CONFIDENTIAL

ARROW 1 SERVICE DATA

SECTION 47

ELECTRONICS

J4 GYROSYN COMPASS

(This data supersedes previous issue dated 24 June 57)

15 JUN 58

ARROW 1 SERVICE DATA

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ELECTRONICS

J4 GYROSYN COMPASS

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DESCRIPTION

GENERAL

1 The J4 Gyrosyn Compass System provides continuously corrected magnetic north heading information which is supplied to two Course Indicators Type ID-250/ARN. Provision is made for supplying this information to indicators of a R-Theta system and a TACAN system.

2 The system may also be used as a directional gyro corrected for apparent drift due to the rotation of the earth.

3 The system comprises the following main component units:

(a) Control Panel - Kearfott No. 423050-3

(b) Directional Control - Kearfott No. 423040-2

(c) Flux Valve (Transmitter) - Sperry No. 620359 - USAF Type C-2

(d) Compensator - Sperry No. 620783

(e) Servo-amplifier - Kearfott No. 423060-2

(f) Servo-amplifier Mounting - Kearfott No. 323478

CONTROL PANEL

4 The control panel incorporates a function selector switch, indicator setting switch, hemisphere selector switch, latitude correction controller and a synchronizing indicator (annunciator).

5 The function selector switch provides for 'MAG' (Magnetic Compass) or 'DG' (Directional Gyro) modes of operation. When selected to the MAG position the synchronizing indicator is uncovered to show when the system is synchronized to the remote compass flux valve. When selected to the DG position the synchronizing indicator is covered and the letters DG appear in its place. The latitude correction controller and hemisphere selector switch are disconnected when the function selector switch is in the MAG position.

6 The indicator setting switch provides for manual synchronization of the repeater indicators. The proper direction of rotation for the switch is indicated by the synchronizing indicator. When the indicator needle is in the "+" region the setting switch must be turned to "+ INCR" i.e. clockwise, to the appropriate position for either a fast (7-9 rpm) or slow (1/2 rpm) slewing rate as desired, and when the indicator is in the "-" region the setting switch must be turned to "DECR -" i.e. counterclockwise to the position appropriate to the slewing rate desired. Synchronization must be obtained only by turning the setting switch in the direction appropriate for the symbol shown on the indicator.

7 The hemisphere selector switch and latitude correction controller are used in 'DG' operation. They are adjusted for the local latitude by setting the latitude dial to the required degree of latitude and the hemisphere selector switch to expose N for northern and S for southern latitudes.

DIRECTIONAL CONTROL

8 The directional control gyro is the stabilizing component of the J4 compass when the system is used as a slaved directional gyro system. It also provides reference signals for repeater indicators and dependent equipment when the system is operating as a latitude-corrected free directional gyro. The directional control contains a gyro motor levelling torquer, azimuth torquer, azimuth servo transmitter, electro-magnetic brake, levelling switch and associated circuitry.

FLUX VALVE AND COMPENSATOR

9 The remote compass flux valve controls the gyro precession for magnetic compass operation and slaves the system to the earth's magnetic meridian. The flux valve is fitted with a compensator which is set during compass swinging to correct compass deviation due to permanent magnetism in the aircraft.

SERVO AMPLIFIER

10 The servo amplifier is the receiving and distribution centre of the system. It contains the azimuth and slaving channels required for system operation. The assembly comprises the compass amplifier and its power supply,

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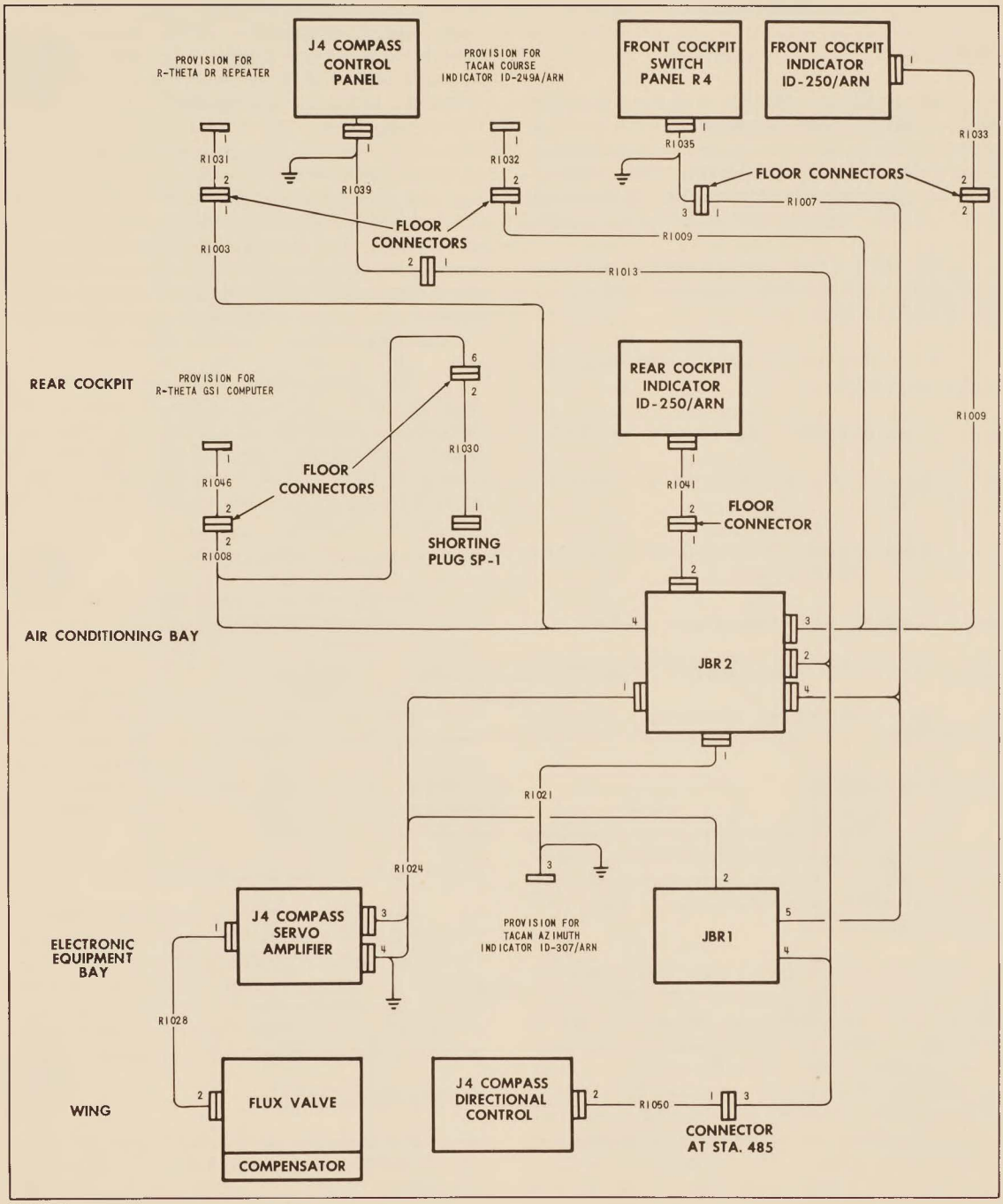

