



Allis Chalmers

Service Manual

**HD6A, HD6AG,
HD6B, HD6E, HD6EP**
Volume 1 of 2

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AC-S-HD6A+

Service Manual

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There is a certain amount of fuel seepage between the lapped surfaces of each fuel injection nozzle valve and its body, which is necessary for lubrication. This leakage of fuel accumulates around the spindle and in the spring compartment of each fuel

injection nozzle-holder and is returned through the fuel return manifold to the fuel return line. The excess fuel delivered to the fuel injection pump by the fuel transfer pump flows to the filter head and returns to the fuel tank.

TOPIC 2 - CHECKING OF FUEL SYSTEM

A. GENERAL

"Missing" or uneven running of the engine, excessive vibration, stalling when idling, and loss of power are indications of insufficient fuel supply to the engine. Before performing any of the following checks, make certain there is an ample supply of clean fuel in the fuel tank and that the fuel tank shut-off valve (if so equipped) is open.

B. AIR IN SYSTEM (FIG. 3)

Loosen the vent screw (5) in top of second stage fuel filter retaining nut. Crank engine with starter. If fuel containing bubbles flows from around the vent screw, air being drawn into the system on the suction side of the fuel transfer pump is indicated. Correct this condition by tightening any loose low pressure fuel line connections, first stage fuel filter connections, and the first stage fuel filter shell retaining nut (3).

C. CLOGGED FUEL FILTERS OR COLLAPSED FUEL LINES (FIG. 3)

Loosen the vent screw (5) in top of second stage fuel filter shell retaining nut (2). Crank engine with starter. If a full flow of fuel is not obtained from around the loosened vent screw, a clogged or collapsed fuel line or a clogged first stage fuel filter element, Fig. 4 (6), is indicated. If this condition exists, remove and replace first stage fuel filter element or clean or replace the necessary fuel line.

D. INOPERATIVE FUEL PRESSURE RELIEF VALVE OR FUEL TRANSFER PUMP (FIG. 2)

The fuel transfer pump (13) should deliver more fuel to the fuel sump of the fuel injection pump than is required for engine operation. The fuel pressure relief valve (17) connected into the fuel return passage of the fuel injection pump, controls maximum fuel pressure within the fuel sump of the injection pump. The relief valve is set to open between 8 and 30 psi. When fuel pressure within the fuel sump of the injection pump exceeds relief valve setting, the pressure relief valve opens and allows excess fuel to return to the fuel tank through the fuel filter head (11) and fuel return line.

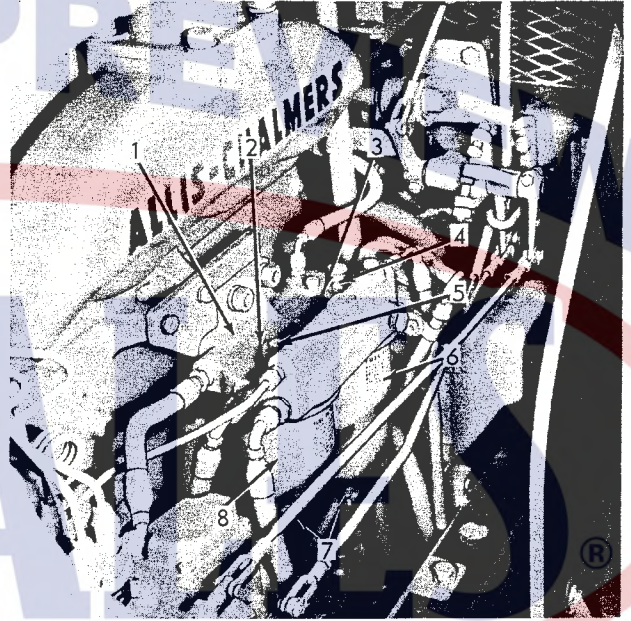


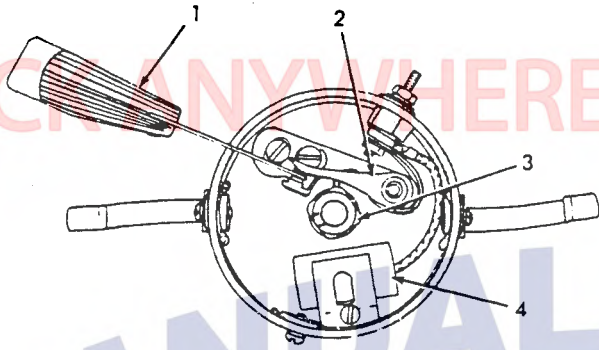
Fig. 3 — Typical Location of First Stage and Second Stage Fuel Filters (T-35382)

