FIAT-ALLIS

65

motor grader
(Diesel and Gas)

operation and maintenance instruction manual

Form 70677548 English

Reprinted

SAFETY RULES

MAINTENANCE (Continued)

Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

Never place gasoline or diesel fuel in an open pan.

Never use gasoline or diesel fuel or other flammable fluid for cleaning parts. Use authorized commercial, non-flammable, non-toxic solvents.

When using compressed air for cleaning parts use safety glasses with side shields or goggles. Limit the pressure to 30 psi according to OSHA requirements.

Do not operate machine in closed areas without proper ventilation to remove deadly gases.

Do not smoke or permit any open flame or spark near when refueling, or handling highly flammable materials.

Do not use an open flame as a light source to look for leaks or for inspection anywhere on the machine.

Be sure all mechanics tools are in good condition. DO NOT use tools with mushroomed heads. Always wear safety glasses with side shields.

Move carefully when under, in or near machine or implements. Wear required protective equipment, such as hard hat, safety glasses, safety shoes, ear protectors.

When making equipment checks that require running of the engine, have an operator in the operator seat at all times with the mechanic in sight. Place the transmission in neutral and set the brakes and lock. Keep head, body, limbs, feet, hands and fingers away from blade or ripper when in raised position.

Shut off engine and disengage the Power Take-Off lever before attempting adjustments or service.

Do not perform any work on equipment that is not authorized. Follow the Maintenance or Service Manual Procedures.

For field service, move machine to level ground if possible and block machine. If work is absolutely necessary on an incline, block machine and its attachments securely. Move the machine to level ground as soon as possible.

Guard against kinking chains or cables. Do not lift or pull thru a kinked chain or cable. Always wear heavy gloves when handling chain or cable.

Be sure cables are anchored and the anchor point is strong enough to handle the expected load. Keep exposed personnel clear of anchor point and cable or chain. DO NOT PULL OR TOW UNLESS OPERATOR'S COMPARTMENTS OF MACHINES INVOLVED ARE PROPERLY GUARDED against accidental cable or chain backlash.

Keep maintenance area CLEAN and DRY. Remove water or oil slicks immediately.

DO NOT pile oily greasy rags -- they are a fire hazard. Store in a closed metal container.

Before starting machine or moving attachment check and adjust and lock operator's seat. Be sure all personel in the area are clear before starting or moving machine and any of its attachments. Sound horn.

Rust inhibitors are volatile and flammable. Prepare parts in well ventilated place. Keep open flame away - DO NOT SMOKE. Store container in a cool well-ventilated place secure against unauthorized personne.

Do not carry loose objects in pockets that might fall unnoticed into open compartments.

SUPPLEMENT NO. 2

OPERATOR'S MANUAL FORM 0677548-0

M-65 GRADER

(5-72)

ATTENTION: Insert this sheet into the front of publication as record of receipt.

Additional copies of this supplement are available.

Subject: Hydraulic system capacity

Models Affected: All

Refer to CAPACITIES (page 4) and change hydraulic system to read: hydraulic system, refill (approx.) 4 gal. (15, 14 lit)

Subject: Directional shift lever shaft lubrication

Models Affected: All

Refer to Fig. A. Lubricate directional shift lever shaft each 100 hours with 2 or 3 shots of pressure gun lubricant. Lubricate from beneath grader with hand type lubricating gun.

