



MAINTENANCE TECHNICAL TRAINING

FOR TRAINING PURPOSES ONLY

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CHAPTER 7

WARNING: IGNITION VOLTAGE IS DEADLY. DO NOT TOUCH IGNITER PLUGS IF IGNITION IS ON. DO NOT TEST IGNITION SYSTEM WHEN PERSONNEL ARE IN CONTACT WITH THE IGNITER PLUGS OR WHEN INFLAMMABLES ARE NEARBY. DO NOT PERFORM ANY MAINTENANCE ON THE SYSTEM WITHIN FIVE MINUTES AFTER SYSTEM OPERATION.

A. IGNITION SYSTEM (ATA 74-00)

1. General Description

- (a) The engine ignition system is a capacitor discharge circuit which provides a means of initiating or sustaining combustion of the fuel air mixture in each engine. The system includes two independent circuits: a high output circuit which is used for intermittent duty; and a lower output circuit which provides continuous ignition. The intermittent duty ignition is intended for use in engine starting, while the continuous duty ignition may be used when required to sustain engine combustion.
- (b) The ignition system converts either 28 volt DC or 115 volt AC power into high voltage pulsating current which produces a spark at the igniter plugs. The heat generated between the igniter plug electrodes vaporizes fuel droplets and brings the fuel air mixture to the critical temperature required for ignition under all conditions.
- (c) The system for each engine consists of control switches (an engine control switch on the pilot's overhead panel and a start lever controlled switch in the lower nose compartment or lower pedestal), a spark exciter unit, two high tension leads and two spark igniters.

B. Engine Ignition Control (ATA 74-31-0) - 727-100

1. General Description

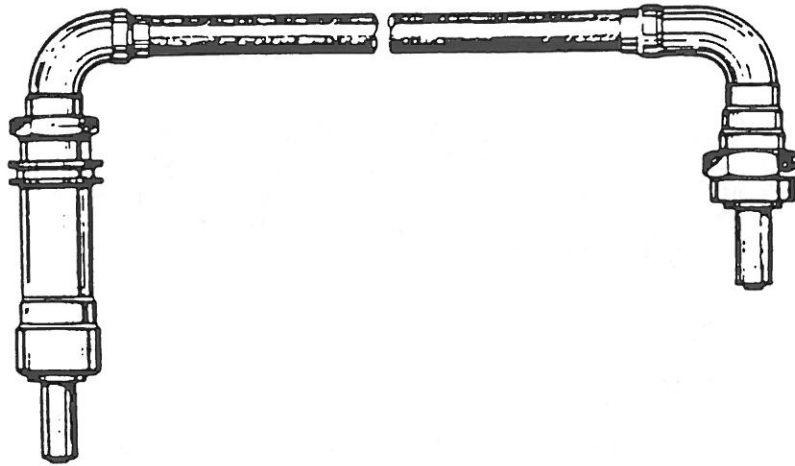
The engine ignition control is integral with engine start control in order to provide electrical power for the ignition system, the engine start switch must be actuated to complete the circuit from the main load control circuit breaker panel to the start lever controlled ignition switches. By the proper positioning of the engine start switch and the start lever, electrical power is made available to the ignition exciter to be converted into high voltage, pulsating current which will produce a spark at the igniter plugs to ignite the air fuel mixture in the engine.



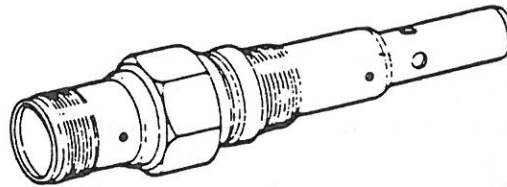
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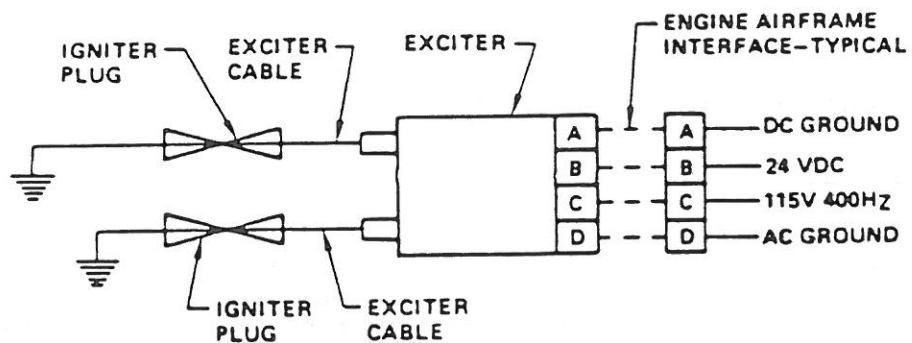
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Igniter Plug Lead Assembly
Figure 4



