

ENGINE CONTROLS - ADJUSTMENT/TEST

1. Throttle Controls

- A. Rigging Throttle Controls (Airplanes 310-35000 thru 310B35771) (Refer to [Figure 501](#)).

NOTE: The rigging procedure is the same for either throttle control.

- (1) Disconnect throttle control rod end (6) at throttle arm (1) on carburetor (3) by removing attaching bolt (2).
- (2) Place throttle lever in control pedestal in the closed position against aft stop. Advance lever approximately 1/4 inch from stop and lock in this position by tightening friction knob on right side of control quadrant.
- (3) Move throttle arm (1) on carburetor to closed (full forward) position against throttle stop.
- (4) Loosen jamb nut (5) on throttle control sliding end (4). Adjust position of rod end (6) by screwing in or out until bolt (2) can be inserted through throttle arm and control rod end as illustrated.

NOTE: Do not allow throttle lever in control pedestal or throttle arm on carburetor to move from positions specified in steps (2) and (3) during adjustment of the rod end.

- (5) Tighten nut (7) on attaching bolt (2). Tighten jamb nut (5).
- (6) Unlock throttle lever in control pedestal. Actuate carburetor arm against both stops by moving cockpit control. With the carburetor arm against either stop, the throttle lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full travel of the carburetor throttle arm (1).

- B. Rigging Throttle Controls (Airplanes 310C35772 thru 310D39299) (Refer to [Figure 502](#)).

- (1) Remove nut (10) which secures control arm (12) to the throttle control (13).
- (2) Pull control arm (12) free of splined shaft on throttle control (13). Do not disconnect linkage (15) from either the fuel control unit or control arm (12).
- (3) Place throttle lever in control pedestal in the closed position against the aft stop. Advance lever approximately 1/4 inch from stop and lock in this position by tightening friction knob on right side of control quadrant.
- (4) Move throttle arm on the fuel control unit to closed (full forward) position.
- (5) Replace control arm (12) on splined shaft of throttle control (13). Do not move the throttle control arm from the full closed position while placing control arm (12) on shaft.
- (6) Secure control arm (12) on the splined shaft with a nut.
- (7) Release the friction lock on the control pedestal and operate the throttle lever to full open (full forward) position and tighten the friction lock.
- (8) Remove the bolt which attaches control arm (12) and linkage (15) and check that the throttle arm on the fuel control unit is full open.
- (9) If the throttle arm on the fuel control unit is not fully operated by the throttle operation, screw the eyebolt on control arm (12) out to increase the travel.
- (10) If the control arm on the fuel control unit reaches full open before the throttle control in the pedestal hits the forward stop the travel is too long and the eyebolt on control arm (12) must be screwed in.
- (11) After the eyebolt on control arm (12) has been screwed in or out, steps (1) through (5) may have to be repeated to correct the position of control arm (12) on the splined shaft.
- (12) With the throttle arm, at the fuel control unit, against either stop, the throttle lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full travel of the throttle arm.
- (13) Fine adjustment may be accomplished by loosening nuts (14) and rotating throttle control (13) on the mounting bracket.

2. Mixture Controls

- A. Rigging Mixture Controls (Airplanes 310-35000 thru 310B35771) (Refer to [Figure 501](#)).

NOTE: The rigging procedure is the same for either mixture control.

- (1) Disconnect mixture control rod end (6) at mixture control arm (9) on carburetor (3) by removing attaching bolt (2).
- (2) Place mixture lever in control pedestal in FULL RICH position against forward stop. Retard lever approximately 1/4 inch from stop and lock lever in this position by tightening friction knob on right side of control quadrant.
- (3) Move mixture control arm (9) on carburetor to FULL RICH (aft) position against stop.
- (4) Loosen jamb nut (5) on mixture control sliding end (8). Adjust position of rod end (6) by screwing in or out until bolt (2) can

be inserted through mixture control arm and control rod end as illustrated.

NOTE: Do not allow mixture lever or mixture control arm to move from position during adjustment of control rod end.

- (5) Tighten nut (7) on attaching bolt (2). Tighten jamb nut (5).
- (6) Unlock mixture lever in control pedestal. Actuate mixture control arm against both stops by moving mixture lever. With the mixture control arm against either stop, the mixture lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full travel of the mixture control arm.

WARNING: Failure of the mixture control arm to reach the full rich position may cause engine damage or possible engine failure at prolonged high power settings.