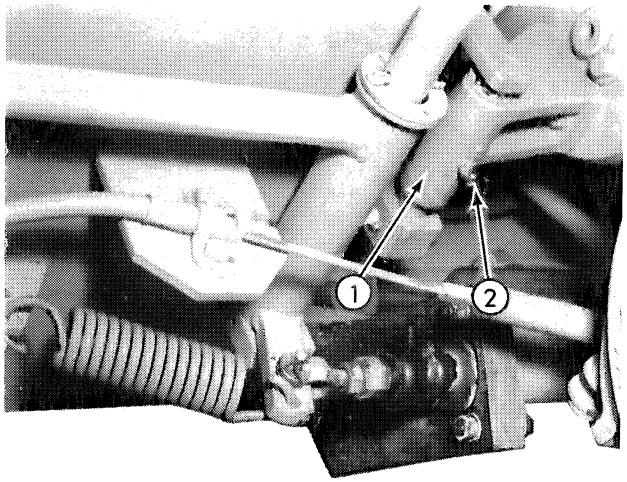

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FIG. A DIRECTIONAL SHIFT LEVER SHAFT LUBE FITTING

1. Bracket
2. Lube fitting

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LIFTING MECHANISM	DIESEL	GASOLINE
Type	Hydraulic	Hydraulic
Diameter of Cylinder (Inside)	2.75 in. (69.85 mm)	2.75 in. (69.85 mm)
Stroke	20 in. (508 mm)	20 in. (508 mm)
Connection Take-up	Shims	Shims
POWER CIRCLE TURN		
Diameter	48 in. (1219.2 mm)	48 in. (1219.2 mm)
Rotation	139°	139°
Throat Clearance (Distance Between Top of Moldboard and Bottom of Circle with Moldboard in Normal Pitch Position)	4.38 in. (111.1 mm)	4.38 in. (111.1 mm)
SIDE SHIFT		
Type	Manual Adjustment	Manual Adjustment
Number of Positions	4	4
Connections	Ball and Socket	Ball and Socket
Connection Take-up	Shims	Shims
HYDRAULIC		
Operating Controls System Pressure	1400 - 1450 psi (98.4 - 101.9 kg/cm^2)	1400 - 1450 psi (98.4 - 101.9kg/cm^2)
Steering System Pressure	1500-1700 psi (105.4 - 119.5 kg/cm^2)	1500 - 1700 psi (105.4 - 119.5 kg/cm^2)
POWER STEERING		
Type	Hydrostatic (Orbitrol)	Hydrostatic (Orbitrol)
FRONT AXLE AND WHEEL LEAN		
Clearance At Center: With 7.50-20 Tires	19.81 in. (503.1 mm)	19.81 in. (503.1 mm)
Axle Oscillation	15°	15°
Wheel Lean	15°	15°
TANDEMS		
Drive	Roller Chain	Roller Chain
Chain Pitch	1.50 in. (38.1 mm)	1.50 in. (38.1 mm)
Wheel Centers	40.75 in. (1035 mm)	40.75 in. (1035 mm)

The information contained herein is general in nature and is not intended for specific application purposes. Fiat-Allis reserves the right to make changes in specifications shown herein or add improvements at any time without notice or obligation.

LUBRICATION AND SERVICE INSTRUCTIONS

GENERAL INFORMATION

WARNING

Always lower moldboard to the ground as a safety precaution when making adjustment or servicing unit.

Lubrication is an essential part of preventive maintenance, controlling to a great extent the useful life of the unit. Different lubricants are needed and some components in the unit require more frequent lubrication than others. Therefore, it is important that the instructions regarding types of lubricants and the frequency of their application be explicity followed. Periodic lubrication of the moving parts reduces to a minimum the possibility of mechanical failures.

To prevent minor irregularities from developing into serious conditions that might involve shutdown and major repair, several other services or checks are recommended for the same intervals as the periodic lubrication. The purpose of these services or checks, which require only a few minutes, is to assure the uninterrupted operation of the unit by revealing the need for adjustment caused by normal wear.

Thoroughly clean all fittings, caps, plugs, etc. before servicing to prevent dirt from entering while performing the service.

Lubricants should be at operating temperature when draining for oil changes.

Oil system equipped with an oil level gauge rod having "Operating Range" marks, are safe to operate when oil level is anywhere within "Operating Range".

After refilling systems at oil change intervals, the oil level should be checked. Run engine at low idle speed for a few minutes to insure that filter, lines, etc. are fully charged before oil level check is made.

NOTE: Oil levels will rise within "Operating Range" on oil level gauge rods (due to expansion of oil) after unit has been placed in service and operating temperatures have stabilized.

After first 50 hours of operation on a new unit or after major repairs to system, change filter element of hydraulic system.

The various hour intervals are based on normal operations; perform the services more often as necessary when operating under severe or abnormal conditions.

