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CF-105 SERVICE DATA

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Signature Gottfousen Rank FL

Section 24
ENGINE CONTROLS

FILE IN VAULT

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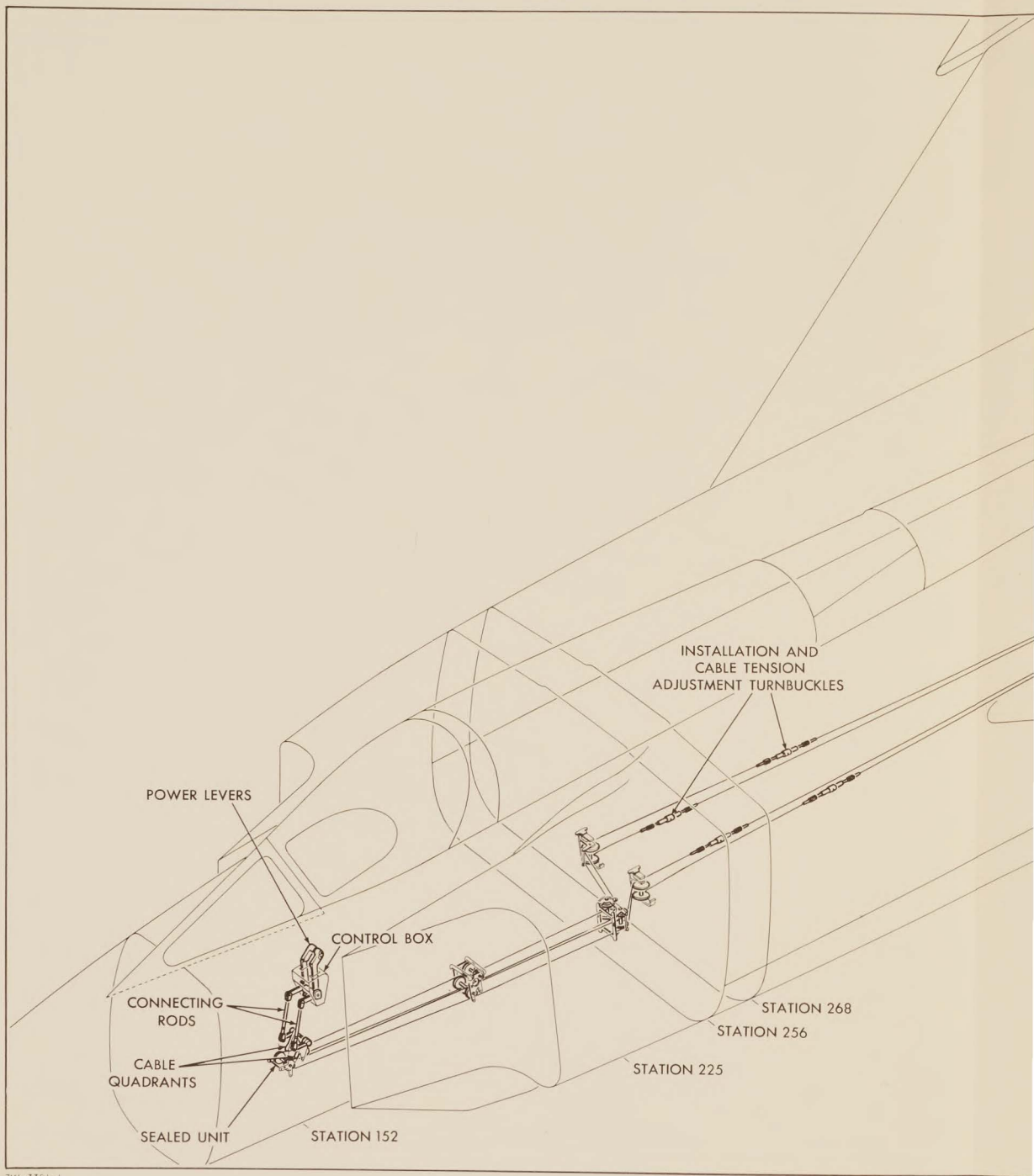
