

SHOP MANUAL

CASE/INTERNATIONAL

MODELS

1896-2096

IDENTIFICATION

Tractor model number and identification serial number are located on a plate on right fender of tractors not equipped with a cab, or on a plate on upper right of cab interior on tractors so equipped. Cab serial number is located on a plate on upper right of cab interior. Engine serial number is located on a plate on left side of timing gear housing. Transmission serial number is on left side of transmission housing. On models so equipped, front-wheel drive serial number is located on a plate on rear of front drive axle housing.

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DUAL DIMENSIONS

This service manual provides specifications in both the U.S. Customary and Metric (SI) system of measurements. The first specification is given in the measuring system used during manufacture, while the second specifications (given in parenthesis) is the converted measurement. For instance, a specification of "0.011 inch (0.279 mm)" would indicate that the equipment was manufactured using the U.S. system of measurement and the metric equivalent of 0.011 inch is 0.279 mm.

CONDENSED SERVICE DATA

	Models	
	1896	2096
GENERAL		
Engine Make	Consolidated	Diesel
Engine Model	6T-590	6TA-590
Cylinders, No. of	6	6
Bore	4.016 in. (102 mm)	4.016 in. (102 mm)
Stroke	4.724 in. (120 mm)	4.724 in. (120 mm)
Displacement	359 cu. in. (5.9 L)	359 cu. in. (5.9 L)
Compression Ratio	17.5:1	17:1
Main Bearings, No. of	7	7
Cylinder Sleeves	None	None
Forward Speeds	12	12
TUNE-UP		
Firing Order	1-5-3-6-2-4	
Valve Tappet Gap, Cold—		
Intake	0.010 in. (0.254 mm)	0.010 in. (0.254 mm)
Exhaust	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)
Injection Pump—		
Make	Robert Bosch	
Model	VE	
Timing	TDC	
Injection Nozzles—		
Make	Robert Bosch 117 mm	
Opening Pressure,		
New	3550-3670 psi (24476-25303 kPa)	3190-3310 psi (21994-22821 kPa)
Used	3200-3625 psi (22063-24994 kPa)	3120-3260 psi (21511-22476 kPa)
Turbocharger—		
Make	Holset	
Engine Governed Speeds (Rpm)—		
Low Idle	750-850	
High Idle	2210-2290	
Rated Load	2100	
Battery Terminal Grounded	Negative	
CAPACITIES		
Cooling System	22 U.S. qts. (20.8 L)	
Crankcase (w/filters)	16 U.S. qts. (15.1 L)	
Transmission & Hydraulic System	100 U.S. qts. (94.6 L)	
Oil Type	Hy-Tran Plus	

CONDENSED SERVICE DATA (CONT.)

	Models	
	1896	2096
CAPACITIES (Cont.)		
Fuel Tank	65 U.S. gal.	
	(246 L)	
Front Drive Axle—		
Differential (Axle) Housing	9 U.S. qts.	
	(8.5 L)	
Oil Type	85/140 EP	
Planetary (Each Side)	1.5 U.S. qts.	
	(1.4 L)	
Oil Type	85/140 EP	

FRONT AXLE (TWO WHEEL DRIVE)

FRONT WHEEL BEARINGS

All Models

1. Refer to Fig. 1 for typical wheel hub and bearing assembly.

The tapered inner and outer roller bearings are not interchangeable. Clean and inspect bearing cups and cones and renew as necessary. Install inner seal (10) with lip facing spindle flange. Install outer seal (9) with lip facing away from bearing (8). Fill hub cavity and pack bearings with No. 2 lithium grease. Coat surface of seal lips with grease.

When adjusting wheel bearings, tighten nut (2) until drag on hub is felt, then back nut off ¼ turn or until next pin hole lines up. Bearings should have zero end play. Install cotter pin.

