AIRCORPS AVIATION

DOCUMENT
AUGUST 2022

Repair Station - P-51 Stock Brakes

Getting into Goodyears

Manufacturer	North American Aviation / Goodyear Aircraft Company
Aircraft	P-51 Mustang
Brake Manufacturer P/N	511124M (Goodyear)
Proper Description	BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE
Location	Mounted to the torque flange of each lower landing gear axle
Nickname	Mustang Stock Brakes / 7" Mustang Brakes

OVERVIEW / EXECUTIVE SUMMARY

Nobody wants brake problems while maintaining or operating any aircraft. For obvious reasons the maintenance and operation of brakes is critical. Fortunately, AirCorps Aviation offers solutions, recommendations, and parts available to keep these critical components in good working order.

Read on to learn why...

LOCATION

The BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE (P/N - 511124M), is installed on each main landing gear axle (P/N 73-33102).

For purposes of length, we will refer to the brake assembly as installed on a P-51D per Equipment Install - Landing Gear Wing (P/N 106-33014).

For reference

P-51B/C Mustang brakes were installed per Installation - Landing Gear (P/N 102-33001)

P-51A Mustangs per Installation - Landing Gear (P/N 99-33001)

A-36 / P-51 Mustangs per Installation - Landing Gear (P/N 73-33001 - Available through AirCorps' Ken Jungeberg Collection)

MAKEUP

The 511124M Goodyear high pressure hydraulic multiple disc brake assembly is made up of 73 individual parts; these brake assemblies can be identified by the size, the removable anchor bracket, and multiple alternating metal discs keyed to the anchor bracket and wheel.

The discs that makeup the brake assembly are of two types: rotating and stationary, which are often referred to as rotors and stators. The rotating discs are made with steel cores and lateral surfaces coated with a bronze friction material which serves as a bearing surface when contact is made with the non rotating discs. The rotating discs are keyed to the wheel and rotate with it. The steel stationary discs are keyed to the brake anchor bracket. The 511124 brake assembly is interchangeable between left gear and right gear.

There are four dimensions for the multiple-disc brakes. The first is the outside diameter of the discs; the second (numerator of the fraction) is the thickness of one rotating disc; the third (denominator of the fraction) is the thickness of one stationary disc, and the fourth indicates the number of pairs of discs.

For Example, the 511124 BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE is 7.6 inches in diameter, has rotating discs .100 thick, stationary discs .125 thick, and 9 pairs of discs.

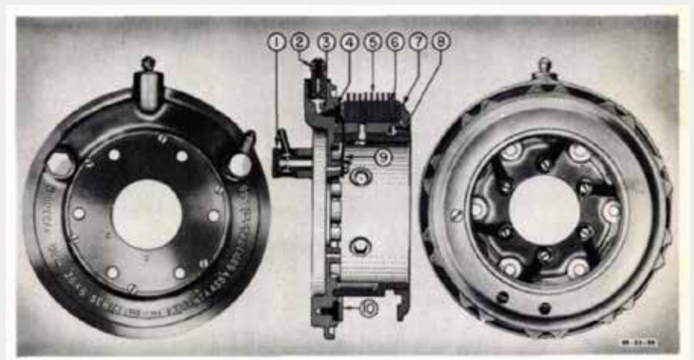


Figure 151—Main Gear Disc-type Brake

The clearance between the stack of discs is .007 times the number of discs. A brake with nine sets of discs has a clearance of .007 x 9 or .063 inches between the stack of discs and the retaining nut.

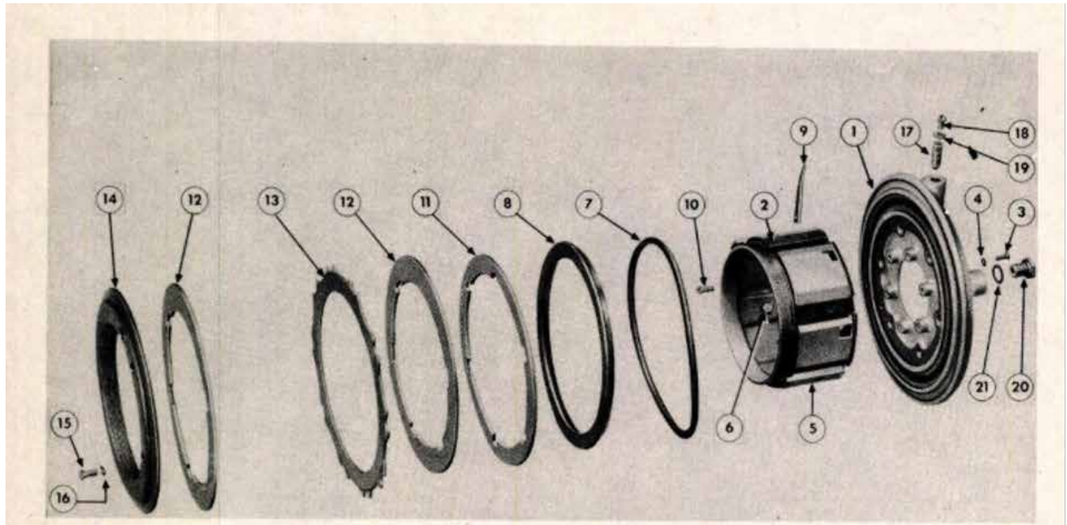


Figure 37—Low-pressure, Wedge-type Spring, Multiple Disc Hydraulic Brake—Exploded View

