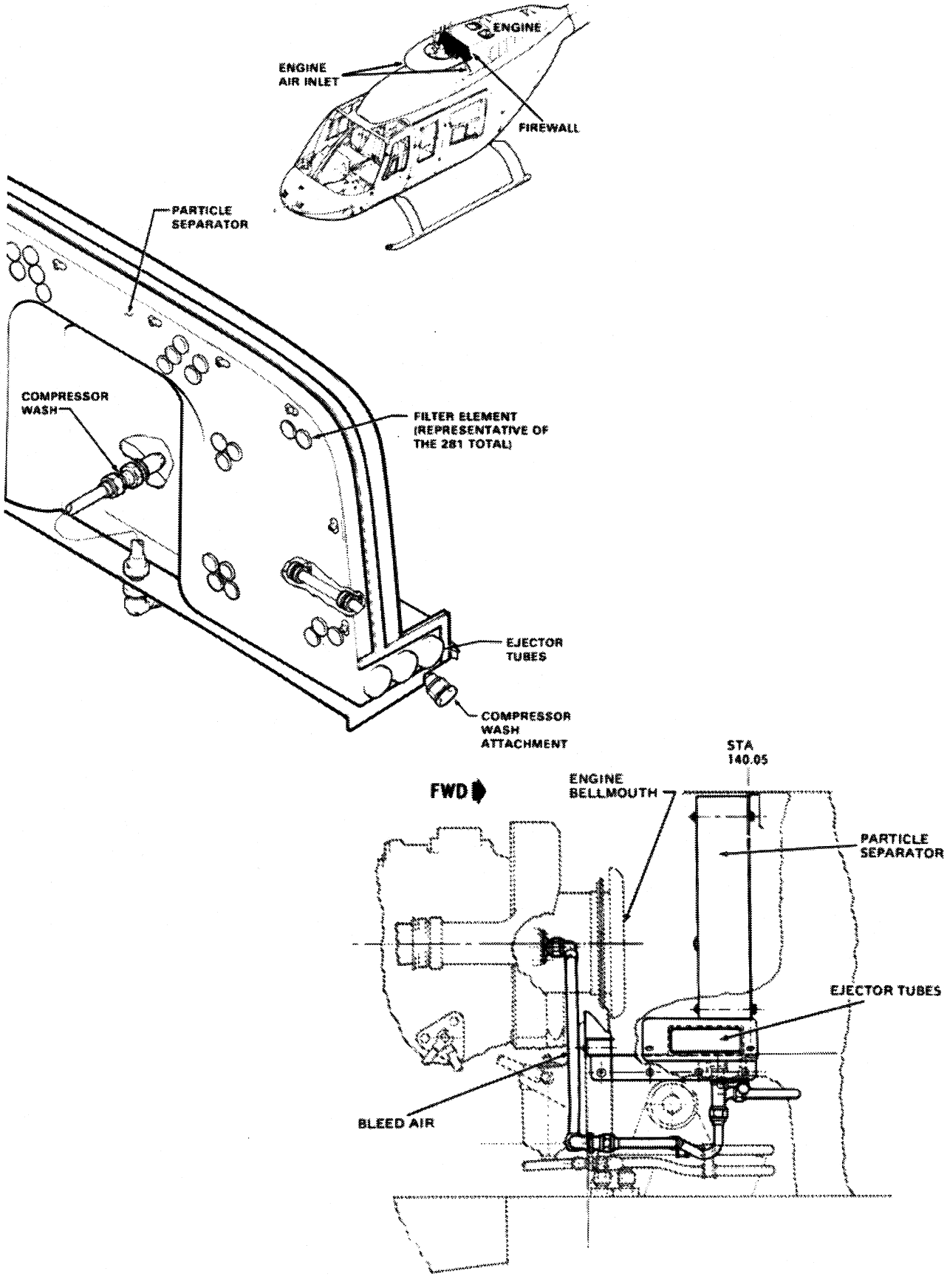
When the particle separator is installed, it adds 13.7 pounds (6.2 kilograms) to the empty weight of the aircraft.

Installation and maintenance instructions are contained in Bell Service Instruction No. 206-2038.



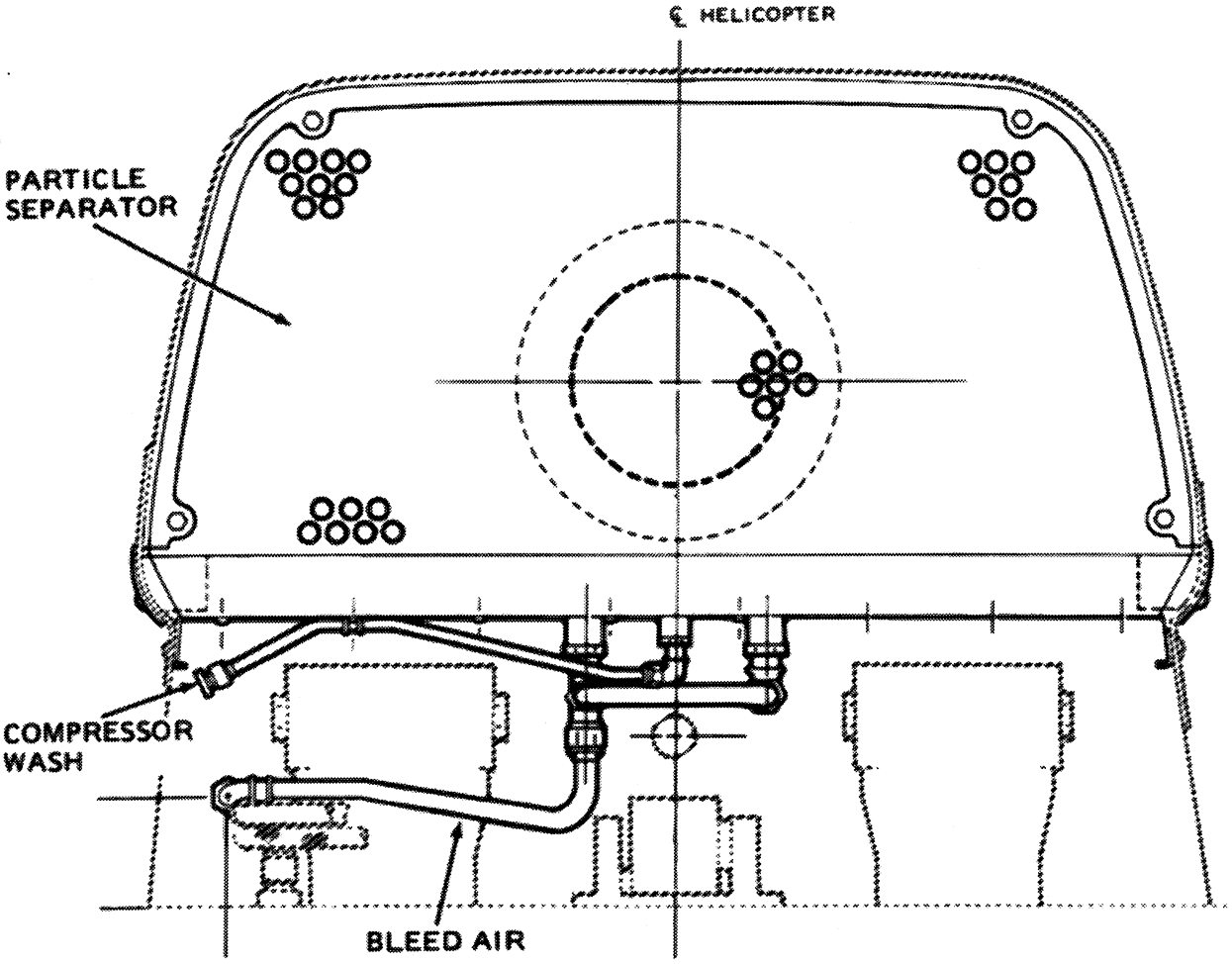
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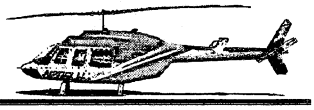
VIEW LOOKING INBOARD RIGHT SIDE

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VIEW LOOKING AFT

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FLIGHT INSTRUMENTS GROUP
BELL KIT NO. 206-706-323-107

The **flight instruments group kit** augments the basic panel with the most popular grouping of additional flight instruments: a **directional gyro, attitude indicator, rate of climb indicator and a turn** and **slip indicator**.

Although the selection of instruments and the layout offered in the kit is only one of any number of possible arrangements, it has been designed to complement the basic panel and to prepare for a further addition of navigation and other aids. It is the first step to a well-coordinated full panel.

The flight instruments group kit reduces the pilot work load by providing better displays that are easier to interpret. This can lead to more accurate flying techniques. That, in turn, extends the operational area.

It is invaluable for flight safety in low visibility conditions, particularly at night when operating away from inhabited areas and at any time that weather conditions deteriorate towards the limits of continued VFR flight.

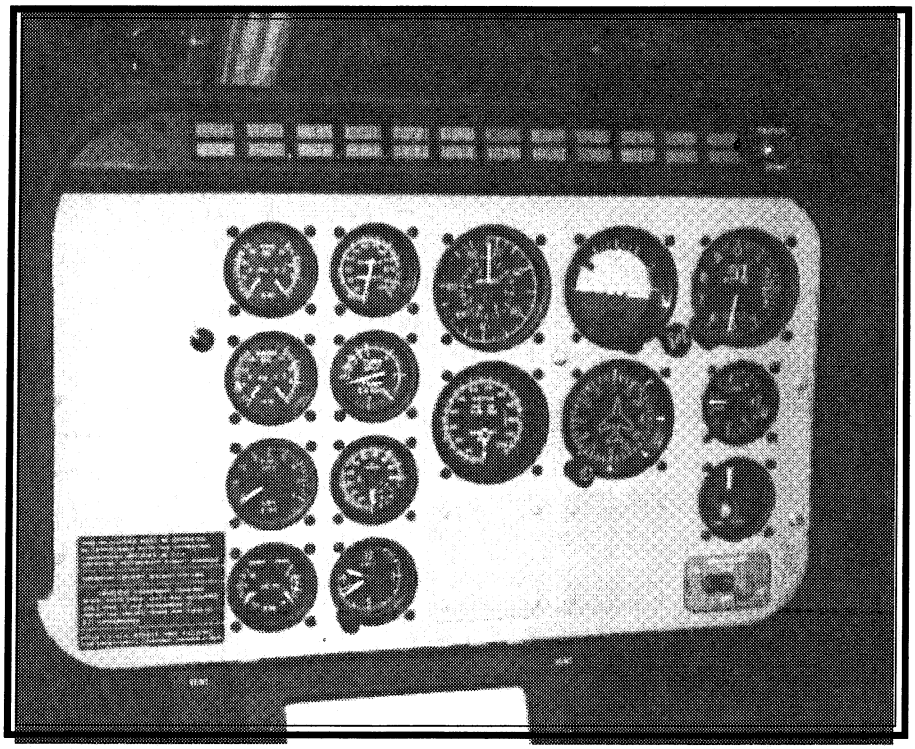
In addition to the instruments, the kit contains all hardware, tubing and wiring needed for installation. Also included are the provisions to connect the **heated pitot tube**.

The electrical instruments operate on direct current which is standard in the helicopter.

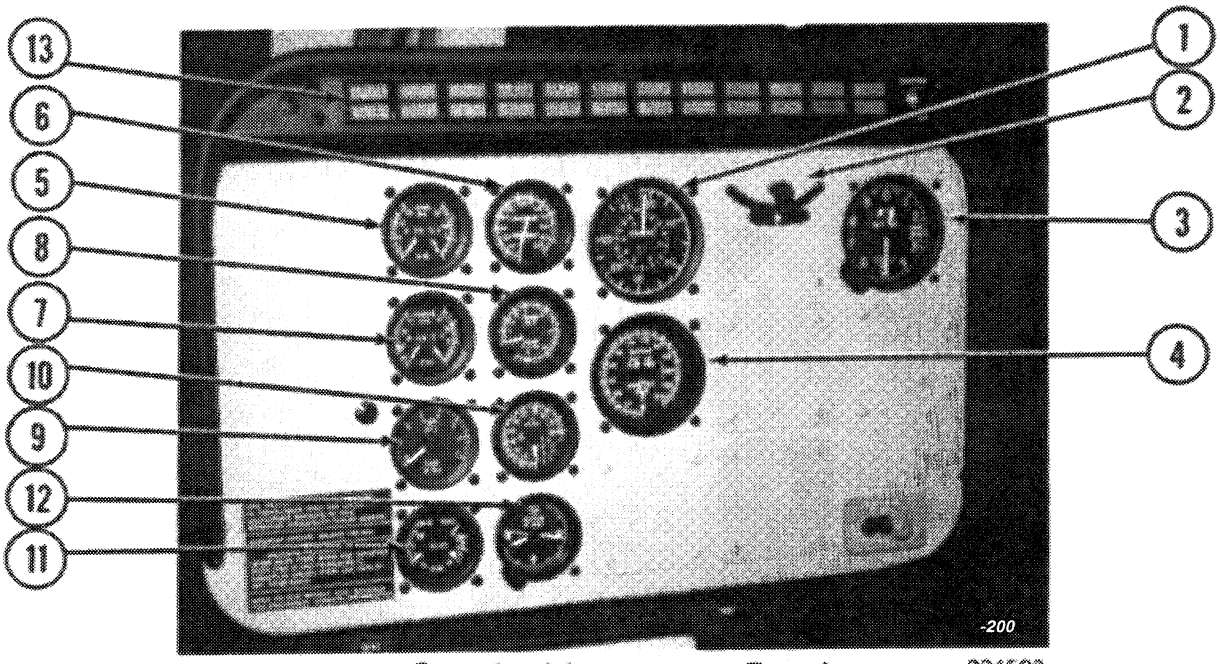
The integral blue-white lighting matches the standard basic panel lighting.

The kit adds 10 pounds (4.5 kilograms).

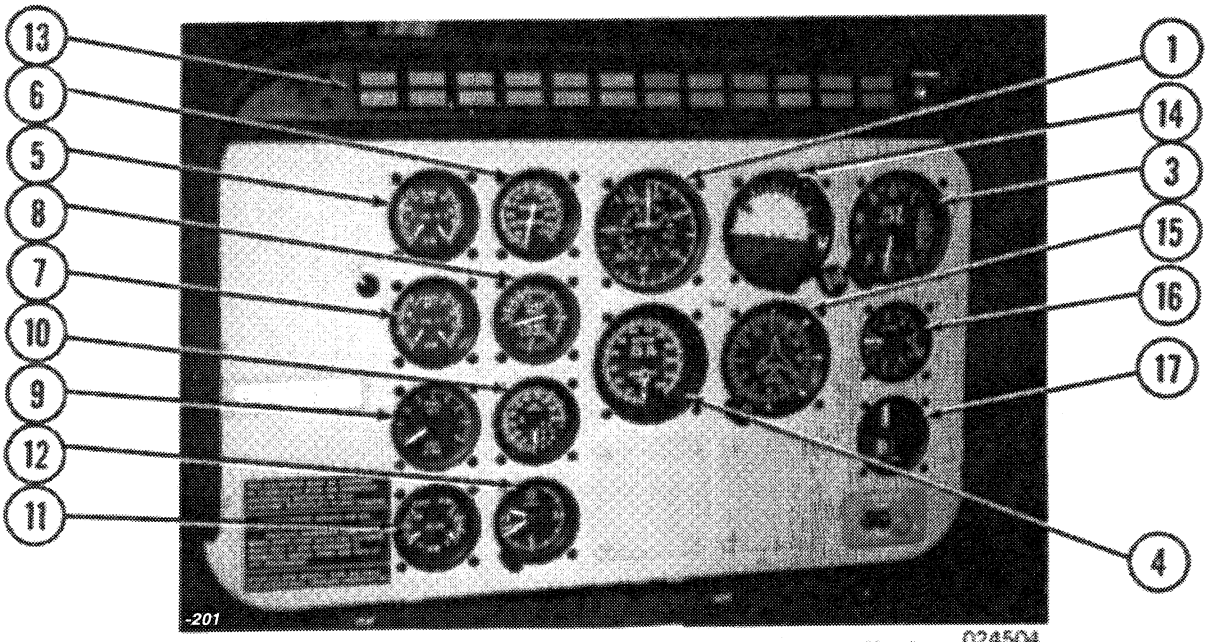
For installation and maintenance instructions, see Bell Service Instruction 206-2007.



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Standard Instrument Panel 024503



With Flight Instrument Kit Installed 024504

1. Airspeed Indicator (with electrically heated pitot tube)
2. Inclinometer
3. Altimeter
4. Dual Tachometer
5. Engine Oil Temperature/Pressure Indicator
6. Torquemeter
7. Transmission Oil Temperature/Pressure Indicator
8. Turbine Outlet Temperature Indicator
9. Fuel Quantity Indicator
10. Gas Producer Indicator
11. Fuel Pressure/Loadmeter Indicator
12. Clock
13. Caution Panel
14. Artificial Horizon
15. Directional Gyro
16. Rate of Climb
17. Turn and Slip

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AFT AUDIO
BELL KIT NO. 206-705-008-153

The **Aft Audio Kit** provides communication between crew and passengers. It consists of an Audio-Sears **handset** mounted on the vertical face of the center seat bench and a Quam-Nichols **speaker** with amplifier, mounted in the parcel shelf.

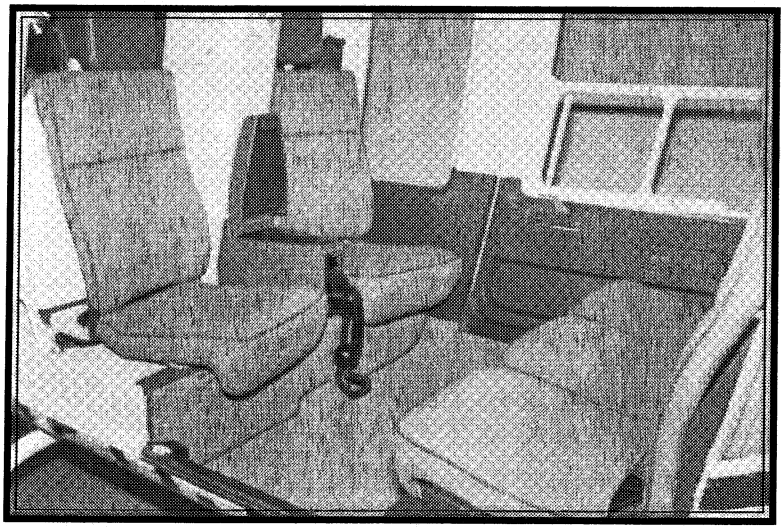
This enables the pilot or copilot to communicate through the handset or the cabin speaker and permits the passenger using the handset to converse with the pilot and copilot.

The handset and cradle are in black.

The kit adds 3 pounds (1.4 kilograms).

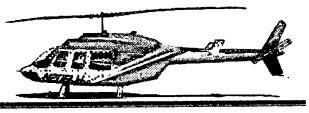


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CUSTOM DELUXE INTERIORS

The standard configuration of the LongRanger includes a fully upholstered seven-place interior.

Frequently a special interior is desirable, in which case, Bell can present other alternatives for selection and can install any customized interior before delivery.

Bell has prepared the most popular of the special interiors in the forms of a kit under the general classification of **"Custom Deluxe Interior."**

The major distinction in the Custom Deluxe Interior is that the rear bench seats two people comfortably with a folding armrest in between. Raising the armrest converts the center space to a third seat. The two outboard forward facing seats are built on wider frames. The center seat belt and shoulder strap can be removed if not needed.

The materials used in the Custom Deluxe Seats are of higher quality than the standard Deluxe configuration. They are available in a choice of attractive, coordinated colors and materials, with carpeting to complement the selected color. The Bell representative has a book of actual samples to aid in the final selection.

The combination of leather and fabric is available in tan, blue, gray and red.

The appointments used in the Custom Deluxe Interior are also of higher quality.

-On the cabin door posts of the main cabin are straps to help passengers climb in or step out.

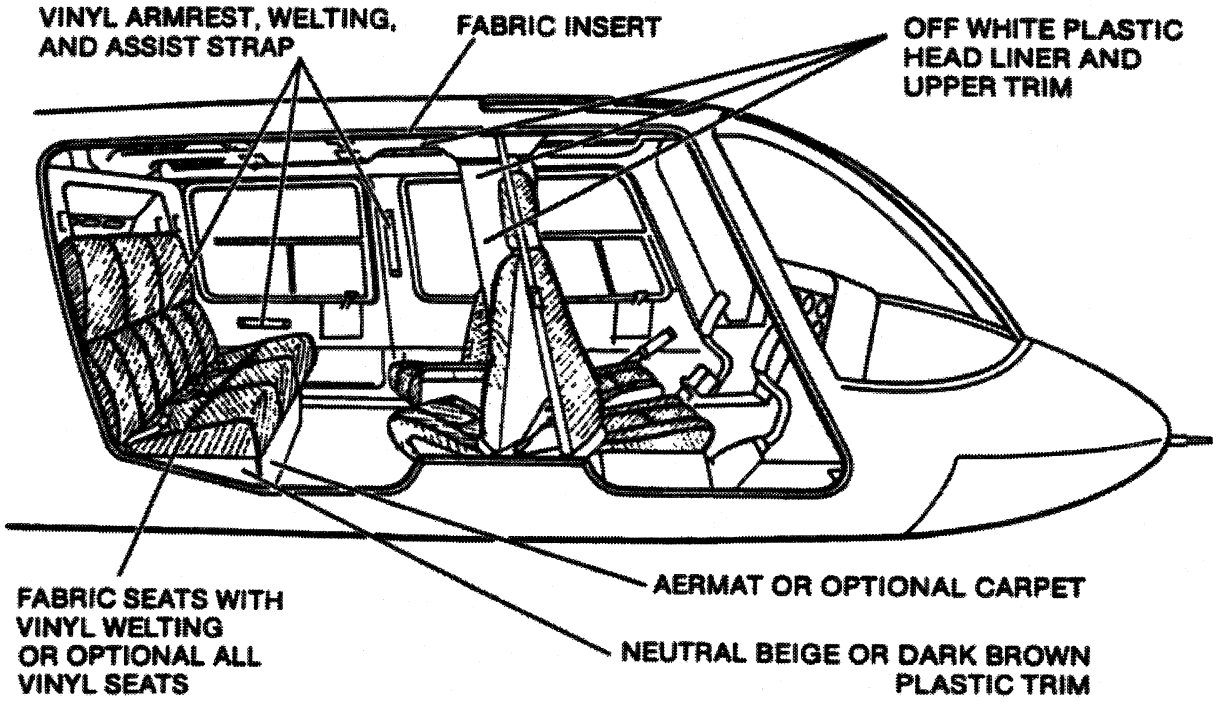
-The armrests on the aft doors are leather covered.

Carpeting that matches the floor covers the lower door panels, the bottom of the parcel shelf and the section between the floor and the panel that fits underneath the windshields.

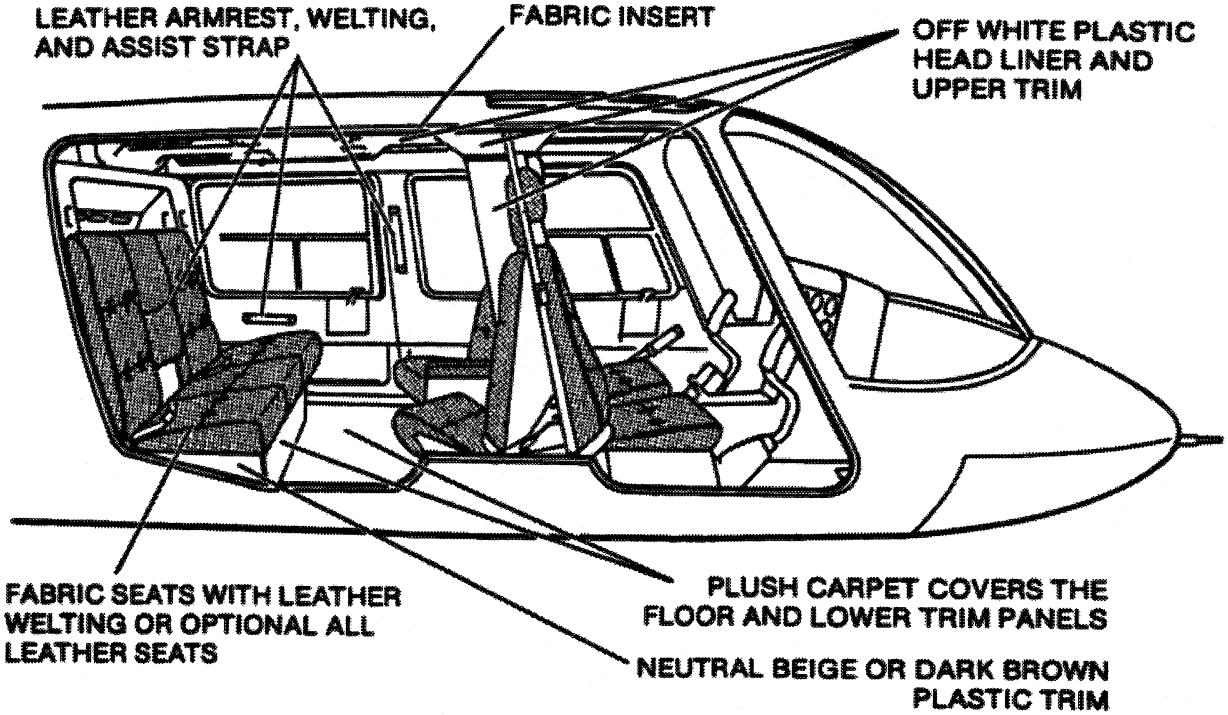
The Custom Deluxe Interior removes approximately 2.4 pounds (1.1 kilograms).

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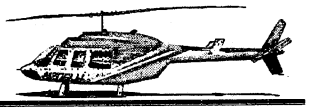
DELUXE INTERIORS



CUSTOM DELUXE INTERIORS



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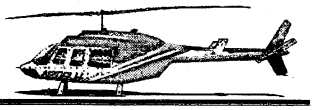


ECONOMY INTERIOR
BELL KIT NO. 206-705-103-103

The **economy configuration** is available on special order for those who want to finish the interior themselves. It consists of a standard seat and seat-back cushion for the pilot, the standard trim kit, the standard soundproofing, vinyl flight-control boots and all seven seat belts with two inertia-reel harnesses forward and five inertia-reel restraining straps aft. The interior is finished in prairie gray lacquer.

The utility configuration is approximately 45.2 pounds (20.5 kilograms) less than the standard configuration weight.

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SPECIAL INTERIORS

In addition to the standard Deluxe interior, the Custom Deluxe kits and the Utility interior, Bell Helicopter Textron has designed and finished the LongRanger in a wide variety of styles to match a customer's existing transport fleet, highlight his company colors, or to meet any other specific needs.

The standard Deluxe and the Custom Deluxe seats can be finished completely in vinyl. The all-vinyl standard Deluxe is approximately the same weight as the standard configuration.

The Custom Deluxe seats can be finished completely in leather. This adds 6 pounds (2.7 kilograms) to the standard configuration.

In some customized configurations, cushions have been used in the cabin instead of seats.

Special interiors cover a wide range of furnishings such as desks and bars, additional lighting, business communications, larger window openings, extra hand holds, etc. The variations are endless.

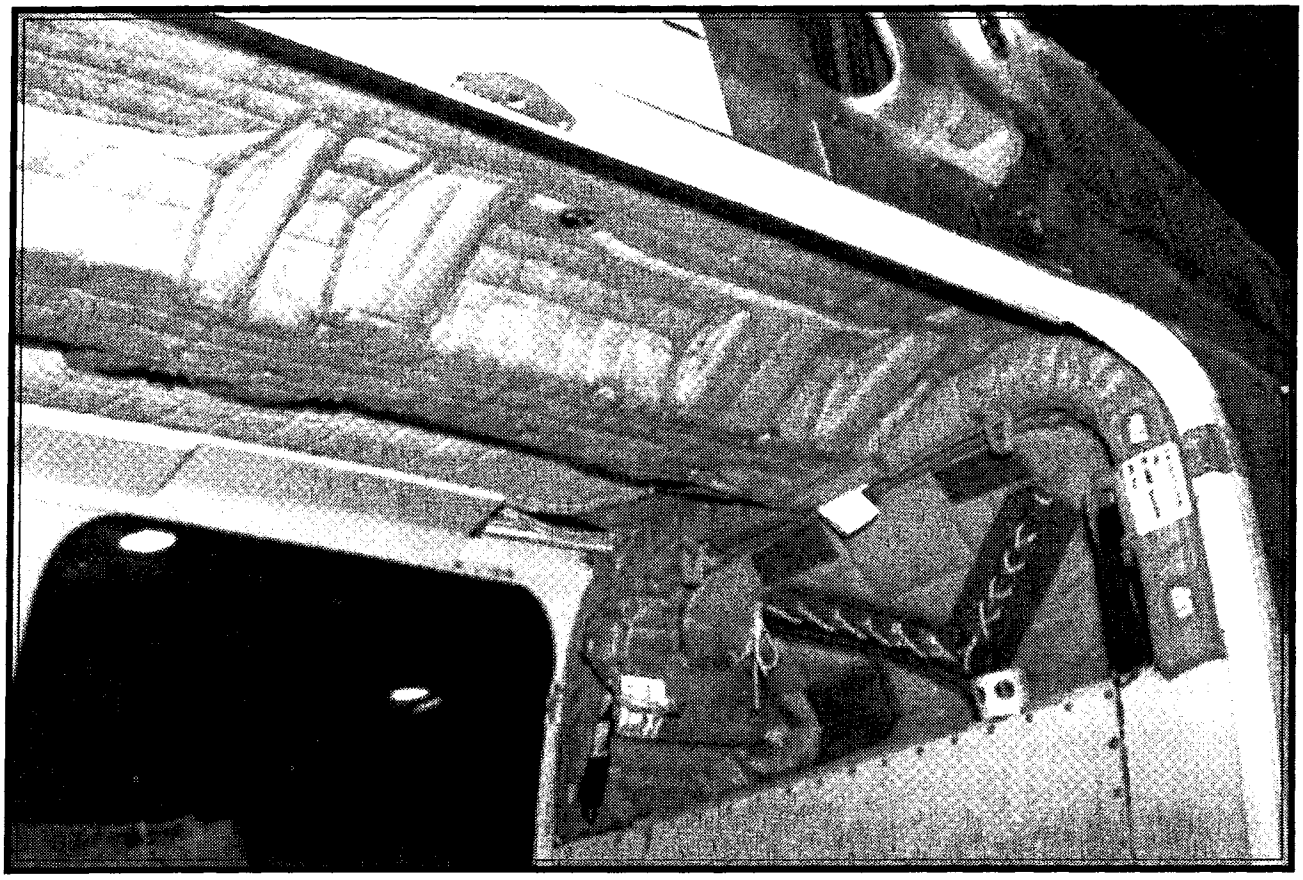
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CUSTOM SOUNDPROOFING BLANKET
BELL KIT NO. 206-706-043-101

The kit consists of one Custom Soundproofing Blanket which is fastened to the aft passenger cabin roof to reduce the noise coming into the cabin from the transmission and engine compartment.

The heavy duty blanket consists of two layers of fiberglass with a lead vinyl center and a quilted "duon" cover. The standard plastic headliner covers it.

The Custom Soundproofing Blank kit adds 13 pounds (5.9 kilograms) to the standard configuration.



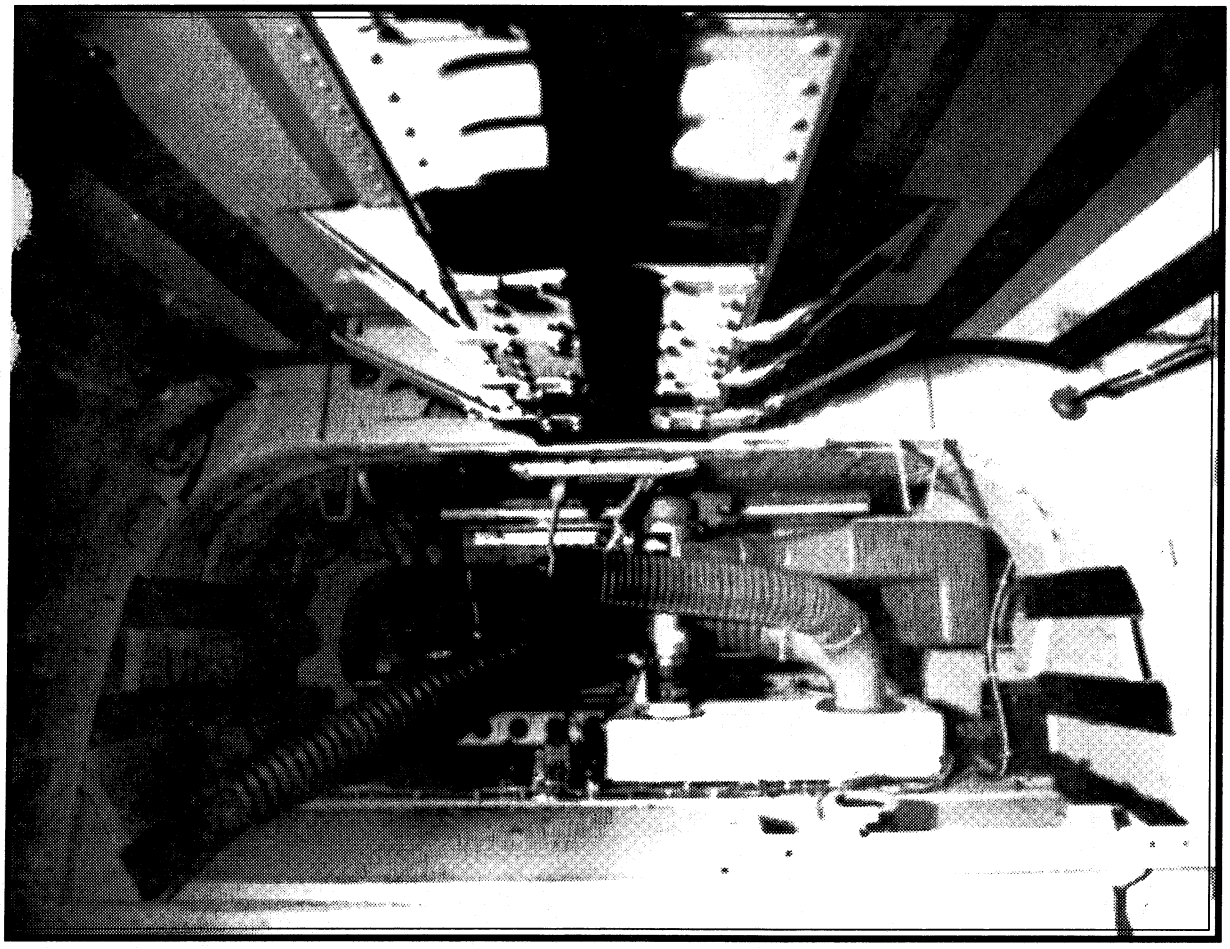
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BLEED-AIR HEATER
BELL KIT NO. 206-706-141-103

The **Bleed-Air Heater** provides heat to the crew and passengers. It forces air, heated to the selected temperature, throughout the forward and passenger compartments and to the windshields.

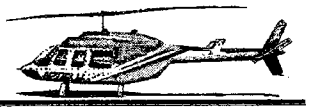
The **Heater Kit** consists of a patented air mixing valve incorporating a solenoid-actuated bleed-air shutoff valve, electrical system, noise suppressor, heated controls, and the necessary installation hardware.

The **Distribution System** consists of the ducting and the adjustable outlets to direct and regulate the flow of heated air.



