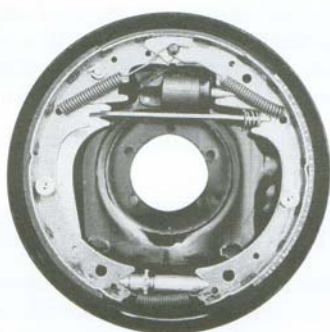


INSTALLATION INSTRUCTION AND SERVICE MANUAL

TITAN 12" x 2" BRAKES

FREE BACKING. UNI-SERVO . DUO-SERVO PREMIER, MARINE, & STANDARD



Limited Warranty TITAN Inc. ("TITAN") warrants its products to be free from defects in material and workmanship for one year from date of delivery to the original purchaser when properly installed, used and maintained by the purchaser.

TITAN LIMITED WARRANTY

TITAN warrants its complete braking systems (TITAN PREMIER, MARINE & STANDARD brakes, TITAN hubs/drums, and TITAN actuators) to be free from defects in material and workmanship for two years when properly installed, used and maintained.

TITAN warrants that the PREMIER BRAKE will be free from a corrosion-related failure of brake components for two years when properly installed, used and maintained.

This warranty does not apply to damage or loss caused by any or all of the following circumstances or conditions:

Freight damage.

Parts, accessories, materials or components not obtained from or approved in writing by TITAN.

Misapplication, misuse and failure to follow the directions or observe cautions and warnings on installation, operation, application, inspection or maintenance specified in any TITAN quotation, acknowledgement, sales literature, specification sheet or installation instruction and service manual ("applicable literature").

If any TITAN products are found upon TITAN's examination to have been defective when supplied, TITAN will either: credit the purchaser's account for the purchase price of the TITAN product; replace the TITAN product; or repair the product. TITAN has sole discretion in choosing which option to provide. For this LIMITED WARRANTY to apply, TITAN must receive notice of the alleged defect within 30 days of either the discovery of the alleged defect or the expiration of the warranty period, whichever is earlier. Any claim not made within this period shall conclusively be deemed waived.

If requested by TITAN, purchaser shall return the alleged defective product to TITAN for examination at TITAN's direction and expense. TITAN will not pay for expenses incurred in returning a product to TITAN without TITAN's prior written authority. TITAN shall not be liable for any other expenses purchaser incurs to remedy any defect. Purchasers waive subrogation on all claims under any insurance.

Limitation of Liability. It is expressly agreed that the liability of TITAN is limited and TITAN does not function as an insurer. THE REMEDIES SET FORTH IN THIS WARRANTY SHALL CONSTITUTE THE EXCLUSIVE REMEDIES AVAILABLE TO THE PURCHASER OR USER AND ARE IN LIEU OF ALL OTHER REMEDIES, EXPRESS OR IMPLIED. THE LIABILITY OF TITAN, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE OF THE PARTICULAR PRODUCT MANUFACTURED, SOLD OR SUPPLIED BY TITAN.

To Obtain Technical Assistance. To enable TITAN to respond to a request for assistance or evaluation of customer or user operating difficulty, please provide at a minimum the following information by calling 1-800-247-1781 or within Iowa 1-515-244-7286:

Model number, serial number and all other data on the specific component which appears to be involved in the difficulty. The date and from whom you purchased your TITAN product.

State your difficulty, being sure to mention at least the following: Application, Nature of load involved, and Weight of the load.

Field Service. If field service at the request of the purchaser is rendered and the difficulty is found not to be with TITAN's product, the purchaser shall pay the time and expense (at the prevailing rate at the time of service) of seller's field representative(s). Charges for service, labor and other expenses that have been incurred by the purchaser, its customer or agent without prior written authorization of TITAN will not be accepted.

TITAN EXTENDS NO WARRANTY, EXPRESS OR IMPLIED, ON PRODUCTS NOT MANUFACTURED BY TITAN OR TO TITAN'S DESIGN SPECIFICATION, INCLUDING BUT NOT LIMITED TO SUCH ITEMS AS NON-TITAN TIRES, BEARINGS, HOSE AND TUBING. PURCHASER'S RECOURSE SHALL BE LIMITED TO ANY WARRANTY OF THE RESPECTIVE MANUFACTURERS.

