PT6A-114/-114A ENGINE CONTROL RIGGING - ADJUSTMENT/TEST

1. General

A. This section provides adjustment and rigging procedures for engine controls and associated annunciators.

2. Emergency Power Control Annunciator Light Switch Adjustment

A. Adjust Emergency Power Control Annunciator Light Switch.

(1) Verify engines are powered OFF.

(2) Verify electrical power is applied to airplane.

(3) Verify EMERGENCY POWER LEVER annunciator light remains illuminated when moving emergency power control lever through full travel range, forward of NORM gate, then back to NORM gate.

NOTE: IDLE stop position is forward of NORM gate.

(4) Move emergency power control lever aft of NORM gate and verify EMERGENCY POWER LEVER annunciator light extinguishes.

NOTE: Normal stowed position is aft of NORM gate.

(5) Adjust EMERGENCY POWER LEVER annunciator light switch, if required.

(a) Remove applicable quadrant components. Refer to Control Quadrant Removal/Installation.

(b) Loosen screw securing EMERGENCY POWER LEVER annunciator switch to switch plate and adjust per steps 2.A.(3) and (4).

(c) Reinstall control quadrant components. Refer to Control Quadrant Removal/Installation.

3. Emergency Power Control Rigging

A. Emergency Power Control Rigging Procedures (Refer to Figure 501 and Figure 502).

NOTE: Emergency power control cable linkages must allow sufficient travel to permit fuel control unit manual override arm full travel from OFF position to MAX position.

(1) The following airplanes incorporate frangible/shear wire, which is installed from the Emergency Power Lever (EPL) to the pedestal cover:

- Airplanes 20800351 and On.
- Airplanes 208B0920 and On.
- Airplanes 20800001 thru 20800350 Incorporating SK208-142.
- Airplanes 208B0001 thru 208B0919 Incorporating SK208-142.

(2) If installed, cut and remove the frangible/shear wire from the EPL to the pedestal cover screw. Refer to Emergency Power Lever Frangible/Shear Wire Removal/Installation in Chapter 76, Quadrant Assembly and Controls - Maintenance Practices.

(3) Place emergency power control lever at maximum power position by moving emergency power control lever forward until lever stops.

(a) Visually check in engine compartment and verify fuel control unit manual override arm is against maximum speed adjustment screw.

(4) Place emergency power control lever at normal position by moving emergency power control lever aft of NORM gate until lever stops.

NOTE: Aft emergency power control lever travel is limited by fuel control internal stop. Normal position is aft of NORM gate.

(5) Rig emergency power control to minimum ineffective range.

(a) Verify EMERGENCY POWER LEVER annunciator light is functional prior to rigging.

CAUTION: The emergency power control lever must be at the normal stowed position during engine start. If it is not at the stowed position, there will be an over temperature condition.

(b) Verify emergency power control lever is in normal stowed position.

(c) Perform a normal engine start. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(d) Beginning at IDLE position, move emergency power control lever forward of NORM gate, slowly advancing to takeoff power.

1 Verify minimum 0.25 inch ineffective range forward of NORM gate before N_g begins advancing from idle.

(6) Adjust emergency power control travel at fuel control unit, if required.

(a) Working from within engine compartment, cut safety wire, remove cotter pin and loosen rod end jam nut at fuel control unit manual override arm.

(b) Adjust emergency power control travel at fuel control unit to achieve minimum 0.25 inch ineffective range forward of NORM gate. Repeat rigging of emergency power control to minimum ineffective range.

(c) Tighten rod end jam nut, install new cotter pin through bolt and nut on fuel control unit manual override arm and safety wire. Refer to Model 208 Series Illustrated Parts Catalog for cotter pin part number.

(7) Return emergency control power lever securely to IDLE side of NORM gate and verify EMERGENCY POWER LEVER annunciator illuminates.

(8) Return emergency power control lever to NORM position and verify EMERGENCY POWER LEVER annunciator extinguishes.

(9) Shut down engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(10) If required, install MS20995CY15 or C489003 frangible/shear wire from the EPL to the pedestal cover. Refer to Emergency Power Lever Frangible/Shear Wire Removal/Installation in Chapter 76, Quadrant Assembly and Controls - Maintenance Practices.