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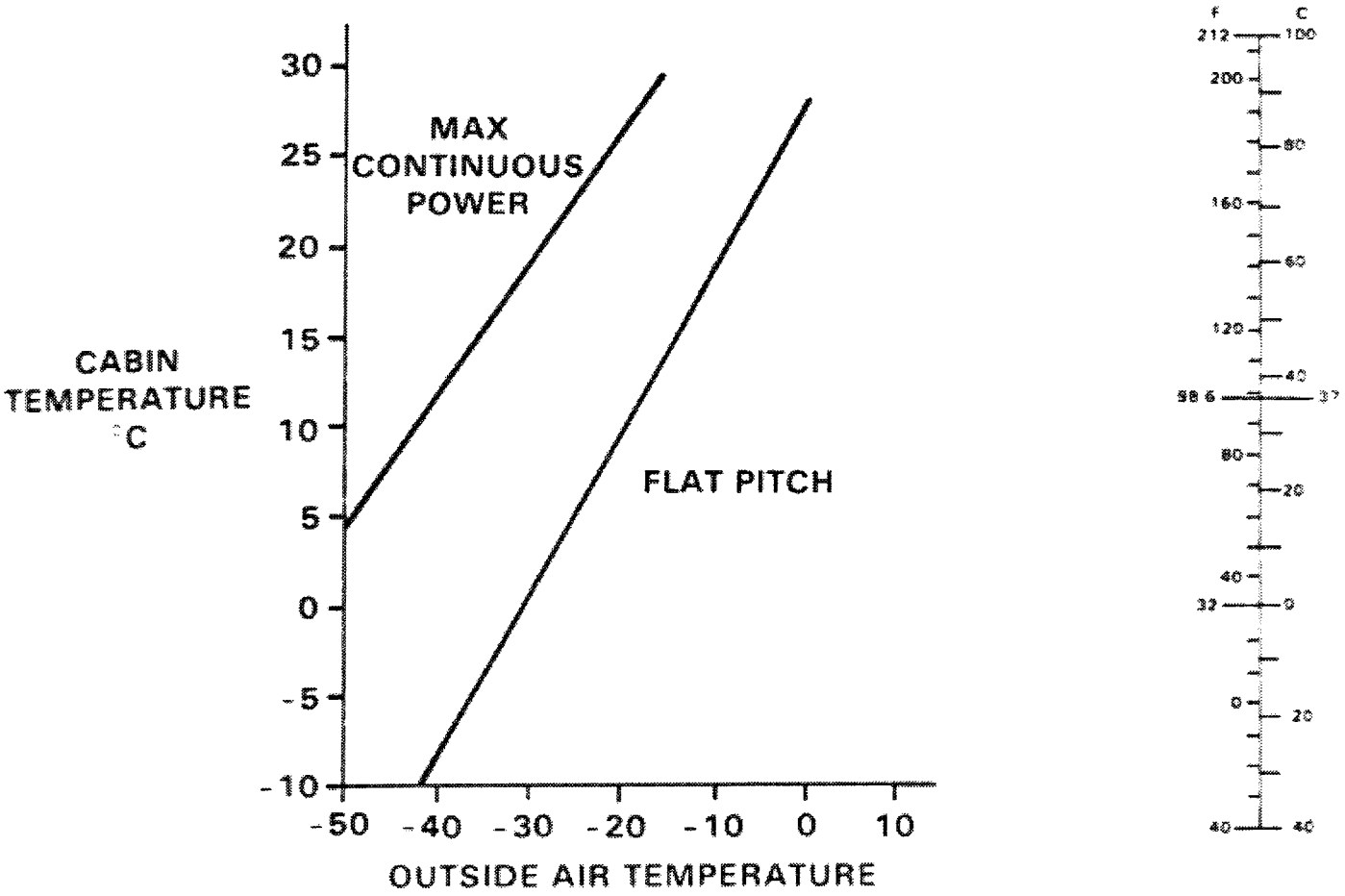


The heater is installed in the equipment compartment which is directly above the baggage compartment and behind the interior cabin shelf. A fresh air inlet is installed on the left side of the fuselage.

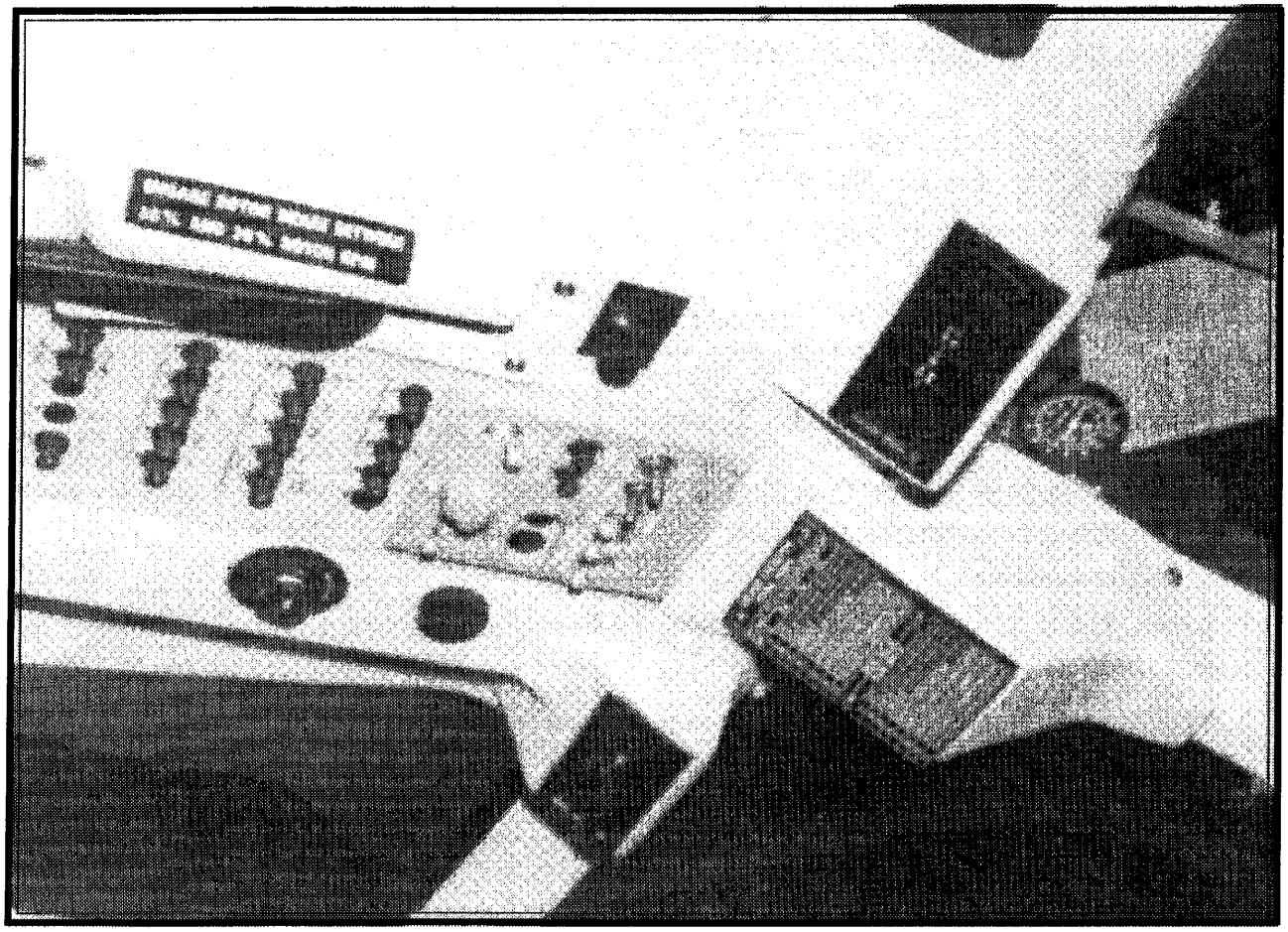
Performance of the heater kit is shown in the figure below. The cabin temperature is shown as a function of outside air temperature. Heating performance is based on engine bleed air pressure and temperature; therefore, heating curves are shown for flat pitch and MCP (maximum continuous power) operation.

For example, if the outside temperature is -30°C, the chart indicates that the heater can provide a comfortable cabin temperature of 19°C while flying at maximum continuous power.

On the ground at an outside temperature of -20°C, a temperature of 9°C can be maintained in the cabin. Fresh air is drawn into the heater through the scoop shaped port on the left side of the fuselage and passes through a noise suppressor. It is then automatically mixed with a quantity of bleed air taken from the compressor section of the aircraft engine and measured to meet the



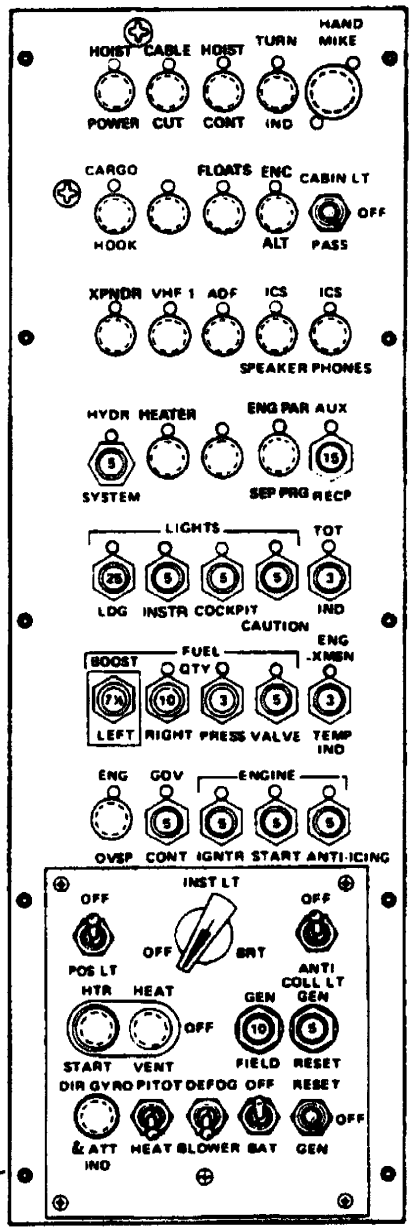
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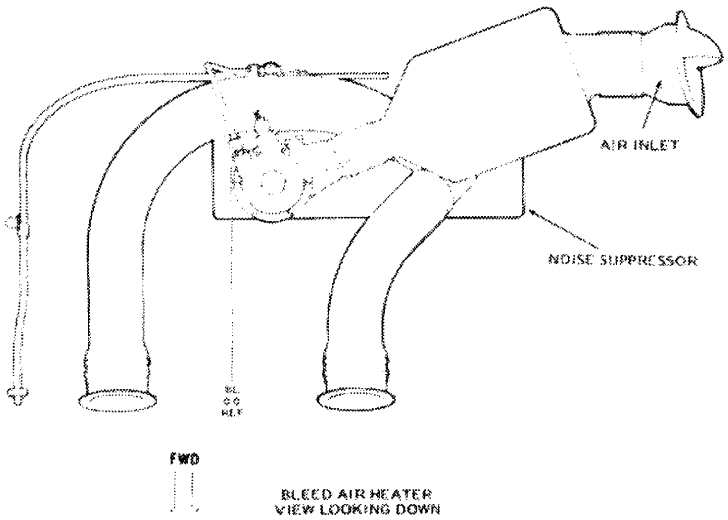
temperature set on the pilot's temperature selector. The temperature selector is conveniently mounted on the upper right side of the control tunnel. It is turned clockwise for more heat. The heated air is distributed through a noise suppressor and into the ducts. Four adjustable distribution outlets are located in the lower forward compartment and four in the passenger cabin ceiling. Two defogging slots with individual open-close covers are mounted at the top of the windshields.

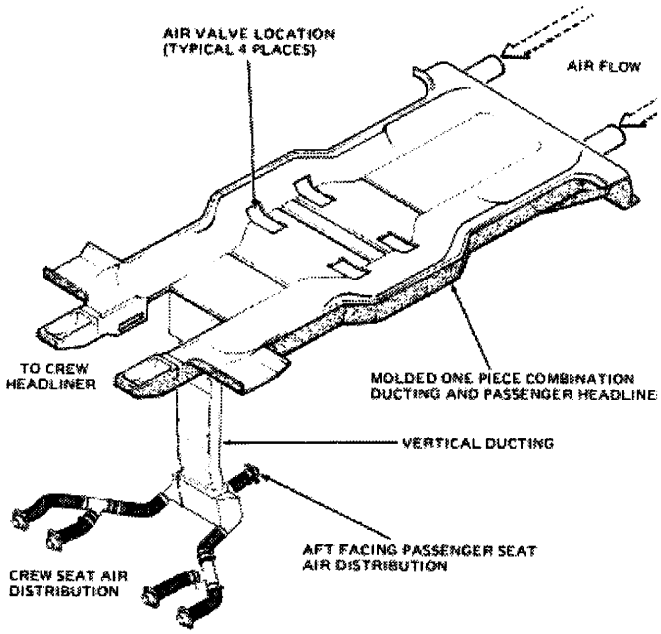
An on-off switch and a circuit breaker are mounted on the overhead console. An overheat switch in the heater duct trips the circuit breaker if the heat exceeds the set maximum. This in turn activates the solenoid which shuts off the bleed air.



TWO POSITION ON-OFF SWITCH

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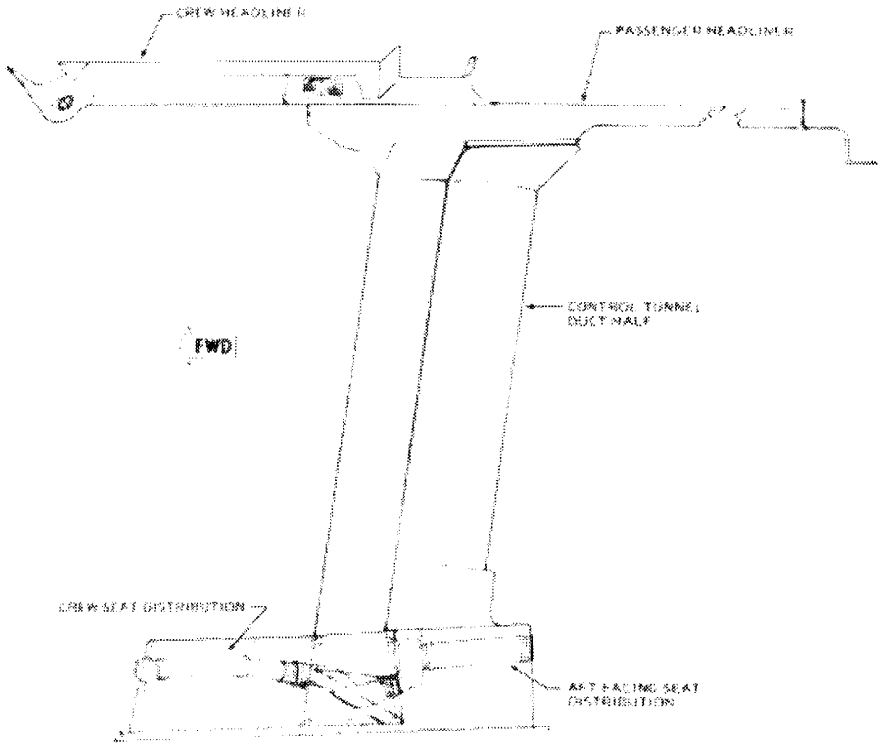




Performance limitations are published in the Flight Manual Supplement BHT-206L3-FMS-2.

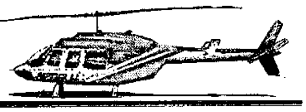
For installation and maintenance instructions, see Bell Service Instruction 206-2023.

The heater adds 21.0 pounds (9.5 kilograms).



LOOKING INBOARD—LEFT SIDE
AIR DISTRIBUTION SYSTEM

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ENVIRONMENTAL CONTROL SYSTEM
BELL KIT NO. 206-705-401-103
PROVISIONS KIT
KEITH PRODUCTS KIT NO. 206-0102-3
ENVIRONMENTAL CONTROL UNIT KIT

The **purpose** of the Environmental Control System kits is to provide a comfortable environment for the pilot and passengers when working in severe operational environments.

Comfort increases the productivity of the crew when the long airborne mission demands a high level of alertness.

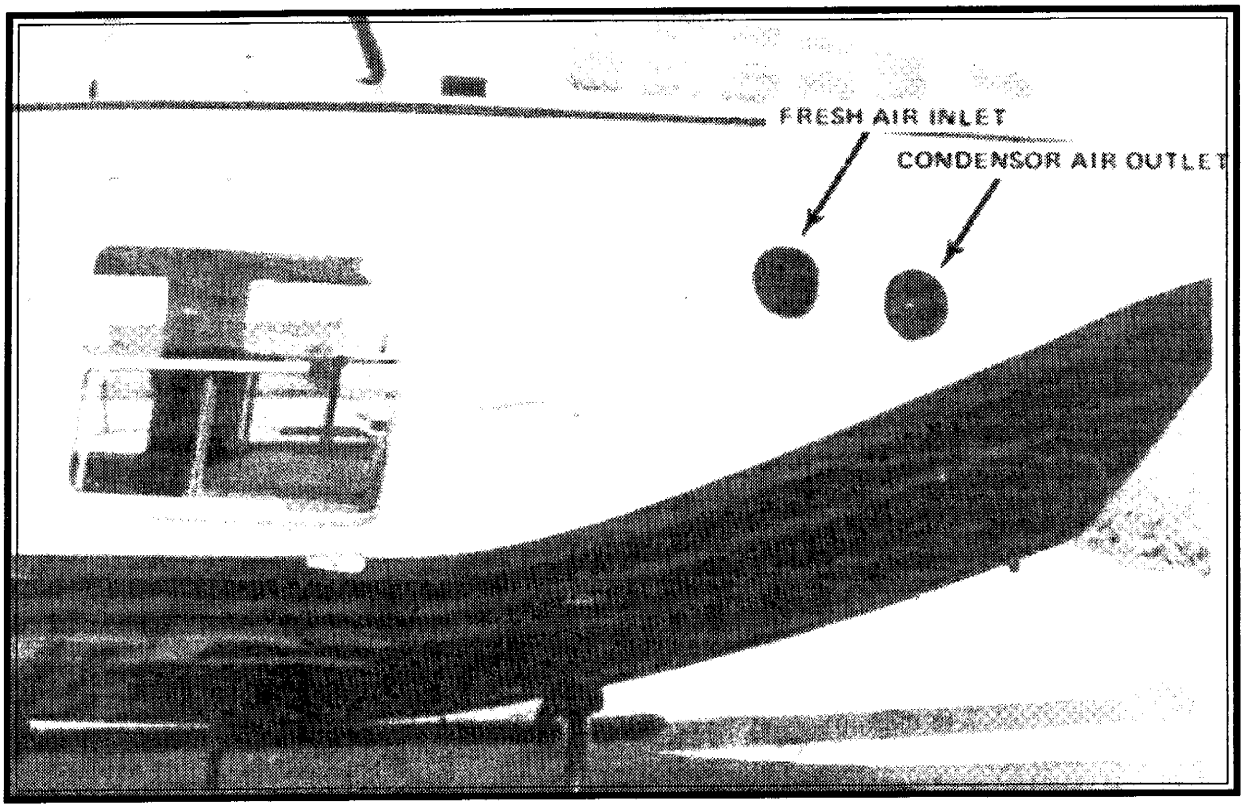
The installation is a completely integrated heating and cooling system which provides a precisely controlled cabin temperature, automatically. The desired temperature is easily set and can be changed at will.

Air circulation can be adjusted by directional, volume-adjustable nozzles that are appropriately and conveniently placed and by the high/low fan control.

In addition to temperature control, the system further improves the comfort level by removing moisture from the circulating air.

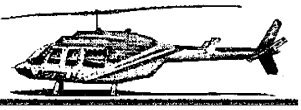
The system can be operated only when the engine is running since the heating components are bleed air and the compressor for cooling is engine driven.

The compressor, driven off the tail rotor drive, is easily accessible.



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The installation does not encroach on cabin or baggage space. It is of minimum weight for high, reliable performance and uses minimum mechanical and electrical power. The cooling system requires 5 horsepower and the normal electrical system requirement is 54 amperes.

The two separate kits - the Bell Helicopter Textron Provisions Kit and the Keith Products Environmental Control Unit Kit - provide the most economical package for the installation.

The Environmental Control System Provisions Kit, No. 206-705-401-103, consists of the ducting and controllable vents to distribute the conditioned air throughout the cabin.

The ducting carries the conditioned air from the equipment compartment forward, along the center of the cabin ceiling. A pair of outlets is mounted at each side of the vertical control tunnel in the aft cabin and a single one on each side in the forward cabin. A port on each side directs airflow to the windshield. Each port has an adjustable door.

Ducts down each side of the tunnel carry the air to an outlet, at floor level, in the aft cabin, one on each side, and to the outlets mounted on the forward face of the crew seat bench, at floor level, one at each seat position.

The Environmental Control Unit, No. 206-0100-31, consists of a vapor cycle, airborne conditioning system of carefully matched components, the ducting, blower and ventilators to mount controllable outlets on each side of the instrument panel, a bleed heater and the necessary controls, electrical components, plumbing and hardware to complete the installation.

The conditioning system is rated at 30,000 BTUH/400 cubic feet per minute and consists of:

- a belt-driven compressor with a self contained oil system, mounted in the engine compartment.
- A condenser/blower, electrically driven, in the equipment shelf.
- an evaporator in the equipment shelf
- an electrically driven evaporation provides circulation air for the cooling system and can augment the air flow when the heater is in use.

The ventilators on the instrument panel are fed by ducting that is connected to the control tunnel ducts. The ducts then go forward under the floor, pass through a blower and terminate in the ventilators. Air flow can be directed aft to the crew or downward to defog the chin bubbles.

The bleed air heater rate at 30,000 BTUH is mounted on the equipment shelf. It has an integral silencer and a DUCT TEMP HIGH caution light.

Controls for the cooling units are mounted on a panel on the radio pedestal. Three switches are provided:

- air conditioner or fan
- hi/lo blower speed
- temperature control

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The Control for the heating unit is mounted on the forward cabin ceiling. It consists of an OFF/MAX rotary control on which the desired temperature is set.

Flight Procedure and performance data are contained in the Flight Manual Supplement.

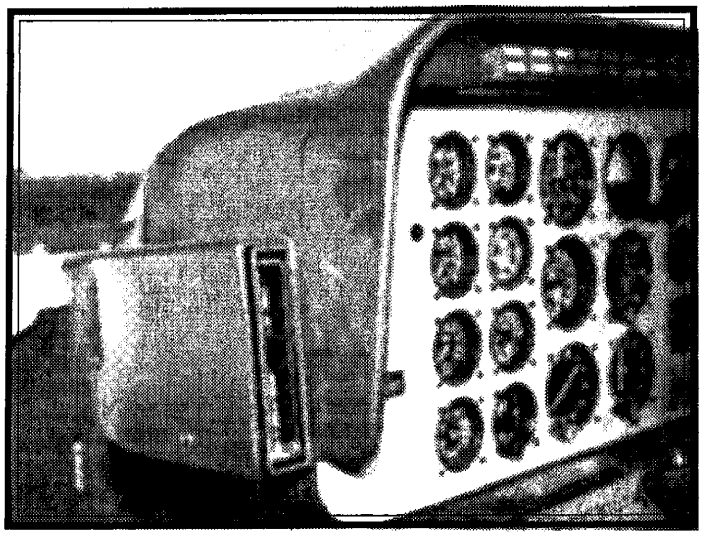
The system uses non-freon R-134A refrigerant gas. The gas is nonexplosive, nonflammable, noncorrosive, practically odorless and heavier than air.

When the temperature is turned on, the compressor compresses refrigerant to a high pressure and temperature. This gas is routed to the condenser where cooling from the fan removes heat from the gas, condensing it into a liquid. The liquid is then stored in the receiver/dryer next to the evaporator until it is used. The refrigerant is metered through the evaporator by the expansion valve at a rate which allows all the liquid to evaporate by the expansion valve at a rate which allows all the liquid to evaporate and return to the compressor at a reduced pressure. The cabin heat is absorbed from the air passing over the evaporator cooling fans.

The bleed air heater system consists of the following components.

- The heat control is located on the pilot's overhead panel. Rotating the control knob clockwise turns the heat on and increases the temperature. Turning it counterclockwise reduces the temperature and turns the heat off.

- The regulator valve is located on the equipment shelf. The valve delivers bleed air as directed by the heat control setting, to the ejector nozzle located internal to the heater silencer via flex duct.



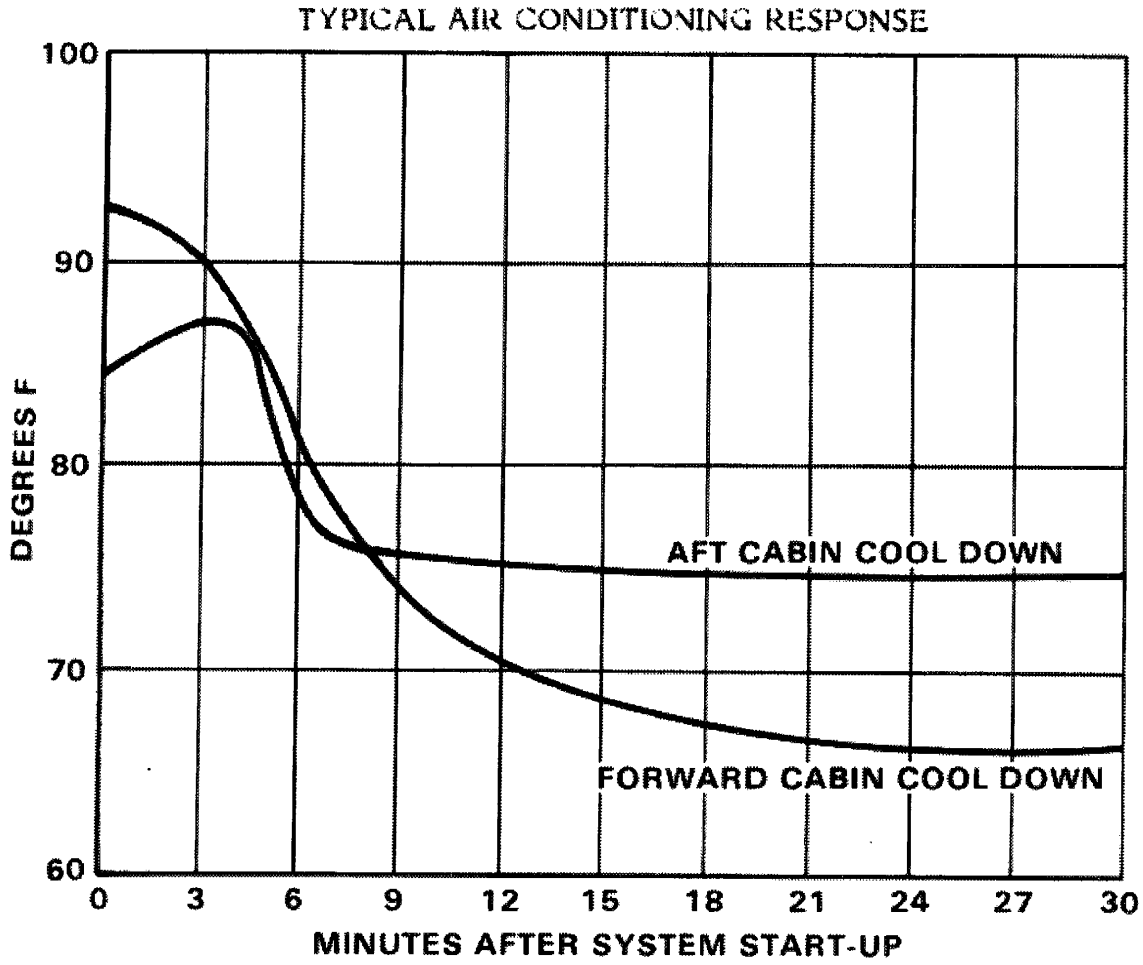
COCKPIT AIR OUTLETS - 215



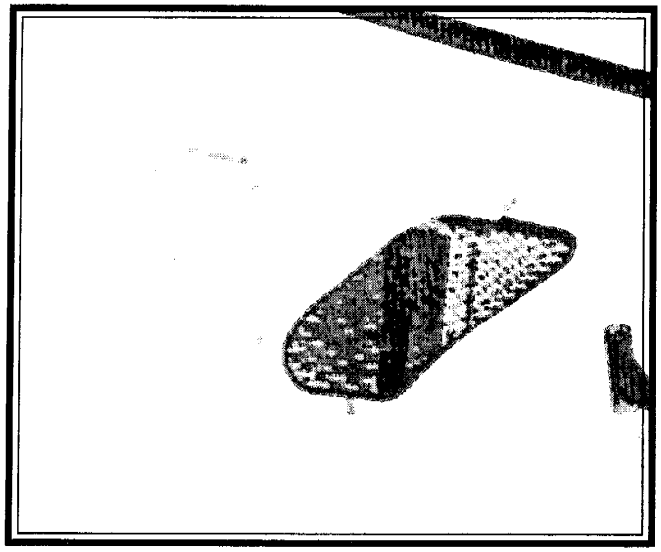
REAR CABIN AIR OUTLETS (AND READING LIGHTS) - 216

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TYPICAL AIR CONDITIONING RESPONSE

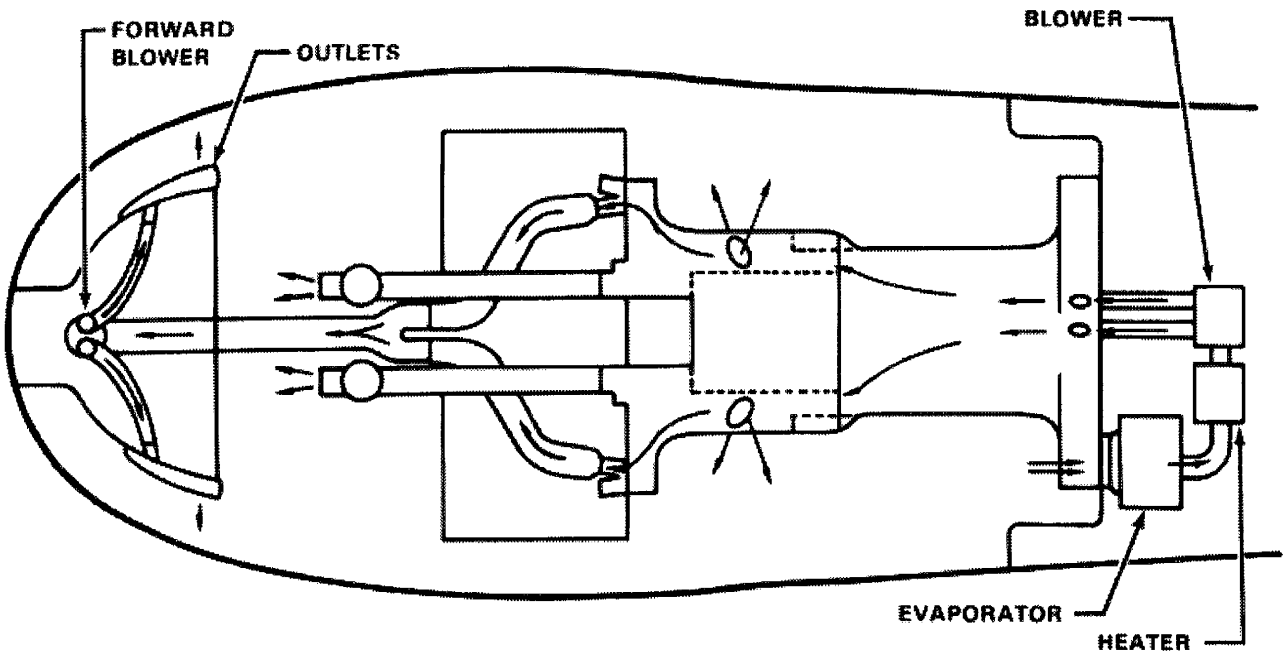


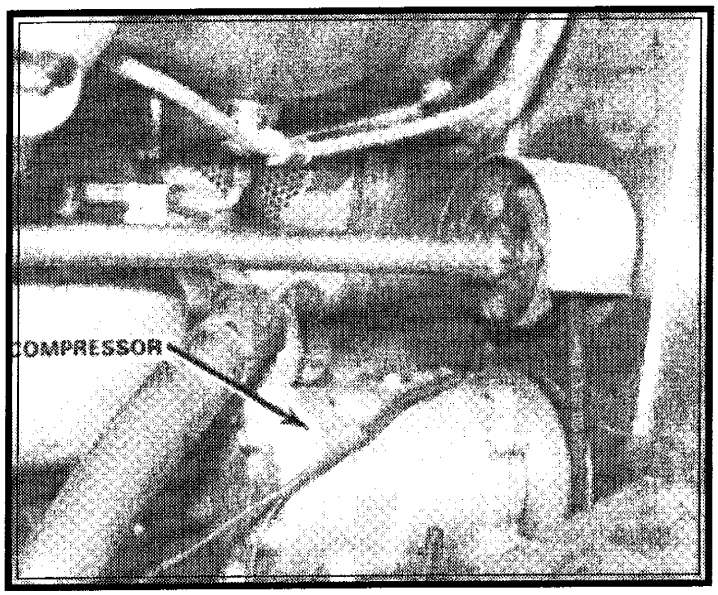
The heater silencer is located just above the access panel in the baggage compartment. Bleed air delivered to the nozzle creates a positive hot air flow to the cabin. This can be augmented by the evaporation blower. A duct temperature switch, when activated, illuminates a light on the instrument caution panel labeled "DUCT TEMP HIGH".

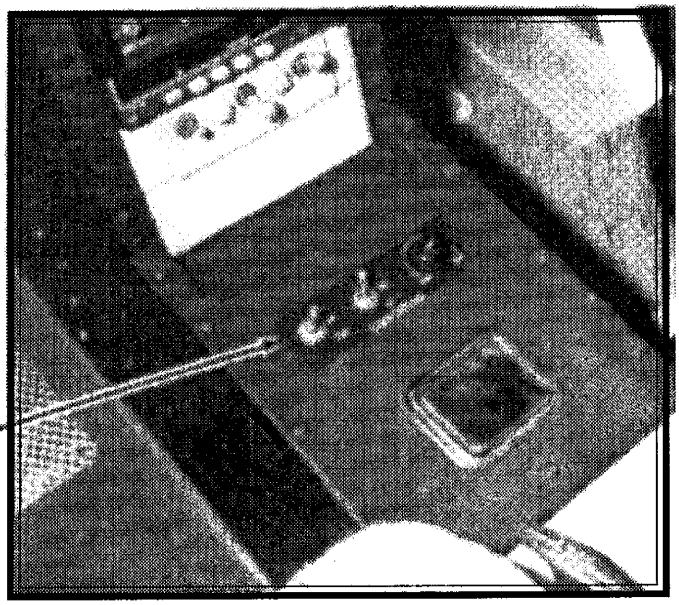


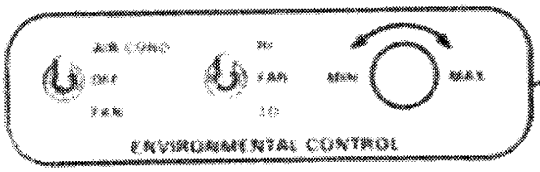
AFT CABIN AIR - 217

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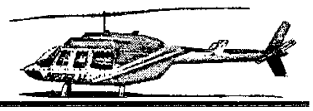




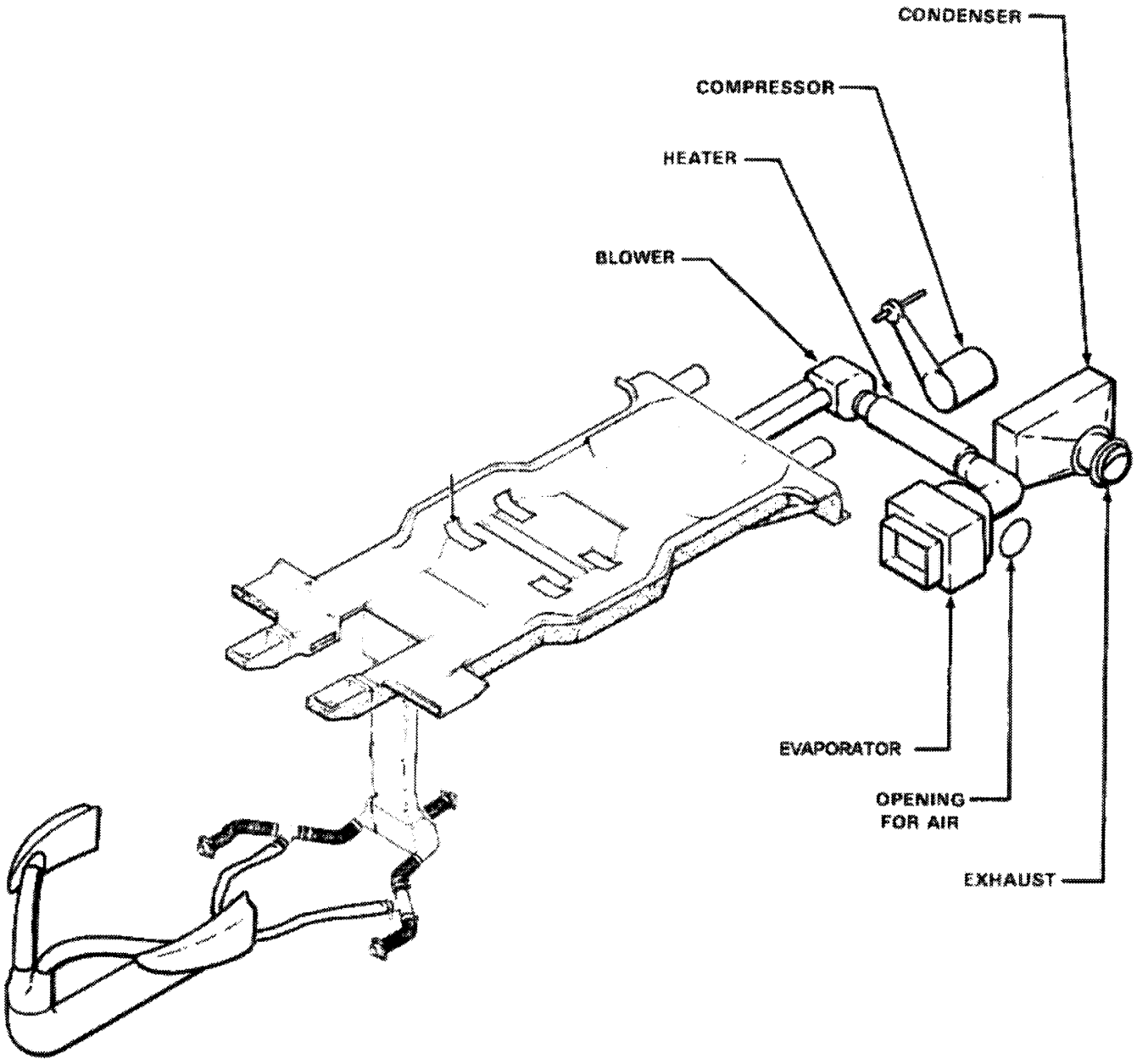


BASIC PANEL

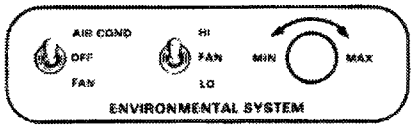
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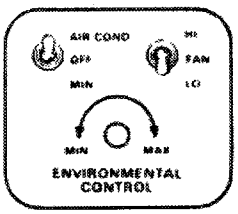
THE COMPLETE KEITH PRODUCTS ENVIRONMENTAL CONTROL SYSTEM



