SERVICE BULLETIN

Diamond AIRCRAFT

Service Bulletin No.: DA20-32-01, Rev.3 **Date Issued:** November 28, 1997

Title: Brake System Retrofit

DIAMOND AIRCRAFT HIGHLY RECOMMENDS COMPLIANCE

1. ATA Code: 3240

PLANNING INFORMATION:

2. Effectivity: DA20-A1 Aircraft S/N 10002 up to and including S/N 10325.

3. General: This service bulletin addresses a brake system retrofit which provides for improved serviceability. This revision updates the parts list and adds instructions for the installation of a stop plate on the nose landing gear.

4. Compliance: Highly recommended.

5. Approval: Engineering data referenced or contained in this bulletin is approved as part of the type design.

6. Labor: Approximately 8 man hours estimated will be required to complete this service bulletin.

This estimate is for direct labor performed by a technician and it does not include setup, planning, familiarization, cure time, part fabrication, tool acquisition or lost time.

7. Material:

Part Number	Description	Qty
20-2722-25-00	Brake pedal, lh	2
20-2722-26-00	Brake pedal, rh	2
20-2700-20-01	Clevis	4
20-7600-93-08	Parking brake bowden cable	1
20-3240-20-05	Vibration mount	1
20-3240-20-03	Brake hose, long	2
20-3240-20-04	Brake hose, short	4
RB221	Grommet	8
RB216	Grommet	6
MS 51958-69	Screw	2
MS 21044 N3	Nut	3
AN960-10	Washer	4
20-2722-21-01	Anti Slip Tread	4
MS171435	Roll Pin	4
20-2722-91-03	Pin, Rudder Pedal	2
892-450	Foam Rubber	24"
MS21919WDG4	Clamp	1
AN3-4A	Bolt	1
MS 24665-24	Cotter Pin	4
MS 24665-153	Cotter Pin	4
MS 171532	Roll Pin	4
20-3220-00-23	Stop Plate, Steering	1
MS24665-285	Cotter Pin	1

The above material is available by ordering materials kit P/N DA20-32-01-AMK3. Not included in kit but available, P/N 20-0600-01-99 Fuel Acess Cover, Aluminum (with preformed edge.)

7. Material:(Continued)

Procure the following parts locally:

Spiral Wrap	3'
Tie wraps and bases	as req'd
Loctite 545	as req'd
Nycote 711 or CRC Corrosion Shell	as req'd
Aeroshell Grease 5	as req'd

8. Special Tools: None.

9. References: 1. DA20 Maintenance Manual Doc. # DA201.
2. Mil Specification MS 33584 (Tubing End Standard Dimensions for Single Flare).

10. Accomplishment Instructions:

10.1 Remove the seats, right side center tunnel access door and instrument panel cover.

10.2 Drain the system of brake fluid.

10.3 Remove 4 screws from the throttle quadrant and lift throttle quadrant for access. Remove all the brake lines (Stratoflex 111 hose, polyester braid). This will require removal of a number of tie wraps in the center tunnel and elsewhere. Be careful not to damage any of the nearby wiring or tubing. Reinstall tie wraps after the brake lines have been removed. Save the fire sleeve or abrasion wrap for reinstallation.

10.4 Disconnect the rudder cables at the firewall.

10.5 Remove the rudder pedal aft bracket and pull the pedals aft to obtain unobstructed access. Disconnect the rudder pedal adjust cable at the pedal latch if the aircraft does not incorporate service bulletin DA20-27-07A.

10.6 Remove the cotter pin and clevis pin connecting the master cylinder and brake pedal. Remove the old brake pedals by removing the roll pin.

10.7 Remove the master cylinders by removing the cotter pin and washer from the rudder pedal 'pins'.

10.8 Drive out the two roll pins holding the rudder pedal 'pins' in the rudder pedal latch frame. Discard the 'pin'.

10.9 Remove the clevises from the master cylinders and discard.

10.10 Remove the parking brake valve.

10.11 Remove the old parking brake bowden cable.

10.12 Remove the hardlines running down the gear leg.

10.13 Drill the two ½ inch diameter holes in the left side of the center tunnel just aft of the cabin heat hole as shown in figure 1.

10.14 Drill the three ½ inch diameter holes in the right side of the tee panel as shown in figure 2.

10.15 Relocate the (1/2 inch) left side brakeline-through-hole in the aft control bulkhead 3 inches inboard (on the same waterline) as shown in figure 3.