		7.6-IN. x 100/125 x 9 DISC H.P. HYDRAULIC BRAKE	
	511124MI	Brake Assembly—High-pressure hydraulic	1
	511154MI	Brake Subassembly—High-pressure hydraulic	1
37- 1	*530467M	Bracket—Brake mounting and piston cavity	1
37- 2	530468	Shelf—Anchor key mounting	1
37- 3	AN505-8-8	Screw—Anchor shelf to mounting bracket	6
37- 5	511159-1	Key—Anchor, stationary brake discs	6
37- 6	H61-250671-51	Screw and Washer—Anchor key to anchor shelf (⅜-inch "Sems unit")	6
	511771	Bushing—Hydraulic pipe inlet hole	2
	AN902-8	Gasket—Hydraulic pipe inlet hole bushing	2
37- 7	510664	Gasket—Piston seal	1
37- 8	511161M	Piston—High-pressure hydraulic	1
37- 9	218557	Spring—Piston return	6
37-10	H62-100851-52	Screw—Piston return spring retaining	6
37-11	272295	Disc—Insulating, piston from brake disc stack	1
37-12	530596-1	Disc—Braking, stationary	10
37-13	530597-1	Disc—Braking, rotating	9
37-14	218263	Nut—Brake disc stack retaining	1
37-15	AN510-10-10R-8	Screw—Lock, brake disc stack retaining nut	1
37-16	1510	Washer—Brake disc stack retaining nut lock screw (No. 10 Shakeproof)	1
37-17	218613	Plug—Bleeder, hydraulic brake	1
37-18	AN520-10-6	Screw—Bleeder plug	1
37-19	AN960-10	Washer—Bleeder plug screw	1
37-20	218375	Plug—Hydraulic line inlet	2
37-21	AN902-5	Washer—Hydraulic line inlet plug	2

BRAKE FUNCTION

Pressure is applied to brakes through a hydraulic fluid line controlled by the brake pedals through two master cylinders. This pressure forces hydraulic fluid into the brake piston cavity and actuates an annular ring piston located at one side of the discs. When pressure is applied to the brake, the piston (P/N 511161) forces the discs together, causing the braking action. These discs are relatively thin and number 19 per brake assembly (Qty 10 - 530596-1 Stationary Discs / Qty 9 - 530597-1 Rotating Discs). All the discs are held on the anchor bracket by a steel retaining nut (P/N 218263). Proper clearance between the discs is obtained by adjusting the position of this nut. When clearance has been adjusted correctly, the nut is locked into place by a lock screw.

The brake piston cavity is sealed by means of a synthetic rubber piston seal gasket (P/N 510664). A bleeder plug (P/N 218613) and fluid line inlet port are provided on the Bracket - BRAKE MOUNTING AND PISTON CAVITY (P/N 530467) often referred to as the backing plate. The insulator disc separates the brake piston from the disc stack. The insulator disc protects the piston from excessive temperatures which would vaporize the brake fluid. Cutouts in the insulator discs permit the piston return springs (P/N 218557) to function against the piston.

Proper Linkage is provided on the airplane so that braking power received at the wheel is proportional to the pressure exerted on the brake pedal. The desired pressure for brake operation is provided by the master cylinder P/N 102-33402 CYLINDER ASSEM - BRAKE MASTER. For independent operation each brake is provided with a separate master cylinder.

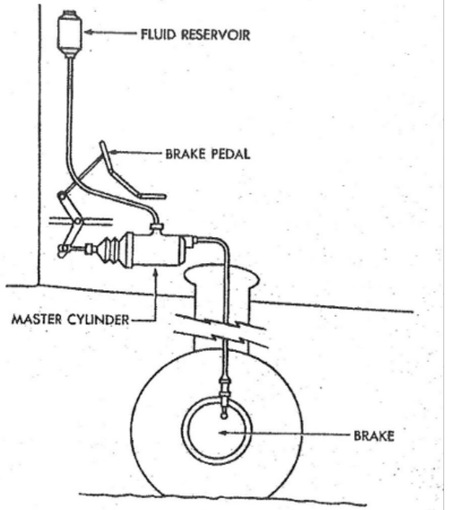
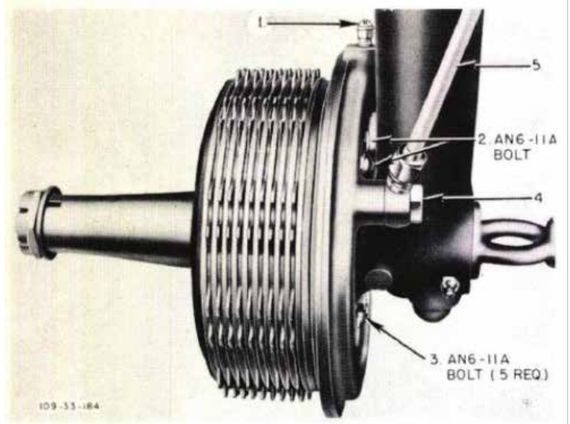


