MODEL UC-98/UC-108
BOOK No. 343
SERIAL No. _____

MACHINE SERIAL NUMBER

The machine serial number is on the serial number capacity plate, or on the Crane Rating Manual located inside the operator's cab. The serial number should always be furnished when ordering parts for the machine or when corresponding with the distributor or factory concerning the machine. Providing the serial number is the only way of ensuring the correct parts and/or information can be furnished.

In the event the serial number is not readable, a number is stamped on the upper revolving frame which can be used to identify the machine. On cable crane this number is located on the right hand boom foot mounting lug. On hydraulic cranes and excavators the number is stamped just below the boom hoist cylinder mounting lugs.

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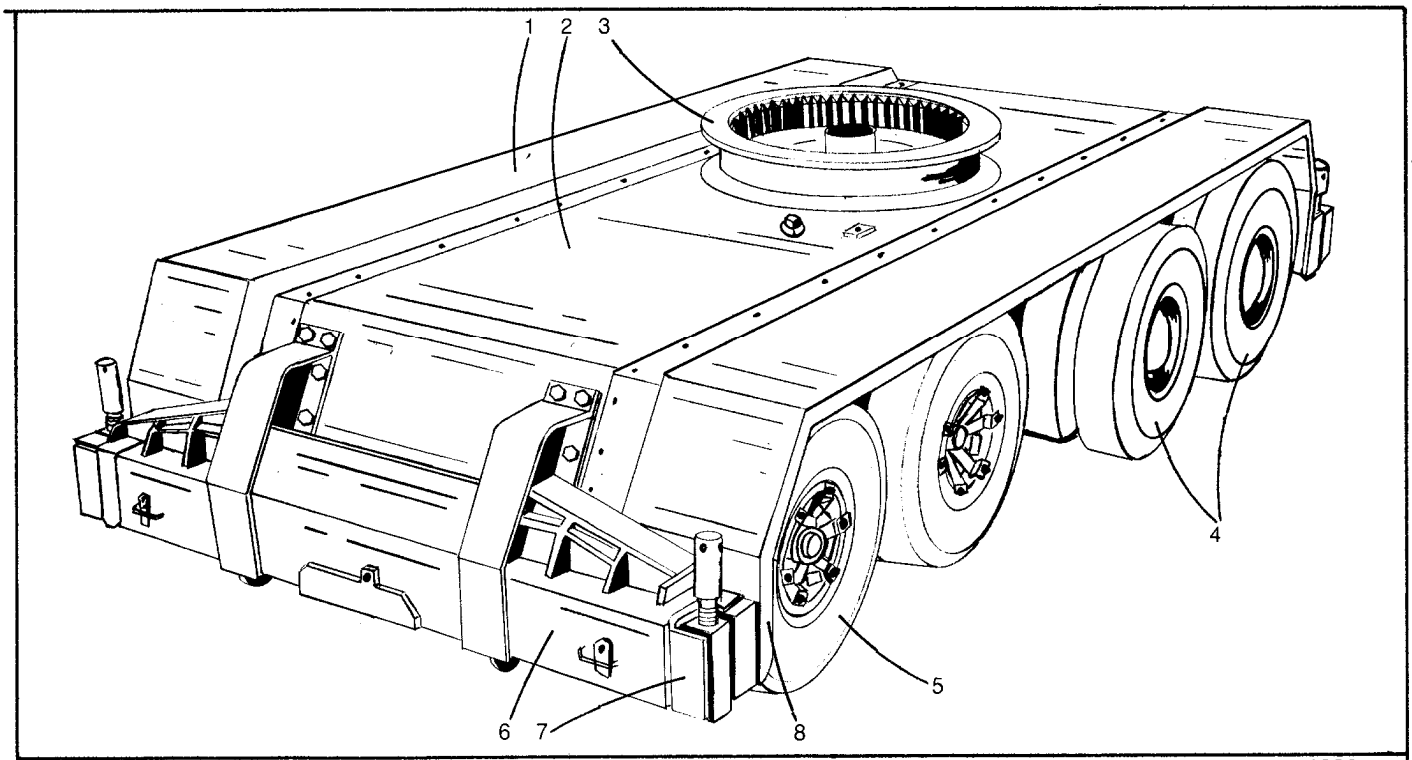

Fig. 1 A118-B
UC Lower Frame
(1) Fender
(2) Deck Plate
(3) Ring Gear
(4) Rear Axles And Wheels
(5) Front Axles And Wheels
(6) Outrigger Box
(7) Outrigger Beam
(8) Fender

Lower Frame Assembly

The UC carrier is an 8X4 rubber tire carrier, designed and manufactured by FMC Corporation. The carrier uses a number of components manufactured by vendors, that have been specified and approved by our engineering department. Lubrication and maintenance instructions for vendor items are published through cooperation with the vendor.

