

Operation & Maintenance Manual

KOMATSU

GD511A-1, GD521A-1 GD523A-1 MOTOR GRADER

SERIAL NUMBERS
GD511A -10031
GD521A -10044 and up
GD523A -30019

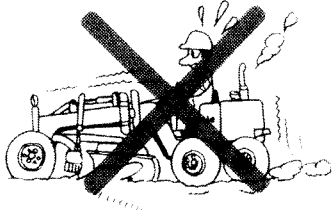
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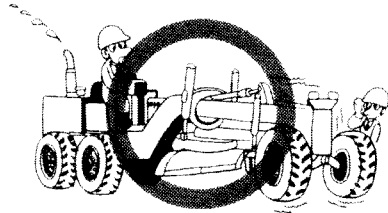


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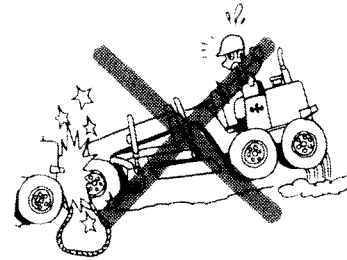
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- Always be aware of the operating capacity of the machine. Using the machine to do work beyond its capacity will not only damage the machine, but may even cause unexpected accidents.

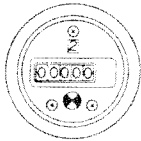


- The machine condition can be judged from many factors. Changes in the gauges, sound, vibration, exhaust gas color or response of the control levers can indicate the occurrence of some disorder. If any disorder occurs, park the machine immediately in a safe place and take appropriate action. Be especially careful in the case of a fuel leak as there is danger of fire.



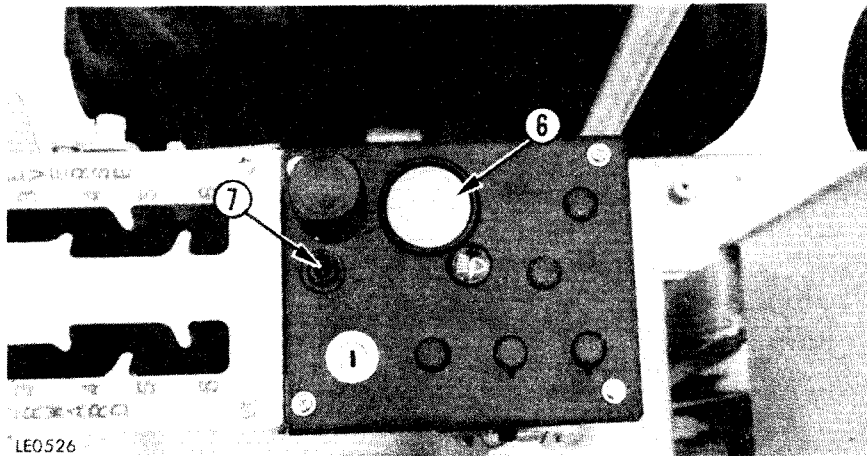
- If the machine breaks down and needs to be towed, first confirm that the brakes are working properly, and then tow, using a wire rope or any other suitable towing equipment.
- When parking the machine after discontinuing work, put the gear shift lever into "NEUTRAL", apply the brake lock, lower the blade, scarifier and ripper to the ground, and put all safety levers into the "LOCK" position. Never leave the operator's seat without switching the engine off.

6. SERVICE METER



The service meter indicates the total number of operating hours of the machine.

While the engine is running, the indicator of the meter will rotate to indicate that the meter is turning over.



7. HEATER SIGNAL

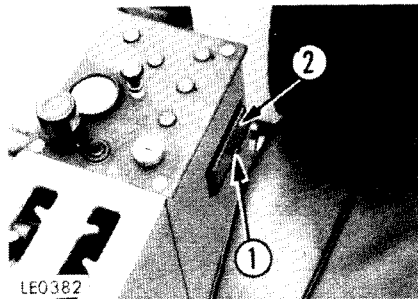


When the starting switch is set to the HEAT position, the heater signal will glow red after about 30 seconds or so, indicating that both the ribbon heater and coil heater are on.

★ The preheating time will vary depending upon the ambient temperature. Accordingly refer to the section COLD WEATHER OPERATION.

FUSE BOX

The fuses protect the electric devices and wiring from burning out.

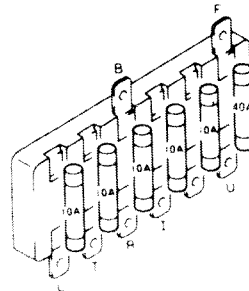


Loosen bolt (1) and remove cover (2).

