

29 May 1945

AIRCRAFT AND MAINTENANCE PARTS

NORTH AMERICAN—REWORK OF LANDING-GEAR FAIRING DOOR ACTUATING
MECHANISM—P-51D, P-51K, F-6D, AND F-6K

This Technical Order replaces T. O. No. 01-60JE-11, dated 4 September 1944, which directed installation of cable fair-lead.

NOTE As prescribed in T. O. No. 00-20A, appropriate reference to this Technical Order will be entered on AAF Forms 60-A for the aircraft affected. The work directed herein will be accomplished as soon as possible and not later than the next 50-hour inspection period by service activities with the aid of base maintenance facilities, if necessary. Wing replacement assemblies, part Nos. 106-14601RA and 104-14601-1RA, in stock, will be reworked prior to issue.

1. To prevent the landing-gear fairing door control cable, when slack, from becoming ensnared on the adjacent landing-gear hydraulic check valve which may result in serious malfunctioning of the landing gear, a modification incorporating prerigged landing-gear fairing door control cable will be installed on the following listed airplanes, in accordance with the instructions contained in paragraph 2.

MODEL	AF SERIAL NOS.
P-51D, F-6D	44-11153 to 44-11352 inclusive 44-13253 to 44-15752 inclusive 44-63160
P-51K, F-6K	44-11353 to 44-11952 inclusive

P-51D airplanes, AF Nos. 44-12853 and 44-63161, and P-51K airplanes, AF No. 44-11953 and subsequent, will be modified by the contractor prior to delivery.

2. The instructions for accomplishing this modification, as contained in North American Service Bulletin P-51-221, are as follows:

a. Exhaust the hydraulic system pressure by pulling the emergency release knob on instrument panel or operating wing flaps until pressure gage on instrument panel reads zero.

b. Open the landing-gear fairing doors.

c. Turn fuel shut-off valve to "OFF" and position fuel selector valve to either left or right combat tank. (Combat tanks must be removed or if installed must be empty.)

d. In the left wheel well disconnect the cable, part No. 106-335173 (or 109-335173), which is attached to

the torque tube assembly and pull through the center rib into the right wheel well. (See figure 1.)

e. Two hydraulic lines in the right wheel well are to be removed and replaced with new lines to provide clearance for the new bell crank. Disconnect and remove the lines as follows:

(1) Remove the line, part No. 106-58808, routed from the top of the hydraulic accumulator to top of unloader valve. (See figure 2.)

(2) Remove the line, part No. 106-58853, routed from the top port of the selector valve to the bottom port of the fairing door emergency release valve.

(3) Plug the open fittings to prevent excessive fluid loss.

f. Temporarily detach the fuel hose in the left wheel well which is routed from the fuel selector valve to the shut-off valve. Detach the hose clamp and fitting at the shut-off valve. (See figure 3.)

g. Remove the fair-lead, part No. 104-34534 (with 109-33367 clip attached), on station O (center) rib adjacent to the landing-gear check valve, by drilling out the two attaching rivets. Some airplanes will have this fair-lead attached with screws. (See figure 1.)

h. Remove the pulley and attaching parts from the pulley bracket on center rib above the location of the fair-lead removed in paragraph 2.g. Remove both portions of the pulley bracket, part Nos. 106-335163 and 106-335163-3, from the rib by drilling out the four attaching rivets.

i. Locate the vertical reinforcing angle on the left side of the center rib. Drill out the second and third

NOTICE: This document contains information affecting the national defense of the United States within the meaning of the Espionage Act, 50 U. S. C. 31 and 32, as amended. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