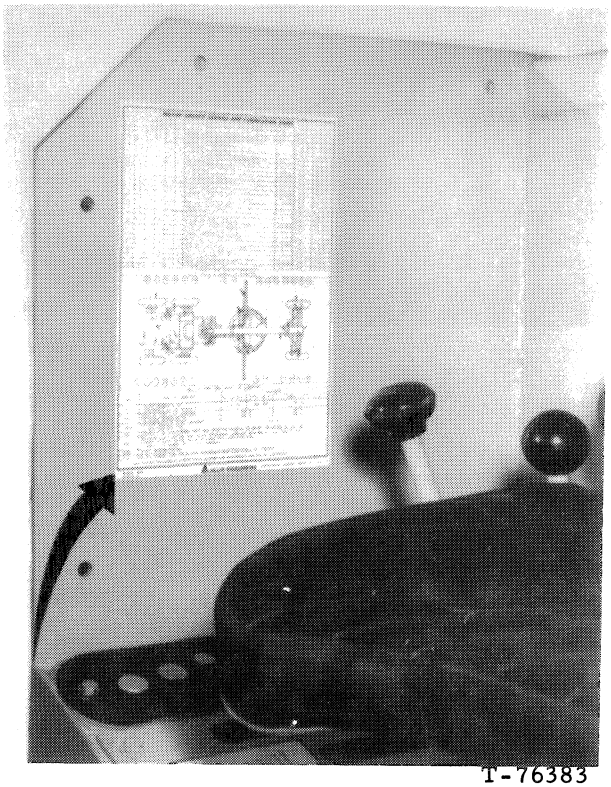

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FIG. 5 LUBRICATION AND SERVICE INSTRUCTION PLATE

10 - HOUR SERVICES

CHECK

1. ENGINE CRANKCASE - OIL LEVEL (Fig. 6 and 7) - With engine stopped, remove crankcase oil level gauge rod, and check oil level. Add oil as necessary until oil level is even with top mark on gauge rod.

2. AIR CLEANER (Fig. 8) - On units with dry-type air cleaner equipped with air cleaner indicator (special equipment) remove and clean element whenever red service signal reaches service level (push RESET BUTTON of indicator after cleaning element). Units with dry-type air cleaner without air cleaner indicator, remove and clean element after every 100 hours of operation. Units with oil bath air cleaner, check pre-cleaner dust level and oil cup. Refer to AIR CLEANER for detailed information.

INSTRUMENTS (Fig. 22)

> **CAUTION**
>
> If any gauge does not indicate proper reading within a few minutes after engine has been started (except engine temperature gauge), engine must be stopped immediately and the cause determined and corrected.

AMMETER - The ammeter located to the right of the operator's seat indicates charging rate of alternator. When battery is in a discharged condition, ammeter should indicate a good rate of charge until battery approaches a fully charged condition. When battery is fully charged, ammeter will indicate nearly zero except for a short time after starter has been in use.

ENGINE TEMPERATURE GAUGE - This gauge indicates engine coolant operating temperature. Coolant operating temperature should be within Operating Range on gauge.

ENGINE OIL PRESSURE GAUGE - This gauge indicates pressure at which engine lubricating oil is circulated through engine. At full throttle oil pressure should be between 20 and 60 psi. at normal engine operating temperature.

AIR CLEANER SERVICE INDICATOR (Special) As the filter element fills with dirt, the red indicator gradually rises. When red indicator reaches the top and locks in position, it is time to change the element; reset indicator by pushing on reset button.

ENGINE HOUR METER (Special) - This meter is a direct reading meter that records up to 10,000 hours and repeats. The red figures indicate 10 ths of an hour. When meter is recording, the small indicator (upper left) is turning .

FUEL PRESSURE GAUGE (Diesel)(Special Equipment) - Fuel pressure range should be between 10 and 71 psi.