1. Fuel Filter Head
2. Second Stage Fuel Filter Shell Retaining Nut
3. First Stage Fuel Filter Shell Retaining Nut
4. First Stage Fuel Filter Vent Screw
5. Second Stage Fuel Filter Vent Screw
6. First Stage Fuel Filter
7. Drain Cocks
8. Second Stage Fuel Filter

Check for an inoperative fuel pressure relief valve (17) or an inoperative fuel transfer pump (13) as follows:

1. Start engine and operate at approximately one-half throttle. Observe the fuel pressure gauge. Gauge should indicate a pressure of 8 to 30 psi. If gauge indicates a pressure below specified minimum, stop engine and disconnect the relief valve-to-filter head return line (10) from the filter head (11).
2. Start engine and operate at approximately one-half throttle. If gauge indicates a pressure below the specified minimum, and a full flow of fuel is observed from disconnected return line, this indicates that the pressure relief valve (17) is stuck in the open position and the

Ignition Circuit



T-73714

FIG. 17 SETTING BREAKER POINT GAP

1. Feeler gauge
2. Breaker point set
3. Cam
4. Condenser

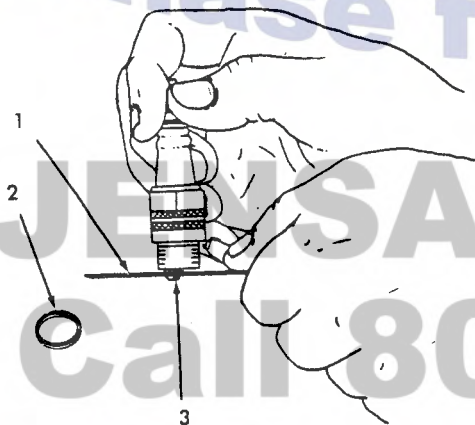
5.3 IGNITION COIL

The ignition coil requires no special service other than to keep the connections to it tight and clean. (The case of the coil should be grounded securely through the mounting bracket.) If the coil is malfunctioning, it should be removed and replaced.

5.4 SPARK PLUGS

5.4.1

Inspection—Visual inspection of the spark plugs is a simple way to judge the condition of the engine. Spark plugs operating normally will show a deposit of medium color and hardness. With the deposit removed, the insulator in the spark plug also should look normal.



(T-73715)

FIG. 18 SETTING SPARK PLUG GAP

1. Wire gauge
2. Washer (copper)
3. Electrode (outer)

5.4.2

Servicing—If inspection reveals any cracks or chips in the spark plug insulator, or if the center electrode is worn within .0938" (2.38 mm) of the end of the insulator, the spark plug should be replaced.

Spark plugs should be cleaned in an apparatus designed for the purpose. Approximately every five hundred hours of operation, the gap between the electrodes should be reset between .028" and .033" (.711 to .838 mm) as shown in Figure 18. The plugs should be reinstalled to 25 lbs.-ft. (3.45 Kg-m) of torque.

5.5 TIMING ADJUSTMENT

5.5.1

Description—Properly adjusted timing assures that the distributor is causing the spark plugs to fire at just the right times in the engine cycle. If the timing is not adjusted properly, and if the engine is capable of running at all, then excess wear of the ignition circuit parts and excess fuel consumption will result.

5.5.2

Adjustment—The following procedure should be used to adjust engine timing.