The UC is a self propelled rubber tire mounted machine. It is driven by the upper engine through a reverse shaft and vertical shaft arrangement much the same as in a crawler mounted machine. The machine uses truck type front and rear axles. Power is transferred to the rear axles by a transmission and drive shaft arrangement in the same manner as a truck.

The frame is heavy steel weldment, with a center pin and roller path welded to the upper frame plate. There is a steel fender bolted to each side of the lower frame. The fenders run the entire length of the lower frame. The transmission and bevel gear housing are bolted to the underside of the upper frame plate.

The steering mechanism, which is similar to a truck, is hydraulically actuated from the upper revolving frame.

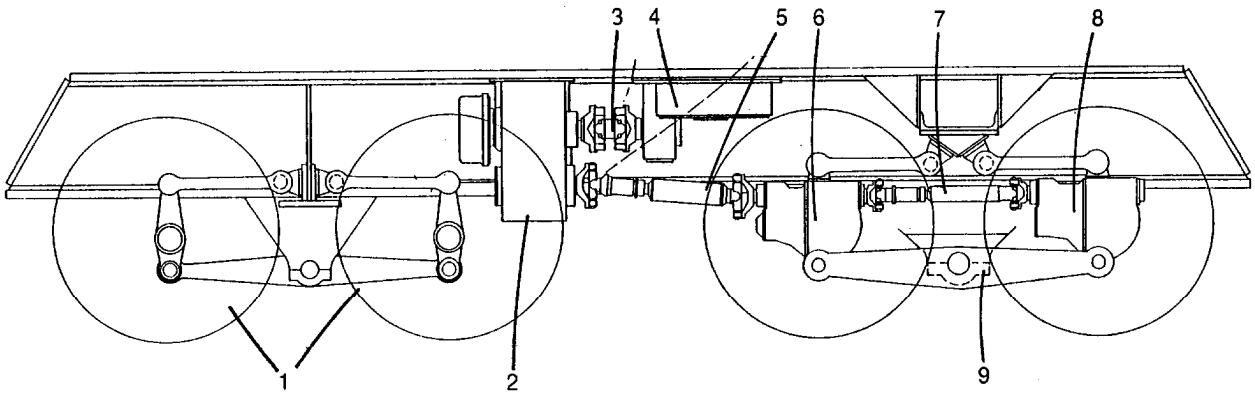

Fig. 2 A112-D
Carrier Drive Train
(1) Front Axles
(2) Transmission
(3) Drive Shaft
(4) Bevel Gear Transmission
(5) Drive Shaft
(6) Front Rear Axle
(7) Drive Shaft
(8) Rear Rear Axle
(9) Equalizer Beams