Figure 2-2. Diagram of Hydraulic System of a Multiple Disc Brake



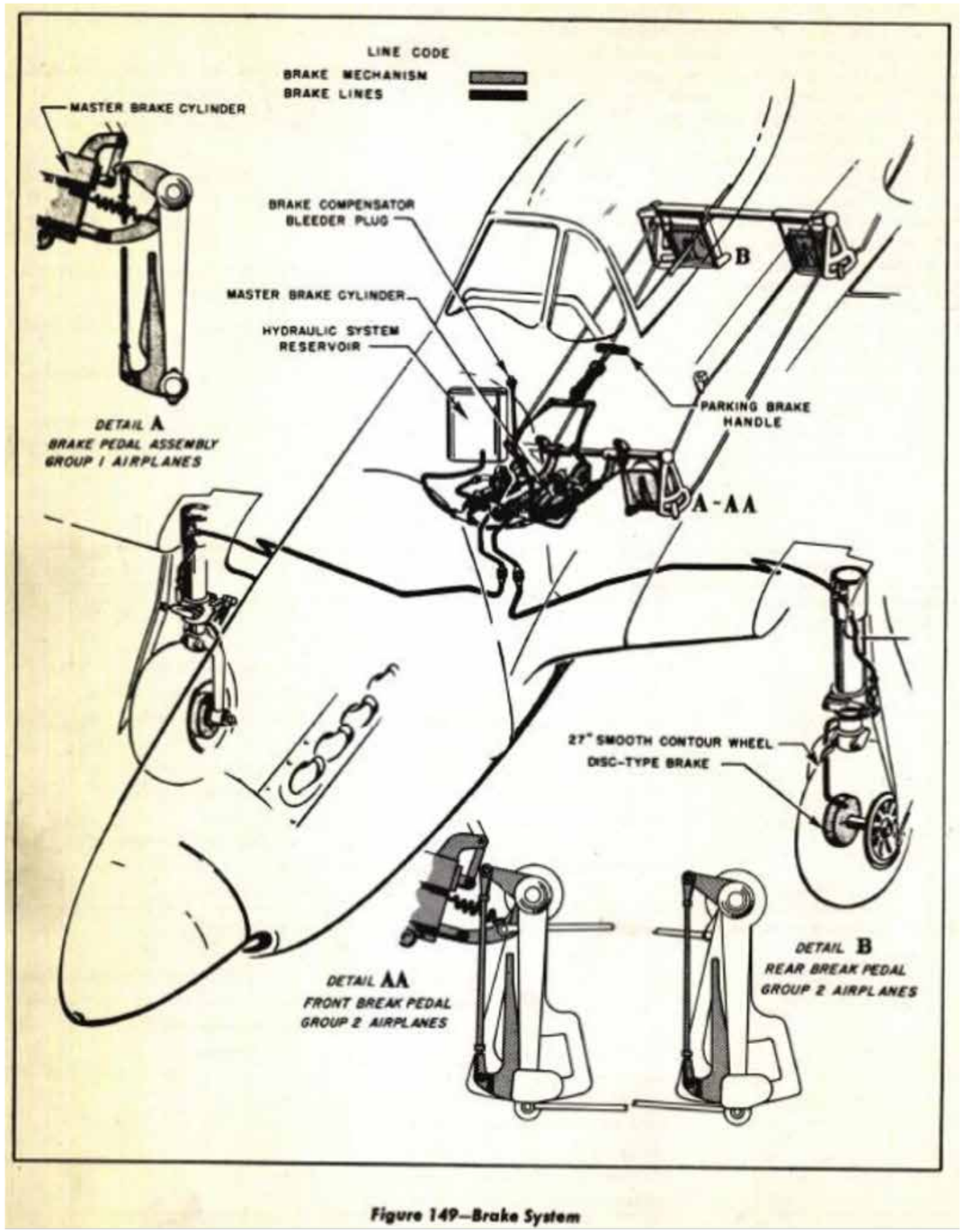


Figure 149—Brake System

BRAKE SYSTEM

The hydraulic brake system consists of two brake master cylinders described above, one connected to each brake by means of hydraulic lines. The brake hydraulic system is entirely separate from the general hydraulic system, except that the same reservoir (P/N 109-580510) supplies hydraulic fluid to both systems. A standpipe arrangement within this reservoir assures a reserve of hydraulic fluid for brake operation, even if the fluid for the general hydraulic system has been lost. The brakes are selectively controlled by toe pedals connected by mechanical linkage to the brake master cylinders. When a toe pedal is depressed, braking pressure is generated in the respective brake cylinder; and when the pedal is released, braking pressure is released. The brake system includes a parking brake operated by the control handle below center of the instrument panel. The parking brake serves to lock fluid pressure in the lines between the master brake cylinder and the brakes for indefinite periods.

P/N - 511124M BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE can be described as providing the following major functions.

- Stopping or slowing a moving aircraft by converting kinetic energy to heat energy by means of friction between the rotating and stationary discs located in the brake assemblies in the wheels.
- Hold the aircraft during a run-up
- Taxiing / steering the aircraft through differential braking

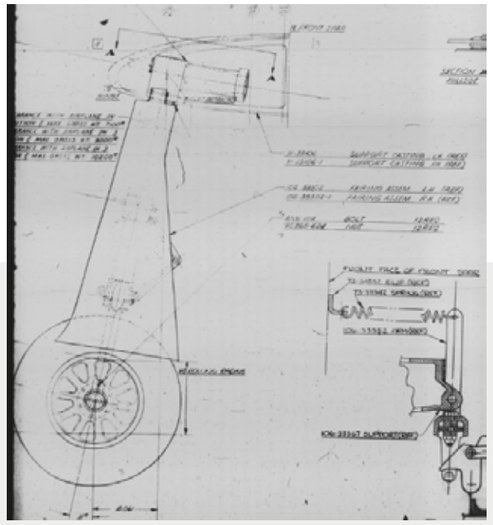
Connecting P/N - 511124M BRAKE ASSEMBLY to P/N 106-33014 -EQUIP INSTALL - LANDING GEAR WING