1. Crank the engine until the Number 1 piston is approaching the top of its compression stroke. This can be determined by observing the cylinder valves. With both valves closed (valve pushrods at bottom of travel), crank the engine by hand until the plain timing mark on the engine flywheel is centered in the timing hole in the flywheel housing. (See Figure 19)

NOTE: There are two timing marks on the flywheel. One is stamped F25 and the other is plain. Do not use the mark stamped F25 at this time.



(T-23050)

FIG. 19 TIMING MARK ON ENGINE FLYWHEEL

1. Timing mark (for No. 1 cylinder)
2. Flywheel
3. Flywheel housing

FR12 ELECTRICAL SYSTEM
(Loader serial no. 59U00101 and up)

NOTE:

1. Circuits are identified by a number, or by a number and letter, contained in a square box. Metal tags bearing the circuit identification number are attached to each wire at all connectors and / or connection points.
2. Components are designated by a number in a circle. The following list identifies each designated component by its name.

LEGEND FOR FIG. 100

- | | |
|--|--|
| 1. †Right front cab floodlight | 35. Flasher unit |
| 2. Right front head light | 36. Turn signal switch |
| 3. Right front side and turn signal/hazard flasher light | 37. Hazard warning switch |
| 4. †Right front side and turn signal/hazard flasher light (Bucket tooth guard) | 38. Light switch |
| 5. †Left front cab floodlight | 39. †Ether starting aid switch |
| 6. Left front head light | 40. Starter solenoid |
| 7. Left front side and turn signal/hazard flasher light | 41. Battery disconnect switch |
| 8. †Left front side and turn signal/hazard flasher light (Bucket tooth guard) | 42. Starter motor |
| 9. †Front windscreen wiper motor | 43. †Ether start assembly |
| 10. Ignition switch | 44. †Thermo guard |
| 11. Panel lights (R.H. Instrument Panel) | 45. Panel light (L.H. Instrument Panel) |
| 12. Voltmeter | 46. †Heater switch |
| 13. Diode assembly | 47. †Heater unit |
| 14. Overstroke sensor switch (2) | 48. Rear windscreen wiper switch |
| 15. †Rear windscreen washer switch | 49. †Rear windscreen wiper motor |
| 16. Hour meter | 50. Turn signal/hazard flasher indicator light |
| 17. Engine oil pressure switch | 51. †Cab floodlight switch |
| 18. Air pressure switch | 52. Brake light switch |
| 19. †Front windscreen washer pump | 53. Excess fuel solenoid |
| 20. †Front windscreen washer switch | 54. Alternator |
| 21. †Dome light | 55. Batteries (2) |
| 22. Neutral safety switch | 56. Alarm switch |
| 23. Relay (2) | 57. Back-up alarm |
| 24. Flow switch | 58. Right rear floodlight |
| 25. Parking brake switch | 59. Right rear turn signal/hazard flasher/tail light |
| 26. Fuse Box | 60. †Registration number plate light |
| 27. 10 amp. fuse | 61. Left rear floodlight |
| 28. †Rear windscreen washer pump | 62. Left rear turn signal/hazard flasher/tail light |
| 29. Parking brake "on" light | 63. Main beam warning light |
| 30. Emergency steering activated light | 64. Flood warning light |
| 31. Buzzer | 65. Fog light switch |
| 32. Brake system fault light | 66. †Rear axle disconnect light |
| 33. Low air pressure light | 67. †Rear axle disconnect switch |
| 34. Front windscreen wiper switch | †Special Equipment |

Study SAFETY RULES in the front of this manual thoroughly for the protection of machine and safety of personnel

3. CLUTCH OIL SEAL REPLACEMENT

NOTE

The following procedure applies to replacement of clutch oil seal for either clutch.

- a. Disassemble clutch and remove clutch hub following procedure in "CLUTCH DISC REPLACEMENT" in this Topic.
- b. Remove capscrews and lockwashers attaching clutch oil seal housing Fig. 37 (3) to cable drum. The housing is provided with 2 tapped holes for puller screws (5); if housing is tight, use capscrews in these holes to free housing.
- c. Using a screw driver, or similar tool, remove clutch oil seal (9) from clutch oil seal housing. Wash and dry the housing.
- d. Start new clutch oil seal into housing and drive or press into position.