★ Replace a fuse with another of the same capacity.

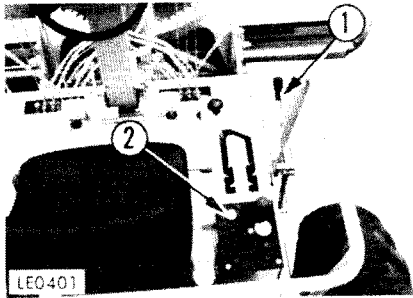
⚠ Before replacing a fuse, be sure to turn off the starting switch.

Fuse arrangement and circuit

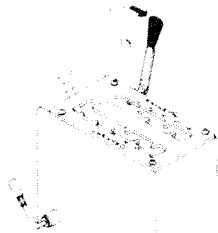


Terminal mark	Fuse capacity	Circuit
L	10 A	Lamps
T	10 A	—
R	10 A	Working lamp, Rear lamp, Turn signal lamp, Back-up buzzer, Back-up lamp
I	10 A	Instruments, Horn, Articulation lock pilot lamp
	10 A	Stop lamp
U	40 A	Lamps

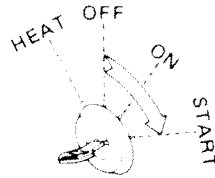
TO START THE ENGINE



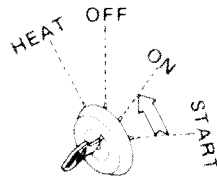
1. Put fuel control lever (1) in LOW IDLING position.



2. To start the engine, put the key (2) to the START position and turn over the starting motor.



3. As soon as the engine starts, release the starting switch key (2) to allow it to return automatically to ON position.



- ★ Do not leave key in START for more than 20 seconds.
- ★ If engine will not start, repeat the starting procedure after about 2 minutes.
- ★ To start engine in cold weather, refer to COLD WEATHER OPERATION.

Special starting

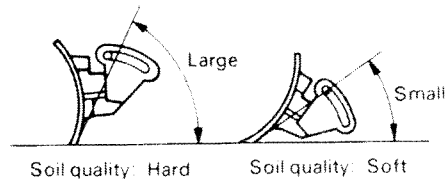
When starting after running out of fuel, fill with fuel, then fill the fuel filter cartridge with fuel and bleed the air from the fuel system before starting.

Refer to FUEL FILTER in EVERY 500 HOURS SERVICE.

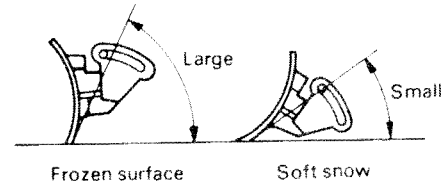
3. Operate simultaneously both right and left lift cylinders and lock when the blade has the required angle.

★ Installation of this power tilt blade gives the following advantages.

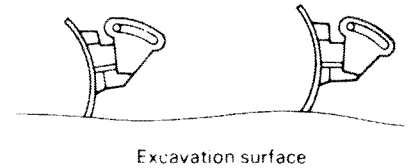
1. Optimum blade cutting angle can be obtained by operating the control lever for soil quality.



2. Since the cutting edge can be set to the desirable angle, a powerful breaking is available to cut the frozen surface during snow removal.



3. If the blade is operated with the hydraulic tip control, the distance between the cutting edge and the excavation surface changes. This means that fine adjustment of the excavation surface is possible.



4. In the low-banking position when raising the dirt and snow, the optimum blade cutting angle can be selected to increase operating efficiency.

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TOWING

TOWING THE MACHINE

This machine must not be towed except in emergencies. When towing the machine, take the following precautions.

When engine can be used.

- Always keep the engine running when towing the machine, so that the steering and braking can be used.

When engine cannot be used.

- When transporting a disabled machine by towing, the transportation distance should be within 600 m at a speed of 8 km/h or less. (When towing more than 600 m, remove the drive shaft.)

- ★ If the distance is more than the above mentioned, or if more than one day has elapsed since the engine trouble, be sure to use the trailer for transportation.
- ★ If the machine is towed without the engine running, no lubrication oil will be supplied to the transmission. The gears and bearings are rotated, so this may cause them to be damaged.
- ★ When the engine cannot be used or the steering booster cannot be used, operation of steering wheel is difficult, so run the machine slowly.