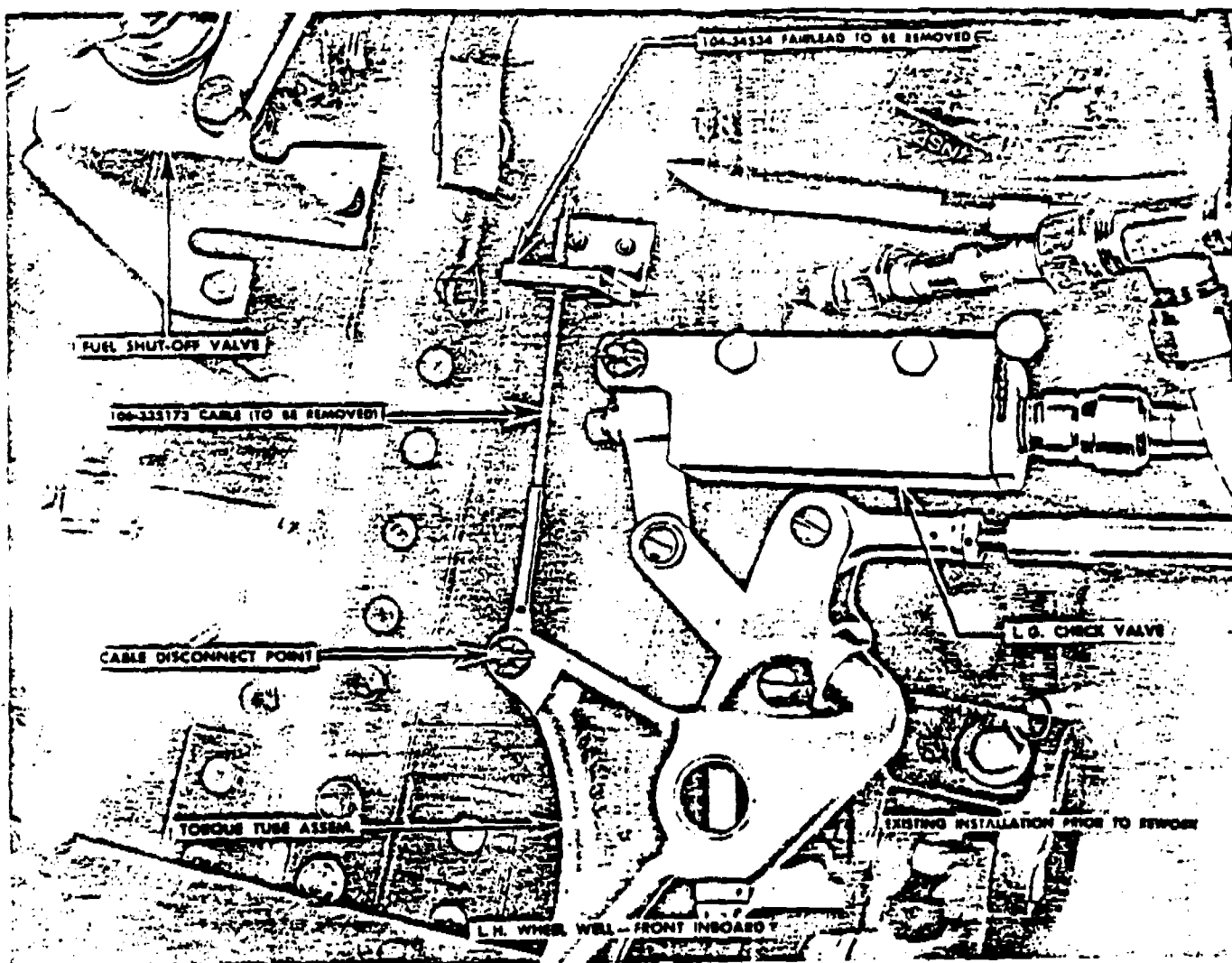


Figure 1 - Existing Cable Installation

rivets from the bottom and the third, fourth, and fifth rivets from the top. The upper holes are to be drilled out to No. 11 (.191-inch) and the lower holes to be drilled out to 1/4 inch (.250). (See figures 3 and 4.)

l. Make the cut-out in the center rib, just aft of the reinforcing angle in accordance with the dimensions shown in figure 4.

k. Install the clip, part No. 109-33355, on the vertical angle, and attach with the bolts and nuts as shown in figure 3.

l. The bell crank, part No. 109-33353, and attaching brackets, are to be installed on the right side of center rib, adjacent to the new cut-out as follows:

(1) Install the forward bracket, part No. 109-33351, over the angle and secure with the attaching parts as shown in figure 5.

(2) Install the bell crank, part No. 109-33353, and aft bracket, part No. 109-33354, by securing to the forward bracket as shown in figure 5.

(3) Using the aft bracket as a template, drill three No. 11 (.191-inch) holes through the rib.