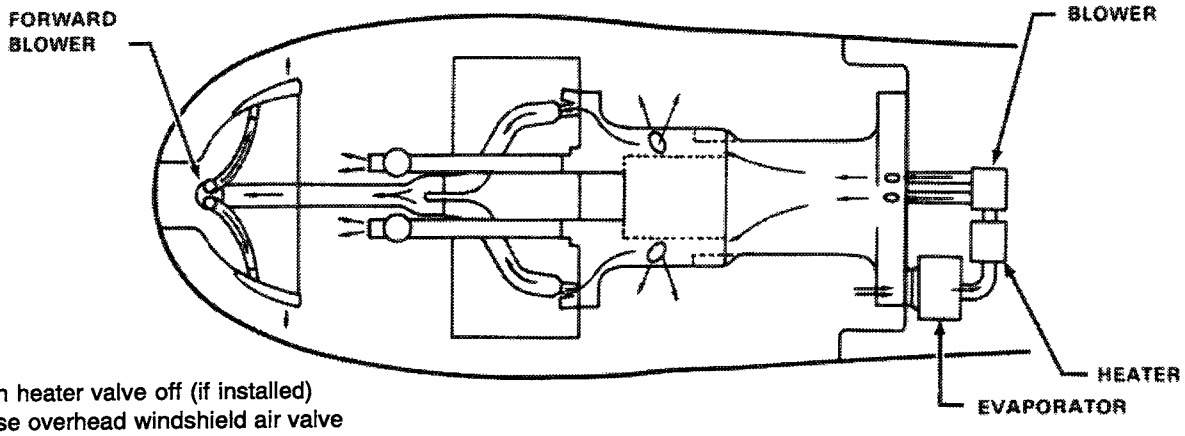
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BASIC PANEL

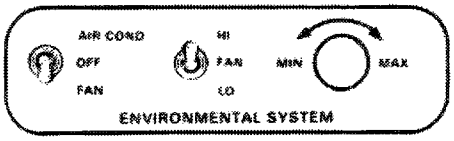


ALTERNATE PANEL

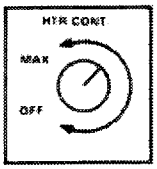


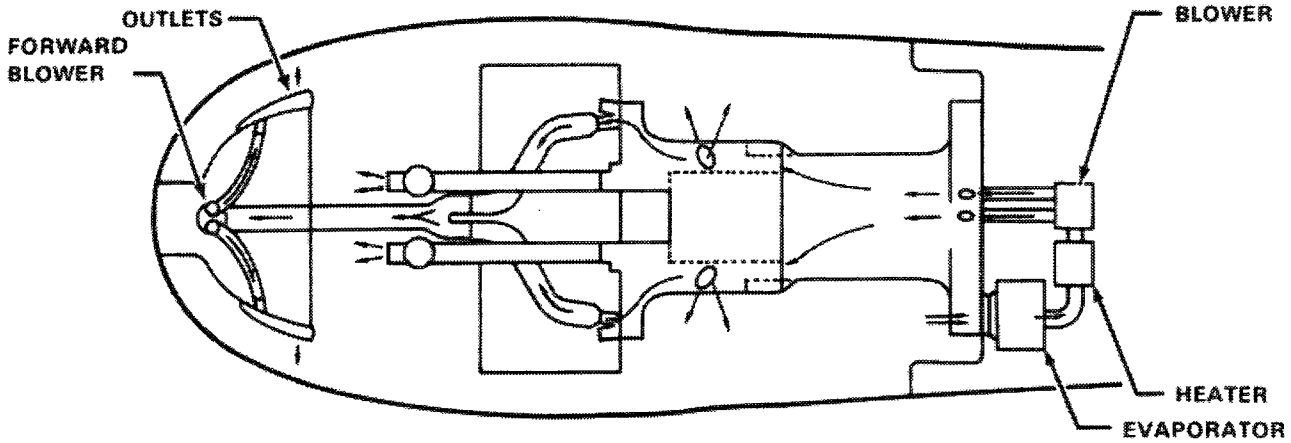
- Turn heater valve off (if installed)
- Close overhead windshield air valve
- Open overhead & instrument panel vents as desired
- Turn air cond - off - fan switch to air cond
- Turn hi - fan - low switch to hi or low as desired
- Set temperature control min - max to desired position

AIR CONDITIONING OPERATING INSTRUCTIONS AND DESCRIPTIONS



BASIC PANEL





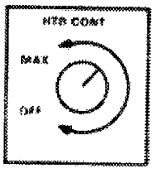
- Adjust cabin vents as desired
- Adjust heater control to desired comfort setting
- Turn air cond - off - fan switch to fan (if installed)
- Turn hi - fan - lo switch to hi or lo as desired (if installed)

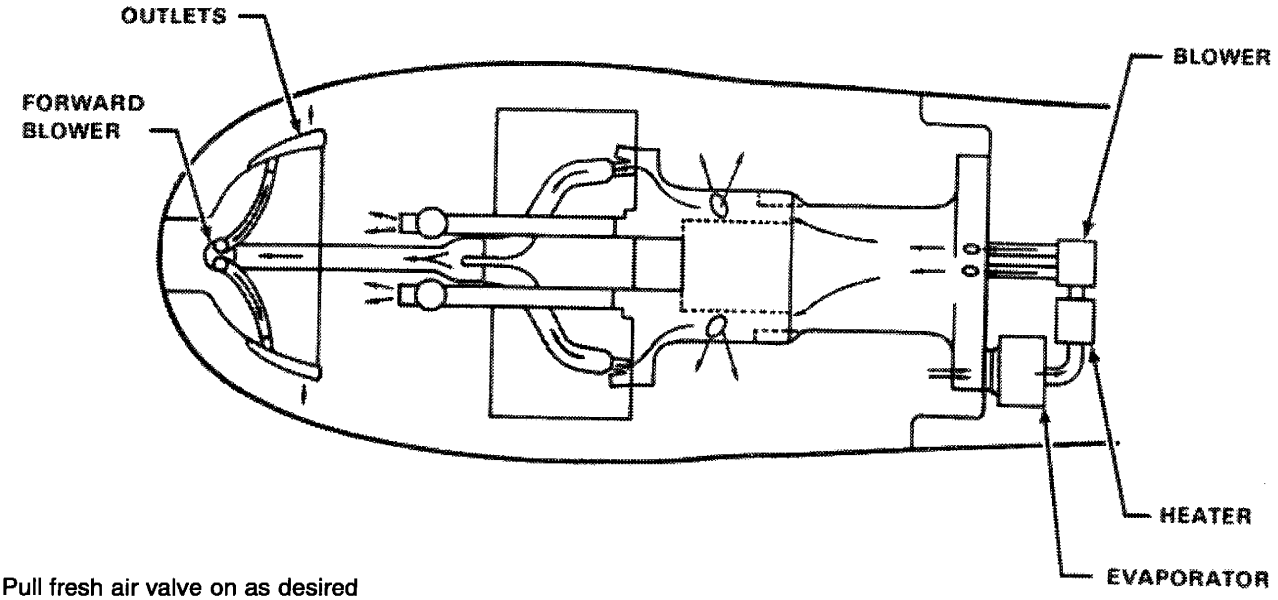
AIR CONDITIONING OPERATING INSTRUCTIONS AND DESCRIPTIONS

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BASIC PANEL



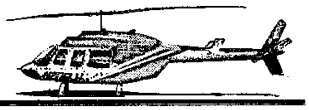


- Pull fresh air valve on as desired
- Open overhead windshield air valve
- Adjust cabin vents as desired
- Adjust heater control to desired settings
- Turn air cond - off - fan switch to air cond (if installed)
- Turn hi - fan - lo switch to hi or lo as desired (if installed)

CABIN DEFOGGING OPERATING INSTRUCTIONS AND DESCRIPTIONS

The provisions (air distribution system) weighs 6.2 pounds (2.8 kilograms). The weight of the ECS equipment installed is 113.6 pounds (57.5 kilograms). Total increase in empty weight is 119.8 pounds (54.3 kilograms).

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CARGO HOOK COMPLETE
BELL KIT NO. 206-706-341-105
HOOK PROVISIONS KIT ONLY
BELL KIT NO. 206-706-341-113

Installation of a **cargo hook** adds the capability for handling external loads quickly and safely.

It permits rapid, economical turnaround with minimum handling.

The hook has a rated capacity of 2000 pounds (907 kilograms) and is mounted near the center of gravity.

Two kits are involved:

The Hook Provisions Kit, No. 206-706-341-113, consists of the supports for the suspension assembly, and associated structural provisions, fittings for the electrical and mechanical release mechanisms and necessary installation hardware. It is available separately so that a fleet owner can prepare more than one of his LongRangers for maximum fleet versatility at minimum cost. Thus, any one so modified, can be employed in an external cargo operation without delay by merely bolting the hook assembly in place and attaching the quick connectors for the release mechanisms.

The Hook Assembly Kit, No. 206-706-341-101, consists of the hook which is suspended from a short lateral beam with the hook opening facing to the right. The beam fits into the two structural brackets and is bolted in place.

The **electrical release** is a switch on the pilot's cyclic stick. In the event of an electrical failure, a mechanical release is provided. It is operated by a pullhandle centrally located between the front seats. A circuit breaker on the overhead panel completes the kit.

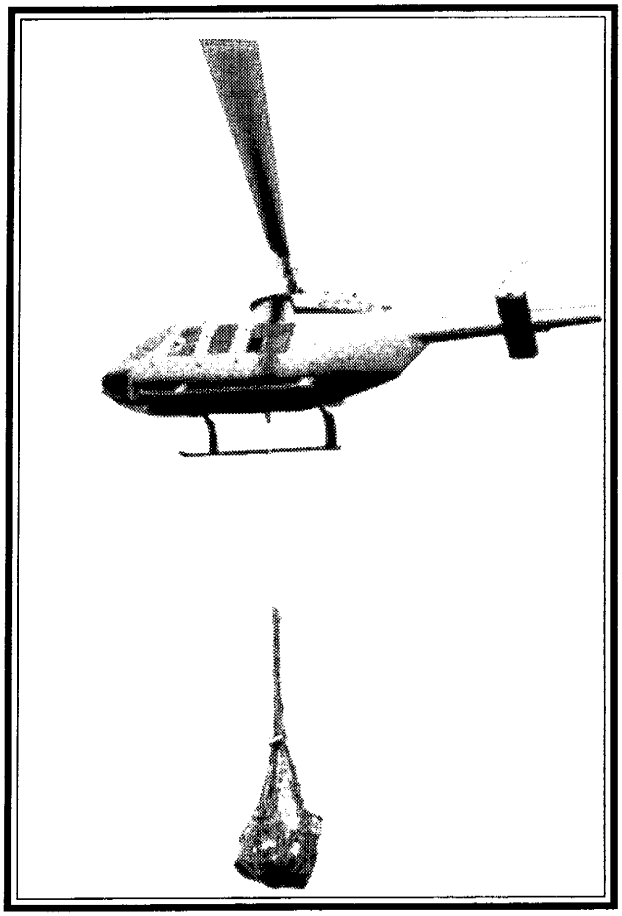
A swivel link is not supplied, but is recommended to allow the load to assume a natural stabilized position, with minimum oscillation in flight.

(Maximum gross weight of the 206L-4 with external load is approved to 4550 pounds (2063 kilograms).

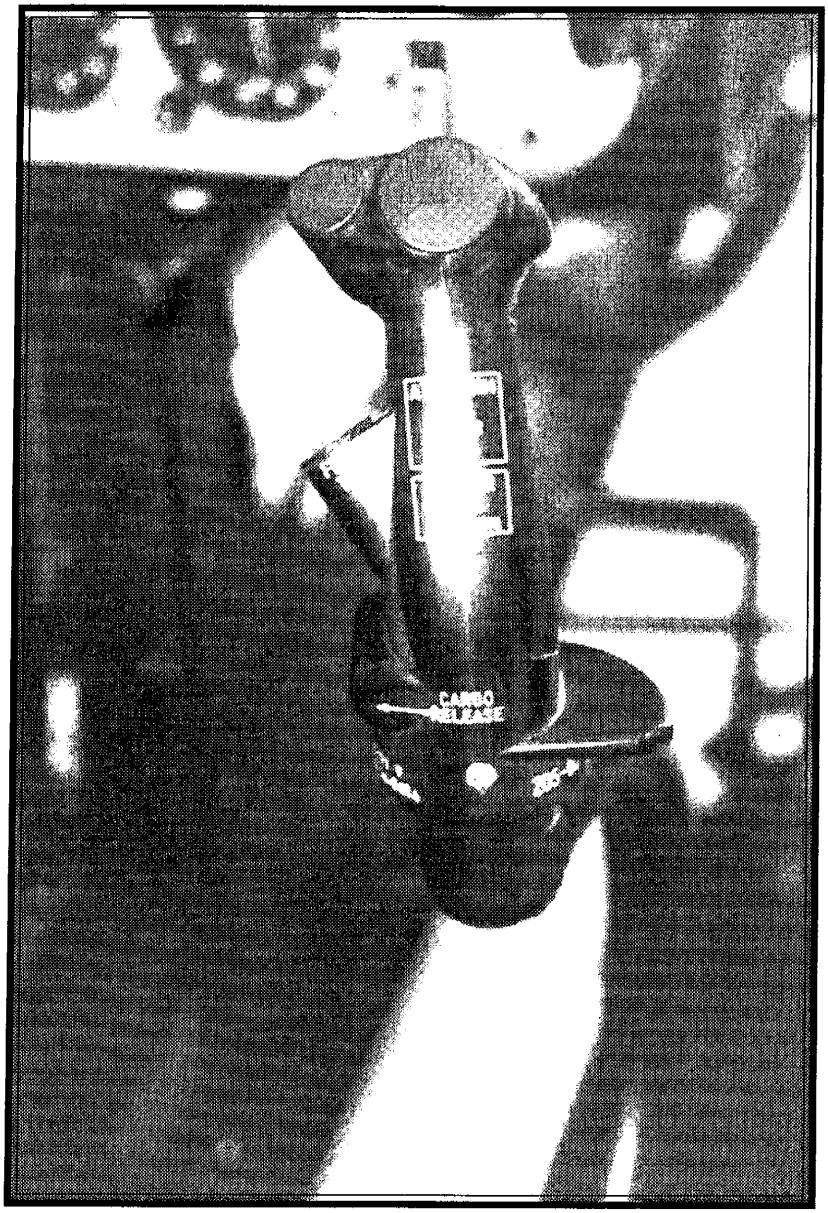
The provisions add 3.6 pounds (1.6 kilograms) and the hook assembly adds an additional 16.7 pounds (7.6 kilograms).

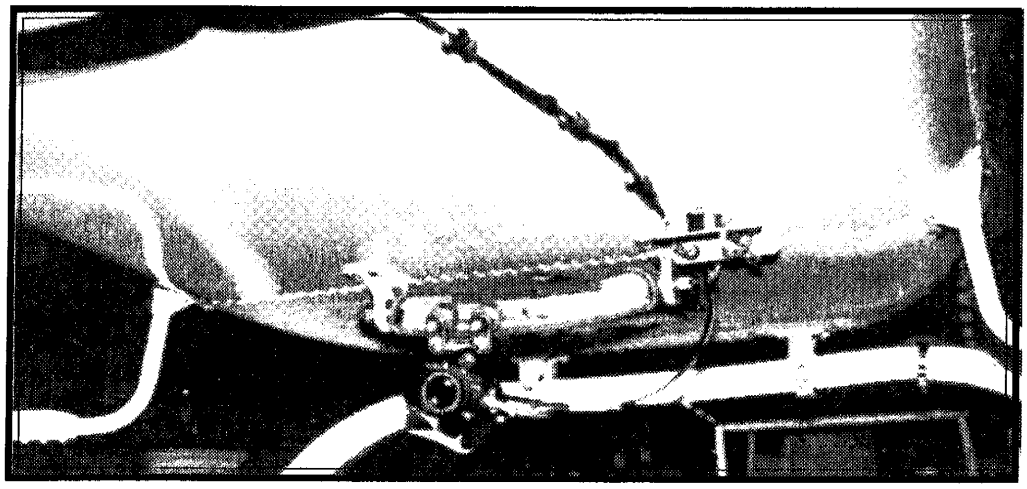
Flight limitations are covered in Flight Manual Supplement: BHT-206L3-FMS-4.

For installation and maintenance instructions, see Bell Service Instruction 206-2012.

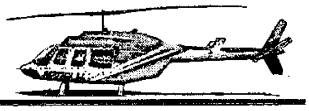


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LITTERS
BELL KIT NO. 206-706-343-101

The Bell **Litter Kit** for the 206L-4 provides the capability of transporting **one or two litter patients internally**. **Two medical attendants** can be accommodated at the same time and both have access to the patients.

The cabin of the standard LongRanger is already fitted with a double door on the left side which gives a 5 feet (1.6 meters) wide unobstructed access to the aft cabin.

The kit includes two identical folding litters and the necessary supporting hardware. The litters are aluminium and each is fitted with a pair of patient restraining straps. One or both litters can be removed or installed in a few seconds, thus providing complete versatility from ambulance to cargo or to full passenger configuration. The simple spring-loaded restraints and the wide access make loading easy for the untrained or inexperienced helpers.

The loading sequence is as follows:

1. Stow copilot and cyclic & collective sticks, ensuring that the electric circuits remain intact (the adapter may be used).

2. Stow the left front seat and seat back cushions. Swing the metal back support for the front seat forward.

3. Open left passenger door. Open center narrow door. Swing both forward. Secure them in the forward position with the red tape (located in the passenger door pocket). The ring on the tape goes over the hook on the helicopter nose.

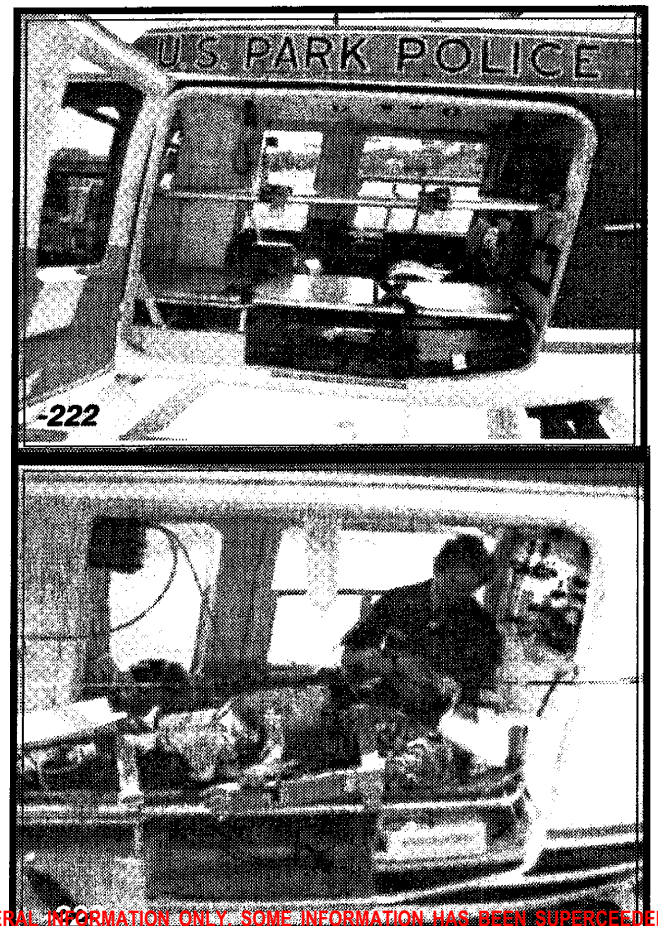
4. Stow the left aft facing and the left and center forward facing seats and their seat back cushions.

5. Raise the support assembly on the center seat to a vertical position. Pull the center seat-back support down so that it rests on the vertical support.

6. Position bottom litter against the forward support and the stop. Secure aft end of litter and lock in position by pulling down and outboard on the spring loaded strap.

7. Position the top litter against the forward support bar and the stop. Secure the aft end of the litter in the same manner as above.

8. Unhook and stow and red tape from the nose of the helicopter. Close the doors.



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There are several advantages:

- because the two litters can be folded and carried in the baggage compartment, taking up little of the space and weight, there is **instant availability** during virtually any other mission;

- the copilot's collective and cyclic sticks must be stowed when the kit is installed; however, the modification does not interfere with any other configuration requirement;

- the patients are inside, quiet and in a controlled temperature;

- the medical attendants have access to each patient from head-to-toe;

- there are no flight restrictions;

- if only one litter is required, it can be installed on either the upper or lower rack; and,

- there is room for considerable medical stores that are easily accessible.

In the continuing rescue role, one or two litters can be left in place. The baggage compartment, the shelf behind the rear seat and the floor space underneath the litters can be used for boxes of medical stores. The litters can carry blankets, etc.

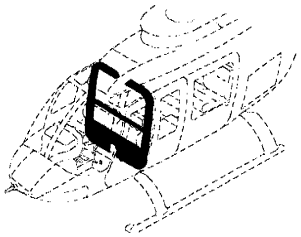
The Air Splint Modification kit includes modifications to the left front seat back and bulkhead installation, a folding litter, and the necessary supporting hardware and is Bell Kit No. 206-706-343-103 for litter equipment and provisions.

The LongRanger and JetRanger litters are not interchangeable.

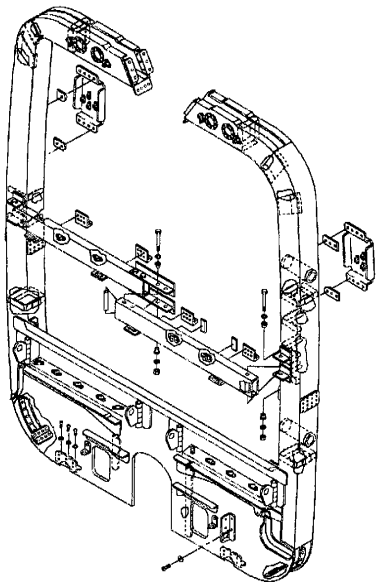
The kit adds 49.5 pounds (22.5 kilograms) if both litters and all cushions are carried (in place or stowed). The litters each weigh 22.0 pounds (10.0 kilograms). The provisions alone weigh 5.7 pounds (2.6 kilograms).

The Litter Kit is covered in the Flight Manual Supplement: BHT-206L3-FMS-12.

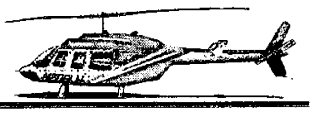
For installation and maintenance instructions, see Bell Service Instruction 206-2001.



BULKHEAD CROSS MEMBER MODIFICATION



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LANDING GEAR FAIRINGS (LOW SKID GEAR ONLY) BELL KIT 206-706-509-101

The airfoil type landing gear fairings go over the forward and aft crosstubes of the **standard low skid gear**. They are made of thermoplastic and have aluminum alloy supports. Additional aerodynamic covers fit over the skid attachment fittings on the forward crosstube.

Fairings are **not available** for the high skid gear or emergency flotation gear.

When installed, the fairings increase airspeed approximately 3 knots (5 kilometers) per hour.

The fairings add 10.2 pounds (4.6 kilograms).

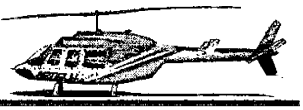
ENCODING ALTIMETER BELL KIT NO. 206-706-007-101

The encoding altimeter is a direct replacement for the standard 206L-4 altimeter. The function of the altimeter is identical to standard unit with the addition of AIRINC pressure altitude signal output (referenced to standard day barometric pressure 29.92 inches of mercury (1013 millibars) for use by (either or both) a transponder or GPS navigation system. The encoding altimeter adds 1.0 pounds (0.5 kilograms).

BLIND ENCODING ALTIMETER BELL KIT NO. 206-706-051-103

The blind encoding altimeter is installed in addition to the standard 206L-4 altimeter, and is remotely located behind the instrument panel. The function of the BLIND ENCODER is to provide AIRINC pressure altitude signal output [referenced to standard day barometric pressure of 29.92 inches of mercury (1013 millibars)] for use by (either or both) a transponder or GPS navigation system. The blind encoding altimeter adds 1.9 pounds (0.9 kilograms).

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HIGH ALTITUDE TAIL ROTOR KIT
BELL KIT NO. 206-704-722-111

The High Altitude Tail Rotor System provides improved directional controllability during hover. The system includes an improved rotor design and tail rotor authority control system (TRACS), which allows maximum available blade pitch angle to increase as altitude increases. The system enables takeoff, landing and hover operations at combinations of gross weights, density altitude and relative wind velocities greater than the basic helicopter is capable of. The encoding altimeter, blind encoder or similar approved altitude encoder must be installed concurrently to provide the altitude signal necessary for TRACS operations.

The TRACS consists of a control panel/display unit, linear actuator and bellcrank assembly and an electronic temperature sensor.

The TRACS controls the amount of a additional pitch allowed in the tail rotor at full left pedal input, based on calculated density altitude (from the encoding altimeter input and the temperature sensor). Zero TRACS actuator travel is represented by 3000 feet H_D. 50% TRACS actuator travel is represented by 5000 feet H_D. 100% TRACS actuator travel is the high altitude position for 7000 feet H_D and above.

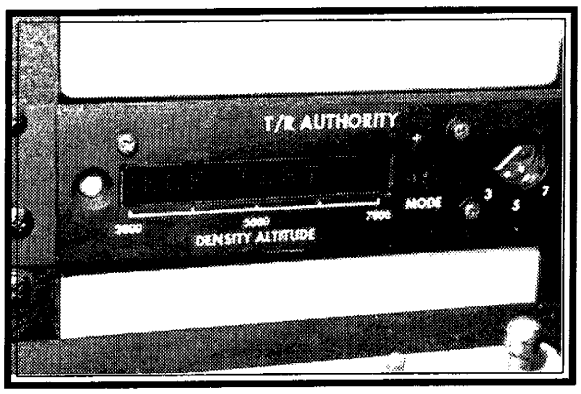
The TRACS has a self test function and continuously displays density altitude and actuator position to allow the pilot to monitor system operation.

Complete operating procedures and limitations are found in the FAA approved BHTI 206L-4 FMS 19.

The complete system installed (not including encoding altimeter weighs 11 pounds (5 kilograms).

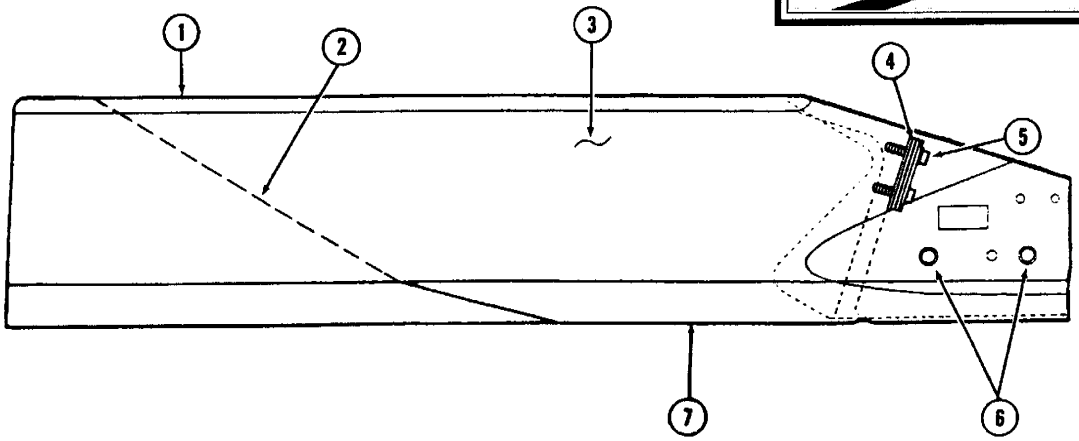
The improved tail rotor included in the kit is derived from the US Army OH-58D and has the following construction features; The two tail rotor blades are constructed with **Kevlar** skins and a **nomex honeycomb** core for corrosion avoidance. Inboard, there are stainless steel reinforcing plates bonded to the blade root for strength at the attachment points. The full length of the blades leading edge has a **stainless steel** abrasion strip, and the blade tip is covered with a **nickel plated stainless steel** shield to protect the blade from erosion.

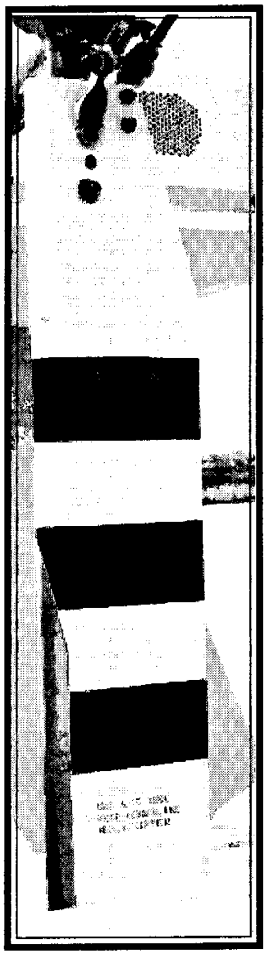
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TRACS







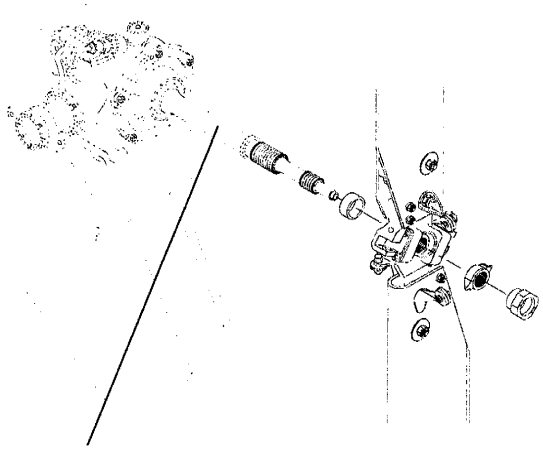
1. TRAILING EDGE STRIP
2. 301-STAINLESS EROSION SHIELD
3. KEVLAR SKIN
4. BALANCE WEIGHT
5. BALANCE SCREW
6. BUSHING
7. 301-STAINLESS ABRASION STRIP

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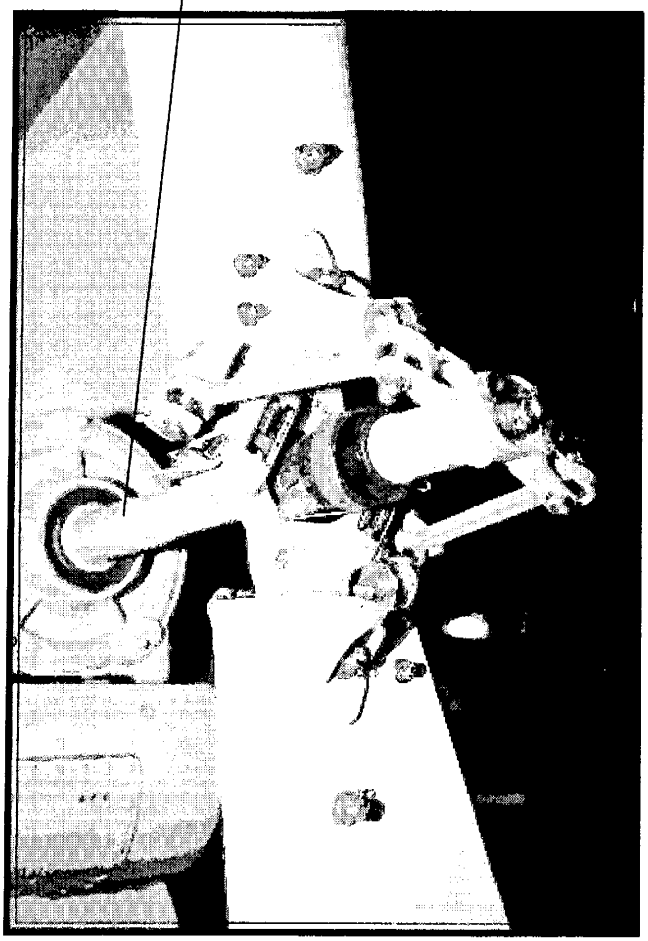
The tail rotor hub has the following features:

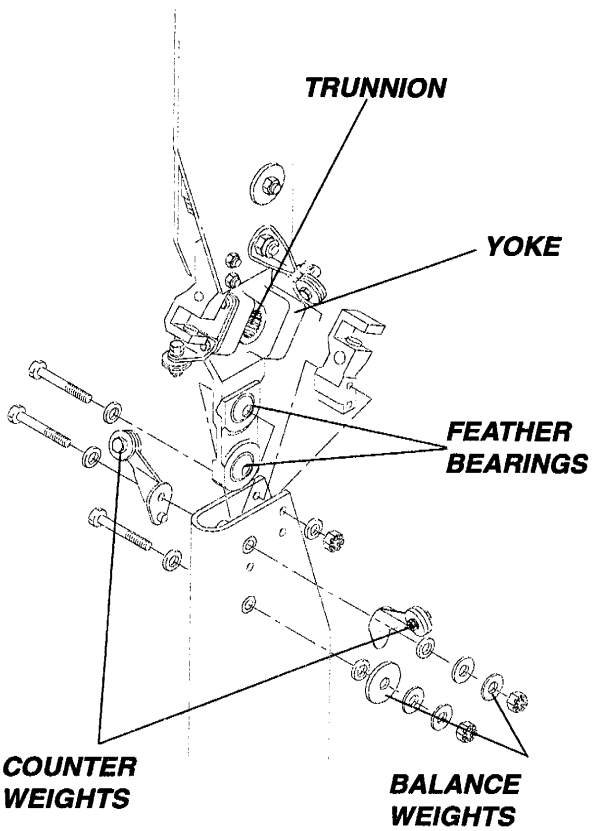
The tail rotor yoke assembly is mounted on the 90° gearbox output shaft. The yoke is forged steel and houses the feathering bearings for the tail rotor blades. The feathering bearings are staked into the yoke and are replaceable. The trunnion consists of two elastomeric bearings that are bonded to the spindles of a splined steel trunnion making it one piece.

Balance weights, on each side of the two blades, are installed on the blade bolts to counteract out of balance forces from the rotor. This is done with the adjustment of the balance of the blades along their spanwise and chordwise axis. The amount of weights installed is dependent on the hub and blade assembly static or dynamic balance. **Counterweights** are added to brackets attached to the yoke along the chordwise axis, to reduce control forces during a hydraulic off condition.

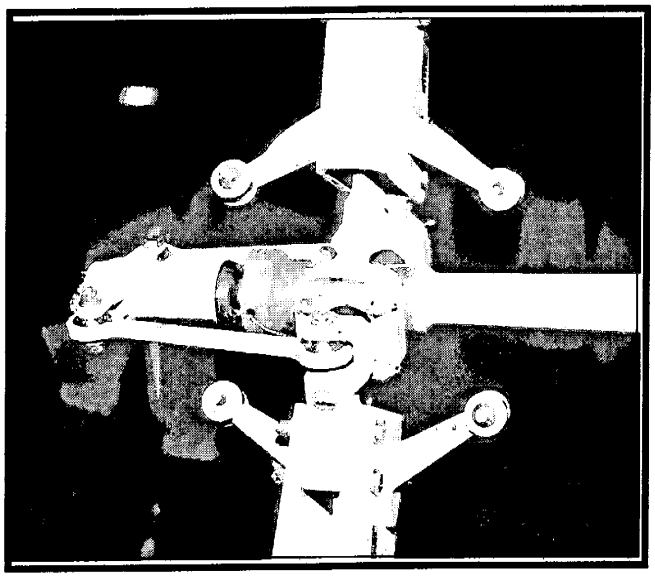


TAIL ROTOR GEARBOX OUTPUT SHAFT

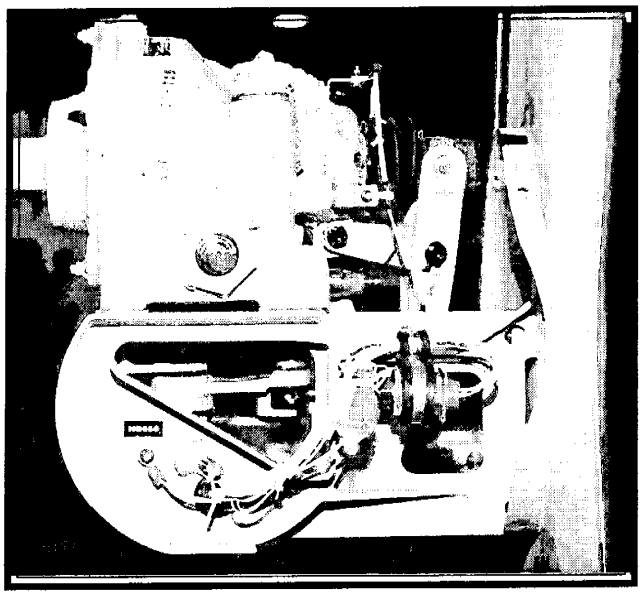




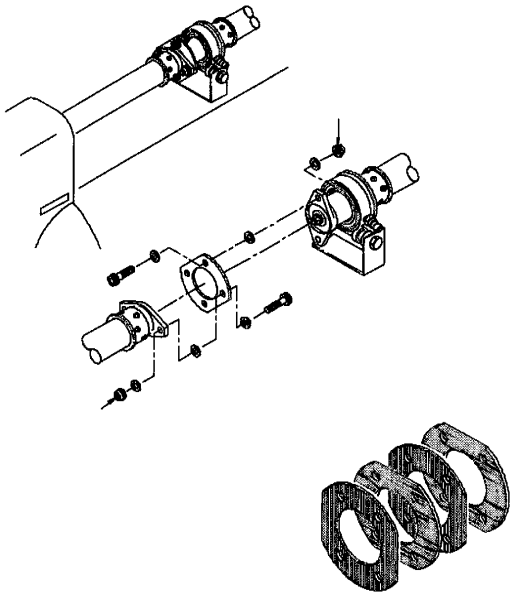
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TAIL ROTOR CROSSHEAD & PITCH LINKS

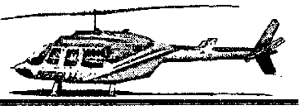


TAIL ROTOR GEARBOX & PITCH CHANGE MECHANISM



FLEXIBLE COUPLING DETAIL

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EMERGENCY LOCATOR TRANSMITTER
Bell Kit No. 206-899-577-003

The customized Emergency Locator Transmitter (ELT) installation provides an automatic beacon in the event of a crash. The built-in computer analyzes the nature of the shock and operates the beacon in loads of 6 ± 1 G in any direction.