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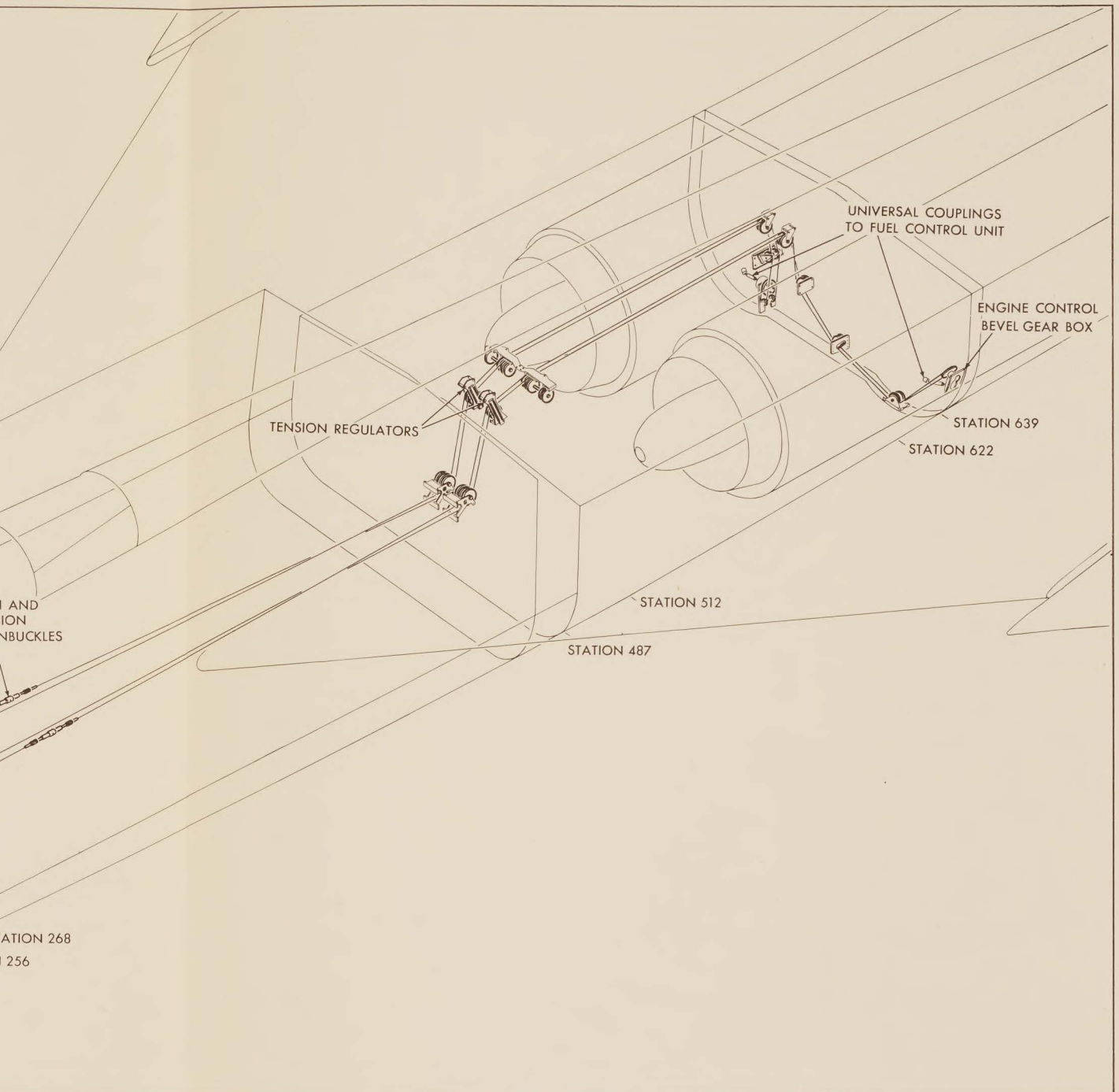
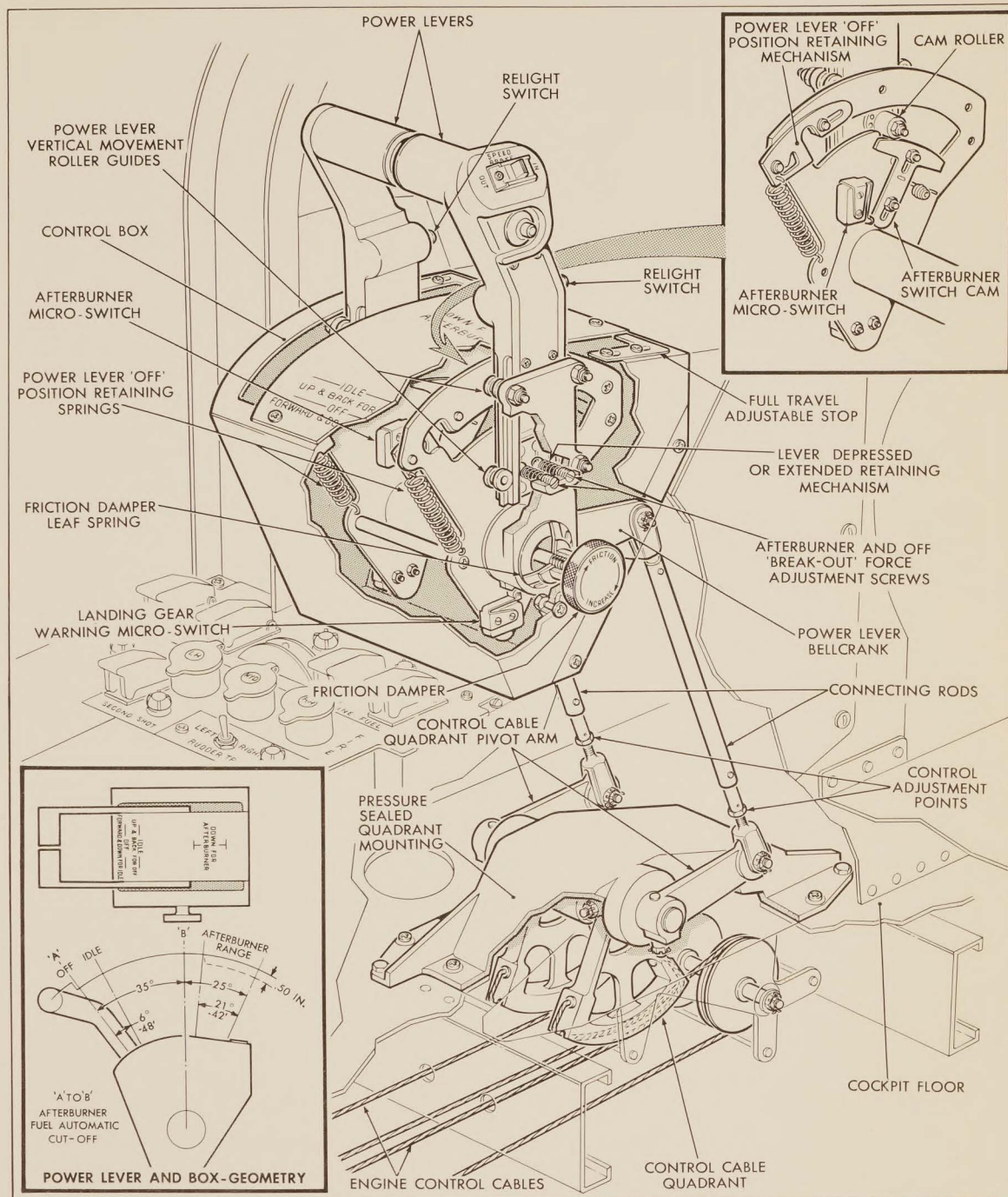


