the gunner's quadrant which end of the launcher is low.

1. Attach the multiple-leg sling (fig. 32) to the lifting lugs on the low end of the launcher and secure with the toggle pins.

2. Using a hoisting device capable of lifting 6,250 pounds, lift the launcher enough to permit shims of the proper thickness to be inserted.

3. Add shims of the proper thickness as required, under the mounting bracket.

4. Lower the launcher and recheck the level with the gunner's quadrant.

5. If the launcher is not level to within ±5 mils, repeat steps (1) through (4) above until the proper level is obtained.

e. Check that the launcher base (8) is not twisted or strained. Check that the forward outrigger (1) fits snugly against the 1/16-inch shim (11) on both sides of the outrigger. If the track section (13) of the forward outrigger is 1/16-inch higher than either of the track sections of the forward attach trusses (9), raise the front of the launcher and insert shims as required under the forward mounting bracket (10) on the side of the launcher where the track sections are uneven.

f. Check the transverse and longitudinal level of the launcher. Repeat e, d, and e above if the launcher is not level to within ±5 mils in both planes.

g. Recheck that the tops of the track sections (14) on the rear attach trusses (2) are 1/32-inch higher than the top of the track section of the rear outrigger (8). If the tops of the track sections are not 1/32-inch higher, place shims under the intermediate mounting brackets (6) until the top of the track sections of the rear attach trusses are 1/32-inch higher than the top of the track section of the rear outrigger.

h. Tighten the two nuts (4) in each of the mounting brackets (5, 6, and 10).

i. Recheck the transverse and longitudinal level of the launcher. Repeat c through g above if the launcher is not level within ±5 mils.

j. Remove the multiple-leg sling from the lifting lugs.

k. Raise the launcher erecting beam enough to remove the 1/16-inch shims. Remove the shims and lower the erecting beam.

l. Close the EQUILIBRATOR SYSTEM BYPASS valve (fig. 21) and raise and lower the launcher erecting beam one full cycle.

27. Mobile Launcher Leveling Checks and Adjustments

Caution: To prevent accidental collapse of a jack under load, install the pin assembly each time a jack is extended or retracted.

Caution: To prevent warping of the launcher base, jacks under load should be extended or retracted simultaneously.

a. Insure that the SYSTEM BYPASS valve (fig. 21) and EQUILIBRATOR SYSTEM BYPASS valve are in the closed position.

b. At the launcher control-indicator, elevate the launcher erecting beam enough to allow a 1/16-inch shim (11, fig. 30) to be placed between the forward outrigger (1) on the erecting beam and the forward attach trusses (9) on the launcher. Lower the erecting beam to the down position, and open the EQUILIBRATOR SYSTEM BYPASS valve (fig. 21).

Note. The operating instructions are placarded on the jack.

c. If the foot plate (4, fig. 33) of the auxiliary jack (1) is extended to the ground, fully retract the jack.

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**Figure 33. Mobile launcher—leveling adjustments.**

1—Auxiliary jack
2—Blast deflector
3—Outrigger jack (2)
4—Foot plate (7)
5—Center jack (2)
6—Forward jack (2)
d. If the foot plates (4) of the center jacks (5) are extended to the ground, fully retract the jacks.

e. Check the level of the launcher erecting beam by placing the gunner's quadrant (fig. 31) across the leveling blocks parallel to the trunnion. Observe that the gunner's quadrant indicates that the erecting beam is level within ±5 mils. If the erecting beam is not level within ±5 mils, level by adjusting the outrigger jacks (3, fig. 33).

f. Check the level of the launcher erecting beam by placing the gunner's quadrant (fig. 31) on the leveling blocks perpendicular to the trunnion. Observe that the gunner's quadrant indicates that the erecting beam is level within ±5 mils. If the beam is not level within ±5 mils, level by adjusting the forward jacks (6, fig. 33).

g. Check that the launcher base is not twisted or strained. Insure that the forward outrigger (1, fig. 30) fits snugly against the 1/16-inch shim (11) on both sides of the outrigger. If the track section (13) of the forward outrigger is 1/16-inch higher than either of the track sections of the forward attach trusses (9), adjust the proper forward jack (6, fig. 33).

h. Recheck the level of the erecting beam as described in e above. Make adjustments as necessary.

i. Extend the center jacks (5, fig. 33) to the ground and adjust so that the tops of the track sections (14, fig. 30) on the rear attach trusses (2) are 1/32-inch higher than the tops of the track sections of the rear outriggers (8).

j. If the 1/32-inch dimension cannot be obtained, relieve all pressure on the center jacks.

k. Place locally fabricated 1/8-inch shims as required under the rear track section support assemblies (2, fig. 30) until the top of the track section (14) on the rear track section support assemblies are a maximum 1/4-inch low with respect to the top of the track sections on the rear outriggers (3, fig. 33).
l. Repeat step 27i above.
   m. Insure that pins are installed in all jacks.
   n. If necessary, adjust the blast deflector by
      operating the ratchet wrench until the blast
      deflector is in the proper position.
   o. Raise the launcher erecting beam enough
      to remove the 1/16-inch shims and lower the
      erecting beam to the down position.
   p. Close the EQUILIBRATOR SYSTEM
      BYPASS valve (fig. 21) and raise and lower
      the erecting beam one full cycle.

