DRIVE AXLE WHEELS

Each wheel is mounted on its spindle with two tapered roller bearings. All of the weight resting on the drive axles is supported by the wheels, bearings, and housing. None of the weight is supported by or transmitted through the axle shafts. This type of construction is known as "Full Floating".

The wheel itself is a large cylindrical casting. The bearing bores and other finished surfaces are machined after the wheel is cast.

DISASSEMBLY

Numbers in parentheses refer to Figure 8.

1. Jack up or lift the unit so its weight is not resting on the drive axle's tires and remove the tires (tractors) or tires and rims (trucks). Drain and remove planetary assembly.

2. Drain the differential housing.

3. Loosen the locking caps screws (1) of spindle nut (2) and remove the nut, using the spindle nut wrench shown in Figure 9. Pull the wheel (7) off of the axle spindle (16), being careful that the outer bearing cone (3) does not fall.

4. Remove lockwires, cap screws, and lockwashers (15) and remove grease guard (14) and brake drum (13) from wheel (7).

5. If bearing (9) or seal (11) is to be replaced, remove snap ring (12). This will allow seal (11), bearing (9), and washer (10) to be driven out of wheel with a soft drift. Bearing cup (8) will have to be driven out, if bearing is to be replaced.

INSPECTION

A bushing (Figure 10, Item 7) is shrunk onto the spindle (16) to provide a smooth contact surface for the oil seal (11). If the bushing is worn or rough, it should be removed and a new bushing shrunk onto the spindle. Heat bushing in oil to 275°F to expand it for installation.

All other parts should be thoroughly examined for damage or excessive wear and replaced, if their condition is questionable.

Fig. 9 - Fish Tail Wrench No. J-6705 In Use

Fig. 8 - Exploded View Of Wheel Assembly
DRIVE AXLE

ASSEMBLY

All parts should be thoroughly cleaned, before assembly, to prevent the introduction of abrasive particles to the moving parts and mating surfaces of the wheel.

1. Pack bearing (9) with grease specified for wheel bearing lubrication in the lubrication chart of this manual and insert the bearing into inner bearing bore. Place washer (10) on bearing; drive in oil seal (11), and install snap ring (12).

2. Fasten brake drum (13) and grease guard (14) to wheel with capscrews and lockwashers (15); wire lock the capscrews. Be sure that drum and wheel are clean where they contact, so that drum will run true.

3. Drive bearing cup (4), if it is being replaced, into the outer bore of wheel (7).

NOTE: If the drive axle is equipped with an outer oil seal, it may be discarded to allow the planetary gear oil to lubricate the inner bearing cone (9). When discarding the outer oil seal, be sure that the inner oil seal (11) is in good condition.

Wrap the spindle threads with masking tape to protect the seals and threads when installing the wheel. Be very careful when sliding the wheel onto the spindle, so that spindle threads are not damaged.

4. Pack outer bearing cone (3) with No. 2 Consistency Wheel Bearing Grease and install cone. Install spindle nut (2) and tighten to fourteen hundred pound feet (1400 lb. ft.) of torque. Use a long bar 5-6 feet long wedged into the wheel and a fish tail wrench special tool No. J-6705 shown in Figure 9. Lock spindle nut with capscrew (1).

SPINDLE

NOTE: The spindles (4) of this axle are not an integral part of the banjo (1). They are cast separately to facilitate the casting and machining processes. The spindles are either bolted (see Figure 10), or welded to the banjo (1). The large flange on the "bolted-type" spindle also serves as a brake backing plate. When a spindle is welded to the banjo, a separate brake backing plate is welded into position.

Ordinarily, there will be no need to remove a spindle from the banjo housing, however, a spindle may be removed by removing the bolts and nuts holding it to the banjo housing. When installing the spindle, tighten all nuts to the correct torque given in the table in Section 33 J.