FIG. 1 ENGINE CONTROLS - COMPONENT LAYOUT

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FIG. 2 CONTROL BOX AND QUADRANT

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SYSTEM DATA SHEET

SYSTEM	SUB-SYSTEM	AIRCRAFT EFF'TY	REF. NO.
ENGINE CONTROLS		25201	14
<p>DESCRIPTION</p> <p>General</p> <p>1. The engine controls operate the engine fuel flow unit of each engine. Two levers mounted in a control box assembly are arranged to provide engine OFF, IDLE, MILITARY and AFTERBURNER ON selections. The power levers operate the engine fuel flow units through two short rods to a cable quadrant which transmits the power lever movement to the cable assemblies. The cables are guided below the cockpit floor and through the fuselage by a series of pulleys and fairleads, terminating at an engine control universal coupling and drive shaft. A spring loaded tension regulator is fitted in the cable run to each engine.</p> <p>Power Levers and Control Box Assembly (Fig 2)</p> <p>2. The control box assembly is located on the left hand side of the front cockpit and mounts two power levers, one for each engine. An initial forward and downward movement of each power lever operates the engine fuel flow unit from OFF to IDLE and the remaining forward movement progressively opens the fuel flow unit to maximum power. When the power lever is approximately two thirds open, it can be depressed to switch on the afterburner. This is achieved by a cam roller on the power lever depressing a spring loaded afterburner switch cam, which operates an afterburner micro-switch. The switch causes the afterburner fuel flow unit and fuel ignitors to operate and opens the engine exhaust nozzle to the afterburner operating position. The power lever is retained in the three vertical positions by two balls which are each spring loaded into three indents on a plate fitted to the control box. Set screws permit loading of the springs to adjust the break-out force. The lever is retained in the OFF position by a mechanism consisting of a camplate and a tensioned spring. Adjustable stops are fitted on the control box at the forward end of the power lever travel to provide adjustment for the maximum power position of each lever.</p> <p>3. When the power lever has been selected to the afterburner ON position, a break-out force of 8 pounds is required to extend the lever and return the engine control to normal operation. Operating the lever from the IDLE to the OFF position requires an up and rearward movement with a break-out force of 15 pounds.</p> <p>4. If the afterburner is on, and power must be reduced quickly, retarding the power lever aft of the AFTERBURNER ON range will cause the cam roller on the power lever to ride up the ramp in the camplate and cut off the afterburner. A hydro-mechanical unit within the afterburner fuel system cuts off the afterburner whenever the power lever is retarded beyond the afterburner on range. This unit is independent of the electrical system, and will operate if the electrical circuit fails, but the afterburner cannot be operated again until electrical power is restored.</p>			
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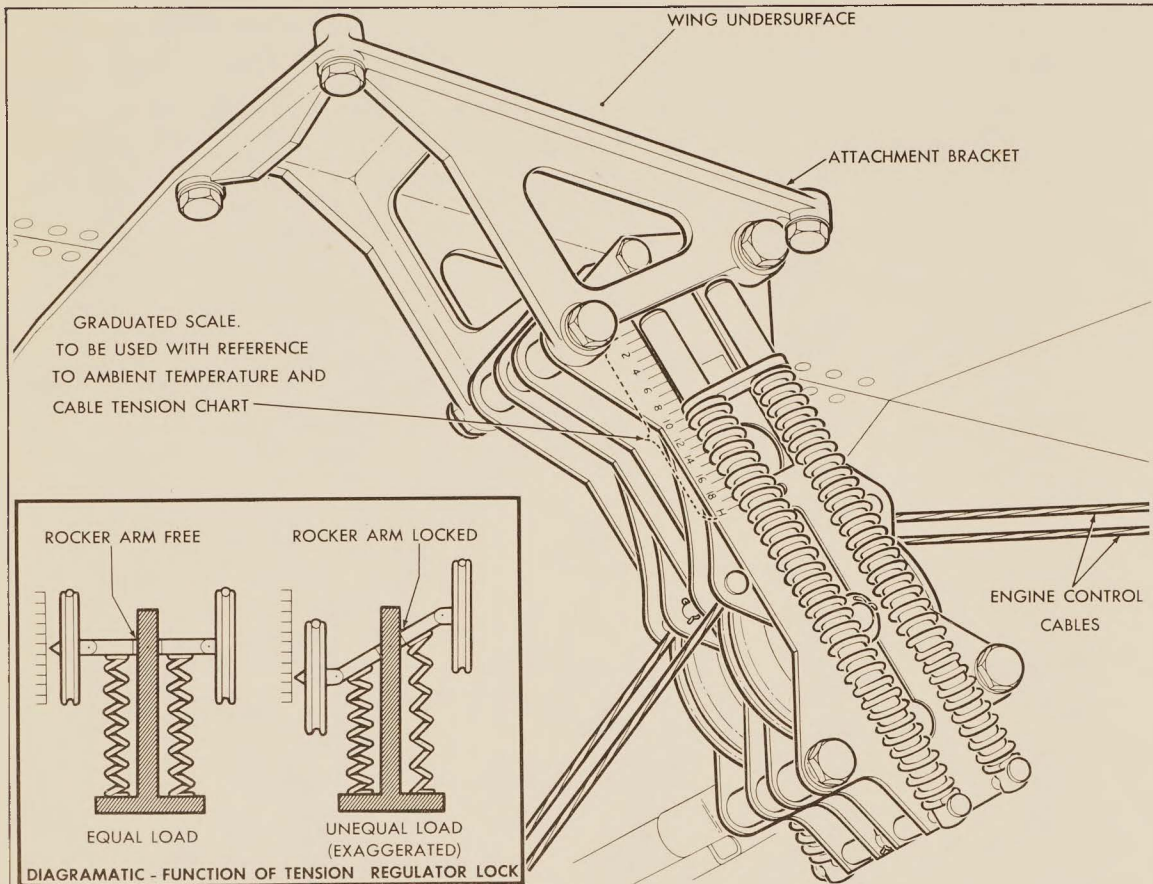


FIG. 3 CABLE TENSION REGULATOR

Cable Controls

5. Control is transferred through the pressurized area by a quadrant assembly fitted in a pressure sealed mounting. A short connecting rod connects the power lever bellcranks to the quadrant levers. Control cables under the cabin floor are connected to the quadrants. From the quadrants, the control cables are routed aft to the engines as shown on Fig 1. Turnbuckles are fitted in the cable system and are positioned below the armament bay roof at stations 268 and 359 to facilitate cable installation and tensioning.