10. Accomplishment Instructions: (Continued)

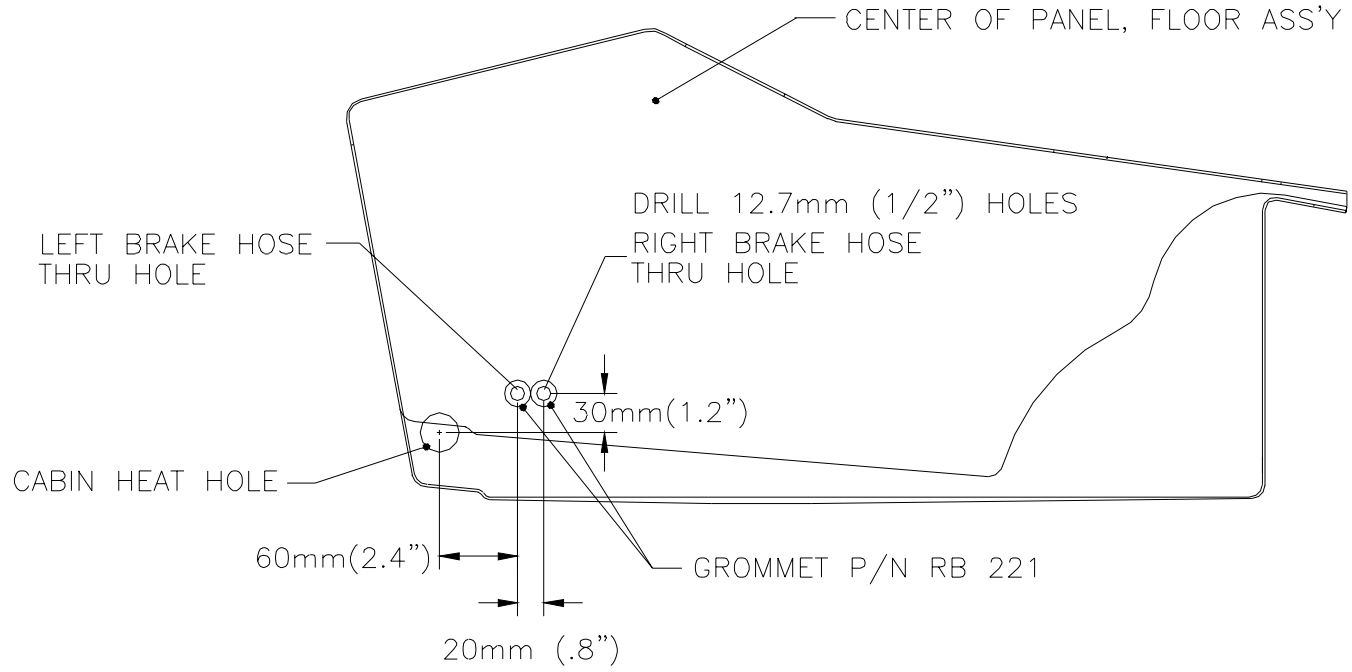

Figure 1

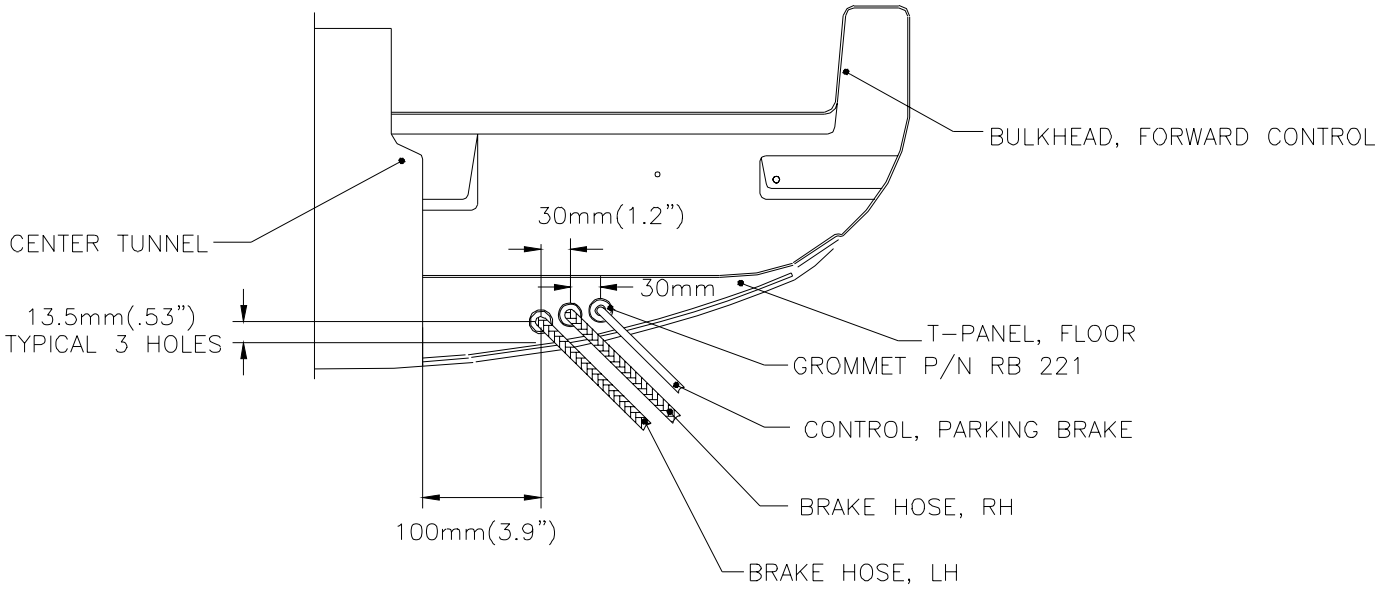

Figure 2

10. Accomplishment Instructions: (Continued)

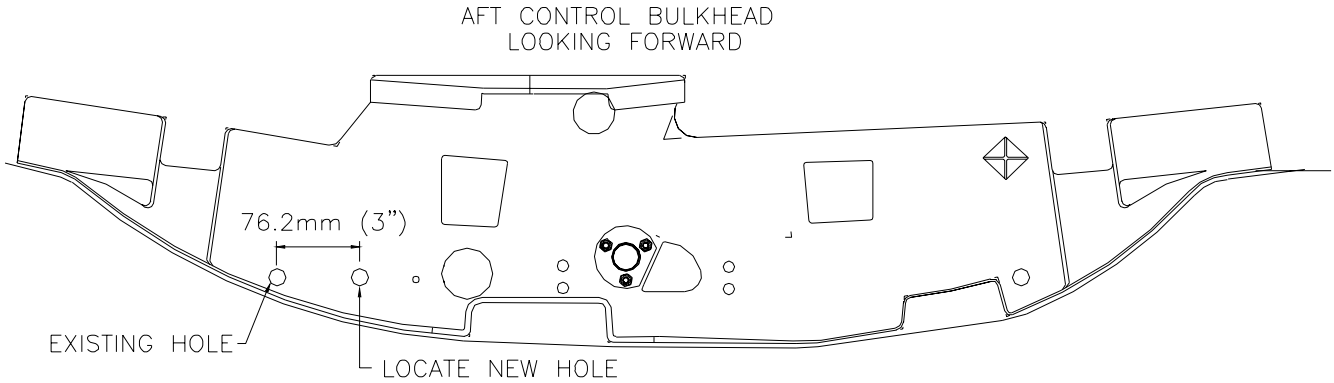

Figure 3

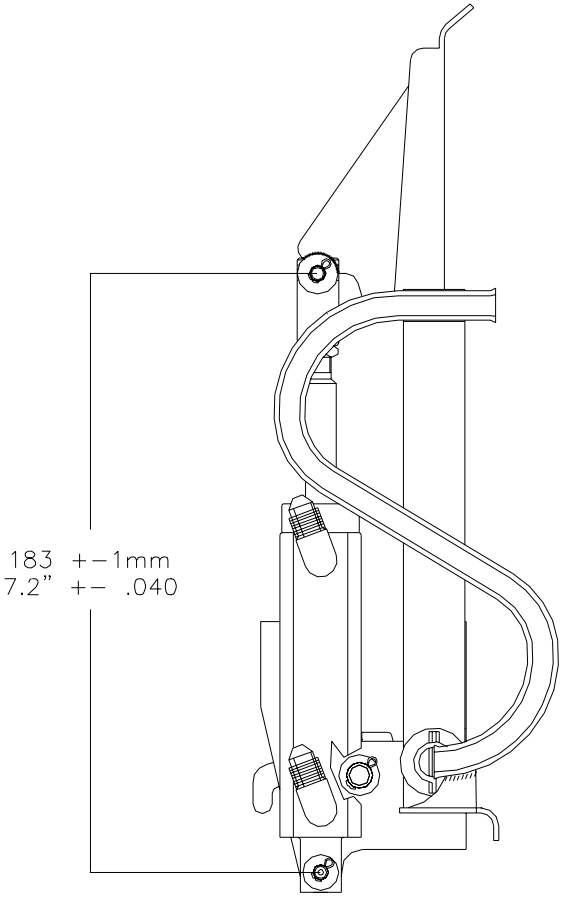

Figure 4

10.16 Install the new brake pedals, P/N 20-2722-25-00 and P/N 20-2722-26-00.

10.17 Install the new rudder pedal pins (20-2722-91-03) with the supplied roll pins. Reinstall the master cylinders. Note: The new pins are 2mm longer than the old ones for identification purposes

10.18 Install the extended clevis P/N 20-2700-20-01 on the master cylinders and reconnect to the brake pedal. Adjust clevis for 183 +/- 1mm mounting hole center to center dimension to maintain proper pedal geometry as shown in figure 4.