SPINDLES

All Models

2. **R&R SPINDLES.** To remove spindle, lift and support front of tractor and remove wheel. Disconnect tie rod ball joint from steering arm (3—Fig. 2). Remove bolt (1) and washer (2) from arm (3). Note index punch marks on arm and shaft indicating location of tapered splines for left or right steering arm, then remove steering arm. Support spindle and remove snap ring (4) and washer (5), then remove spindle (8) from axle extension (7).

3. **SPINDLE BUSHINGS.** With spindles removed, spindle bushings (6—Fig. 2) can be removed using a suitable drift punch. New bushings are presized and should not require reaming if carefully installed.

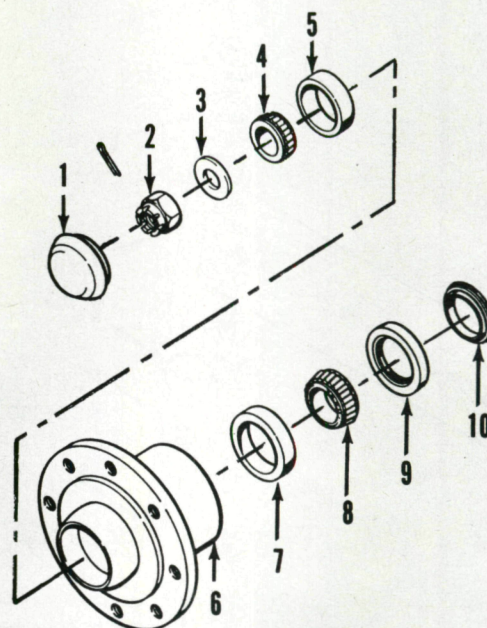


Fig. 1—Exploded view of wheel hub and bearing assembly used on all two-wheel drive tractors.

- | | |
|-----------------|------------------|
| 1. Cap | 6. Hub |
| 2. Nut | 7. Bearing cup |
| 3. Washer | 8. Bearing cone |
| 4. Bearing cone | 9. Seal (outer) |
| 5. Bearing cup | 10. Seal (inner) |

Paragraphs 4-5

Press new bushings into axle ends until bushing flange seats against surface of axle ends.

Assemble by reversing disassembly procedure making sure punch marks on shaft and steering arm align. Tighten bolt (1) to 200-250 ft.-lbs. (271-339 N·m) torque. Lubricate through grease fitting with No. 2 lithium grease. Tighten tie rod slotted nut to 100-125 ft.-lbs. (136-168 N·m) torque and install new cotter pin.

4. TIE RODS AND TOE-IN. Disassembly of tie rod assembly is obvious after examination of unit and reference to Fig. 3. However, upon reassembly make sure clamp bolts (5) are installed in same number hole as axle extension.

Tighten tie rod slotted nuts to a torque of 100-125 ft.-lbs. (136-169 N·m). Install new cotter pins. Tighten clamp bolt (5) nuts to a torque of 45-54 ft.-lbs. (61-73 N·m).

Front wheel toe-in must be 1/8-1/2 inch (3.1-12.7 mm). To adjust toe-in, remove clamp bolt (5) from left