28. Mobile Launcher Axle Brake Adjustment

   a. Hydraulic Brake Adjustment. Perform
      the hydraulic brake adjustment as described
      below.

      *Note.* The key numbers shown in parentheses in
      (1) through (10) below refer to figure 34 unless
      otherwise indicated.

      (1) Check that the drain cock (3) is
          closed. Connect the air hose assem-
          blies (1) from the prime mover to
          the couplings (2).

      (2) Check that both parking brakes (fig.
          35) are released. At the prime mover,
          actuate and release the mobile
          launcher axle brakes.

      (3) Disconnect the air hose assemblies
          from the couplings.

      (4) Slowly open the drain cock and allow
          the mobile launcher axle to depre-
          surize.

      (5) Set the parking brake lever at one
          side of the axle. At the other side, use
          a jack capable of lifting one ton to
          raise the axle until the tire clears the
          ground.

      (6) Turn one adjusting stud assembly
          (fig. 35) counterclockwise until the
          wheel drags when rotated.

      (7) Turn the stud assembly in the oppo-
          site direction until the drag is just
          relieved; continue turning the stud
          assembly an additional 1/4 turn.

      (8) Repeat steps (6) and (7) above for
          the other stud assembly.

      (9) Lower the axle and remove the jack.
          Release the parking brake.

      (10) Repeat steps (1) through (9) above
           at the other wheel.

   b. Parking Brake Adjustment. Check the
      parking brakes and adjust as required in steps
      (1) through (4) below if maintenance has
      been performed on the mobile launcher axle
      brakes.

      *Note.* The parking brake check should be performed
      on a level surface.

      (1) Set both parking brake levers (fig.
          35).

      (2) Slowly start to tow the mobile
          launcher. Check that both tires on the
          mobile launcher axle hold or skid, but
          do not roll.

      (3) If a tire rolls with the parking brake
          set, adjust the parking brake on that
          side of the axle as described in (a)
          through (d) below.

          (a) Release the parking brake lever.

          (b) Loosen the locking nut.

          (c) Turn the adjusting nut to adjust
              the parking brake. Tighten the
              locking nut.

          (d) Check that the parking brake oper-
              ates freely, with no binding or
              interference.

![Figure 35. Mobile launcher axle—localized bleed points.](image)
(4) Repeat steps (1) and (2) above to check the adjustment of the parking brake.

29. Mobile Launcher Axle Brake System Servicing Procedures

Warning: To prevent injury to personnel, make certain the mobile launcher axle is properly secured when performing a and b below.

Note. Key numbers in parentheses in a and b below refer to figure 34 unless otherwise indicated.

a. Mobile Launcher Axle Brake System Drain and Flush. The mobile launcher axle is received with preservative fluid in the brake system. Prior to placing the axle in service, the preservative fluid must be removed, the brake system flushed, and the hydraulic brake fluid installed. Axles which are to be stored, or which are to be idle for 60 days or longer, must have the hydraulic brake fluid removed, the brake system flushed, and preservative fluid installed. Drain and flush the axle brake system as prescribed in steps (1) through (14) below.

Note. The axle brake system is actuated from the prime mover during the procedures prescribed in steps (1) through (14) below.

(1) Check that the air hose assemblies (1) from the prime mover are connected to the couplings (2). Check that the drain cock (3) is closed.

(2) Drain the master cylinder assembly (5) as prescribed in (a) through (c) below.

(a) Clean the connector bolt (6) on the end of the master cylinder assembly. Loosen the connector bolt.

(b) Depress the brake pedal on the prime mover. Preservative fluid or hydraulic brake fluid will be forced out around the threads of the connector bolt.

(c) Repeat (b) above until all fluid has been removed from the master cylinder. Tighten the connector bolt.

(3) Drain at the bleeder valve (fig. 36) nearest the ground on the wheel cylinder assembly farthest from the master cylinder assembly (5) as prescribed in (a) through (c) below.