The EBC 302H series by Emergency Beacon Corporation is specially designed for helicopter use. It activates at 6 ± G loads at 360° in azimuth as well as full vertical components.

The ELT is a complete, self-contained, battery powered unit with an integral antenna that is always fully deployed, ready for instant signal transmission. The ELT has a switch so that it can be turned on manually. It also has a built-in test light for checking the power output, modulation and the state of the battery.

The battery has a three year shelf life. It provides the beacon with a range up to 300 miles (480 km) for eight days.

It can withstand 1000 G and function in temperatures from -45°C to 71°C (-50°F to 160°F).

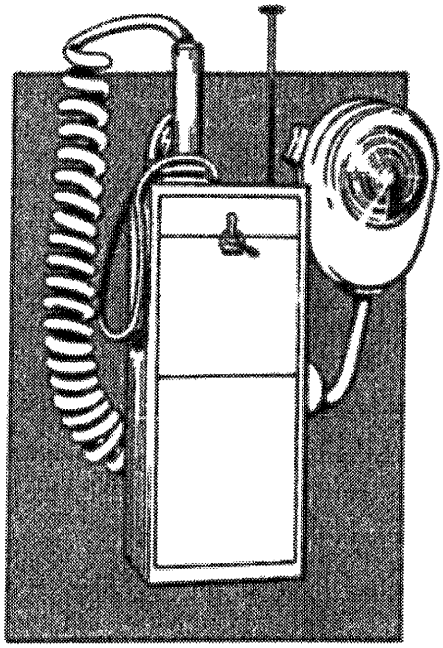
The installation consists of a bracket which holds the ELT securely in position. It is mounted on the left forward doorpost.

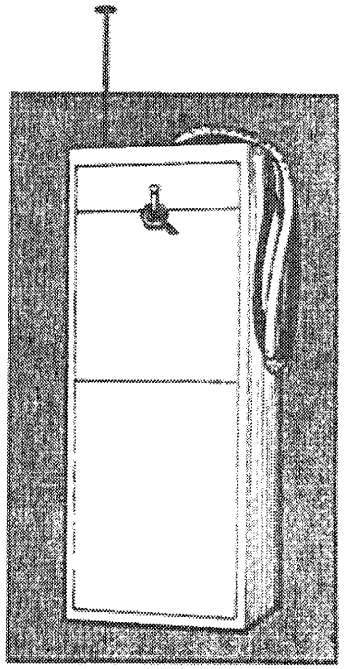
For IFR configuration see 206-899-577-013.

The completely self-contained ELT can be removed and hand carried.

There is a choice of three units. All are the same size and weight. The EBC 302H transmits the emergency signal simultaneously on 121.5 and 243.0 MHz. The EBC 302VH has in addition a microphone jack which takes the standard microphone. This provides voice transmission capability. The EBC 302VRH adds a headset jack so that two-way conversation can be carried out on 121.5 MHz.

The ELT weighs 1.9 pounds (0.86 kilograms).





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CAMERA ACCESS DOOR
Bell Kit No. 206-899-810-101 and 206-899-810-103

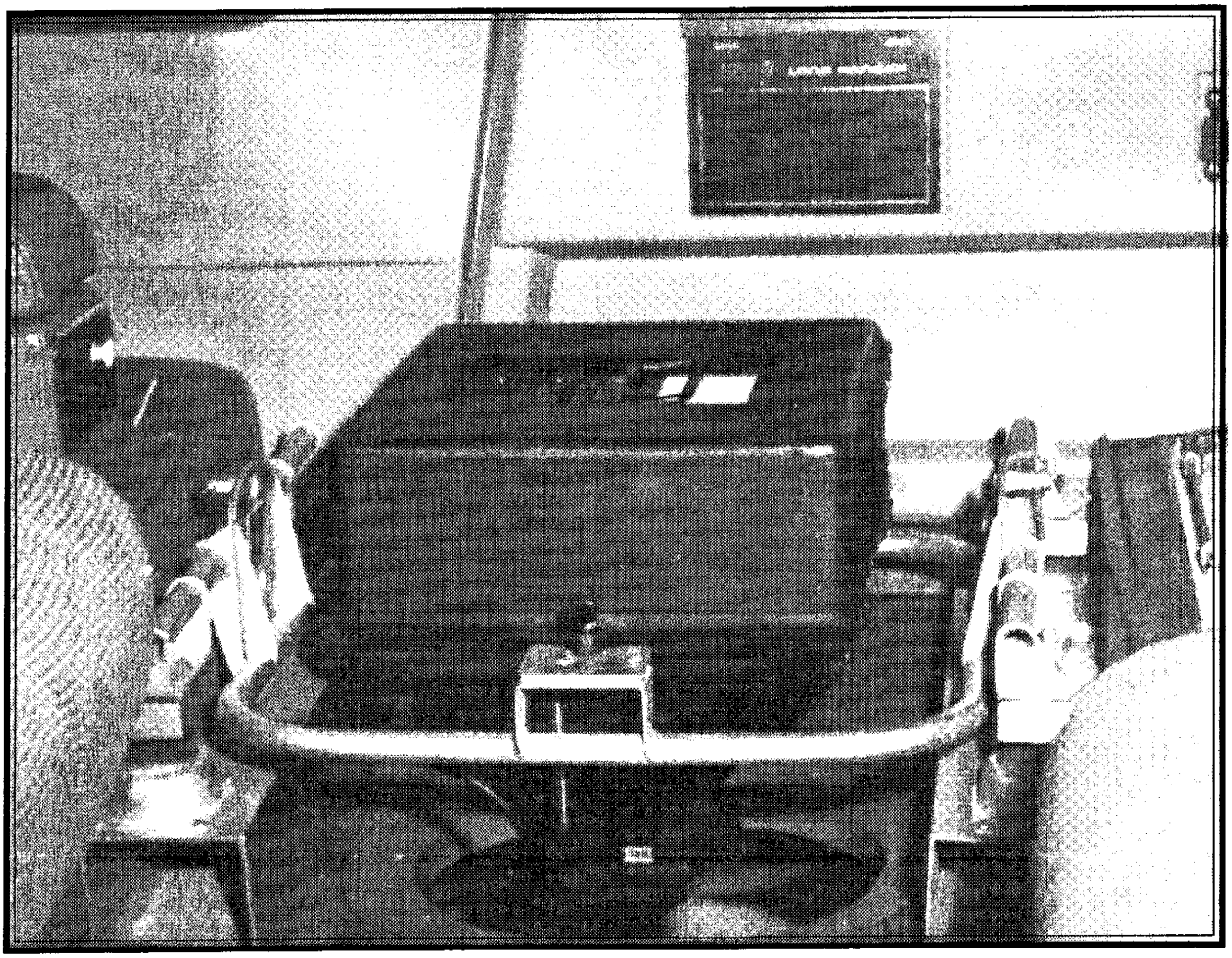
The customized Camera Access Door kits accommodate the camera inside the LongRanger cabin for vertical photography.

The camera port is cut into the cabin floor. Two sizes are readily available. The -101 port is 8 x 12 inches (20.3 x 30.5 cm). The -103 port is 14 x 10 inches (35.6 x 25.4 cm). Each has rounded corners.

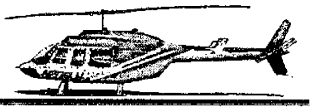
The kit consists of doublers, coverplate and the materials necessary to complete the opening.

The levelling plate is replaced on the cover plate when the installation is completed.

The -101 kit adds 1.5 pounds (0.7 kilograms) and the -103 kit adds 3 pounds (1.4 kilograms).



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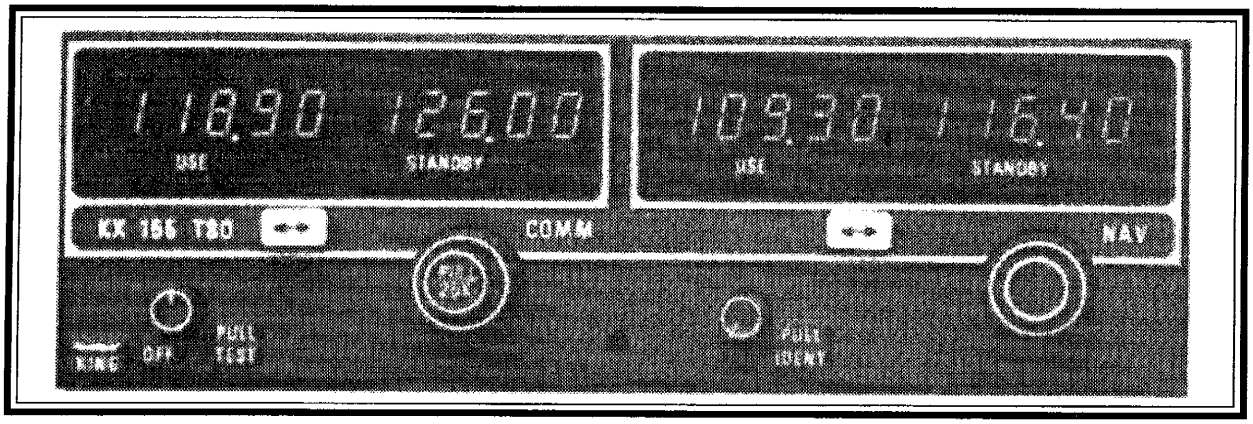


BENDIX/KING PRODUCT PRODUCED BY ALLIED SIGNAL
VHF COMMUNICATION/NAVIGATION TRANSCEIVER - KX 155
BELL KIT NO. 206-705-008-103
TRANSCEIVER
BELL KIT NO. 206-705-008-163
PROVISIONS

The **KX 155 Communications/Navigation Transceiver** provides:

- VHF two-way voice communications, 720 channels in the 118 to 135.975 megahertz range.
- Intercommunication between pilot and copilot.
- 200 navigation channels in the 108 to 117.95 megahertz range.
- Channeling for distance measuring equipment.

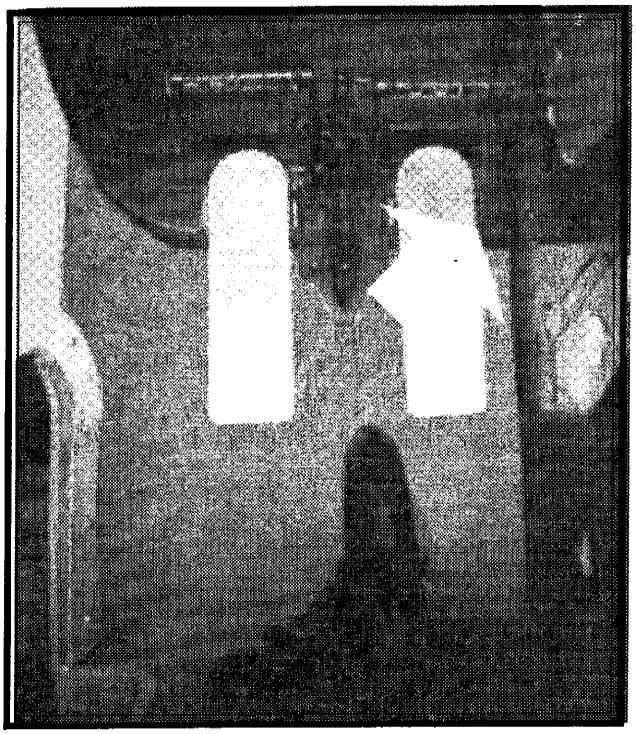
The KX 155 has simultaneous digital display of one active and one standby frequency (either communication or navigation or both). A push button control switches to either one.



AlliedSignal
AEROSPACE

Commercial Avionics Systems
400 N. Rogers Road
Olathe, Kansas 66062-1212
Phone: (913) 782-1302
Fax: (913) 791-1302

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-202

The Transceiver Kit, No. 206-705-008-103, includes the **transceiver, two David Clark headsets**, each with an adequate length of coiled cable and built-in microphone, a vendor manual and warranty, and necessary hardware to complete the installation.

The transceiver is part of the Bendix/King Silver Crown series. It is crystal controlled, solid state, and panel-mounted (6.25X2.05X10.2 inches; 159X52X258mm). Internal lighting is blue/white.

Additional Capability

A second KX 155 Transceiver can be added. Although it will cover the same frequency range, both can be operated simultaneously on different channels.

When a second KX 155 and a second indicator are installed, a second source of navigational information is provided.

Bell or Bendix/King service center installation is required in order to obtain the King full year warranty.

The Provisions Kit, No. 206-705-008-163, includes a Bendix/King KMA 24H audio panel, two Quam-Nichols speakers in the forward cabin, hand microphone and the antenna for the KX 155. Hardware includes all the cables, mounting brackets, jacks and circuit breakers to complete the installation for either single or dual flight controls.

The transmit and ICS switches on the cyclic stick grip are connected. If dual controls are installed, the transmit and ICS switches on the copilot's cyclic grip are connected and the copilot's intercommunication foot switch is installed.

The audio panel is mounted above the transceiver, on the radio pedestal.

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The audio panel's function is to manage the flow of radio communications to and from the helicopter when there is more than one radio in the system.

The pilot can select which transmitter is active and which combination of receivers will be directed to headsets, and to cabin speakers or passenger headset, if installed.

The **Bendix/King KMA 24H Audio Panel** enables the audio management of up to three transceivers and five receivers. These can be individually switches on and directed to headphones or speakers by push buttons.

A rotary switch allows the pilot to transmit on the selected communication transceiver, Comm 1, Comm 2, Comm 3, Comm 4, public address system, or external speakers, and emergency.

The integral intercom with its own volume control can coordinate up to five microphone inputs and has adequate power to handle up to six headphones connected in parallel.

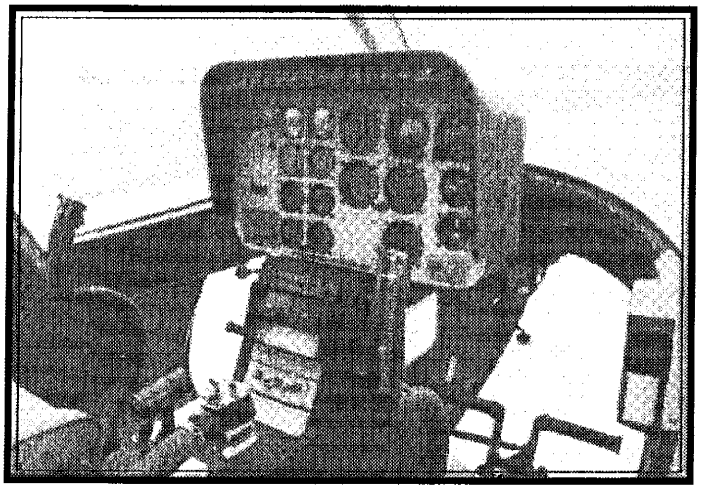
"Pilot priority" has been incorporated into the mike switching. If both the pilot's and copilot's mikes are keyed simultaneously, the pilot's mike is automatically given transmit priority. This authority can be designated, by internal adjustment, to either the pilot or copilot position to accommodate flying training needs.

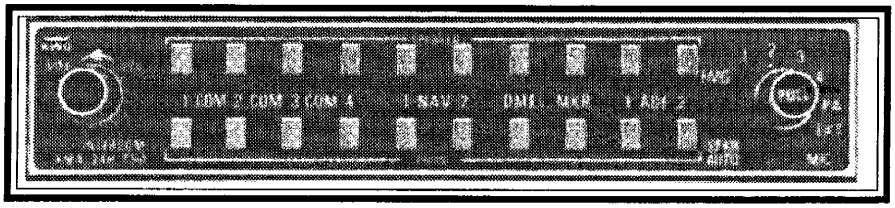
The AUTO switch automatically links the speaker or headphones to the selected transmitter. When AUTO is being used, it can be left in the OFF position.

The panels are back-lit with blue/white lighting.

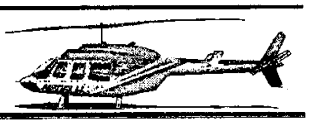
The complete installation adds 18.3 pounds (8.3 kilograms).

Items removed to permit installation are shipped with the helicopter.





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BENDIX/KING PRODUCT PRODUCED BY ALLIED SIGNAL
COURSE DEVIATION INDICATOR - KI 208
BELL KIT NO. 206-705-008-151

The **Course Deviation Indicator KI 208**, when used in conjunction with a VHF NAV/COMM Transceiver such as the KX 155, provides course deviation information from the selected VHF Omni Range (VOR) station.

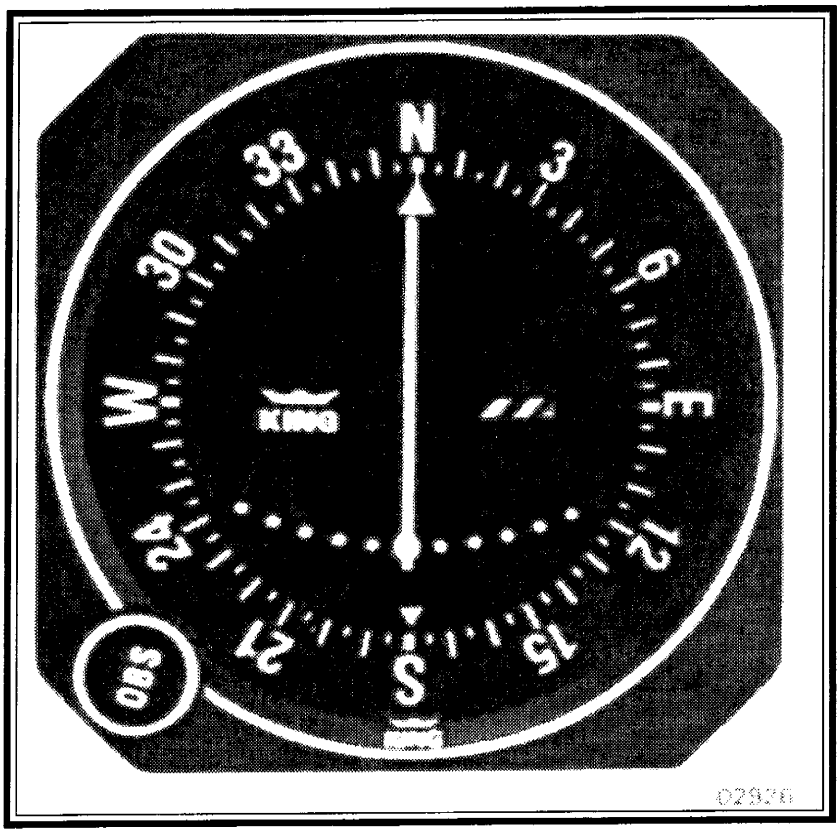
The kit consists of a 3 inch (76 millimeter) indicator, a VOR antenna, the required installation hardware and wiring.

The indicator has a built-in VOR/LOC converter, blue/white lighting, prominent warning flag when inoperative, graphic TO and FROM indication and large easy to read numbers.

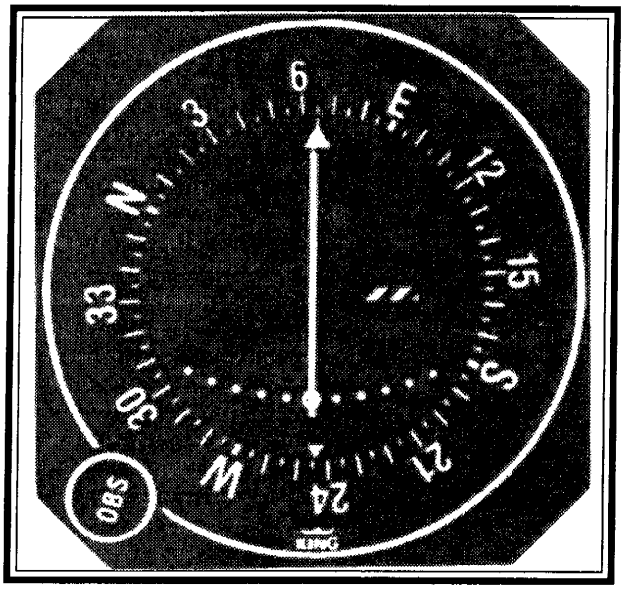
Bell or Bendix/King Service Center installation is required to obtain King's full year warranty.

The kit adds 3.4 pounds (1.5 kilograms).

The Audio Panel Bendix/King KMA 24H must be installed when the transceiver and Course Deviation Indicator are installed.

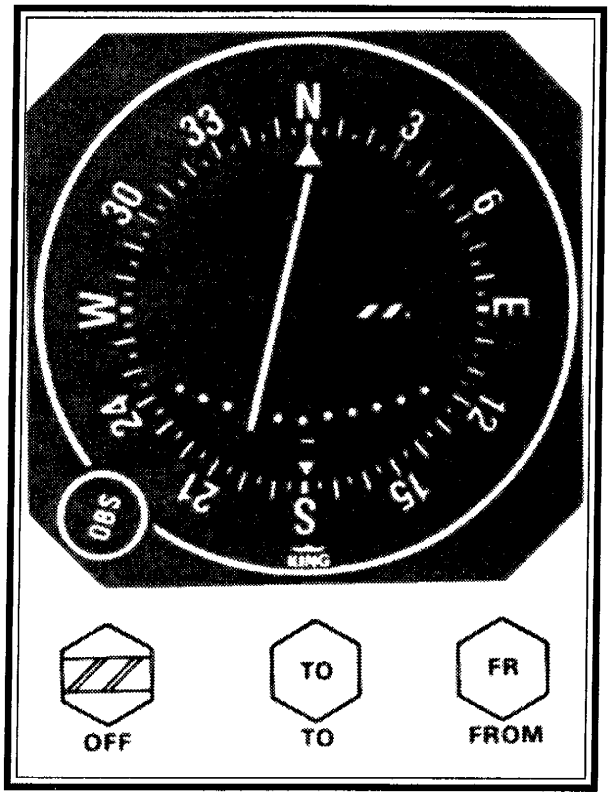


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The compass card of the KI 208 is turned, placing the desired course on the index at the top, using the Omni bearing selector (OBS) knob.

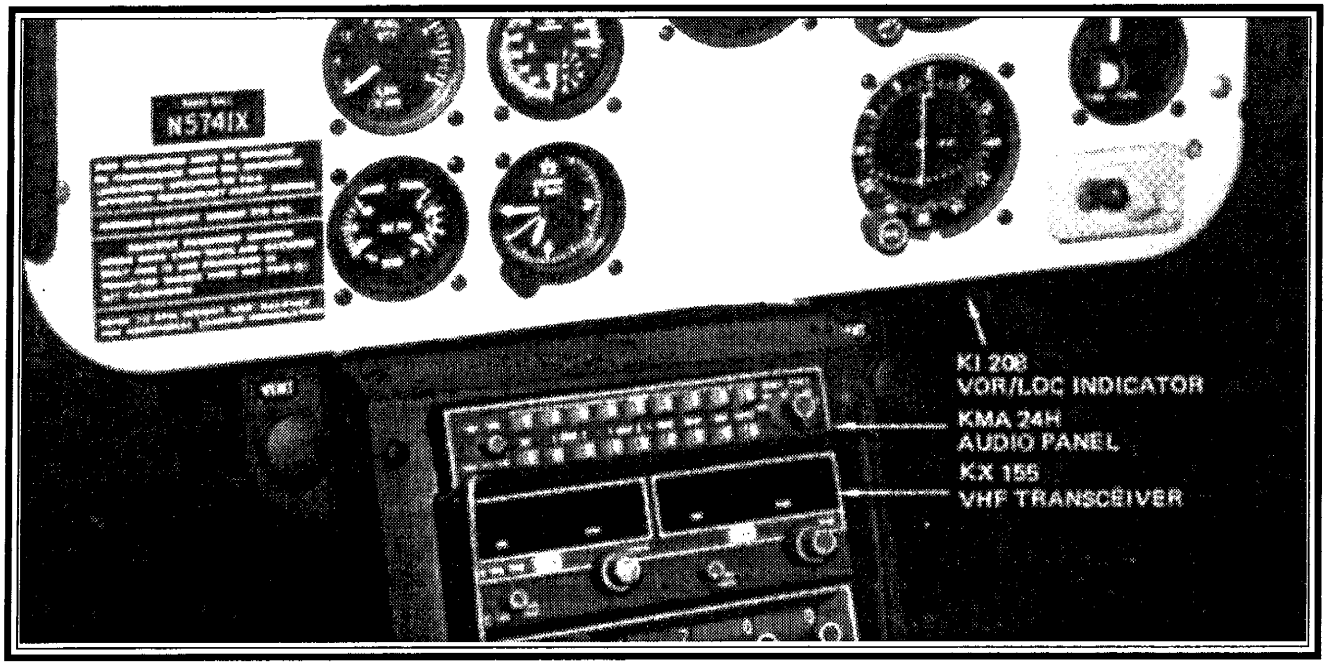
The deviation needle swings right or left indicating deviation left or right of the selected course.



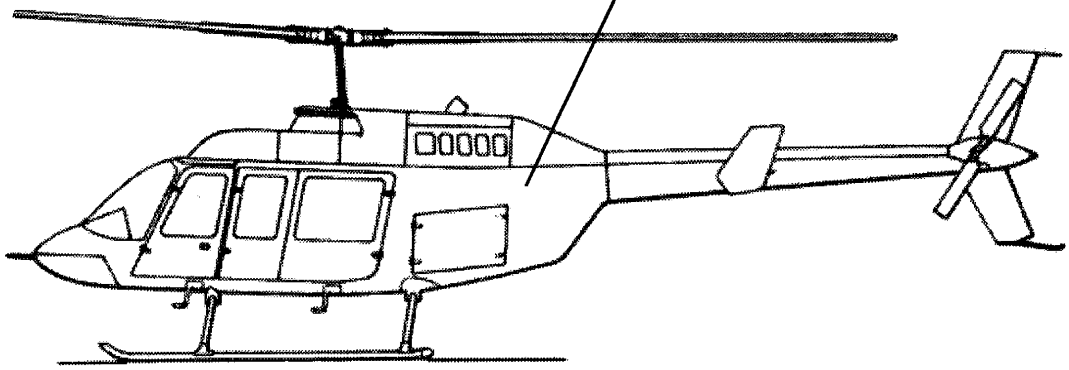
The heading of the helicopter has no effect on the TO or FROM indicators. They react only to the heading set on the indicator.

The OFF (barber pole) disappears when a valid signal is received.

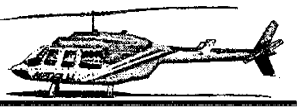
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VOR Antenna Location - Both Sides



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BENDIX/KING PRODUCT PRODUCED BY ALLIED SIGNAL AUTOMATIC DIRECTION FINDER - KR 87 AND KI 227 BELL KIT NO. 206-705-008-131

The **KR 87 ADF receiver** with the **KI 227** indicator can provide the relative bearing to a selected transmitting station which is within the 2-0 to 1699 kilohertz range. The needle on the indicator shows the direction of the radio transmitter relative to the aircraft's heading. The KR 87 displays the active ADF frequency on the left. A digital time readout is on the right to show flight time (FLT) or Event time (ET). The KI 227 has a manually rotatable compass card. The receiver shows the commercial radio bands.

An **integral timer** provides display of flight and elapsed time and can be programmed to count up or down for timed approaches, trip leg timing or fuel management.

The KR 87/KI 227 combination is a part of the Bendix/King Silver Crown Series.

The kit includes the receiver, 3 inch (1 76mm) indicator, the loop/sense antenna, the wiring and hardware required to complete the installation, a vendor manual and the warranty.

The receiver is crystal controlled with digital tuning for positive, easy operation. It is solid-state, self contained, pedestal mounted (6.25X1.35X10.13 inches; 159X33X257mm).

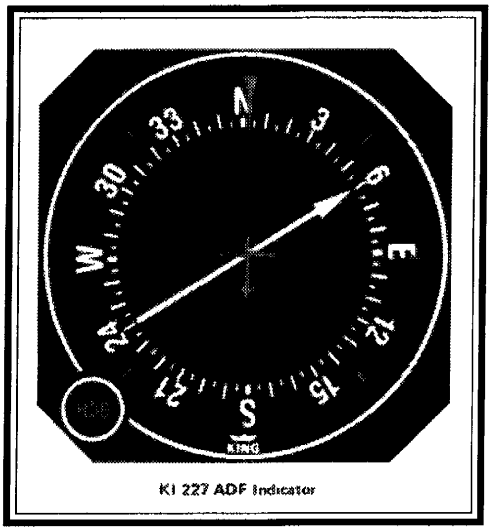
Once the volume control is set, audio reception volume is held relatively constant over side variations of signal input.

Both the indicator and the receiver are backlit, blue/white lighted, with easy to read numbers. Both meet FAA's Technical Standard Orders.

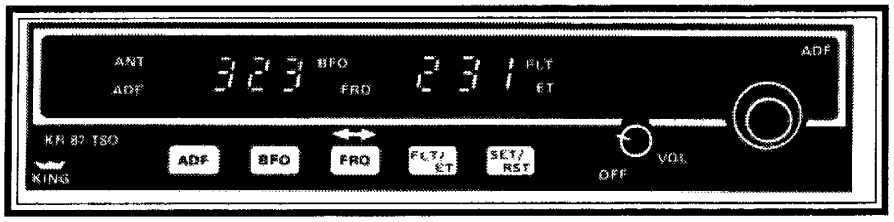
Items removed to permit installation are shipped with the helicopter

Bell or Bendix/King Service Center installation is required in order to obtain Bendix/King's full year warranty.

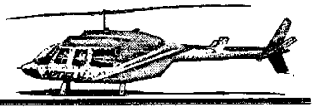
The kit adds 7.1 pounds (3.2 kilograms).



KI 227 ADF Indicator



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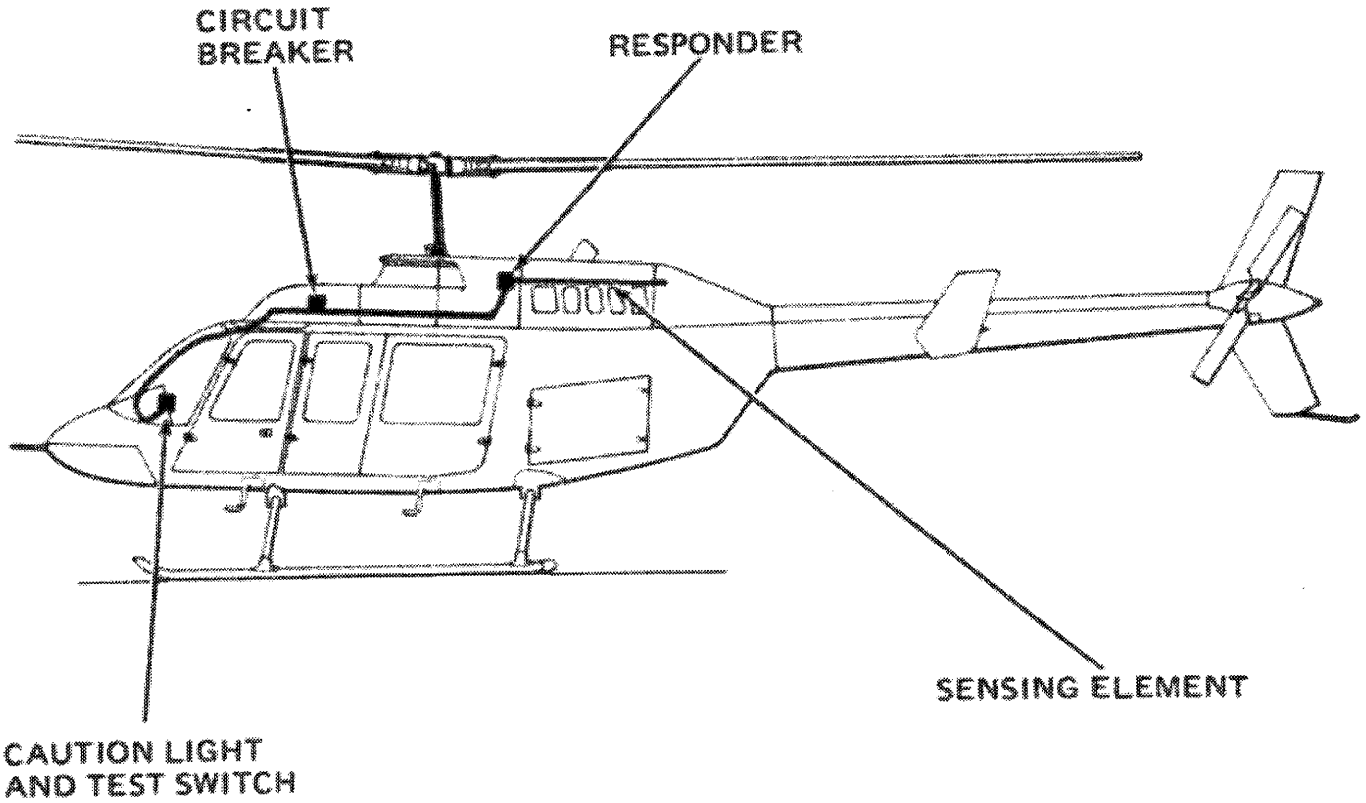
ENGINE FIRE DETECTION SYSTEM
BELL KIT NO. 206-899-793-101

The Bell Fire Detection System provides the pilot with a fire warning indicator which will illuminate if the engine compartment overheats.

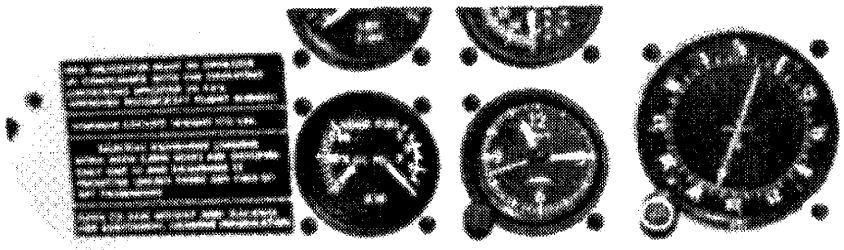
The customized kit consists of a responder assembly with approximately 3.6 meters of sensor element mounted to the top of the engine cowling. The element crisscrosses the top of the whole engine compartment.

A red caution light is installed in the caution panel on the bottom row second from the left. A push-to-test switch/light is mounted to the immediate right of the caution lights. This light shows that the continuity of the system is intact. Wiring, hardware and installation drawings complete the kit.

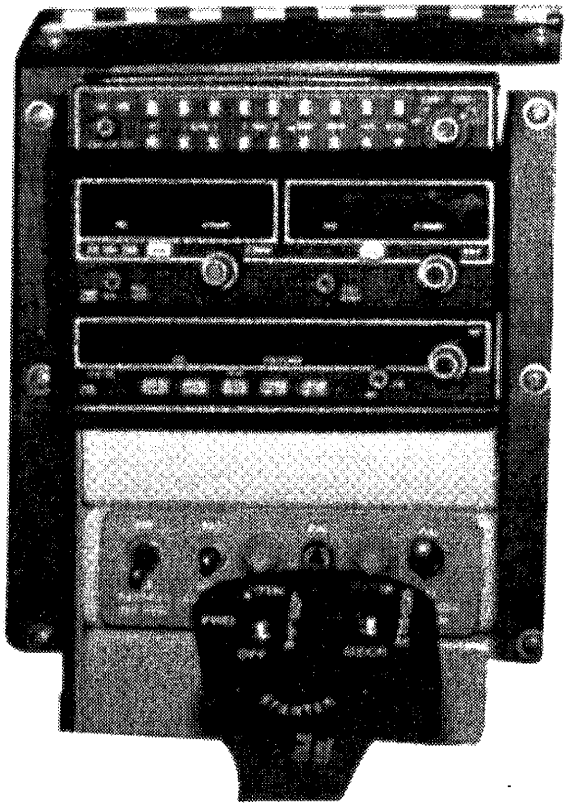
The kit adds 2 pounds (0.9 kilograms).