6. At the RH engine the cables terminate at a pulley which is connected to the engine fuel flow control unit by a quick-disconnect universal coupling. See Fig 5.

7. At the LH engine the cables terminate at a pulley which drives a bevel gearbox. The bevel gearbox connects to the engine fuel flow control unit by a quick-disconnect universal coupling.

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SYSTEM DATA SHEET

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ENGINE CONTROLS		25201	14

8. The universal couplings are connected to each engine fuel flow control unit by a drive coupling. See Fig 4.

Cable Tension Regulator (Fig 3)

9. Cable tension regulators are incorporated in each engine cable system at station 495. The regulators are fitted to maintain tension of the cables to compensate for temperature changes and structural deflections.

10. Each cable tension regulator consists of a frame body, two pulleys and guides, and two springs to each pulley. The whole forms a mechanism which allows each pulley to move up or down in the body of the regulator to give a spring loaded compensated up or down travel of 2.5 inches maximum. A locking arrangement is incorporated to lock the pulleys when a control load is placed on one cable.

11. A graduated and numbered scale is engraved on the body of the tension regulator to assist in the tensioning of cables when installing and calibrating the controls. The controls are tensioned with reference to a special chart which determines the tension scale number at the existing ambient temperature.

Control Cable Tensioning

12. The engine control cables are checked and tensioned with the aircraft on firm level ground, at full operational weight, and with the weight of the aircraft on the landing gear.

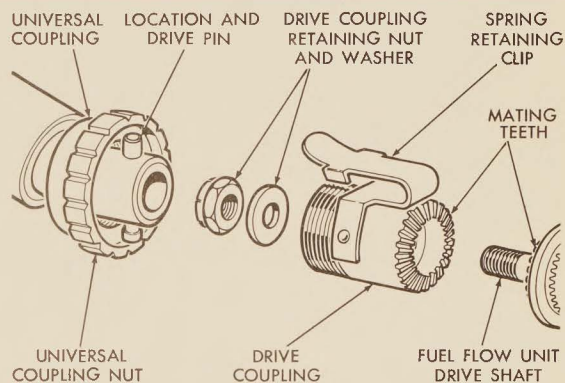
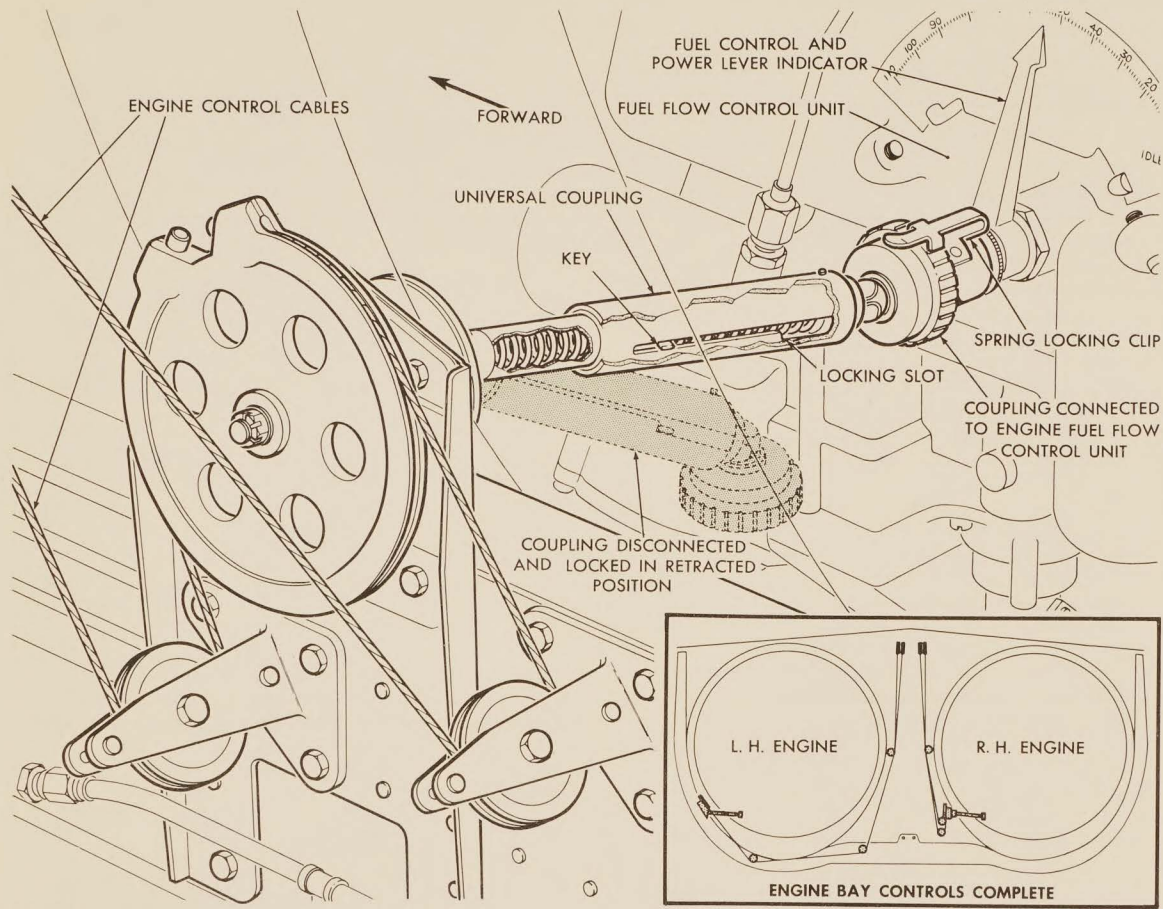