Igniter Plug
Figure 5



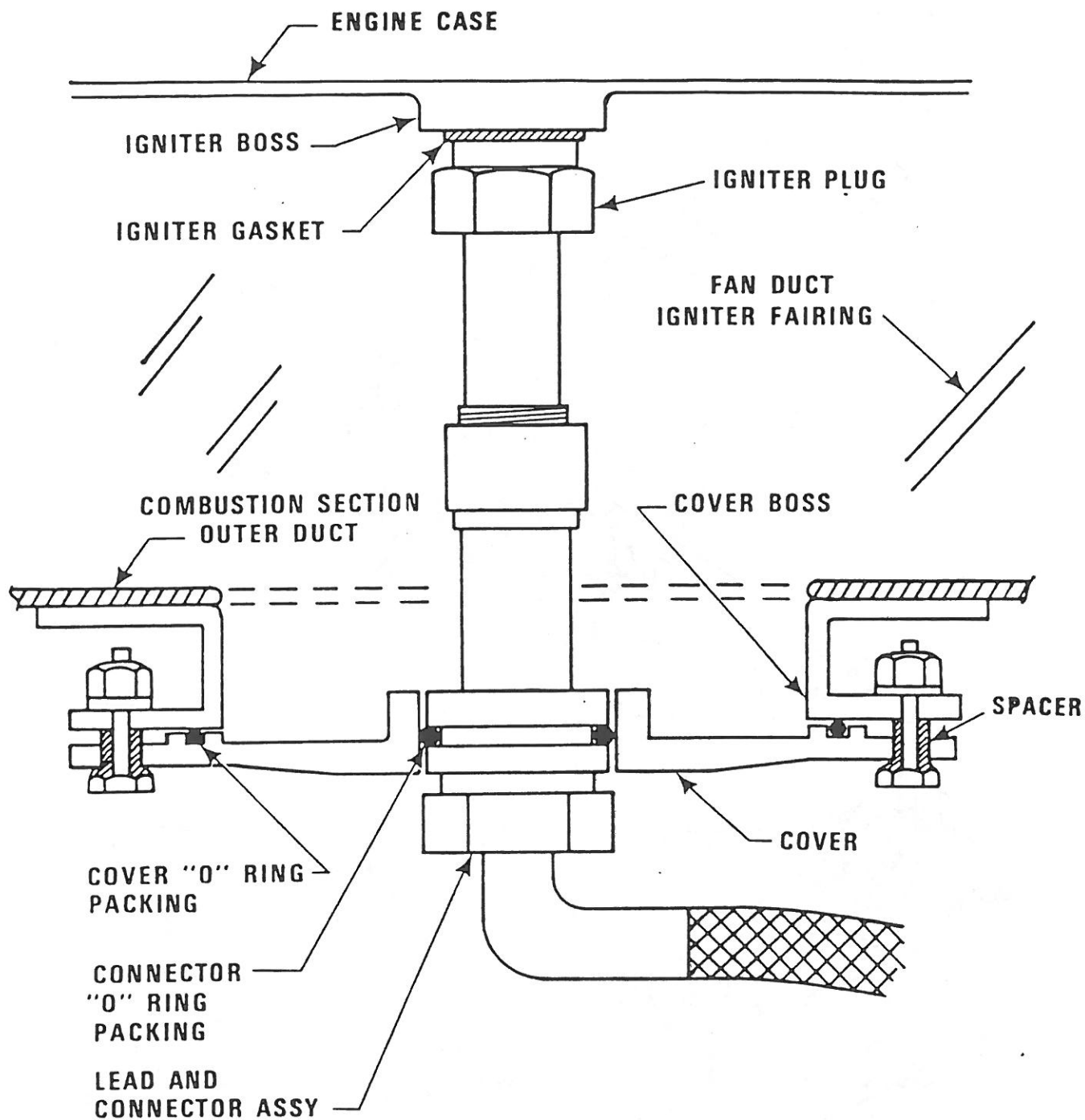
20-4 Joule DC Starting And Continuous Ignition System