B. Rigging Mixture Controls (Airplanes 310C35772 thru 310D39299) (Refer to [Figure 502](#)).

- (1) Remove nut (10) which secures control arm (9) to the mixture control (6).
- (2) Pull control arm (9) free of splined shaft on mixture control (6). Do not disconnect linkage (11) from either the fuel control unit or control arm (9).
- (3) Place mixture lever in control pedestal in IDLE CUT-OFF position against the aft stop. Advance lever approximately 1/4 inch from stop and lock in this position by tightening friction knob on right side of control quadrant.
- (4) Move mixture arm on the fuel control unit to IDLE CUT-OFF (full back) position.
- (5) Replace control arm (9) on splined shaft of mixture control (6). Do not move the mixture control from the IDLE CUT-OFF position while placing control arm (9) on shaft.
- (6) Secure control arm (9) on the splined shaft with nut (10).
- (7) Release the friction knob on the control pedestal and operate the mixture lever to the full open (FULL RICH) position and tighten the friction lock.
- (8) Remove the bolt which attaches control arm (9) and linkage (11) and check that the mixture arm on the fuel control unit is full open (FULL RICH).
- (9) If the mixture arm on the fuel control unit is not fully operated by mixture lever operation, screw the eyebolt on control arm (9) out to increase the travel.
- (10) If the control arm on the fuel control unit reaches full open before the mixture control in the pedestal hits the forward stop, the travel is too long and the eyebolt on control arm (9) must be screwed in.
- (11) After the eyebolt on control arm (9) has been screwed in or out, steps (1) through (5) may have to be repeated to correct the position of control arm (9) on the splined shaft.
- (12) With the mixture arm, at the fuel control unit, against either stop, the mixture lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full travel of the mixture arm.
- (13) Fine adjustment may be accomplished by loosening bolts (7) and rotating mixture control (6) on bracket (3).

3. Propeller Controls

A. Rigging Propeller Controls (Airplanes 310-35000 thru 310B35771) (Refer to [Figure 501](#)).

NOTE: The rigging procedure is the same for either propeller control.

- (1) Disconnect propeller control rod end (6) at propeller governor arm (15) by removing attaching bolt (2) and spacer (14).
- (2) Place propeller pitch lever in control pedestal, in FULL INCREASE RPM position against forward stop. Retard lever approximately 1/4 inch from stop and lock lever in this position by tightening friction knob on right side of control quadrant.
- (3) Place governor arm (15) in full forward position against stop (FULL INCREASE RPM).
- (4) Loosen jamb nut (5) on propeller control sliding end (13) and adjust position of control rod end (6), by screwing in or out, until bolt (2) can be inserted through rod end and governor arm (15) without binding.

NOTE: Do not allow propeller pitch lever or propeller governor arm to move from position during adjustment of the control rod end.

- (5) Install bolt (2) as illustrated in [Figure 501](#), with spacer (14) between rod end (6) and governor arm (15). Tighten nut (7) on attaching bolt (2). Tighten jamb nut (5).
- (6) Unlock propeller pitch lever in control pedestal. Move the pitch lever to the feather position (full aft). Check to see that the propeller governor arm is against its stop in the full aft position. With the governor arm against either stop, the pitch lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full

travel of the governor arm.

B. Rigging Propeller Controls (Airplanes 310C35772 thru 310D39299) (Refer to [Figure 502](#)).

- (1) Disconnect propeller control rod end (27) at propeller governor arm (29) by removing bolt (26).
- (2) Place propeller pitch lever in control pedestal in FULL INCREASE RPM position against the forward stop. Retard lever approximately 1/4 inch from stop and lock lever in this position by tightening friction knob on right side of control quadrant.
- (3) Place governor arm (29) in the full forward position against stop (FULL INCREASE RPM).
- (4) Loosen jamb nut (22) on propeller control sliding end and adjust position of control rod end (27), by screwing in or out until bolt (26) can be inserted through rod end and governor arm without binding.

NOTE: Do not allow propeller pitch lever or propeller governor arm to move from position during adjustment of the control rod end.

- (5) Install bolt (26), with spacer (28) between rod end (27) and governor arm (29). Tighten nut (30). Tighten jamb nut (22).
- (6) Unlock propeller pitch lever in control pedestal. Move the pitch lever to the FEATHER position (full aft). Check to see that the propeller governor arm is against its stop in the full aft position. With the governor arm against either stop, the pitch lever should be approximately 1/4 inch from the quadrant stop. This unused travel provides the necessary cushion to assure full travel of the governor arm.