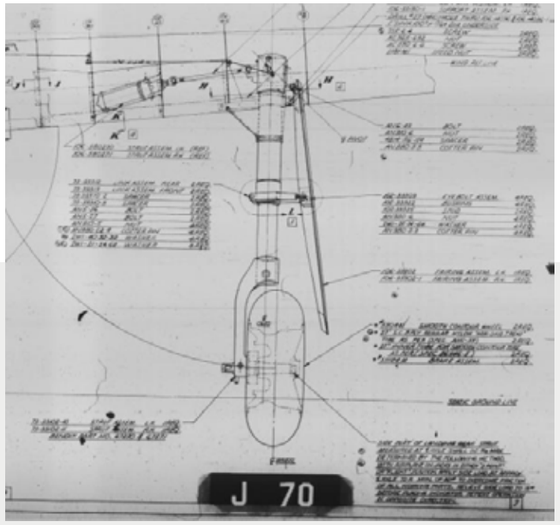
AN6-11A & AN365-624A (6 ea per Landing Gear Strut)

ATTACH P/N - 511124M - BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE

TO 73-33102 - STRUT ASSEM - LANDING GEAR

And 530441M - 27" SMOOTH CONTOUR LANDING WHEEL ASSEMBLY





Connecting P/N - 511124M BRAKE ASSEMBLY to P/N 106-58014 EQUIP INSTALL HYDRAULIC & BRAKE SYSTEM WING (In Red)

AN777-5D (1 per gear leg) AN775-5 (1 per gear leg) and AN901-5C (2 per gear leg) - Links to Depot

ATTACHES

P/N - 511124M - BRAKE ASSEMBLY - 7.6 x .100/.125 x 9 HIGH PRESSURE

TO

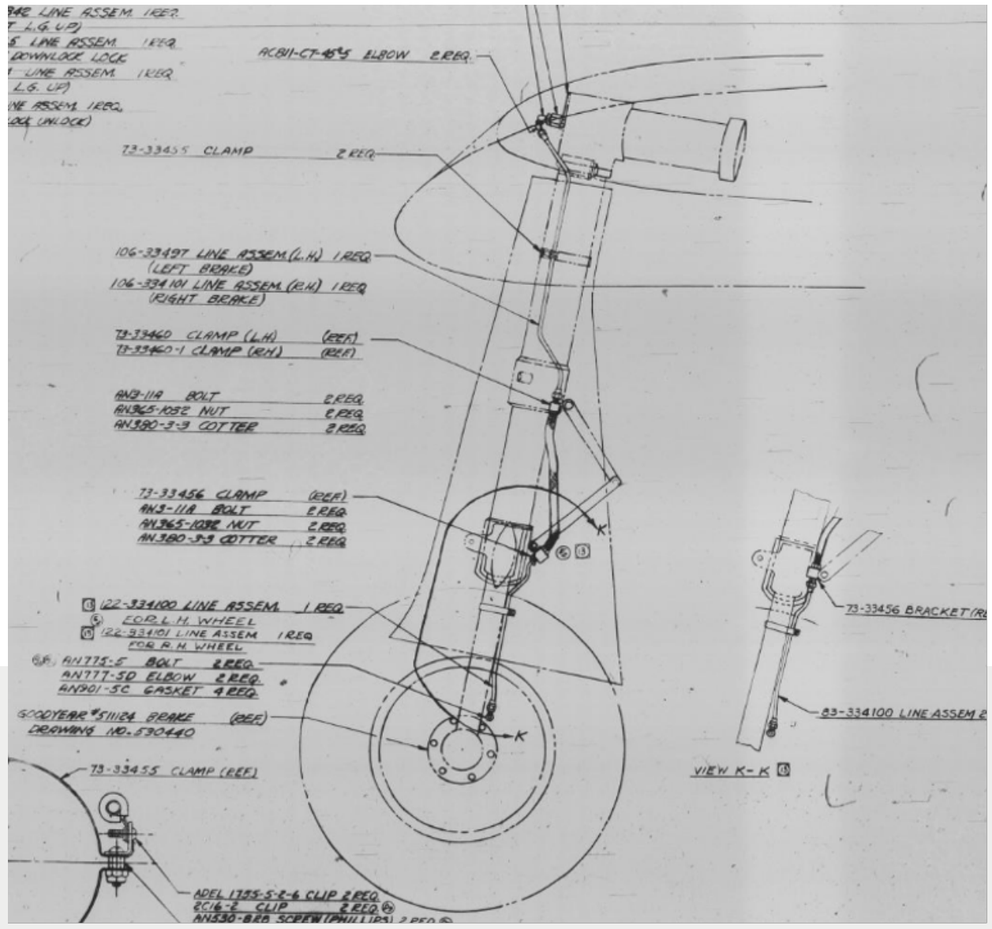
122-334100 - LINE ASSEM - HYD. MAIN LDG. GR. HOSE TO WHEEL CYL. BRAKE LEFT

(Left Landing Gear)

Or

122-334101 - LINE ASSEM - HYD. MAIN LDG. GR. HOSE TO WHEEL CYL. BRAKE RIGHT

(Right Landing Gear)



MUSTANG BRAKES - THE P-51 / P-63 BRAKE DISCUSSION

P-51 WHEEL / BRAKE ASSEMBLIES

The 511124 Goodyear brake assembly for the P-51 was likely designed and engineered by Goodyear in the same date range (August 1940) as that of the P-51 Landing Gear assembly. The brake design never changed considerably as evidenced by the usage of that brake assembly on the prototype P-51 drawing 73-33001.[1] The 511124 brake assembly was used on all models through the P-51D model mustangs. The 511124 Brake Assembly was designed to be solely used with the 530441M 27" SMOOTH CONTOUR LANDING WHEEL ASSEMBLY.

530441 27" SC LANDING WHEEL P-51 MUSTANG

511124M BRAKE ASSEMBLY P-51 MUSTANG

[1]Drawing 73-33001 is not on any of the digitized microfilm on AirCorps Library. This rare drawing is part of the Ken Jungeberg Collection of original North American Aviation P-51 Mustang drawings held by AirCorps.