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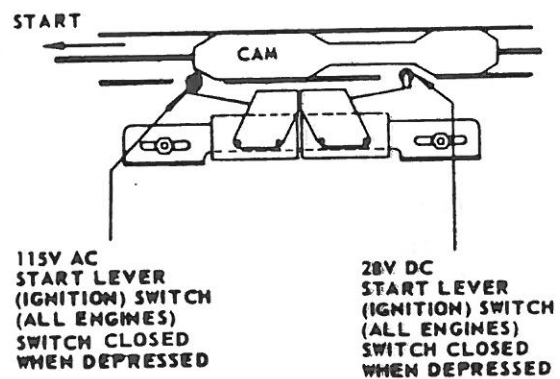
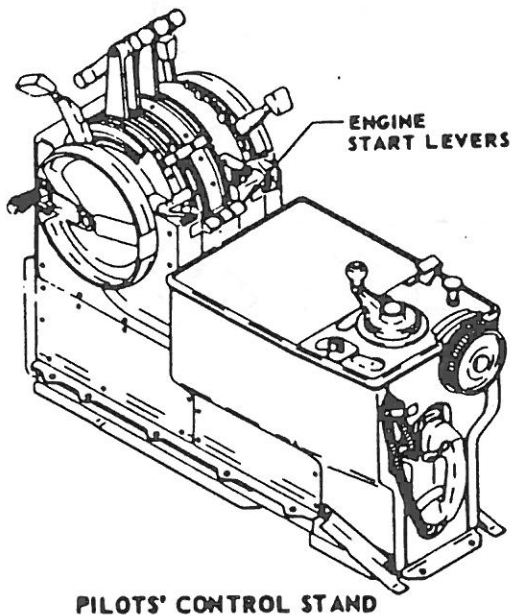
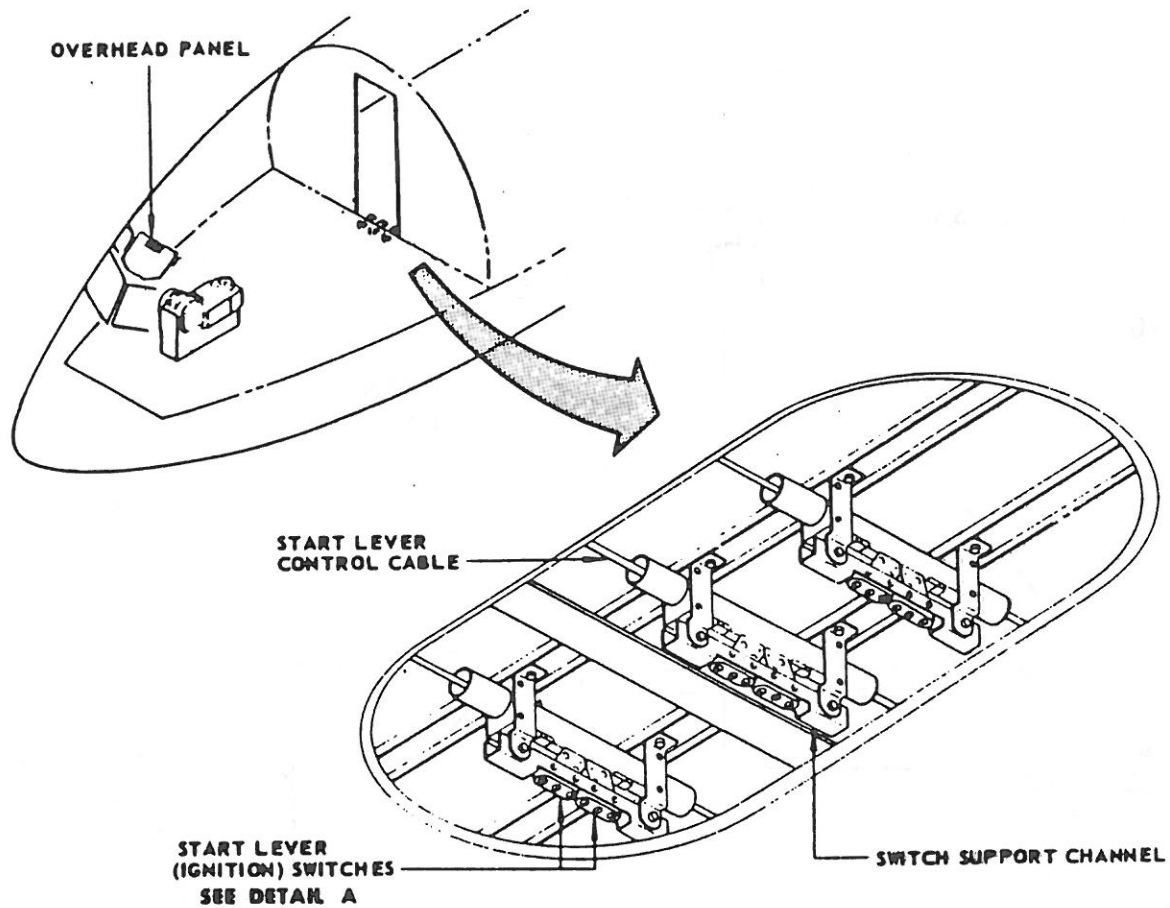
IGNITER & LEAD INSTALLATION JT8D



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DETAIL A

Ignition System Equipment Location

727-100'



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2. Start Lever Switches

- a. There are three start lever switch assemblies, one for each engine. Each start lever switch assembly contains an intermittent duty switch and a continuous duty switch. These start lever switches are cam operated switches that control application of the intermittent and continuous duty ignition systems in the exciter unit. The switches are located in the lower nose section between floor beams.
- b. A cam attached to the start lever switch cable passes through each start lever switch assembly. As the cable is actuated by the start lever, the cam engages a follower on the switch actuating arm causing the switches to open or close. Both the intermittent and continuous duty ignition start lever switches are rigged to close when the start lever is ahead of the CUTOFF position. The switching is arranged so that when the intermittent duty ignition system is activated, the continuous duty ignition system is deactivated.