THIS WARRANTY EXCLUDES ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY PURPOSE.

THIS WARRANTY DOES NOT COVER NOR EXTEND TO INCIDENTAL OR CONSEQUENTIAL DAMAGE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

No representative has authority to make any representation, promise or agreement except as stated in this Limited Warranty. TITAN reserves the right to make design and other changes upon its products without any obligation to install the same on any previously sold or delivered products.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE DESCRIBED ABOVE. EFFECTIVE JULY 1, 1991 THIS WARRANTY SUPERSEDES ALL PRIOR WARRANTIES, WRITTEN OR IMPLIED.

DUE TO THE WIDE VARIATION IN USES TO WHICH TITAN PRODUCTS (WHEELS, HUBS, BRAKES, ETC.) ARE SUBJECTED BY USERS, WE ARE UNABLE TO SPECIFY CARRYING CAPACITIES OR SPEEDS FOR A PARTICULAR APPLICATION. THEREFORE, THE MANUFACTURER MUST TEST HIS EQUIPMENT UNDER THE MOST SEVERE CONDITIONS TO DETERMINE THAT TITAN PRODUCTS ARE

SUITABLE

PNEUMATIC TIRE WARNING

Danger-Only specially trained persons using proper equipment shall mount or demount pneumatic tires. Serious or fatal injuries can result from using improper mounting procedures.

TITAN 12" SURGE-O-MATIC BRAKES

BRAKE INSTALLATION

1. Brake Mounting Flange

To assure correct brake action, the mounting flange must be square and concentric with the axle spindle. A flange that is not properly installed will contribute to rapid lining wear and improper brake action.

The 12" TITAN brake is designed to interchange with existing equipment mounting on flanges with (5) holes on 3-7/8" B.C. and a 3-1/4" register diameter. Several manufacturers offer complete axles with flanges attached, or you may choose to install flanges yourself.

Use a flange welding fixture to properly position the flange for welding. Bolt the flange to the welding fixture securely with all bolts.

Install the fixture (and flange) onto the spindle and tighten spindle nut. If flange is being installed on a round axle, rotate to secure "wheel cylinder up" location when the axle is installed.

It is best not to make a continuous weld around the flange. First, tack weld on all four sides between the bolts. Follow this with a full weld up each side of the axle. It is usually not advisable or necessary to weld across the top and bottom of the axle. The bottom of the axle is its most highly stressed area and a weld at this point will weaken the axle. Allow the axle, spindle, and flange to cool before removing welding fixture.

2. Installing Brakes

Place the brake against spindle flange. In mounting the brake, be sure the hydraulic wheel cylinder is at the top. Brakes are also marked as "RIGHTS" and "LEFTS". The brake designated as "LEFT" travels on the driver's side of the road.

3. Installing Brake Drum

When the brakes have been correctly assembled to the axle flanges, the hub and drum assemblies may be mounted on the axle spindle.

Pack the inside bearing with suitable wheel bearing grease. Force grease through and around the rollers. Place the bearing in the hub and install the grease seal flush with the end of the hub using an arbor press or soft mallet. Remove excess grease.

To avoid injury to bearing seal, lubricate seal seat prior to putting on the brake drum. Grease pack and install the outer bearing on spindle. Place flat washer and spindle nut on spindle. Turn drum as you tighten nut. When a pronounced drag is felt in the bearings, back off nut one complete slot and install cotter pin and dust cap.

Caution: Do not pack hub full of grease. Excessive grease may leak into brake drums causing brake failure.

Wheels may now be mounted on the trailers.