P-63 WHEEL / BRAKE ASSEMBLIES

The P-63 Kingcobra built by Bell Aircraft is a fighter that emanated from its predecessor the P-39 Airacobra. The P-63 Kingcobra used a similar sized 530761 27" SMOOTH CONTOUR LANDING WHEEL and tire. The wheel uses the same races and bearings and fits on the P-51 axle assembly without any changes to the landing gear strut. A number of mustang owner operators use the P-63 brake 511638 - BRAKE ASSEMBLY - HIGH PRESSURE - 10.0 W x 100/125 x 7 on their aircraft. The change only requires some slight modifications to the striker and plunger. Both the design and dimensions of the P-63 wheel and brake combo are quite different from the stock mustang brake. We will write a blog specifically on the P-63 wheel and brake, until then, here are a couple of differences.

- The P-63 Brake 511638 is a 10" Brake
- The P-63 brake used 8 Stationary Discs and 7 Rotating Discs
- The P-63 wheel used a split rim design, the wheel has a separate flange on the outboard side which is held in place by a lockring. The split rim design for changing tires is a nice convenience

Interestingly the wholly Australian Mustangs built by Commonwealth Aircraft Corporation (CAC) had the larger 511638 brakes as the standard factory equipment. In doing so they modified the design of the P-51 brake master cylinder and the Wing Equipment Install Hydraulic & Brake System. We have these CAC drawings and can detail that modification in the P-63 brake blog as well. Most mustangs today are not flying with the modified master cylinders.

There is a lot of belief and opinion on stock vs. P-63 wheels and brakes, both work and are readily available. Know your airplane and maintain the systems well.

530761 27" SC LANDING WHEEL P-63 Kingcobra

511638 BRAKE ASSEMBLY - P-63 Kingcobra

INTERCHANGEABILITY OF P-51 AND P-63 WHEELS AND BRAKES

The wheels and brakes detailed above can only be paired together. It is not possible to interchange any components from aircraft model to aircraft model. Operators will need to have an all stock P-51 wheel and brake setup or an all P-63 wheel and brake setup.

P-51 Mustang - 530441 Wheel Assembly & 511124 Brake Assembly

P-63 Kingcobra - 530761 Wheel Assembly & 511638 Brake Assembly

REMOVAL OF BRAKE ASSEMBLIES

Assuming the wheel is removed from the axle. Detach lower brake line and fitting from the aft inlet boss. Loosen and remove six AN6-11A bolts and AN365-624A nuts. Slide brake assembly off the axle and bearing race collar on the shock strut axle. Instructions for removal and installation of P-51 brakes are outlined in Tech Order - Maintenance Instructions for F-51D, F-51M, ZF-51K, and TF-51D, T.O. No. 1F-51D-2 (AN 01-60JE-2), 30-Nov-1956

INSPECTION

This heavily worked and integral component on the P-51 Mustang requires frequent inspection and attention to prevent failure, particularly if there are unknowns in terms of recent service.

Some key questions in determining if your brake assemblies need to be inspected / tested / replaced / repaired:

- Which type of wheels and brakes are being used? (Identification photos above)
- Have the wheels and brakes recently been inspected?

AirCorps recommends these additional inspections / actions.

- Wheels and brake equipment installed should be visually checked during pre-flight to verify there are no visible leaks and attachment of lines and fittings are in good working order. Know your aircraft so any change will draw your attention.
- If leaking is present, remove the wheel and inspect the brake seal and O-ring groove. Wheels and brakes cannot be serviced or repaired while installed.
- Operation, Service, & Overhaul Instructions with Parts Catalog for Goodyear Multiple Disc Brakes, AN 03-25D-2, 5-Aug-1945 is both concise and well written for inspection periods and areas of focus.

As a reference, the Aircraft Inspection & Maintenance Guide - P-51, 00-20A-2-P-51, 7-Nov-1947 outlines a detailed inspection of the aircraft fuel system that should happen during pre-flight, after flight, daily, and at 25, 50, 100 hour inspections. Here are the required inspections outlined for the brake system on the P-51 Mustang.

					WHEELS, BRAKES AND TIRES (COLUMN 38)
		Hrs	Hrs	Hrs	**WHEELS**
P	D	25	50	100	Wheels for visual evidence of damage, corrosion.
				100	Bearing cups for condition.
				100	Inboard bearing felt grease retainer for condition, replace if necessary.
				100	Wheel bearings for lateral and radial roughness.
				100	Wheels for true and free operation.
			50	100	Retaining nuts, bolts, cotter pins for security.
				➧	200 Hours. Bearings removed, inspected, lubricated (T.O. No. 03-25A-1)
		25	50	100	Wheel disc keying lugs for tightness, condition.
		Hrs	Hrs	Hrs	**BRAKES**
P	D	25	50	100	Brakes visually inspected for fluid leakage. (If leakage is apparent, remove wheels and look for defective brake seal.)
	D	25	50	100	Brakes for proper operation.
	D	25	50	100	Brake pedals for equal pressure.
		25	50	100	Master Cylinders for leaks, external damage.
		25	50	100	Lines for security, chafing, scratches, cuts, other obvious defects.
		25	50	100	Brake discs for cleanliness
		25	50	100	Brakes adjusted to .063 inch clearance between discs and disc stack retaining nut
		25	50	100	Brake unit for broken or defective parts (T.O. No. 03-25D-2)
			50	100	Brake unit cleaned
				➧	500 Hours. Brake unit disassembled; component parts for wear, other defects (T.O. No. 03-25D-2)
		25	50	100	Parking brake and pedal brake control linkage for proper connection.
		25	50	100	Brake plunger packing nuts for torque of 150 inch-pounds.
		25	50	100	Brake linings for ewar to determine whether brake blocks should be replaced.
P	D	25	50	100	Brake line swivel assemblies on each main gear for condition, security, clearance, evidence of leakage