NOTE

Make certain seal is installed with sealing lip toward cable drum bearing Fig. 31 (30) when seal housing is installed.

- e. Lubricate seal with clean oil. Install oil seal housing; replace housing gasket if necessary. Secure housing to cable drum with capscrews and lockwashers.
- f. Install clutch hub, Fig. 31 (37) in position on clutch shaft and install clutch hub snap ring (40).
- g. Clean and dry clutch discs thoroughly. Assemble clutch (refer to "CLUTCH DISC REPLACEMENT" in this Topic).

4. DRUM OIL SEAL REPLACEMENT

NOTE

The following procedure applies to replacement of drum oil seal for either cable drum.

- a. Remove brake band assembly (refer to "BRAKE LINING REPLACEMENT" in this Topic). Loosen cable from cable drum.
- b. Disassemble clutch, remove clutch hub, and remove clutch seal housing following procedure in "CLUTCH SEAL REPLACEMENT" in this Topic.
- c. Remove clutch hub inner snap ring, Fig. 37 (4) and retainer capscrews from drum bearing retainer Fig. 38. Remove drum bearing retainer shims. Tie shims to retainer to prevent loss.
- d. Fig. 39, remove cable drum from drum sleeve.

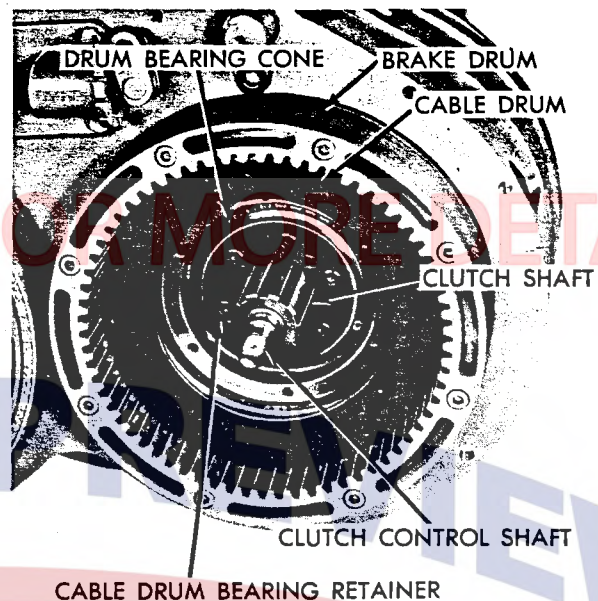


Fig. 38 -- Cable Drum Bearing Retainer - Installed (T-16212)

NOTE

It may be necessary to place a wooden block against cable drum and to strike block with hammer, to force rear bearing cone from drum sleeve.



Fig. 39 -- Removing Cable Drum (T-16213)

- e. Fig. 40, using screw driver, or similar tool, remove drum oil seal from cable drum. Clean counterbore (for oil seal) in cable drum. Also, make certain drum bearing cones and cups are

clean and in good condition; replace bearing cones and cups if necessary.

- f. Start drum oil seal into position in cable drum and drive or press seal into counterbore.

NOTE

Make certain seal is installed with sealing lip towards front bearing cup in cable drum.

- g. Lubricate drum oil seal, Fig. 40, and drum bearing cones with clean oil. Install cable drum in position on drum sleeve, Fig. 39, and install rear bearing cone.
- h. Cable drum bearings are properly adjusted when they have .002" to .003" pre-load. Install drum bearing retainer with original shim pack and tighten retainer capscrews evenly. Turn cable drum by hand and if drum turns freely, remove a shim (or shims) until a slight pre-load is noted when turning cable drum.