4. Adjusting Brakes

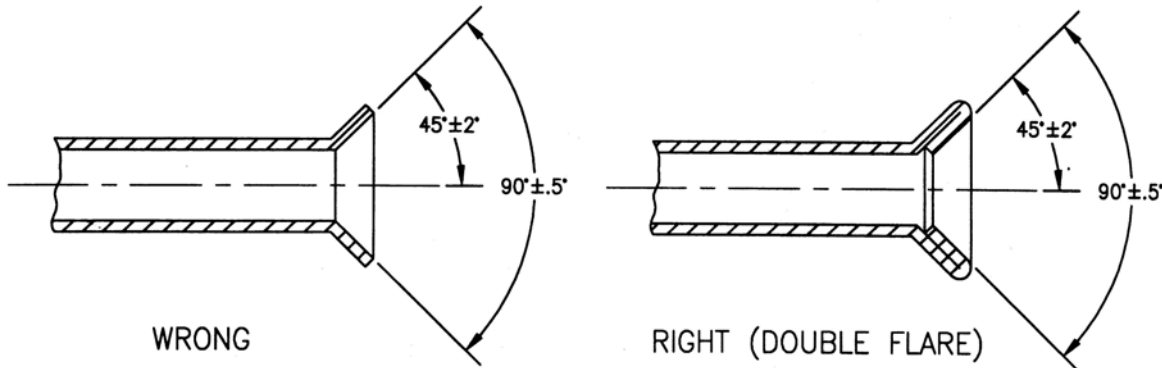
Before removing the jacks, adjust the brakes.

The brake adjustment nut is located behind a slot at the bottom of the backing plate. Tighten until you cannot rotate wheel by hand, then back off the adjustment 10 notches.

ALWAYS ROTATE DRUM IN DIRECTION OF FORWARD ROTATION ONLY.

5. Hydraulic Lines

Use care in forming tubing to avoid sharp bends or kinks. Double flare steel tubing to assure tight leak proof connections. Anchor all hydraulic lines at two foot intervals to prevent chafing and vibration. Use hydraulic rubber hose at points of flexing. Anchor hose ends to avoid stress on tubing.



6. Bleeding the System

The first requisite for safe, sure hydraulic braking is the use of quality brake fluid. Use only DOT-3 heavy duty fluid. If pressure bleeding equipment is available, follow the manufacturer's instruction in bleeding the system.

If system must be bled manually, proceed as follows: Fill master cylinder with fluid. Install bleeder hose on first wheel cylinder to be bled, (if tandem axle trailer, bleed rear axle first). Have loose end of hose submerged in brake fluid in glass container to observe bubbling.