10.19 Form the edge of the fuel access panel to allow entry of the parking brake cable as shown in figure 5. Apply the new foam rubber to the access panel as it was previously installed. The relief area on the panel should be a sufficient size for the cable but still allow the panel to seal the fuel compartment completely when reinstalled.

NOTE: Some early S/N aircraft have a fiberglass fuel access panel. This may be modified as required or updated with P/N 20-0600-01-99.

10. Accomplishment Instructions: (Continued)

10.20 Install the cable clamp as shown in figure 5. Install the new parking brake bowden cable as shown in figure 5.

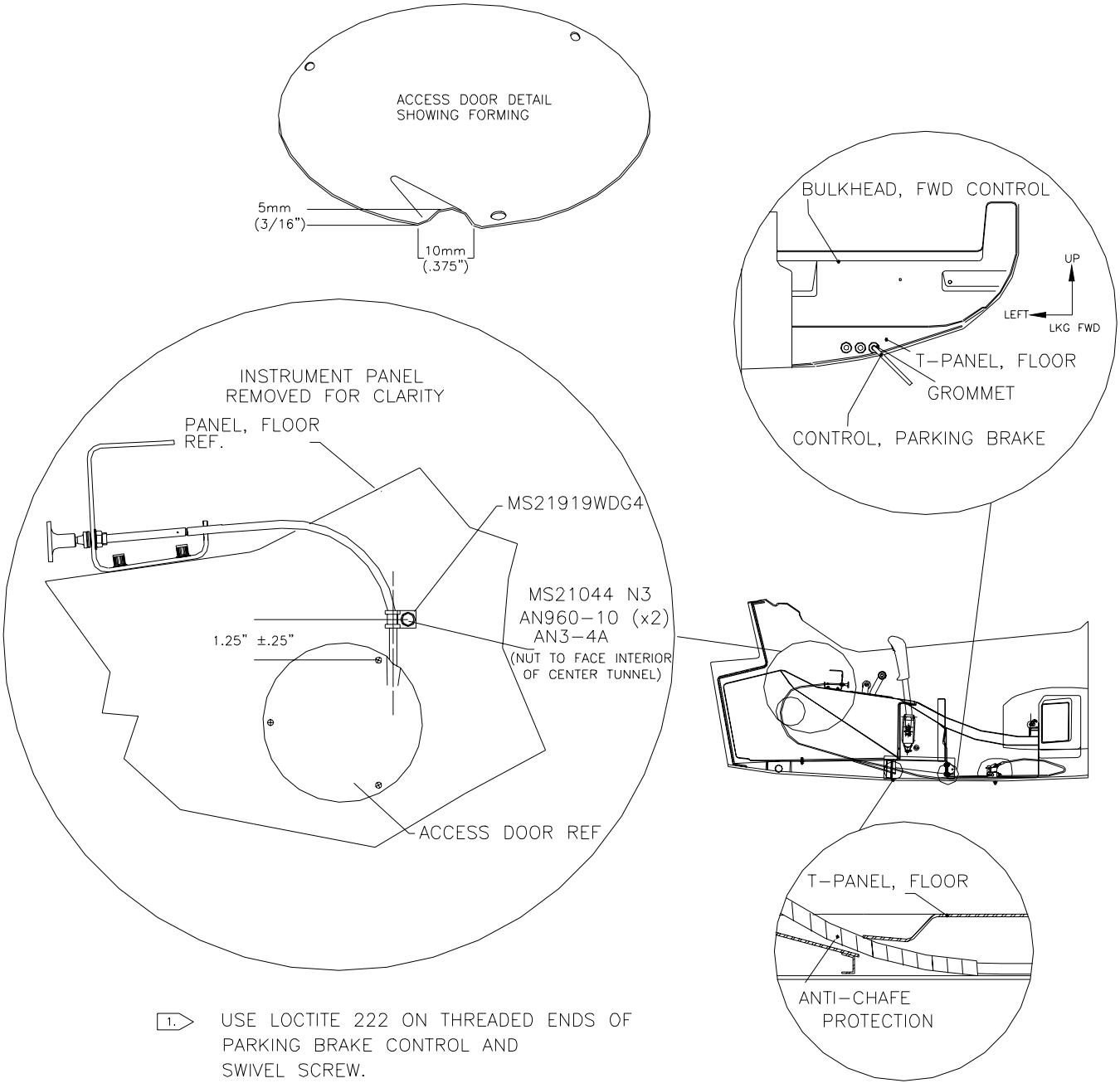

Figure 5

10. Accomplishment Instructions: (Continued)

10.21 Install the rudder pedal assembly onto the sledge tubes. Reconnect the rudder adjust cable if previously disconnected.

