

OPERATOR'S MANUAL

KUBOTA TRACTOR

MODEL B8200



F-3240

B1600DT

READ AND SAVE THIS BOOK



ABBREVIATIONS LIST

Abbreviations	Definitions
ZWD	Two-Wheel Drive
4WD	Four Wheel Drive
API	American Petroleum Institute
ASAE	American Society of Agricultural Engineers, USA
ASTM	American Society for Testing and Materials, USA
DIN	Deutsches Institut für Normung, GERMANY
DT	Dual Traction [4WD]
GST	Glide Shift Transmission
HST	Hydrostatic Transmission
m/s	Meters Per Second
PT	Permanent Type (= Ethylene glycol anti-freeze)
PTO	Power Take Off
ROPS	Roll-Over Protective Structure
rpm	Revolutions Per Minute
r/s	Revolutions Per Second
SAE	Society of Automotive Engineers
SMV	Slow Moving Vehicle
SPT	Semi-Permanent Type
UDT	KUBOTA UDT fluid (Transmission-hydraulic fluid)

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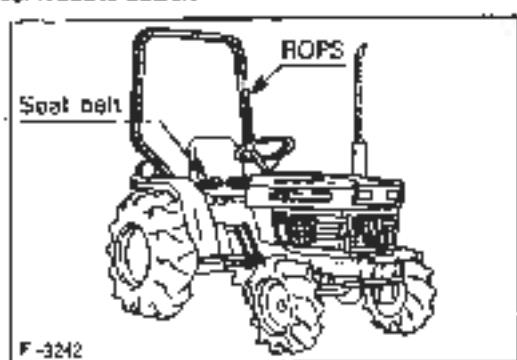


SAFE OPERATION

Careful operation is your best insurance against an accident. Read this section carefully before operating the tractor. All operators, no matter how much experience they may have had, should read this and other related manuals before operating tractor or any implement attached to it. It is the owner's legal obligation to instruct all operators in safe operation.

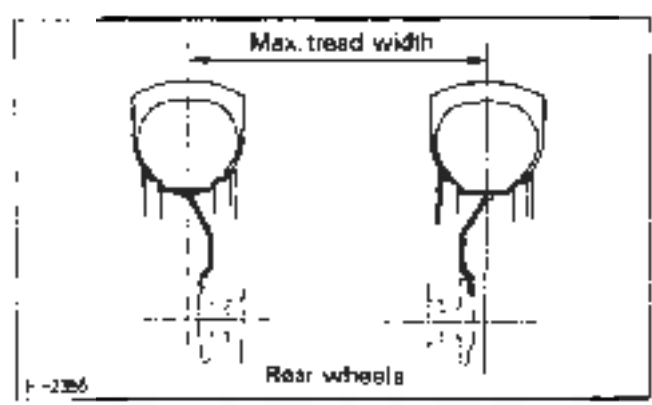
1. BEFORE OPERATING THE TRACTOR

- (1) Know your equipment and its limitations. Read this entire manual before attempting to start and operate the tractor.
- (2) Pay special attention to the warning and caution labels on the tractor itself.
- (3) Kubota recommends the use of a Roll Over Protective Structures (ROPS) and seat belt in almost all applications. This combination will reduce the risk of serious injury or death should the tractor be upset.
If the ROPS is loosened or removed for any reason, make sure that all parts are reinstalled correctly before operating the tractor.
Never modify or repair a ROPS because welding, bending, drilling, grinding, or cutting any portion may weaken the structure.
A damaged ROPS structure must be replaced, not repaired or revised. If any structural member of the ROPS is damaged, replace the entire structure at your local Kubota dealer.



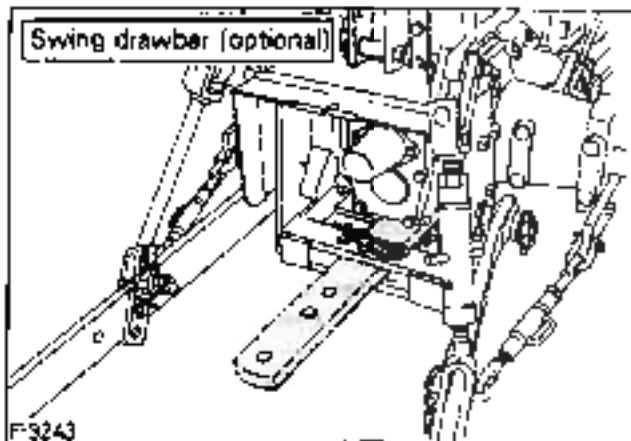
- (4) Always use the seat belt if the tractor has a ROPS. Do not use it if there is no ROPS. Check the seat belt daily and replace if frayed or damaged.
- (5) Do not operate tractor or any implement attached to it while under the influence of alcohol, medication, or other substances or while fatigued.
- (6) Carefully check the vicinity before operating tractor or any implement attached to it. Check for overhead clearance which may interfere with a ROPS. Do not allow any bystanders around or near tractor during operation.