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FIG. 1 J4 GYROSYN COMPASS - GENERAL ARRANGEMENT

azimuth servo magnetic amplifier, the azimuth servo, the slaving cut-off relay and the necessary relays for automatic synchronization.

OPERATION

11 When the system is initially energized and the function selector switch is selected to the MAG position, or when switching, during operation, from the DG to MAG position, an error may exist between the remote compass flux valve and its synchro control transformer in the servo amplifier. This error is amplified and rectified in a phase sensitive rectifier circuit in the servo amplifier. The output of the phase sensitive rectifier actuates a magnetic amplifier which applies power to a slewing servo motor to drive an azimuth control transformer at a fast slewing rate of 5 degrees per minute in the proper direction to minimize the error. This automatic synchronization operation will continue for a 10 second period after which time the system will return to the normal magnetic mode and approach a null at the normal slewing rate of 2 degrees per minute. When the system is synchronized the synchronizing indicator needle on the control panel will remain on the synchronization index and the compass indicators will show magnetic heading.

12 Selecting the function selector switch to the DG position causes the gyro to precess in the direction selected on the hemisphere selector switch and at a rate determined by the setting of the latitude correction controller. When the indicators are synchronized manually, as described in para 6, the servo motor follows the gyro. This mode of operation is used in certain areas such as polar regions where rapid magnetic deviation changes cause corrections from the flux valve to become erratic.

13 The compass system needs at least two minutes warm-up time in the MAG mode of operation. This allows the gyro to attain operating speed. To achieve rated accuracy in the DG mode the system requires 12 minutes warm-up time. The gyro base should be approximately in the horizontal plane just prior to and for about 10 seconds after the application of power.

14 After the gyro motor is up to speed, manipulating the compass controls cannot cause

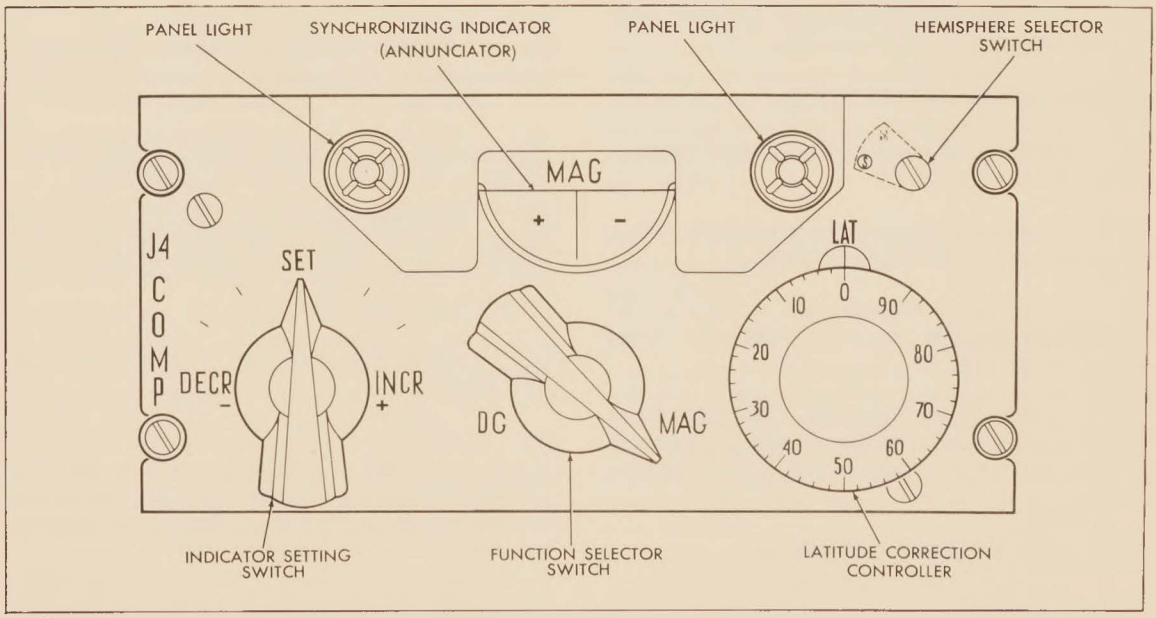

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FIG. 2 J4 GYROSYN COMPASS - CONTROL PANEL

damage to the system, so particular precautions need not be exercised while making adjustments.

15 To prevent damage to the gyro during violent aircraft manoeuvres, a caging switch marked NORMAL/AEROBATICS is provided on the front cockpit switch panel R4. The gyro is caged when the switch is selected to the AEROBATICS position.

SYSTEM POWER REQUIREMENTS

16 The J4 compass system operates on 27.5 volts DC at 1 amp; 115 volts AC, 400 cps, single phase at 54VA; and 115 volts AC, 400 cps, three phase at 16 VA.

TESTING AND SERVICING

GENERAL

17 Function testing should be carried out at the periods specified in the Maintenance Schedule and after replacing or repairing any part of the system.