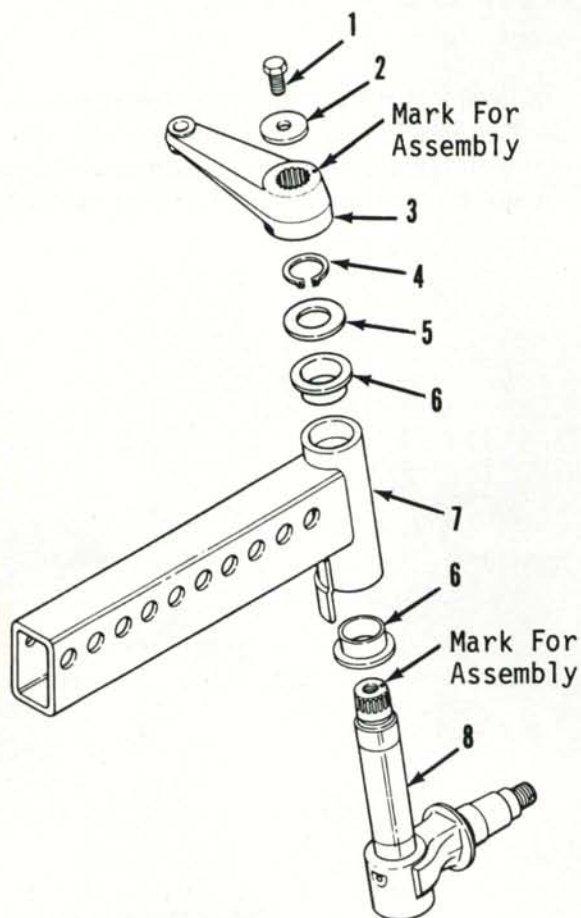


Fig. 2—Exploded view of steering spindle used on all two-wheel drive tractors. Note assembly marks.

- | | |
|-----------------|-------------------|
| 1. Cap screw | 5. Washer |
| 2. Washer | 6. Bushings |
| 3. Steering arm | 7. Axle extension |
| 4. Snap ring | 8. Spindle |

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tie rod extension. Loosen jam nut (8), then turn extension (9) in or out until desired toe-in is obtained. Install clamp bolt (5) and tighten nut to a torque of 45-54 ft.-lbs. (61-73 N·m). Tighten jam nut (8) against tie rod extension (9).

AXLE MAIN MEMBER AND PIVOT PIN

All Models

5. To remove axle main member, first raise and support tractor under engine side rails with suitable jack stands. Disconnect tie rods from steering arms, then refer to Fig. 3 and disconnect power steering cylinder (10) from axle main member and tie rod lug. Secure steering cylinder up and out of the way. Be careful not to damage hydraulic lines to cylinder.

Refer to Fig. 4 and remove bolt (3), washer and spacer. Remove front grease fitting and install a slide hammer to pivot shaft (2). Support axle main member with a rolling floor jack, then pull pivot shaft out front of front support (1). Catch thrust washers (4 and 5) as shaft is removed. Lower axle main member enough to clear front support and roll forward from tractor.

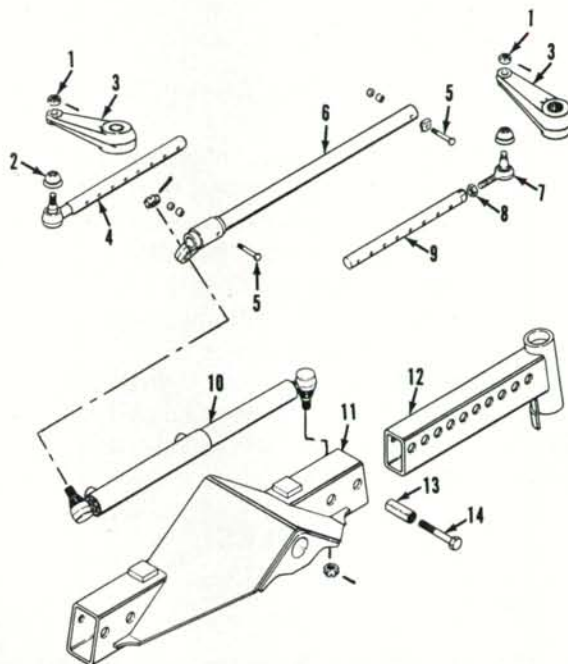


Fig. 3—Exploded view of steering tie rod, cylinder, arms and related parts used on two-wheel drive tractors.

- | | |
|---------------------------|---------------------------|
| 1. Slotted nuts | 9. Tie rod extension L.H. |
| 2. Dust covers | 10. Steering cylinder |
| 3. Steering arms | 11. Axle main member |
| 4. Tie rod extension R.H. | 12. Axle extension |
| 5. Clamp bolts | 13. Spacer |
| 6. Tie rod tube | 14. Locator bolt |
| 7. Tie rod end | |
| 8. Jam nut | |

Bushings (6) can now be removed using a suitable drift punch. Drive new bushings into bore of axle main member until flush to 1/16 inch (1.6 mm) below outer surface.