- (7) Before allowing other people to use your tractor, explain how to operate and have them read this manual before operation.
- (8) Never wear loose, torn, or bulky clothing around tractor. It may catch on moving parts or controls, leading to the risk of accident. Use additional safety items, ... hard hat, safety boots or shoes, eye and hearing protection, gloves, etc., as appropriate or required.
- (9) Do not allow passengers or non-qualified operators on the tractor at any time. The operator must remain in the tractor seat throughout operation.
- (10) Check brakes, clutch, and other mechanical parts for faulty adjustment and wear. Replace worn or damaged parts promptly. Check the tightness of all nuts and bolts regularly. (For further details, see MAINTENANCE AND ADJUSTMENTS.)
- (11) Keep your tractor clean. Dirt, grease, and trash accumulations contribute to fires and lead to personal injury.
- (12) Use only implements meeting the specifications listed under IMPLEMENT LIMITATIONS in this manual. Use proper weights to front or rear of tractor to reduce the risk of upsets. Follow the safe operating procedures specified in the manuals included with the equipment.
- (13) The narrower the tread, the greater the risk of a tractor upset. For maximum stability, adjust the wheels to the largest practical tread width. (See page 24).



2. OPERATING THE TRACTOR

- (1) Never start engine or operate levers from anywhere other than the seat.
- (2) Before starting the engine, make sure that all levers (including auxiliary control levers) are in their neutral positions, that the parking brake is engaged, and that both the clutch and the Power Take-Off (PTO) are disengaged.
Fasten the seat belt if the tractor has a ROPS.
- (3) Do not start engine by shorting across starter terminals or bypassing the safety start switch. Machine may start in gear and move if normal starting circuitry is bypassed.
- (4) Pull only from the drawbar or hitch. Never hitch to axle housing or any other point except drawbar; such arrangements only increase the risk of serious personal injury or death due to a tractor upset, (fixed or swinging type)

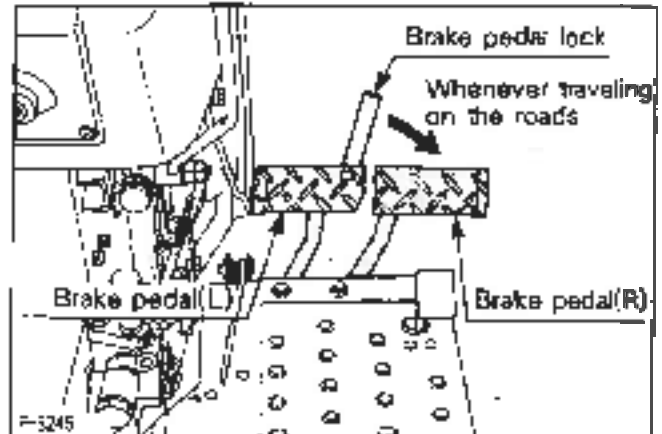


- (5) Do not operate or idle engine in a non-ventilated area. Carbon monoxide gas is colorless, odorless, and deadly.
- (6) Keep all shields and guards in place. Replace any that are missing or damaged.
- (7) Avoid sudden starts. To avoid upsets, slow down when turning, on uneven terrain, and before stopping.
- (8) The tractor cannot turn with the differential locked and attempting to do so could be dangerous.
- (9) Do not operate near ditches, holes, embankments, or other terrain features which may collapse under the tractor's weight. The risk of tractor upset is even higher when the ground is loose or wet.
- (10) Driving forward out of a ditch or mire or up a steep slope risks a tractor upset backward. Always back out of these situations. Extra caution is required with four-wheel drive models because their higher traction can give the operator false confidence in the tractor's ability to climb slopes.
- (11) To avoid upsets, always back up steep slopes. Stay off hills and slopes too steep for safe operation.
- (12) Watch where you are going at all times. Watch for and avoid obstacles. Be alert at row ends, near trees, and other obstructions.
- (13) When working in groups, always let the others know what you are going to do before you do it.

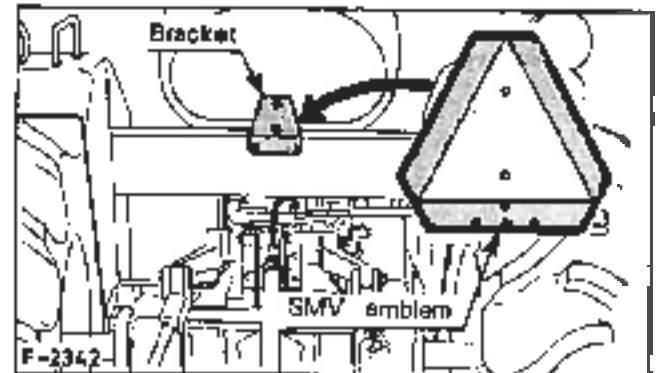
- (14) Never "freewheel". Disengaging the clutch or shifting into neutral while descending a slope could lead to a loss of control.
- (15) Never try to get on or off a moving tractor.

3. DRIVING THE TRACTOR ON THE ROAD

- (1) Lock the two brake pedals together to help assure straightline stops. Uneven braking at road speeds could cause the tractor to roll over.