		Hrs	Hrs	Hrs	TIRES
P	D	25	50	100	Tires for proper inflation, general condition (T.O. NO 04-10-1)
	D	25	50	100	Tires for slippage on rim (T.O. NO 04-10-1)
			50	100	Tires for wear, cuts, brakes, blisters, other visible damage (T.O. NO. 04-10-2 & T.O. No. 4T-1-3 (Formerly 04-10-2, T.O. No. 04-10-2B)
				➡	Tires for abnormal usage. Tires removed and inspected (T.O. NO. 04-10-2 & T.O. No. 4T-1-3 (Formerly 04-10-2, T.O. No. 04-10-2B)
				➡	When uneven wear is indicated, casings removed and reversed on same wheels
				➡	When excessive rust or corrosion is present on wheel rims. Casings removed and inspected for damage.
				➡	Whenever casings are removed. Inner tubes for evidence of wrinkles, creases, cuts, punctures, chafing, pinching, etc; valves for physical damage.
				➡	At Installation. Inner tube heavy portion, lined up with red dot balance mark on casing.
					*P= Preflight / D= Daily

P-51 BRAKE FAILURE MODES

The following chart is available in Document Part Number: Maintenance Instructions for F-51D, F-51M, ZF-51K, and TF-51D, T.O. No. 1F-51D-2 (AN 01-60JE-2), 30-Nov-1956

	BRAKE SYSTEM TROUBLESHOOTING	
TROUBLE	**PROBABLE CAUSE**	**REMEDY**
Excessive forward Travel of Brake Pedals	Normal wear of bronze discs.	Install new discs.
	Improper adjustment of disc clearance.	Readjust brakes.
	Leak in system.	Find and repair leak.
	Air in system.	Correct fault; then bleed system.
	Brake pedal linkage set improperly.	Set rudder pedals to neutral; then adjust linkage so top of brake pedal is about ¾ inch forward of pedal hangar.
	Insufficient fluid in reservoir and brake standpipe.	Fill reservoir and bleed system.
	Vent in hydraulic system clogged.	Clear vent and see if it permits air passage.
	Improper bleeding - air left in system.	Wait until air accumulates in large bubbles; then bleed the brakes.
TROUBLE	**PROBABLE CAUSE**	**REMEDY**
Brakes Dragging or Locking	Improper adjustment of disc clearance.	Set Disc Clearance.
	Dirt in system.	Flush system.
	Binding of brake piston or dust shield.	Remove parts and clean in hydraulic fluid.
	Use of improper brake fluid.	Replace seals; flush reservoir with mineral oil, Specification No. AN-VV-O-336.
	Weak or broken piston springs preventing or retarding piston return.	Replace springs.
	Mechanical linkage frozen because of weak or broken brake pedal return spring.	Replace the spring.
	Damaged parking brake spring may prevent or retard release of pressure.	Replace the spring.

BRAKE FAILURE MODE #1

WEAR OF ROTORS AND STATORS

How to recognize - Chipping-bent-warped-rust-thickness-pitting

How to inspect - remove wheel and brake, disassemble, and measure / check for flatness

Tolerance of damage or wear : Zero

The P-51 Mustang T.O. 01-60J-52 from 1945 specified that .020" wear was allowed. However T.O. No. 4B1-2-3 (Formerly AN 03-25GAC-1) brake overhaul manual dated 1960, revised the earlier TO to allow only .010" in wear.

Solutions offered: Replacement of discs

Failure Location # 1

The most common failure occurs in the wear of the rotating disc (PN 530597-1). The disc should be inspected for flatness and that the thickness is no less than .090". The friction coating should not be flaking off, and should not have been blasted with sand like coarse abrasives which compromise the friction coating.

Failure Location # 2

Another common failure occurs in the 530596-1 Stationary Disc. This steel disc that is ground and chromed can also show wear. This disc should be checked for flatness and there should be no pitting or flaking of the chrome or accumulation of foreign matter fused to the disc. Cracks emanating from the anchor key slot corner is a common problem to watch out for.

FAILURE MODE #2 - Leaking brake due to failed piston seal gasket

The brake piston cavity is sealed by means of a synthetic rubber piston seal gasket (P/N 510664). This seal should be inspected. Fresh pliable seals can be located.

How to inspect - remove wheel and brake, disassemble brake, and visually inspect

Tolerance of damage or wear : Zero

Solutions offered: Replacement of 510664 piston seal gasket

FAILURE MODE #3 - Leaking brake due to pitted / corroded brake piston cavity

With 70 year old BRACKET - BRAKE MOUNTING AND PISTON CAVITY (P/N 530467) we are seeing a prevalence of pitted magnesium cavities for the PISTON SEAL GASKET. brake mounting and piston cavity (P/N 530467) often referred to as the backing plate.

How to inspect - remove wheel and brake, disassemble brake, and visually inspect

Tolerance of damage or wear : Zero

Solutions offered:

Option 1 - Replacement of 530467 BRACKET - BRAKE MOUNTING AND PISTON CAVITY

Option 2 - Repair by machining of the piston cavity on 530467 BRACKET to accept an oversized 510664 Piston Seal Gasket

FAILURE MODE #4 – Excessive wear on the anchor key retainer blocks.