18 A high impedance AC Voltmeter, 0-100V scale, is required to carry out the tests described below.

PREPARATION FOR TESTING

19 Prepare to carry out function testing, proceeding as follows:

(a) Remove all loose magnetic objects from the aircraft and from the person.

(b) Remove all objects such as the tow bar and towing vehicle out of interference range of the aircraft.

(c) Connect an external 115V AC three phase power supply to the aircraft, ensuring that the source of supply is out of interference range.

FUNCTION TESTING PROCEDURE

20 Two operators are required to carry out function testing. The procedure is as follows:

(a) Select to ON the master electrical switch located in the front cockpit.

(b) Remove the dorsal electronics access panel and plug a high impedance 0-100V AC Voltmeter into the receptacle in the base of the directional control.

(c) Close the J4 Compass DC supply circuit breaker located on JBR1.

(d) Close the J4 Compass AC supply ØB, ØA, ØC, and the instrument transformer input circuit breakers located on JBR1.

CAUTION

The DC circuit breaker must be closed first, and, if the system is shut down by opening the circuit breakers, it must be opened last.

(e) Note that a distinct click is heard in the directional control as soon as the system is energized, indicating that the electromagnetic brake is operating.

(f) Check that the gyro motor is running, by listening or placing the fingers on the case.

(g) Check that the AC Voltmeter reads less than 15 volts while the gyro is levelling.

(h) Observe the operation of the gyro through the window in the side of the case. Check that the gimbal oscillation damps out in under 30 seconds.

(j) Allow two minutes for the equipment to warm up.

(k) Select the function selector switch to MAG, move the synchronizer SET control to the decrease or increase position and check that the annunciator pointer takes up its position and remains at the synchronization index.

(m) Set the hemisphere switch to 'N', the latitude control to the local latitude and the function selector switch to DG.

(n) Rotate the indicator setting control clockwise two scale divisions and check that the cards on the two radio magnetic indicators ID-250 in the front and rear cockpits rotate smoothly to show increased reading.

(p) Repeat operation (n) with a counter-clockwise rotation of the indicator setting control to show decreased reading.

(q) Select the function selector switch to MAG and check that the radio magnetic indicators take up the aircraft magnetic heading and that the annunciator pointer comes to rest on the centre index, showing that the system is synchronized.

(r) Check that manual synchronization can be carried out whenever the function selector switch is in the MAG position.

(s) Check that automatic synchronization takes place when the function selector switch is selected momentarily to DG and then back to MAG.

COMPASS SWINGING PROCEDURE

21 The gyrosyn compass error must be determined and compensated while the aircraft is at the compass swinging area. The various compass deviation factors are as follows:

Coefficient A - This signifies a constant deviation on all headings and is calculated by taking the mean value of all deviations recorded during the swing. Compensation is achieved by rotating the flux valve bodily in relation to the aircraft.

Coefficient B - This signifies a deviation caused by longitudinal permanent magnetism in the aircraft and is rectified by the compensator longitudinal magnets. This error is maximum East to West and zero North to South.

Coefficient C - This signifies a deviation caused by lateral permanent magnetism and is rectified by lateral compensator magnets.

Coefficients D and E - These signify deviations resulting from a "soft iron" effect in the aircraft and cannot be compensated for. Such errors are plotted on the compass deviation card.

22 The following measures must be taken when the aircraft is at the compass swinging area.

(a) Remove all loose magnetic objects from the aircraft and from the person.

(b) Remove the tractor, tow bar and other such objects out of interference range. (To determine whether such objects interfere or not, it is necessary to wait at least four minutes for their effects to appear on the indicator).

(c) Check that the external power supply is out of interference range.

(d) Check that all flying controls are in the neutral position.

23 Using a sighting compass corrected to ± 1/4 degree and accurately rigged sighting points, compensate for coefficient A errors proceeding as follows:

(a) Set the aircraft heading magnetic East.

(b) Switch on the gyrosyn compass and allow four minutes warm up time.

(c) Tap the remote flux valve and the indicator lightly with a non-magnetic object before reading and record the difference between the indicated heading and the true heading. If the indicated heading is greater than the true heading, record as "plus", and, if less, record as "minus".

(d) Repeat operation (c) with the aircraft heading magnetic South, West and North in that order.

(e) Add the differences and divide by four, and rotate the flux valve bodily the required number of degrees in the appropriate direction to compensate for this average error. To correct positive error, rotate the flux valve counter-clockwise viewed from above, and to correct negative error, rotate clockwise.

24 Compensate for errors due to coefficients B and C proceeding as follows:

(a) Place the aircraft on a North heading (0 degrees).

(b) Correct for all error at this heading by turning the N-S adjusting shaft on the compensator, through the hole in the flange, until the indicated reading corresponds to the aircraft heading within ± 0.5 degrees.

(c) Place the aircraft on an East (90 degrees) heading and correct for the error to within ± 0.5 degrees by adjusting the E-W shaft on the compensator.

(d) Place the aircraft on a South (180 degrees) heading and note the error. Correct for half the error by rotating the N-S adjusting shaft. This must produce a reading within ± 0.5 degrees of the aircraft heading.

(e) Place the aircraft on a West (270 degrees) heading and note the error. Correct one half the error by rotating the E-W adjusting shaft. This must produce a reading within ± 0.5 degrees of the aircraft heading.

25 Enter the remaining errors (coefficients D and E) on the compass deviation card, noting the error every 30 degrees. Ensure that at each of the four cardinal points, the residual error does not exceed ± 0.5 degrees.