- (2) Always slow the tractor down before turning. Turning at high speed may tip the tractor over.
- (3) Make sure that the Slow-Moving Vehicle (SMV) emblem is clean and visible. Use hazard lights as required.



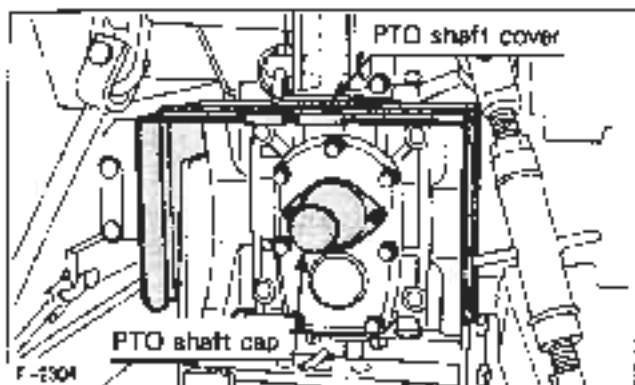
- (4) Observe all local traffic and safety regulations.
- (5) Turn the headlights on. Dim them when meeting another vehicle.
- (6) Drive at speeds that allow you to maintain control at all times.
- (7) Do not apply the differential lock while traveling at road speeds. The tractor may run out of control.
- (8) Avoid sudden motions of the steering wheel as they can lead to a dangerous loss of stability. The risk is especially great when the tractor is traveling at road speeds.
- (9) Do not operate an implement while the tractor is on the road. Lock it in the raised position.
- (10) When towing other equipment, use a safety chain and place an SMV emblem on it as well.

4. STOPPING THE TRACTOR

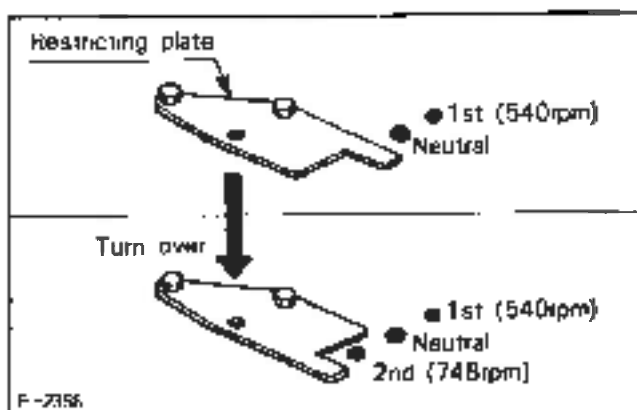
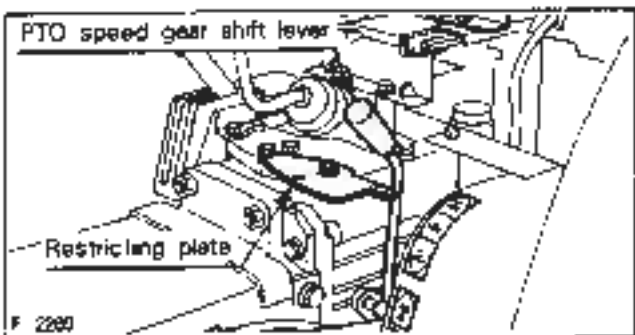
- (1) Disengage the PTO, lower all implements, place all control levers in their neutral positions, apply parking brake, turn off the engine, and remove the ignition key.
- (2) Make sure that the tractor has come to a complete stop before dismounting.

5. OPERATING THE PTO

- (1) Wait until all moving components have completely stopped before getting off the tractor, connecting, disconnecting, adjusting, cleaning, or servicing any PTO driven equipment.
- (2) Keep the PTO shaft cover in place at all times. Replace the PTO shaft cap when the shaft is not in use.



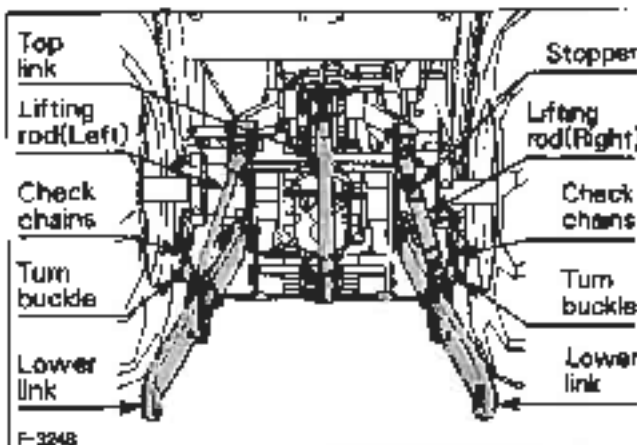
- (3) Before installing or using PTO driven equipment, read the manufacturer's manual and review the safety labels attached to the equipment.
- (4) To prevent PTO driven equipment from racing out of control, stick to the lower (540 rpm) speed unless the higher (748 rpm) one is specifically recommended as safe by the equipment manufacturer.