4. Power Control Lever Reverse Gas Generator N_g Pickup Adjustment

A. Adjust Power Control Lever Reverse Gas Generator (N_g) Pickup (Refer to Figure 503).

(1) Start engine, observing all operating limitations. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(2) Operate engine at IDLE for five minutes, allowing temperatures to stabilize.

(3) Place propeller speed control lever in MAX forward position.

(4) Move power control lever from IDLE, then slowly aft to REVERSE position.

(a) Verify propeller RPM increases to peak, then decreases 10 RPM to 50 RPM before gas generator (N_g) begins increasing from idle. Adjust control lever reverse gas generator (N_g) pickup as required.

1 Cut and remove safety wire on reverse gas generator pickup bolt.

2 Loosen jam nut while securing generator pickup bolt.

CAUTION: Reverse gas generator pickup bolt adjustment is sensitive and shall be adjusted in increments of one-eighth turn between adjustments.

3 Rotate reverse generator pickup bolt clockwise or counterclockwise in increments of one-eighth turn to achieve a minimum torque of 900 foot-pounds at MAX REVERSE.

4 Torque jam nut while securing generator pick up bolt.

5 Safety wire reverse gas generator pickup bolt. Refer to Chapter 20, Safetying - Maintenance Practices.

(b) Shut down engine. Refer to Pilot's Operating Handbook and Approved Flight Manual.

5. Fuel Control Lower Idle Adjustment

A. Adjust Fuel Control Lower Idle (Refer to Figure 504).

(1) Start engine, observing all operating limitations. Refer to Pilot's Operating Handbook and Approved Flight Manual.

NOTE: Low idle maximum has been approved at 55 percent for all engine configurations.

NOTE: Do not allow N_g to drop below 52 percent. Advance power lever as required.

(a) Operate engine at idle for five minutes, allowing temperatures to stabilize.

(b) Advance power lever as required to achieve 52 to 55 percent N_g.

(2) Position generator switch to ON and adjust electrical load to 40 Amperes.

(3) Position BLEED AIR HEAT switch to ON.

(4) Rotate CABIN HEAT TEMP control to full HOT.

(5) Position fuel condition control lever to LOW IDLE.

(6) Position power control lever to IDLE position, forward and against detent gate.

(7) Verify N_g is 52 percent to 55 percent.

(a) If 52 percent to 55 percent N_g is not achieved, adjust idle adjusting screw.

1 Cut and remove safety wire on idle adjusting screw.

2 Using and Allen key, hold idle adjusting screw securely to prevent movement and release torque on nut.

CAUTION: Idle speed adjustment is sensitive and shall be adjusted in increments of one-eighth turn between idle speed checks.

3 Rotate idle speed adjusting screw clockwise or counterclockwise in increments of one-eighth turn to increase or decrease idle speed. Tighten jam nut, but do not safety wire at this time.

a If idle speed remains unchanged during adjustment, FCU arm is at pickup point and must be rerigged. Refer to Power Control Forward Linkage Rigging.

(8) Shut down engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(9) Torque jam nut from 20 inch-pounds to 25 inch-pounds and safety wire nut. Refer to Chapter 20, Safetying - Maintenance Practices.

6. Fuel Condition Control Lever High Idle Adjustment

A. Adjust Fuel Condition Control Lever High Idle (Refer to Figure 504).

(1) Start engine, observing all operating limitations. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(2) Operate at idle for five minutes, allowing temperatures to stabilize.

(3) Position power control lever to IDLE.

(4) Position generator to ON and adjust electrical load to 40 Amperes.

(5) Position BLEED AIR HEAT switch to OFF.

(6) Position fuel control lever to HIGH IDLE.

(a) If 64 to 66 percent N_g is not achieved, adjust high idle stop bolt.

1 Cut and remove safety wire on high idle stop bolt.

CAUTION: Idle adjustment is sensitive and shall be adjusted in increments of one-eighth turn between idle checks.

2 Rotate high idle stop bolt, in increments of one-eighth turn, clockwise to increase or counterclockwise to decrease idle speed. Finger tighten jam nut, but do not safety wire at this time.

NOTE: Adjusting the high idle stop bolt will also effect the amount of lever cushion.