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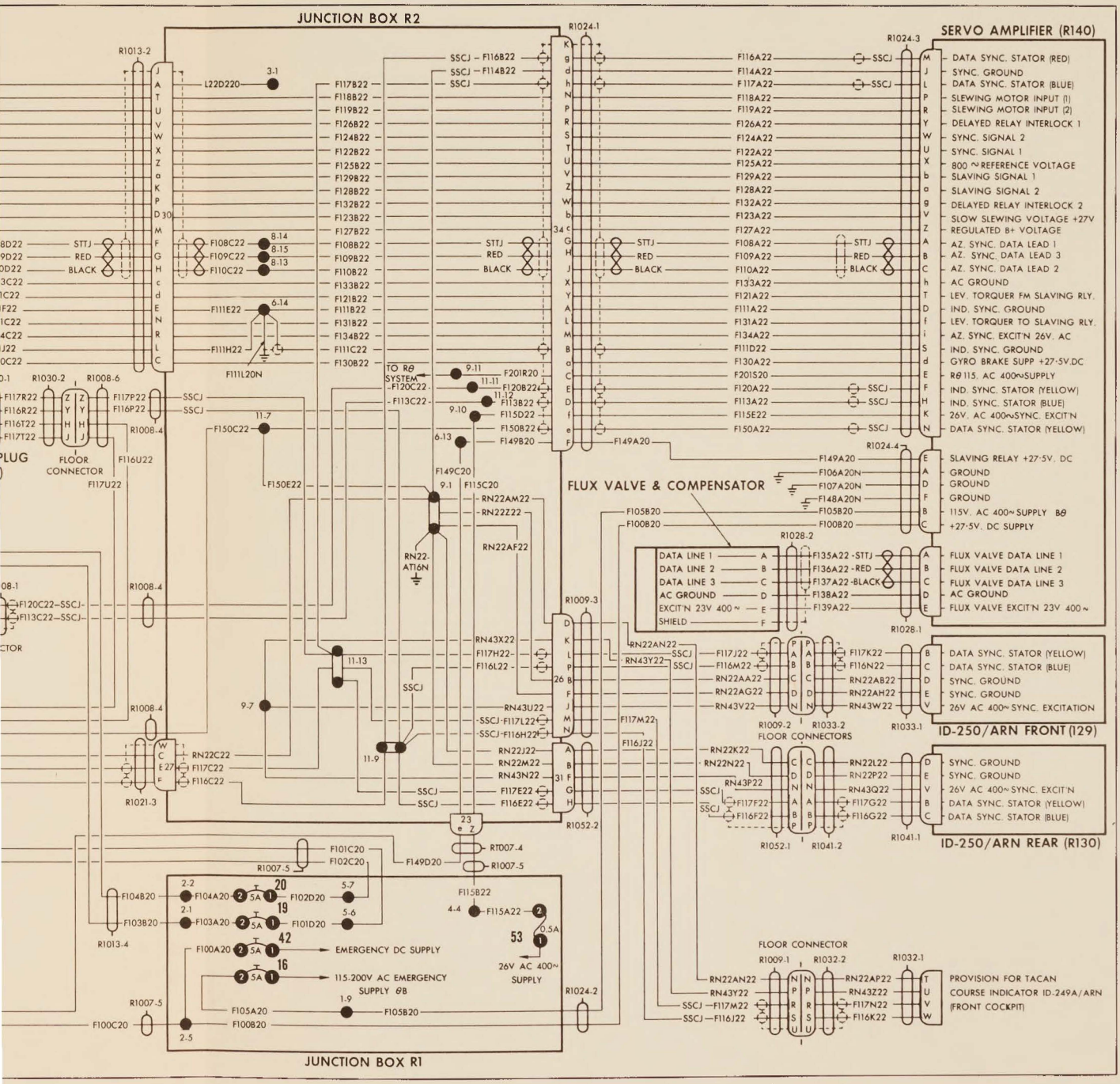

FIG. 3 J4 GYROSYN COMPASS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J 4 GYROSYN COMPASS	Control Panel	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Kearfott Co.	423050-3	25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1000 hours

FUNCTION

Houses the J4 Compass System function selector switch, hemisphere selector switch, latitude correction controller, indicator setting switch and synchronizing indicator.

LOCATION

Front cockpit - RH console.

ACCESS — MEN X MINUTES

Remove the unit from the console by releasing four Dzus fasteners.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure cable assembly R1039-1.
Secure the ground lead.
Secure the panel to the console with four quick-release fasteners.

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INSPECTION	MEN X MINUTES	
Check the panel for security and cleanliness. Check that the connector is securely and properly fitted. Check that the ground lead is secure and making good electrical contact.		

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FUNCTIONAL CHECKS	MEN X MINUTES	
Check the panel light filaments for serviceability.		

GROUND HANDLING AND GROUND TEST EQUIPMENT

External power supply.
0-100V AC voltmeter.
Magnetic sighting compass.

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

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COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J 4 GYROSYN COMPASS	Directional Control	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Kearfott Co.	423040-2	25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 1000 hours

FUNCTION

Stabilizing component of the J4 compass system when used as a slaved directional gyro system. Provides reference signals available for repeater indicators and dependent equipments when the system is operating as a latitude-corrected free directional gyro.

LOCATION

Dorsal at station 505.

ACCESS

MEN X MINUTES

Remove dorsal electronics access panel - six latches.

REPLACEMENT PROCEDURE

MEN X MINUTES

Keep the unit upright.
Fit and secure the unit to its shockmount with two mounting screws and two wing nuts.
Fit and secure cable assembly R1050-2.
Refit the dorsal electronics access panel - six latches.

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INSPECTION	MEN X MINUTES	
Check that the unit is securely mounted. Check that the electrical connector is securely and properly fitted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

External power supply.
0-100V AC voltmeter.
Magnetic sighting compass.

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J4 GYROSYN COMPASS	Flux Valve	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Sperry Gyroscope Co.	Sperry No. 620539 USAF Type C-2	25201

OVERHAUL LIFE: KNOWN- ESTIMATED- 1000 hours

FUNCTION

To sense, in the form of an electrical indication, deviation from magnetic north. These indications are transmitted to the J4 compass servo-amplifier.

LOCATION

Leading edge of right inner wing.

ACCESS — MEN X MINUTES

Remove the access panel located in the leading edge of the RH wing - 54 screws.