- (5) When operating stationary PTO driven equipment, always apply the tractor parking brake and place chocks behind and in front of the rear wheels. Stay clear of all rotating parts.

6. USING 3-POINT HITCH

- (1) Use the 3-point hitch only with equipment designed for 3-point hitch usage.

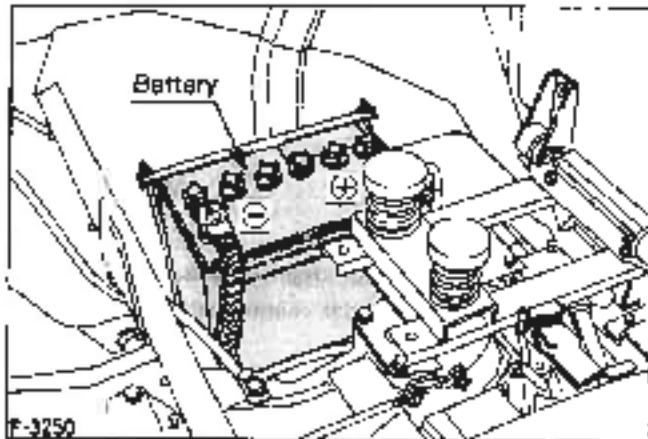


- (2) When using a 3-point hitch mounted implement, be sure to install the proper counterballast weight on the front of the tractor.
- (3) When transporting on the road, set the implement lowering control in the "lock" position to hold the implement in the raised position.

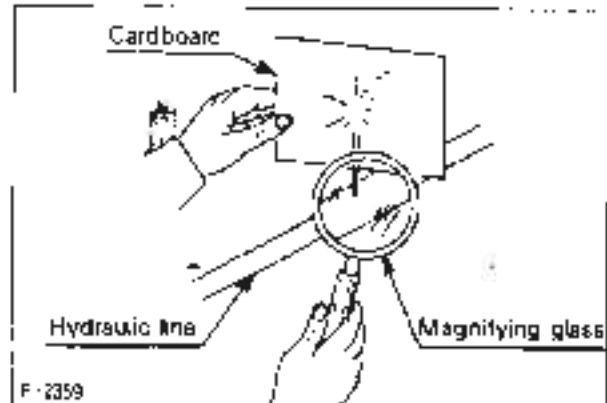
7. SERVICING THE TRACTOR

Before servicing the tractor, park it on a firm level surface, set the parking brake, place the gear shift lever in neutral and stop the engine.

- (1) Allow the tractor time to cool off before working on or near the engine, muffler, radiator, etc.
- (2) Always stop the engine before refueling. Avoid spills and overfilling.
- (3) Do not smoke when working around battery or when refueling. Keep all sparks and flames away from battery and fuel tank. The battery presents an explosion hazard because it gives off hydrogen and oxygen.... especially when recharging.
- (4) Before "jumping" a dead battery, read and follow all of the instructions. (See page 5)
- (5) Keep first aid kit and fire extinguisher handy at all times.
- (6) Do not remove radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely. If the tractor has a coolant recovery tank, add coolant there instead of to the radiator.
- (7) Disconnect the battery's ground cable before working on or near electric components.
- (8) To avoid sparks from an accidental short circuit, always disconnect the battery's ground cable \ominus first and connect it last.



- (9) Do not attempt to mount a tire on a rim unless qualified to do so and all proper safety precautions are followed.
- (10) Provide adequate support when changing wheels or the wheel tread width.
- (11) Make sure that wheel bolts have been tightened to the specified torque.
- (12) Escaping hydraulic fluid under pressure has sufficient force to penetrate skin, causing serious personal injury. Before disconnecting hydraulic lines, be sure to release all residual pressure. Before applying pressure to the hydraulic system, make sure that all connections are tight and that all lines, pipes, and hoses are free of damage.

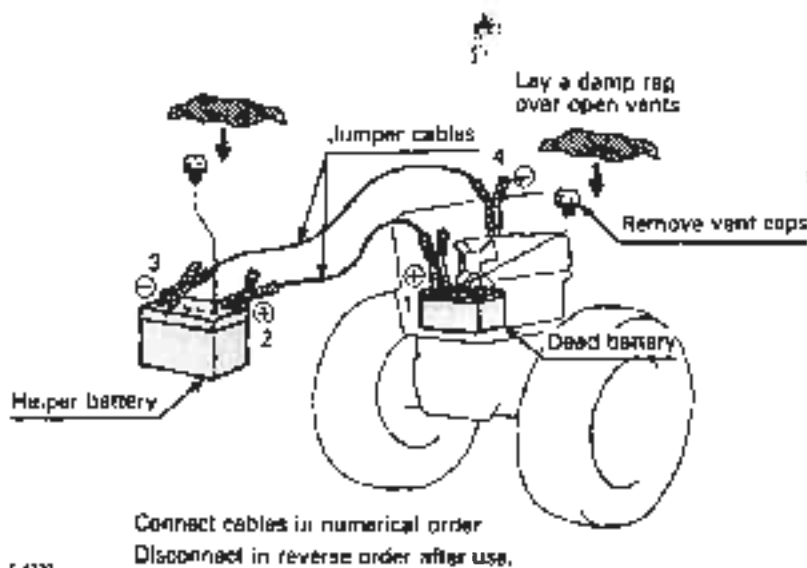


Fluid escaping from pinholes may be invisible. Do not use hands to search for suspected leaks. Use a piece of cardboard or wood, instead. Use of safety goggles or other eye protection is also highly recommended. If injured by escaping fluid, see a medical doctor at once. This fluid can produce gangrene or severe allergic reaction.