(4) Secure the aft bracket with the attaching parts as shown in figure 5.

m. Install the rod, part No. 109-33352, on the left side of the center rib. Secure the bearing end to the bell crank at the top and secure the plain flat end to the arm of the torque tube at the bottom. (See figure 3.)

n. Install the spring, part No. 109-33357, by hooking it to the clip at the bottom and to the bell crank at the top. (See figure 3.)

o. Replace cables, pulleys, etc., in right wheel well as follows:

NOTE The arrangement of the landing-gear door and timing valve cables in the right wheel well are different on certain airplanes. For this reason it is necessary to supply parts that are not used on all of the "Airplanes Affected."

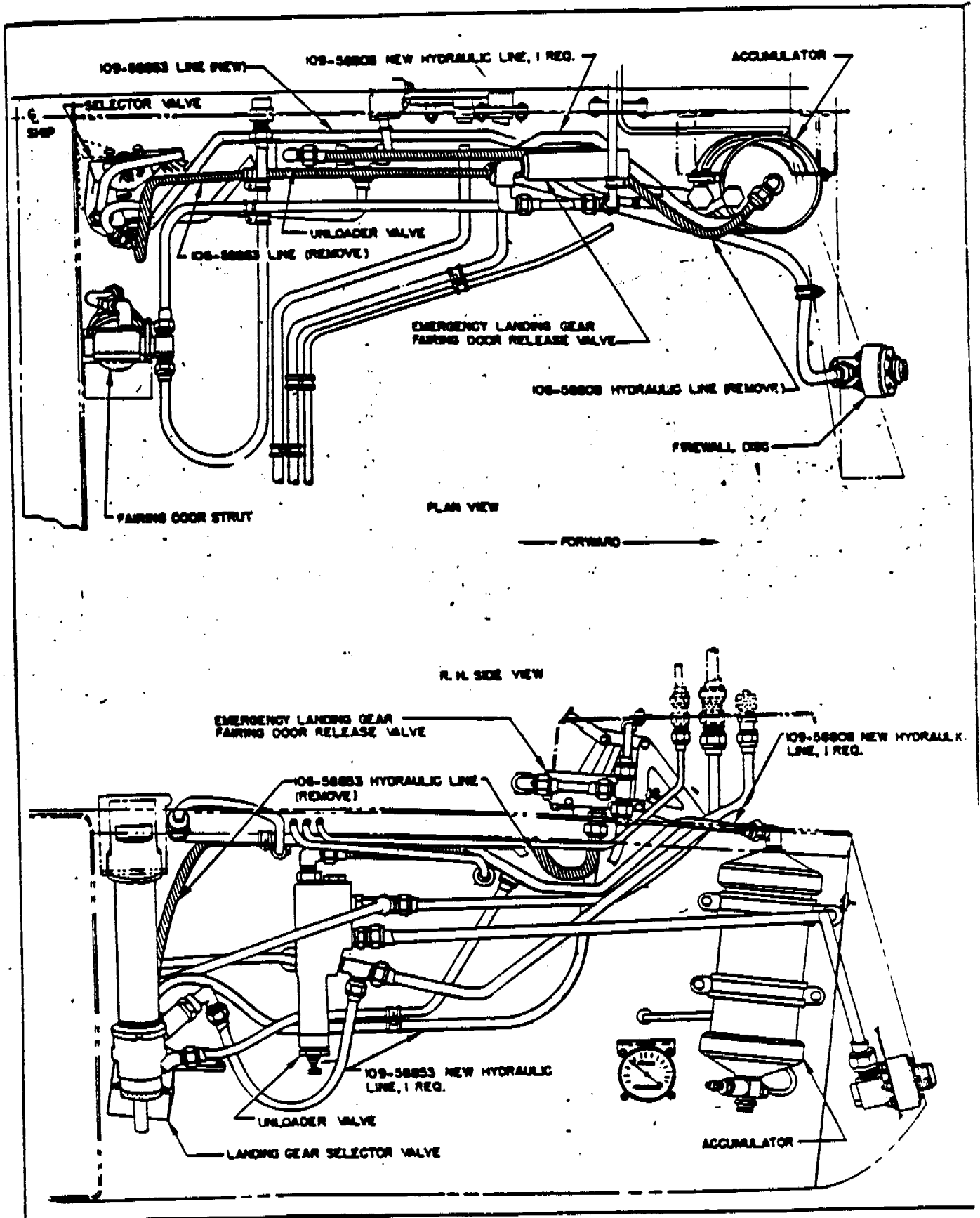


Figure 2 - Replacement of Hydraulic Lines

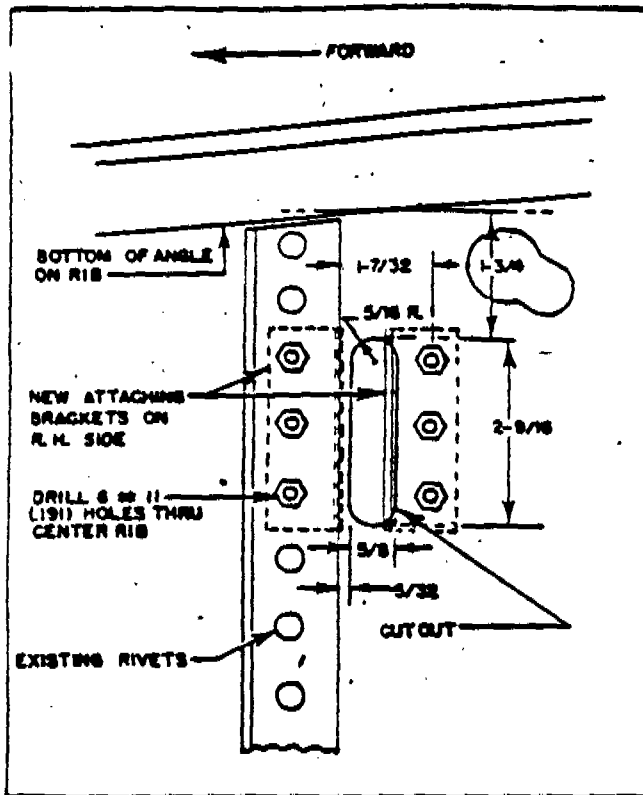


Figure 4 - Cut-out in Center Rib

The following three specific categories distinguish the parts and instructions as applied to each group. Refer to figure 6 in conjunction with these instructions.

(1) Replacement of cables on:

P-51D 44-11153 to 44-11162 inclusive
44-13253 to 44-14462 inclusive

(a) Remove the cable, part No. 106-335173, routed from the torque tube arm to the turnbuckle just outboard of station 50 rib by disconnecting at the turnbuckle. (See figure 6.)

(b) Remove the cable, part No. 106-335106, routed from the bell crank on the strut to the turnbuckle just inboard of station 50 rib.

(c) Remove the bell crank, part No. 99-33562, from the top of the landing-gear strut. Install the new bell crank (same part number) using the same attaching parts. The replacement of the bell crank necessitates the temporary removal of the two brake lines and fitting from the strut. Plug lines when detached to prevent excessive fluid loss. Parking brake must be "OFF."

(d) Remove the pulley bracket, part No. 99-33564, at station 61.5 rib, just outboard of landing-gear strut by drilling out the attaching rivets. Drill