4. Air Controls

A. Rigging Alternate Air Controls (Airplanes 310-35000 thru 310B35771) (Refer to [Figure 501](#)).

NOTE: The rigging procedure is the same for either alternate air control.

- (1) Disconnect alternate air control rod end (6) from alternate air valve actuating arm (21) on carburetor air box (17) by removing attaching bolt (2).
- (2) Place alternate air control knob in control pedestal in the COLD (full in) position and turn knob clockwise to lock it in this position.
- (3) Position alternate air valve actuating arm (21) so that the air valve (16) in the air box (17) is parallel with the bottom of the air box.

NOTE: The position of the air valve may be checked by opening the spring-loaded alternate air door (18). The air valve should be parallel with the bottom of the air box to provide minimum interference with air flow.

- (4) Loosen jamb nut (5) on alternate air control sliding end (20). Adjust position of rod end (6) by screwing in or out until bolt (2) can be inserted through air valve actuating arm (21) and rod end (6) as illustrated.

NOTE: Do not allow alternate air control knob in control pedestal or the alternate air valve actuating arm to move from the positions specified in steps (2) and (3) during adjustment of the rod end.

- (5) Tighten nut (7) on attaching bolt (2). Tighten jamb nut (5).
- (6) Unlock alternate air control knob and pull knob out to HEAT position. Open spring loaded alternate air door (18) on air box (17) and check to see that air valve (16) is fully closed.

B. Rigging Induction Air Controls (Airplanes 310C35772 thru 310D39299) (Refer to [Figure 502](#)).

- (1) Remove bolt (19) from control plate (17).

NOTE: Spring arm (20) is shown against the right control plate stop only to clarify the illustration. Spring arm (20) normally rides against the left stop of the control plate.

- (2) Place the induction air knob on the control pedestal all the way in and locked.

NOTE: Spring arm (20) is the only part actually attached to the induction air door. Control plate (17) merely controls the position of the spring arm.

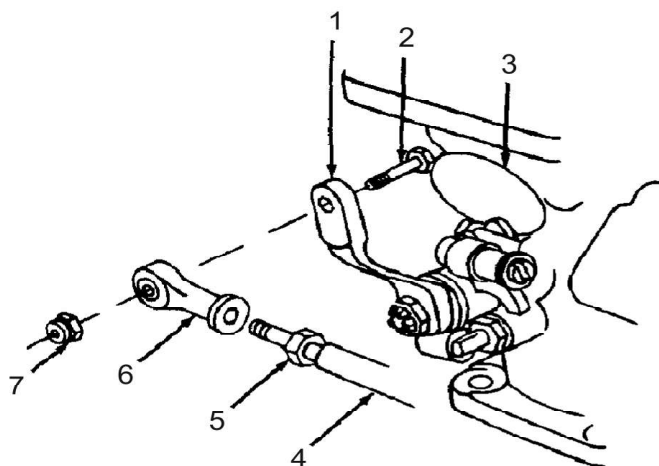
- (3) When the spring arm (20) is at the limit of its travel to the left, the induction air door is fully closed. With the spring arm in this position, set the control plate (17) so that its left stop just clears the cam on the end of the spring arm.
- (4) Being careful not to move the control plate (17), screw clevis (18) in or out until bolt (19) may be installed without binding. Install nut on bolt (19).
- (5) With the induction air control knob still in and locked, manually move spring arm (20) to the right until the spring arm cam hits the right stop of the control plate. Release the spring arm. The spring arm should return to the control plate left stop.
- (6) If the spring arm does not return to the left stop, more gap must be allowed between the spring arm cam and the control

plate left stop. Refer to step (3).

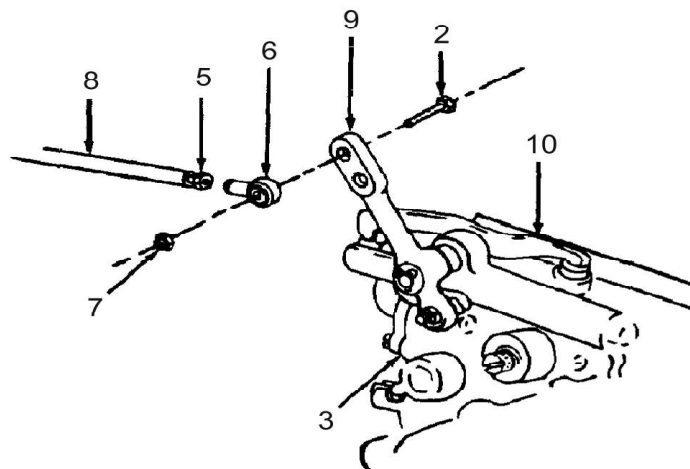
- (7) Unlock and pull the induction air knob out until the induction air door hits its open stop. Check for freedom of operation. Push the induction air knob in and lock. Check that the induction air door is fully closed.