A grease slinger (6) is arc welded to certain models of this axle, when it is assembled at the factory. Ordinarily, the slinger will last the life of the vehicle, but a new slinger may be easily installed by welding it to the spindle at four spots. All traces of the old weld should be removed before installing the new slinger.

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Image: Diagram of Drive Axle and Spindle Assembly

1-Banjo
2-Nut
3-Bushings
4-Spindle
5-Bolts
6-Grease Slinger
7-Oil Seal Bushing

Fig. 10 - Spindle And Banjo Assembly
BRAKES

CAMSHAFT AND CAM

1. Pry the snap ring (1) from the end of the camshaft (8) to free slack adjuster. Disconnect the slack adjuster from the brake chamber by removing the clevis pin in the push rod clevis. Slide the slack adjuster from the camshaft.

2. Remove the cam and camshaft as a unit. In some instances the cam and camshaft are integral and cannot be separated. In other instances the cam can be removed by removing the snap ring and sliding it from the shaft.

ANCHOR PINS

1. Remove grease fittings, if used, from anchor pins.

2. Remove anchor pin nuts (21) and tap out anchor pins (14).

BACKING PLATE

NOTE: Backing plate (4) does not have to be removed except when replacing or re-bushing the front axle spindles.

1. Disconnect air chamber lines.

2. Remove nuts and bolts attaching backing plate to spindle. Remove backing plate.

DRIVE WHEEL BRAKES

SINGLE BRAKE SHOES

Numbers in parentheses refer to Figure 3.

1. Jack up rear of vehicle so that rear wheels are off the ground. Completely drain lubricant from drive axle including planetary assemblies.

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Fig. 3 - Exploded View of Typical Drive Wheel Brake Assembly

1-Anchcr Pin Lock Ring
2-Anchcr Pin Link
3-Anchcr Pin
4-Anchcr Pin Lock Nut
5-Grease Flitting
6-Lining Nut & L.W.
7-Bushing
8-Roller Pin
9-Lining Bolt
10-Lining Plug
11-Brake Lining
12-Roller
13-Brake Shoe
14-Return Spring
15-Camshaft Snap Ring
16-Cam
17-Camshaft Spacer
18-Camshaft
19-Backing Plate
BRAKES

2. Remove planetary assembly from wheel and remove spindle nut from spindle. Support tire and wheel with rope sling and crane. Walk wheel off spindle, be careful that outer bearing does not fall to the ground.

3. Remove brake return spring (14) or springs.

4. Pry the lock rings (1) from the anchor pins (3) and remove anchor pin link (2).

5. Pull off brake shoes (13).

6. Remove lining from brake shoes.

CAMSHAFT

1. Disconnect brake chamber push rod from slack adjuster. Remove snap ring from camshaft and slide off slack adjuster.

2. Slide assembled cam (16) and camshaft (18) from backing plate (19). Remove snap ring (15) and slide cam from camshaft.

ANCHOR PINS

1. Remove grease fittings (5).

2. Remove anchor pin nuts (4) and tap out anchor pins (3).

DUAL BRAKE SHOES

Numbers in parentheses refer to Figure 4.

1. Disconnect brake chamber push rod from slack adjuster. Remove snap ring (2) from inner camshaft (3) and slide off slack adjuster. Also remove grease fitting (1) from inner camshaft.

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**Fig. 4 - Exploded View of Dual Brake Shoe Assembly**

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1-Grease Fittings  12-Lock Plate  24-Secondary Brake Shoes
2-Snap Ring  13-Primary Brake Shoe  25-Secondary Lining
3-Inner Camshaft  14-Primary Brake Lining  26-Pipe
4-Camshaft Coupling  15-Plug  27-Elbow
5-Outer Camshaft  16-Screw  28-Pipe
6-Coupling  17-Lockwasher  29-Return Spring
7-Pipe  18-Nut  30-Lockwire
8-Anchor Pin  19-Pin  31-Bolt
9-Anchor Pin Bushing  20-Roller  32-Guard
10-Bolt  21-Cam  33-Brake Drum
11-Lockwasher  22-Spacer  34-Elbow
BRAKES

2. Remove snap rings (2) and link (23) from anchor pins (8). Remove outer brake return spring (29) and slide outer brake shoes (13 & 24) off anchor pins (8).