When reassembling, coat pivot shaft and bushings with antiseize compound. Install steel washer (4), nylon washer (5), then second steel washer (4) at front and rear of axle main member. When axle main member and pivot shaft are installed, install and tighten spacer, washer and bolt (3) to a torque of 93-112 ft.-lbs. (126-152 N·m).

If axle extensions (12—Fig. 3) have been removed, reinstall and insert spacers (13—Fig. 4) and locator bolts (14). Install and tighten nuts (15) to a torque of 400-480 ft.-lbs. (542-651 N·m).

FRONT SUPPORT

All Models

6. To remove front support (1—Fig. 4), first disconnect headlight wiring, then remove grille, hood and side panels. Drain coolant from radiator and disconnect upper and lower radiator hoses. Disconnect air intake tube, oil cooler lines and air conditioner lines at quick couplers. Attach a hoist to the radiator, condenser and oil cooler assembly support brackets, remove two rear bolts and three front bolts, then lift off the assembly. Remove front axle assembly as out-

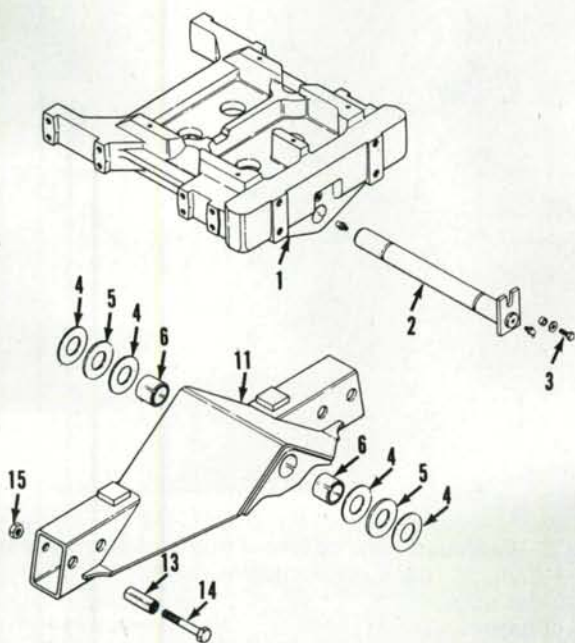


Fig. 4—Exploded view of front axle and support used on two-wheel drive models.

- | | |
|------------------|----------------------|
| 1. Front support | 11. Axle main member |
| 2. Pivot shaft | 13. Spacer |
| 3. Bolt | 14. Locator bolt |
| 4. Steel washers | 15. Nut |
| 5. Nylon washers | |
| 6. Bushings | |

lined in paragraph 5. Attach a hoist to front support, then unbolt and remove.

Reinstall by reversing removal procedure. Tighten side rail to front support bolts to a torque of 380-450 ft.-lbs. (515-610 N·m). Tighten the five cap screws securing the radiator, condenser and oil cooler support bracket to front support to a torque of 35-42 ft.-lbs. (48-57 N·m).

FRONT DRIVE AXLE

Models 1896 and 2096 tractors are available with a ZF front drive axle.

DRIVE AXLE ASSEMBLY AND SUPPORT

Models So Equipped

7. **REMOVE AND REINSTALL.** To remove the front drive axle assembly, place transmission in PARK and securely block rear wheels. Unbolt and remove drive shaft shield and the front drive shaft assembly. Disconnect steering cylinder lines and cap or plug all openings. Loosen front wheel to hub nuts on both front wheels. Install a side frame jack CAS-10500-1 or front split stand CAS-10749 on each side of tractor. Raise front of tractor until front wheels are off the ground. Remove wheel nuts and using a hoist, remove front wheels. Place a floor jack or special axle carrier CAS-10500-4 under front axle. Remove cap screw (5—Fig. 5), washer (4) and spacer (3). Then, remove pivot shaft (2) and thrust washers (6 and 9). Lower axle (floor jack) or raise tractor (axle carrier) and roll assembly forward from tractor. Inspect bushings (7) and renew as necessary. When installing new bushings, apply a coat of Loctite Anti-Seize to bore in axle housing. Freeze bushings in dry ice and carefully install flush to 1/16 inch (1.6 mm) below the face of axle housing.