8. JUMP STARTING INSTRUCTIONS AND PRECAUTIONS

If ice is present or the battery is cracked, DO NOT ATTEMPT TO "JUMP START" vehicle.

- (1) Bring helper vehicle with a battery of the same voltage as disabled tractor within easy cable reach. "THE VEHICLES MUST NOT TOUCH".
- (2) Engage the parking brakes of both vehicles and put the shift levers in neutral. Turn both Key switches off.
- (3) Put on safety goggles and rubber gloves
- (4) Remove the vent caps from both batteries.
- (5) Cover vent holes with damp rags. Do not allow the rags to touch the battery terminals.
- (6) Attach the red clamp to the positive (red, ⊕ or pos.) terminal of the dead battery and clamp the other end of the same cable to the positive (red, ⊕ or pos.) terminal of the helper battery.
- (7) Clamp the other cable to the negative (black, ⊖ or neg.) terminal of the helper battery.
- (8) Clamp the other end to the engine block or frame of the disabled tractor as far from the dead battery as possible.
- (9) Start the helper vehicle and let its engine run for a few moments. Start the disabled tractor.
- (10) Disconnect the jumper cables in the exact reverse order of attachment. (Steps 6, 7 and 8).
- (11) Remove and discard the damp rags. Reinstall the vent caps



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9. WARNING AND CAUTION LABELS

① Part No. 35260-3491-2

⚠ CAUTION

TO AVOID PERSONAL INJURY:

1. Read and understand the operator's manual before operation.
2. Before starting the engine, make sure that everyone is at a safe distance from the tractor and that the PTO is OFF.
3. Do not allow passengers on the tractor at any time.
4. Before allowing other people to use the tractor, have them read the operator's manual.
5. Check the tightness of all nuts and bolts regularly.
6. Keep all shield in place and stay away from all moving parts.
7. Lock the two brake pedals together before driving on the road.
8. Slow down for turns, or rough roads, or when applying individual brakes.
9. On public roads use SMV emblem and hazard lights, if required by local traffic and safety regulations.
10. Pull only from the drawbar or hitch.
11. Before dismounting, stop the engine, set the parking brake, and lower the implement.

② Part No. 35820-9883-2

⚠ WARNING

AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY.

1. Do not start engine by shorting across starter terminals or by-passing the safety start switch. Machine may start in gear and move if normal starting circuitry bypassed.
2. Start engine only from operator's seat with transmission and PTO in neutral. Never start engine while standing on ground.

③ Part No. 35260-2978-2

⚠ WARNING

TO AVOID PERSONAL INJURY OR DEATH FROM ROLL OVER:

1. Kubota recommends the use of a Roll-Over Protective Structure (ROPS) and seat belt in almost all applications.
2. Remove the ROPS only when it substantially interferes with operation or itself presents a safety risk. (Examples include work in orchards and vineyards.) ALWAYS REINSTALL IT BEFORE USING THE TRACTOR IN OTHER APPLICATIONS.
3. Never use just the seat belt, or just the ROPS. They must be used together. For further details, consult your Operator's Manual or your local dealer.

④ Part No. 35260-2979-1

⚠ WARNING

TO AVOID PERSONAL INJURY:

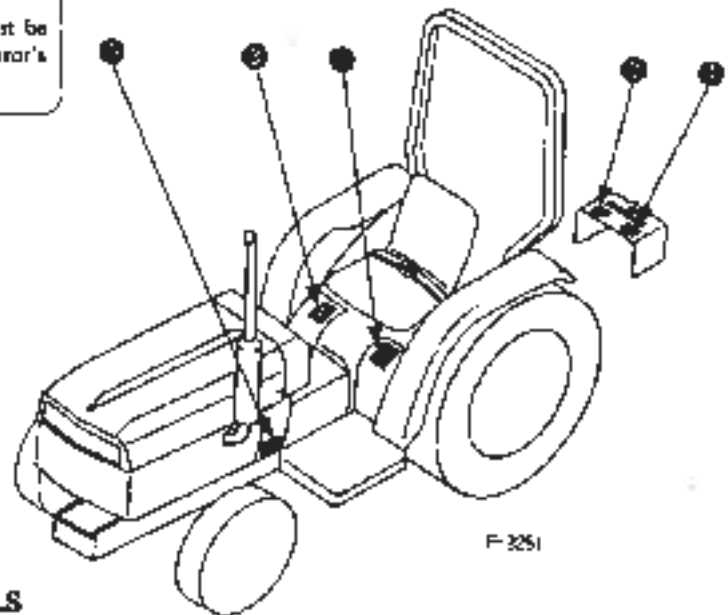
1. Attach pulled or towed loads to the drawbar only.
2. Use the 3-point hitch only with equipment designed for 3-point hitch usage.