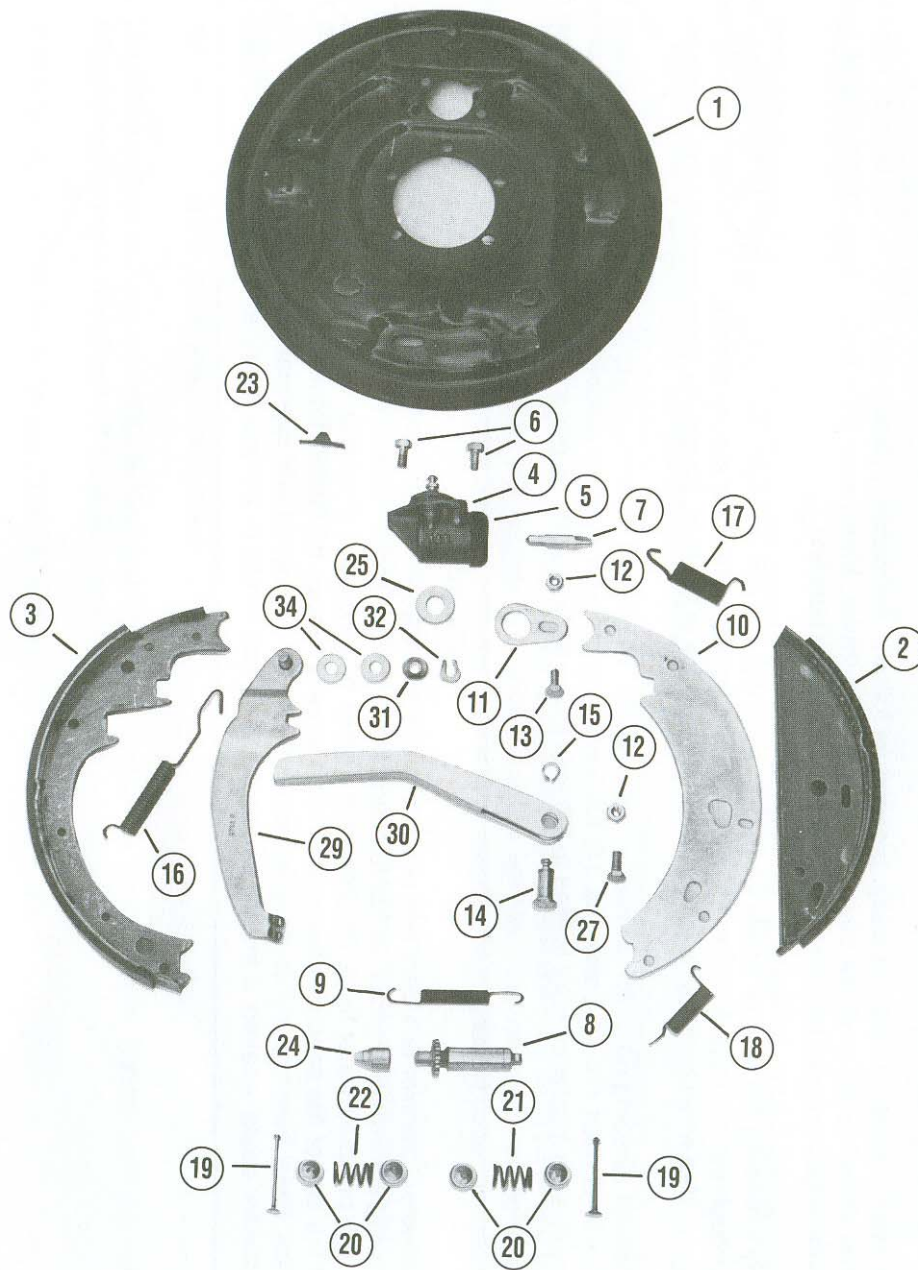
By loosening the bleeder screw located in the wheel cylinder one turn, the system is open to the atmosphere through the passage drilled in the screw. Pump actuator with long steady strokes. The bleeding operation is completed when bubbles no longer rise to the surface of the fluid. Be sure to close bleeder screw securely.

Repeat bleeding operation at each wheel cylinder. During the bleeding process, replenish the brake fluid, so the level does not fall below the 1/2 full level in the master cylinder reservoir. After bleeding is completed, make sure master cylinder is filled to 3/8 inch below the top of the reservoir, and filler cap securely in place.