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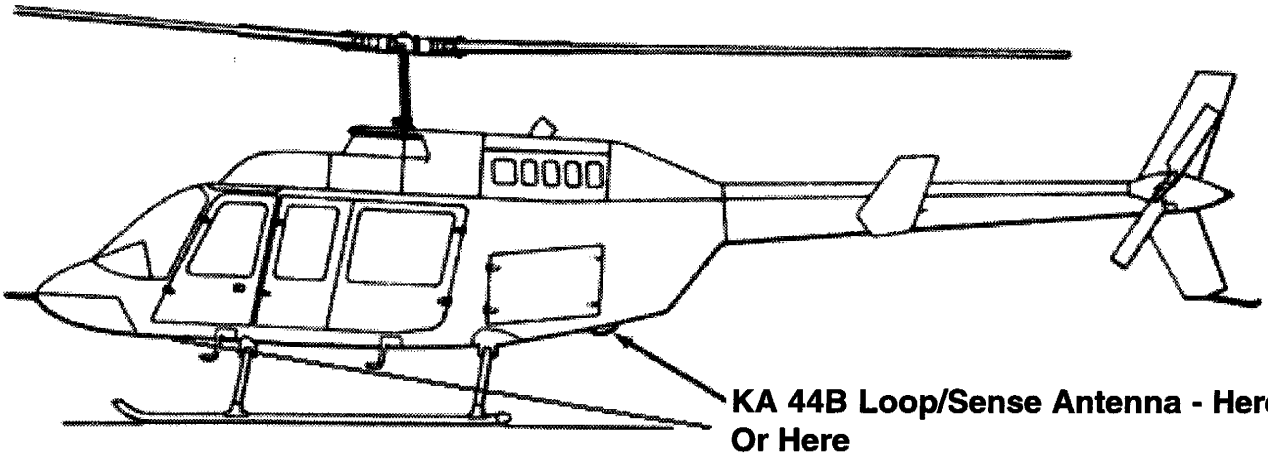
KI 227



KMA 24H
AUDIO PANEL

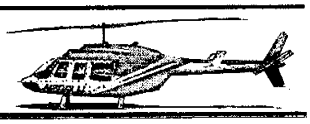
KX 155
VHF TRANSCEIVER

KR 87
ADF



KA 44B Loop/Sense Antenna - Here Or Here

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BENDIX/KING PRODUCT PRODUCED BY ALLIED SIGNAL
TRANSPONDERS - KT-76A AND KT-70
KT-64A - BELL KIT NO. 206-705-008-117
KT-64A PROVISIONS - BELL KIT NO. 206-705-008-115
KT-70 - BELL KIT NO. 206-705-008-157
KT-70 PROVISIONS - BELL KIT NO. 206-705-008-155

The Bendix/King KT-76A and KT-70 transponders enable the air traffic controller to identify your helicopter clearly, quickly and accurately. The response to interrogation is automatic. Additional identification can be requested in which case the reply is activated by pressing the ident push-button.

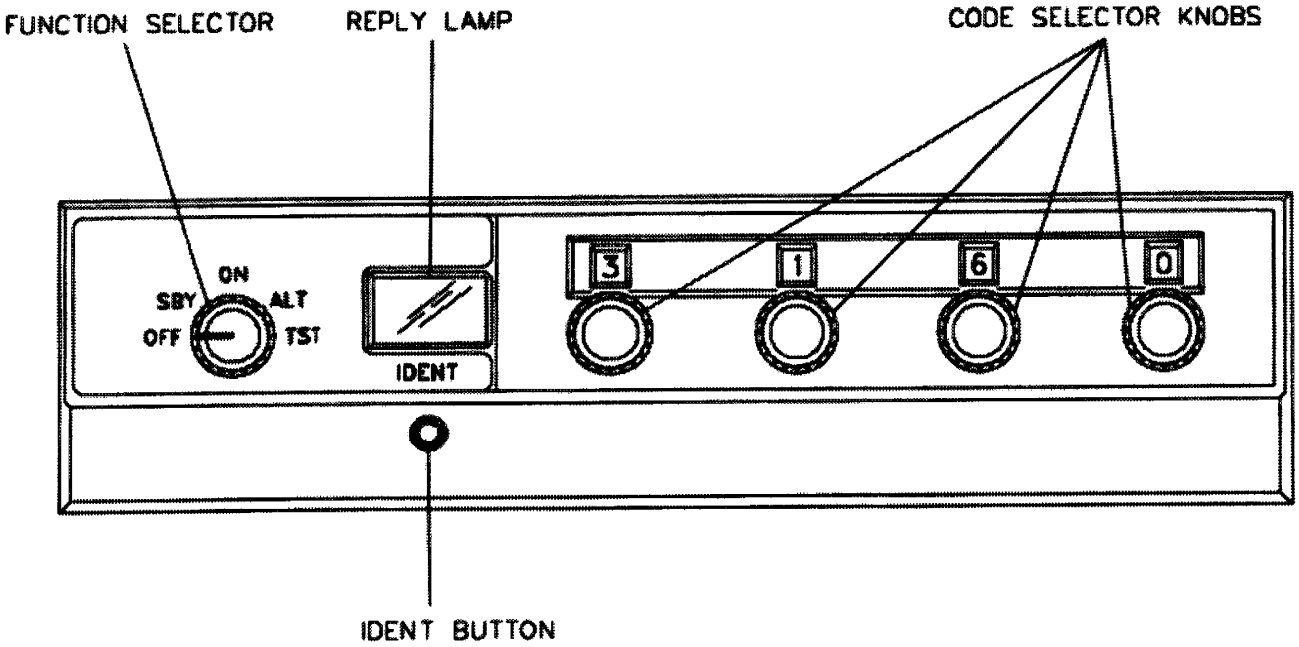
The provisions kits, include the antenna and the wiring, bracket and hardware necessary to complete the installation.

Items removed to permit installation are shipped with the helicopter.

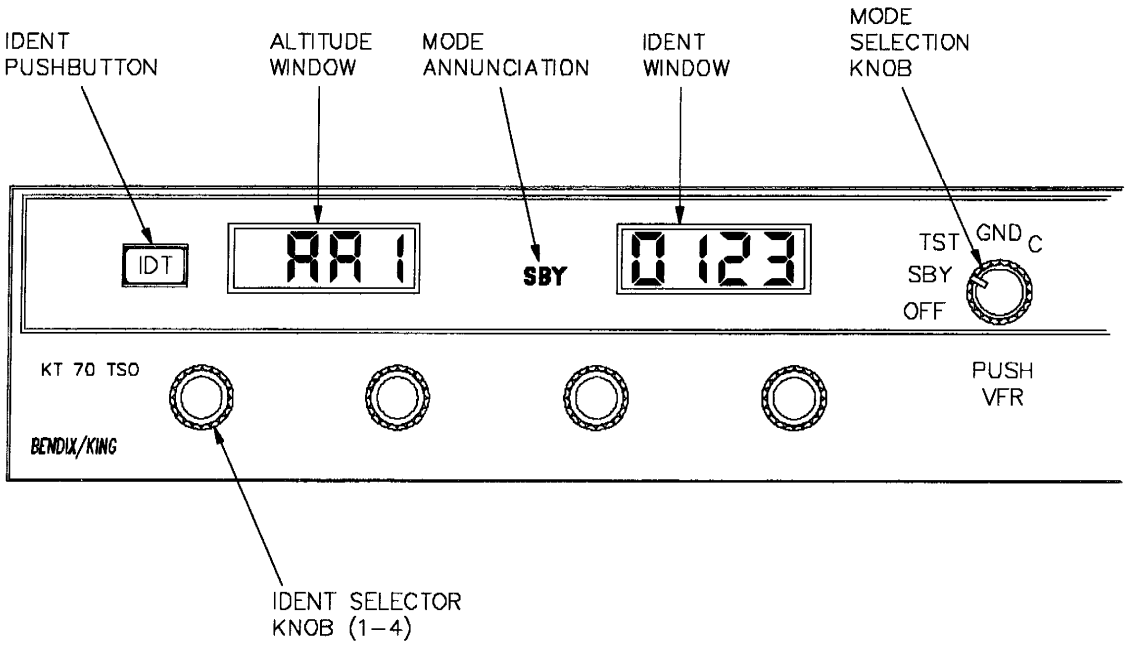
The transponder kits include the transponder, a vendor manual and warranty.

Both the KT-76A and KT-70 are Class I radio transmitter/receivers operating on radar frequencies and have adequate power for use at all operating altitudes. The sets receive ground radar interrogation at 130 MHz and these trigger a coded response of radar pulses at 1090 MHz, which is transmitted back to the ground radar.

KT-76A



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They respond in any of 4096 preselected "codes." Codes differ only in number of pulses transmitted, not in frequency. Transmitter frequency remains always at 1090 MHz. The assigned code, or emergency codes, are easily set and appear as an illuminated digital readout.

The transponder's coded reply pulses reinforce the normal "blip" which appears on air traffic control radar. When the IDENT button is pressed, the blip will flash or "bloom" so the controller can positively identify the aircraft and its location.

When connected to an OPTIONAL **encoding altimeter** or **blind encoder**, both also transmit the **aircraft altitude** in flight level increments (three digits, representing even 100 foot increments referenced to 29.92 in. of Hg.).

The **primary difference** between the KT-76A and the KT-70 is the code display and setting controls. The **KT-76A** has a **mechanical display** and individual rotating knobs which manually set each of the four numbers.

The **KT-70** has an **LED code display** with individual rotating knobs which sets each code number in turn. Additionally, when the main function selector is depressed and held momentarily, the ATC code will automatically revert to 1200 [VFR].

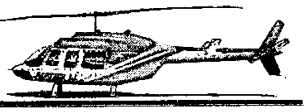
The KT-70 also has a **second digital display window** which will show the **altitude reported** by the OPTIONAL encoding altimeter or blind encoder.

Both transponders have blue/white control face lighting. The KT-76A has an **amber** reply light. The automatic dimming feature matches its intensity to the cockpit lighting conditions. They are panel mounted and meet FAA Technical Standard Orders.

Bell or Bendix/King Service Center installation is **required** to obtain the King full year warranty.
The complete **KT-76A** installation adds 3.9 pounds (1.8 kilograms).

The complete **KT-70** installation adds 4.6 pounds (2.1 kilograms).

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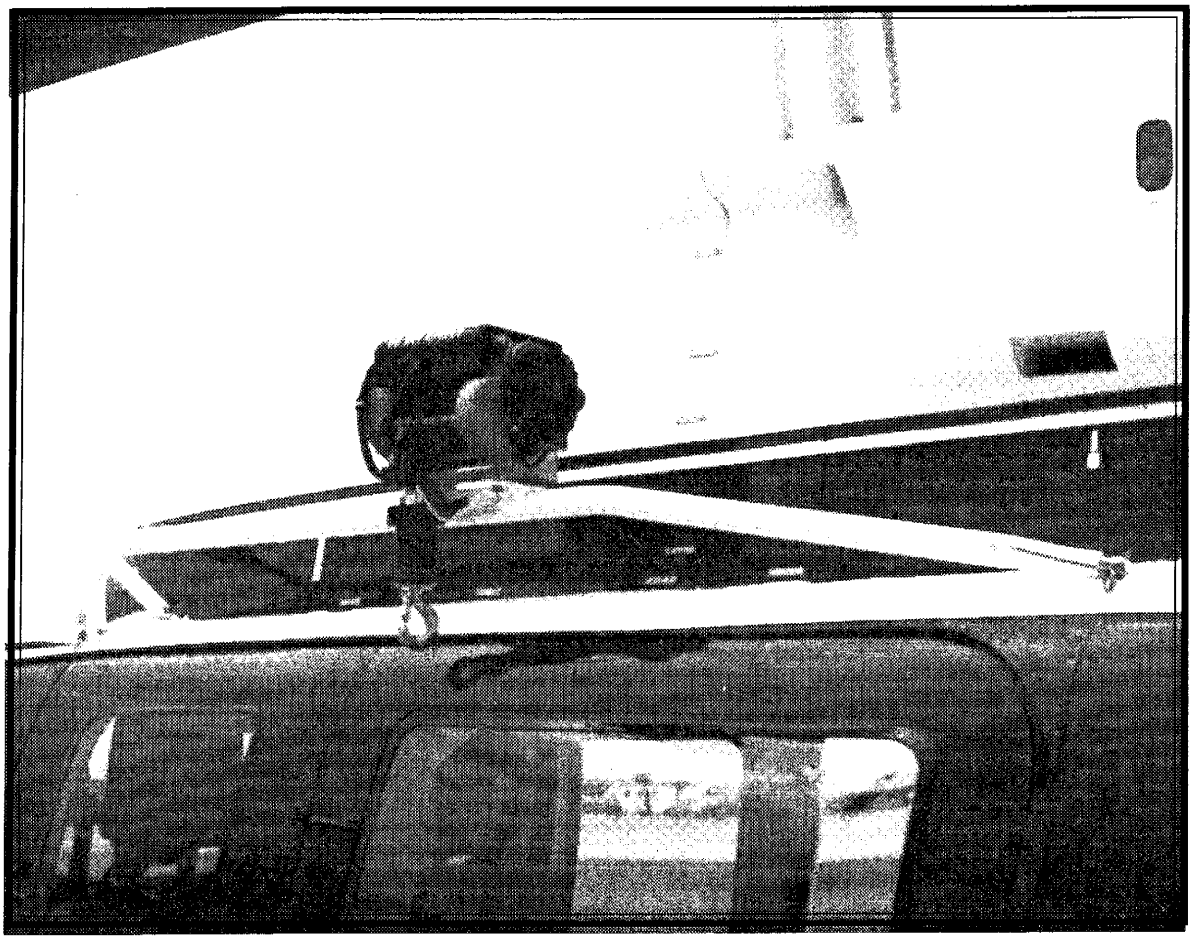


BREEZE CORPORATION HOIST
Bell Kit No. 206-899-976-101
Customized Provisions
Bell Kit No. 206-899-976-102
Hoist Kit

The hoist permits delivery or pick up of personnel or cargo from areas not suitable for a helicopter landing. The unit consists of provisions customized at Bell and a hoist kit.

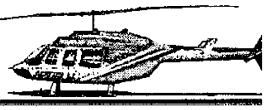
The provisions are listed separately so that the fleet owner can prepare more than one of his LongRangers at minimum cost.

Any one of them, so equipped, can be selected to undertake the hoist operation without delay. Once the provisions are installed, the installation or removal of the hoist can be done very quickly in the field.



Breeze-Eastern
700 Liberty Avenue
Union, New Jersey 07083-8198
Phone: (908) 686-4000
Fax: (908) 686-6495

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- *The Hoist Provisions* consist of the pilot cyclic grip assembly, master control panel, structural provisions, hoist supports, guard assemblies for the skid gear and fuselage and the necessary hardware and electrical components.

- *The Hoist Kit* adds the hoist motor and winch assembly, mounting frame, crewman pendant control, and the necessary hardware and electrical components to complete the installation.

The hoist is externally mounted above the left rear door. It is fastened to the fuselage attachment points by three easily inserted pins, and has quick "plug-in" electrical attachments.

During the hoisting operation, the cable travels between fuselage and skid. To help prevent wear, different guards are provided. One guard fits the skid of either the standard or the high skid landing gear, and one fits on the fuselage for either configuration, just below the left doors.

An additional guard is required for the emergency floats kit.

Two overhead circuit breakers are provided: one for hoist power, the other for cable-cut power.

The hoist, built by Breeze Corporation, Inc., has an approved capacity of 300 pounds (136 kilograms), a cable length of 100 usable feet (30 meters) and a rate of 50 feet (15 meters) of the cable are painted red as a caution to the operator.

The hoist has been FAA approved to carry the full 300 pound (136 kilogram) load through three consecutive cycles (full down and full up), resting 30 seconds at the end of each run. The three cycles can be repeated at 40-minute intervals. If either the load or the cable length is reduced, then the number of cycles can be increased. For example, with a 200 pound (91 kilogram) load, and a 50 foot (15 meter) cable length, the hoist is capable of continuous operation.

The pilot can control the hoist operation from a spring-loaded switch on the cyclic stick grip. The hoist master-panel mounted at the left of the instrument panel provides him with:

1. A power switch which energizes the system and also enables control to be switched from his cyclic stick to the crewman's pendant;

2. A "cable cut" switch, protected by a spring-loaded guard cover which operates an electric "guillotine" to shear the cable in the event it becomes fouled; and,

3. A light to warn the pilot in the event the hoist motor overheats. The light itself can be tested by pushing its spring-loaded cover during the preflight check.

The grip with the hoist control switch can be installed on the copilot's stick. Usually, however, it is put on the pilot's stick.

The crewman's pendant is a pistol-grip control which is connected to the plug on the control tube tunnel by a length of coiled cable. The up/off/down switch on the grip is spring-loaded to the off position.

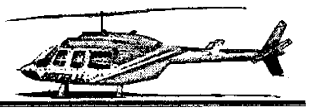
The transmission and motor assemblies are sealed units and require no lubrication or adjustments.

A fail-safe electromechanical brake will not permit backing off under any load within the capacity of the hoist. It operates automatically when the hoist is stopped from motion in either direction, even when power failure occurs. The brake assembly requires no maintenance.

The free-swiveling hook is equipped with a safety keeper, and an energy-absorbing rubber bumper.

A limit switch prevents run-out beyond the last three windings of the cable. Another limit switch stops the motor, on reel-in, when the bumper ring contacts the hook assembly.

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The spin-resistant stainless steel cable is 1/8 inch (0.32 centimeter) in diameter, and is designed to an 1900 pound (862 kilogram) breaking strain.

If fuselage-mounted steps are in use, the left rear one must be removed.

- Since the hoist load comes up inside the skid, the high-skid gear is recommended, particularly for personnel hoisting. This provides more room and makes it easier to climb aboard the helicopter.

- Gloves and helmets are recommended for all personnel, particularly those being hoisted.

- The pilot should test every load by lifting it slightly off the contact surface with collective pitch. This provides a sense of control feel before operating the hoist motor.

- The object being hoisted must be completely in the cabin before forward flight is established.

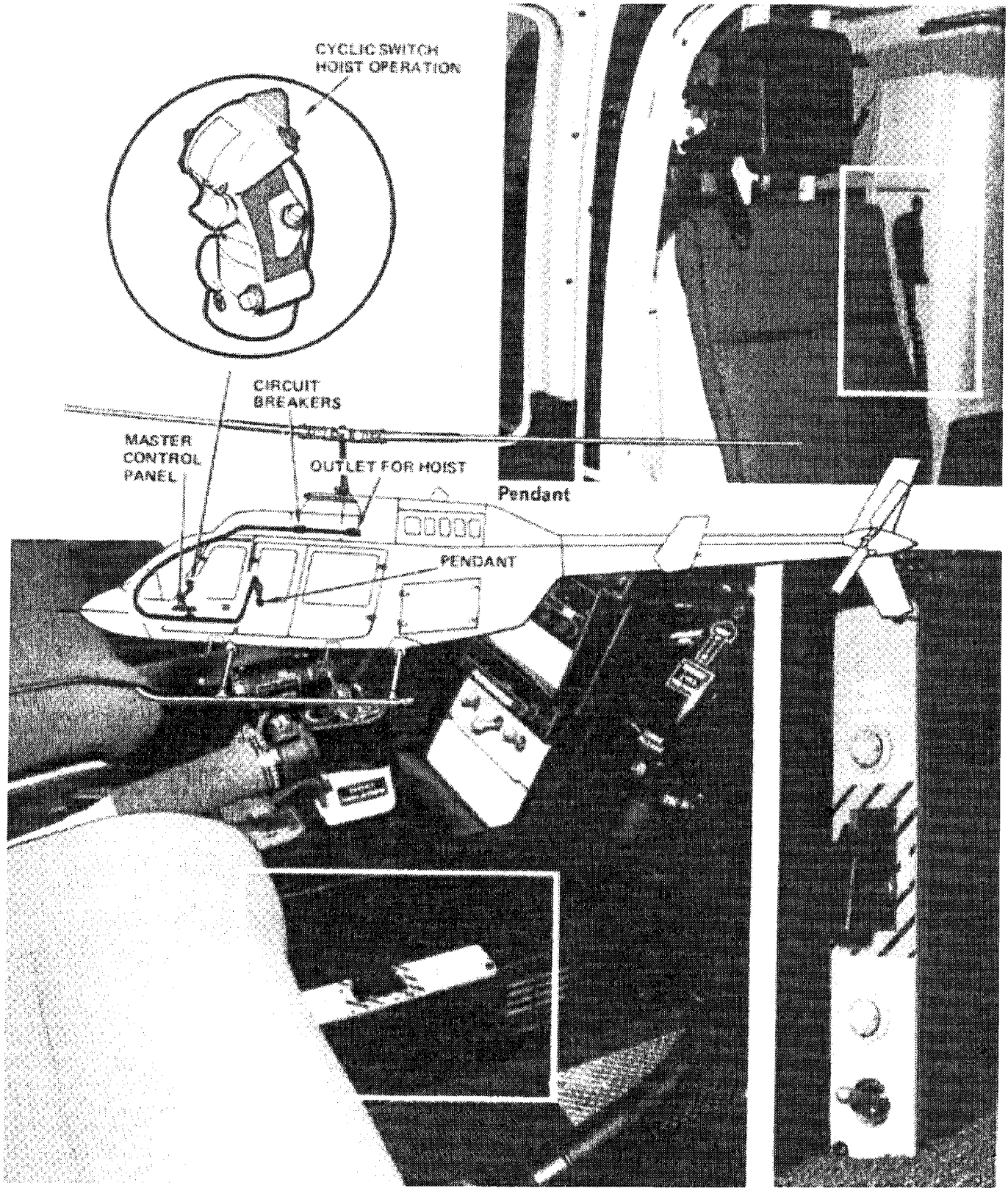
- The left rear door is removed for the duration of the hoisting operation.

- If a flat object is being hoisted from a calm water surface, break the surface tension as the hoist commences.

The provisions add 9 pounds (4 kilograms) and the hoist adds an additional 34 pounds (15 kilograms).

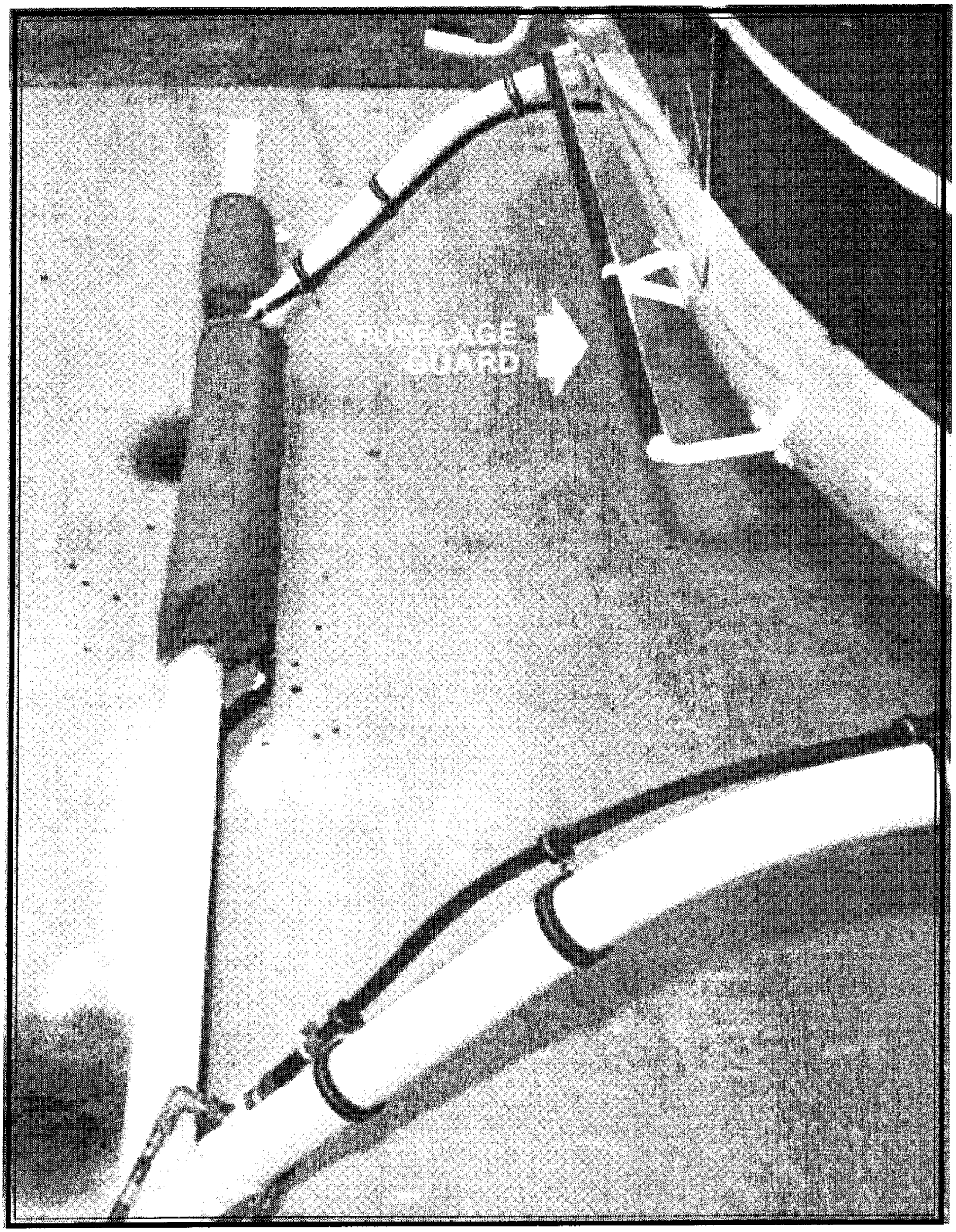
It is compatible with the emergency floats.

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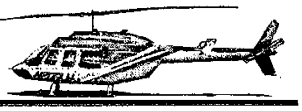


Master Control Panel - 233

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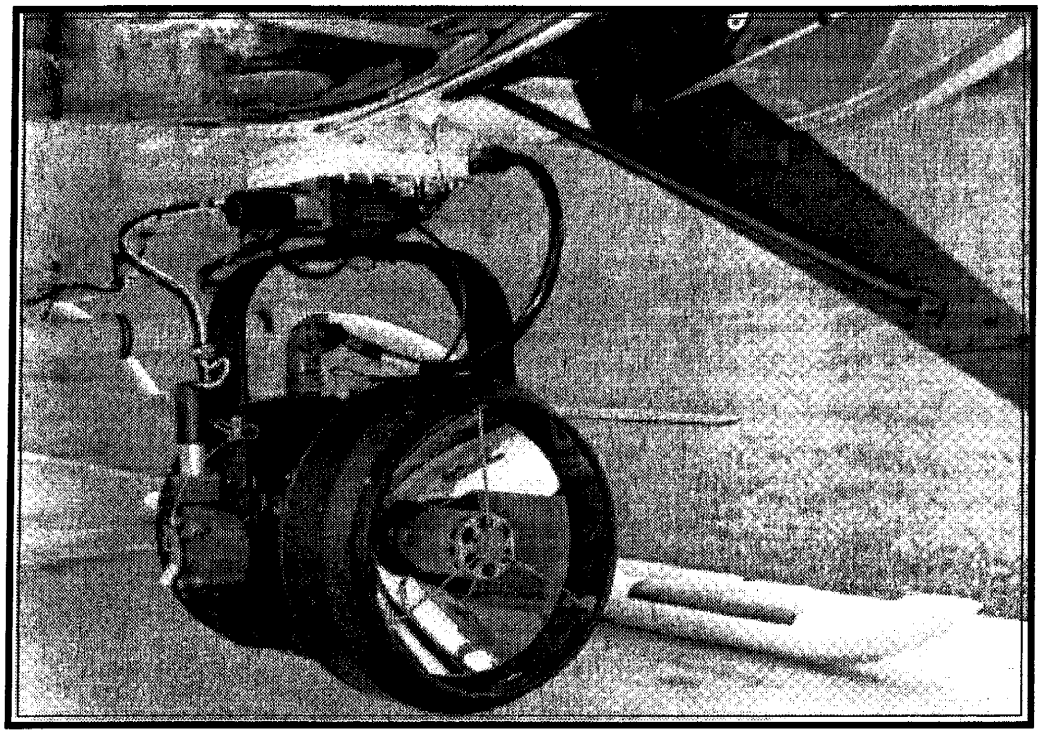
AERONAUTICAL ACCESSORIES, INC.
QUICK MOUNT KITS FOR NIGHTSUN AND STARBURST
Bell Kit No. 206-822-101 w/High Skid Gear (Nightsun)
Bell Kit No. 206-822-102 w/Pop-Out Floats (Nightsun)
Bell Kit No. 206-832-250 (Starburst)

The Nightsun and Starburst Quick Mount Kits from Aeronautical Accessories, Inc. provide for installation of the Spectrolab, Inc. SX-16 and SX-5 Searchlights. The SX-16 Kit includes a redundant autostow centering feature with panel mounted position indicators. Installation and removal of the Nightsun or Starburst searchlight can be accomplished in less than five minutes once the kit has been initially installed.

Kits include all necessary hardware, flight manual supplements and complete installation instructions.

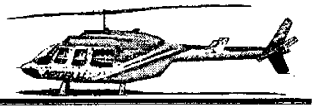
Nightsun Quick Mount Kit Net weight increase - 8.5 pounds. Starburst Quick Mount Kit Net weight increase - 6.75 pounds.

FAA/STC approved for Bell 206 Series.



AERONAUTICAL ACCESSORIES, INC.
P.O. Box 3689, Bristol, TN 37625
423-538-5151 800-251-7094 Fax 423-538-8469
www.aero-access.com

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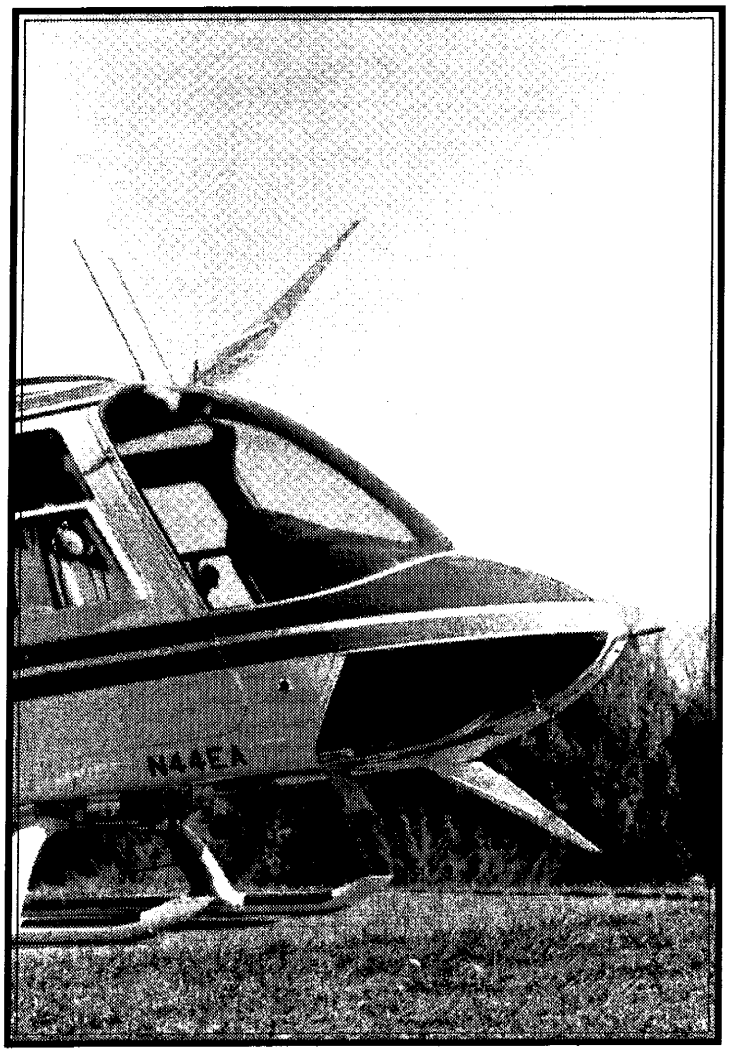


AERONAUTICAL ACCESSORIES, INC.
WSPS®
WIRE STRIKE PROTECTION SYSTEM®

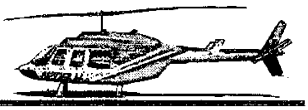
The Aeronautical Accessories, Inc. WSPS Wire Strike Protection System is designed to provide a measure of protection for the Bell 206L in the event of an advertent flight into horizontally strung mechanical, electrical transmission and communication wire and cables. The WSPS is designed to reduce the possibility of flight control damage during a wire strike and decrease the possibility of wire becoming entangled in the landing gear.

In actual cases, this system was effective against multiple wire strikes. The typical WSPS consists of an upper and cutter/deflector, a windshield deflector, and lower cutter/deflector. Each cutter is equipped with high tensile steel cutting blades. Most kits come complete with the necessary hardware to accommodate high or low skid gear and fixed or pop-out floats.

FAA/STC approved for Bell 206 Series.



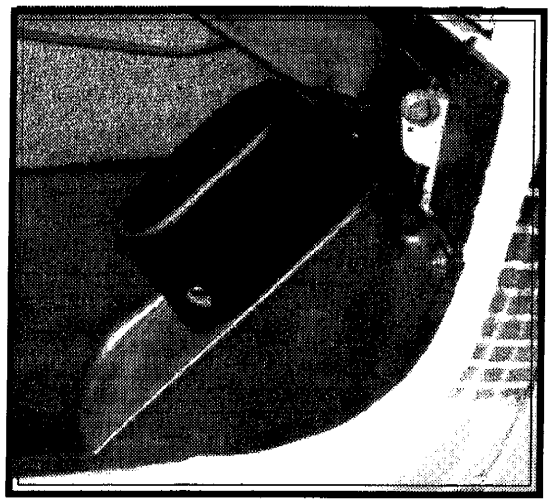
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AERONAUTICAL ACCESSORIES, INC.
CYCLIC AND COLLECTIVE SAFETY COVERS™

The Cyclic Support Safety Cover protects the copilot's cyclic support when the quick-change dual control sticks are removed. The Collective Safety Cover prevents passenger interference with the copilot collective stub when the stick is removed.

The snap on/off covers are initially installed in less than five minutes and include all hardware and installation instructions. These covers from Aeronautical Accessories, Inc. can be purchased individually or as a complete Dual Control Safety Kit™ including Tail Rotor Safety Kit®.

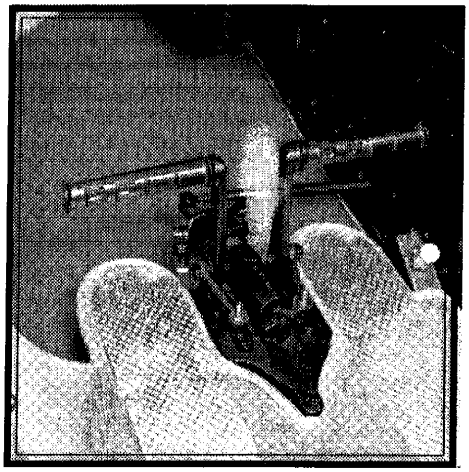


AERONAUTICAL ACCESSORIES, INC.
TAIL ROTOR SAFETY KIT®

The Aeronautical Accessories, Inc. Tail Rotor Safety Kit is designed to disconnect the copilot's tail rotor pedals from the flight control system when the quick-change dual control sticks are removed, thus preventing passenger interference with the flight controls.

Moving the tail rotor pedals from the locked position to the engaged position (or reversed) can be accomplished in less than 5 minutes, once the kit has been initially installed. This kit comes with complete instructions and all hardware necessary for the installation.

FAA/STC approved for Bell 206 Series and Bell 407.



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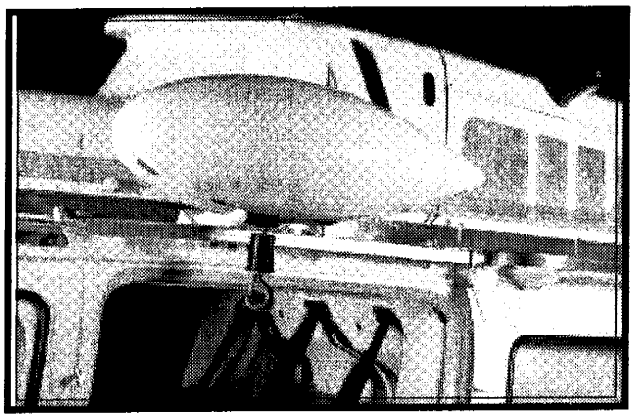
AERONAUTICAL ACCESSORIES, INC.
HOIST KIT

The Aeronautical Accessories, Inc. Rescue Hoist Kit is designed for maximum safety, and ease of installation and operation. It is designed to be quickly installed or removed once the provisions are initially fitted to the Bell 206L.

The kit comes complete with a 300 pound electric hoist, hoist provisions and all required hardware, electrical materials and complete installation instructions.

Net weight - 56 pounds.

FAA/STC approved for Bell 206L Series.



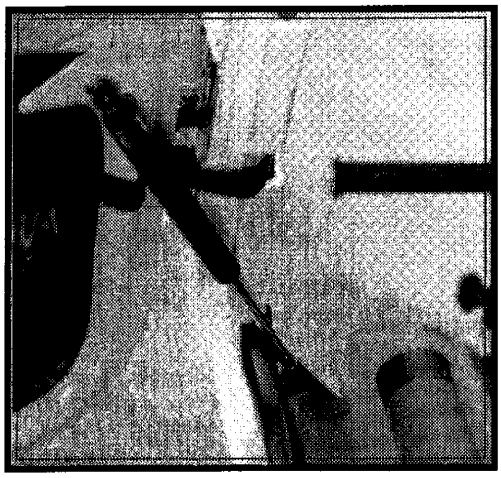
AERONAUTICAL ACCESSORIES, INC.
AUTOMATIC DOOR OPENERS

Aeronautical Accessories, Inc. Automatic Door Openers open cockpit, cabin and baggage doors automatically when the door latches are released. The sturdy gas cylinders are equipped with an exclusive feature which controls the rate of opening and prevents doors from traveling past normal open positions. Automatic Door Openers provide easy entrance and exit of crew and passengers and help prevent damage to doors and airframe due to rotorwash or sudden wind gusts.