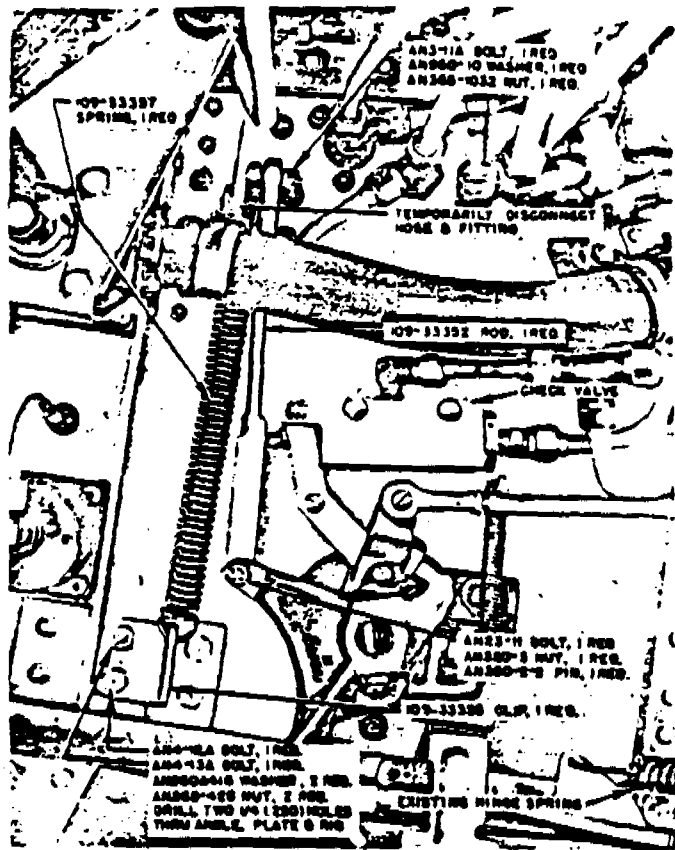


Figure 5 - New Cable and Rod Installation Left Wheel Well

out the holes in the rib and install the new bracket (same part number). Attach it to the rib with the screws as shown in figure 6. Remove the pulley and attaching parts from old bracket and install them on the new bracket with the new additional pulley and attaching parts as shown in figure 6.

(e) Remove the fair-lead, part No. 106-335178, from station 50 rib by drilling out the attaching rivets. Install the new fair-lead (same part number) and secure it to the rib with the attaching parts as shown in figure 6.

(f) Install the cable, part No. 109-33556, by connecting it to the bell crank on the center rib with the attaching parts as shown in figure 5.

(g) Install the cable, part No. 109-335174, by routing it from the bell crank on the landing-gear strut to the turnbuckle connection with the inboard cable, part No. 109-33356. Route cable through the new fair-lead and pulley bracket and install the new turnbuckle and attaching parts as shown in figure 6.

(2) Replacement of cables on:

P-51D 44-14453 to 44-14852 inclusive
44-11163 to 44-11352 inclusive
P-51K 44-11353 to 44-11952 inclusive

(a) Remove the cable, part No. 109-335173, which is routed from the torque tube arm in left



Figure 5 - Bell Crank - Right Wheel Well

wheel well to the turnbuckle in right wheel well just outboard of station 50 rib. Disconnect cable at the turnbuckle and remove the turnbuckle. (See figure 6.)

(b) Remove the spring, part No. 117-42111, which is attached to the beam just outboard of station 50 rib and to the turnbuckle on the cable.

(c) Install the new turnbuckle, part No. AN155-168, by securing it to the existing cable routed from the bell crank on the landing-gear strut. (See figure 6.)

(d) Install the cable, part No. 109-33356. Route from the new turnbuckle to the bell crank on the center rib. Secure the cable to the turnbuckle and to the bell crank with the attaching parts as shown in figure 6.

(3) Replacement of cables on:

P-51D 44-14853 to 44-15752 inclusive
44-63160

(a) Remove the cable, part No. 109-335173, which is routed from the torque tube arm in the left wheel well to the turnbuckle in the right wheel well just outboard of station 50 rib. Disconnect cable at turnbuckle and remove the turnbuckle. (See figure 6.)

(b) Remove the spring, part No. 117-42111, which is attached to the beam just outboard of station 50 rib and to the turnbuckle on the cable.

(c) Install the new turnbuckle, part No. AN155-168, by securing to the existing cable routed from the bell crank on the strut. (See figure 6.)