10.22 Reinstall the rudder pedal aft bracket.

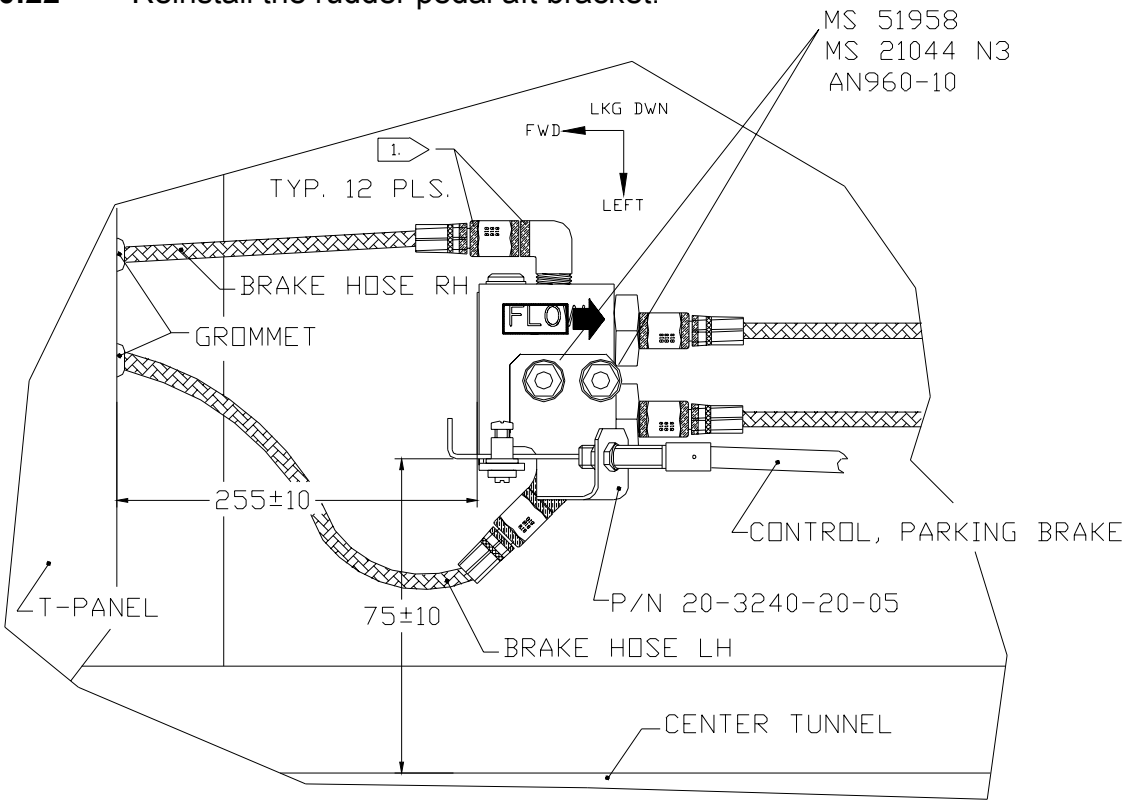

Figure 6

10.23 Install the fittings on the brake valve as shown in figure 6 using loctite 545 to reseal the threads. If the fittings installed on the aircraft are not exactly as shown select an arrangement that allows for clearance of the parking brake valve lever and the left hand brake line.
Install 20-3240- 20-05, vibration mount between the valve and the fuselage.
Install the parking brake valve. Drill two #10 holes using the parking brake valve to mark the holes in the location shown in figure 6. Install the screw head to the outside of the aircraft. Tighten the nut to secure the valve but do not dimple the skin of the aircraft.