Figure 501 : Sheet 1 : Engine Control Rigging (Airplanes 310-35000 thru 310B35771)

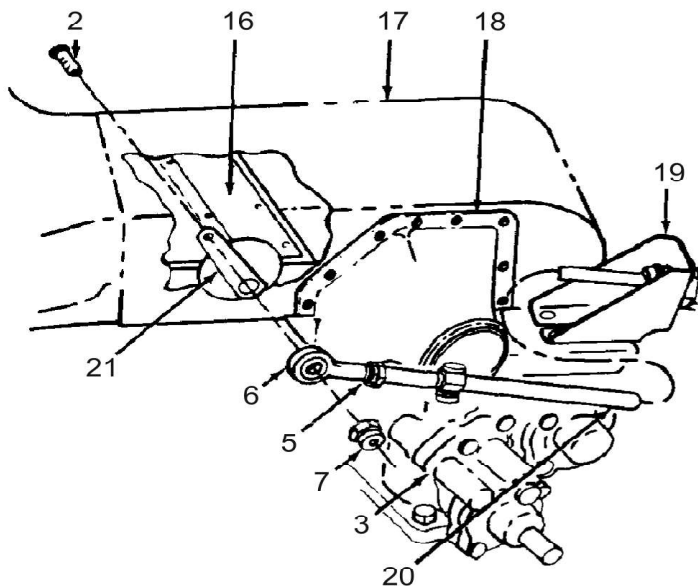
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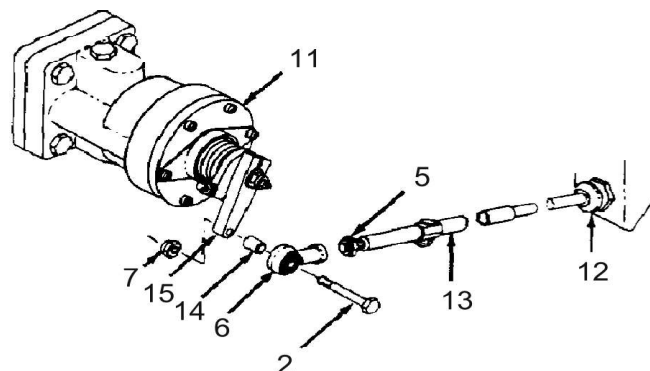
THROTTLE CONTROL