The Baggage Door Opener holds the baggage door open to facilitate the loading and unloading of luggage or cargo. Automatic Door Openers are available for individual doors or in 4-door and 5-door kits.

Net weight increase - 1.2 pounds.

FAA/STC approved for Bell 206 Series.



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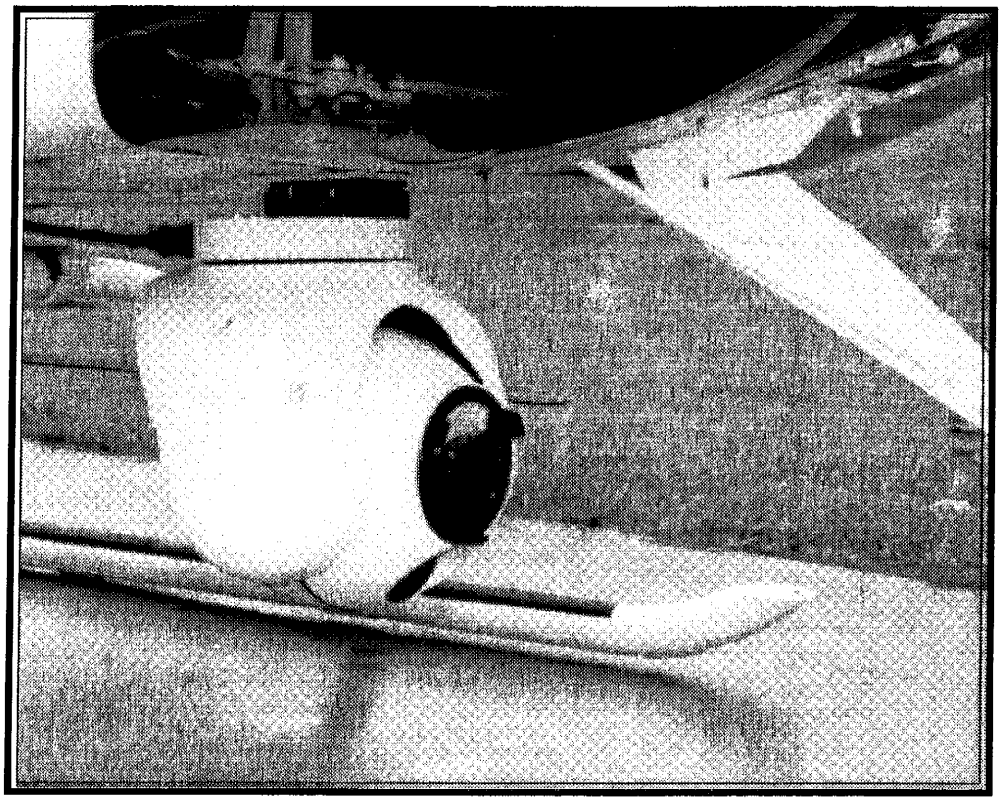
AERONAUTICAL ACCESSORIES, INC.
QUICK MOUNT KIT FOR THERMAL IMAGERS/CAMERAS

The Aeronautical Accessories, Inc. Thermal Imager/Camera Quick Mount Kit provides a sturdy, vibration-free installation of thermal imager/camera systems. Installation or removal of the system can be accomplished in minutes once the kit has been initially installed.

Kit includes all necessary hardware, flight manual supplements and complete installation instructions.

Net weight increase - 1.5 pounds.

FAA/STC approved for Bell 206 Series.



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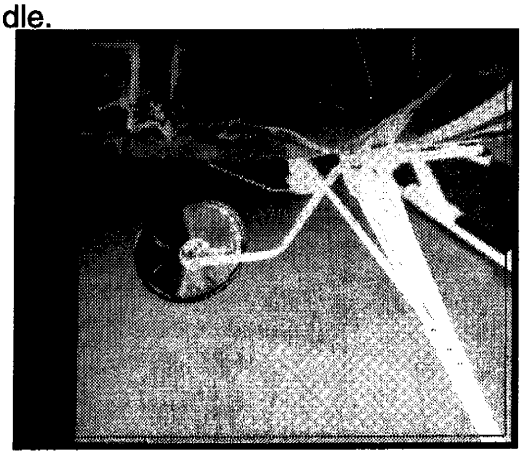
AERONAUTICAL ACCESSORIES, INC.
CARGO MIRROR

The Cargo Mirror provides an extra measure of safety during external load operations. The Cargo Mirror allows the pilot to see the hook and the load for accurate positioning during hook-up and release. The Cargo Mirror stows for cruise flight and is easily adjusted from inside the cockpit using a friction-lock positioning handle.

The kit comes complete with all necessary hardware and installation instructions.

Net weight increase - 2 pounds.

FAA/STC approved for Bell 206 Series.

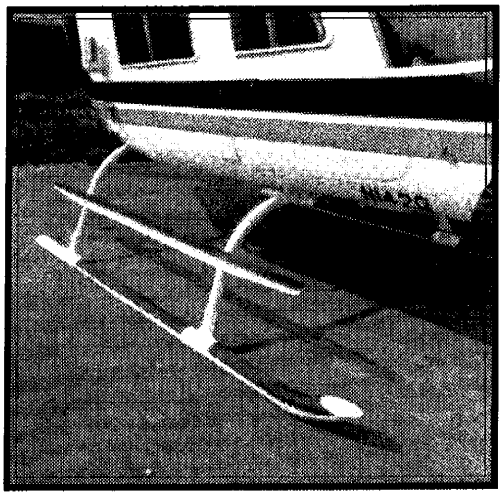


AERONAUTICAL ACCESSORIES, INC.
FLITESTEP®

The Aeronautical Accessories, Inc. Flitestep eases entry and exit of crew and passengers on the Bell 206L helicopters equipped with high skid gear. In addition, the extended length of the Flitestep allows safe, easy access to engine and transmission compartments for preflight inspection and other maintenance functions.

The Flitestep Kit can be installed in less than 30 minutes.

FAA/STC approved for Bell 206 Series.



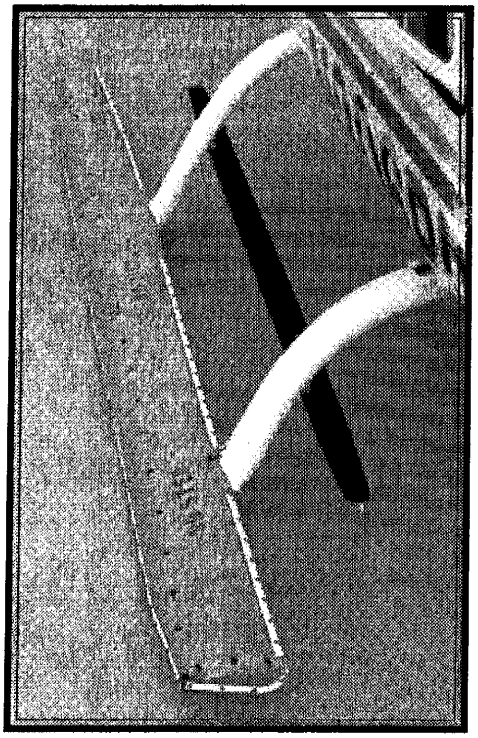
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AERONAUTICAL ACCESSORIES, INC.
FLOATSTEP™

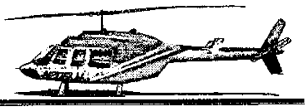
The Aeronautical Accessories, Inc. Floatstep eases entry and exit of crew and passengers on the Bell 206L helicopter equipped with Emergency Flotation Landing Gear. In addition, the extended length of the Floatstep allows safe, easy access to engine and transmission compartments for preflight inspection and other maintenance functions.

The Floatstep Kit is available for both pan-style and lightweight pop-out float configurations.

FAA/STC approved for Bell 206 Series helicopters.



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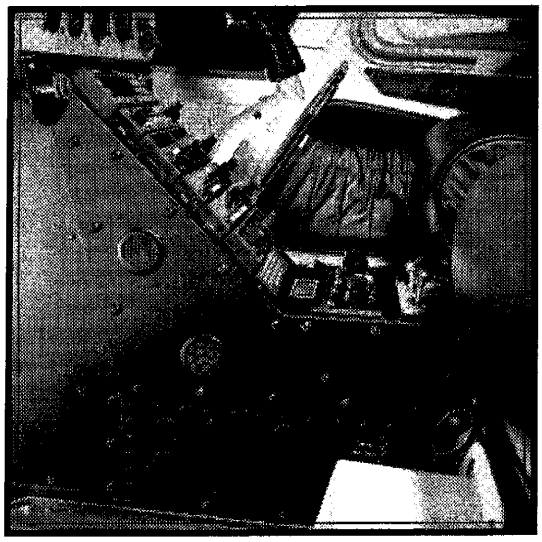
AERONAUTICAL ACCESSORIES, INC.
AVIONICS CONSOLE ASSEMBLY

The Avionics Console Assembly from Aeronautical Accessories, Inc. replaces the standard Bell Avionics Panel and allows for installation of a greater variety of avionics and other mission related equipment.

The unique design offers the operator a wider range of equipment locations and ease of installation.

Net weight increase - 1.5 pounds.

FAA/STC approved for Bell 206 Series helicopters.

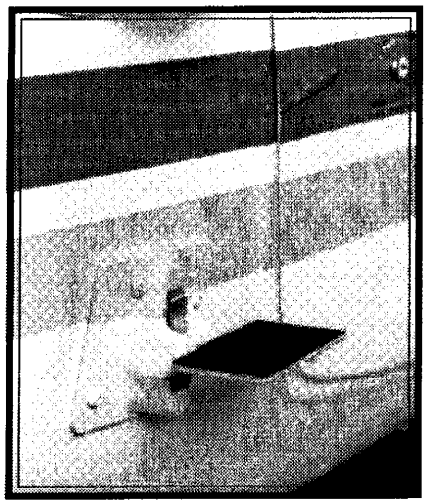


AERONAUTICAL ACCESSORIES, INC.
FOLDING MAINTENANCE STEP™

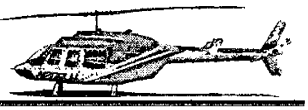
The popular Maintenance Step is available in a lightweight, fold-up version for Bell 206 Series helicopters. The Folding Maintenance Step provides a practical solution to the problem of access to the cabin roof for maintenance and preflight functions.

The left Folding Maintenance Step also includes a Baggage Door Retention Strap to prevent damage to the cargo door.

FAA/STC approved for Bell 206 Series helicopters.



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AERONAUTICAL ACCESSORIES, INC. STEP/HANDLE™

The lightweight aluminum Step/Handle from Aeronautical Accessories, Inc. provides a convenient and sturdy handhold and a flat stepping surface for the right and left sides of the cabin roof. Installation of the Step/Handle provides a safer platform for preflight and maintenance functions.

The Step/Handle also protects the cabin roof from heavy stepping loads. One or two Step/Handles can be installed on each side of a Bell 206 Series helicopters.

FAA/STC approved for Bell 206 Series helicopters.



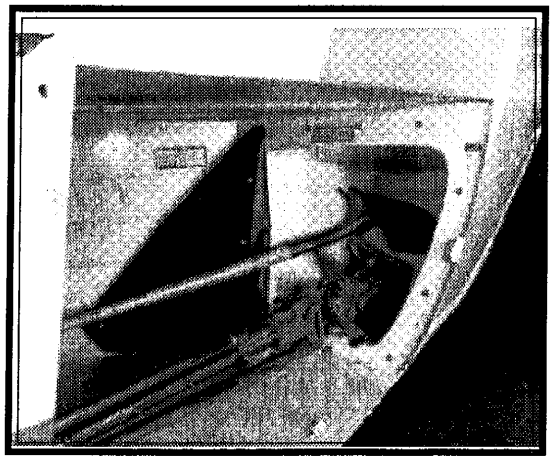
AERONAUTICAL ACCESSORIES, INC. SPACEMAKER®

The Aeronautical Accessories, Inc. Spacemaker expands the capacity and the light of Bell 206 LongRanger baggage compartment by approximately 50%, allowing extended length cargo to be carried in the baggage compartment. The Spacemaker eliminates aircraft interior wear and tear caused by golf clubs, surveyor's transits, long handled shovels and other common cargo too long for conventional baggage compartments.

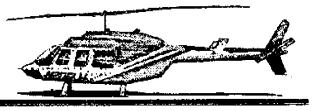
The kit is of a durable, one-piece molded fiberglass construction and includes a lightweight snap-on cover to compartmentalize the baggage area. The Spacemaker meets Office of Aircraft Services contract requirements.

Net weight increase - 6 pounds.

FAA/STC approved for Bell 206 Series helicopters.



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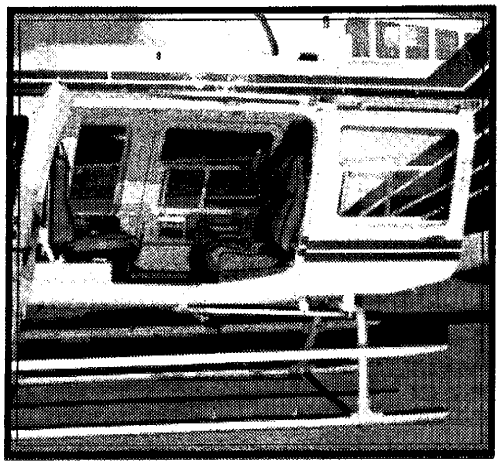
AERONAUTICAL ACCESSORIES, INC.
SLIDING DOOR KIT

The Aeronautical Accessories, Inc. Sliding Door Kit is designed to increase the versatility of the Bell 206 LongRanger helicopter. Available for left and right rear doors, this economical option provides an excellent platform for electronic news gathering operations and aerial photography. Patient loading and unloading during EMS operations is facilitated with the Sliding Door installation. Law enforcement, fire fighting and military operations are further enhanced when used in combination with a Rappelling Kit.

The Sliding Door Kit includes all drawings, hardware and detailed instructions required for the conversion. An optional Hoist Cable Guard is available for aircraft equipped with the Bell Helicopter Textron or Aeronautical Accessories, Inc. Rescue Hoist kit.

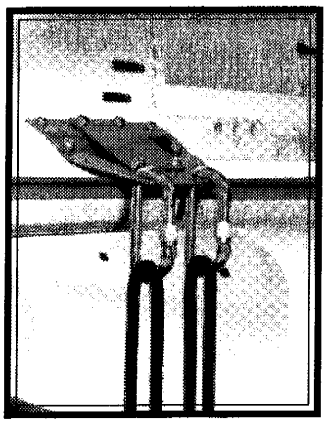
Net weight increase -10.5 pounds.

FAA/STC approved for the Bell 206 Series helicopters.



AERONAUTICAL ACCESSORIES, INC.
RAPPELLING KIT

The Aeronautical Accessories, Inc. Rappelling Kit provides a safe, secure attaching point for use when rappelling from Bell 206 LongRanger helicopters. Kits are available for installation on both sides of the cabin room.



When used in conjunction with the Sliding Door Kit, the Rappelling Kit provides a complete system for fire fighting, law enforcement or military insertion operations.

Net weight increase - 2.25 pounds.

FAA/STC approved for Bell 206 Series helicopters.

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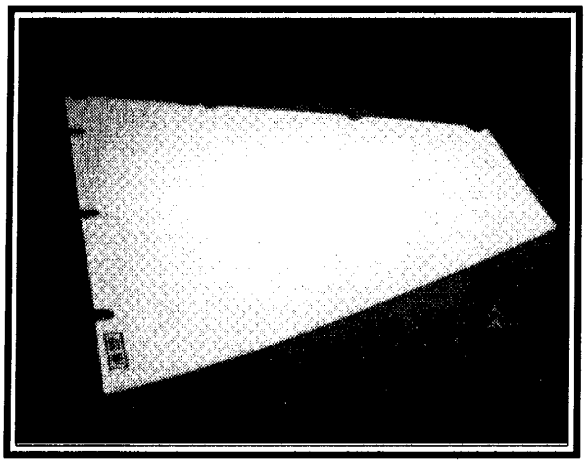
AERONAUTICAL ACCESSORIES, INC.
BAGGAGE FLOOR PROTECTOR

The Baggage Floor Protector from Aeronautical Accessories, Inc. provides durable lightweight protection for Bell 206 LongRanger baggage compartment floors. The one-piece Kydex construction allows safe, dent and gouge-free cargo loading and unloading eliminating costly honeycomb repair.

The Baggage Floor Protector is chip resistant, will not absorb oil or moisture, is easily cleaned, and can be installed in less than 30 minutes.

Net weight increase - 4.5 pounds.

FAA/STC approved for Bell 206 Series helicopters.



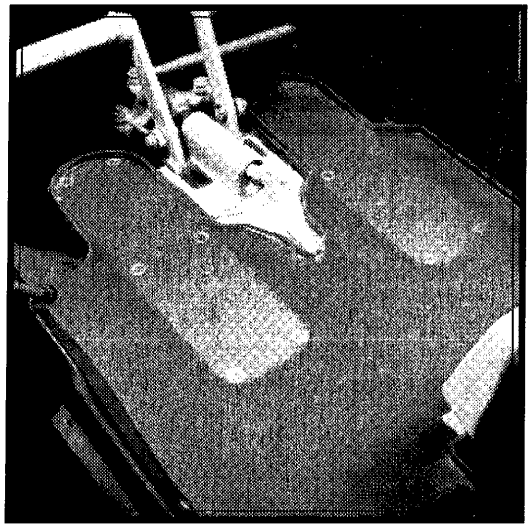
AERONAUTICAL ACCESSORIES, INC.
CABIN FLOOR PROTECTORS

These Cabin Floor Protectors from Aeronautical Accessories, Inc. provide low cost, lightweight protection for your Bell 206 LongRanger helicopter's carpet and cabin floor.

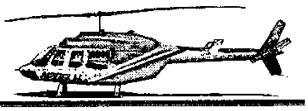
The clear, polycarbonate Cabin Floor Protectors are easily removed for cleaning.

Net weight increase - 8.5 pounds.

FAA/STC approved for Bell 206 helicopters.



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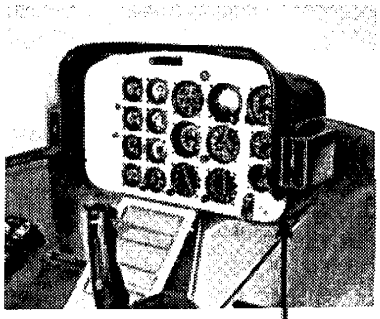


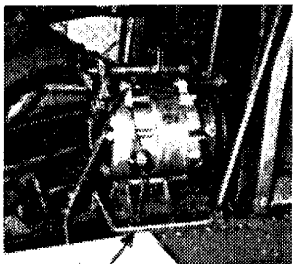
AIR COMM CORPORATION
AIR CONDITIONER FOR BELL 206 LONGRANGER
With the "Design Standard" System

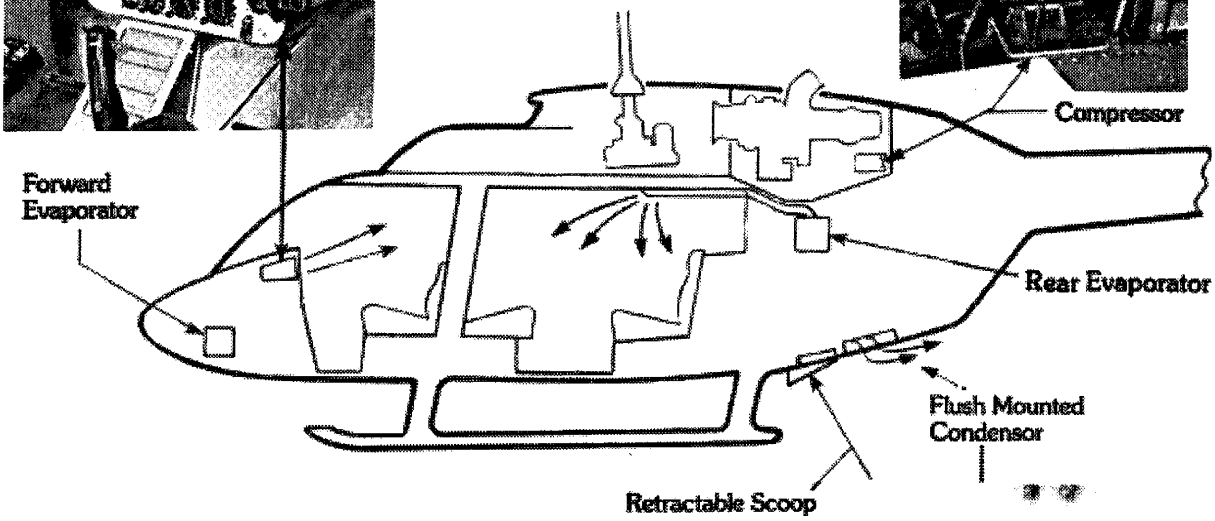
- Excellent cooling performance
- Lightweight (85 pounds)
- Proven reliability
- *Bell-approved* compressor drive concept

Special Features:

- Lightweight aluminum tubular plumbing with o-ring fittings.
- System freon bypass valve to eliminate compressor cycling.
- Retractable scoop - automatically opens and closes when AC is switched to ON and OFF, respectively. Retractable scoop is required for belly-mounted condenser due to thick boundary layer.
- Hidden belly mounted condenser, no visible air inlet/outlet "cut off."
- Excellent performance - proven by field experience.









ACC Air Comm Corporation
Boulder Municipal Airport
3300 Airport Road
Boulder, CO 80301
(303) 440-4075
FAX (303) 440-6355

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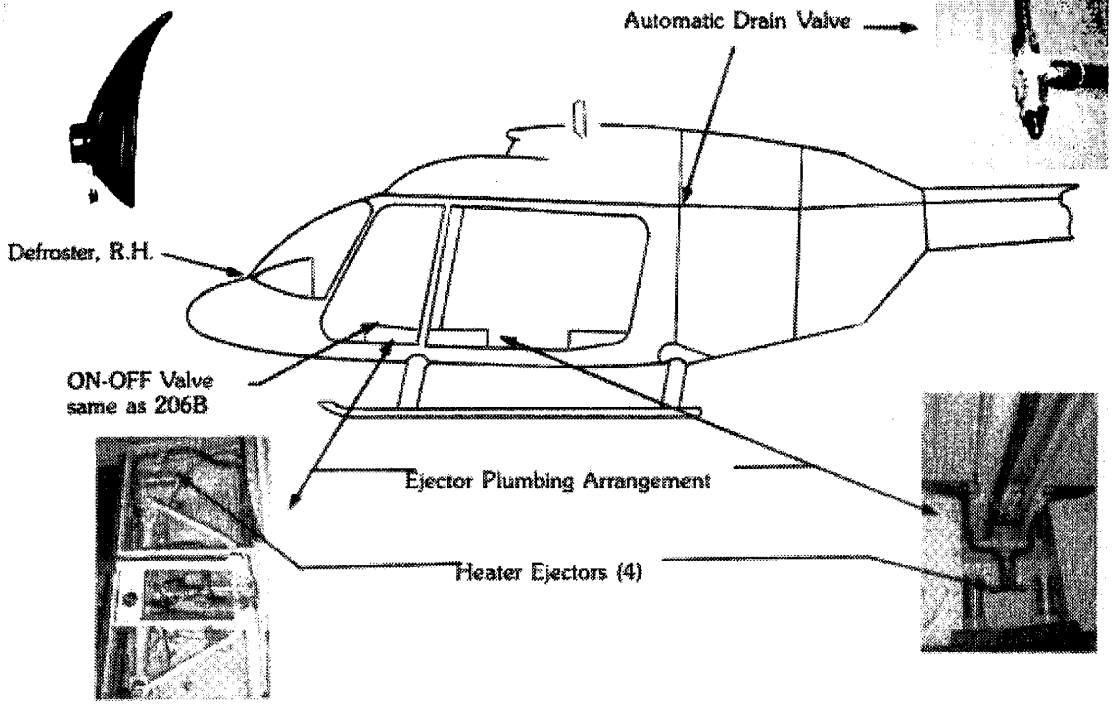


AIR COMM CORPORATION
CABIN HEATER

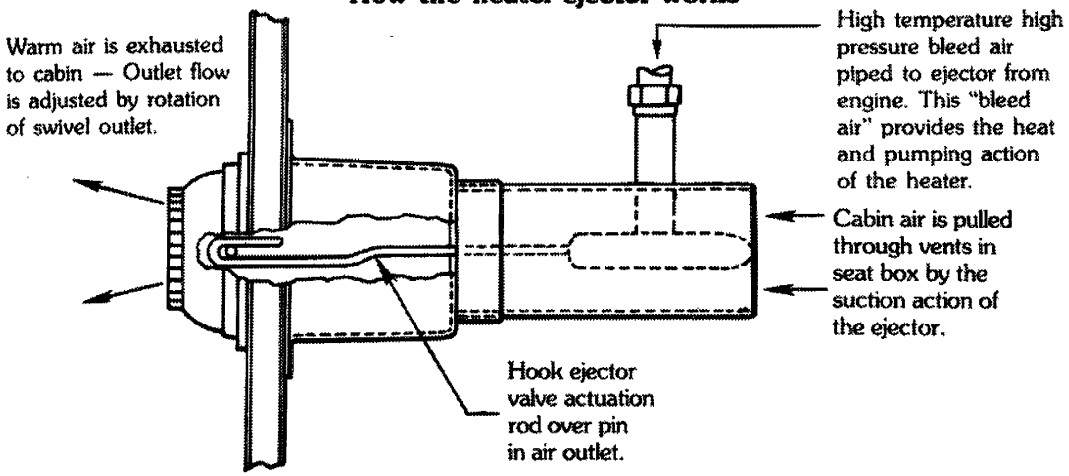
- Exceptional Performance - Proven to - 35° F.
- Low Noise Level
- Unique Individual OUTLET FLOW CONTROL Feature.
- High-Performance Windshield Defroster.
- Lightweight/Maintenance-free System (no blowers or moving parts).
- Available as a factory-installed option.
- Special Features:

  Automatic Bleed Line Drain Valve
  Side Window and Chin Bubble Defoggers
  ARCTIC HEATER Option
  Cabin exhaust ventilation system - ventilates cabin/enhances side window defogging.

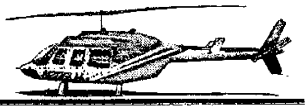




How the heater ejector works



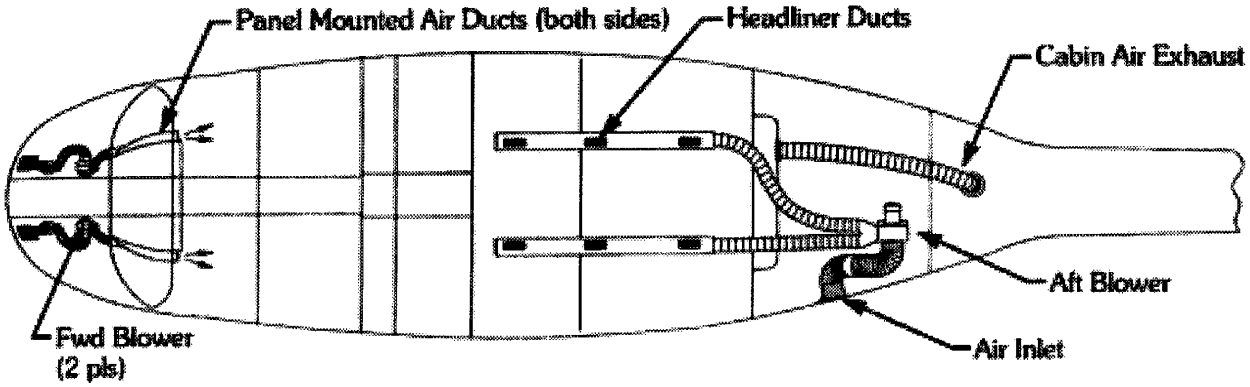
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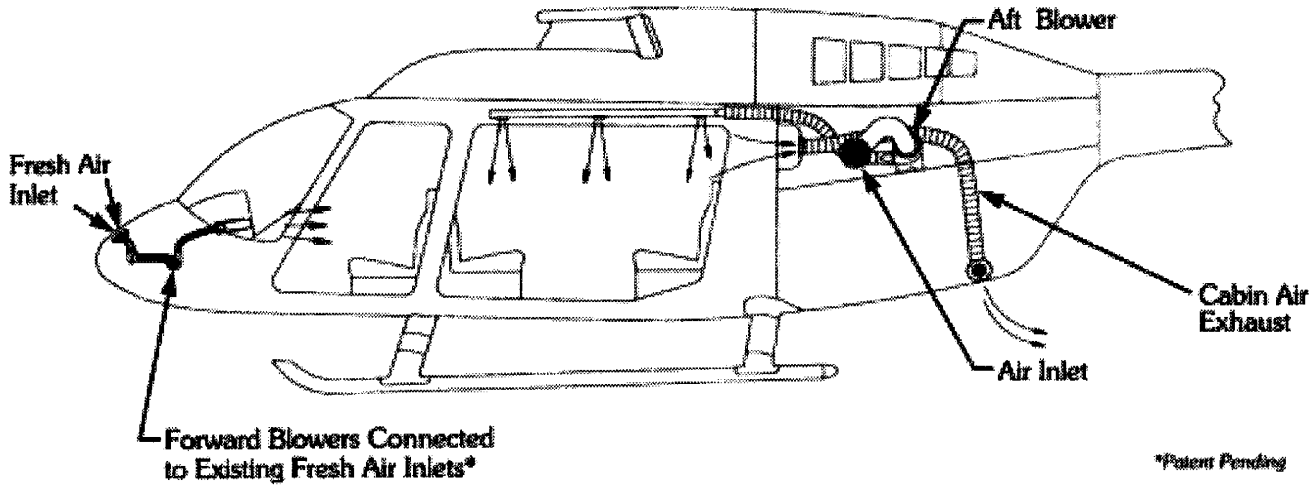


AIR COMM CORPORATION
CABIN VENTILATION SYSTEM FOR BELL 206/407

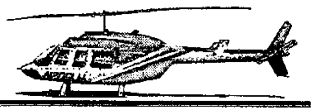
A practical low cost/lightweight ventilation system for aircraft not requiring air conditioning.

- Forced air ventilation system for cabin comfort.
- Effective as a cabin side window defog system.





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AVIONICS SPECIALTIES, INC.
ENGINE MONITORING SYSTEM

The Avionics Specialties, Inc. Power Analyzer and Recorder - PAR is a compact, lightweight, on-board computer based, Engine Monitoring System which provides accurate and automatic monitoring of your turbine engine's performance. It establishes trending data and records engine operational exceedances which can significantly increase the life of your turbine engine as well as enhance the overall safety of your flight operations.

The PAR offers maintenance crews and pilots reliable information to diagnose the performance degradation of the various engine modules (power turbine, gas producing turbine, etc.) and records limit exceedances without manual queuing eliminating the possibility of unmonitored exceedances during critical flight periods. The recording of information on starts, cool downs, accumulated engine time, accumulated airframe time, and Power assurance checks is automatic.

The PAR System is comprehensive and durable, weighing less than 7 pounds and consists of the following components:

The PAR Computer, which is the nucleus of the system, providing self-testing, signal processing, data computations, and data storage. The PAR Computer is capable of storing 375 log records and are accessible by either the PAR Display, the PAR Printer, or an IBM Compatible Personal Computer.

The PAR Display provides a visual interface to the PAR system information monitored to the pilot. The display is a 2-line display of 16 LED characters each, presented on a dot matrix readout with four push buttons and seven step dimming capability.

The PAR Warning Light Module functions as an annunciating display to draw attention to the pilot's flight instrumentation when an engine operational exceedance occurs.

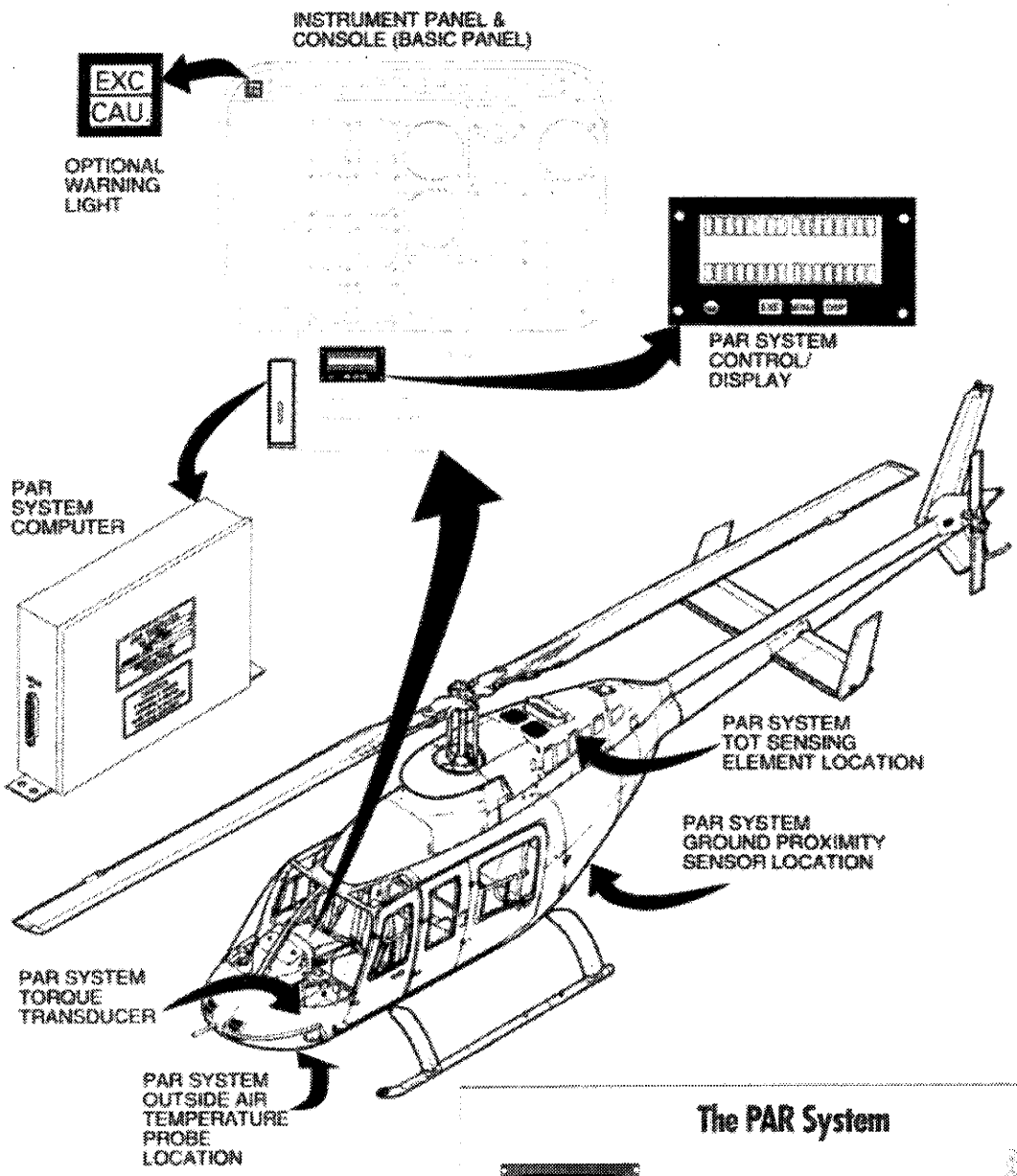
The Torque Transducer which is installed in parallel with the aircraft transducer to provide engine torque pressure data to the PAR Computer.

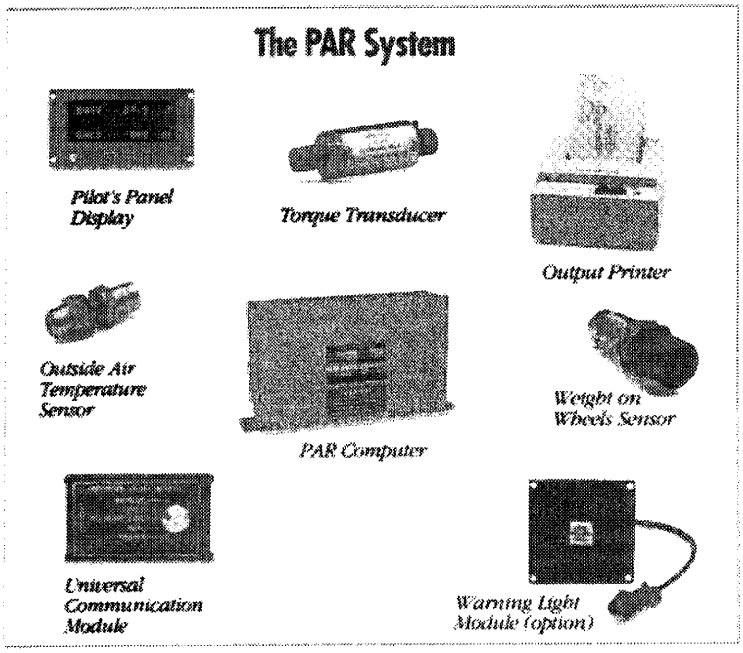
The Outside Air Temperature Probe senses the Outside Air Temperature which is used for air data computation by the PAR Computer.

By providing accurate engine parameter information, necessary maintenance diagnostics can be performed before major damage is incurred. This reduces operating costs and increases engine life, possibly saving lives in the process. To help keep your aircraft on-line longer, use the Power Analyzer and Recorder - PAR by Avionics Specialties, Inc.