REPLACEMENT PROCEDURE — MEN X MINUTES

Secure the unit to its mounting with three mounting screws.
Connect the electrical wiring.
Refit the access panel located in the leading edge of the RH wing - 54 screws.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check the flux valve for security of mounting. Check that the unit is undamaged.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

External power supply.
0-100V AC voltmeter.
Magnetic sighting compass.

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J 4 GYROSYN COMPASS	Compensator	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Sperry Gyroscope Co.	620783	25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1000 hours

FUNCTION

To compensate the flux valve for constant magnetic distortion introduced by the aircraft structure or electrical equipment.

LOCATION

Leading edge of RH inner wing, mounted on the flux valve.

ACCESS — MEN X MINUTES

Remove the access panel located in the leading edge of the RH wing - 54 screws.

REPLACEMENT PROCEDURE — MEN X MINUTES

Fit and secure the compensator to the flux valve with six mounting screws.
Refit the access panel located in the leading edge of the RH wing - 54 screws.

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES	
Check that the unit is securely mounted.		

FUNCTIONAL CHECKS	MEN X MINUTES	

GROUND HANDLING AND GROUND TEST EQUIPMENT

External power supply.
0-100V AC voltmeter.
Magnetic sighting compass.

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J 4 GYROSYN COMPASS	Servo-amplifier	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Kearfott Co.	423060-2	25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1000 hours

FUNCTION

Amplifies electrical indications received from the J4 compass flux valve. Houses the compass amplifier and its power supply, the azimuth servo-amplifier, the azimuth servo magnetic amplifier, azimuth servo, the slaving cutoff relay and relays for automatic synchronization.

LOCATION

Electronics equipment bay - LH side.

ACCESS

	MEN X MINUTES	
Release the electronics equipment bay centre access door - 33 camlocs. Release the motor actuator switch access flap on the RH underside of the electronic equipment bay - two camlocs. Select the motor actuator switch DOWN and lower the electronic equipment bay centre access door.		

REPLACEMENT PROCEDURE

	MEN X MINUTES	
Clamp the amplifier to its mounting by securing one wing-nut. Fit and secure cable assemblies (R1028-1, R1024-4, R1024-3). Select the motor actuator switch UP and raise and secure the electronic equipment bay centre access door - 33 camlocs. Secure the motor actuator switch access flap - two camlocs.		

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the unit is securely mounted. Check that the electrical connectors are securely and properly fitted. Check that the ground leads are secure and making good electrical contact.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

External power supply.
0-100V AC voltmeter.
Magnetic sighting compass.

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

ARROW 1 SERVICE DATA

COMPONENT DATA SHEET

SYSTEM	SUB-SYSTEM	COMPONENT	REF. NO.
ELECTRONICS	J4 GYROSYN COMPASS	Servo-amplifier Mounting	47

AVRO PART NO.	MANUFACTURER	MAN'F'R'S PART NO.	AIRCRAFT EFFECTIVITY
	Kearfott Co.	323478	25201

OVERHAUL LIFE: KNOWN– ESTIMATED– 1500 hours

FUNCTION

Shockmounts the J4 compass Servo-amplifier.

LOCATION

Electronics equipment bay - LH side.

ACCESS

	MEN X MINUTES
Release the electronics equipment bay centre access door - 33 camlocs. Release the motor actuator switch access flap on the RH underside of the electronic equipment bay - two camlocs. Select the motor actuator switch DOWN and lower the electronic equipment bay centre access door.	

REPLACEMENT PROCEDURE

	MEN X MINUTES
Fit the mounting to the airframe with four mounting bolts. Select the motor actuator switch UP and raise and secure the electronic equipment bay centre access door - 33 camlocs. Secure the motor actuator switch access flap - two camlocs.	

ARROW 1 SERVICE DATA

INSPECTION	MEN X MINUTES
Check that the unit is securely mounted.	

FUNCTIONAL CHECKS	MEN X MINUTES

GROUND HANDLING AND GROUND TEST EQUIPMENT

SPECIAL TOOLS TO REMOVE OR SERVICE

REMARKS

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SECTION 48

INSTRUMENT PACK

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INSTRUMENT PACK

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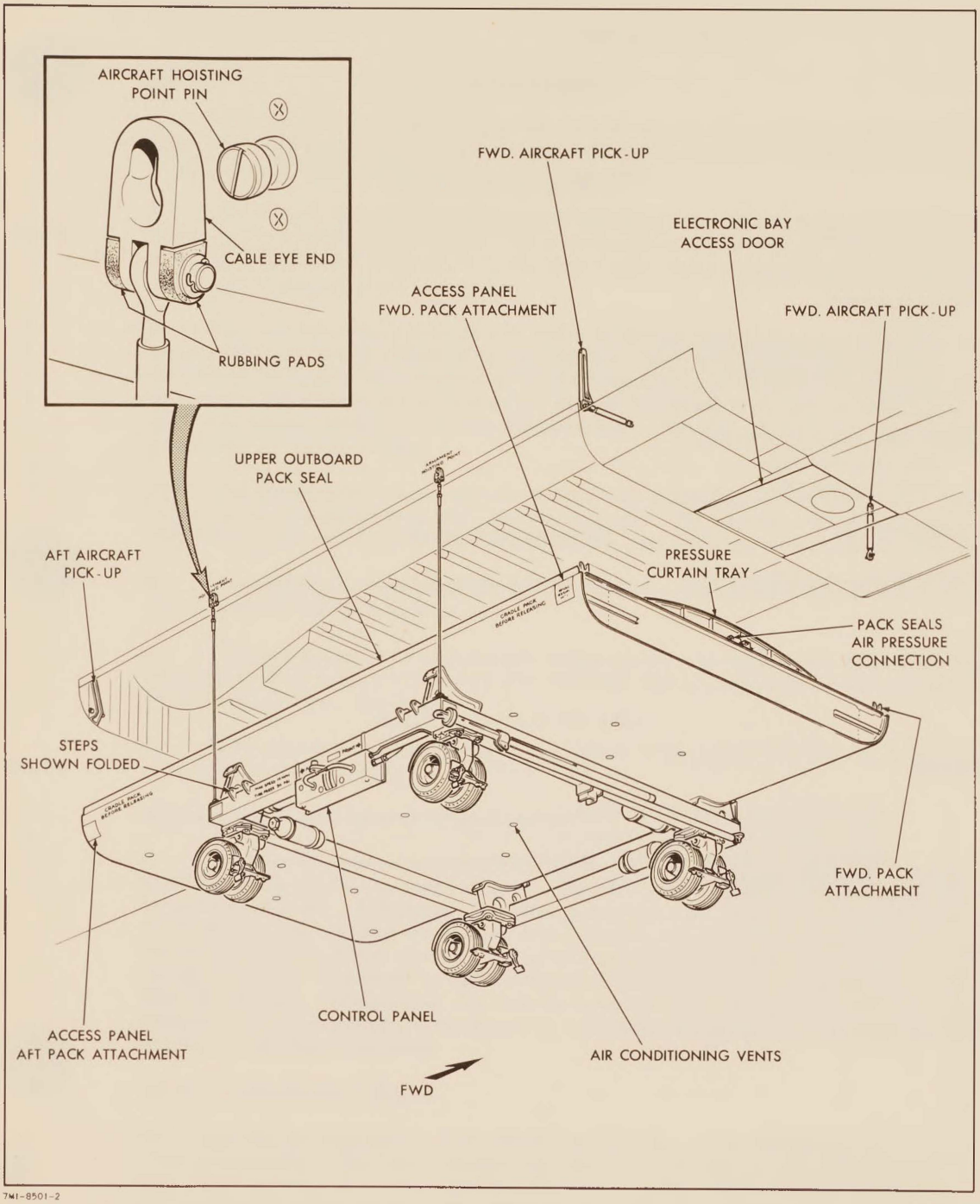