NOTE: In order to maintain proper lever cushion, it may be necessary to adjust the nut on the upper cut off and flight idle linkage. Turning the nut clockwise will increase the idle speed, which will allow a higher idle stop and more lever cushion.

(7) Shut down engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(8) Torque jam nut from 20 inch-pounds to 25 inch-pounds and safety wire nut. Refer to Chapter 20, Safetying - Maintenance Practices.

7. Propeller Speed Control Lever Adjustment

A. Adjust Propeller Speed Control Lever (Refer to Figure 505).

(1) Start engine, observing all operating limitations. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

(2) Operate at idle for five minutes, allowing temperatures to stabilize.

(3) Position propeller speed control lever to MAX PROP RPM.

(4) Advance power control lever to achieve 1900 RPM.

(5) Continue advancing power control lever slowly. Verify propeller governor maintains 1900 RPM, +10 or -10 RPM.

(a) If 1900 RPM, +10 or -10 RPM, is not maintained, recheck propeller speed control lever rigging. Refer to Power Control Aft Linkage Rigging.

(b) Return power control lever to IDLE position.

(c) If propeller RPM exceeds 1900 RPM, +10 or -10 RPM, adjust propeller governor maximum RPM stop.

CAUTION: Propeller governor maximum rpm stop adjustment is sensitive and shall be adjusted in increments of one-eighth turn between adjustments.

1 Cut and remove safety wire on propeller governor maximum RPM stop jam nut.

2 Using an Allen wrench, hold screw securely to prevent movement and release torque on jam nut.

3 Tighten jam nut and safety wire nut. Refer to Chapter 20, Safetying - Maintenance Practices.

(d) With power lever at IDLE, move propeller speed control lever to FEATHER position. Verify propeller feathers and propeller governor speed adjusting lever contacts feather stop. Adjust cable bulkhead fittings as required.

(6) Shut down engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.

8. Engine Operating Limits

A. Engine operating limits are provided for both PT6A-114 and PT6A-114A engines. Refer to Chapter 71, Power Plant - Adjustment/Test.

Figure 501 : Sheet 1 : Emergency Power Lever Adjustment

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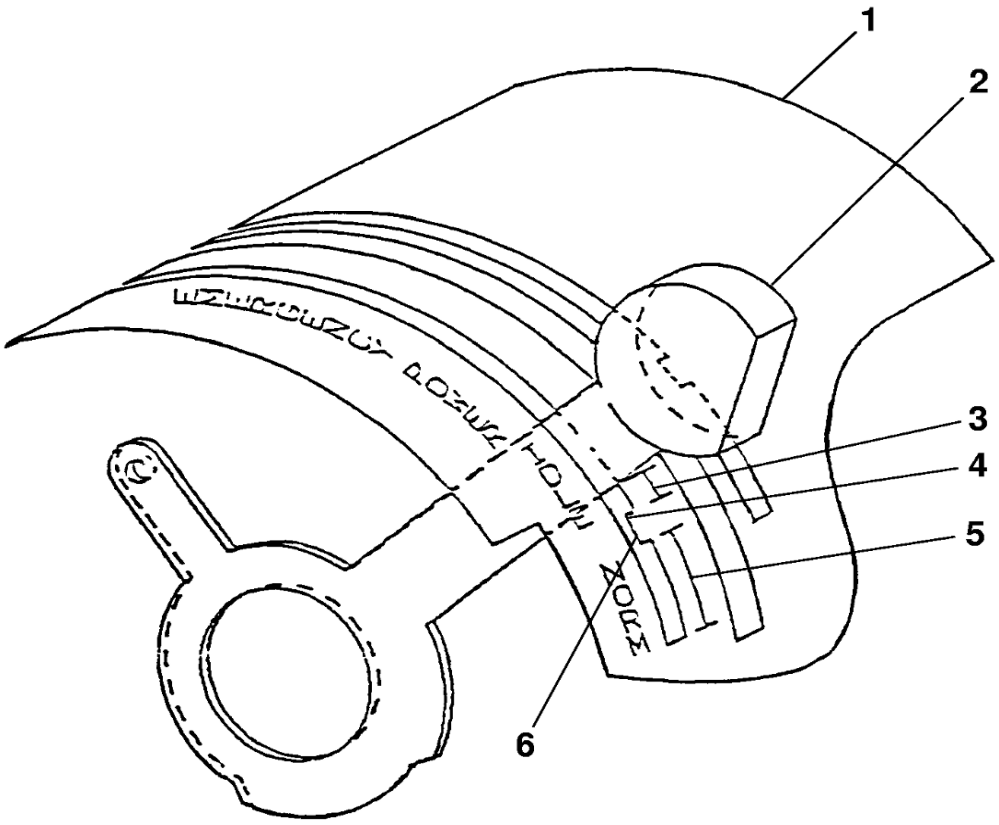