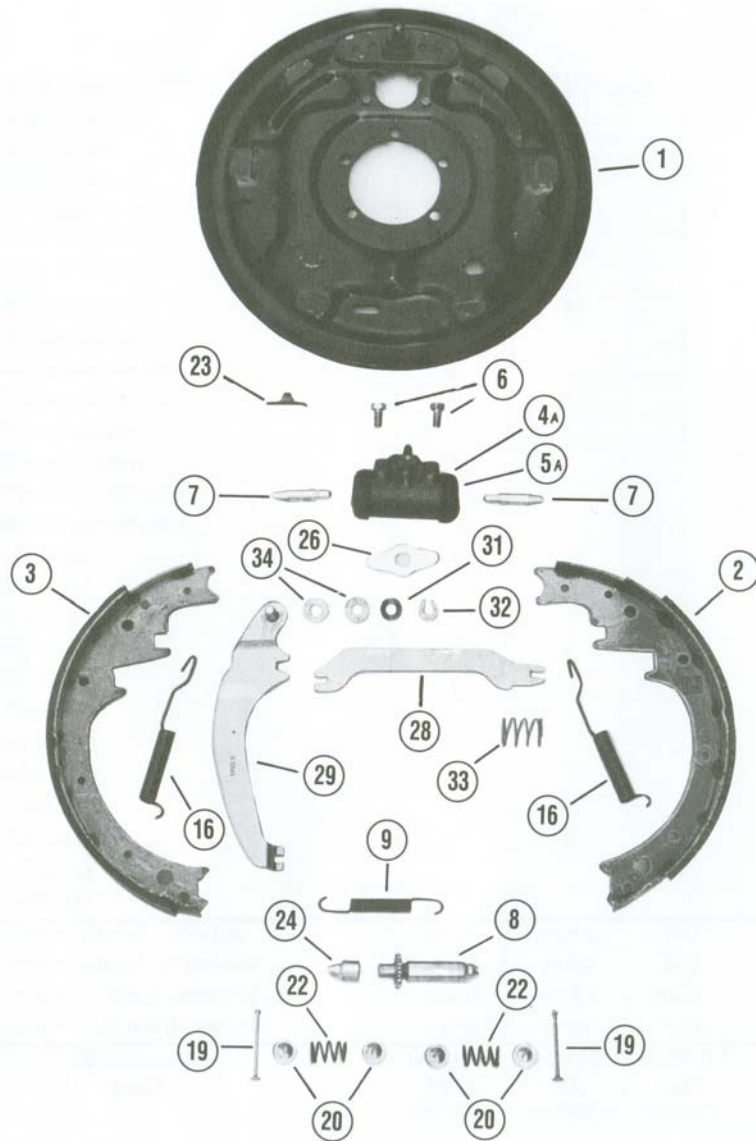
WARNING

Saltwater, granular fertilizers and other corrosive materials are destructive to metal. To prolong the life of a braking system used under corrosive conditions, we recommend that the Actuator be flushed after use with a high pressure water hose. Be sure to re-grease bearings and oil all moving parts after the unit has dried. At the end of the season, when unit is to be stored, remove the brake drums and clean inside the brakes. Pack wheel bearings before drum is installed. Failure to properly and adequately grease and maintain the actuator could weaken it and/or cause it to fail and result in serious injury and/or property damage.

