

Kit Installation Publication

Main Wheel & Brake Conversion Kit Cleveland Wheel & Brake Systems Part No. 199-90

IM199-90

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Publication No.: IM199-90, Revision L

Manufacturer:



Cleveland Wheel & Brake Systems
1160 Center Road
Avon, Ohio 44011

TO: HOLDERS OF IM199-90 INSTALLATION MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-170A AND MAIN BRAKE ASSEMBLY PART NO. 30-144.

Attached to this transmittal letter is Revision H of IM199-90 (dated 2005-07-01)

Revision H, Dated 2005-07-01

REVISION H CONTAINS ALL PAGES OF THE MANUAL. Pages that have been added or revised are outlined below together with the highlights of the revision.

Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows	Per (DCN-0364-50)
All Sections/All Pages	Revised to latest standard format
Maintenance, Overhaul, Parts List	Removed pages. Information is found in maintenance manuals

TO: HOLDERS OF IM199-90 INSTALLATION MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-170A AND MAIN BRAKE ASSEMBLY PART NO. 30-144.

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REVISION HIGHLIGHTS

Section/Page No.

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As Follows	Per (DCN-0383-06)
Title Page/Pg T-1	A90 was A90 Add models C90GT, C90GTi
Kit Applicability/Pg 1	Table 1. 65-A90 was A90 Add models C90GT, C90GTi
Section 6/Pg 2	Update contact information
Section 9.2.3/Pg 7	(NOW) MIL-T-5544 (WAS) MIL-T-55544

TO: HOLDERS OF IM199-90 INSTALLATION MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-170A AND MAIN BRAKE ASSEMBLY PART NO. 30-144.

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Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows	Per (ECO-0066231)
Title Page/Pg T-1	Data rights statement updated from pg I (ADD) export statement
Pg I	(RE-LOCATE) data rights statement to title page
Section 9.2.2.1/Pg 5	Step a. (NOW) 60 to 80 in-lb (6,8 to 9,0 N-m) (WAS) 75 to 100 in-lb (8,4 to 11,3 N-m)
Section 13/Pg 16	(DELETE) PRM78 from Kit Parts List

TO: HOLDERS OF IM199-90 INSTALLATION MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-170A AND MAIN BRAKE ASSEMBLY PART NO. 30-144.

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Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows

Per (CA-00000789)

All Sections/All Pages

Document completely revised
(NOW) CWBS document standards, content and format
(WAS) Parker document standards, content and format

STEP 1: VERIFY EQUIPMENT

VERIFY THAT THE ASSEMBLY PART NUMBERS AS LISTED ON THE KIT PARTS LIST MATCH THE PART NUMBERS AS INDICATED ON THE ASSEMBLY NAMEPLATES.

STEP 2: REVIEW KIT HIGHLIGHTS

REVIEW USAGE RESTRICTIONS (IF ANY), AIRCRAFT MODIFICATIONS (IF ANY) AND INSTALLATION HARDWARE THAT IS INCLUDED IN THE KIT.

IMPORTANT

MODEL YEAR AND SERIAL NUMBER EFFECTIVITY OF AN AIRCRAFT CAN AFFECT CONVERSION KIT INSTALLATION. AIRFRAME MANUFACTURER UPGRADES, SERVICE BULLETINS AND SIMILAR DOCUMENTATION CAN ALSO AFFECT HOW A KIT IS EQUIPPED.

BECAUSE OF THE MANY POSSIBLE AIRCRAFT CONFIGURATIONS, SOME KITS WILL NOT INCLUDE THE HARDWARE NEEDED TO COMPLETE THE KIT INSTALLATION. THESE ITEMS MUST BE OBTAINED SEPARATELY. MODIFICATIONS TO THE AIRFRAME CAN ALSO BE REQUIRED.

SEE SECTION 3.0 & 3.1 FOR ADDITIONAL INFORMATION SPECIFIC TO CONVERSION KIT NO. 199-90.

STEP 3: TECHNICAL ASSISTANCE

FOR TECHNICAL ASSISTANCE, CONTACT THE TECHNICAL SERVICES HOTLINE:

Cleveland Wheel & Brake Systems
1160 Center Road
Avon, Ohio 44011 U.S.A.
Attn: Technical Services/Hotline

E-mail: clevelandwbhelp@clevelandwbs.com
Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)
Website: www.clevelandwheelandbrake.com

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1.0 INTRODUCTION

The information herein addresses the installation of a Cleveland Wheel & Brake Systems Conversion Kit. It is published for the guidance of qualified maintenance personnel responsible for the installation of a Cleveland Wheel & Brake Systems Conversion Kit, manufactured by Cleveland Wheel & Brake Systems.

1.1 PURPOSE

This manual provides the necessary procedures to accomplish the installation of an STC'd Cleveland Wheel & Brake Systems Conversion Kit. For information regarding service limits, maintenance and component overhaul, a copy of the Cleveland Wheel & Brake Systems Component Maintenance Manuals, CM30-144 and CM40-170A are included in this kit. The manuals should be passed on to the owner or retained by the maintenance facility for future reference.

2.0 TSO NOTICE

The wheels and brakes used in this STC'd conversion kit carry a "TSO" marking which identifies them as having been fully laboratory tested and qualified to meet the applicable Federal Aviation Agency (FAA) specifications and requirements.