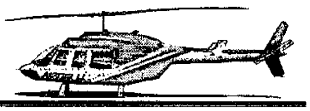
AVIONICS SPECIALTIES, INC.
PO Box 8400
Charlottesville, VA 22906-6400
Phone: (804) 973-3311
Fax: (804) 973-2976

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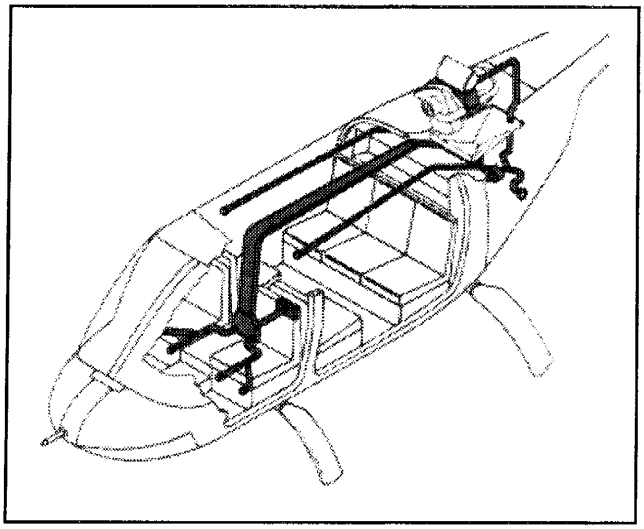
CASEY
MUFF-TYPE CABIN HEATER

The Casey Heater for the 206L series features design modifications not found on the original 206 series. The 206L series incorporates a new shroud design and exhaust changes -- all leading to full use of the C-20/C-28 and C-30 engine waste heat output and greater Casey Heater reliability.

With the use of lighter plastic heat ducting, aircraft weight additions are severely reduced. A new heat duct temperature limiter has been added to all 206L series kits allowing for an even flow of heat. The use of lighter, more durable components, provides new value for your helicopter heating dollar.

BELL 206 CASEY HEATER FEATURES:

- No TOT increase
- No loss of horsepower
- No fuel consumption
- Lower operating costs
- Improved rear passenger visibility
- Fits C-20, C-28 and C-30 engines



CASEY HEATER SPECIFICATIONS

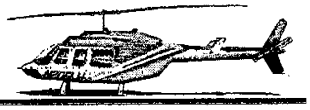
Kit Part Number	206L-C30-TX1
Applicability	Bell 206L3
FAA STC No.	SH1018EA
Canadian DOT STA No.	SH75-2
Weight	32.9 lbs.
Electrical Load	17 Amps
Installation Time	55 Man Hours
Heat Generated	50,000 BTU/hr @ 0°F
Air Flow	290 Ft³/min @ 60°F
Cabin Temp.	60°F @ –40°F OAT

Kit Part Number	206L-C28-HS2
Applicability	All Bell 206L-1
FAA STC No.	SH1018EA
Canadian DOT STA No.	SH75-2
Weight	35.25 lbs.
Electrical Load	17 Amps
Installation Time	60 Man Hours
Heat Generated	50,000 BTU/hr @ 0°F
Air Flow	275 Ft³/min @ 60°F
Cabin Temp	60°F @ –40°F OAT*

*with winter cowling and recirculation option installed

Spar Aerospace Limited
Spar Aviation Services
70 Hymus Blvd.
Pointe-Claire (Que.) Canada H9R 1C9
Phone: 514-426-4300 Est. 223
Fax: 514-426-3499

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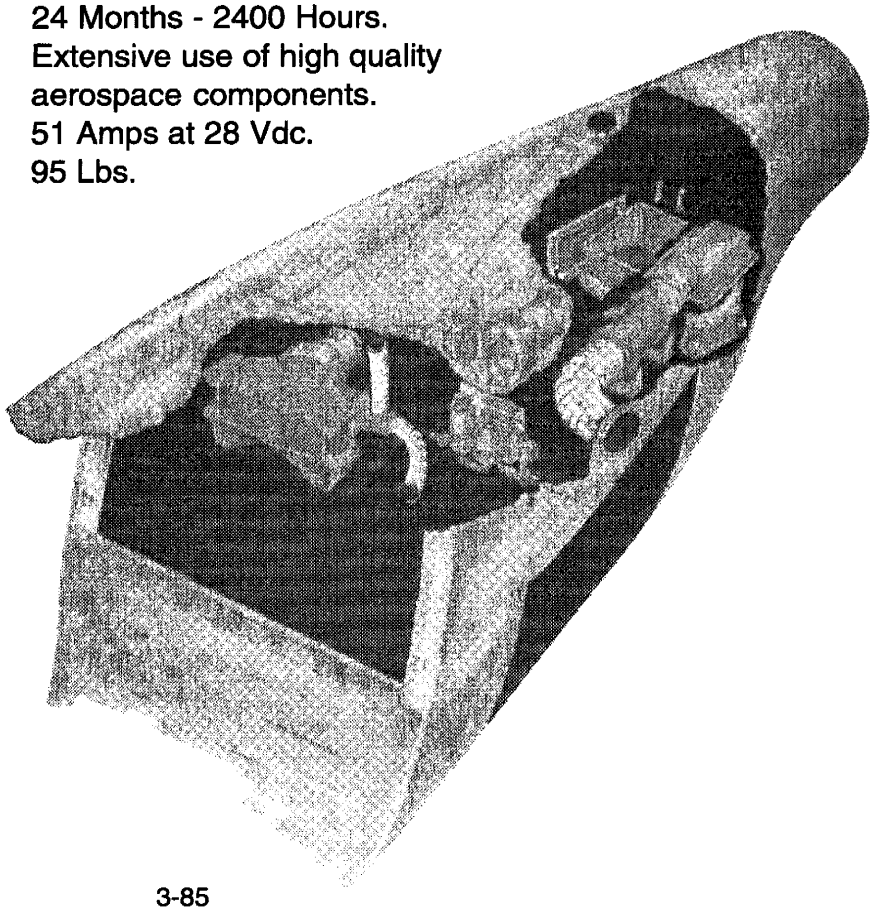
CASEY
ENGINE DRIVEN AIR CONDITIONER

The Casey Air conditioning System for the Bell 206L-1, L-3 and 206L-4 helicopter fits to any LongRanger helicopter and can be combined with the Casey heater for complete environmental control. Major features of this vapor cycle unit are: a direct engine driven compressor, plate fin heat exchangers, extensive use of MIL spec components, automatic temperature control and digital speed control.

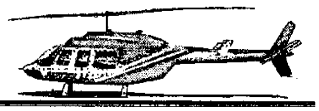
A large evaporator fan delivers over 300 CFM of cooling air through ducts supplied with the system. Forward mounted evaporators are not needed. The system has been sized to provide the required cooling at ground idle to ease operation in EMS and corporate applications.

All refrigeration controls are mounted on a single panel for ease of maintenance and charging.

· Refrigerant	Non-freon R-134A
· Capacity	27,000 BTU/Hr at 103°F.
· Drive	Safe mechanical drive from left hand accessory drive pad on Allison 250-C28 or 250-C30 engines.
· Control	Hot gas bypass control with continuous running compressor for extended component life.
· Warranty	24 Months - 2400 Hours.
· Design	Extensive use of high quality aerospace components.
· Electrical	51 Amps at 28 Vdc.
· Weight	95 Lbs.
· Installation 100 Hours.	



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CASEY
ECS (ENGINE DRIVE AIR CONDITIONING/MUFF-TYPE HEATER)

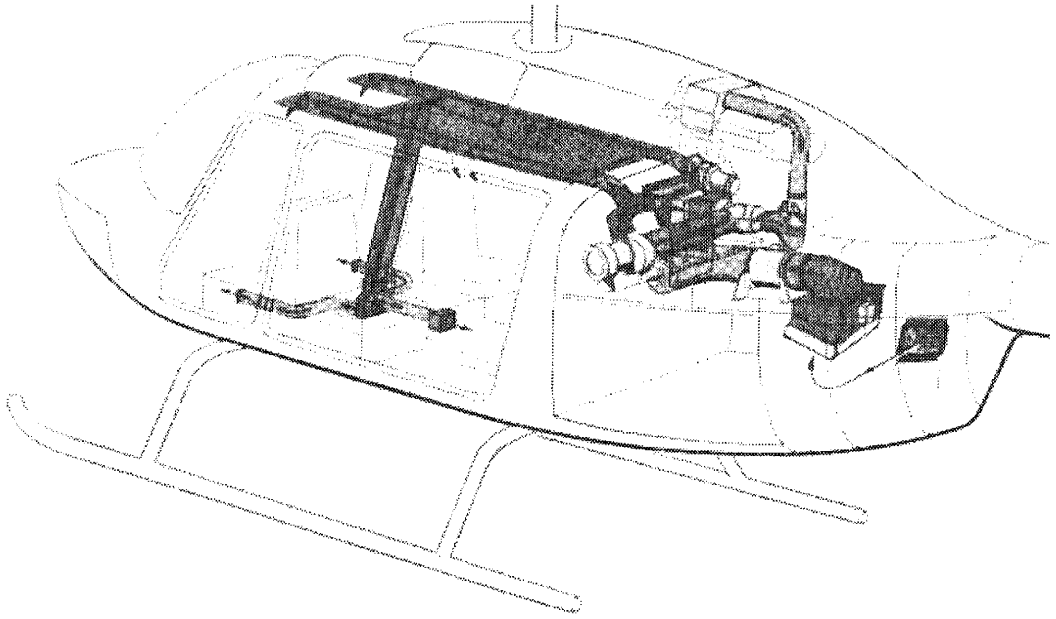
The Casey Environmental Control System for the Bell 206L-1, 206L-3 and 206L-4 helicopter combines the outstanding performance of the Casey Vapor Cycle Air conditioning system with the well established Casey heater, providing cabin comfort under all operating conditions.

Major features of this system are: Air conditioning power extracted from engine accessory drive pad, plate fin heat exchangers, MIL quality components, zero power and fuel penalty for heater operation, low maintenance and long life, integral controls.

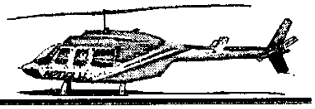
Over 300 cfm of cooling air in the air conditioning mode and 200 cfm of hot air in the heating mode is provided by a single fan. Rated cooling performance is provided at ground idle and the system is automatically controlled by hot gas bypass, utilizing a continuous running compressor.

All refrigeration controls are mounted on a single panel for ease of maintenance and charging.

· Refrigerant	Non-Freon R-134A.
· Capacity	Cooling 27,000 BTU/Hr at 103°F. Heating 40,000 BTU/Hr at -40°F.
· Air conditioning Drive	Left Hand Accessory Drive Pad.
· Heat Source	Engine Waste Heat Recovery.
· Electrical Load	Cooling 51 Amps at 28 Vdc. Heating 25 Amps at 28 Vdc.
· Weight	114 Lbs.
· Installation 150 Hours.	
· Warranty	24 Months - 2400 Hours.



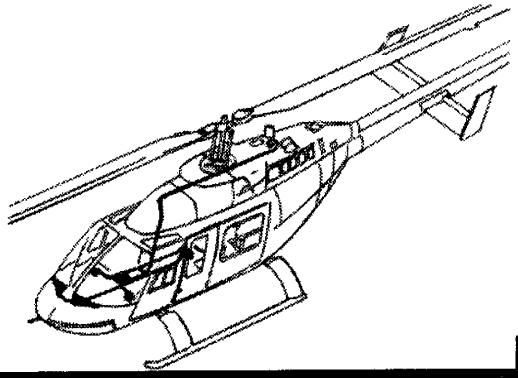
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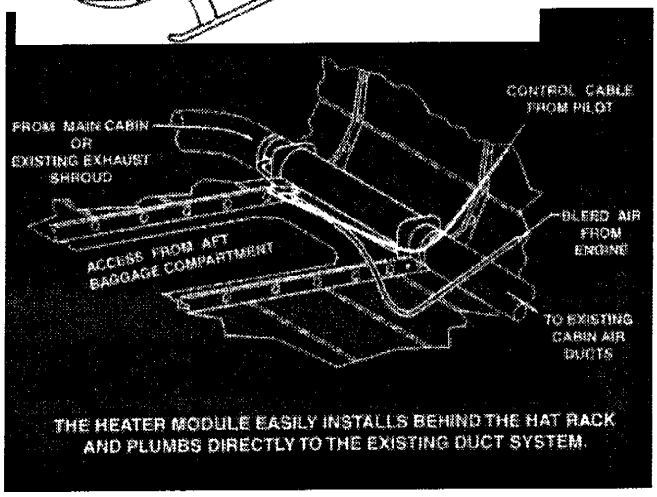


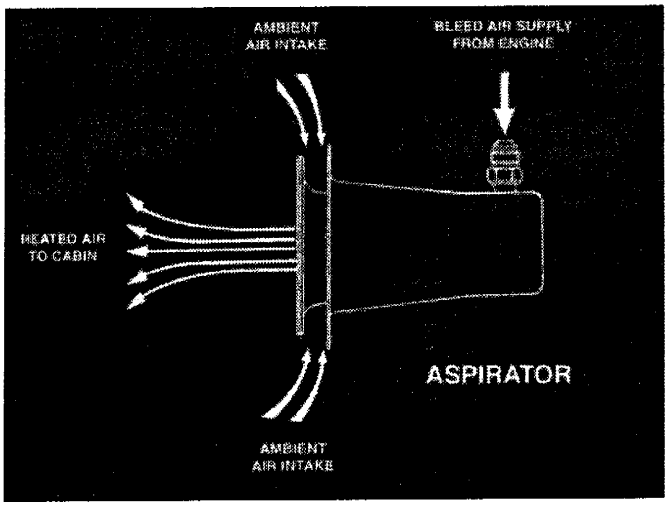
DART AEROSPACE LTD.
CABIN HEATER

No expensive weight - up to 60 pounds
No combustion can overhaul
No exhaust shroud maintenance

No electric blowers
No electric controls and valves
No unreliable operation
Yes high reliability
Yes virtually no maintenance
Yes lightweight installation
Effective defog in rainforest conditions
Quiet operation with even effective heat throughout cabin, tested at -40°



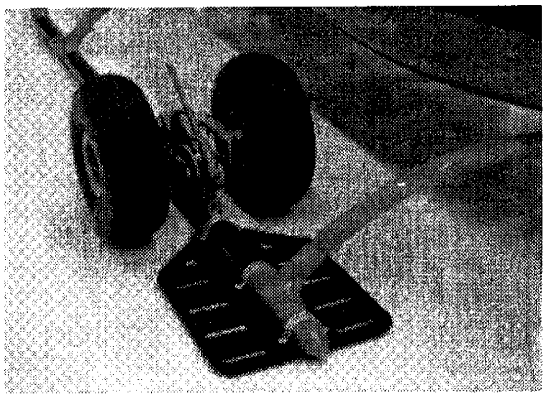




DART AEROSPACE LTD.
BEARPAW

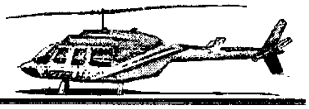
Dart bearpaws are made of ultra high molecular weight polymer which has been proven to be more wear resistant than aluminum, stainless steel or fiberglass.

This material has memory so that it will bend when landing on rocks and then return to its original shape after takeoff. Tests have shown that this material keeps its resilience down to 80° (-112°F).



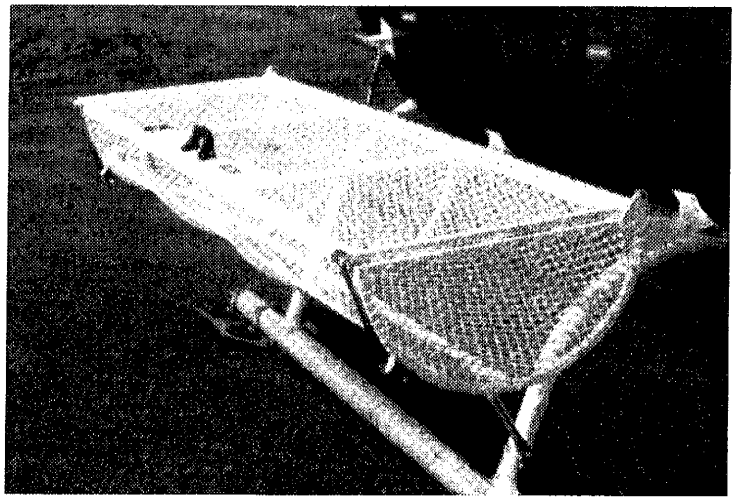
Dart Aerospace Ltd.
2071 Malaview Avenue
Sidney, BC, V8L 5X6 Canada
Phone: 1-800-556-4166
E-Mail: heli@dartaero.com
http://www.dartaero.com/

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DART AEROSPACE LTD.
HELI-UTILITY-BASKET™

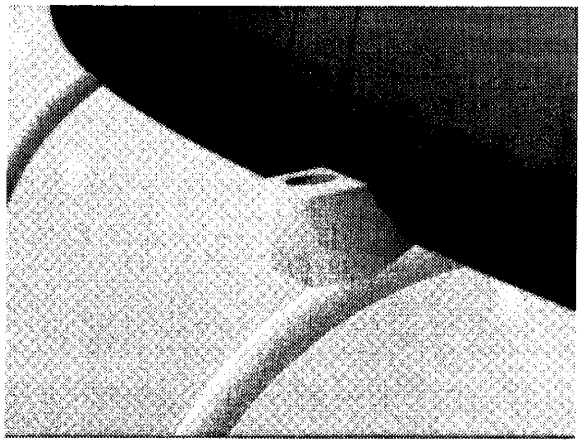
Transport:
Skis
Tools
Luggage
Golfclubs
Fishing Gear



Snowboards
Small packages
Mining Equipment
Fire Fighting Gear
Survey Equipment
Camping Equipment

DART AEROSPACE LTD.
EXTERNAL TORQUEMETER

e into your existing wet-line torquemeter
e and have and externally mounted alternate
orquemeter for easyand clear viewing when
ooking down through the bubble window or
ith the window removed.

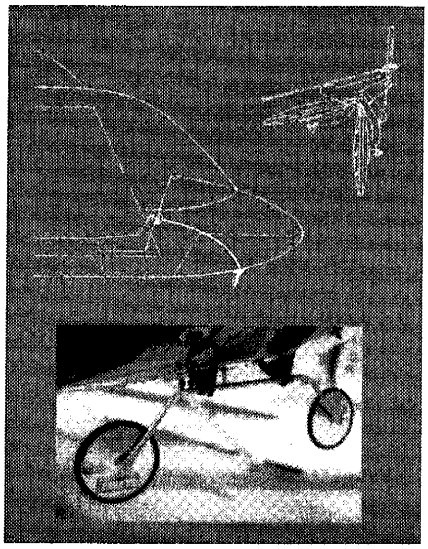


DART AEROSPACE LTD.
ADJUSTABLE-CARGO-MIRROR

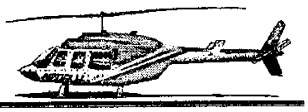
Clear view of cargo hook for accurate and safe hookup and release of external loads.

Dual mirror gives copilot clear view.

Mirror easily adjustable from cabin.



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EEE AVISOURCE, INC.
FLIGHT VIEW

The FLIGHT VIEW is a lightweight, inexpensive airborne observation system designed for use in helicopters and other light aircraft. The equipment consists of high sensitivity miniature cameras, equipped with either wide or narrow angle lenses, that permits a clear view of the targeted area in the specially designed monitor.

Its primary function is to allow aircraft crew members to view areas otherwise not visible to them. Depending on the mission of the aircraft, each operator will find the equipment useful in a wide variety of applications; typical use of the equipment is described below:

The FLIGHT VIEW is specially useful during the take off and landing phases of the flight, where unexpected objects or individuals represent a probable tail rotor strike and a potential safety threat, a common occurrence in the helicopter industry. Also, during external cargo operations where the crew can verify proper engaging, disengaging, and routing of the sling harness, ground and/or area clearance, and load angle. During tactical operations, where a rear view provide added security and domain, the FLIGHT VIEW will prove to be an indispensable tool.

The following paragraphs provide a general description of the system's components and some of the optional equipment. Customizing installation hardware and equipment enclosures are available for tailoring the system to the particular operational requirement.

GENERAL FLIGHT VIEW CHARACTERISTICS

MONITOR- MODEL EM-01

General: 3.5 inch Black & White High Contrast

Image: Electronic "Mirror"

Power Input: 28 Volt DC

Power Consumption: 1.0 Amp. Max. (incl. camera)

Dimensions: 4.06 inches (w) x 4.25 inches(h) x 9.50 inches (d)

Weight: 2.25 lbs. (1 kg)

Mounting brackets not included in specifications; installations vary with aircraft type and location. Panel mounted-monitor and other enclosures are available.

EXTERNAL CAMERA ENCLOSURE MODEL ECE-01

(includes spot light & audible warning)

Power Consumption. 1.0 Amp. Max. (spot light)

Dimensions: 4.90 inches(w) x 5.45 inches (h) x 7.25 inches(d)

Weight: 1.38 lbs. (630 grams) (incl. camera & components)

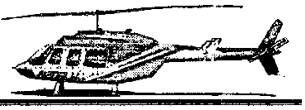
by:



EEE AVISOURCE, INC.

2514 GRAVEL ROAD • FORT WORTH, TEXAS 76118 U.S.A.
TEL: (817) 595-1414 •
FAX: (817) 595-2222 • TLX: 734096 EEE

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CAMERA AND LENS ASSEMBLY MODEL EC-01-01

General: Miniature auto iris, extra wide angle photometric lens

Synchronization: Internal crystal control

Resolution: 350 lines

Illumination: 0.2 lux F1.2 minimum

Power Input: 28 Volt DC - (system)

Video Output: 1vp-p 75 ohms

Operating Temp.: 5°F to 114°F (-15°C to 45°C)

Dimensions: 1.97 inches(w) x 2.28 inches (h) x 4.18 inches (d)

Weight: 4.2 oz. (120 grams)(inc. camera & components)

EXTERNAL CAMERA ENCLOSURE MODEL ECE-02

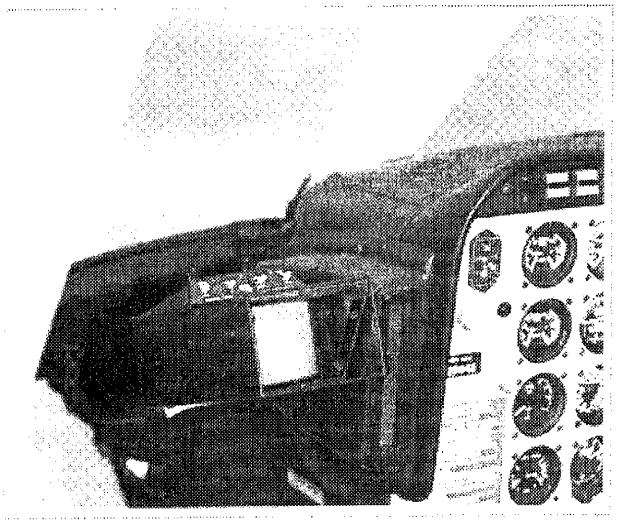
Dimensions: 3.92 inches (w) x 2.96 inches(h) x 7.25 inches (d)

Weight: 1.0 lbs. (450 grams) (incl. camera & components)

Installation Brackets specification not included. Hardware will depend on aircraft type.

OPTIONS: Color and Black & White cameras or monitors; monitor sizes; motorized swivel camera support; video recorder equipment; GPS interface to video recorder.

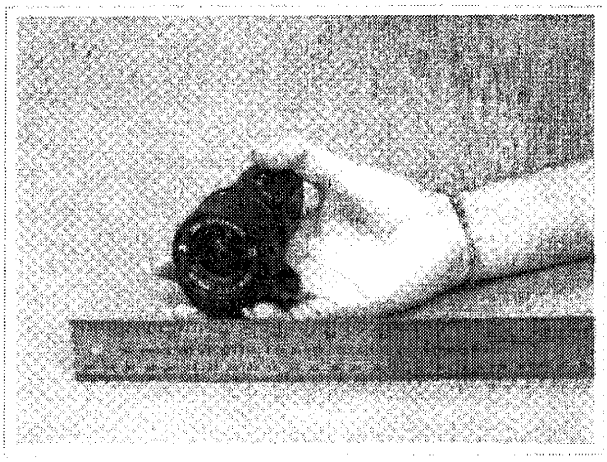
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MONITOR - MODEL EM-01

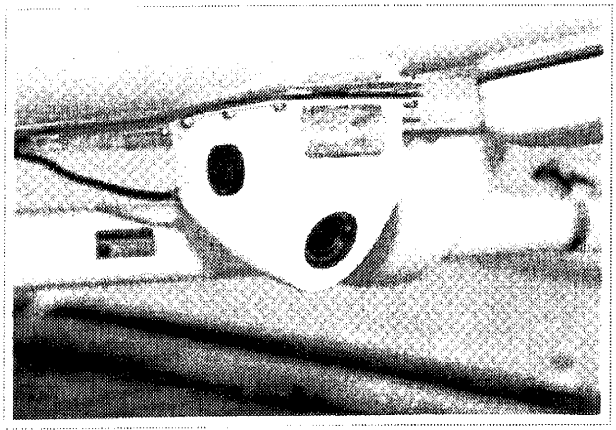
General:	3.5" B & W High Contrast
Image:	Electronic "Mirror"
Power Input:	28v DC
Power Consmpt:	1.0 Amp. Max. (incl. camera)
Dimensions:	4.06" (w) x 4.25"(h) x 9.50" (d)
Weight:	2.25 lbs. (1 kg)

Mounting brackets not included in specifications; installations vary with aircraft type and location. Panel mounted-monitor and other enclosures are available.



CAMERA AND LENS ASSEMBLY MODEL EC-01-01

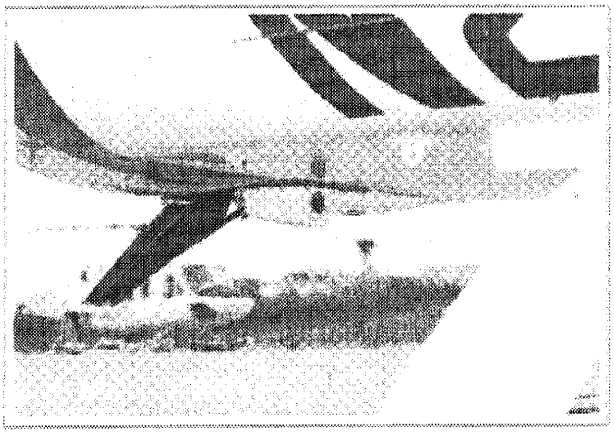
General:	Miniature auto iris, extra wide angle photometric lens
Synchronization:	Internal crystal control
Resolution:	350 lines
Illumination:	0.2 lux F1.2 minimum
Power Input:	28v DC - (system)
Video Output:	1vp-p 75 ohms
Operating Temp.:	5°F to 114°F (-15°C to 45°C)
Dimensions:	1.97" (w) x 2.28" (h) x 4.18" (d)
Weight:	4.2 oz. (120 g) (inc. camera & components)



EXTERNAL CAMERA ENCLOSURE MODEL ECE-01

(includes spot light & audible warning)

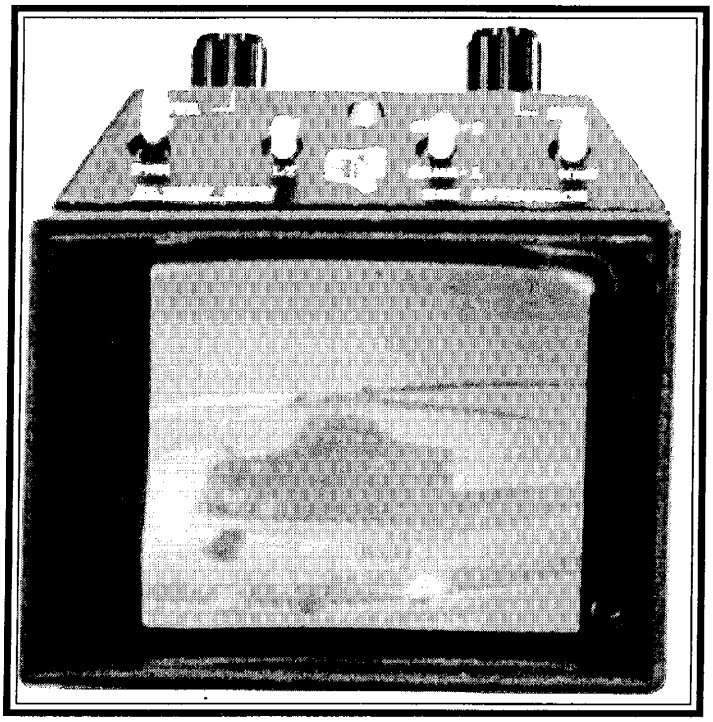
Power Consump.:	1.0 Amp. Max. (spot light)
Dimensions:	4.90" (w) x 5.45" (h) x 7.25" (d)
Weight:	1.38 lbs. (630 g) (incl. camera & components)

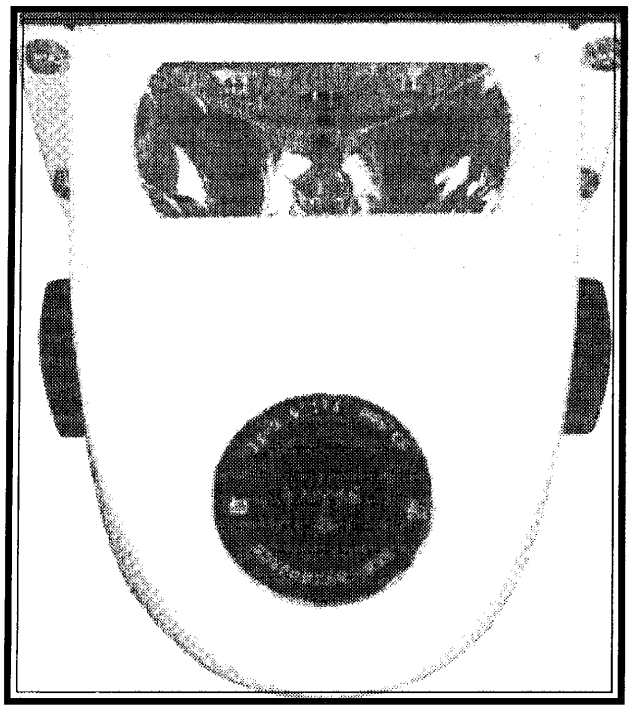


EXTERNAL CAMERA ENCLOSURE MODEL ECE-02

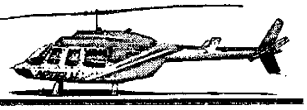
Dimensions:	3.92" (w) x 2.96" (h) x 7.25" (d)
Weight:	1.0 lbs. (450 g) (incl. camera & components)

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FLIR SYSTEMS, INC.
AERIAL CAMERA SYSTEMS
UltraMedia™

The UltraMedia from FLIR Systems, Inc. (FSI) sets new performance standards for gyro-stabilized aerial camera systems. This innovative system combines unmatched image stability and crisp 36:1 magnification in a compact, lightweight and low-cost package that provides new flexibility to airborne operations in surveillance, broadcast news and entertainment applications.

Superior Images

Image stability far superior to conventional aerial cameras is provided by a 5-axis gyro-stabilized design. Images remain steady, even in tightly banked turns. This advanced gyro system cannot be unseated by extreme aircraft maneuvers. No daily set up or balancing of the gyros is required.

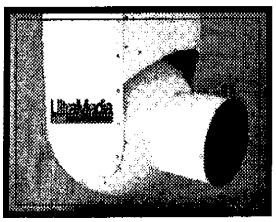
UltraMedia can be nosed-mounted allowing 360° visibility. The low profile design, a mere 15" in diameter and 17.5" tall, minimizes drag to improve fuel efficiency and increase flight time. Complete with camera and lens the gimbal weighs **69 pounds** providing flexibility for other mounting options. The camera system is installed on a variety of platforms such as the Bell 206L-4.

Flexible Configurations

FSI configures the Ultra Media complete with a choice of industry standard daylight cameras including Sony Hitachi and Ikegami. Several lens options are available. A 36:1 Fujinon zoom lens or 33:1 Canon zoom, both with a motorized 2x extender, give the UltraMedia double the range of standard systems, a maximum of 72:1. The system is controlled by an intuitive control panel inside the aircraft cockpit. Video can either be recorded for future use or transmitted live to the studio or field operations center.

Proven Performance/Unmatched Support

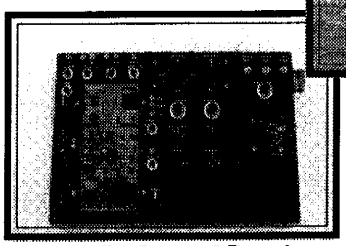
UltraMedia is the most popular aerial camera system used by broadcast and law enforcement organizations who need the ultimate in long distance surveillance capability. Since 1978, FSI has provided imaging systems worldwide for a variety of airborne applications in broadcast imaging, public safety, defense and industry. With systems installed in over 50 countries FSI provides unmatched service and support to ensure your success.



UltraMedia



Side Mount on a Bell 206L-4

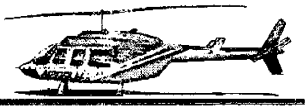


UltraMedia Control Panel

FSI
FLIR SYSTEMS™

Corporate Headquarters:
FLIR Systems, Inc.
16505 SW 72nd Avenue
Portland, OR 97224 USA
Telephone: (503) 684-3731
Fax: (503) 684-3207
Web Site: www.flir.com

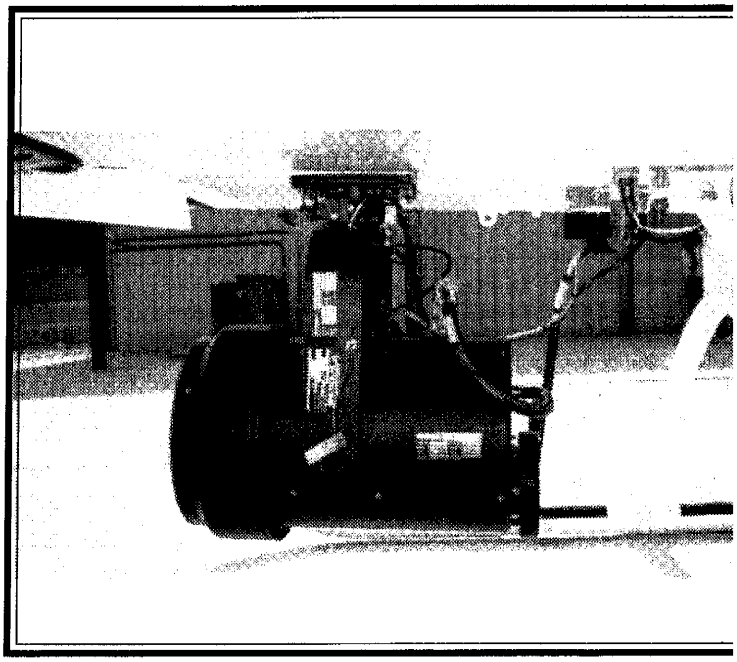
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PREMIER AVIATION, INC.
SX-16C NIGHTSUN

Premier will install this high intensity, xenon airborne illumination system as a belly mount installation on your Bell 206 model helicopter. Premier's customers include many law enforcement agencies around the world, together with EMS, security and search & rescue operations.

The Premier system allows selection of either cyclic or remote control of direction and focus of the searchlight. The auto-stow capability features magnetic proximity centering in both the vertical and horizontal axes when stow is selected. The system also features a quickmount capability for easy removal when not in use.



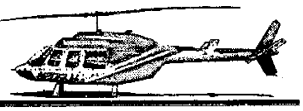
FEATURES/CHARACTERISTICS:

- FAA Certified
- 30 million candlepower
- Beam with is 4 degrees to 20 degrees
- Quick startup, 3 to 5 seconds
- Installed weight is approximately 65 pounds
- Requires high skid gear or float gear

PREMIER AVIATION, INC.
Excellence In Aviation Worldwide

2621 Aviation Parkway
Grand Prairie. Texas 75052
972-988-6181
Fax 972-660-2670

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PREMIER AVIATION, INC.
ADJUSTABLE CREW SEAT

Premier Aviation, Inc. holds a Supplemental Type Certificate (STC) issued by the Federal Aviation Administration for its adjustable crew seats for installation in the Bell 206A, 206B, and 206L, L-1, L-3 and L-4 series aircraft. These crew seats help to reduce the pilot fatigue and stress associated with flying extended missions. They track forward and aft, recline, and have an adjustable lumbar support system. Premier offers a wide variety of custom upholstery options.

The adjustable crew seats mount in the existing Bell seat pan area which allows for easy installation and removal. When installed, the height of the seat cushion is the same as the standard Bell seat, so there is not any loss of headroom.

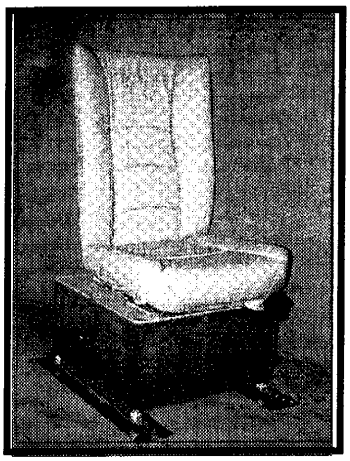
The seat shell and seat cushion design virtually eliminates "hot spots", therefore assuring longer comfort cycles during extended flights.