(a) Clean the bleeder valve (9). Attach one end of the bleeder hose (7) to the bleeder valve and place the other end of the bleeder hose into a suitable container (8).

(b) Open the bleeder valve by turning counterclockwise, and depress the brake pedal on the prime mover. Preservative fluid or hydraulic brake fluid will be forced out of the bleeder valve.

(c) Repeat (b) above until all fluid has been removed from the wheel cylinder assembly. Tighten the bleeder valve.

(4) Repeat step (3) above at the bleeder valve farthest from the ground on the wheel cylinder assembly farthest from the master cylinder assembly.

(5) Repeat step (3) above at the bleeder valve nearest the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(6) Repeat step (3) above at the bleeder valve farthest from the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(7) Remove the filler cap (4) and fill the reservoir of the master cylinder assembly (5) with denatured alcohol 6810-201-0905.

(8) Depress the brake pedal on the prime mover.

(9) Fill the reservoir of the master cylinder assembly with denatured alcohol.

Note. The reservoir of the master cylinder assembly must be kept full while performing steps (10) through (13) below.

(10) Drain at the bleeder valve (fig. 36) nearest the ground on the wheel cylinder assembly farthest from the master cylinder assembly as prescribed in (a) and (b) below.

(a) Open the bleeder valve by turning counterclockwise, and depress the brake pedal on the prime mover. Denatured alcohol will be forced out of the bleeder valve.
(b) Repeat (a) above until the alcohol flow is clear and without a trace of preservative fluid or hydraulic brake fluid.

(11) Repeat step (10) above at the bleeder valve farthest from the ground on the wheel cylinder assembly farthest from the master cylinder assembly.

(12) Repeat step (10) above at the bleeder valve nearest the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(13) Repeat step (10) above at the bleeder valve farthest from the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(14) Drain the denatured alcohol from the brake system as prescribed in steps (2) through (6) above.

b. Mobile Launcher Axle Brake System Air Bleed. For location of the localized bleed points, refer to figure 36. Air bleed the mobile launcher axle brake system as prescribed in steps (1) through (8) below.

Note. The mobile launcher axle brake system is actuated from the prime mover during the procedures prescribed in steps (1) through (8) below.

Note. The key numbers shown in parentheses in steps (1) through (8) below refer to figure 34.

(1) Check that the air hose assemblies (1) from the prime mover are connected to the couplings (2). Check that the drain cock (3) is closed.

(2) Remove the filler cap (4) and fill the reservoir of the master cylinder assembly (5) with hydraulic brake fluid.

Note. The reservoir of the master cylinder assembly must be kept full during the brake system air bleed procedures to prevent air from entering the system.

(3) Air bleed the master cylinder assembly as prescribed in (a) through (c) below.

(a) Clean the connector bolt (6) on the end of the master cylinder assembly. Loosen the connector bolt.

(b) Depress the brake pedal on the prime mover. Fluid will be forced out around threads of the connector bolt and expelled air will show as foam in the fluid.

(c) Repeat (b) above until the fluid flow is clear and without foam. Tighten the connector bolt.

(4) Air bleed at the bleeder valve nearest the ground on the wheel cylinder assembly farthest from the master cylinder assembly, as prescribed in (a) through (c) below.

(a) Clean the bleeder valve (9). Attach one end of the bleeder hose (7) to the bleeder valve, and place the other end of the bleeder hose in a suitable container (8), half filled with hydraulic brake fluid, so that the end of the bleeder hose is submerged in the fluid.

(b) Open the bleeder valve and depress the brake pedal on the prime mover. Fluid will be forced through the bleeder hose and expelled air will show as bubbles in the fluid.

(c) Repeat (b) above until the fluid is clear and free of foam.

(d) Close the bleeder valve.

(e) Remove the bleeder hose from the bleeder valve.

(5) Repeat step (4) above at the bleeder valve farthest from the ground on the wheel cylinder assembly farthest from the master cylinder assembly.

(6) Repeat step (4) above at the bleeder valve nearest the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(7) Repeat step (4) above at the bleeder valve farthest from the ground on the wheel cylinder assembly nearest the master cylinder assembly.

(8) Fill the reservoir of the master cylinder assembly to between 1/2 and 3/8 inch of the top of the reservoir. Install the filler cap (4).

30. Stop-and-Positioning Latch Adjustments

When initially installing a launching-handling rail on the launcher, the stop and positioning latches should be adjusted as prescribed below.

a. Rotate the positioning handle (1, fig. 37) to the RESET position.
b. Move the launching-handling rail (2) until the latches (4 and 8) contact the stops (5 and 9).