Modifications or use of unapproved parts will void the TSO qualification and warranty for the wheel and brake assemblies.

3.0 KIT APPLICABILITY

NOTE: Service bulletins, service letters and similar documentation issued by the airframe manufacturer or other STC installations can affect the installation of Conversion Kit No. 199-90. Contact the airframe manufacturer for documentation applicable to your model aircraft and review the maintenance log for any other STC's installed for compatibility before installing Conversion Kit No. 199-90.

Table 1 Kit Applicability

MAKE	STC	MODELS (SERIAL NUMBERS)
Beech Aircraft	SA619GL	65-A90 (LJ-114 through LJ-317) B90 (LJ-318 through LJ-501) C90 (LJ-502 through LJ-1062) C90A (LJ-1063 and up) C90GT (All) C90GTi (LJ1847, LJ1853 and up) E90 (LW-1 and up) H90 (All) 65-A90-1 and 65-A90-4 (All)

3.1 KIT EQUIPMENT

Refer to paragraph 13.0 for the kit parts list.

NOTE: Review this installation manual and the installation drawing, number 50-80, completely before removal of existing original equipment and installation of 199-90 kit equipment.

- a. The wheel well skin requires modification. Refer to section 10.0.
- b. The following hardware is not included in the 199-90 Conversion Kit:
 - Hydraulic system connection hose.
 - Axle nut and cotter pin.
 - Fuel line repositioning hardware.

4.0 SAFETY

Follow proper safety precautions when servicing aircraft braking systems.

- A “**SAFETY WARNING**” flagged by this symbol  , calls attention to possible injury and serious or life-threatening situations if not followed.
- A “**WARNING**” calls attention to use of materials, processes, methods, procedures, or limits which must be followed precisely to avoid injury to persons.
- A “**CAUTION**” calls attention to methods and procedures, which must be followed to avoid damage to equipment.
- A “**NOTE**” calls attention to an essential operating or maintenance procedure, condition, or statement, which must be highlighted.

5.0 ORDER INFORMATION

To order spare parts, contact the nearest Cleveland Wheel & Brake Systems distributor in your area, or contact Cleveland Wheel & Brake Systems at the following address or numbers:

Cleveland Wheel & Brake Systems
1160 Center Road
Avon, Ohio 44011 U.S.A.
Attn: Technical Services/Hotline

E-mail: clevelandwbhelp@clevelandwbs.com
Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)
Website: www.clevelandwheelandbrake.com

6.0 EQUIPMENT DESCRIPTION

6.1 BRAKE ASSEMBLY

For a complete parts breakdown and fastener torque values of the brake assembly, refer to CM30-144 Component Maintenance Manual.

The brake is a cast aluminum dual caliper, four piston external disc design, with sintered metallic lining. It is suitable for use with brake fluid conforming to MIL-PRF-5606 or MIL-H-5606.

6.2 WHEEL ASSEMBLY

For a complete parts breakdown and fastener torque values of the wheel assembly, refer to CM40-170A Component Maintenance Manual.

The wheel is cast aluminum and conforms to all tire and rim association standards for a 24 x 7.7 divided type wheel, suitable for use with all 8.50 - 10, 8 or 10 ply tubeless or tube type tires. The wheel assembly is configured with an air valve assembly for use with a tubeless tire.

NOTE: Refer to the installation drawing, 50-80, for aircraft model and tire ply rating applicability.

7.0 GENERAL INFORMATION

7.1 BRAKE ASSEMBLY

The brakes are shipped from the factory as a complete assembly. Relocate the bleeder components and the inlet fitting to the necessary ports for left hand or right hand installation. The brakes are equipped with 7/16-20 UNF-3B ports.

7.2 WHEEL ASSEMBLY

The wheels are shipped from the factory as a complete assembly. The bearing cones are packed with grease and installed in the wheel halves.

8.0 KIT INSTALLATION

Review this installation manual, IM199-90 and the installation drawing, 50-80, completely before removal of existing equipment and installation of 199-90 kit equipment.

SAFETY WARNING:  INSURE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING UNDER AN IMPROPERLY STABILIZED AIRCRAFT CAN CAUSE INJURY OR DEATH.

SAFETY WARNING:  COMPLETELY DEFLATE THE TIRE BEFORE REMOVING THE VALVE CORE. VALVE CORES UNDER PRESSURE CAN BE EJECTED LIKE A BULLET AND CAUSE INJURY OR DEATH.

8.1 REMOVE ORIGINAL EQUIPMENT

CAUTION: ALWAYS CHECK THE CONDITION OF ORIGINAL EQUIPMENT HARDWARE THAT WILL BE RETAINED SUCH AS FITTINGS, HOSES, AXLE NUTS, ETC. REPLACE THESE ITEMS AS NEEDED.

- a. Properly raise and support the aircraft by following the airframe manufacturer's instructions.
- b. Remove the cap from the tire inflation valve and slowly deflate the tire.
- c. Confirm that the tire is completely deflated.
- d. When all the tire pressure has been released, remove the valve core from the inside of the valve stem.

NOTE: The cotter pin is not supplied as part of the 199-90 kit and must be obtained separately. Refer to the airframe parts catalog for the part number and the quantity.