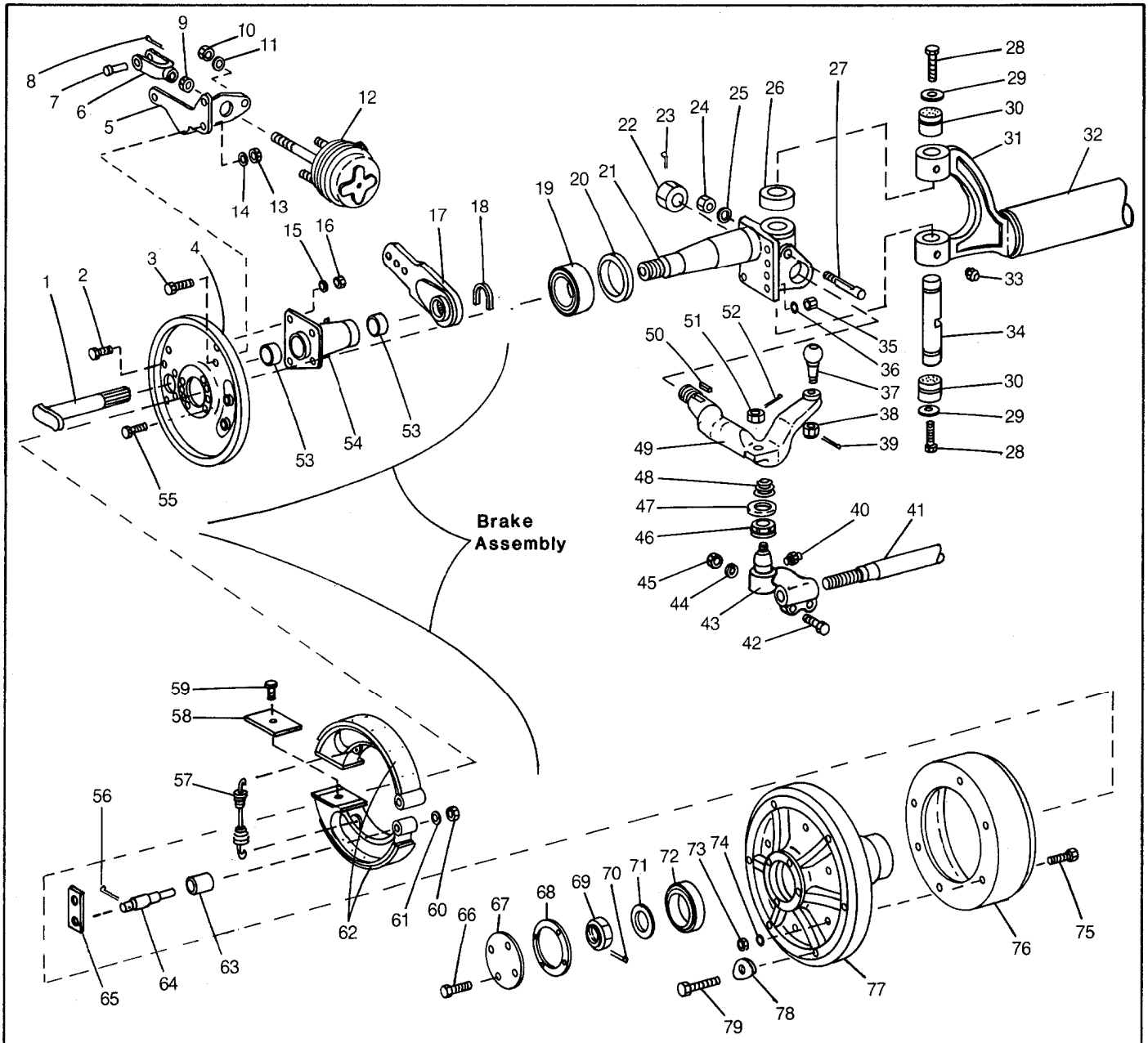

Fig. 1 NA388-B
Front Axle Disassembly

(1) Camshaft	(17) Slack Adjuster	(33) Grease Zerk	(49) Steering Arm	(65) Plate
(2) Capscrew	(18) Lock	(34) Knuckle Pin	(50) Key	(66) Capscrew
(3) Capscrew	(19) Bearing	(35) Nut	(51) Nut	(67) Hub Cap
(4) Backing Plate	(20) Grease Retainer	(36) Lockwasher	(52) Cotter Pin	(68) Gasket
(5) Bracket	(21) Steering Knuckle	(37) Ball Stud	(53) Bushing	(69) Nut
(6) Yoke	(22) Nut	(38) Nut	(54) Bracket	(70) Cotter Pin
(7) Clevis Pin	(23) Cotter Pin	(39) Cotter Pin	(55) Capscrew	(71) Spindle Washer
(8) Cotter Pin	(24) Nut	(40) Grease Zerk	(56) Cotter Pin	(72) Bearing
(9) Nut	(25) Lockwasher	(41) Cross Rod	(57) Spring	(73) Nut
(10) Nut	(26) Thrust Bearing	(42) Capscrew	(58) Wear Plate	(74) Lockwasher
(11) Lockwasher	(27) Draw Key	(43) Cross Rod End	(59) Screw	(75) Capscrew
(12) Brake Actuator	(28) Capscrew	(44) Lockwasher	(60) Nut	(76) Brake Drum
(13) Nut	(29) Dust Plug	(45) Nut	(61) Lockwasher	(77) Wheel Hub
(14) Lockwasher	(30) Bushing	(46) Washers	(62) Brake Shoe Assy.	(78) Rim Clamp
(15) Washer	(31) Axle Yoke	(47) Cover	(63) Bushing	(79) Stud & Nut
(16) Nut	(32) Axle Tube	(48) Spring	(64) Anchor Pin	

5.1 Disassembly

(a) Jack up the front end of vehicle so tires clear floor (use outrigger jacks). Block up securely at this position. Remove wheel and tire assembly (Refer to SM1-69-2.0).