How to recognize - grooving or wear from moving discs

How to inspect - remove wheel and brake, disassemble, and measure / check tolerances

Tolerance of damage or wear : T.O. No. 4B1-2-3 (Formerly AN 03-25GAC-1) brake overhaul manual specifies to replace any keys grooved or notched greater than .002

Solutions offered: Replacement of anchor keys

REWORK OF MAIN LANDING GEAR BRAKE ASSEMBLIES, T.O. NO. 01-60J-52, 26-MAR-1945

VIEW ONLINE

To reduce the possibility of brake drag after pedal pressure has been released with consequent fusing and locking of the brakes, the piston return spring tension was increased on brakes, part number 511124-M1 this rework was to be done on all P-51A, B, C, D, K airplanes.

BLEEDING P-51 DISC BRAKES

WEAR OF ROTORS AND STATORS

To reduce the possibility of brake drag after pedal pressure has been released with consequent fusing and locking of the brakes, the piston return spring tension was increased on brakes, part number 511124-M1 this rework was to be done on all P-51A, B, C, D, K airplanes.

Note: Air in the brake system causes the pedals to have a springy, rubbery action, or a lack of resistance to foot pressure. The air must be eliminated by forcing fluid through the brake lines until there are no more air bubbles in the fluid

STEP 1 See that the hydraulic fluid reservoir is full.

STEP 2 Remove cap screw and washer from brake bleeder plug and insert T55 bleeder hose.

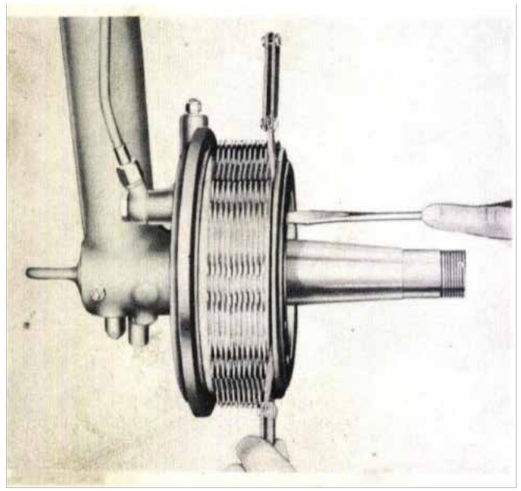
STEP 3 Place the free end of the bleeder hose in a clean receptacle containing a little hydraulic fluid, and then loosen the bleeder plug. This will allow fluid to flow by gravity and fill the brake system.

STEP 4 When fluid begins to flow out of the bleeder hose, hold the free end of hose under the fluid level in the receptacle, push the brake pedal forward, and then allow the pedal to come back slowly. Repeat this operation until no more air bubbles come from the bleeder hose.

STEP 5 Tighten the bleeder plug, remove bleeder hose, and install bleeder plug cap screw and washer.

STEP 6 Follow the same procedure at the opposite brake and at the parking brake compensator bleeder lug just aft of the hydraulic system reservoir.

ADJUSTING P-51 DISC BRAKES



STEP 1 Remove wheel

STEP 2 Loosen adjustment screw until anchor nut turns freely

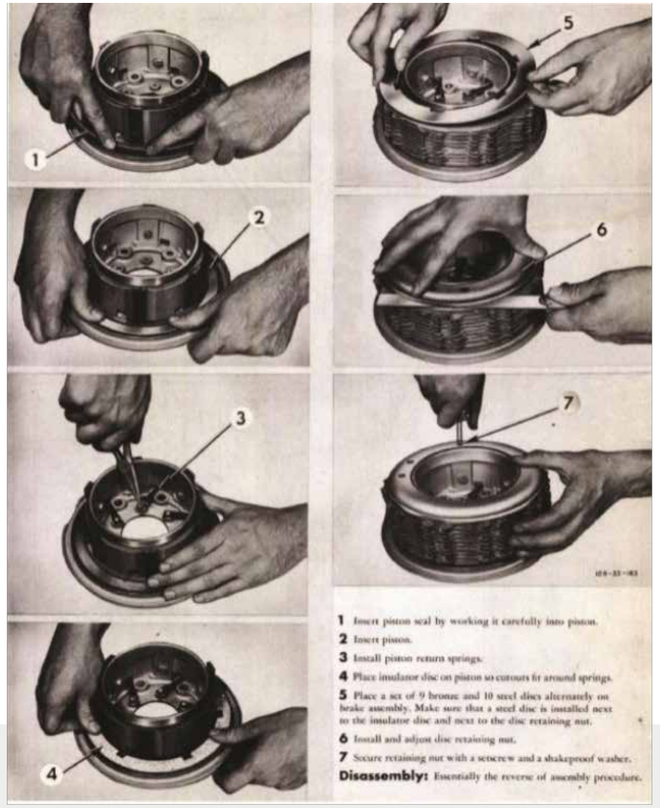
STEP 3 Turn anchor nut clockwise until tight; then loosen to .056 inch clearance on new brakes and .063 inch clearance on worn brakes.

STEP 4 Turn the anchor nut to the next set screw hole and tighten the set screw.

STEP 5 Test the anchor nut to make sure it is tight. If the nut turns more than 1/8 inch, the set screw is not in a set screw hole.

NOTE: Insert feeler gauges in at least two places.

ASSEMBLING P-51 DISC BRAKES



STEP 1 Insert piston seal by working it carefully into piston.

STEP 2 Insert piston.

STEP 3 Install piston return springs.

STEP 4 Place insulator disc on piston so cutouts fit around springs.

STEP 5 Place a set of 9 bronze and 10 steel discs alternately on brake assembly. Make sure that a steel disc is installed next to the insulator disc and next to the disc retaining nut.

STEP 6 Install and adjust disc retaining nut.

STEP 7 Secure retaining nut with a setscrew and a shakeproof washer.

DISASSEMBLY: Essentially the reverse of assembly procedure.