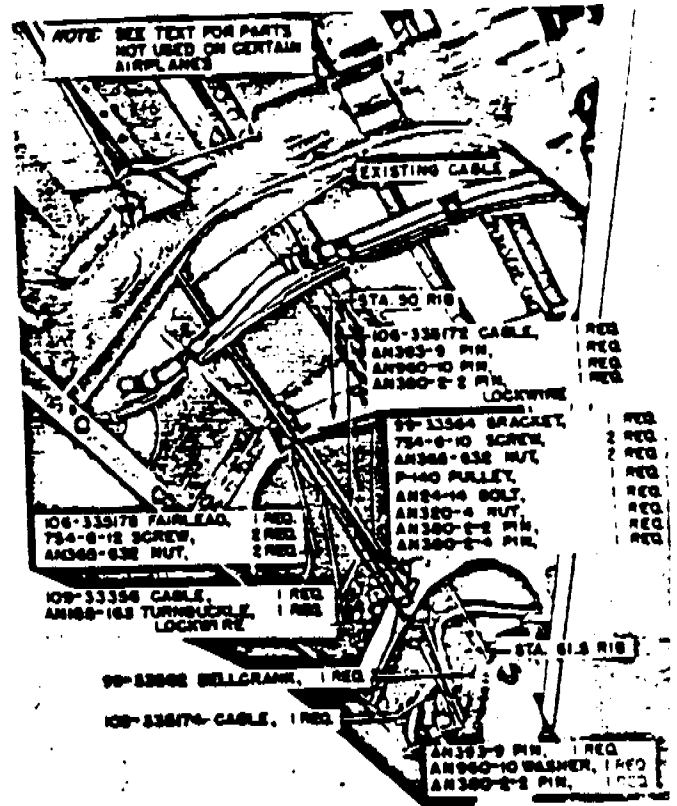


Figure 6 - Cables and Attaching Parts - Right Wheel Well

(d) Install the cable, part No. 109-33356, routing it from the new turnbuckle to the bell crank on the center rib. Secure the cable to the turnbuckle and to the bell crank with the attaching parts as shown in figures 5 and 6.

(4) Replacement of yokes and rollers:

P-51D 44-11153 to 44-11352 inclusive
44-13253 to 44-15052 inclusive
P-51K 44-11353 to 44-11452 inclusive

NOTE The replacement of the forward yokes and rollers on the preceding airplanes is necessary to provide clearance between the yoke and the door skin and preclude the possibility of malfunctioning of the door locks. The aft rollers and yokes which are the same as the forward ones will not require rework. Refer to figure 7 in conjunction with the following instructions which apply to both left and right wheel wells.

(a) Locate the forward door lock yoke at sta 83.5 rib in the wing leading edge, just outboard of gun camera. (See figure 7.)

(b) Remove the complete yoke and roller assembly by detaching the vertical bolt which secures unit to the upper portion of the latch and spring assembly. Save the washers and nut from the vertical. Remove the nut which secures the smaller horizontal roller for installation on the new roller assembly.

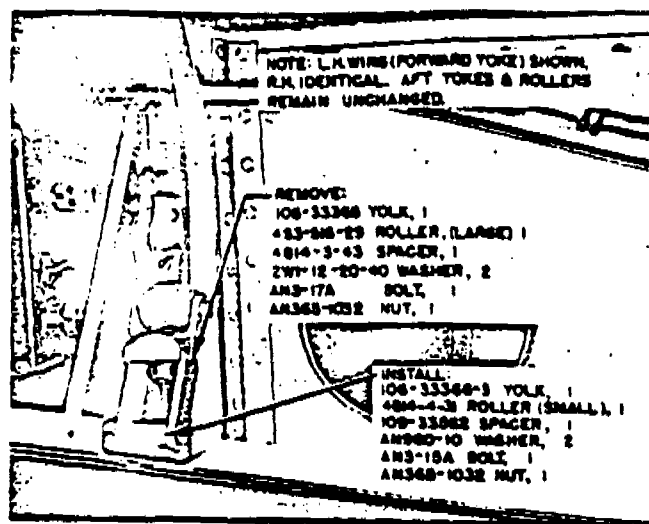


Figure 7 - Replacement of Yokes and Rollers

(c) As shown in figure 7, assemble a new yoke and roller assembly consisting of a new yoke, spacer, roller, bolt, washers, and the nut removed from the horizontal roller.

(d) Install the new unit by securing it to the upper portion of the latch and spring assembly with the nut and washers removed in paragraph 2.g.(4)(b).

q. In the left wheel well reinstall the fitting in the shut-off valve. Reconnect the fuel hose by inserting the hose on the fitting and reinstalling the hose attaching clamp. Turn fuel shut-off valve to "ON" in cockpit.

g. In the right wheel well install the new replacement hydraulic lines as follows:

(1) Remove plugs temporarily installed.

(2) Install the line, part No. 109-58808, by routing from the top of the hydraulic accumulator to the top of the unloader valve. (See figure 2.)

(3) Install the line, part No. 109-58853, by routing from the top port of the selector valve to the bottom port of the emergency fairing door release valve.

f. Check and refill the hydraulic system reservoir. Check the replacement lines for leakage.