10. Accomplishment Instructions: (Continued)

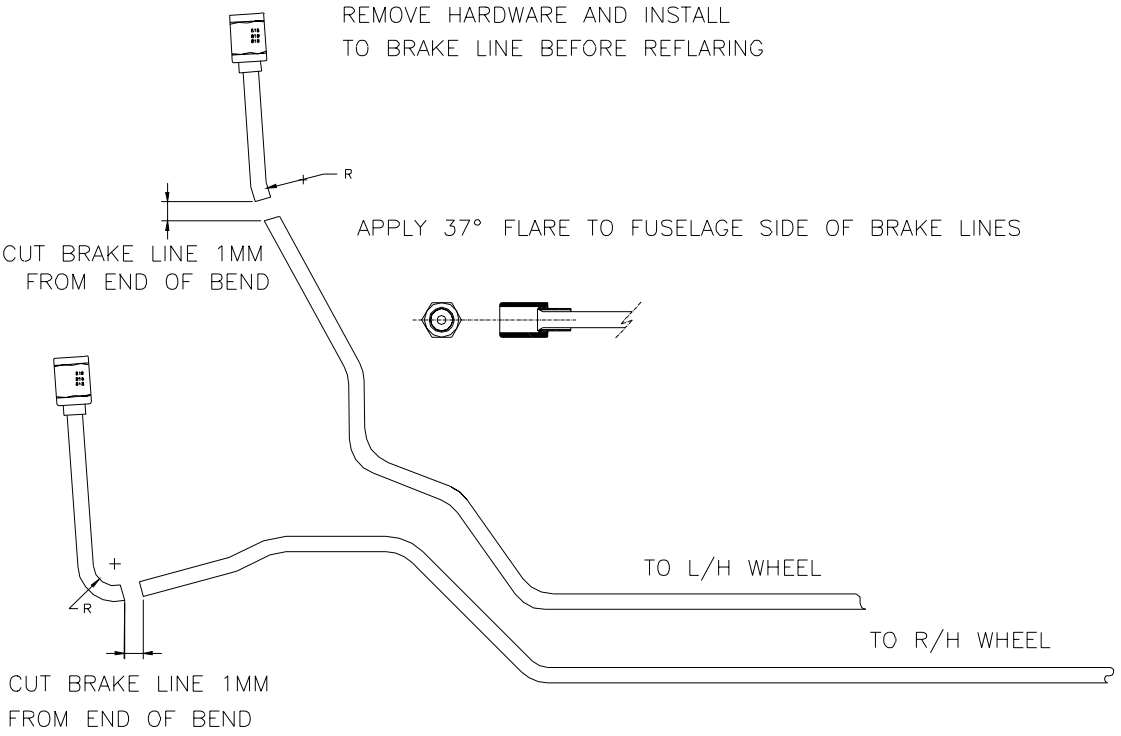

Figure 7

10.24 Cut the ends of the hard-line as shown in figure 7 and flare (37 degree single flare to MS 33584). Use the original nut and sleeve. Make sure that the nut and sleeve are on the tubing in the proper orientation during the flaring operation. Inspect flare for cracks. Touch up any areas of the line bared of paint.

NOTE: Cut the hard-line as close as possible to the tube bend radius to ensure that sufficient tube remains to flare the tube with the nut and sleeve installed.

10.25 Run the cross over lines (use 2 short hoses 20-3240-20-04) through the through hole at the top of the floor at the firewall. Reuse the firesleeve that the 111 hose was originally packaged in.

10.26 Run the long hoses (20-3240-20-03) following the routing shown in figure 8 and spiral wrap the areas as shown in figure 5. Install the grommets onto the hoses and insert into the holes shown in figure 1 and 2.