To remove front support (1—Fig. 5), disconnect headlight wires, then remove grille, hood and side panels. Drain cooling system, then disconnect upper and lower radiator hoses. Disconnect air intake tube, oil cooler lines and air conditioner lines at quick couplers. Attach a hoist to the radiator, condenser and oil cooler assembly support brackets, remove two rear bolts and three front bolts, then lift off the assembly. Attach a hoist to the front support, then unbolt and remove.

Reinstall by reversing removal procedure. Tighten side rail to front support bolts to a torque of 380-450 ft.-lbs. (515-610 N·m). Tighten the five cap screws securing the radiator, condenser and oil cooler support bracket to front support to a torque of 35-42 ft.-lbs. (48-57 N·m).

Inspect thrust washers (6 and 9) for excessive wear and renew as necessary. Reinstall axle assembly to

front support. Make sure nylon thrust washer (9) is installed between steel thrust washers (6). Use as many additional steel washers as possible at rear side of axle housing (8) to shim axle housing forward. Secure pivot shaft (2) in place with spacer (3), washer (4) and cap screw (5), tightened to a torque of 93-112 ft.-lbs. (126-152 N·m). Connect steering cylinder lines and reinstall drive shaft. Tighten drive shaft bolts and nuts to a torque of 45-54 ft.-lbs. (61-73 N·m). Install drive shaft shield. Install front wheels and remove jacks. Tighten front wheel to hub nuts to a torque of 115-130 ft.-lbs. (156-176 N·m).

WHEEL HUB AND PLANETARY

Models So Equipped

8. R&R AND OVERHAUL. To remove the wheel hub and planetary, support axle housing and remove wheel and tire assembly. Rotate wheel hub until drain plug (9—Fig. 6) is at bottom, remove plug and drain oil. Remove the two socket head screws (8), then remove planetary carrier (10). Unbolt and re-

move lockplate (2). Using a spanner wrench CAS-1762 or equivalent, remove slotted nut (1). Remove ring gear (3), outer bearing cone (5), hub (6) and inner bearing cone (7). If necessary, remove bearing cups (5 and 7), oil seal (1—Fig. 7) and dust seal (2) from hub. Sun gear (17—Fig. 6) is secured to axle shaft "U" joint (11—Fig. 7) with a snap ring (10). If necessary to remove sun gear, remove pivot housing (5) as outlined in paragraph 9.

To remove planetary gears (12—Fig. 6), remove snap rings (14) and slide gear and bearing assemblies from carrier (10). Remove tapered retaining ring (11) and slide bearing (13) from gear (12). Repeat operation for other two gears. Remove thrust washer (15) from center of carrier.

Clean and inspect all parts and renew any showing excessive wear or other damage. Remove snap ring (16) and check condition of splined thrust washer (18) and thrust washer (19). Renew as necessary and reassemble on sun gear. Reinstall bearings (13) in planetary gears (12) and install retaining ring (11) with wide side of ring toward bearing. Install gear assemblies and secure with snap rings (14).