3. Operation

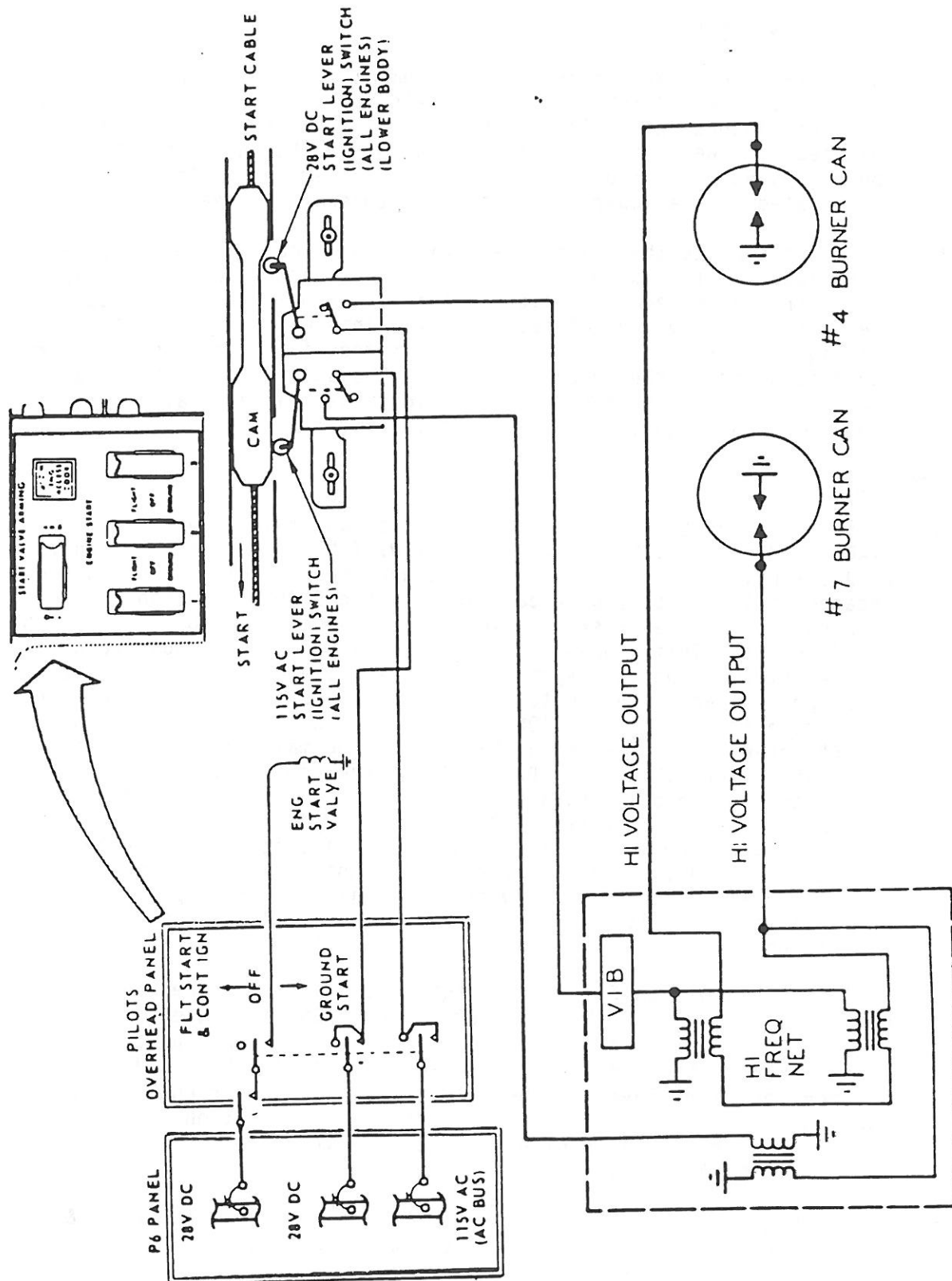
- a. To initiate ignition for a ground start of an engine close the ENG START, CONTINUOUS IGNITION AND START IGNITION circuit breakers on the P6-3 circuit breaker panel. Move the applicable engine start switch located on the pilot's overhead panel to the GROUND position and advance the applicable start lever on the pilot's control stand to the START detent. This procedure closes the circuit for 28 volt DC power to the intermittent duty system of the exciter unit where the voltage is stepped up and directed to both #4 and #7 spar igniters. Release the engine start switch at 40% RPM, N2. Place the start lever in the "IDLE" detent after the engine has reached normal idle speed. When the start lever is in the "IDLE" detent, the continuous duty switch is closed and continuous ignition will be activated if the engine start switch is placed in the "FLIGHT" position. By this procedure, 115 volt AC power from the continuous ignition circuit breaker is fed into the continuous duty system of the exciter unit where this voltage is stepped up and directed to only the #7 igniter. The purpose of this AC ignition system is to provide continuous ignition during critical flight conditions.
- b. To initiate ignition for an in-flight start of an engine which has been shut down, check that the "CONTINUOUS IGNITION" and "START IGNITION" circuit breakers on the P6-3 circuit breaker panel are closed. Place the engine start switch in the "FLIGHT" position and advance the start lever to the "START" detent. After engine startup, the engine start lever is placed in the "IDLE" position and if continuous ignition is desired, the engine start switch should remain in the "FLIGHT" position.
- c. Although the 727-233 have cams installed and switches in the E & E compartment ceiling, they are not connected and have switches as the other 727-200 aircraft.