- e. Remove and retain the axle nut. Discard the cotter pin.
- f. Remove the original equipment main landing gear wheels from the axle.
- g. Disconnect the lower hydraulic line from the existing brake housing fitting and cap tightly.
- h. Remove the original equipment brake assemblies from the axle.
- i. Discard all the original brake assembly mounting hardware

NOTE: New mounting hardware is including in the 199-90 kit.

8.2 INSTALL CLEVELAND EQUIPMENT

Refer to installation drawing, 50-80 and Section 13.0 Kit Parts List, for item number identification. Item numbers are in parenthesis.

8.2.1 Install the Torque Plate Assembly

The axle flange attachment hardware is included in the 199-90 Conversion Kit. Refer to the installation drawing, number 50-80 for details on axle attachment hardware.

- a. Refer to the 50-80 installation drawing for torque plate mounting orientation and alignment.

NOTE: Install the bolt with the bolt head on the inboard side of the torque plate assembly.

- (1) The torque plate assembly (13) attaches to the axle flange using the mounting hardware: bolts (6), washers (5) and nuts (4). Torque the nuts in a criss-cross pattern to the value specified on the 50-80 installation drawing. After all the nuts have been torqued, check the torque a second time to ensure that the proper torque value is obtained.

8.2.2 Mount the Tire

- a. To facilitate the installation of the wheel assembly onto the axle later, remove the snap ring (33), hubcap (12A), and bearing cone (32) from the outboard wheel half. Place the removed items on a clean surface to avoid contamination.

NOTE: You do not need to remove the inner wheel half snap ring (28) and grease seal (27).

- b. Remove all eight nuts (36), sixteen washers (35), and eight bolts, (36), then separate the wheel halves.
- c. Examine the bead seat area of the wheel halves. If necessary, remove all lubricant, grease or foreign material with a mild soap and water solution or with denatured alcohol.
- d. The mating surfaces of the wheel halves should not have nicks, burrs, small dents, or other damage. Damaged mating surfaces can prevent the wheel halves from mating or sealing.
- e. The preformed packing (31) groove in each wheel half should be examined for damage or other debris that would prevent the packing from properly seating. Remove any lubricant, grease or foreign material with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

8.2.2.1 Tubeless Tire

- a. Examine the air valve grommet for damage such as cuts, tears, cracking. Replace if necessary. Install the grommet dry. Re-install the air valve assembly in the outboard wheel half and dry torque the valve nut to 60 to 80 in-lb (6,8 to 9,0 N-m).
- b. Place the brake disc into position in the inner wheel half. Then while holding the brake disc and inner wheel half together, place the components on a clean work surface with the register side of the inner wheel half facing up.

NOTE: The register is the area where the wheel halves contact each other.

- c. Remove and examine the preformed packing (31) for damage. Replace if necessary.

- (1) Apply a light coat of Dow Corning 55 O-ring lube or a lube per MIL-G-4343 or an equivalent to the preformed packing before installation.

NOTE: A light coat of the wheel bearing grease can be used as an alternate.

CAUTION: THE PREFORMED PACKING (31) MUST BE INSTALLED UNIFORMLY. IT SHOULD BE FREE OF KINKS AND TWISTS.

- (2) Re-install the preformed packing in the wheel register groove of the inboard wheel half.

CAUTION: COMPOUNDS SUCH AS TALC INCREASE TIRE SLIPPAGE. REMOVING TALC WILL MINIMIZE TIRE SLIPPAGE ON THE WHEEL.

- d. Make sure that the tire is clean inside. If it is not clean then wipe the bead seat base with a mild soap and water solution or with a suitable rubber cleaner.

CAUTION: WHEN YOU INSTALL A TIRE, DO NOT APPLY A LUBRICANT TO THE TIRE OR THE WHEEL BEAD SEAT. A LUBRICANT CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE.

- e. Position the tire on the inner wheel / disc being careful not to disturb the preformed packing (31).
- f. Place the outer wheel half inside the tire and align the bolt holes of both wheel halves.
- g. Align the red balance dot on the tire with the air valve assembly.
- (1) If there is no balance dot on the tire.
- (a) Align the tire serial number with the air valve assembly.

8.2.2.2 Tube Type Tire

NOTE: The preformed packing (31) does not need to be installed when using a tube type tire.

CAUTION: COMPOUNDS SUCH AS TALC INCREASE TIRE SLIPPAGE. REMOVING TALC FROM THE TIRE BEADS WILL MINIMIZE TIRE SLIPPAGE ON THE WHEEL.

- a. Make sure that the tire is clean inside. If it is not clean then wipe the bead seat base with a mild soap and water solution or with a suitable rubber cleaner.

CAUTION: WHEN YOU INSTALL A TIRE, DO NOT APPLY A LUBRICANT TO THE TIRE OR THE WHEEL BEAD SEAT. A LUBRICANT CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE.

CAUTION: APPLY TIRE TALC TO THE TIRE TUBE ONLY. TIRE TALC ON THE TIRE BEADS CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE OR TUBE VALVE STEM.

- b. Lubricate or dust the tire tube lightly with tire talc. This will prevent the tube from sticking to the inside of the tire or to the tire beads. It also helps the tube assume its normal shape inside the tire during inflation and lessens the chances of wrinkling or thinning from irregular stretching.
- c. Inflate the tube with dry nitrogen to slightly round, and insert the tube in the tire.