*Note.* If the tapered portion (11) of the latches contacts the erecting beam stops, adjustment of the latches is not necessary.

c. Adjust the setscrews (10) until the tapered portion (11) of the latches (4 and 8) contact the stops.

d. Rotate the positioning handle to the SKIP position.

e. Move the rail across the erecting beam.

f. Move the rail back until the latches (3 and 7) contact the stops (5 and 9).

*Note.* If the tapered portion of the latches contacts the stops, further adjustment of the latches is not necessary.

g. Adjust the setscrews until the tapered portion of the latches (3 and 7) contacts the stops.
30.1 Timer Checks

a. Quarterly, check the timers in the launcher control-indicator (LCI) as prescribed in steps (1) through (6) below.
   (1) Insure that all controls and switches are in the initial operating condition.
   (2) At the LCI, set the TEST-FIRE switch to TEST, the test station selector switch to the appropriate launcher or test station, and the LAUNCHER DC POWER switch to OFF.
   (3) Using the test leads of multimeter TS-352/U, connect the multimeter between pin 13 (28v dc common) and pin 14 (cage voltage) of connector J1G at the launcher erecting beam or test station.
   (4) At the LCI set the LAUNCHER DC POWER and HEATERS AND GYROS switches to the ON (up) position. The multimeter should indicate -33 to -36 volts. After 8 to 12 seconds, the voltage should drop to zero.
   (5) Remove the test lead from J1G-14 and connect it to J1G-7 (uneage voltage).
   (6) At the LCI set the UNCAGE-CAGE switch to UNCAGE. The multimeter should indicate -33 to -36 volts.
   b. Return all controls and switches to the initial operating condition.
   c. Report any out-of-tolerance indications or defective operations of the timer to the direct support shop.

30.2 K8A Insulation Leakage Test

Note. Request DS/GS maintenance perform the procedures in a through e below.

a. Check will be performed semiannually as prescribed in b through e below.
b. Set switch S44A in the SCI to NONE.
c. Insure that all section power is off.
d. Open the SCI access door, and pull out the door interlock switch.
e. Using an insulation test set, perform the following point-to-point checks, noting the condition of switch S8AA and assuring a minimum indication of 1 megohm.
   (1) S8AA set to OFF. Check between J13B pin C and S44A DK2 wire 267D20.
   (2) S8AA set to ON. Check between J13B pin C and S44A DK2 wire 267D20.

30.3 Regulated Power Supply Sensing Circuit Inspection

a. Check will be performed semiannually.
b. Insure that all power is off.
c. Verify that wire terminal lugs, bus bars, and terminal strips are in satisfactory condition and free of contaminants that would prevent proper electrical contact. Terminals should be securely attached to terminal strips.
d. At launcher control-indicator 9978253, check wires 2915D18, 2915J18, and terminal E30Y-338. Check wires 3120E20, 3120D20, terminal E30AA-418; check wires 3008Q18, 3008H18, 3008K18, 3008L18, 3008R18, bus bar, and terminals E35N-57 and -58. Check wires 3121E20, 3121D20 and terminal E30AA-417. Check wires 3120E20 and 3121E20 at power supply CR1A, terminal RS+ and RS-.
e. At the monorail launcher distribution box, check wires 2915C18, 2915F18, 2915F18, and terminal E30K-105. Check wires 3008C18, 3008E18, and terminal E30K-116.
f. At the monorail launcher beam, check wires 2915H18, 2915G18, and terminal E30E-89. Check wires 3008G18, 3008F18, and terminal E30E-101.
g. At the launching handling rail, check wires 2915B18, 9BB13, 9BC18, 9BL12, bus bar, and terminals E30B-54 and -55. Check wires 3008B18, 20WC18, 20XV12, 20WB13, 20ABD18, 3020A18, bus bars, and terminals E30A-41, -42, and -43.
CHAPTER 3
CORRECTIVE MAINTENANCE

Section I. INTRODUCTION

31. General
The organizational maintenance technician is authorized to isolate malfunctions to the chassis or component involved, replace the defective chassis or components with spares and readjust them for proper operation. Replacement procedures for multiple-use items, where the replacement procedures are obvious, are not covered in this chapter.

32. Maintenance Allocation
The prescribed maintenance responsibilities of the organizational maintenance technician will apply as reflected in the appropriate parts manual.

Section II. CORRECTIVE MAINTENANCE OF THE FLIGHT SIMULATOR GROUP

33. General
a. This section contains instructions for performing corrective maintenance of only those items of the flight simulator group which are of a complex nature. Corrective maintenance of the flight simulator group consists of the replacement of parts listed in TM 9-1410-250-15P/2/2 and the related cleaning and inspection functions.

b. After corrective maintenance is performed on the flight simulator group, the complete monthly check must be performed prior to putting the flight simulator group back into operation.