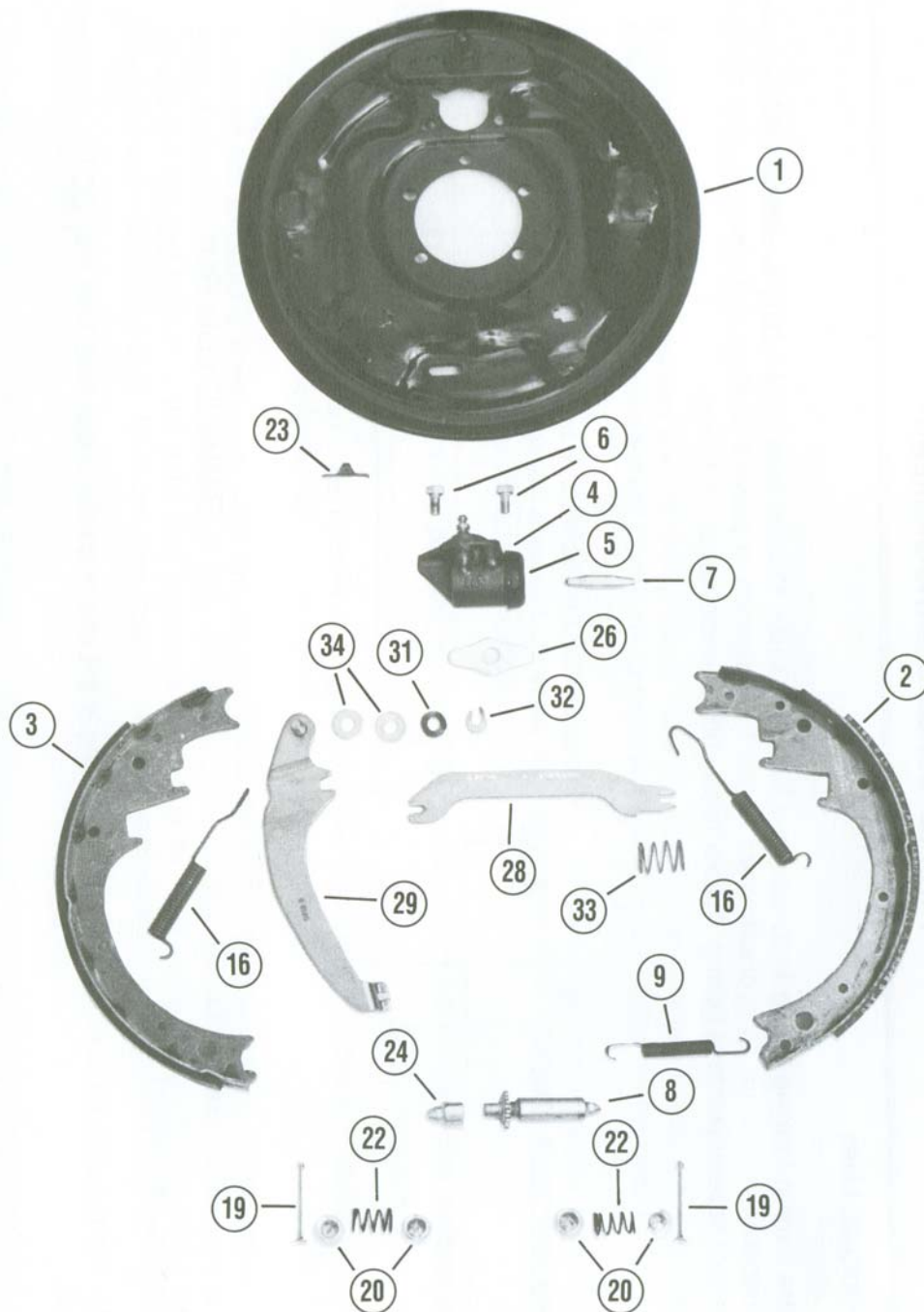
TITAN 12" FREE BACKING BRAKE



TITAN 12" DUO SERVO BRAKE



TITAN 12" UNI SERVO BRAKE



TITAN 12" x 2" BRAKE PARTS LIST

REF. NO.	PART. NO.	PART DESCRIPTION	BRAKE TYPE						
			PREMIER FREE BACKING	PREMIER UNI-SERVO	MARINE FREE BACKING	MARINE UNI-SERVO	FREE BACKING	UNI-SERVO	DUO-SERVO
0	-	Complete Brake w/o Parking Brake-Right	44895	44983	42032	24758	42028	23510	23490
0	-	Complete Brake w/o Parking Brake-Left	44896	44984	42033	24759	42029	23511	23491
0	-	Complete Brake w/o Parking Brake-Right	44860	44985	N/A	N/A	42030	23512	23495
0	-	Complete Brake wi Parking Brake-Left	44861	44986	N/A	N/A	42031	23513	23496
1	18496	Back Plate Assembly					1	1	1
1	24760	Back Plate Assembly			1	1			
1	44859	Back Plate Assembly	1	1					
2	18497	Front Shoe Assembly					1		
2	23492	Front Shoe Assembly						1	1
2	24984	Front Shoe Assembly			1				
2	24761	Front Shoe Assembly				1			
2	44845	Front Shoe Assembly	1						
2	44989	Front Shoe Assembly		1					
3	18503	Rear Shoe Assembly					1	1	1
3	24762	Rear Shoe Assembly			1	1			
3	44848	Rear Shoe Assembly	1	1					
4	9776	Wheel Cylinder Assembly-Right			1	1	1	1	
4A	17185	Wheel Cylinder Assembly-Right							1
4	44245	Wheel Cylinder Assembly-Right	1	1					
5	9777	Wheel Cylinder Assembly-Left			1	1	1	1	
5A	17186	Wheel Cylinder Assembly-Left							1
5	44246	Wheel Cylinder Assembly-Left	1	1					
6	23457	Cap Screw & Lockwasher			2	2	2	2	2
6	44849	Cap Screw & Lockwasher	2	2					
7	9783	Push Rod			1	1	1	1	2
7	44377	Push Rod	1	1					
8	23323	Adjusting Screw Assembly			1	1	1	1	1
8	44854	Adjusting Screw Assembly	1	1					
9	9784	Spring-Adjusting Screw					1	1	1
9	43258	Spring-Adjusting Screw			1	1			
9	44850	Spring-Adjusting Screw	1	1					
10	46223	Shoe Lever			1		1		
10	46224	Shoe Lever	1						
11	17917	Travel Link			1		1		
11	44389	Travel Link	1						