PERIODIC MAINTENANCE

Proper lubrication and maintenance assure trouble-free operation and long machine life. Time and money spent for scheduled periodic maintenance will be amply compensated by prolonged machine operation and reduced operating cost.

All hourly figures given in the following descriptions are based on service meter readings. In practice, however, it is recommended to rearrange all of them into units of days, weeks and months to make the maintenance schedule more convenient. Under rough job site or operating conditions, it is necessary to somewhat shorten the maintenance intervals stated in this manual.

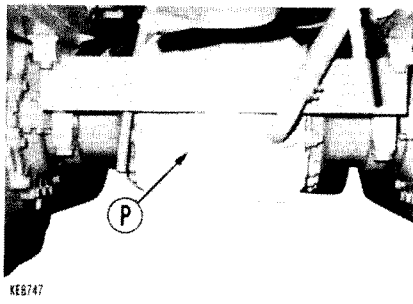
MAINTENANCE TABLE

No.	ITEM	SERVICE	PAGE
i	Ball joint	Check clearance	95
j	Battery electrolyte level	Check	95
k	Wheel hub nut	Check and retighten	96
l	Parking brake lever	Check travel	96
m	Wheel brake	Check and adjust	98
EVERY 500 HOURS SERVICE			
a	Fuel filter	Replace cartridge	99
b	Transmission filter	Replace element	100
c	Circle guide	Check clearance	100
d	Radiator fin	Clean	102
EVERY 1000 HOURS SERVICE			
a	Lubricating		103
-1	Drive shaft	Lubricate 2 points	103
b	Transmission case	Change oil and clean strainer	103

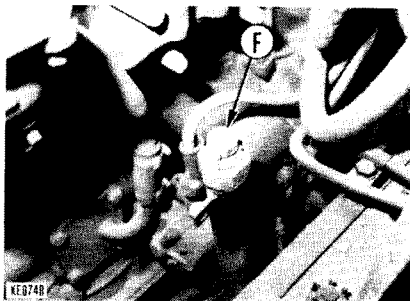
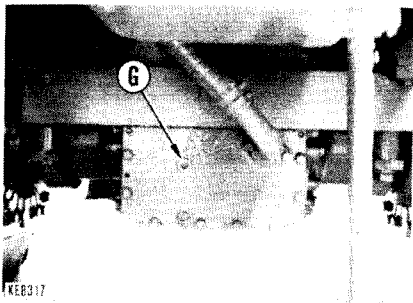
No.	ITEM	SERVICE	PAGE
c	Final drive case	Change oil	104
d	Circle reverse gear case	Change oil	105
e	Tandem drive case	Change oil	106
f	Hydraulic tank and filter	Change oil and replace element	107
g	Drawbar front ball joint	Check looseness	108
h	Toe-in	Check and adjust	108
i	Front wheel bearing play	Check and adjust	110
j	Corrosion resistor	Replace cartridge	111
k	Turbocharger rotor	Check play	112
l	Turbocharger various fasteners	Check and retighten	112
EVERY 2000 HOURS SERVICE			
a	Front wheel bearing	Lubricate (both right and left sides)	114
b	Engine breather	Clean	114
c	Alternator and starting motor	Check	115
d	Engine valve clearance	Check and adjust	115
e	Vibration damper	Check	115
f	Turbocharger	Check and clean	115

d. FINAL DRIVE CASE

(For GD511A)



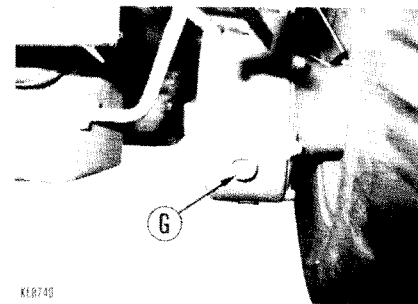
(For GD521A, GD523A)



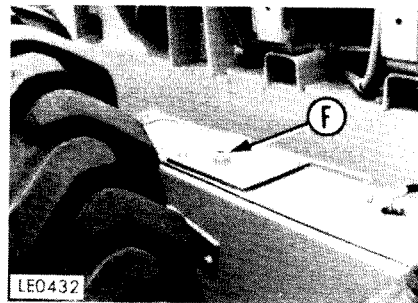
Check the oil level with oil level plug (P) 3 minutes after stopping the engine. If necessary, add oil through filler (F).