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Ignition Circuit Simplified B727-100

EXCITER UNIT



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C. ENGINE IGNITION CONTROL - (ATA-00-00) 727-200

1. General

- a. The engine ignition control is integral with engine start control. To provide electrical power for the ignition system, the engine start switch must be actuated to complete the circuit from the main load control center circuit breaker panel to the start lever controlled ignition switches. By properly positioning the engine start switch and the start lever, electrical power is made available to the ignition exciter to be converted into high voltage, pulsating current which in turn, will produce a spark at the igniter plugs #4 and #7 to ignite the air fuel mixture in the engine.

2. Start Lever Switches

- a. There are six start lever switches, two for each engine. The start lever switches are located in the pilot's control stand and are actuated by cams on the start control drums. The start lever switches provide for intermittent ignition through the 28 volt DC switches and continuous ignition through the 115 volt AC switches.
- b. One start lever actuated engine fuel shutoff valve switch is provided for each engine. A cam attached to the start drum engages the switch follower causing the switch to open or close.

3. Operation

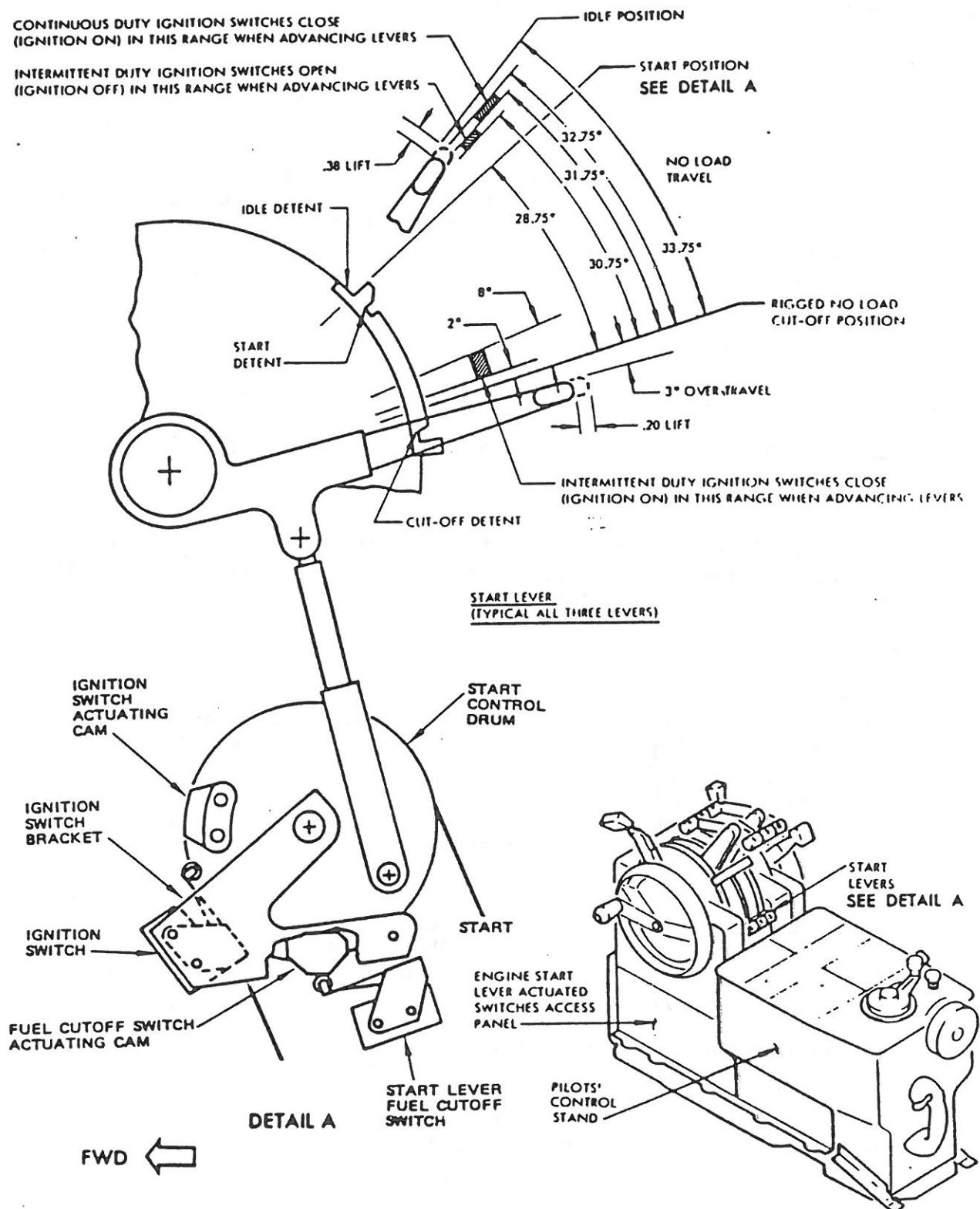
- a. To initiate ignition for an engine ground start, the START ignition circuit breaker on the main load control circuit breaker panel P6 must be closed. Placing the start valve arm switch in the ARM position, holding the applicable engine start switch in the GROUND position and advancing the applicable start lever to the START detent, provides 28 volt DC power to the intermittent duty system of the exciter unit where the voltage is stepped up and directed to both spark igniters. During critical flight conditions, continuous ignition is obtained with the start lever in the IDLE detent and the engine start switch in FLIGHT position. The CONT ignition circuit breaker must be closed. This supplies 115 volt AC power to the continuous duty system of the exciter unit where the voltage is stepped up and directed to only one spark igniter (#7).
- b. To initiate ignition for an in-flight start of an engine which has been shut down, check that the START and CONT IGNITION circuit breakers on the P6 circuit breaker panel are closed, place the start lever in the START detent and the start switch in the FLIGHT position. After engine startup, continuous ignition (one spark igniter only) may be maintained by placing the start lever in the IDLE position.