⑤ Part No. 35200-2634-1

⚠ WARNING

TO AVOID PERSONAL INJURY:

1. Keep PTO shield in place at all times.
2. Do not operate the PTO at speeds faster than the speed recommended by the implement manufacturer.



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CARE OF WARNING AND CAUTION LABELS

- (1) Keep warning and caution labels clean and free from obstructing material.
- (2) Clean warning and caution labels with soap and water, dry with a soft cloth.
- (3) Replace damaged or missing warning and caution labels with new labels from your Kubota dealer.
- (4) If a component with warning and caution label (s) affixed is replaced with new part, make sure new label (s) is large attached in the same location (s) as the replaced component.
- (5) Mount new warning and caution labels by applying on a clean dry surface and pressing any bubbles to outside edge.

1. SERVICING OF TRACTOR

Your dealer is interested in your new tractor and has the desire to help you get the most value from it. After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself.

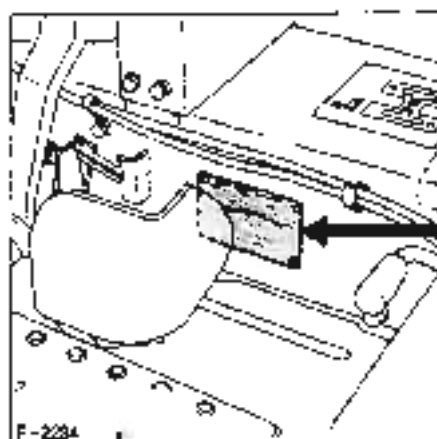
However, when in need of parts or major service, be sure to see your KUBOTA dealer.

For service, contact the KUBOTA Dealership from which you purchased your tractor or your local authorized KUBOTA dealer.

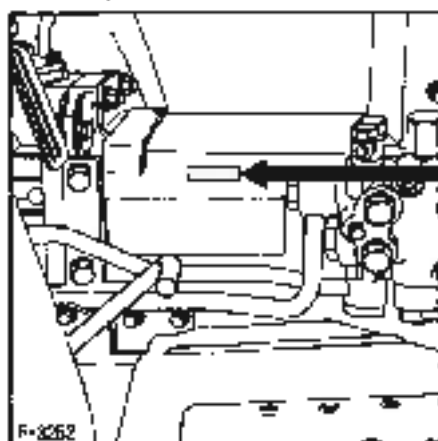
When in need of parts, be prepared to give your dealer both the tractor and engine serial numbers.

The tractor serial number is located on the transmission housing on the right-hand side of the tractor. The engine serial number is located on the engine crankcase, right side. Locate the serial numbers now and record them in the space provided.

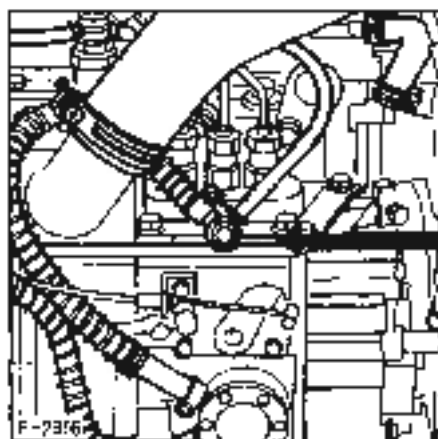
	Type	Serial No.
Tractor	_____	_____
Engine	_____	_____
Date of Purchase	_____	
(To be filled in by purchaser)		