1. PEDESTAL COVER
2. EMERGENCY POWER LEVER
3. 0.25 INCH MINIMUM INEFFECTIVE RANGE
4. IDLE STOP
5. NORMAL STOWED POSITION
6. NORMAL GATE

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Figure 502 : Sheet 1 : Fuel Control Unit Adjustment

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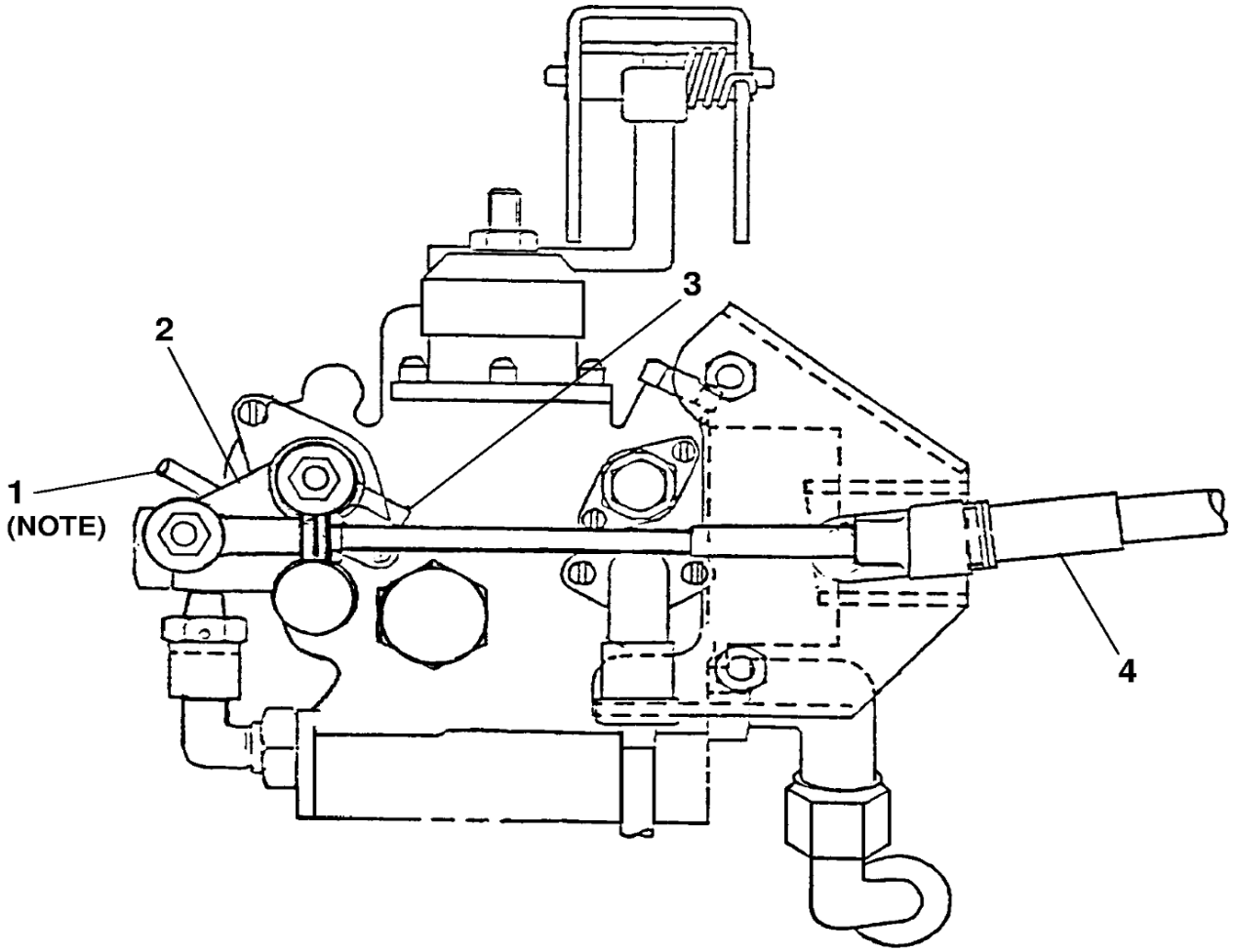