WARNING

Do Not Attempt To Disassemble Or Perform Knuckle Pin Repair With Vehicle Supported By Jacks Only.

(b) Remove hub cap (67), gasket (68), cotter pin (70), nut (69) and spindle washer (71).
(c) Remove outer bearing (72).
(d) Remove wheel hub assembly (77).
(e) Remove brake actuator (12) from bracket (5).
(f) Remove brake assembly from steering knuckle (21) by removing capscrews (55).
(g) Remove cotter pin (52) and nut (51) to disassemble cross rod assembly from the steering arm (49). Remove cross rod end (43) from steering arm with a devils fork and hammer.
(h) Remove cotter pin (23), nut (24) and steering arm (49) from steering knuckle (21).

Note: It is not necessary to remove steering arm unless it requires service.

(i) Remove dust plug capscrews (28) and dust plug (29).
(j) Remove nut (24). Tap draw key (27) out by use of brass hammer on threaded end.
(k) Tap out knuckle pin (34) with a bronze drift.

Note: Do not strike the hardened steel knuckle pin directly with a steel hammer.

(l) Remove steering knuckle (21) and thrust bearing (26).

5.2 Bushing Replacement

(a) Remove axle assembly (refer to SM1-4-1.0 for axle removal) and use a press to remove and replace bushings (30).
(b) Install axle assembly.

5.3 Assembly

(a) Make sure knuckle pin holes in axle yoke (31) are clean and dry.
(b) Position and support steering knuckle (21) in axle yoke (31).
(c) Slide thrust bearing (26) between upper face of the steering knuckle (21) and axle yoke (31).
(d) Align steering knuckle hole and thrust bearing hole with axle yoke holes.
(e) Align knuckle pin "flat" to mate with draw key hole, and tap knuckle pin (34) through axle yoke (31), thrust bearing (26) and steering knuckle (21) from the top or bottom side.
(f) Install draw key (27) so the "flat" on the key mates with corresponding "flat" on knuckle pin.

Note: Before setting draw key, center knuckle pin to equalize gap between upper and lower gap mounting surfaces.

(g) Install lockwasher (25) and nut (24).
(h) Install dust plugs (29) and capscrews (28).
(i) Install steering arm (49) into steering knuckle (21), connect key (50) and tighten nut (22). Position cotter pin (23). Install cross rod assembly, tighten nut (51) and position cotter pin (52).
(j) Install brake assembly, brake actuator (refer to SM1-3-4.0 for brake service). Pack bearings (19, 72) with grease. Install bearing (19) and grease retainer (20) in wheel hub (77). Install hub on spindle.
(k) Install bearing (72), spindle washer (71), nut (69) and adjust. (Refer to SM1-2-3.0).
(l) Install gasket (68) and hub cap (67). Install wheel and tire assembly. See SM1-69-2.0.