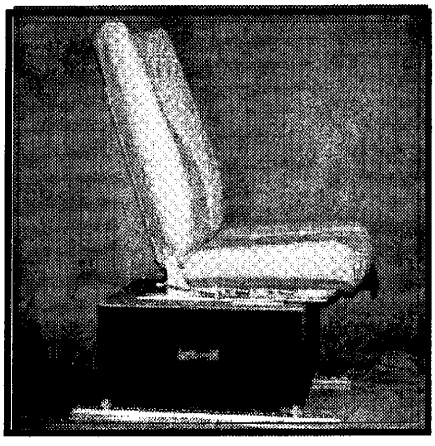
FEATURES/CHARACTERISTICS:
Premier's improved seat design incorporates the following enhancements:

- Forward and aft tracking up to four inches.
- Infinite recline positions up to 15 degrees.
- Adjustable lumbar support system, the same system that is standard equipment in many luxury automobiles.
- The seat foam material is an ergonomic foam that has thermal softening abilities. The thermal behavior of the seat cushion provides a custom form fit that is suitable for any individual.
- The pilot sits as far aft as the standard Bell seat.
- There are two seat heights available. The standard seat, which is the same height or a special version that is lower than the standard Bell seat, therefore, there is an increase in available headroom.
- Superior lateral support.
- Superior back and should support.
- The seat design allows you to sit "in" rather than "on" the seat.
- Easy installation.
- For shorter pilots, eliminates radical anti-torque pedal adjustments, and comfort is improved due to tracking and reclining capabilities.
- Wide variety of custom upholstery options including leather, fabric, vinyl, etc.
- The additional weight above the standard Bell seat is approximately 7.0 pounds.

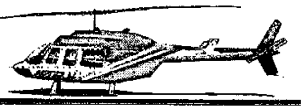
OPTION

- For taller pilots: a seat cushion that sits lower than the standard cushion, therefore allowing for increased headroom.





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PREMIER AVIATION, INC.
ENLARGED INSTRUMENT PANEL

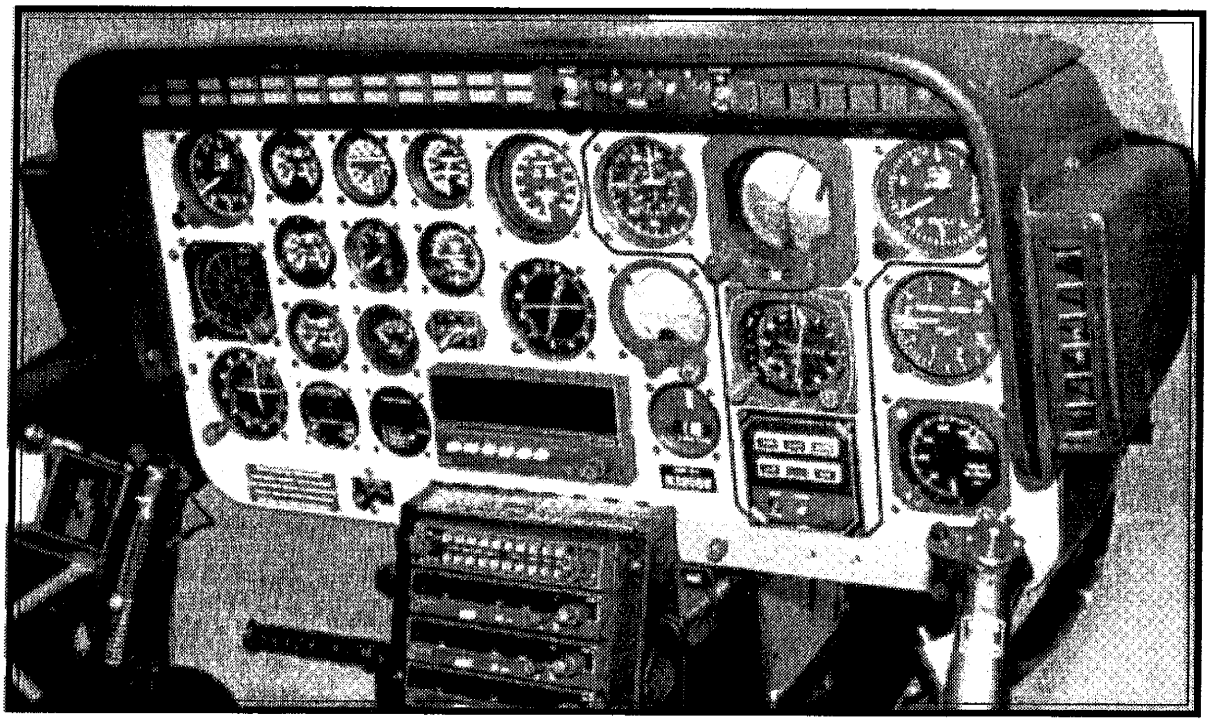
Premier's enlarged, low profile instrument panels provide an extended capability platform for additional mission equipment.

The panels can be effectively used in demanding operating environments, such as EMS or Law Enforcement operations, as well as IFR flight regimes.

The panels can be designed to fit most any instrumentation specifications and are custom configured and constructed.

FEATURES/CHARACTERISTICS:

- FAA Certified
- Panel is configured to your specifications
- Approximately 30% more panel area available for additional instrumentation
- Eyebrow is padded and covered in leather
- Servicing is made easier because of two piece fiberglass shrouds
- Approximately 5 pounds additional weight above the standard Bell panel
- Approved for 125 pounds of equipment

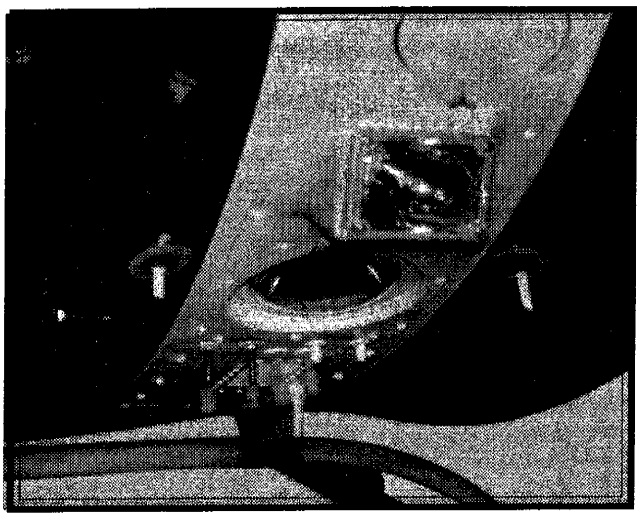


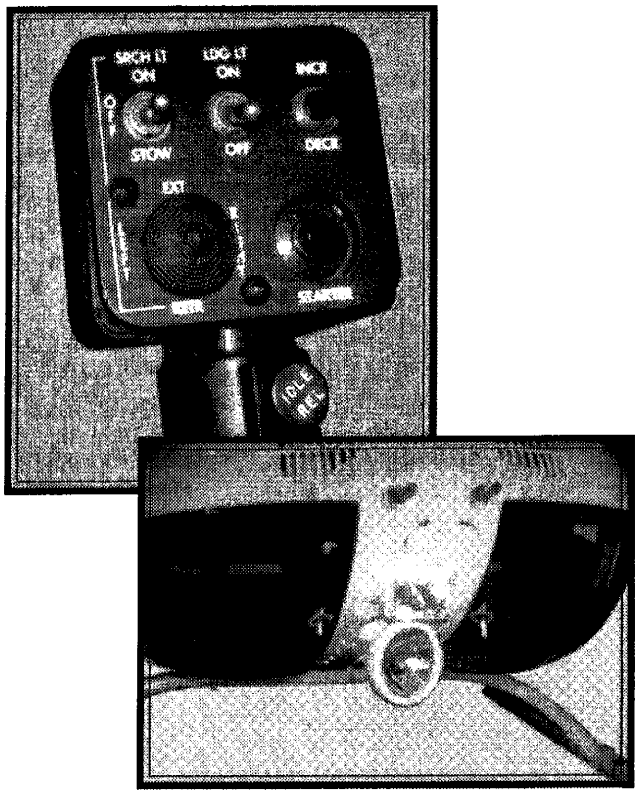
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PREMIER AVIATION, INC.
STEERABLE LANDING LIGHT

Premier holds an FAA STC (Supplemental Type Certificate) for its steerable landing light for Bell 206 model helicopters. This powerful and totally controllable light helps give the illumination needed for hovering or taxing over crowded ramps and help facilitate takeoffs and landing over unlighted obstacles, thereby avoiding any hazards.

The steerable landing light is controlled with the pilot's collective mounted controls. It can be moved forward or aft, as well as rotated 360 degrees and stows automatically from any position.

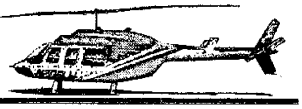




FEATURES/CHARACTERISTICS:

- FAA Certified
- 400,000 candlepower illumination
- Beam width is 13 degrees
- Installed weight is approximately 10 pounds
- Does not require high skid gear or float gear
- Kit also includes a stationary light that has 100,000 candlepower illumination in the forward position.

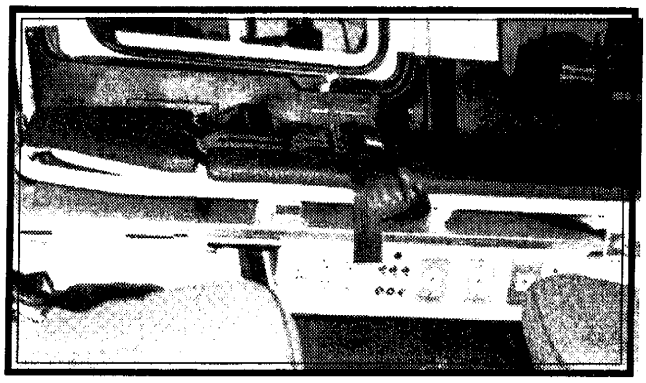
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SPECTRUM AEROMED, INC.
BELL BLR LIFE SUPPORT SYSTEM

The **SPECTRUM 500 BLR Air Ambulance Life Support System** is fully modular, quick change interior especially designed for the Bell 206L-4 LongRanger. The entire system can be installed or removed in under five minutes once the seats are removed. No tools are needed for installation of the module. The quick change nature of the unit gives the aircraft multi-mission capability. No structural modifications to the aircraft are needed.

Spectrum Aeromed, Inc. has designed its equipment for maximum safety. The connections for the equipment, medical air, etc. are hospital approved medical connectors to maintain system integrity and sterility. The patient is also at seat height which flight crews report is more suitable for patient care and is better emotionally for the patient, than positioning close to the floor.

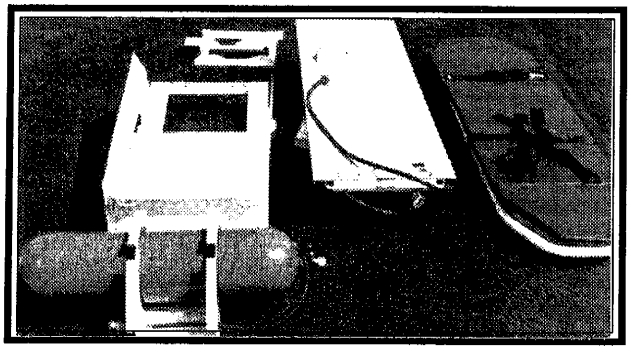


The Spectrum 500 BLR is a self contained module equipped with oxygen, medical air and suction. The oxygen supply is a 2200 liter Kevlar wrapped cylinder. The dual air compressors operate at 11 lpm @50 psi each. Standard features include 500 watt inverter with two 115 VAC outlets and one 28 VDC outlet and pneumatic outlets for oxygen, air and suction.

The Spectrum stretcher is designed with patient comfort in mind for the two inch foam pad with Staph-Check covering to the expandable arm rests. The stretcher is specially designed to eliminate cleaning and disinfecting problems and to increase patient safety.

Spectrum Aeromed strives to meet the customers needs and has the engineering capability to customize units to meet the customer's special needs.

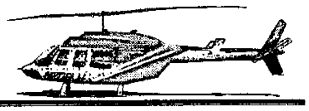
The unit adds 130 pounds.



SPECTRUM AEROMED

304 4th Street N., Wheaton, MN 56296
Phone: (320) 563-4340
Toll Free: (800) 753-4340
Fax: (320) 563-8709
Web Site: www.spectrum-aeromed.com
E-mail Address: aeromed@traversenet.com
Contact: Jody Hasbargen

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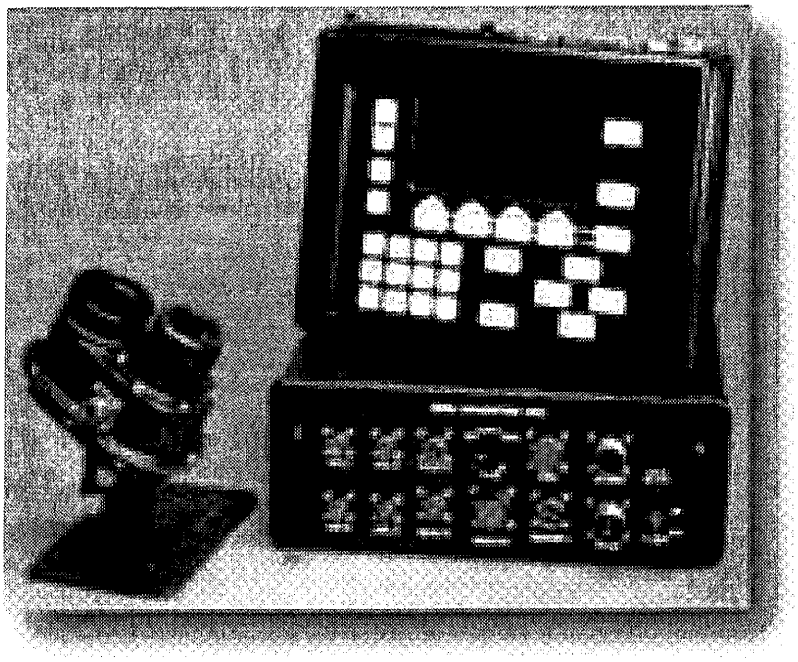


SIGNAL PROCESSING SYSTEMS
ROTOR ANALYSIS DIAGNOSTIC SYSTEM

Signal Processing Systems manufactures and sells the Rotor Analysis Diagnostic System - Advanced Technology (RADS-AT). The RADS-AT is used to perform vibration analysis and rotor track/balance of helicopters. Bell Helicopter has selected the RADS-AT as the primary system to use on its helicopters.

Located on the first page of Bell's Rotor Track and Balance and Vibration Monitoring manual for the 206L/206L-1/206L-2/206L-3/206L-4 and 206LT is the following statement:

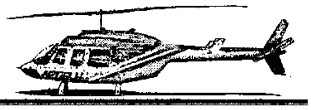
"The Signal Processing System (SPS) RADS-AT is the primary vibration analysis and rotor smoothing equipment recommended by Bell Helicopter Textron for maintaining the Model 206L Series."



SPS
Signal Processing Systems
A Division of Global Associates, Ltd.

13112 Evening Creek Drive South
San Diego, California 92128-4199
Telephone: (619) 679-6000
Fax: (619) 679-6400
Website: www.sps-globalus.com

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TECH TOOL PLASTICS, INC.
LITTER WEDGE WINDOW

Wedge style provides increased shoulder & elbow room

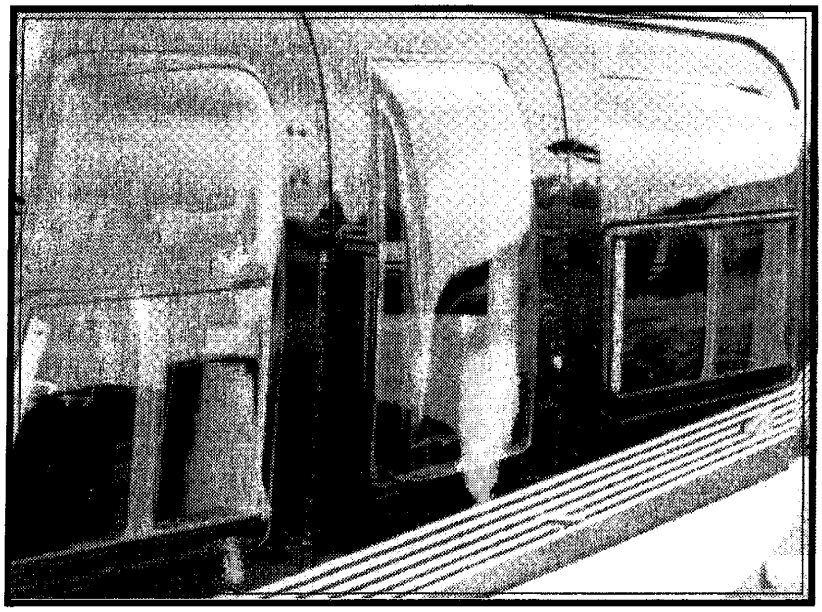
Window is same contour as forward & aft wedge windows

Gives helicopter a uniform & custom appearance

Enhances cabin comfort for all helicopter operations

Available in quick-change rubber mount or rivet installation

FAA/STC, CAA & Transport Canada approved



TECH TOOL PLASTICS, INC.
CAMERA WINDOW

Added comfort & increased productivity

Custom design offers increased air circulation

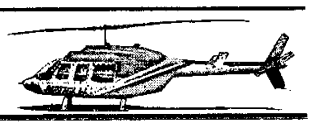
Excellent for law enforcement observation

Camera access for photography



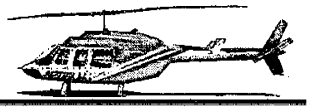
Tech-Tool Plastics, Inc.
7800 Skyline Park Drive
Fort Worth, Texas 76108
Telephone: 817-246-4694
Toll Free: 1-800-433-2210
Fax: 817-246-7402

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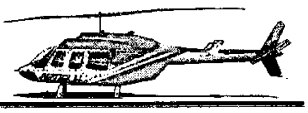


SECTION FOUR
DIMENSIONS & WEIGHTS
TABULAR PERFORMANCE

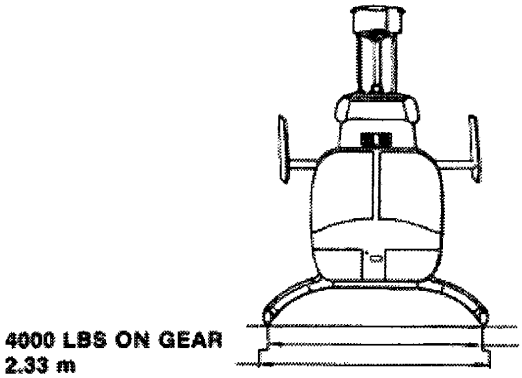
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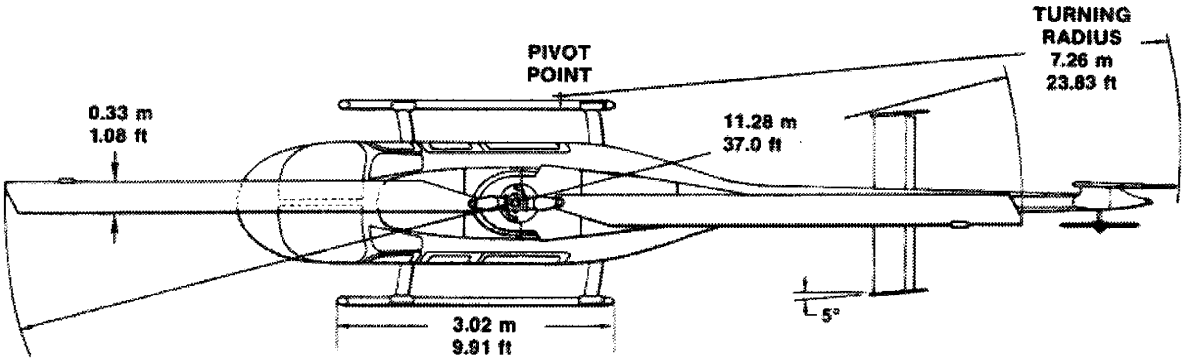


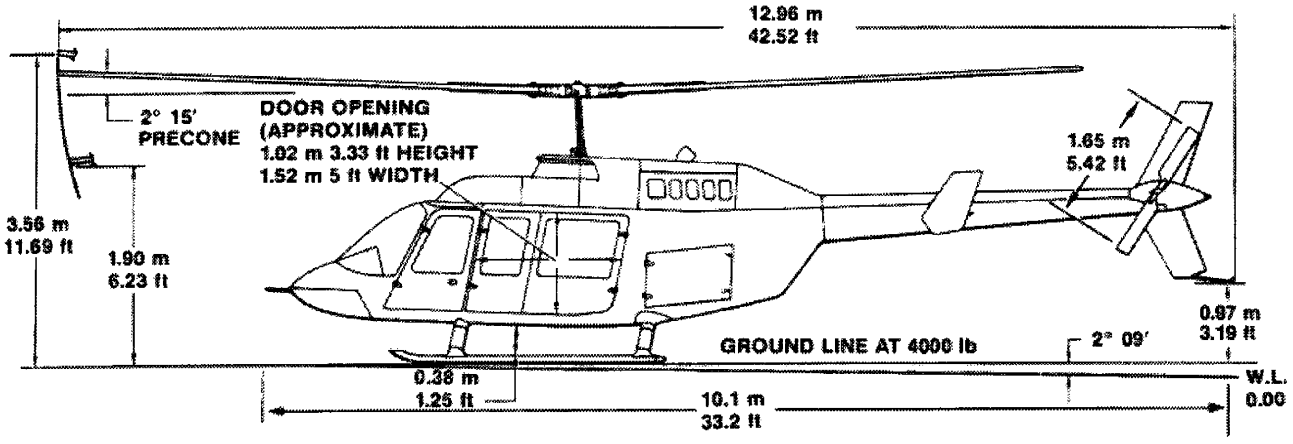
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PRINCIPAL DIMENSIONS

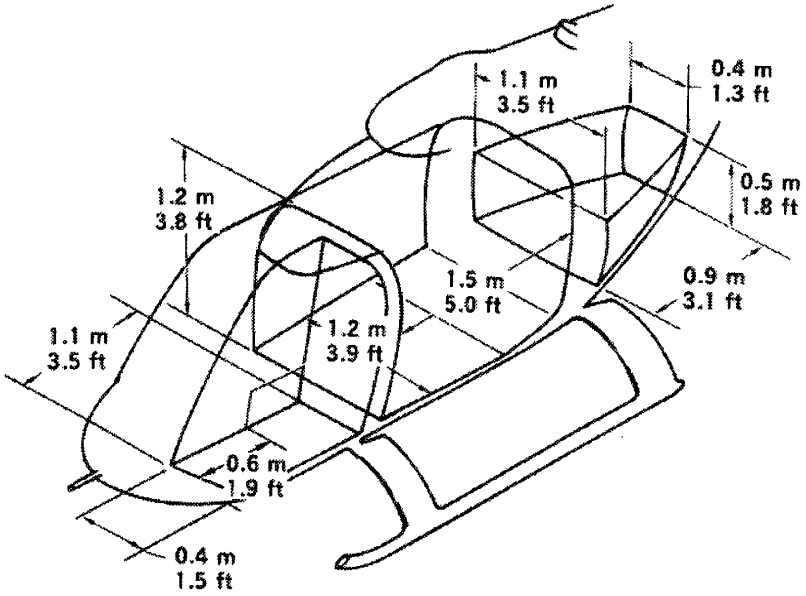






PRINCIPAL DIMENSIONS

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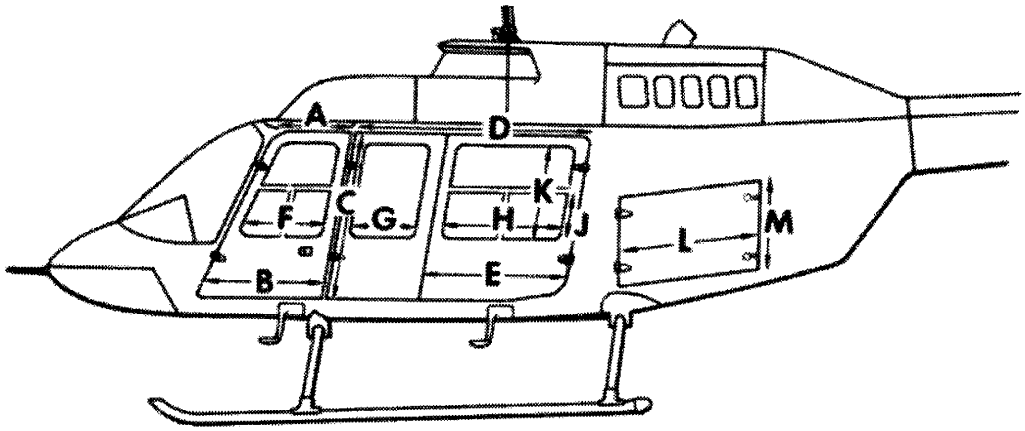


Approximate cargo space:

Aft cabin - 80 cubic feet (2.2 cubic meters)
including left front - 100 cubic feet (2.8 cubic meters)
Baggage compartment - 16 cubic feet (0.45 cubic meters)

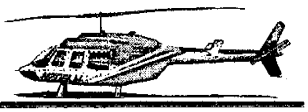
Cabin floor stressed for 75 lb/ft² (3.7 kg/100 cm²)
Baggage compartment floor stressed for 86 lb/ft² (4.2 kg/100 cm²).

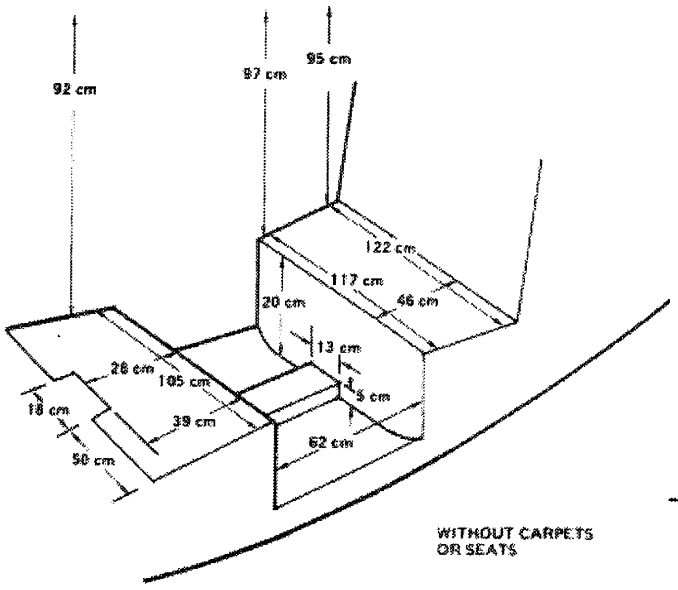
Baggage compartment maximum loading 250 pounds (113 kilograms).

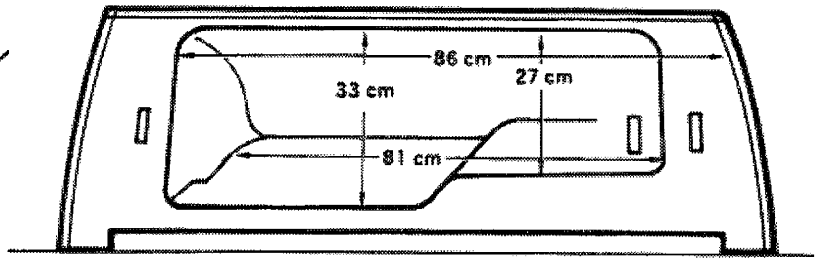


	CM	IN		CM	IN
A	49.5	19.5	G	36.8	14.5
B	78.7	31.0	H	76.2	30
C	104	41	J	27.9	11
D	152.4	60.0	K	70.0	24
E	91.4	36.0	L	94.0	37
F	43.2	17	M	58.4	23

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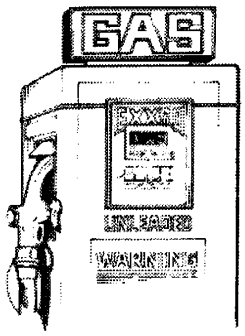




WEIGHTS

The Maximum Gross Weight for the LongRanger IV

Internal loading	4450 pounds (2018 kilograms)
External loading	4550 pounds (2063 kilograms)



The LongRanger in Standard Configuration as described

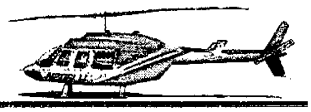
Empty weight*	2290 pounds (1031 kilograms)
Engine oil	13 pounds (6 kilograms)
	2303 pounds (1037 kilograms)

Full Fuel

110.7 US gal (419.0 liters) usable at 6.8 lb/gal
(0.815 kg/liter) 753 pounds (241 kilograms) usable fuel.

** The weight includes all the equipment described in the standard configuration, and trapped fluids. It does not include ballast because ballast is a function of installed optional equipment.*

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SPECIFICATION SUMMARY

(Serial No. 52188 & Subsequent)

WEIGHTS	**LBS**
Standard Configuration Weight (***Note 1***)	2302
FAA Normal Gross Weight	4450
FAA External Load Gross Weight	4550
Standard Configuration Useful Load (Gross Weight-Standard Configuration)	2148
Maximum External Load	2000

Note 1: **Includes** thirteen (13.0) pounds of engine oil. **Ballast** is not included in standard configuration weight (ballast is a function of installed equipment).

PERFORMANCE SUMMARY: (International Standard Day Except as Noted)

TAKEOFF, GROSS WEIGHT		***LBS***	***3600***	***4000***	***4450***
IGE Hovering Ceiling	ISA	ft	20,000 +	17,900	10,000
(2.5 skid height)	ISA+20 C	ft	18,600	15,300	7700
	ISA+30 C	ft	16,700	13,400	6600
OGE Hovering Ceiling	ISA	ft	16,600	13,600	6500
	ISA+20 C	ft	13,800	10,500	4200
	ISA+30 C	ft	11,500	7600	3100
Service Ceiling MCP,	ISA	ft/min	20,000 +	20,000 +	10,000
100 ft/min	ISA+20 C	ft/min	20,000 +	20,000	7700
	ISA+30 C	ft/min	20,000 +	17,500	6600
Range LRC Speed					
@ Average Gross Weight,	ISA	SLnm	334	327	321
Full Fuel		SLkn	116	114	110
		5000 ftnm	382	372	357
		5000 ftkn	118	117	114
MCP Speed @ Takeoff	ISA	SLkn	115	113	112
Gross Weight	ISA+20 C	SLkn	118	115	111
	ISA	5000 ftkn	120	117	111
	ISA+20 C	5000 ftkn	122	118	107
Loiter, ISA @ 52 knots		SL ft hr	3.9	3.8	3.7
		5000 ft hr	4.5	4.3	4.1

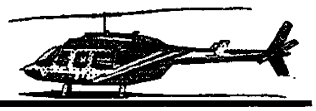
ENGINE POWER RATINGS:

(Allison 250-C30P)Uninstalled Thermodynamic Capability	
Takeoff , SHP	650
Maximum Continuous, SHP	557
TRANSMISSION RATING:	
Takeoff , SHP	490
Maximum Continuous, SHP	370
FUEL:	
Type	Aviation Turbine
Capacity (Usable)	110.7Gallons

Performance charts may be seen in the approved Flight Manual and Technical Brochure.

THE DATA SET FORTH ON THIS DOCUMENT ARE GENERAL IN NATURE AND MAY VARY WITH CONDITIONS. FOR PERFORMANCE AND OPERATING LIMITATIONS FOR ANY SPECIFIC FLIGHT MISSION, REFERENCE MUST BE MADE TO THE APPROVED FLIGHT MANUAL.

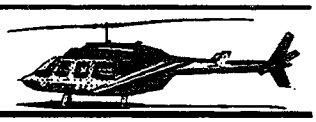
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OPTIONAL ACCESSORIES

PART NUMBER	KIT DESCRIPTION	WT CHG LBS(KG)
AIRFRAME		
206-706-127-113	DUAL CONTROLS	10.8(4.9)
206-706-210-113	LT WEIGHT POP-OUT FLOATS	156.0(70.8) (1
206-706-064-105	HIGH SKID GEAR	33.8(15.3) (1
206-706-509-101	SKID GEAR FAIRINGS	10.2(4.6) (3
206-706-123-001	MAINTENANCE STEP	1.3(0.6)
AUDIO		
206-705-008-153	AFT AUDIO ICS - ONE STATION	3.0(1.4)
AVIONICS		
206-705-008-131	ADF EQUIPMENT (KR-87)	7.1(3.2)
206-705-008-163	VHF/ADF PROVISIONS w/ AUDIO PANEL (KMA24H-71)	10.5(4.8)
206-705-008-103	VHF EQUIPMENT (KX-155)	7.7(3.5)
206-706-007-101	ENCODING ALTIMETER	1.0(0.5) (1
206-706-051-103	BLIND ENCODING ALTIMETER	1.9(0.9)
206-706-323-107	FLIGHT INSTRUMENTS LESS DIR. GYRO.	6.5(2.9)
206-706-323-107	FLIGHT INSTRUMENTS	10.0(4.5)
206-705-008-151	OMNI w/ PROVISIONS (KI208)	3.6(1.6)
206-705-008-115	TRANSPONDER PROVISIONS (KT-76A)	0.8(0.4)
206-705-008-117	TRANSPONDER EQUIPMENT (KT-76A)	2.5(1.1)
206-705-008-155	TRANSPONDER PROVISIONS (DIGITAL) (KT-70)	0.8(0.4)
206-705-008-157	TRANSPONDER EQUIPMENT (DIGITAL) (KT-70)	3.9(1.8)
ENGINE		
206-706-212-121	PARTICLE SEPARATOR w/ ECU	13.7(6.2)
206-706-212-123	PARTICLE SEPARATOR	13.7(6.2)
206-899-793-101	ENGINE FIRE DETECTION	1.9(0.9)
ENVIRONMENT		
206-0102-3	ECU EQUIPMENT (Non Freon)	113.6(51.5)
206-705-401-103	ECU DUCT PROVISIONS	6.2(2.8) (2
206-706-141-103	BLEED AIR HEATER	21.1(9.6)
EQUIPMENT		
206-704-722-101	HIGH ALTITUDE TIL ROTOR	11.0(5.0) (5
206-706-502-101	ROTOR BRAKE	13.3(6.0)
206-706-341-105	CARGO HOOK EQUIPMENT	3.6(1.6)
206-706-341-113	CARGO HOOK PROVISIONS	16.7(7.6)
206-706-343-101	LITTER PROVISIONS	5.4(2.4)
206-706-343-103	LITTER PROVISIONS w/ AIR SPLINT MOD.	7.9(3.6)
206-706-324-101	LITTER EQUIPMENT[2 LITTERS]	33.0(15.0)
206-706-208-101	REVERSE FLOW SNOW BAFFLE	4.9(2.2)
206-899-976-101	RESCUE HOIST PROVISIONS	10.3(4.7)
206-899-976-102	RESCUE HOIST EQUIPMENT	26.2(11.8)

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OPTIONAL ACCESSORIES (continued)

PART NUMBER	KIT DESCRIPTION	WT CHG LBS(KG)
INTERIOR		
206-706-512-101	ASHTRAY	0(0)
	DELUXE SEATS, FABRIC/VINYL	BASIC SHIP
206-705-714-105B	CUSTOM DELUXE SEATS-ALL LEATHER	6.0(2.7) (1
206-705-714-109A	CUSTOM DELUXE SEATS, FABRIC / LEATHER	[-2.4(-1.1)] (1
206-705-715-105B	DELUXE SEATS, ALL VINYL	0(0)
206-705-103-101	ECONOMY [PILOT SEAT/TRIM ONLY]	[-47.0(-21.3)]
206-706-043-101	SOUND-PROOFING	13.0(5.9)
HELICOPTER EXTERIOR		
	ANY THREE COLORS [DUPONT POLYURETHANE ONLY] APPLIED IN STANDARD SCHEMES SHOWN ON PAINT SELECTOR PAGES INCLUDED IN BASIC SHIP PRICE.	
VENDOR KITS		
SX-16C/016551	NIGHTSUN SEARCHLIGHT	69.6(31.6) (4
965-36502-002	WIRE STRIKE PROTECTION SYSTEMS	
	LOW SKID GEAR	16.4(7.4)
	HIGH SKID GEAR	17.4(7.9)

All equipment kits require Provision Kits prior to installation.

Notes:

(1) Price includes credit for standard ship hardware

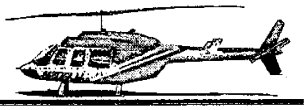
(2) Provisions only. ECU equipment: part number206-0102-3

(3) Only compatible with low skid gear.

(4) Requires High Skid Gear.

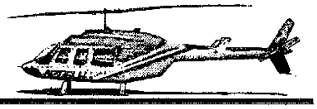
(5) Requires Encoding Altimeter or Blind Encoder.

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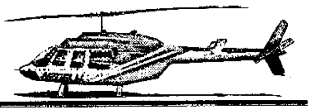


INDEX OF SECTION ONE
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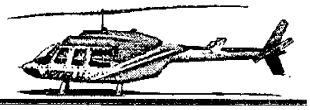


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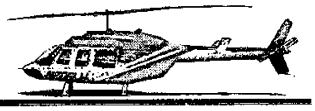
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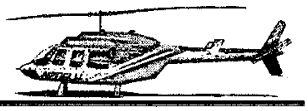
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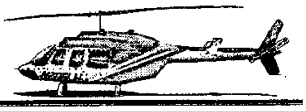
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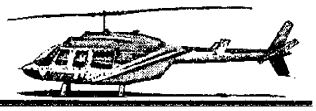
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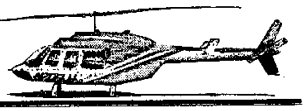
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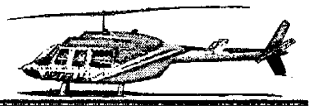
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