AFT VIEW OF ENGINE LOOKING FORWARD

NOTE: DO NOT ADJUST SCREW

1. MAXIMUM SPEED ADJUSTMENT SCREW **(NOTE)**
2. MANUAL OVERRIDE LEVER ARM
3. OFF POSITION OF FCU OVERRIDE STOP
4. EMERGENCY POWER CONTROL CABLE

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Figure 503 : Sheet 1 : Engine Control Rigging

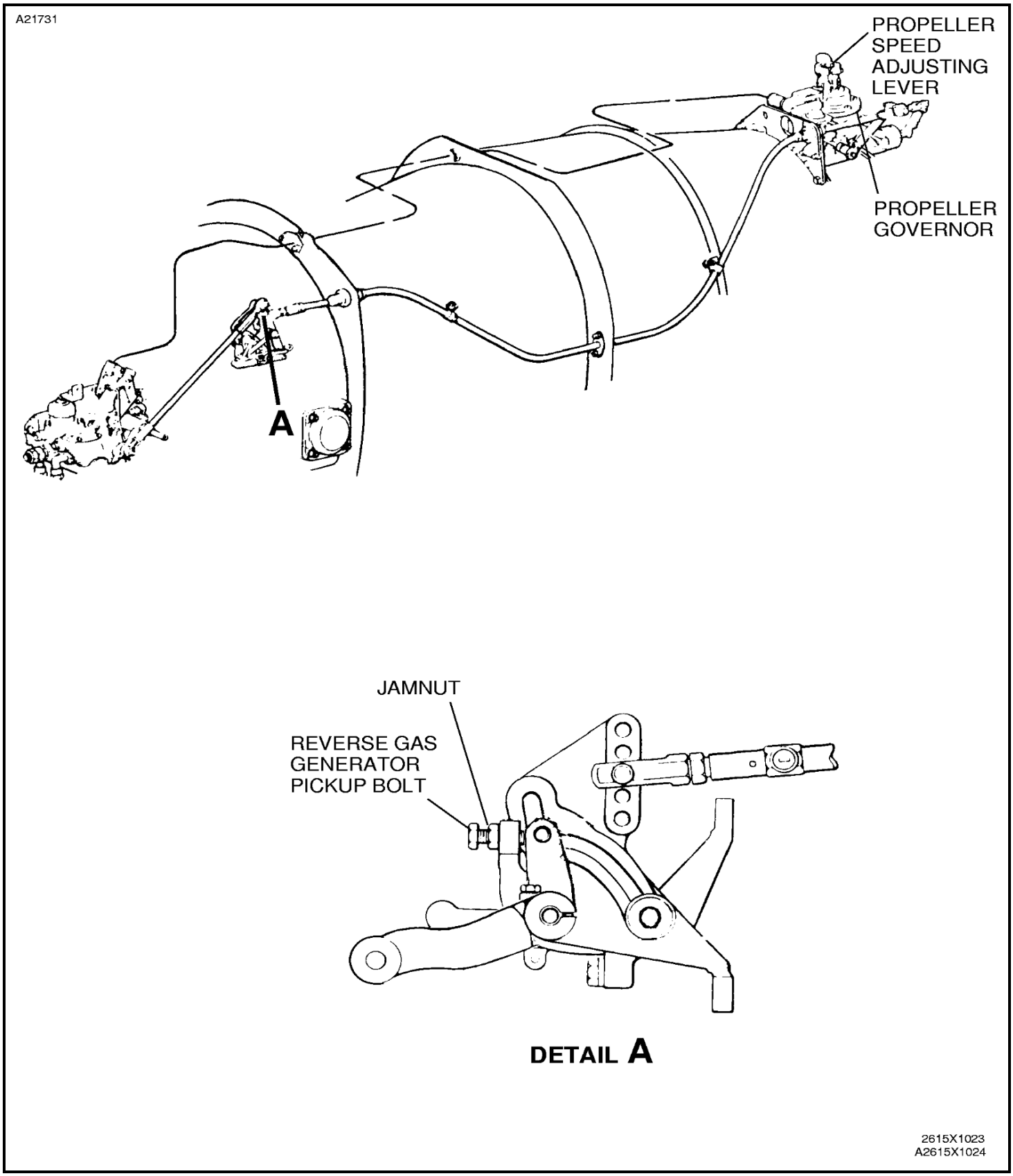

Figure 504 : Sheet 1 : Fuel Control Linkage

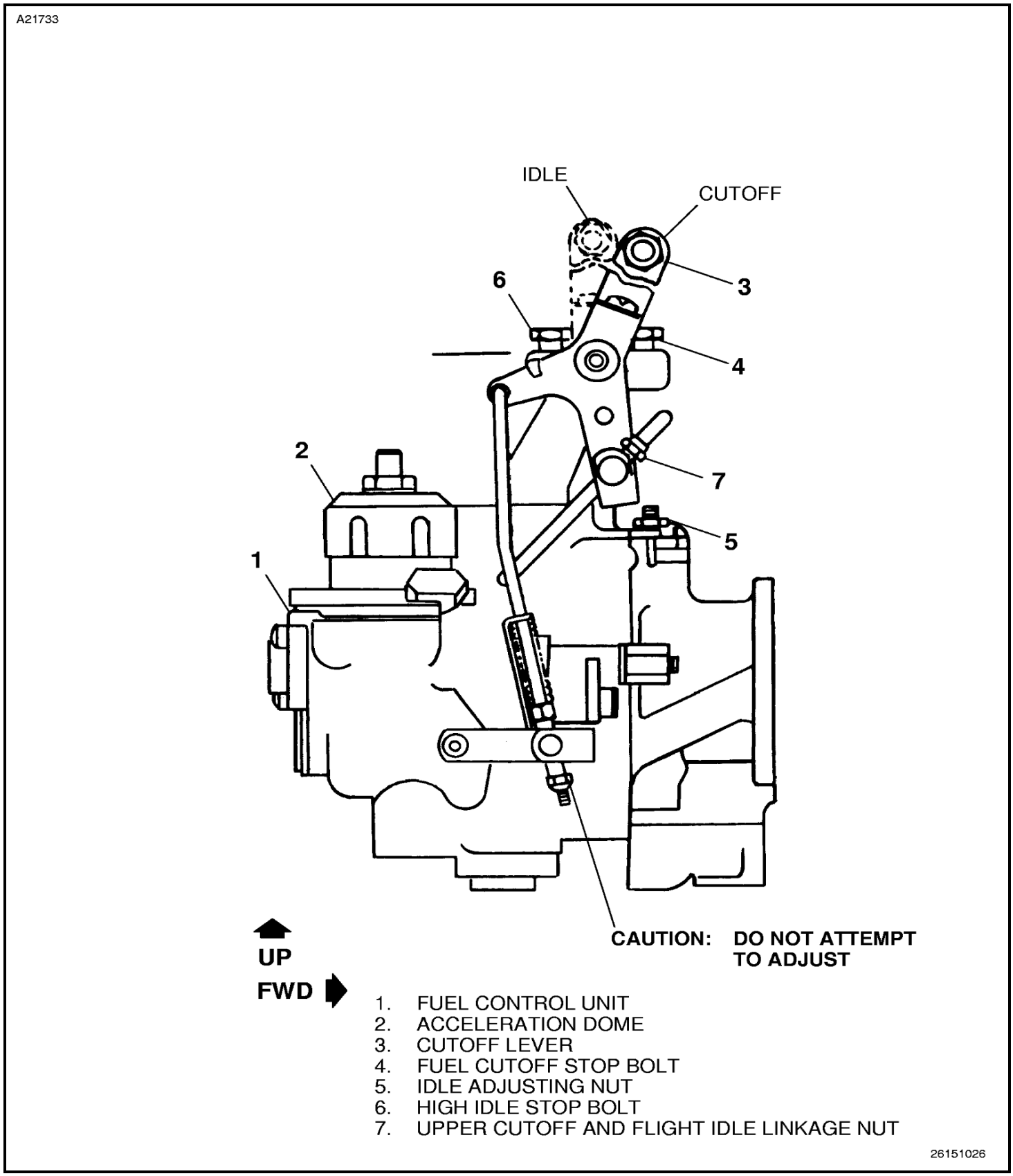

Figure 505 : Sheet 1 : Propeller Speed Linkage Adjustment

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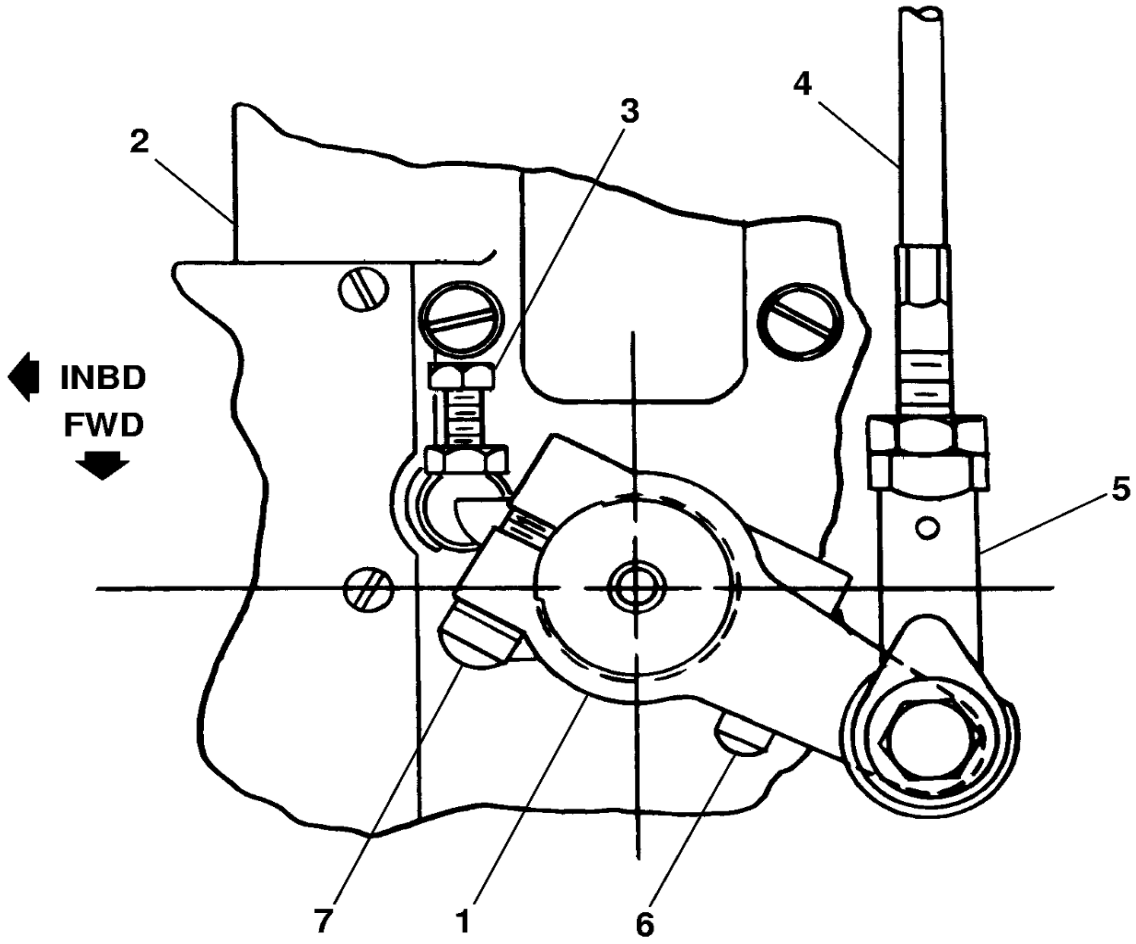

1. PROPELLER SPEED ADJUSTING LEVER
2. PROPELLER GOVERNOR
3. MAXIMUM RPM STOP
4. PROPELLER SPEED CONTROL CABLE
5. PROPELLER SPEED CONTROL CABLE ROD END
6. FEATHER STOP
7. LEVER RETAINING SCREW

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