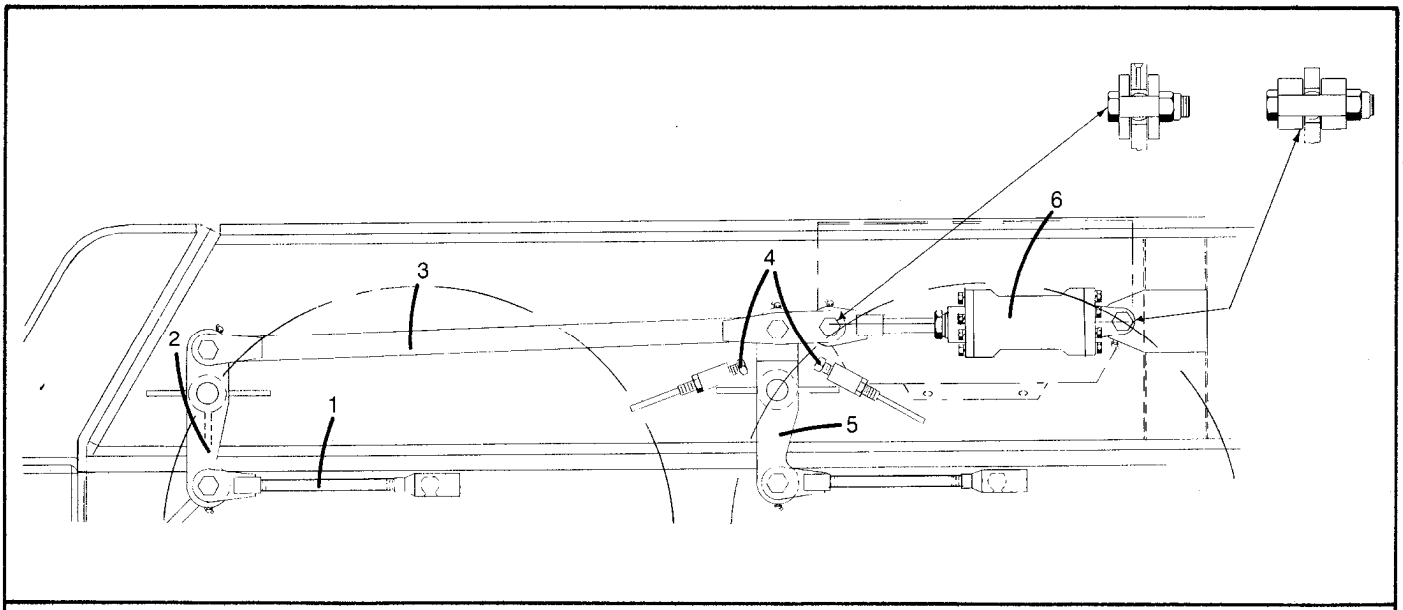

Fig. 1 A109-D
Steering Linkage
(1) Drag Link
(2) Front Wheel Steer Arm
(3) Steering Rod
(4) Stop Bolts
(5) Rear Wheel Steer Arm
(6) Steering Cylinder

Front Axles

The tandem front axles are mounted to the carrier by means of two equalizing beams - one on each side. The equalizing beams serve two purposes: they reduce each bump or road irregularity and they distribute the load between the two axles. Shock loadings can transfer from one axle to the other.

The front axles are each supported by four torque rods - two on each side. These rods resists the tendencies of the axles to twist forward or backward due to starting or stopping inertia.

The machine is steered hydraulically, from the upper, by Speed-o-Matic pressure. The operation is controlled by a lever on a valve, mounted to the right of the operator below the control panel. Oil is directed through the rotating joint by the steer valve. The oil enters the steering cylinder, and starts to move the piston within it. Oil returning from the other side of the steer cylinder piston is directed back up the rotating joint, through the steer valve, and to the sump tank.

To turn the machine in the opposite direction, reverse the position of the control lever in the upper cab. Oil now flows into the other end of the cylinder. Again, the oil on the other side of the piston is returned through the rotating joint and the steer valve, to the sump tank.

The wheels will not return to center automatically. If the steer valve is returned to the neutral position, the wheels will remain in whatever position they were in, when the steer valve was returned to neutral.

The steer cylinder piston rod puts force on a steer rod that is tied to two steering arms. One of these arms actuates the front front axle and the other actuates the rear front axle. There is a drag link running from each steering arm to the axle that it actuates. These drag links are adjustable for wheel alignment purposes.

Resistance Valve: A resistance valve is incorporated in the Speed-o-Matic system on self propelled, rubber tire mounted machines. Speed-o-Matic oil cannot flow through this valve to the steering and parking brake controls (machines with hydraulic brakes), until 775 PSI (5344 kPa) of pressure is build up in the Speed-o-Matic system. This valve has three main functions.

(a) The parking brake cannot be released, and the steering controls will not operate, until the Speed-o-Matic pressure is built up. This is necessary because the machine is steered hydraulically, and at least 775 PsI (5344 kPa) pressure is needed to effectively steer the machine.
(b) If the steering lines should break during a steering operation, the S-o-M system pressure will drop and when it reduces to 775 PSI (5344 kPa), the parking brake will automatically apply and the resistance valve will close and stop the flow of oil to the lower hydraulic system, maintaining operating pressure in the machine upper.
(c) During normal travel, with the parking brakes released, the resistance valve will automatically close if a combination of steering and upper S-o-M controls are operated at the same time to effectively