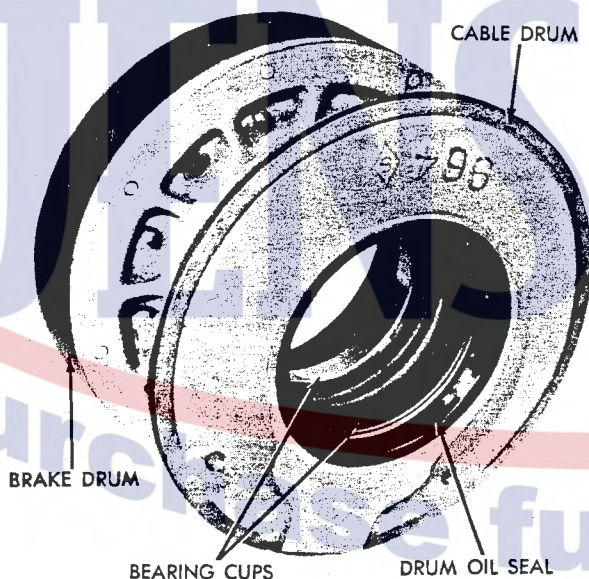


Fig. 40 -- Cable Drum Oil Seal - Installed (T-16217)

NOTE

Strike cable drum with soft hammer when adjusting bearings to make certain bearings are properly seated.

- i. Install clutch seal housing, Fig. 37, replace oil seal and seal housing gasket if necessary. Secure seal housing to cable drum with 6 capscrews and lockwashers.
- j. Install inner snap ring for clutch hub, Fig. 37 (4). Install clutch hub in position on clutch shaft and install clutch hub snap ring, Fig. 34 (4).

- k. Thoroughly clean and dry clutch discs. Assemble clutch (refer to "CLUTCH DISC REPLACEMENT" in this Topic). Install and adjust brake band assembly (refer to "BRAKE LINING REPLACEMENT" in this Topic).

- 1. Adjust clutch (refer to "ADJUSTMENTS" in this Topic).

5. CONTROL SHAFT NUT SEAL REPLACEMENT

- a. Remove clutch lever return spring, Fig. 31.
- b. Remove clutch lever.
- c. Using screw driver or similar tool, pry control shaft nut seal, Fig. 31 (18) from control shaft nut (20).
- d. Thoroughly clean counterbore of control shaft nut (20) and control shaft screw (17) at seal location. Lubricate control shaft screw and sealing lip of new oil seal with clean oil.
- e. Start new seal (18) in position on control shaft screw, making certain sealing lip of seal is toward rear. Press or drive oil seal into position in counterbore of nut.
- f. Install clutch lever in position on clutch control shaft screw; do not tighten lever clamping capscrew at this time.
- g. Install clutch lever return spring. Connect control rod end to clutch lever shaft.
- h. Adjust clutch (refer to "ADJUSTMENTS" in this Topic).

G. CLUTCH SHAFT GEARS, BEARINGS, INTERMEDIATE GEAR, AND INPUT PINION REPLACEMENT

1. DISASSEMBLY

- a. Drain oil from gear case.
- b. Loosen cables from cable control unit. Remove unit from adapter assembly installed on rear of tractor.
- c. Wash and clean unit thoroughly. Remove both brake band assemblies (refer to "BRAKE LINING REPLACEMENT" in this Topic).
- d. Disassemble both clutches (refer to "CLUTCH DISC REPLACEMENT" in this Topic).
- e. Remove both clutch hub snap rings, Fig. 31 (40) and pull clutch hubs (37) from clutch shafts (13). Remove rear snap rings.
- f. Remove capscrews and lockwashers attaching each clutch oil seal housing, Fig. 37 (3) to cable drum. Each seal housing is provided

TOPIC 11—DOZER REMOVAL AND INSTALLATION

A. MODEL CA AND HA DOZER REMOVAL

1. Lower moldboard to ground and attach hoist to top of moldboard; remove moldboard pivot pin and collars. Disconnect upper and lower strut assemblies from moldboard, and remove moldboard.
2. Disconnect and remove strut assemblies from "C" frame; blockup "C" frame and disconnect lower sheave block or hydraulic cylinders.
3. Disconnect "C" frame trunnions from tractor and back tractor away.

NOTE

Wire each shim pack together to prevent loss.