10. Accomplishment Instructions: (Continued)

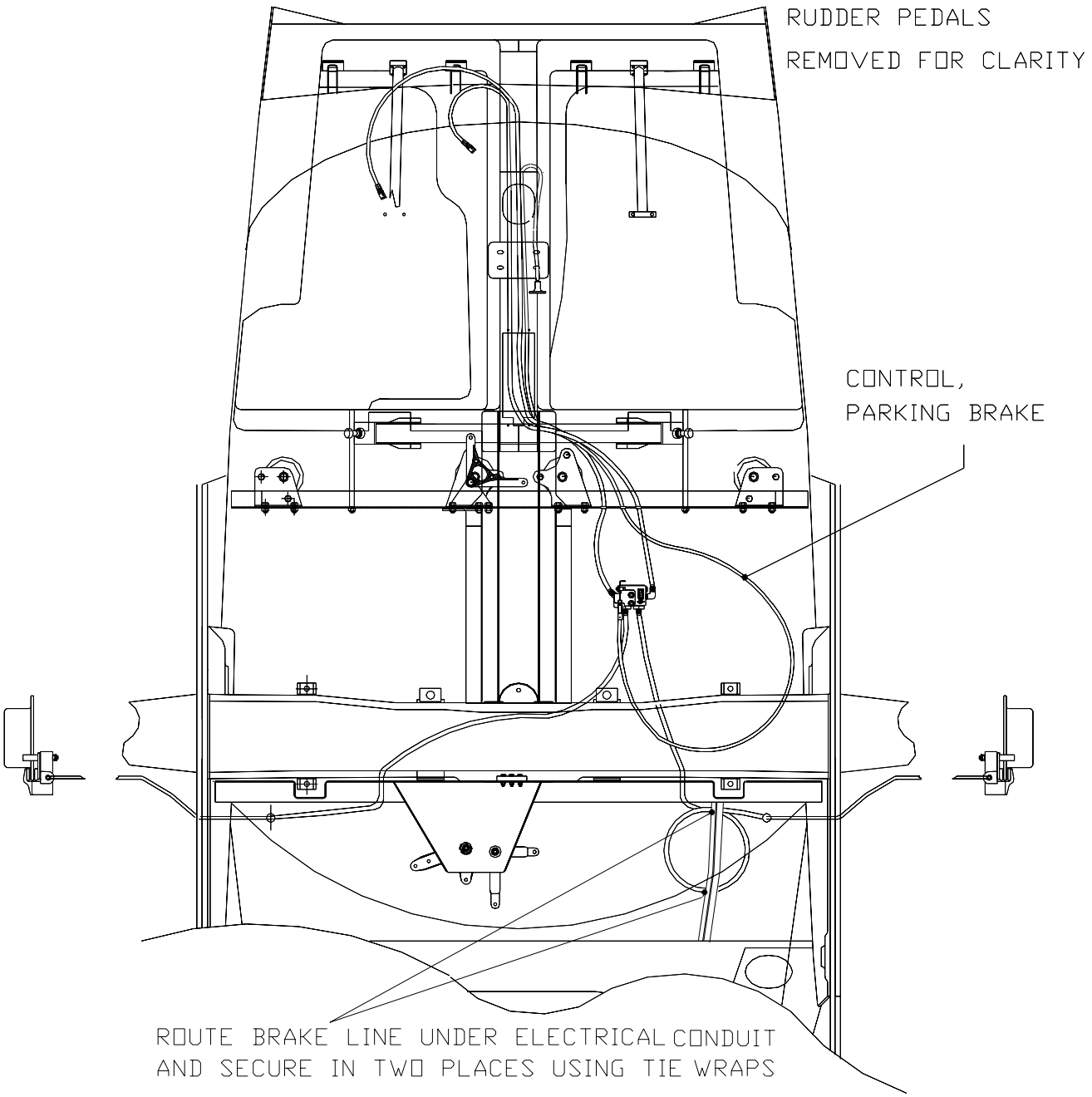

Figure 8

10. Accomplishment Instructions: (Continued)

10.27 Reinstall the gear leg hardlines.

10.28 Run the two short lines from the parking brake valve to the hardlines following the routing shown in figure 8. Secure hoses down with tiewrap bases as required. Route the looped brake line on the right side under the electrical conduit and secure with tie wraps as shown in figure 8.

10.29 Attach the flare fittings to the master cylinders, parking brake valve and hardlines. Tighten the lines at the end with the least access first.

10.30 Attach the bowden cable and ensure proper parking brake operation.

10.31 Move the rudder pedals full forward and full aft. Check for interference with any of the flexible brake lines. Check that hoses are not twisted during rudder pedal deflection.

10.32 Bleed the system.

10.33 Check system for leaks.

10.34 If no leaks are found apply Nycote 7-11or CRC Corrosion Shell to all flare fittings on the new brake hoses as shown in figure 6.

10.35 Remove the nose wheel pant if installed

10.36 Raise the nose wheel off the ground.

10.37 Note the order of parts removal. Remove the cotter pin and nut and remove the fork and wheel assembly.

10.38 Discard the existing nose gear steering stop plate. Clean all of the parts before reinstalling them

10.39 Place the new steering stop plate in the same build up order as the removed stop plate. Adjust the centering tang as required to fit the new stop plate. Tap the tang lightly with a soft faced mallet so that it conforms to the shape of the new stop plate. Aircraft serial # 10002 through 10050 do not use a ring only. Aircraft with only the ring installed should not use the washer with the tang.

10.40 Complete the assembly in the same order as noted during removal (also refer to figure 9). Thoroughly pack the assembly with Aeroshell Grease 5.