NOTE: The tube heavy spot is indicated by a painted yellow stripe about ½ inch wide by 2 inches long.

- d. Align the stripe on the tube with the tire red balance dot.
 - (1) If the tube has no balance mark.
 - (a) Align the tube valve with the tire red balance dot.
- e. Position the tire and tube on the outboard wheel half inserting the valve stem through the valve hole in the wheel half tube well.
- f. Place the inboard wheel half/disc inside the tire and tube, so that the bolt holes in both wheel halves and brake disc are aligned.

8.2.3 Attach the Wheel Half Sub-Assemblies

CAUTION: THE COUNTERSUNK SIDE OF THE WASHER (35) IS TO BE INSTALLED TOWARD THE BOLT HEAD OR NUT (AS APPLICABLE).

NOTE: The nuts (36) are to be located on the outboard wheel half side of the wheel assembly opposite the brake disc.

- a. Prior to installed the fasteners, ensure that all bearing surfaces of the bolts (34), washers (35) and nuts (36) as well as the threads are coated with a uniform amount of SAE AMS2518 (MIL-T-5544) anti-seize compound.
- b. Install a minimum of three washers and bolts, (35 and 34) in the inboard wheel half equally spaced, then:
 - (1) Compress the wheel halves and install a washer (35) onto the threaded end of each bolt.
 - (2) Then, install a nut (34) and tighten the nuts by hand.
- c. Install the remaining bolts, washers, and nuts the same way.

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES TO TORQUE THE WHEEL NUTS AND BOLTS. THE USE OF IMPACT OR POWER WRENCHES CAN CAUSE OVER TIGHTENING.

NOTE: The fasteners must be tightened by applying the torque to the nut while holding the bolt head.

- c. Use the following steps and torque all of the nuts (36).
 - (1) Step one: (1/3 final torque): Lubtork to 100 in-lb (11,3 N-m) in a criss-cross pattern.
 - (2) Step two: (2/3 final torque): Lubtork to 200 in-lb (22,6 N-m) in a criss-cross pattern.
 - (3) Step three: (Final torque): Lubtork to 300 in-lb (33,9 N-m) in a criss-cross pattern.

8.2.4 Inflate the Tire

SAFETY WARNING:  ALWAYS PLACE THE TIRE IN AN INFLATION CAGE BEFORE INFLATING. INFLATING THE TIRE CAN BE VERY DANGEROUS. THE TIRE CAN EXPLODE. FAILURE TO USE AN INFLATION CAGE CAN CAUSE SERIOUS INJURY OR DEATH. SERVICE THE TIRE WITH INFLATION EQUIPMENT DESIGNED FOR THIS OPERATION.

DO NOT INFLATE THE TIRE TO THE OPERATING PRESSURE UNTIL THE WHEEL/TIRE ASSEMBLY HAS BEEN MOUNTED ON THE AIRCRAFT.

- a. Inflate the tire just enough to seat the beads on the wheel. Then reduce the tire pressure to the tire manufacturer's recommended storage pressure and remove the wheel/tire assembly from the inflation cage.

8.2.5 Install the Wheel/Tire Assembly On the Aircraft

- a. Examine the axle and nut for burrs or rough threads. The axle nut should rotate freely on the axle and not exhibit any drag or resistance. Apply a thin coat of the wheel bearing grease to the axle threads and all of the bearing surfaces of the washer (3) and axle nut.

NOTE: Use the same grease that was used to pack the bearing cones.

- b. Mount the wheel/tire assembly on the axle.
- c. Install the outboard bearing cone (32) that was removed earlier (reference 9.2.2).
- d. Install the washer (3) that is included in the 199-90 kit and then install the existing axle nut.

8.2.6 Tighten the Axle Nut

- a. Tighten the axle nut to 300 in-lb (33,9 N-m) while rotating the wheel to make certain that the bearing cones are seated. Then back the torque off to zero (0 in-lb).

CAUTION: DO NOT EXCEED 120 IN-LB (13,5 N-M) ON FINAL TORQUE WHEN ADVANCING THE AXLE NUT TO ALIGN THE COTTER PIN HOLE ON THE AXLE WITH ONE OF THE AXLE NUT SLOTS.

- b. While rotating the wheel, re-torque the axle nut to 60 to 120 in-lb (6,8 to 11,3 N-m) at the alignment position of the cotter pin hole on the axle and the axle nut castellation. If one of the slots in the axle nut do not line up with the cotter pin hole in the axle, continue to tighten the axle nut until the first available alignment is reached, but do not advance the axle nut using torque in excess of 120 in-lb (13,5 N-m).

- c. Install the cotter pin.
- d. Install the hubcap (12A) and secure with the snap ring (33).

NOTE: Aircraft equipped with the extended axles are to use the hubcap (12B) that is included in the 199-90 kit.

- e. Service the tires to inflation pressure as specified on drawing no. 50-80.