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FIG. 1 INSTALLATION OF INSTRUMENT PACK

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DESCRIPTION

General

1. The Arrow 1 aircraft utilizes the armament bay for carrying a flight test instrumentation pack. The method of attachment of this pack to the aircraft is similar to that employed for the missile pack which will be used in later aircraft.

2. The instrument pack consists structurally of a box beam frame strengthened by lateral beams and longitudinal stringers. It is enclosed on the underside by a light alloy skin. Four attachment assemblies mounted at the upper four corners of the pack lock onto four pick-ups in the centre fuselage of the aircraft.

3. The four aircraft pick-ups are attached to the centre fuselage, two front pick-ups at station 294 and two aft pick-ups at station 482. The left-hand front pick-up pin is mounted on a link which is free to move fore and aft and laterally, and takes vertical loads only. The right-hand front pick-up is free to move fore and aft and takes side and vertical loads. Both front links are spring loaded to the installed position. The two aft pick-ups are rigidly attached to take loads in all directions.

4. Two ducts in the armament bay roof carry temperature controlled air, exhausted from the cabin, to the armament bay and instrument pack. The pack is sealed in flight by seals on all four sides, and vents in the bottom skin of the pack provide an exhaust for the air.

5. Up to fifteen access panels may be installed in the bottom skin of the instrument pack for easy access to various instruments.

6. The instrument pack is installed in the aircraft by means of a pneumatic hoist which attaches by four cables to hoisting pins located, two on each side of the aircraft fuselage, above the armament bay. See Fig 1.

7. Four ground handling brackets are bolted to the upper surface of the pack, for attachment of a ground handling sling.

Forward Pack Attachments (Figs 2 and 3)

8. The two forward pack attachment assemblies are similar and each consists of two fixed V-shaped guide brackets which engage with the aircraft pick-up pin, and a double latch which locks over the pin. The latches are retained in the open position by a hold-open spring. After the brackets are engaged the latches are moved to the fully locked position by turning a hexagon headed pin with a socket wrench. Stops are provided to prevent the linkage turning past the locked position. A pip-pin is then inserted in a hole provided in the frame of the assembly to lock the linkage. The pip-pin can only be inserted when the latches are in the fully locked position. The mechanism is unlocked by removing the pip-pin and turning the hexagon headed pin in the direction indicated.

Aft Pack Attachments (Fig 4)

9. The two aft attachment assemblies are similar, each consisting of a fixed double hook and a latch assembly. The hook engages with the aircraft pick-up pin and the latch locks over the pin. The latch is held in the open position by a spring, and is turned to the fully locked position by turning a hexagon headed pin, which is connected to the latch by a linkage. A roll-pin

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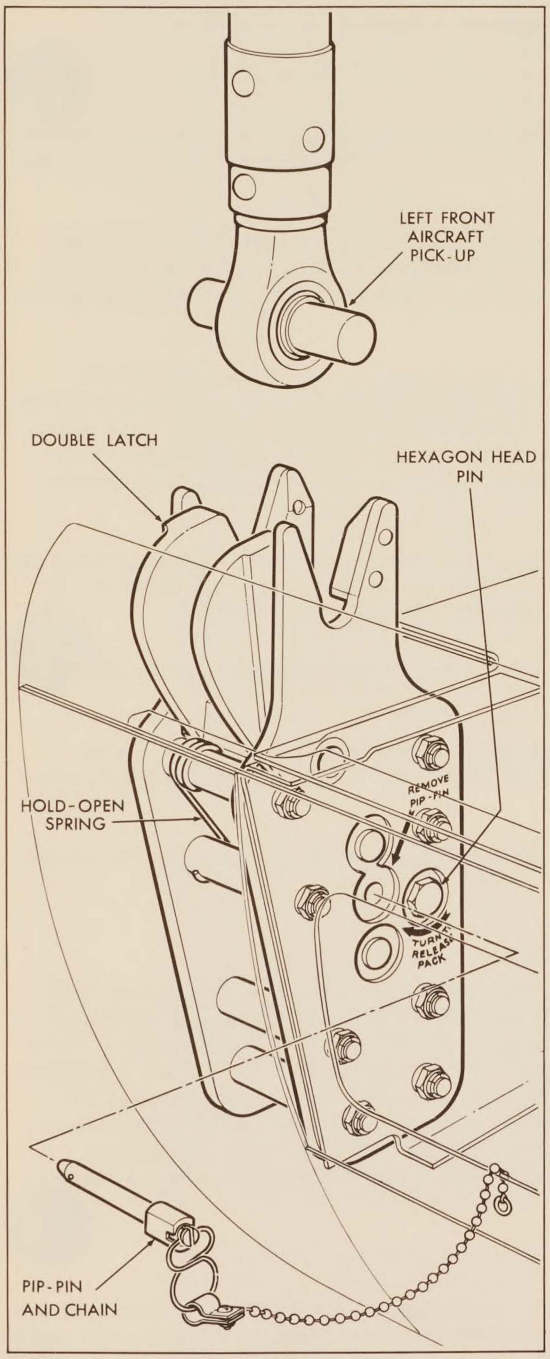