Identification plate



Tractor serial number



Engine serial number

2. SPECIFICATIONS

Model		M200E (2WD)			M200D (4WD)			
Engine gross power		14.2 kW (19HP)*						
PTO power		11.9 kW (16HP)*						
Engine	Model	DB50						
	Type	Vertical, water-cooled, 4-cylinder diesel						
	No. of cylinders	3						
	Bore and stroke	75mm x 70mm (3.0 in. x 2.8 in.)						
	Total displacement	927 cm ³ (56.6 cu in.)						
	Rated revolution	43.3 r/s (2600 rpm)						
	Fuel	Diesel fuel No. 2-D						
	Starter	Electric starter with battery, glow plug and decompression device, 12V, 1.0 kW						
	Lubrication	Forced lubrication by trochoidal pump						
	Cooling	Water with pressurized radiator						
Battery		12V 165 Ah						
Capacities	Fuel tank	20 l (5.3 U.S. gal.)						
	Engine crankcase	3.1 l (2.3 U.S. gal.)						
	Engine coolant	4.0 l (4.7 U.S. gal.)						
	Transmission case	1.0 l (1.1 U.S. gal.)						
	Steering box	0.2 l (0.2 U.S. gal.)						
	Front axle diff. case				2.1 l (2.2 U.S. gal.)			
	Front axle gear case				0.5 l (0.5 U.S. gal.)			
Tires	Front	Farm 4.00-12	Farm 6.50-10	Turf 23 x 8.5-12	Farm 6-12	Farm 6-12	Turf 24 x 8.5-12	
	Rear	8.3-24	12.4-16	13.6-16	12.4-16	8.3-24	13.6-16	
Dimensions	Overall length	mm (in.)	2710 (106.7)	2710 (106.7)	2710 (106.7)	2710 (106.7)	2710 (106.7)	
	Overall width	mm (in.)	1095 (43.1)	1365 (53.7)	1408 (55.3)	1385 (53.7)	1095 (43.1)	1405 (55.3)
		mm (in.)	1135 (44.7)			1135 (44.7)		
	Overall height	mm (in.)	1890 (74.4)	1900 (74.8)	1925 (75.8)	1900 (74.8)	1890 (74.4)	1920 (75.8)
		with muffler	mm (in.)	Vertical	Vertical	Vertical	Vertical	Vertical
	Wheel base	mm (in.)	1535 (60.4)	1535 (60.4)	1535 (60.4)	1535 (60.4)	1535 (60.4)	1535 (60.4)
	Min. ground clearance	mm (in.)	280 (11.0)	260 (10.2)	275 (10.8)	235 (9.3)	235 (9.3)	235 (9.3)
Treads	Front	mm (in.)	830 (32.7)	905 (35.6)	900 (35.4)	900 (35.4)	905 (35.6)	
	Rear	mm (in.)	890 (35.0)	1050 (41.3)	1090 (41.3)	1050 (41.3)	890 (35.0)	1050 (41.3)
		mm (in.)	930 (36.6)			930 (36.6)		
Weight	kg (lbs.)	645 (1420)	652 (1440)	688 (1515)	710 (1565)	708 (1560)	720 (1580)	
PTO Shaft		Transmission case rear (rear PTO) and engine front (front PTO)						
Rear PTO		SAE 7 3/8 (with over running clutch)						
		2 speed 19 and 12.5 r/s at 42.2 engine r/s (640 and 748 rpm at 2534 engine rpm)						
Clutch		Dry single plate						
Steering		Ball screw type						
Transmission		Gear shift, 8 forward and 3 reverse						
Min. turning radius		m (feet)	2.4 (7.9)			2.8 (9.2)		
Brake		Internal expanding type, right and left independent with interlocking device						
Differential		Bevel gear						

Note: * Manufacturer's estimate

■ Traveling speeds

Model				B8200		
Tire sizes				8.3-24	12.4-16	13.6-16
		Range Selector lever	Main gear shift lever			
Forward	1	L	1	1.08 km/h (0.67 mph)	1.04 km/h (0.65 mph)	1.07 km/h (0.66 mph)
	2	L	2	1.92 km/h (1.19 mph)	1.86 km/h (1.15 mph)	1.90 km/h (1.18 mph)
	3	L	3	2.88 km/h (1.79 mph)	2.77 km/h (1.72 mph)	2.85 km/h (1.77 mph)
	4	M	1	4.74 km/h (2.95 mph)	4.57 km/h (2.84 mph)	4.70 km/h (2.92 mph)
	5	H	1	7.28 km/h (4.53 mph)	7.01 km/h (4.36 mph)	7.21 km/h (4.48 mph)
	6	M	2	8.44 km/h (5.24 mph)	8.12 km/h (5.05 mph)	8.35 km/h (5.19 mph)
	7	M	3	12.66 km/h (7.86 mph)	12.18 km/h (7.57 mph)	12.53 km/h (7.79 mph)
	8	H	2	12.86 km/h (8.04 mph)	12.47 km/h (7.75 mph)	12.82 km/h (7.97 mph)
	9	H	3	19.42 km/h (12.07 mph)	18.70 km/h (11.62 mph)	19.23 km/h (11.95 mph)
Reverse	1	L	R	1.44 km/h (0.89 mph)	1.39 km/h (0.86 mph)	1.43 km/h (0.89 mph)
	2	M	R	6.33 km/h (3.93 mph)	6.09 km/h (3.78 mph)	6.26 km/h (3.89 mph)
	3	H	R	8.71 km/h (5.41 mph)	8.35 km/h (5.18 mph)	8.61 km/h (5.35 mph)

[at 43.3 engine r/s (2800 engine rpm)]

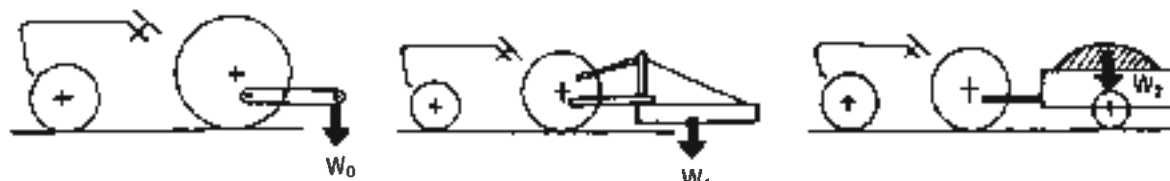
(Specifications and design subject to change without notice)

3. SPECIFICATIONS OF IMPLEMENT LIMITATIONS

The Kubota B8200 tractor has been thoroughly tested for proper performance with implements sold or approved by KUBOTA. Use with implements which exceed the maximum specifications listed below, or which are otherwise unfit for use with the Kubota B8200 tractor may result in malfunctions or failures of the tractor, damage to other property and injury to the operator or others. [Any malfunctions or failures of the tractor resulting from use with improper implements are not covered by the warranty.]