MIXTURE CONTROL



ALTERNATE AIR CONTROL



PROPELLER GOVERNOR CONTROL

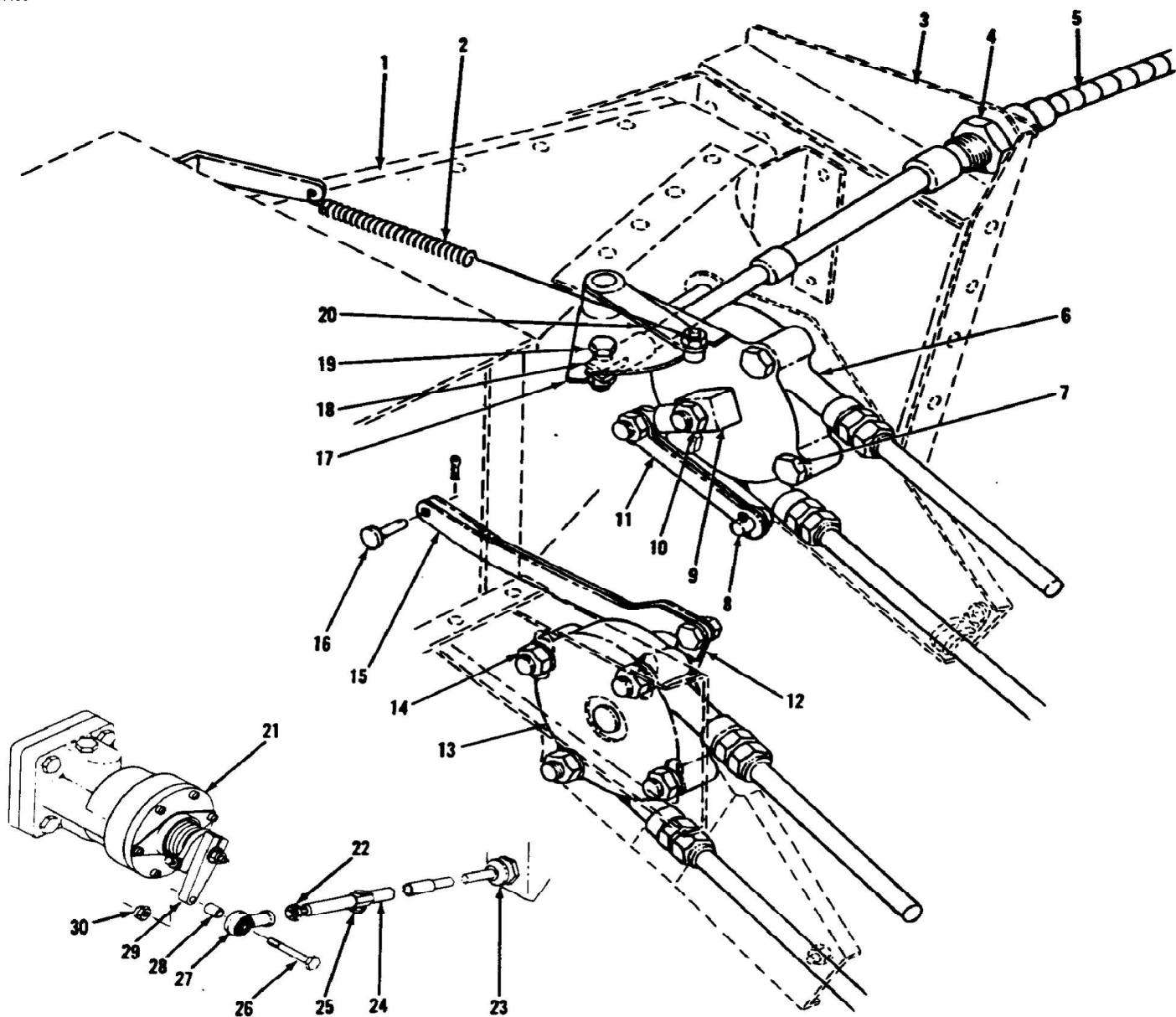
1. Throttle Arm
2. Bolt
3. Carburetor
4. Throttle Control Sliding End
5. Jamb Nut
6. Control Rod End
7. Nut

8. Mixture Control Sliding End
9. Mixture Control Arm
10. Idle Cut-Off Lever
11. Propeller Governor
12. Swivel Connector
13. Propeller Control Sliding End
14. Spacer

15. Propeller Governor Arm
16. Alternate Air Valve
17. Carburetor Air Box Assembly
18. Carburetor Hot Air Adapter
19. Mounting Bracket
20. Alternate Air Control Sliding End
21. Alternate Air Valve Actuating Arm

Figure 502 : Sheet 1 : Engine Control Rigging (Airplanes 310C35772 thru 310D39299)

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|--------------------|---------------------------------|------------------------|
| 1. Air Intake Box | 11. Linkage | 21. Propeller Governor |
| 2. Spring | 12. Control Arm | 22. Lock Nut |
| 3. Bracket | 13. Throttle Control | 23. Swivel Connector |
| 4. Nut | 14. Nut | 24. Sliding End |
| 5. Cable Housing | 15. Linkage | 25. Lock Plug |
| 6. Mixture Control | 16. Pin | 26. Bolt |
| 7. Bolt | 17. Induction Air Control Plate | 27. Control Rod End |
| 8. Pin | 18. Clevis | 28. Spacer |
| 9. Control Arm | 19. Bolt | 29. Governor Arm |
| 10. Nut | 20. Spring Arm | 30. Nut |