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FIG. 2 L.H. FORWARD PACK ATTACHMENT

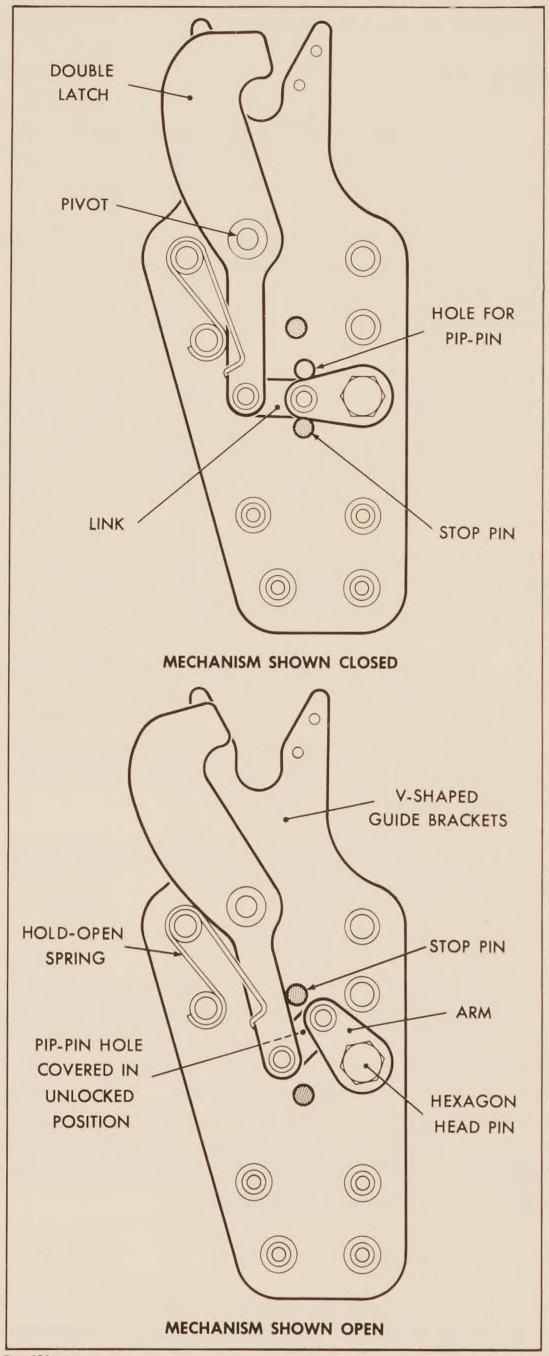

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FIG. 3 OPERATION OF FORWARD PACK ATTACHMENT

prevents the linkage turning past the locked position. A pip-pin is then inserted in the hole provided to lock the linkage in position. The mechanism is unlocked by removing the pip-pin and turning the hexagon headed pin with a socket wrench.

10. Guides mounted on the aft attachment assemblies locate on rollers on the outboard sides of the aircraft pick-ups and align the pack for installation.

Sealing

11. The instrument pack is sealed by five seals, three pneumatic and two static. The upper forward pack seal is static and consists of a pressure curtain in the armament bay pressing against a curtain tray at the forward end of the pack. The lower forward pack seal is pneumatically operated and consists of a teflon-covered, rubber-padded alloy spring projecting aft from the bulkhead at station 292 and following the lateral contour of the armament bay. When the pack is installed this spring contacts a contoured channel at the forward edge of the pack. A pneumatic tube mounted above the spring inflates in flight and maintains close contact between the spring and the contoured channel.

12. The upper outboard seals run the length of the pack on the outer edges. Each consists of a teflon-covered, rubber-padded, alloy spring, which projects upwards from the edge of the pack and presses against a contoured channel at the lower outboard edge of the armament bay. A tube mounted inboard of the spring inflates when the aircraft leaves the ground and maintains close contact between the spring and the contoured channel. The aft seal is static and consists of a V-shaped rubber seal attached to the bulkhead at station 482 which makes a contact with a shaped extrusion on the aft edge of the pack when the pack is installed.

13. A solenoid operated control valve on the bulkhead at station 296 supplies low pressure air through a flexible hose to the pneumatic seals on the pack. The flexible hose connects with a union at the front end of the pack. Access to the connection is from the electronics bay forward of the armament bay.