8.2.7 Install the Brake Assembly On the Aircraft

- a. Remove the twelve brake tie bolts (15) and washers (14), and both insulator shims (25) from the brake assembly (2). Then remove all four of the back plate assemblies (26).
NOTE: Leave the pressure plate assemblies (23) on the anchor bolts (20).
- b. Apply a dry graphite or silicone lubricant to the anchor bolts (20).
- c. Slide the brake assembly onto the torque plate assembly (13) that was installed earlier (reference 9.2.1).
- d. Re-install the twelve brake tie bolts (15 or 15A) and washers (14) into the two brake cylinders.
NOTE: The supplied bolts (15) have a patch lock added (nylon material embedded in the threaded end) which serves as a self-locking element.
NOTE: The optional field alternate bolts (15A) have drilled heads for safety wire retention.
- e. Re-install the two insulator shims (25) on the tie bolts.
- f. Position and align the back plate assemblies (26) between the brake disc (29) and the inboard wheel flange. Next, thread the brake tie bolts (15 or 15A) into the back plate assemblies. Torque to between 85 to 90 in-lb (9,6 to 10,2 N-m).
NOTE: The optional field alternate bolts (15A) will require safety wire. Safety wire the bolts per NASM33540 after pressure testing the brake assembly. See step 9.2.8 f.

8.2.8 Connect the Brake Assembly

- CAUTION:** DO NOT EXCEED 1,35 N-M (12 IN-LB) WHEN TIGHTENING THE BLEEDER SCREW. TORQUE IN EXCESS OF 1,35 N-M (12 IN-LB) WILL DAMAGE THE BLEEDER SEAT
- a. Re-connect the existing lower hydraulic line to the brake inlet fitting (item 17).
NOTE: Pressure bleeding from the brake to the reservoir is recommended for best results. Repeat if necessary to ensure that any entrapped air is removed from the system.
 - b. Check the brake reservoir for adequate fluid level and bleed the brake system.
 - (1) No fluid flow from the bleeder screw is cause for examination. Refer to CM30-144 Component Maintenance Manual for troubleshooting.
 - c. Tighten the bleeder screw snug to prevent leakage.
 - d. Apply 600 psi to the brake and check for leakage.

-
- e. Depress and release the toe pedal several times.
 - (1) Check for brake drag by rotating the wheel by hand. Check for excessive play. A slight amount of drag is acceptable; however, a tightly bound wheel should be investigated and corrected before releasing the aircraft to service.
 - NOTE:** An improperly seated lining or air in the hydraulic system can cause excessive drag.
 - f. Safety wire the optional field alternate bolts (15A) in accordance with NASM33540.

8.3 BRAKE LINING CONDITIONING

It is important to condition new linings properly to obtain the service life designed into them. Condition the linings per the attached product reference memo PRM14A.

9.0 MODIFICATIONS

9.1. WHEEL WELL MODIFICATION

NOTE: Modification Template 'A' is included in the 199-90 kit.

Due to the location of the leading brake cylinder, the forward outboard lower wheel well skin will need to be trimmed to provide the proper clearance for the brake cylinder during wheel retraction into the wheel well. The modification to the lower skin is outlined as follows for both the left and the right wheel wells.

- a. Use Template 'A' to locate and mark the skin as shown on the installation drawing 50-80, sheet 2. Also refer to Figure 1.
- b. Cut and remove the brackets, Beech Part No. 50-980029-2 left, 50-980029-3 right section and lower skin. See Figure 2 for Beech bracket identification.
- c. Remove all sharp edges and burrs.
- d. Place the brackets (8 - left side) and (9 - right side) along the cutout.
- e. Locate by drilling from the top down.
- f. Place the filler (11) along the cutout area and drill to match the location of the brackets (8 and 9).
- g. Fasten the brackets (8 and 9) and the filler (item 11) into place with Cleco or an equivalent fastener system.
- h. Secure the brackets (items 8 and 9) and the filler (item 11) with sixteen rivets (item 7) as shown in the installation drawing 50-80.
- i. Secure the following with rivets (7). See Figure 2 and installation drawing 50-80:
 - Two end tabs (10) to the left side brackets (8) and Beech P/N 50-980029-2
 - Two end tabs (10) to the right side brackets (9) and Beech P/N 50-980029-3

CAUTION: MAINTAIN ADEQUATE CLEARANCE BETWEEN THE LEADING BRAKE CALIPER (LOWER EDGE) AND THE FUEL LINE IN THE NACELLE DURING THE RETRACTION TEST. SEE SECTION 10.2.

NOTE: If the aircraft is equipped with a mechanical retraction system, the circuit breaker for gear retraction can be tripped then slowly jogged to slowly raise gear and inspect for clearance. Re-set the breaker after completing the retraction test.

NOTE: If the aircraft is equipped with a hydraulic gear retraction system, the dragline can be disconnected and the gear can be manually raised to check for clearance. Re-connect the dragline after completing the retraction test.

j. After the skin has been cut out and the support brackets (8 and 9) have been installed, perform a gear retraction test prior to releasing the aircraft back into service.

k. Remove the aircraft from the jacks.