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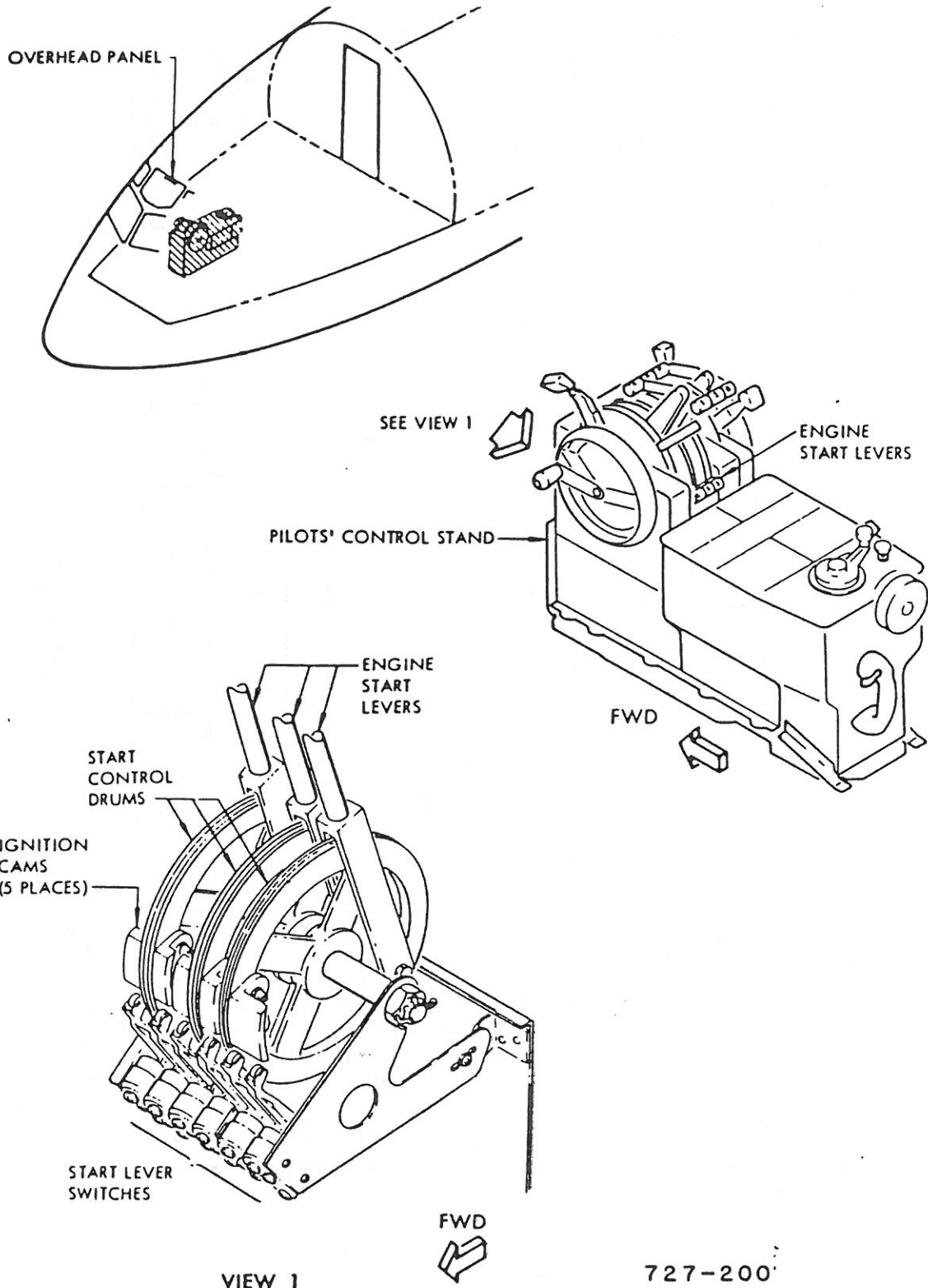
Engine Start Lever Switch