ENGINE CONTROL SYSTEM INSTALLATION

ITEM	PART NUMBER	NOMENCLATURE							EFFECTIVITY		UNITS PER ASSY
		1	2	3	4	5	6	7	FROM	TO	
-		ENGINE CONTROL SYSTEM INSTALLATION							35772	& ON	
1		ENGINE CONTROL SYSTEM COMPONENTS- FUSELAGE									RF
2	0850599-3	BOX- RH CONTROL TELEFLEX 15384									2
2A	0850599-1	BOX- LH CONTROL TELEFLEX 15384									2
3	AN3-11A	BOLT- ATTACH BOX									6
4	AN507-1032R18	SCREW- ATTACH BOX									8
5	NAS1149F0332P	WASHER- ATTACH BOX									14 R
6	AN363-1032	NUT- ATTACH BOX									14
7	0851619-1	BARREL ASSY- MIXTURE CONTROL									2
8	0851539-3	BOLT- EYE- MIXTURE CONTROL									2
-	8A 0851539-4	ARM ASSY- THROTTLE CONTROL									2
8B	0851539-2	ARM									1
-	8C 0851539-5	BOLT									1
9	0851538-1	LINK- MIXTURE									2
10	0851571-1	LINK- THROTTLE									2
11	AN3-3A	BOLT									4
-	11A 0861116-1	SPACER									4
-	11B NAS1149F0332P	WASHER									4 R
-	11C MS20364-1032C	NUT									4
12	MS20392-2-7	PIN									2
13	MS20392-2-9	PIN									2
14	MS24665-132	COTTER PIN									4
15	0852000-9	BRACKET									2
16	AN741-18P	CLAMP- TYPE A									4
17	AN4-6A	BOLT									4
18	MS21044N4	NUT									4 R
19	0850250-199	CONDUIT- PROPELLER									2
20	0850250-2	TELESCOPIC UNIT- PROPELLER									2
21	S-1106-3	ROD END									2
22	AN315-4R	NUT									2
23	AN3-17A	BOLT									2

	24	MS21045L3	.	NUT	2	R
	25	NAS75-3-029	.	BUSHING	2	
	26		.	CONTROL- HOT AIR- REFER TO 76-10-00 FIGURES 05	RF	
	27	0850509-1	.	CLEVIS- CONTROL	2	
-	27A	AN315-3R	.	NUT- CHECK	2	
	28	AN3-7A	.	BOLT	2	
-	28A	0850507-1	.	BUSHING	2	
-	28B	NAS1149F0332P	.	WASHER	2	R
-	28C	MS20364-1032C	.	NUT	2	
	29	0850250-5	.	CONNECTOR	2	
	30	0850250-197	.	CONDUIT- LH PROPELLER CONTROL - CONNECTOR TO NACELLE RIB	1	
-	30A	0850250-195	.	CONDUIT- RH PROPELLER CONTROL - CONNECTOR TO NACELLE RIB	1	
	31	0850042-1	.	CLAMP- SECURE LH CONDUIT	1	
	32	0850250-188	.	CONDUIT- LH MIXTURE CONTROL - CONTROL BOX TO NACELLE RIB	1	
-	32A	0850250-189	.	CONDUIT- RH MIXTURE CONTROL - CONTROL BOX TO NACELLE RIB	1	
	33	0850250-186	.	CONDUIT- LH THROTTLE CONTROL - CONTROL BOX TO NACELLE RIB	1	
-	33A	0850250-187	.	CONDUIT- RH THROTTLE CONTROL - CONTROL BOX TO NACELLE RIB	1	
	34	0850250-201	.	CONDUIT	4	
	35	0850250-15	.	CONDUIT- CONTROL - FUSELAGE TO NACELLE RIB	4	
	36	0850250-21	.	CONDUIT- THROTTLE CONTROL - FUSELAGE TO NACELLE RIB	2	
	37	0850250-4	.	CONNECTOR- CONNECT CONDUITS AT NACELLE RIB	6	
	38	MS35333-44	.	WASHER- CONNECT CONDUITS AT NACELLE RIB	6	R

	39	A3046-A5-92	CLAMP- TINNERMAN - ATTACH LH HOT AIR CONTROL	1	
-	39A	NAS43DD-3-13	SPACER- ATTACH LH HOT AIR CONTROL	1	
	40	A3046-A5-92	CLAMP- TINNERMAN - ATTACH RH HOT AIR CONTROL	2	
-	40A	NAS43DD-3-13	SPACER- ATTACH RH HOT AIR CONTROL	2	
-	40B	AN515-8R10	SCREW- ATTACH RH HOT AIR CONTROL	2	
	41	0850551-1	BRACE- MIXTURE CONTROL SUPPORT	2	
	42	0850551-2	BRACE- THROTTLE CONTROL SUPPORT	2	
	43	MS21919G4	CLAMP- ATTACH CONTROL	4	
	44	NAS221-6	SCREW- ATTACH CONTROL	4	
	45	MS21045L3	NUT- ATTACH CONTROL	4	R

- Item Not Illustrated

Figure 02 : Sheet 1 : ENGINE CONTROL SYSTEM INSTALLATION

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