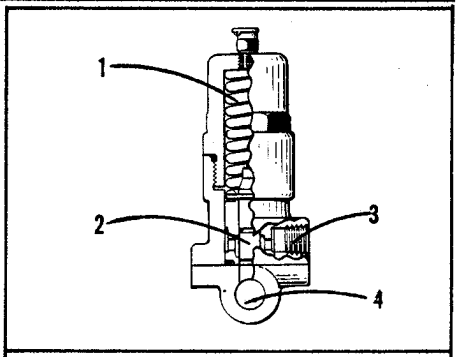

Fig. 2
Resistance Valve

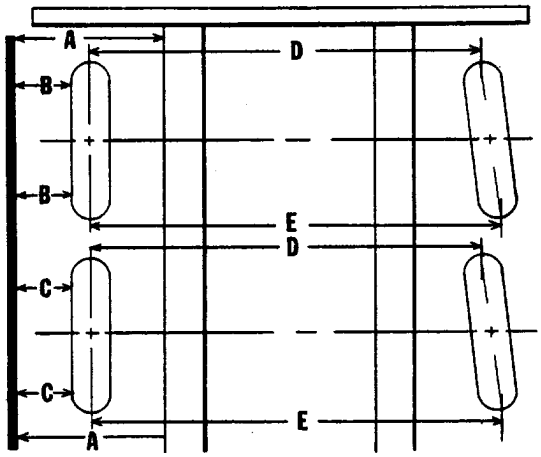

Fig. 3 LA234-A
Front Wheel Alignment

lower the system pressure below 775 PSI (5344 kPa) and thus lock this pressure in the parking brake system to effectively hold the parking brake released and prevent a sudden application of the parking brakes which would result in a sudden, abusive stopping of the machine.

On machine with air brakes, a pressure switch is included in the S-o-M system. The park/emergency brakes won't release until S-o-M pressure is built up to 775 PSI (5344 kPa). At this point the pressure switch actuates a solenoid valve which disengages the brakes.

If S-o-M pressure is lost, contacts in the pressure switch open, deenergizing the solenoid valve. The valve dumps air from the rear brake actuators allowing springs within the actuators to apply the rear wheel brakes.

Front Wheel Alignment: To obtain maximum tire life, the front wheels must be kept in proper alignment. Front wheel alignment should be checked periodically, and corrected if necessary. This is more critical on a tandem axle machine than on a single axle machine. If the wheels are not properly aligned, the tires will "fight" each other, causing abnormal tire wear. This is caused by one set of tires pointing in a slightly different direction than the other set of tires. To correct, or check front wheel alignment the following procedure Should be followed: (See Fig. 3.)

(a) Jack up the carrier until all four wheels clear the ground. Block the machine in this position.
(b) Operate the steering until the two left wheels are in line with each other, and straight ahead with respect to the carrier frame. This may be checked as illustrated in Fig. 3. Place a straight edge next to the wheels. Make sure it is parallel to the frame by measuring at (A). When the straight edge is in position, measure from it, to the milled area where the tire lugs are located. This is indicated by (B) and (C) in Fig. 3. When the wheels are in line with each other, (B) should equal (B), and (C) should equal (C), but (B) does not have to equal (C). A drag link adjustment may be necessary to correct any misalignment.
(c) Once the front left tires are in alignement the toe-in must be checked. Toe-in may be checked by scribing a chalk link around the circumference of each wheel, at the center of thread. The different between the distance (D) on the front of the tire, and (E) on the back of the tire indicates the amount of toe-in. The measurement of (D) Should be 1/8" ± 1/32" (3.175mm) less than the measurement at (E). This may be changed by adjusting the length of the tie rod.
(d) The front wheels must be checked for interference with the lower frame when turned to their extreme position in either direction. Adjust stop bolts to limit wheel movement.

Wheel Bearing Adjustment: Wheel bearing adjustment should be checked occasionally. The rollers and races must be in proper contact to assure maximum bearing life. The wheel bearings can be adjusted in the following manner:
(a) Jack up one end of the axle till the wheel clears the ground.

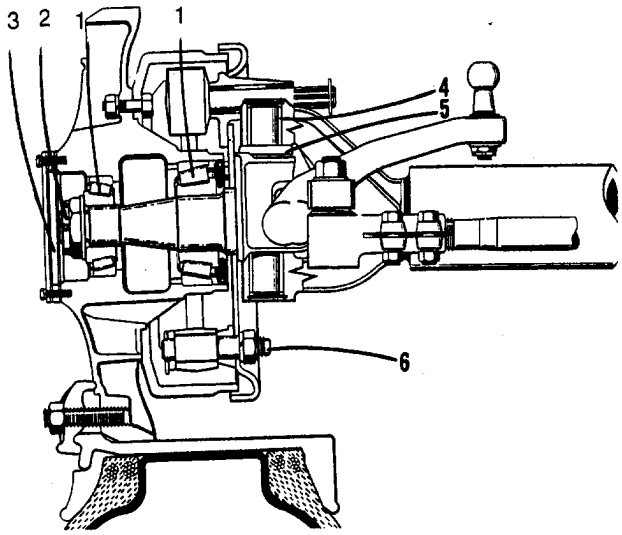

Fig. 4 A164-C
Front Axle Assembly
(1) Bearings
(2) Nut
(3) Hub Cap
(4) Bushing
(5) Thrust Bearing
(6) Anchor Pin