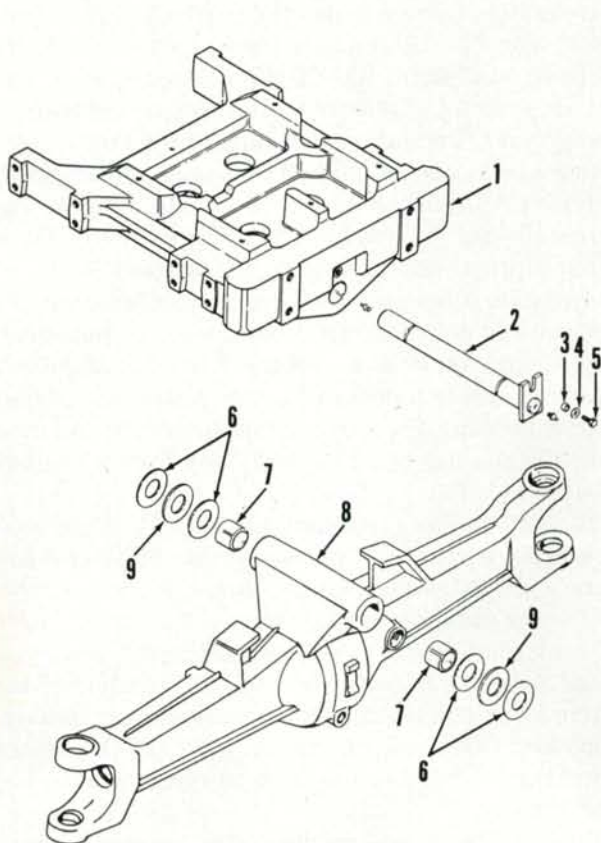


Fig. 5—Front support and axle housing used on models equipped with front drive axle.

- | | |
|---------------------------|---------------------------|
| 1. Front support | 7. Bushings |
| 2. Pivot shaft | 8. Axle housing |
| 3. Spacer | 9. Thrust washers (nylon) |
| 4. Washer | |
| 5. Cap screw | |
| 6. Thrust washers (steel) | |

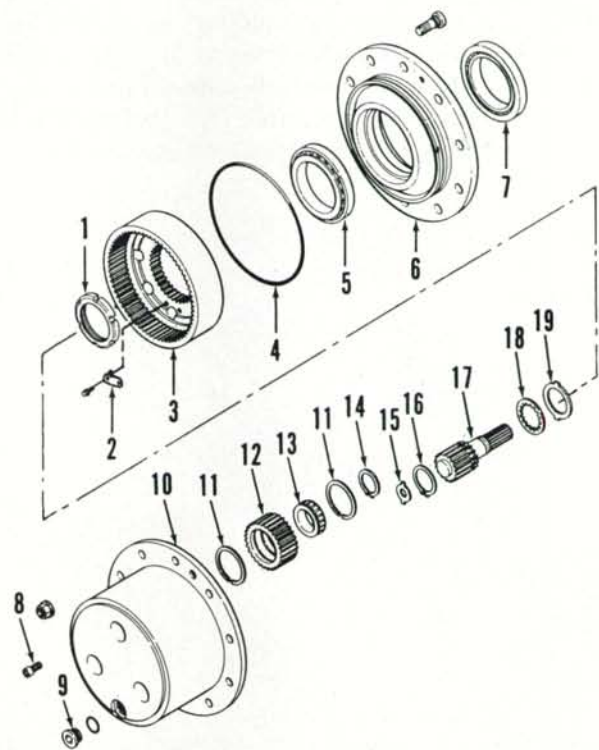


Fig. 6—Exploded view of wheel hub and planetary unit used on front drive axle.

- | | |
|-------------------------------|---------------------------|
| 1. Slotted nut | 9. Drain plug |
| 2. Lockplate | 10. Planetary carrier |
| 3. Ring gear | 11. Retaining rings |
| 4. "O" ring | 12. Planetary gear |
| 5. Bearing cup & cone (outer) | 13. Roller bearing |
| 6. Hub | 14. Snap ring |
| 7. Bearing cup & cone (inner) | 15. Thrust washer |
| 8. Socket head screw | 16. Snap ring |
| | 17. Sun gear & shaft |
| | 18. Splined thrust washer |
| | 19. Thrust washer |

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