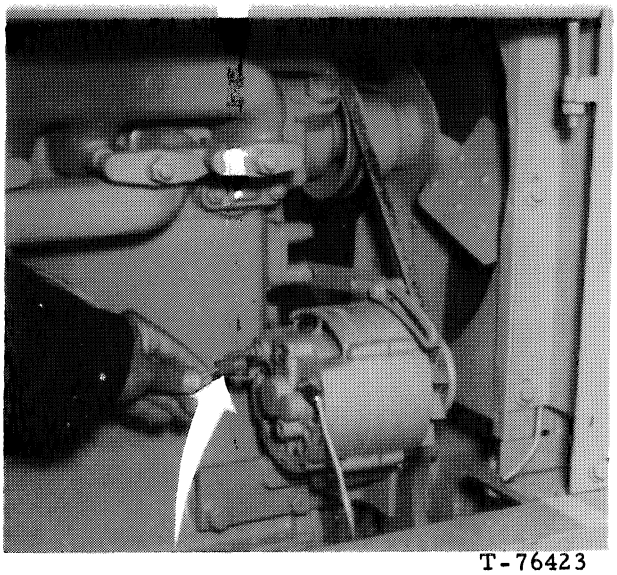

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FIG. 29 DISCONNECTING WIRE FROM ALTERNATOR

FAN, WATER PUMP AND ALTERNATOR DRIVE BELTS ADJUSTMENT

Drive belt is properly adjusted when straight side of belt (side opposite from alternator) can be pressed inward by hand .50" to .75" (12.7 - 19.05 mm) at a point half way between crankshaft pulley and fan pulley. Refer to ENGINE COOLING SYSTEM for complete adjustment procedures.

ELECTRICAL CABLES

Inspect the electrical cables frequently to detect any loose connections or frayed insulation. Tighten connections and wrap any frayed spots with friction tape to prevent short circuits.

STARTING MOTOR

The starting motor is a heavy duty, 12 volt, solenoid type unit. This solenoid shifts starter pinion gear into mesh with the engine flywheel ring gear. When engine starts to run the pinion gear disengages from ring gear.

CAUTION

Do not operate starting motor continuously for more than 30 seconds without pausing to allow it to cool for at least 2 minutes. Failure to observe this rule will result in total destruction of the motor coils and armature.

DISTRIBUTOR (GASOLINE)

Terminals of distributor must be kept clean and tight. Distributor timing may be checked with timing light as follows:

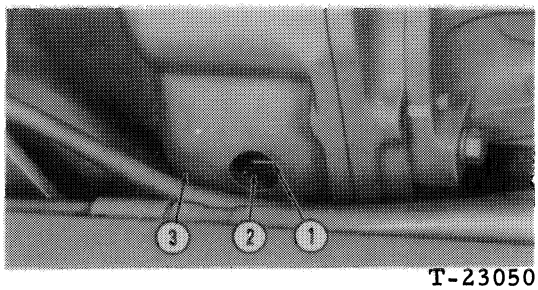

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FIG. 30 TIMING MARK ON ENGINE FLYWHEEL (Gasoline)

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

NOTE: Automatic spark advance is set to gradually advance spark 25° between 300 and 1600 engine rpm.

1. With engine at normal operating temperature, operate engine at 250 to 300 rpm. At this speed distributor timing should be in fully retarded position and plain timing mark, Fig. 30, should be visible, centered in timing hole located in lower left hand side of the clutch housing. If timing mark is not clearly visible, mark with white chalk or paint.
2. If mark is not centered in timing hole, two distributor retaining capscrews must be loosened and distributor housing turned to advance or retard timing as necessary to center timing mark.

NOTE: Turning distributor housing clockwise direction retards timing; turning counterclockwise advances timing.

3. Operate engine at 1600 to 1700 rpm; distributor should now be in fully advanced position(25°)and F 25 timing mark should be visible centered in timing hole;if F25 timing mark is not visible, automatic advance mechanism in distributor should be checked for worn or damaged parts.

NOTE: If distributor has been removed from engine, refer to"ELECTRICAL SYSTEM "Service Manual Form 0664045-2 for detailed timing instructions.

SPARK PLUGS (GASOLINE)

Visual inspection of spark plugs provides a simple method of estimating engine condition. Spark plugs operating normally will show medium color deposit of medium hardness and good insulator when deposit is removed.

Clean spark plugs in a plug cleaning apparatus designed for the purpose and reset gap periodically (approximately each 500 hours). If inspection reveals any cracks or chips in insulator or if center electrode is worn within .09" (2.38 mm) of end of insulator and/or badly rounded, plug should be replaced. The specified

MOLDBOARD, DRAWBAR AND CIRCLE ADJUSTMENTS

The moldboard cutting edges should be replaced when edges become blunt. New cutting edges should be installed before old ones are worn to the point where further use would cause wear on main structure of moldboard. The end bits are also replaceable and should be replaced when necessary.