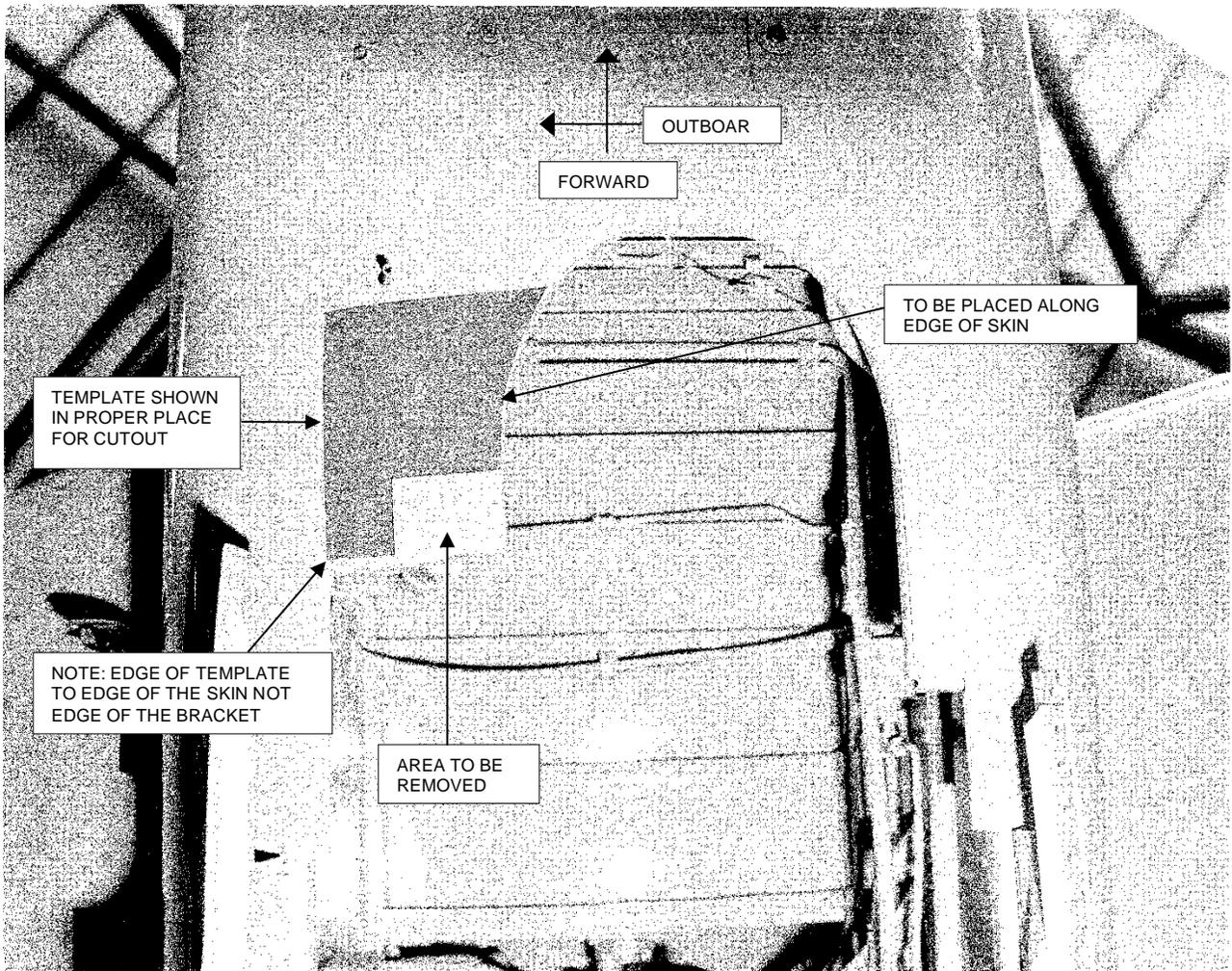


Figure 1 Mark the Skin

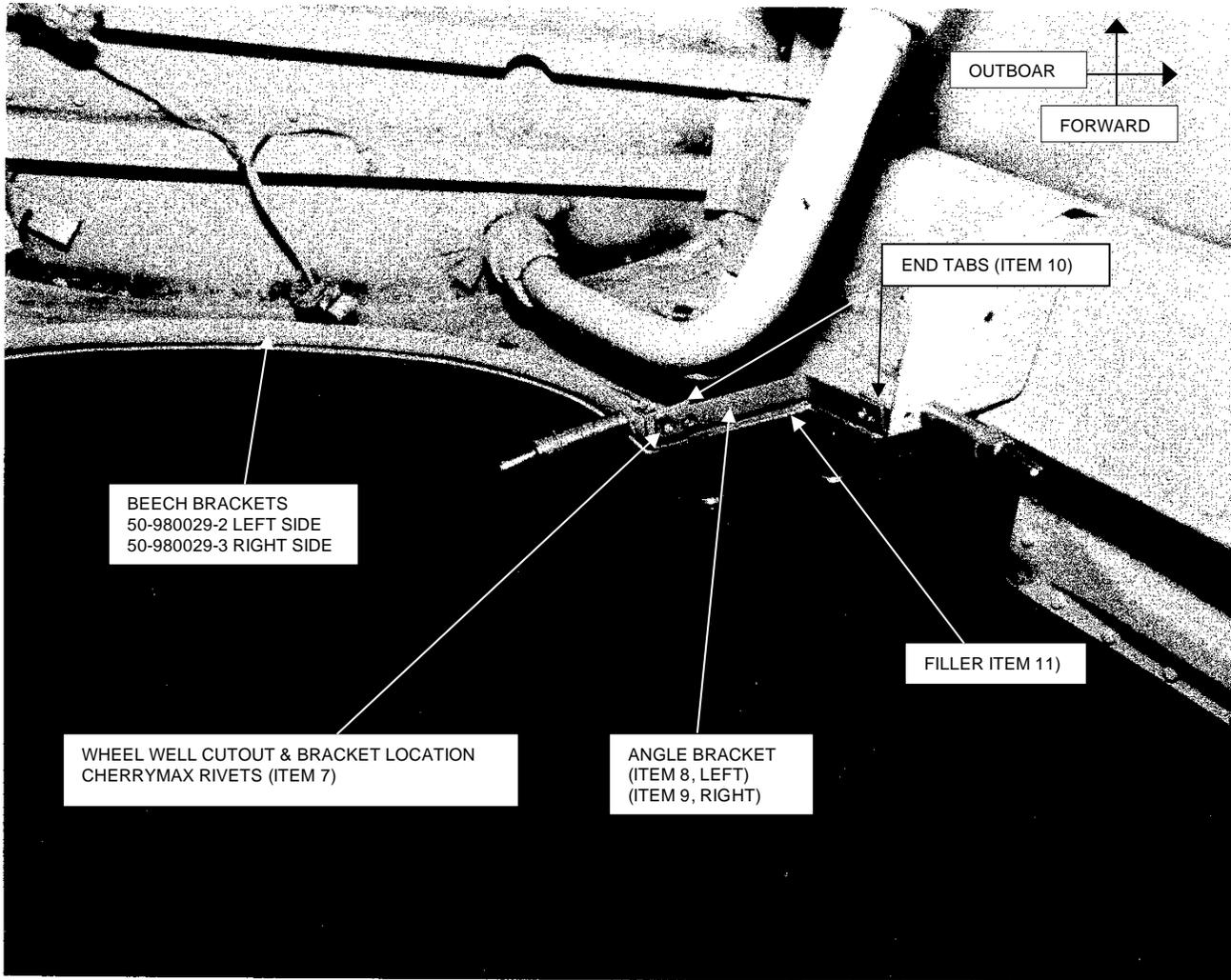


Figure 2 Beech Brackets

9.2. REPOSITIONING THE FUEL LINE (REFER TO FIGURE 3)

After completing the gear retraction test to check for adequate clearance between the brake cylinder and the fuel line, it may be necessary to reposition the fuel line and restrain it to ensure positive clearance at all times. Complete the following procedure if needed:

CAUTION: LOOSENING OF THE B-NUTS WILL CAUSE FUEL SEEPAGE TO OCCUR. AT THE DISCRETION OF THE INSTALLER, WORK QUICKLY TO MINIMIZE FUEL SEEPAGE OR DEFUEL THE AIRCRAFT IN ACCORDANCE WITH THE AIRCRAFT SERVICE MANUAL.

- a. Loosen the B-Nuts on the T-Fitting then move the fuel line toward Bracket "B" (away from the skin cutout) to the desired clearance.
- b. Tighten the B-Nuts in accordance with the aircraft service manual requirements.
- c. Secure the fuel line to Bracket "A" using the following components not supplied in this kit:
 - Clamp, P/N MS21919WDG13, quantity: one
 - Bushing, Beech P/N 50-810145-3 or equivalent, quantity: as required
 - Bolt, P/N AN3- (length as required), quantity: one
 - Washer, P/N AN960-10, quantity: as required
 - Nut, Beech P/N 130909N29 or equivalent, quantity: one
- d. Repeat the procedure for the fuel line in the opposite nacelle.