TITAN 12" x 2" BRAKE PARTS LIST (Continued)

REF. NO.	PART. NO.	PART DESCRIPTION	BRAKE TYPE						
			PREMIER FREE BACKING	PREMIER UNI- SERVO	MARINE FREE BACKING	MARINE UNI- SERVO	FREE BACKING	UNI- SERVO	DUO- SERVO
12	17406	Locknut			2		2		
12	44248	Locknut	2						
13	7949	Hex Cap Screw			1		1		
13	44247	Hex Cap Screw	1						
14	12560	Pin-Front Shoe, w/o Parking Brake			%1		%1		
14	44382	Pin-Front Shoe, w/o Parking Brake	#1						
15	7778	Retaining Ring	1		1		1		
16	9786	Spring-Shoe					1	2	2
16	24763	Spring-Shoe			1	2			
16	44851	Spring-Shoe	1	2					
17	9785	Spring-Lever					1		
17	24919	Spring-Lever			1				
17	44386	Spring-Lever	1						
18	6814	Spring-Shoe					1		
18	24920	Spring-Shoe			1				
18	44387	Spring-Shoe	1						
19	18508	Pin-Shoe Hold Down	2	2	2	2	2	2	2
20	9789	Cup-Shoe Hold Down	4	4	4	4	4	4	4
21	9790	Spring-Hold Down					1		
21	24980	Spring-Hold Down			1				
21	44852	Spring-Hold Down	1						
22	9791	Spring-Hold Down					1	2	2
22	24756	Spring-Hold Down			1	2			
22	44388	Spring-Hold Down	1	2					
23	9254	Cover Plate-Adjusting Hole					1	1	1
23	24757	Cover Plate-Adjusting Hole	1	1	1	1			
24	18836	Socket			1	1	1	1	1
24	44857	Socket	1	1					
25	18950	Washer			1		1		
25	44395	Washer	1						
26	10961	Shoe Guide Plate				1		1	1
26	44460	Shoe Guide Plate		1					
27	12972	Hex Cap Screw			1		1		
27	44858	Hex Cap Screw	1						
*28	44991	Parking Strut		1				1	1

TITAN 12" x 2" BRAKE PARTS LIST (Continued)

REF. NO.	PART. NO.	PART DESCRIPTION	BRAKE TYPE						
			PREMIER FREE BACKING	PREMIER UNI- SERVO	MARINE FREE BACKING	MARINE UNI- SERVO	FREE BACKING	UNI- SERVO	DUO- SERVO
*29	44865	Parking Lever-Right	1	1			1	1	1
*29	44866	Parking Lever-Left	1	1			1	1	1
*30	44863	Toggle Link-Right	1				1		
*30	44864	Toggle Link-Left	1				1		
*31	9794	Spring Washer	1	1			1	1	1
*32	9795	Retainer	1	1			1	1	1
*33	44992	Spring-Parking Strut		1				1	1
*34	44869	Washer	2	2			2	2	2
* -	9123	Hex Cap Screw					5		
* -	44870	Hex Cap Screw	5						
* -	9670	Hex Nut					5		
* -	44871	Hex Nut	5						
* -	7933	Lockwasher					5		
* -	44872	Lockwasher	5						
-	15845	Wheel Cyl. Kit-Wagner FC 13620	0.5	0.5	0.5	0.5	0.5	0.5	1.0

Substitute 44383 Pin for Premier Free Backing Brakes w/ Parking Brake. %

Substitute 9796 Pin for Free Backing Brakes w/ Parking Brake.

* Used on models with parking brake linkages.