B. MODEL CA AND HA DOZER INSTALLATION

1. Fig. 92, install guide brackets and wear plates as shown; tighten capscrews securely.

2. Fig. 93, install trunnions and tighten cap-screws securely. Position "C" frame to trunnion as shown in Fig. 94. Install pivot caps, using necessary amount of shims to prevent binding; do not allow any looseness.

NOTE

Use equal amount of shims on upper and lower positions.

3. Model CA, install lower sheave block in position on "C" frame.
4. Model HA, position piston rods so they may be assembled to "C" frame.
5. Move moldboard in position at front of "C" frame; install moldboard pivot pin and collar to attach moldboard to "C" frame. Install upper and lower strut assemblies in position on rear of moldboard. Move moldboard to desired angle and connect strut brackets to "C" frame; adjust strut bars to obtain desired position on moldboard.

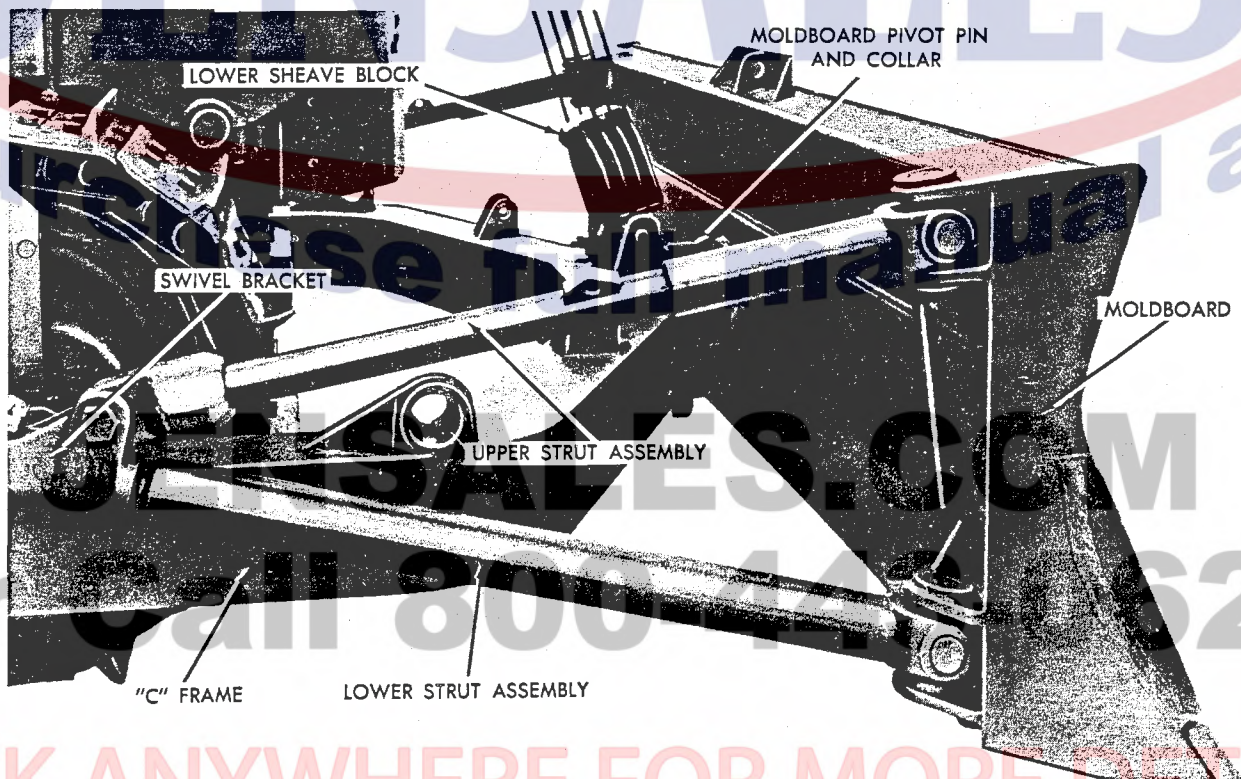


Fig. 90 -- Typical Model CA (Cable Angle) Dozer (T-19341)