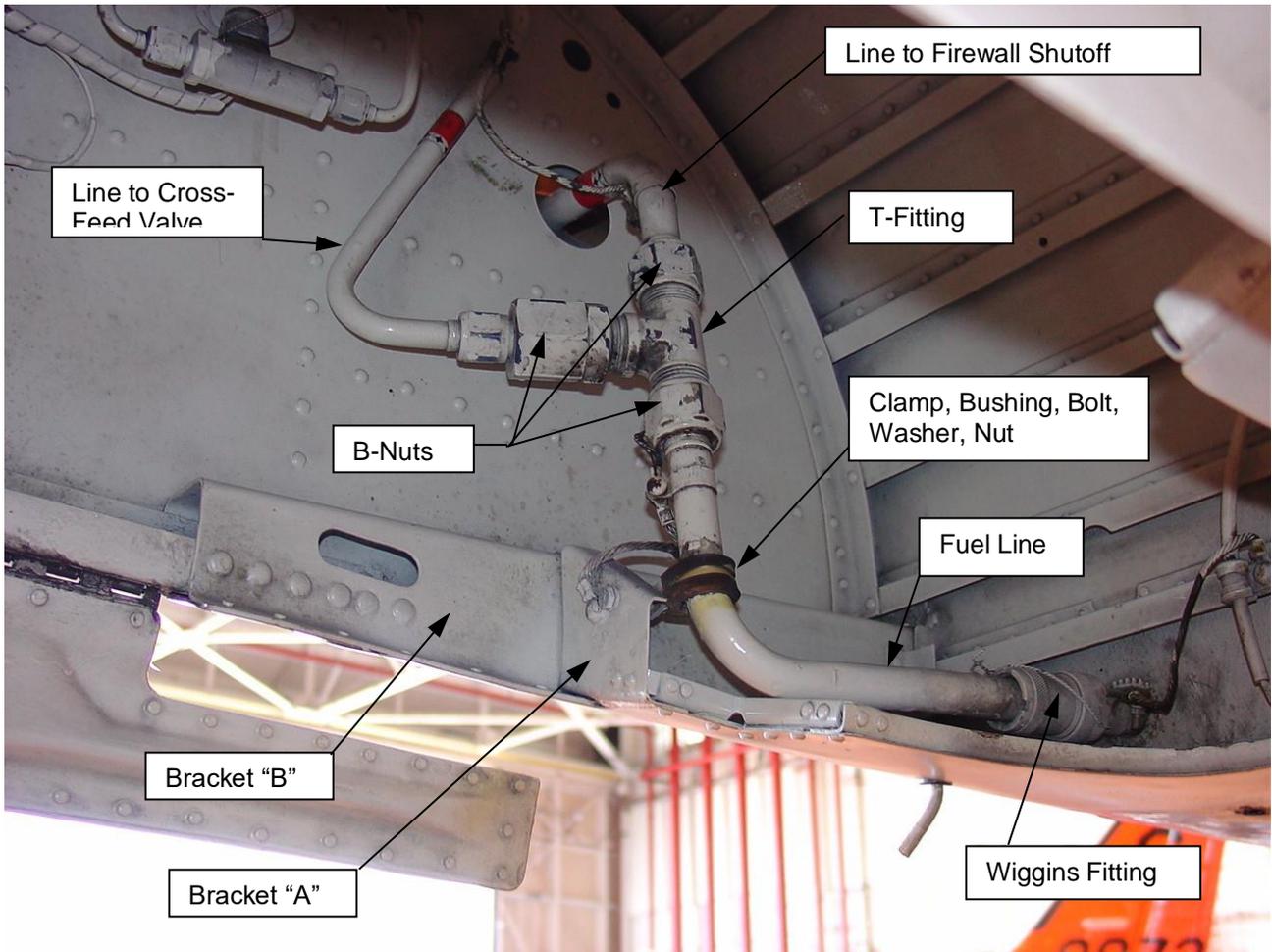


Figure 3 Securing the Fuel Line

10.0 WEIGHT AND BALANCE COMPUTATIONS

Weigh the original equipment wheels and brakes. Subtract from the new weights to derive weight increase created by the kit installation. Multiply the weight increase by the applicable aircraft moment and revise the weight and balance information in the log book.

10.1 WEIGHT AND BALANCE DATA

Weights do not include the tire or tube.

New installed (per gear leg)

Brake assembly14.30 lbs.

Wheel assembly29.00 lbs.

Total43.30 lbs.

Complete form 337 and make appropriate log book entries.

11.0 FLIGHT MANUAL INSERTS

Inserts are located in front with conversion kit documentation.

Attach the "Item Installed Labels" (referenced below) into (or copy into) the flight manual as close as possible to the original section titled Main Wheel and Brake Assembly. Enter the correct arm and moment in the blocks provided. Zero the items out for the original main wheel and brake assemblies that have been removed.

X	Two dual piston, single disc Brake Assemblies, Cleveland Wheel & Brake Systems P/N 30-144	14.30 ea.
X	Two 24 x 7.7 Type VII Wheel Assemblies, Cleveland Wheel & Brake Systems P/N 40-170A	29.00 ea.

Attach the "Description Label" (referenced below) into (or copy into) the Pilots Operating Manual as close as possible to the section titled Brake System.

Cleveland Wheel & Brake Systems Brake Assembly P/N 30-144 is a dual caliper, single fixed disc design, using two pistons per caliper (total of four pistons per brake) which respond to fluid pressure from the master cylinders for brake application.

12.0 KIT PARTS LIST
199-90 KIT

<u>(1) ITEM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
(2) 1	40-170A	Wheel Assembly	2
(3) 2	30-144	Brake Assembly	2
3	095-02900	Washer (Wheel Bearing Retaining)	2
4	094-10400	Nut	24
5	095-10500	Washer	48
6	103-22100	Bolt	24
7	105-00800	Rivet	32
8	110-05400	Bracket (Left Side)	1
9	110-05500	Bracket (Right Side)	1
10	110-05600	End Tab	4
11	110-05700	Filler	2
12B	158-01400	Hubcap (To be used on early model 90's with extended axle)	2
	IM199-90	Installation Manual for Conversion Kit 199-90	1
	50-80	Installation Drawing (sheets 1 & 2)	1
	CM40-170A	Component Maintenance Manual for 40-170A Wheel Assembly	1
	CM30-144	Component Maintenance Manual for 30-144 Brake Assembly	1
	SA619GL	Supplemental Type Certificate	1
	PRM14A	Conditioning Procedure for Metallic Brake Lining	1
	PRM78	(Deleted)	
	Template A	Wheel Well Modification Template	1
	-----	Pilot Operating Manual Inserts	1
	-----	Product Registration Card	1

(1) Refer to 50-80 Installation Drawing.

(2) For a complete parts breakdown, refer to Maintenance Manual CM40-170A.

(3) For a complete parts breakdown, refer to Maintenance Manual CM30-144.