AIRCORPS / AERO TRADER BRAKE INVENTORY TRADE

Carl Scholl and Tony Ritzman are names synonymous with the warbird industry and movement. Their life's work and dedication to the warbird community through their company Aero Trader, has paved the way for the existence of shops and warbird collections throughout the world.

Like many in our industry, both were bitten by the aviation bug in their early 30s. The initial purchase of a derelict B-25 parked at the Ramona Airport in California grew into Aero Trader, one of the top warbird restoration operations in the world. Today, it is safe to say that no B-25 flying in the world operates without the parts, support, and knowledge of Carl, Tony, and the Aero Trader team.

What does this have to do with P-51 brakes?

A little more backstory first, Pat Harker is also a name synonymous with the warbird industry, a fellow native of Minnesota, Pat has been an incredible supporter of AirCorps Aviation over our 10+ years. Some of our most enjoyable memories with Pat are being covered in sand and dust while digging warbird parts out of obscure collections, or driving across the United States with gawking passerbys wondering what aircraft we are hauling.

In July of 2019 with a tropical storm coming up the gulf coast, the four AirCorps owners and Pat exited our rental truck into 104 degree heat and tropical humidity in Macon Mississippi. Opening the hangar door, we walked through a wall of spiderwebs to load N9899C, a North American B-25N SN: 44-29127 that Pat had sold to us. In two days we had emptied the hangar, and the aircraft and trucks were loaded and enroute back to Bemidji.

"Experience is what you get when you don't get what you want," is a great quote with relevance to the warbird industry. We will chalk this purchase and amazing B-25 adventure up to experience. Our grand ambitions of picking away at the B-25 project on the side were constantly hampered by leading a shop of nearly 60 talented people and wonderful yet demanding outside restoration projects. Realizing we weren't taking the project anywhere we knew that the home for the airframe and 20+ gaylord boxes of B-25 spares needed to be with Carl and Tony. Aerotrader is the home and the type certificate holders for the B-25, and we knew that our airframe and mounds of spare parts could serve the operators of the Mitchell bomber better through them.

In January of 2021 after AirCorps completed the restoration of a B-25C center section and newly fabricated engine cowlings. During the delivery we approached Carl and Tony about trading our B-25 project. The transaction was a handshake deal. In exchange for the B-25 project and thousands of spare B-25 parts AirCorps received about a semi load of P-51 mustang parts, the set of P-51 fixtures from Square One Aviation, and the single engine fighter wheel and brake inventory.

Carl and Tony have been both mentors and supporters as we have grown AirCorps. Not many people across the globe understand both the challenges and enjoyment of bootstrapping building a restoration shop from concept to reality while supporting a flying fleet of aircraft. Much of what we know as the warbird industry of today wouldn't be possible without the acquisition of inventories, specialization, and expertise of Carl, Tony, and the Aero Trader Team. Additionally, their contributions to AirCorps Library and our efforts to Preserve and Serve the warbird industry by digitizing critical technical publications, drawings, and manuals has been unmatched.

THE WARBIRD BRAKE INVENTORY & AIRCORPS REPAIR STATION

Upon completing the trade with Aero Trader, we transported the inventory of brake parts to Bemidji MN and the AirCorps shop and organized them by variant. Thousands of rotors and stators, hundreds of backing plates, anchor keys, springs and every component necessary to build up P-51, P-63, Corsair, Hellcat, Bearcat, and TBM brake assemblies.

This inventory aligns with the Certified FAA Repair Station (8ORR202D) where multi-disc Goodyear brakes are a listed capability and can be inspected, repaired and serve warbird operators across the world. Brake parts and components that are in short supply can be produced through our talented fabrication team and the AirCorps FAA PMA Quality System (PQ04274CE).

WHEN PURCHASING

AIRCORPS AVIATION

If you're replacing 511124 or 511638 brake assemblies, or sub components, ensure airworthiness prior to purchasing. AirCorps has parts to support most single engine fighter brakes, has multi disc brakes in our repair station capabilities, can perform inspections, answer questions. We also stock overhauled warbird brake, landing gear, hydraulic, and systems components that provide immediate solutions to AOG or maintenance challenges.

– AirCorps Depot

THE P-51 GURU

Mark Tisler achieved his Airframe & Powerplant in 1988 after graduating college with a degree in Agricultural Mechanization from Washington State University. In 1988, he began working with Gerry Beck at Tri-State Aviation in Wahpeton, ND. Mark's love of warbirds didn't stop at just airframes, his humble and technical expertise make him a favorite of operators, veterans, and aircraft owners. Tisler has worked on 13 major P-51 restorations and everything from a Stearman to a Corsair. As a co-owner of AirCorps he helps lead the award winning Restoration & Maintenance departments, which work not only on resurrecting historic aircraft but also prepping restored aircraft for flight readiness. His capable team does inspections, light and heavy maintenance, and component overhaul / repair for a variety of aircraft.

This month Mark can be found installing a new carburetor on a Stearman in Minneapolis and doing annuals on an SNJ, TBM, P-51C, & P-51D. He has also been installing new production windscreen glass in a P-51 and overhauling several sets of landing gear.

Contact us for more info on ways we can assist with your project!

Additional Relevant Landing Gear Actuating Rod Tech Orders & Information:

AirCorps Library - P-51 Mustang Resources

Aircraft Inspection & Maintenance Guide - P-51, 00-20A-2-P-51, 7-Nov-1947

T.O. 01-60JE-2, Maintenance Instructions for F-51D, F-51M, ZF-51K, and TF-51D, T.O. No. 1F-51D-2 (AN 01-60JE-2), 30-Nov-1956)

Maintenance Instructions - Cavalier Mustang - F-51D, T.0. 1F-51D-2, 27-Sept-1968