FIG. 4 FUEL FLOW CONTROL UNIT
DRIVE COUPLING

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FIG. 5 ENGINE CONTROLS - ENGINE BAY

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COMPONENT DATA SHEET

SYSTEM ENGINE CONTROLS	SUB-SYSTEM	COMPONENT Cable Tension Regulator	REF. NO. 14-1
AVRO PART NO. 7-1462-21	MANUFACTURER Pacific Scientific	MAN'FR'S PART NO. R-90-2001-35.00	AIRCRAFT EFFECTIVITY 25201
OVERHAUL LIFE: KNOWN-		ESTIMATED- 1500 hours	
FUNCTION Ensures correct tension of the engine controls by compensating for temperature changes and structural deflection.			
LOCATION At the wing undersurface in the duct bay at station 495.			
ACCESS Release 74 camloc fasteners and lower the electrical access panel.			MEN X MINUTES
REPLACEMENT PROCEDURE Position the cable tension regulator and secure with two mounting bolts. Replace and tension two control cables.			MEN X MINUTES

INSPECTION		MEN X MINUTES	
Inspect for security, damage and wear.			
FUNCTIONAL CHECKS		MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT			
B4 access stand.			
SPECIAL TOOLS TO REMOVE OR SERVICE			
REMARKS			
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COMPONENT DATA SHEET

SYSTEM ENGINE CONTROLS	SUB-SYSTEM	COMPONENT Control Quadrant	REF. NO. 14-2
AVRO PART NO. 7-1452-5	MANUFACTURER AVRO Aircraft Co.Ltd.	MAN'FR'S PART NO. 7-1452-5	AIRCRAFT EFFECTIVITY 25201
OVERHAUL LIFE: KNOWN-		ESTIMATED- 500 hours	
FUNCTION Transmits the movement of power levers to the control cables.			
LOCATION Under the left hand front cockpit floor at station 152.4.			
ACCESS Accessible through console panel. Remove 9 screws and release panel.			MEN X MINUTES
REPLACEMENT PROCEDURE Position the quadrant assembly to the cockpit floor with sealant applied to the mounting. Secure the mounting to the cockpit floor with four bolts and 18 screws. Connect the rod assemblies. Install the control cables to the quadrant. Tension control cables and check calibration.			MEN X MINUTES

INSPECTION							MEN X MINUTES	
<p>Ensure that there is a free and unrestricted movement of the power levers and quadrant. Inspect the connections for security, corrosion, damage and wear.</p>								
FUNCTIONAL CHECKS							MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT								
<p>B4 access stand.</p>								
SPECIAL TOOLS TO REMOVE OR SERVICE								
REMARKS								
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