Do not use oil or grease on moldboard circle face as these will mix with dirt and cause hard "caking". If lubrication is desired, frequent application of diesel fuel will prove to be most satisfactory; this will also prevent mud or snow from freezing to circle when operating in cold weather.

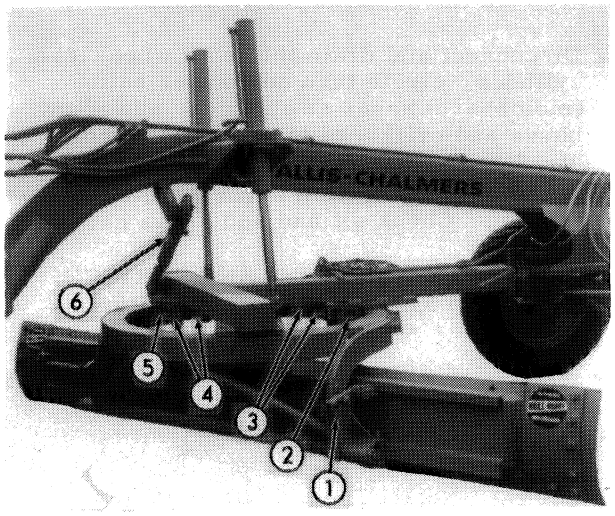

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FIG. 37 MOLDBOARD AND CIRCLE GUIDE ADJUSTMENTS

1. Pitch support (link)
2. Front circle guide
3. Guide adjusting screws
4. Guide clamping nuts
5. Rear circle guide
6. Moldboard side shift link

MOLDBOARD

1. MOLDBOARD ADJUSTMENT (Fig. 37)

a. Angle Adjustment

Accomplished hydraulically.

b. Pitch Adjustment

To change the pitch of the moldboard, lower the moldboard to the ground. Loosen the moldboard pivot bolts, remove the bolts from the pitch links and move the grader forward or backward until the moldboard has the desired pitch position. Install and tighten the pitch link bolts and tighten the pivot bolts.

c. Offset Adjustment

Minor side shift adjustments may be made by removing the pin from the side shift link and rod, and reinstalling the pin in the proper hole when the desired side shift is obtained.

The moldboard may be offset to the right or to the left. To do this, remove pin and move moldboard in order to get an angle of around 45°; lower front end of moldboard slightly into the ground or block it with some other device. Turn front wheels until they are almost parallel to moldboard, then move grader slowly forward to get desired position. Reinstall pin.

A hydraulically shiftable moldboard is available as special equipment.

d. Vertical Adjustment

Eliminate excessive play between the face of the circle and wear plates by removal of shims between the wear plates and circle guides. Each shim is .03" (.79 mm) thick. Rotate the circle after shims have been removed and guide bolts tightened, to be sure there is .06"(1.58 mm) clearance at the tightest point and the circle turns freely in the guides. Make the adjustment on one guide at a time.

IMPORTANT: When adjusting the circle guides make certain that the circle is kept centered to the center line of drawbar.

e. Horizontal Adjustment

After the vertical adjustment of the circle has been made, loosen the lock nuts on the adjusting screws of the circle front and rear guides. Loosen the circle guide nuts then turn the adjusting screws as necessary to provide .06"(1.58 mm)clearance between the inner circumference of the circle and each of the guide plates. Tighten the circle guide nuts and check to be sure the circle turns freely.

2. DRAWBAR BALL AND SOCKET ADJUSTMENT

Looseness due to wear on moldboard drawbar ball and socket, at front end of moldboard drawbar, can be eliminated by removing shims from under ball socket to obtain .000" - .005"(.000-.127 mm)looseness.

3. SIDE SHIFT LINK AND HYDRAULIC CYLINDER ADJUSTMENTS

The ball joints should be .000"-.005"(000-.127 mm)loose. If clearance exceeds this tolerance, remove shims beneath caps as necessary to restore tolerance.