10.50 Refer to the maintenance manual for the friction adjustment of the nose wheel caster.

10.51 Install the cotter pin (p/n MS24665-285) and lower the nose gear.

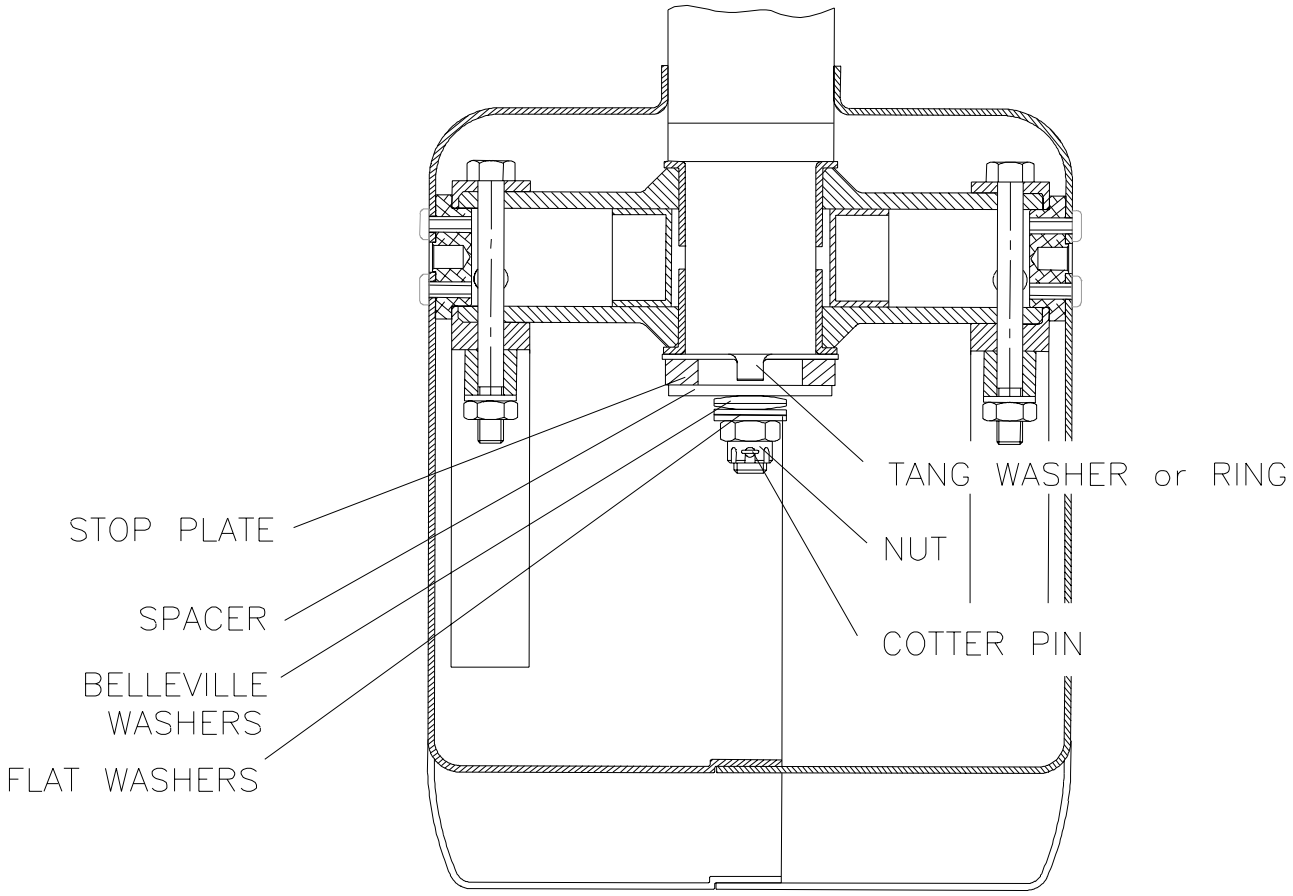
TANG WASHER or RING
NUT
COTTER PIN
STOP PLATE
SPACER
BELLEVILLE WASHERS
FLAT WASHERS

Figure 9

10.52 Reinstall the pant if one was removed and lower the nose gear.

10.53 Reinstall all items to aircraft previously removed to gain access.

10.54 Check operation of the parking brake. Note that the bowden cable will have more bounce than the old design due to the increase in length.

10.55 Ground run the aircraft and check braking action and directional control.

10.56 Ensure the appropriate log book entry is made. Amend the aircraft weight and balance record.

11. Weight and Balance: The affect on C of G is negligible. There is an empty weight reduction of 1.3 Lbs. (0.59 Kg).

12. Electrical Load Data: Not applicable.

13. Terms and Conditions: Contact your Diamond Aircraft distributor for information regarding price and availability.

To obtain satisfactory results, procedures specified in this service bulletin must be accomplished in accordance with accepted methods and current government regulations. Diamond Aircraft Industries Inc. cannot be responsible for the quality of work performed in accomplishing the requirements of this service bulletin.
If you no longer own the aircraft to which this service bulletin applies, please forward it to the current owner and send the name of the current owner to Diamond Aircraft Industries, Inc., at the address below.

Diamond Aircraft Industries Inc. 1560 Crumlin Sideroad, London, Ontario, Canada N5V 1S2
Phone: (519) 457-4041 Fax: (519) 457-4045