3. ADJUSTMENT OF REWORKED MECHANISM. - The adjustment of the new fairing door actuating cable and rod is to be accomplished with reference to figures 3 and 8 as follows:

(1) Jack up the airplane.

(2) Remove both hinge springs, and spring "A" on bell crank. (See figure 8.)

(3) Adjust cable so vertical arm of bell crank will travel an equal distance both sides of vertical with the travel of the gear.

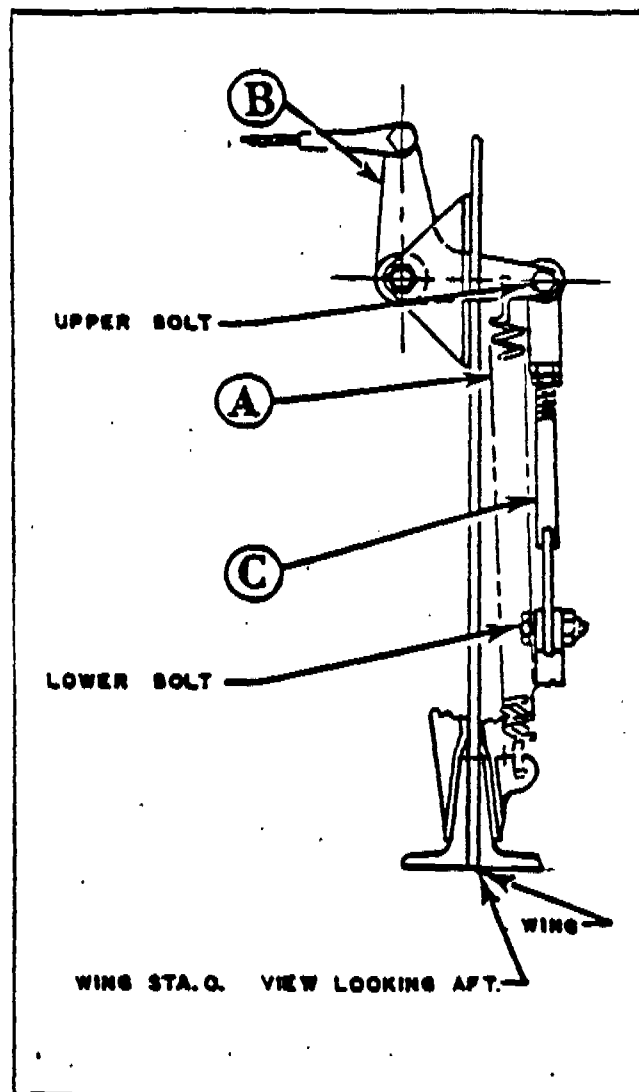


Figure 8 - Adjustment of Cable and Rod

(4) With gear handle to torque tube linkage correctly adjusted, have gear in "DOWN" position and landing-gear handle in "UP" position. Connect spring "A." Place upper bolt in rod "C." Adjust rod "C" so that when lower bolt is installed it can be inserted without difficulty. Actuate hinge rod "C" so as to fully retract door locks while installing lower bolt.

(5) Reinstall both hinge springs.

4. The yokes and rollers are to be adjusted with adherence to the following and reference to figure 9. There should be 1/32 to 1/16 inch between the tip of the hook and the roller when the roller is actuated with the fairing doors retracted under hydraulic pressure in the gear up position. This adjustment may be obtained by changing washers on the vertically positioned bolt which secures the upper portion of the yoke. Transpose the washers from the top to the bottom of the yoke or vice versa as required. If all washers are exhausted from above the yoke, then the 1/16-inch dimension may be increased, but only until a dimen-

sion of 1/4 inch is reached from the lower face of the hook to the roller.

NOTE The preceding adjustment instructions cover that part of the landing-gear system as reworked in this Technical Order only.

3. The following parts are required per airplane to accomplish this change. These parts are furnished as complete kits for initial installation and will be requisitioned in accordance with T. O. No. 00-35A-15. Parts required for maintenance after the initial installation, or for modification of spares in stock, will be requisitioned from the property classes as indicated.