34. Replacement of the Delay Line Driver-Detector
a. Removal of the Simulator Test Set.
   (1) Remove the six pan-head screws (1, fig. 38), lockwashers (2), and flat washers (3) that secure the simulator test set (4) to the shell (5).
   (2) Use the handles (6) and carefully lift the simulator test set out of the shell.

   (1) Turn the RELEASE knob (17, fig. 39) 90 degrees counterclockwise and remove the HERCULES missile-code delay line (16).
   (2) Disconnect connectors J2 through J5 (fig. 40 and 5, 7, 8, and 3, fig. 41) on the delay line driver-detector.
   (3) Loosen the captive screws (18, fig. 39), and remove the delay line driver-detector (1).

d. Installation of the Delay Line Driver-Detector.
   (1) Position the delay line driver-detector and secure it with the captive screws.
   (2) Connect connectors P1 and P3 (5 and 8, fig. 41) from the pulse transfer relay to connectors J2 and J4, respectively, on the delay line driver-detector.
   (3) Connect connectors P8 and P9 (2 and 1, fig. 42) from the HERCULES signal data converter to connectors J3 and J5 (fig. 40 and 7 and 3, fig. 41) on the delay line driver-detector.
   (4) Install the HERCULES missile-code delay line.

d. Installation of the Simulator Test Set.
   (1) Hold the simulator test set by the handles and align the groove (22, fig. 39) with the alignment pin (7, fig. 38) inside the shell; carefully lower the simulator test set into the shell.
(3) Disconnect P6 of the pulse transfer relay from J1 on the AJAX missile delay line.

(4) Loosen the knurled screw (5) and remove the AJAX missile delay line.

(5) Disconnect J1 through J6 on the pulse transfer relay (9).

(6) Loosen the four screws and remove the pulse transfer relay.

b. Installation of the Pulse Transfer Relay.

(1) Secure the pulse transfer relay (9) to the pulse delay network (8) with the four screws.

(2) Connect J1 through J6 to the pulse transfer relay.

(3) Place the AJAX missile delay line (7) on the pulse delay network and secure with the knurled screw (5).

(4) Connect P6 to J1 and P2 to P1.

36. Corrective Maintenance of the Air Conditioning Filters

a. Exhaust Air Conditioning Filter (4, fig. 13).

(1) Remove the six fillister-head screws, six flat washers, and six lockwashers (5); remove the cap (3) from the flight simulator group.

(2) Remove the two fillister-head screws and two lockwashers (1) that secure each clamp (2); remove the four clamps and the exhaust air conditioning filter (4) from inside the cap (3).

(3) Clean and charge the dirty filter.

(4) Position the clean filter in the cap with the arrow that indicates the direction of air flow pointing toward the top of the cap.

(5) Position the four clamps (2), and secure each clamp with two No. 8-32 x 3/8 fillister-head screws and two No. 8 lockwashers (1).

(6) Install the cap (3) on the flight simulator group, and secure with the six No. 12-24 x 7/8 fillister-head screws, six No. 12 lockwashers, and six 1/4-inch flat washers (5).

b. Intake Air Conditioning Filter (6, fig. 43).

(1) Remove the six fillister-head screws and six lockwashers (8). Remove the
filter holder (7) and the intake air conditioning filter (6) from the flight simulator group.

(2) Clean and charge the dirty filter.

(3) Position the clean filter on the flight simulator group with the arrow that indicates the direction of air flow pointing toward the top of the flight simulator group.

(4) Position the filter holder (7), and secure with the six no. 8-32 x 3/8 filister-head screws and six no. 8 lockwashers (8).

37. Replacement of the Rectifying Crystal Unit

Note. The key numbers shown in parentheses in a and b below refer to figure 44.

a. Removal.

(1) Remove the simulator test set from the shell (par. 34a).

(2) Remove the crystal seating plug (1) and cap (2) from the RF detector (4).

Caution: Ground the chuck to prevent the rectifying crystal unit from being damaged by the static charges, by maintenance personnel, or ungrounded equipment. Handle the rectifying crystal unit by the ground (large end) only.

(3) Remove the chuck (17) with the rectifying crystal unit attached, and remove the rectifying crystal unit from the chuck.
Figure 10. Simulator test set—cable diagram.
1—Pulse transfer relay connections  
2—Clamp  
3—Connector J5  
4—Connector J6  
5—Connectors P1 and J2  
6—Delay line driver-detector connectors  
7—Connector J3  
8—Connectors P3 and J4

Figure 41. Pulse delay network—bottom view.