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IGNITION SYSTEM EQUIPMENT LOCATION

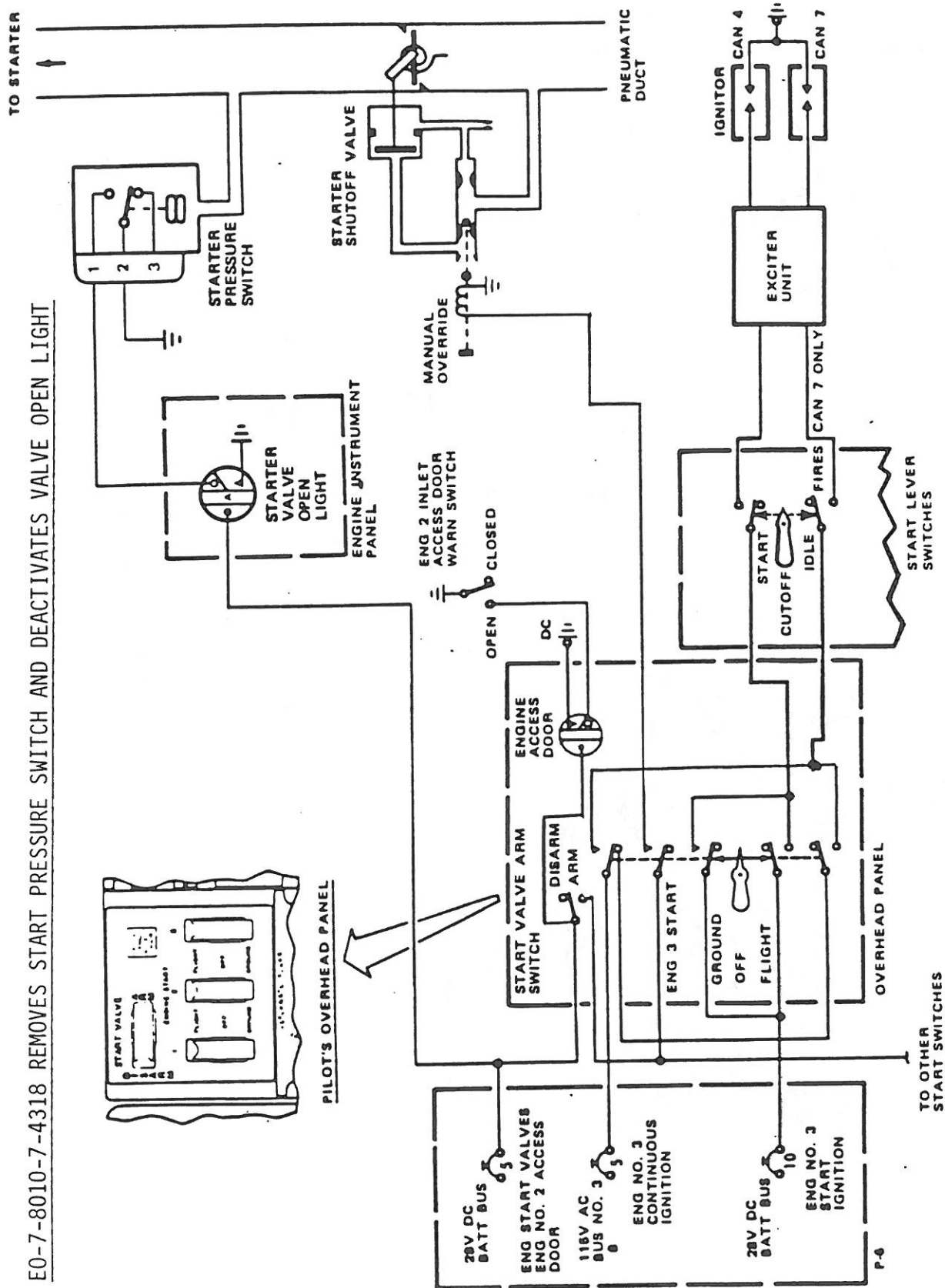


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E0-7-8010-7-4318 