(b) Remove the hub cap, and wipe excess grease from end of spindle.
(c) Remove cotter pins from end of spindle.
(d) Tighten the adjusting nut, while rotating the wheel back and forth, until a slight bind is felt.
(e) Back off the adjusting nut to the nearest locking hole, or enough to allow the wheel to rotate with .001" to .010" (.025 to .25mm) end play.
(f) Replace the cotter pin.
(g) Replace the hub cap.

Wheel Bearing Repacking

At the interval specified in Section 2 of the Operator's Manual the wheel bearings must be removed, cleaned with kerosene, diesel fuel, or some similar approved solvent, repacked with grease, and adjusted as explained earlier in this SM. Use only wheel bearing grease that meets or exceeds the specifications listed in Section 2 of the Operator's Manual. Pack the cap, and the hub between the the two bearing cups with grease to the level of the cups smallest diameter. The seal which retains grease in the inner bearing should be examined, and replaced if worn or damaged.

The tapered roller bearings, whenever removed from the axle, should be handled with great care and kept free from dirt or water. When reassembling, caution should be used to prevent any foreign material from allowing metal to metal contact between the roller bearing cups and cones, the spindles on which they ride, and the shoulders against which they are intended to fit.

Wheel Torque Procedure: See SM1-69-2.0.

Single Diaphragm Actuator

Air under pressure is admitted to port (3) when the foot brake pedal is depressed. The air pressure pushes on the diaphragm (5) and push rod assembly (10) to apply the brakes. When air is released from the actuator, the brake spring and spring (7) disengage the brake and return the diaphragm and piston assembly to their disengaged position.

Actuator Disassembly:

(a) Block the wheel of the carrier so it cannot move.
(b) Disconnect the air line leading to the actuator.
(c) Remove the pin which connects the yoke (11) to the brake slack adjuster.
(d) Remove mounting nuts, and remove actuator from the axle.
(e) Pull out the push rod and clamp it at the non-pressure plate with a vise or vise grips. Cover or tape the vise or vise grip jaws to prevent damage to the push rod.
(f) Remove the clamp ring nuts and bolts.
(g) Spread the clamp ring slightly with a screw driver and remove.
(h) Remove the pressure plate and diaphragm.
(i) Remove the yoke and locknut from the push rod.
(j) Release the grip on the push rod.
(k) Remove the push rod assembly and spring.
(l) Thoroughly clean and inspect all parts. Replace any worn parts. When the diaphragm or spring, or both are replaced, they should be replaced in the other brake chamber on the same axle.

Actuator Assembly:

(a) Install push rod assembly and spring. Compress spring, and clamp the push rod in a vise.
(b) Install diaphragm over push rod assembly. Install pressure plate over diaphragm.
(c) Spread clamp ring and install on actuator. Install and tighten nuts and bolts (2).
(d) Remove assembly from vise. Install locknut (12) and yoke (11).
(e) Install actuator on axle. Connect yoke to slack adjuster.
(f) Connect air line to actuator.

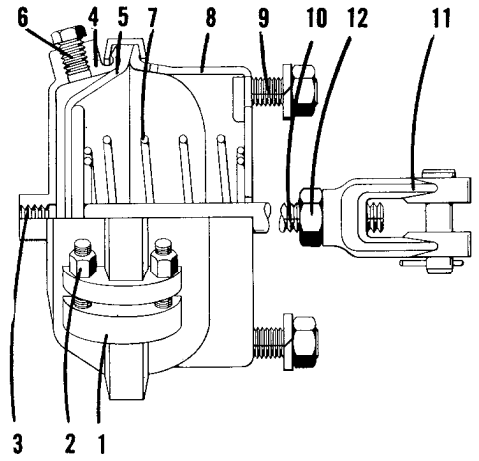

Fig. 1
Single Diaphragm Actuator

(1) Clamp Ring	(7) Spring
(2) Nuts And Bolts	(8) Non-Pressure Plate
(3) Inlet Port	(9) Mounting Bolts
(4) Pressure Plate	(10) Push Rod Assembly
(5) Diaphragm	(11) Yoke
(6) Inlet Port	(12) Locknut

(g) Adjust brakes as explained in SM Area 1-3.