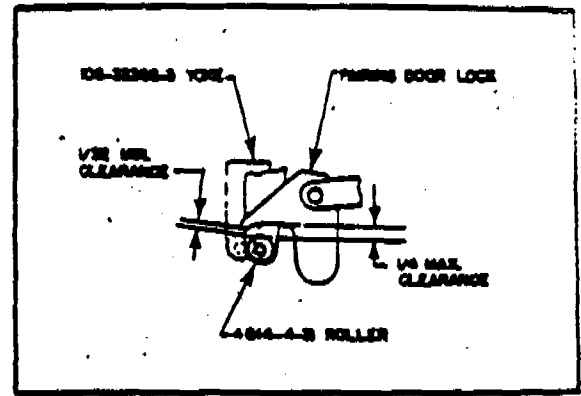


Figure 9 - Adjustment of Fairing Door Rollers

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
1	1300TO-01-60-96	109-89017	KIT, "Rework of Landing-gear Fairing Door Actuating Mechanism - P-51D, P-51E, F-6D, and F-6E," consisting of the following parts:	15	AF Stock
1		109-33351	Bracket	01-M	
1		109-33352	Rod	01-M	
1		109-33353	Bell Crank	01-M	
1		109-33354	Bracket	01-M	
1		109-33355	Clip	01-M	
1		109-33356	Cable	01-M	
1		109-33357	Spring	01-M	
1		109-58808	Hydraulic Line	01-M	
1		109-58853	Hydraulic Line	01-M	
1		99-33563	Bell Crank	01-M	
1		99-33564	Pulley Bracket	01-M	
2		106-33366-3	Yoke	01-M	
2		109-33562	Spacer	01-M	
2		4B14-4-31	Roller	01-M	
1		106-335172	Cable	01-M	
1		109-335174	Cable	01-M	
1		106-335178	Fair-lead	01-M	
1		F140	Pulley - Formica	04-A	
1		AN155-168	Turnbuckle	04-A	
3		AN3-6A	Bolt	04-A	
3		AN3-10A	Bolt	04-A	
2		AN3-15A	Bolt	04-A	
1		AN3-11A	Bolt	04-A	
1		AN23-9	Bolt	04-A	
2		AN4-12A	Bolt	04-A	
1		AN23-11	Bolt	04-A	
1		AN24-14	Bolt	04-A	
1		AN4-13A	Bolt	04-A	
2		734-8-10	Screw	01-M	
2		734-8-12	Screw	01-M	
5		AN960-10	Washer	04-A	
12		AN960A10	Washer	04-A	
1		AN960-416	Washer	04-A	
2		AN960A416	Washer	04-A	
4		AN365-832	Nut	04-A	
3		AN365-428	Nut	04-A	
7		AN365-1032	Nut	04-A	
2		AN320-3	Nut	04-A	
1		AN320-4	Nut	04-A	
5		AN380-2-2	Pin	29	
1		AN380-2-4	Pin	29	
2		AN383-9	Pin	04-A	

RESTRICTED
T. O. No. 01-60-95

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
	6800-787400		Steel - Wire, soft zinc-coated, .054-inch, Specification No. AN-QQ-W-435	23-A	

b. The following parts removed and not reinstalled in accordance with preceding instructions will be condemned at once and so tagged for disposition as condemned property.

QTY	PART NO.	NOMENCLATURE
1	109-33367	Clip
2	106-33366	Yoke
1	104-34534	Fair-lead
1	106-335178	Fair-lead
1	117-42111	Spring
1	106-58808	Hydraulic Line
1	106-58853	Hydraulic Line
1	99-33562	Bell Crank
1	106-335106	Cable
1	106-335173	Cable
1	99-33564	Pulley Bracket
1	109-335173	Cable
1	106-335163-3	Bracket
1	AN3-17A	Bolt
1	106-335163-3	Bracket
1	483-516-29	Roller - Large
1	4B14-3-43	Spacer
2	2W1-12-20-40	Washer

c. One complete kit of parts packed for shipment measures 12 x 12 x 28 inches and weighs 16 pounds.

4. Approximately 12 man-hours are required to accomplish this change.
5. The weight change affected by this modification is negligible.

BY COMMAND OF GENERAL ARNOLD:

Prepared by Aircraft Section,
Maintenance Div, Hq, ATSC.

L. T. MILLER
Major General, U.S.A.
Acting Director
Air Technical Service Command