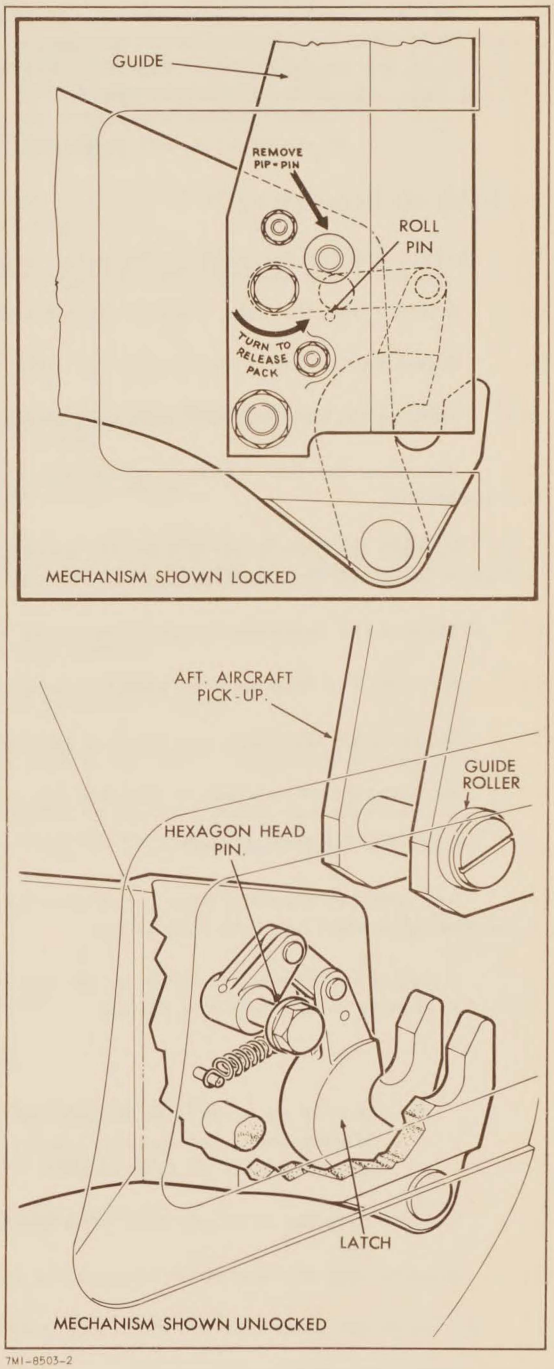

FIG. 4 AFT PACK ATTACHMENT

14. The control valve is actuated by a micro-switch on the right-hand main landing gear leg torque link. Air is supplied to the pneumatic pack seals when the weight of the aircraft is removed from the landing gear. For description and operation of the pneumatic seals see Arrow I Service Data - Low Pressure Air System.

TESTING AND SERVICING

Installing the Pack (Fig 1)

15. Before placing the pack on the armament hoist, check the hoist as follows:

(a) Ensure that the stop cock is closed and that the control handle is in the STOP position.

(b) Examine the hoist externally for serviceability.

(c) Ensure that the rubber pads and contoured boxes are secure and serviceable.

(d) Examine the four cables, cable eye-end fittings and turnbuckles for security and serviceability.

(e) Ensure that the hoist pneumatic system contains sufficient air pressure. The minimum pressure required for installation is 1200 psi.

16. Position the instrument pack correctly on the hoist and proceed as follows:

(a) Remove the four access panels covering the attachment assemblies.

(b) Manoeuvre the hoist and pack in position below the armament bay.

(c) Stow the hoist tow bar in the tow bar stowage hook provided.

(d) Open the hoist stop cock.

(e) Release the hoisting pins located in the fuselage above the armament bay. The pins are of the spring loaded bayonet catch type.

(f) Connect the cable eye-ends to the hoisting pins. Steps are provided on the hoist to facilitate access to the hoisting points.

NOTE

If it is necessary to extend the cables to reach the hoisting points, slowly move the control handle to DOWN and maintain cable tension by pulling on all four cables.

(g) Ensure that the front pick-up pins are correctly aligned.

(h) Ensure that all four pack attachment locks are open.

17. To raise the pack into the aircraft, proceed as follows:

(a) Slowly move the control handle to UP and allow the cables to tighten.

NOTE

After making the initial UP selection apply tension to the four cables to prevent the cable eye-ends becoming disengaged from the hoisting pins. This function may be performed by personnel pulling downwards on the cables until the slack has been taken up.

(b) Continue to raise the hoist. Trim the fore-and-aft level of the pack by rotating the control handle until the pack is aligned in the armament bay.

(c) Engage the rear guides with the rollers on the aircraft pick-ups and allow the pack to go fully home until the attachment hooks engage.

(d) Return the control handle to the STOP position.

(e) Lock each latch by fitting a socket wrench on the hexagon headed pin and turning the latch to the locked position. Insert the pip-pin to lock the latch.

(f) Replace the access panels over the attachment assemblies.

(g) Connect the flexible hose from the control valve on the bulkhead at station 292 to the pack connection at the front of the pack. Access to the connection is through the electronics bay forward of the armament bay.

18. To remove the hoist from the aircraft proceed as follows:

(a) Move the mechanical lock release lever down and hold it down.

(b) Slowly move the control handle to DOWN and lower the hoist, trimming as necessary.

(c) When the hoist is fully down pull up on the cables to provide sufficient slack for disconnection. Return the control handle to STOP and release the mechanical lock release lever.

(d) Close the stop cock.

(e) Disconnect and stow the hoist cables.

(f) Lock the hoisting pins in the retracted position.

Removing the Pack (Fig 1)

19. Check the hoist as detailed in para 15, then proceed as follows:

(a) Position the hoist below the aircraft and stow the tow bar.

(b) Release the four hoisting pins on the side of the aircraft.

(c) Open the pneumatic stop cock on the hoist.

(d) Attach the cable eye-ends to the hoisting pins. See para 16 (f).

(e) Move the control handle slowly to UP, maintaining tension on the cables as detailed in para 17.

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(f) Allow the hoist to rise and cradle the pack.

(g) Stabilize pressures on gauges B and C at 900 psi by rotating the control handle as necessary and return the control handle to STOP.

WARNING

The pack must not be unlocked when pressures shown on gauges B and C, on the hoist control panel, are below 900 psi.

(h) Disconnect the air supply flexible hose at the forward end of the pack.

(j) Remove the four access panels covering the attachment assemblies.

(k) Unlock the latches by removing the pip-pins and turning the hexagon headed pins in the direction indicated.

20. To lower the pack proceed as follows:

(a) Move the mechanical lock release lever down and hold it down.

(b) Slowly move the control handle to DOWN and allow the pack to descend, trimming as necessary by rotating the control handle.

(c) When the hoist reaches the ground pull up on the cables to provide sufficient slack for disconnection and return the control handle to STOP. Release the mechanical lock release lever.

(d) Close the stop cock.

(e) Remove the cable eye-ends from the hoisting pins, and stow the cables.