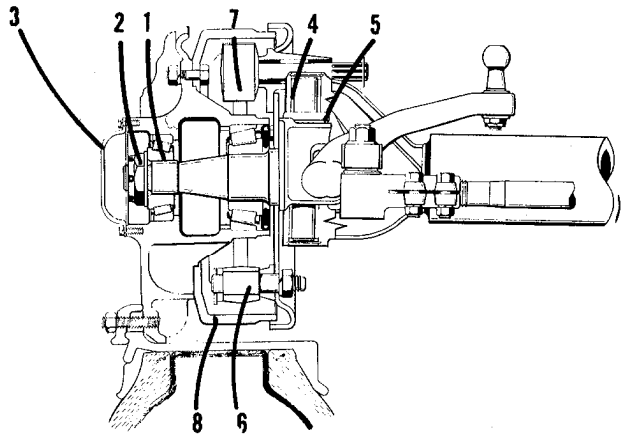

Fig. 1
Front Axle Assembly
(1) Bearings
(2) Adjusting Nut
(3) Hub Cap
(4) Bushing
(5) Thrust Bearing
(6) Anchor Pin
(7) Slack Adjuster

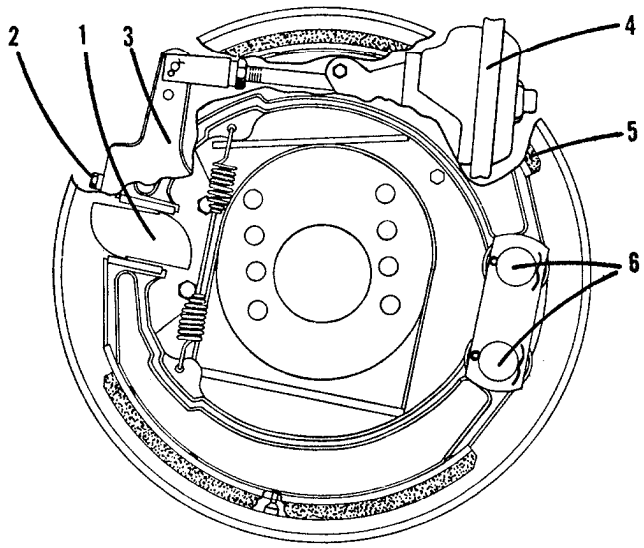

Fig. 2
Brake Assembly
(1) Brake Cam
(2) Adjusting Screw
(3) Slack Adjuster
(4) Brake Actuator
(5) Brake Shoe
(6) Anchor Pin

Front Wheel Brakes

The front wheel brakes are of the two shoe eccentric anchor pin design. They require no major adjustment after initial setting and "break in" of new lining. The taking up of wear is by means of the slack adjusters (Fig. 2) throughout the life of the lining. After the initial setting and "break in" of the lining, the eccentric adjustment is not changed. Changing the eccentric adjustment during the life of the lining will create an out of round condition resulting in uneven and short lining life, poor braking, unusually high temperatures, and heat cracked drums.

As is the case of any brake, worn linings must be replaced before the heads of the lining rivets start to rub and score the brake drums. When relining, brake drums should be checked for scoring or heat cracking. Wear plates, anchor pins, bushings, and springs must be cleaned and examined for replacement if necessary.

Adjustment: After the brakes have been relined, the following initial adjustment is required.
(a) Jack up front wheels.
(b) Adjust slack adjuster until toe of shoes contacts brake drum and prevents wheel from turning.
(c) Release the slack adjuster just enough to free the wheel.
(d) Expand each anchor pin in the same manner, releasing each of them just enough to allow the wheel to turn freely.
(e) Continue this procedure a second and third time, if necessary, to obtain the best possible brake adjustment. After relining there are always high spots which must be eliminated before there is full and perfect contact between the lining and the drum. Maximum brakes are not obtained until these high spots are worn off. These high spots can be removed while the vehicle is in use by careful, gradual braking. Excessive braking during this break in period may start drum trouble. Each application of the brake increases the contacting surface until full contact between lining and drum is obtained. At this point, any additional adjusting of the brake is to be done with the slack adjusters only.

Front Brake Removal: The front wheel brakes may be removed from the machine for inspection or repair as follows:
(a) Jack up the machine until the front wheel clears the ground.
(b) Unbolt and remove the hub cap from the wheel. (See Fig. 1).
(c) Remove the cotter pin,