3. Remove snap ring (2) from outer camshaft (5) and pull off outer cam (21) and spacer (22).

4. Remove bolt (10) and lockwasher (11) from anchor pin lock plate (12) and remove plate. Remove grease pipe (7) couplings (6) with grease fittings (1) from anchor pins.

5. Remove inner brake shoe return spring. Drive out anchor pins (8) so that inner brake shoes (13 & 24) can be removed. It is not necessary to completely remove the anchor pins. When driving the pins be careful that the brake shoes do not fall to the ground.

6. Remove two snap rings (2) from outer camshaft (5). Pull shaft out of camshaft coupling (4). Lift out the other spacer (22) and inner cam as the shaft is being removed.

7. The camshaft coupling (4) and inner camshaft (3) can be removed if it is necessary to do so.

INSPECTION

1. Check backing plate for cracks and bends. Replace if necessary.

2. Cams should be checked for flat spots. Flat spots on cams can cause serious pulling, especially in the front axle brakes.

3. Check for bent camshafts. Bent camshafts will tend to bind in the bushings, push the shoes open at an angle tending to bend the anchor pins or cause a taper wear pattern of the brake lining.

4. Check camshaft bushings or anchor pin bushings for excessive wear and replace if worn.

5. Check brake drums for cracks, checks, distortion and scored surfaces. Severely scored brake drums may be salvaged by reboring. The maximum the drums can be rebored is 3/16". Drums should be bolted to the hub or wheel when being rebored. With rebored drums, an oversized lining should be used. If oversize lining is not available, it will be necessary to shim the standard lining. A metal shim should be used between the shoe and lining to conduct the heat away from the lining. When using over-sizing lining, each shoe must have added to the original thickness ONE HALF the amount removed from the drum.

6. Check brake shoe rollers for binding. If they bind, clean and oil; if they still bind, the roller and pin should be checked for excessive wear. Replace, if excessively worn.

7. Clean all rust off face of brake shoes and smooth down bolt or rivet holes so lining will fit snugly.

RELINING BRAKES

Experience has shown that for a high standard of brake safety and performance it is necessary to replace all the linings on a given wheel at the same time, rather than replace them singly when they become excessively worn. This procedure of replacing all the linings on a wheel at one time equalizes the wear between the brake shoes, thus utilizing the full braking area of the shoes and permitting them to operate simultaneously. Therefore, when relining the brake shoes be sure to reline all the shoes for a given wheel.

NOTE: For your convenience the brake linings are now being sold in kit form. Each kit contains the necessary parts to reline an entire wheel.

COMBINATION BRAKE LINING

The combination linings consist of two linings for the forward or primary shoe and two linings for the reverse or secondary shoe. The forward or primary shoe is the shoe that opens by moving about the hinge or anchor pin in the same direction as the wheel turns. Therefore, it is the shoe that tries to wedge into the brake drum or be carried away from the cam by the turning of the drum. The reverse or secondary shoe is the opposite shoe.

An easy method of identifying the two types of shoes is illustrated in Figure 5. When the brake cam is to the front of the axle, the forward or primary shoe is the top shoe and when the brake cam is to the front of the axle, the forward or primary shoe is the bottom shoe. The reverse or secondary shoe is the bottom shoe in the first case and the top shoe in the second case.

The individual linings for each shoe are easily identified by a color. The linings for the forward or primary shoe have blue edges and the linings for the reverse or secondary shoe have yellow edges. Be sure to mount the linings on the correct shoe because a misapplication of the linings during replacement will result in rapid lining wear and loss of braking capacity.