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

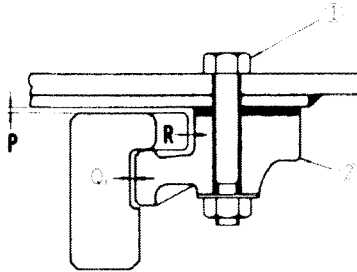
e. TANDEM DRIVE CASE



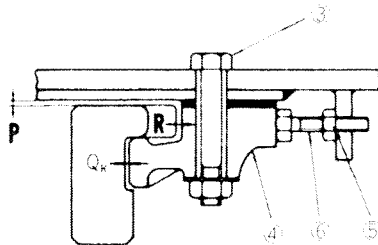
(For GD511A)



Section A-A
(Two places on the front side)



Section B-B
(Two places on the rear side)



Adjustment

Rest the blade on the ground.

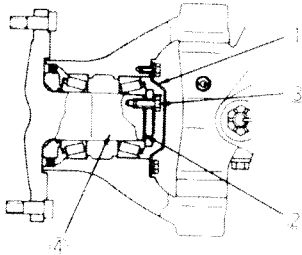
1. To adjust the clearance at portion (P), loosen bolt (1) and (3) and adjust thickness of shims for the circle guide (2) and (4). Two kinds of shims different in thickness (1 mm and 0.5 mm) are provided.
2. To adjust the clearance at portion (Q), first loosen bolt (1), push circle guide (2) rearward to make the clearance (Q)_F zero, and temporarily: tighten bolt (1). (Slightly move the machine forward, with the blade rested on the ground, to make the clearance (Q)_F zero.)
3. Then, loosen the bolt (3). Loosen locknut (5) fastening bolt (6) and turn in the bolt to push circle guide (4) until the clearance (Q)_R becomes zero. Be sure to equally tighten right and left bolts (6)).

4. With the clearance (Q)_R kept in zero, back bolt (6) half rotation, and tighten locknut (5). Back circle guide (4) until it comes into contact with bolt (6) and tighten bolt (3).

★ When either of the following conditions arises, replace the circle guide.

1. Clearance at portion (R) has decreased to zero.
2. Clearance between the circle tooth top and circle reverse pin gear tooth bottom land has decreased to zero or clearance between the circle tooth bottom land and the circle reverse pin gear tooth top has decreased to zero.

**j. CORROSION RESISTOR
(For GD511A)**

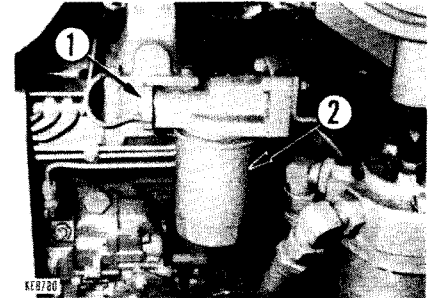


3. Remove cover (1). Select proper shims (2) and set them temporarily. Tighten bolt (3) and rotate the shaft by more than 3 revolutions each for clockwise and counterclockwise directions.

4. Loosen bolt (3). Reduce the number of shims (take out a $t = 0.1$ or $t = 0.3$ shim), and decide the thickness of shims properly so that the pulling force of the spring balance becomes to 8 to 12 kg.

This measurement of the pulling force should be done after shaft (4) has been rotated by more than 3 turns and after the bearing has ceased rotating.

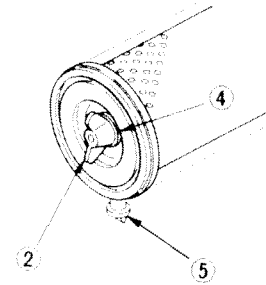
★ Also wait until the bearing gets down to normal room temperature for adjustment.



1. Close valves (1).
2. Using the filter wrench provided, remove cartridge (2) by turning it counterclockwise.
3. Fit a new cartridge after applying a dab of engine oil to the seal face.

1. Loosen wing nut (2), remove cover (3) and outer element.
 2. Clean the air cleaner body interior and the removed cover.
 3. Clean and inspect the element. (See the item "Cleaning outer element" for cleaning procedure.) Install the cleaned element.
 4. Push the dust indicator reset button to return the red piston to the original position.
- ★ Replace the outer element which has been cleaned 6 times repeatedly or used throughout a year. Replace the inner element at the same time.

- ★ Replace both inner and outer elements when the dust indicator red piston appears soon after installing the cleaned outer element even though it has not been cleaned 6 times.
- ★ Remove one seal from the outer element. The number of times the outer element has been cleaned can be seen by the number of removed seals.



- ★ Replace seal washer (4) or wing nut (2) if they are broken.
- ★ When inspecting or cleaning the air cleaner, remove evacuator valve (5) and clean with compressed air.

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