REMOVES START PRESSURE SWITCH AND DEACTIVATES VALVE OPEN LIGHT



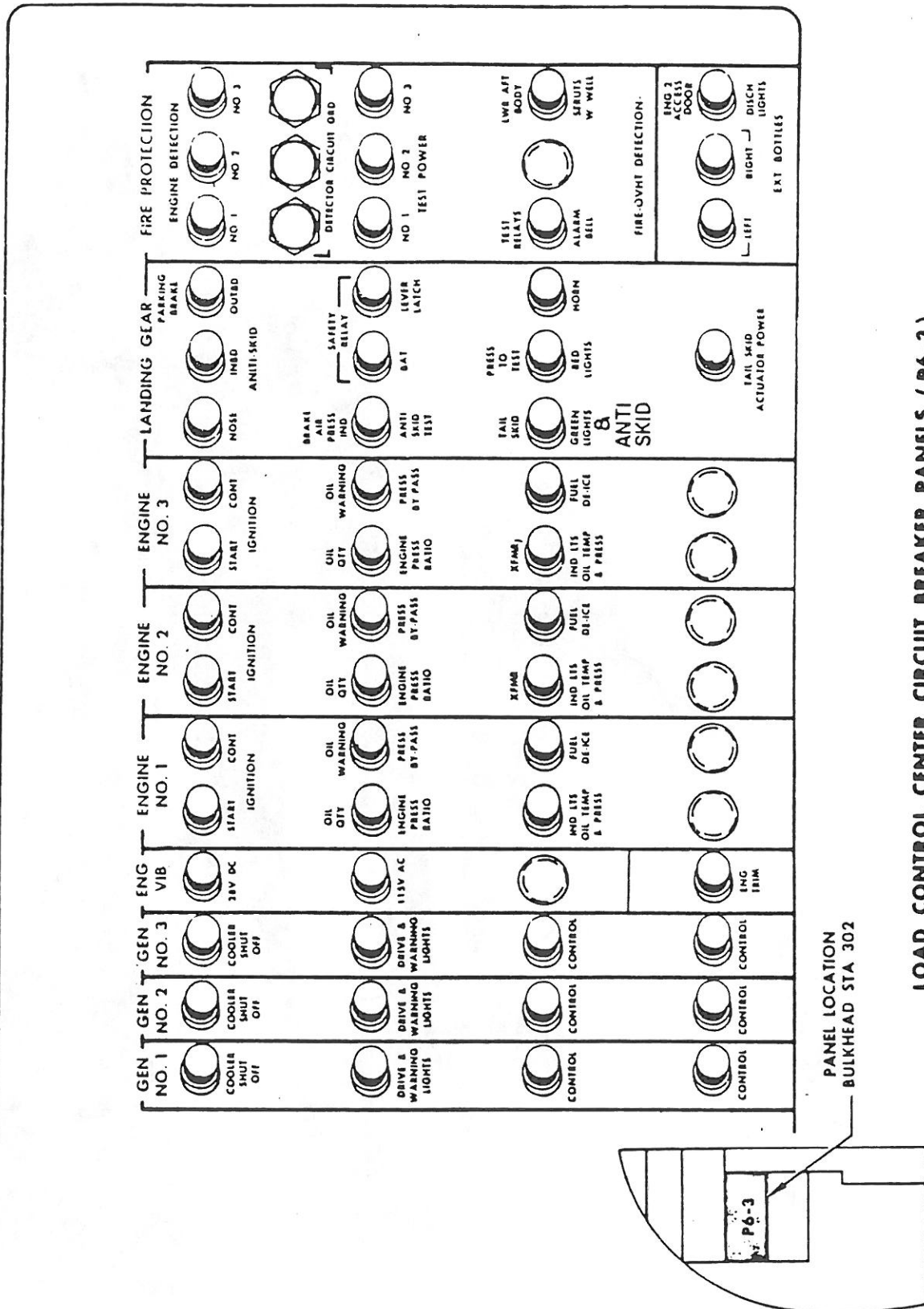
IGNITION CIRCUIT SIMPLIFIED (727-200)



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