Tread (max. width)		Rear	Operating condition	Lower link and max. loading weight W_0	Actual figures		
Front	2WD				4WD	Implement weight W_1	Trailer loading weight W_2
	805mm (31.6 in.)	970mm (38.2 in.)	1050mm (41.3 in.)	General control operation (Flat ground and slope condition)	Below 360 kg (800 lbs.)	As in the following list	Below 1000 kg (2200 lbs.)

Lower link end max. loading weight..... The max. allowable load which can be put on the lower link end: W_0
 Implement weight..... The implement's weight which can be put on the lower link: W_1
 Trailer loading weight..... The max. loading weight for trailer (without trailer's weight): W_2



Implement		Remarks	85200E(2WD)	85200H(4WD)
Rotary mower	Rear (1 Blade)	Max. cutting width Max. weight	122 cm (48 in.) 227 kg (500 lbs.)	122 cm (48 in.) 227 kg (500 lbs.)
	Mid or Rear (2-3 Blade)	Max. cutting width Max. weight	152 cm (60 in.) 227 kg (500 lbs.)	152 cm (60 in.) 227 kg (500 lbs.)
	Sickle bar	Max. cutting width	152 cm (60 in.)	152 cm (60 in.)
Rotary tiller	Max. tilling width Max. weight	107 cm (42 in.) 250 kg (550 lbs.)	107 cm (42 in.) 250 kg (550 lbs.)	
Bottom plow	Max. size	14 in. x 1	12 in. x 2	
Disc plow	Max. size	22 in. x 2	22 in. x 2	
Cultivator	Max. size	122 cm (48 in.) 1 Row	137 cm (54 in.) 1 Row	
Disc harrow	Max. harrowing width Max. weight	152 cm (60 in.) 227 kg (500 lbs.)	152 cm (60 in.) 227 kg (500 lbs.)	
Sprayer	Max. tank capacity	246 l (65 gals.)	246 l (65 gals.)	
Front blade	Max. cutting width Max. weight Sub frame necessary	152 cm (60 in.) 182 kg (400 lbs.)	152 cm (60 in.) 182 kg (400 lbs.)	
Rear blade	Max. cutting width Max. weight	152 cm (60 in.) 227 kg (500 lbs.)	152 cm (60 in.) 227 kg (500 lbs.)	
Front-end loader	Max. lifting capacity Max. width Oil pressure, relief valve Sub frame necessary		318 kg (700 lbs.) 127 cm (50 in.) 9.8 MPa (100 kgf/cm ²) 1420 psi	
Box blade	Max. cutting width Max. weight	132 cm (52 in.) 227 kg (500 lbs.)	132 cm (52 in.) 227 kg (500 lbs.)	
Back hoe (Use maximum rear wheel track width)	Max. digging depth Max. weight Sub frame necessary	152 cm (60 in.) 383 kg (800 lbs.)	152 cm (60 in.) 383 kg (800 lbs.)	
Snow blower	Max. working width Max. weight Sub frame necessary	152 cm (60 in.) 227 kg (500 lbs.)	152 cm (60 in.) 227 kg (500 lbs.)	
Trailer	Max. load capacity	1000 kg (2200 lbs.)	1000 kg (2200 lbs.)	
Three point lift	Max. load capacity	See page 9.		

4. HANDLING NEW TRACTOR

How a new tractor is handled and maintained determines the life of the tractor.

A new tractor just off the factory production line has been, of course, well fitted and tested, but the various parts are not accustomed to severe types of work, so care should be taken to operate the tractor for the first 100 hours at a slower speed and avoid excessive work or operation until the various parts become well "broken-in." The manner in which the tractor is handled during the "breaking-in" period greatly affects the life of your tractor. Therefore, to obtain the maximum performance and the longest life of the tractor, it is very important to properly break-in your tractor.

In handling a new tractor the following precautions should be well observed:

■ Operation during the breaking-in period

- Do not start quickly nor apply the brakes suddenly.
- In winter, operate the tractor after fully warming up the engine.
- Do not run the engine at speeds faster than necessary.
- On rough roads, slow down to suitable speeds. Do not operate the tractor at fast speed.

■ Changing lubricating oil for new tractors

The lubricating oil is specially important in the case of a new tractor. The various parts are not "broken-in" and are not accustomed to each other; small metal grit may develop during the operating of the tractor; and this may wear out or damage the parts. Therefore, care should be taken to exchange the lubricating oil a little earlier than would ordinarily be required.

For further details of exchange interval hours, see check list page 31.

■ Read "Safe Operation"

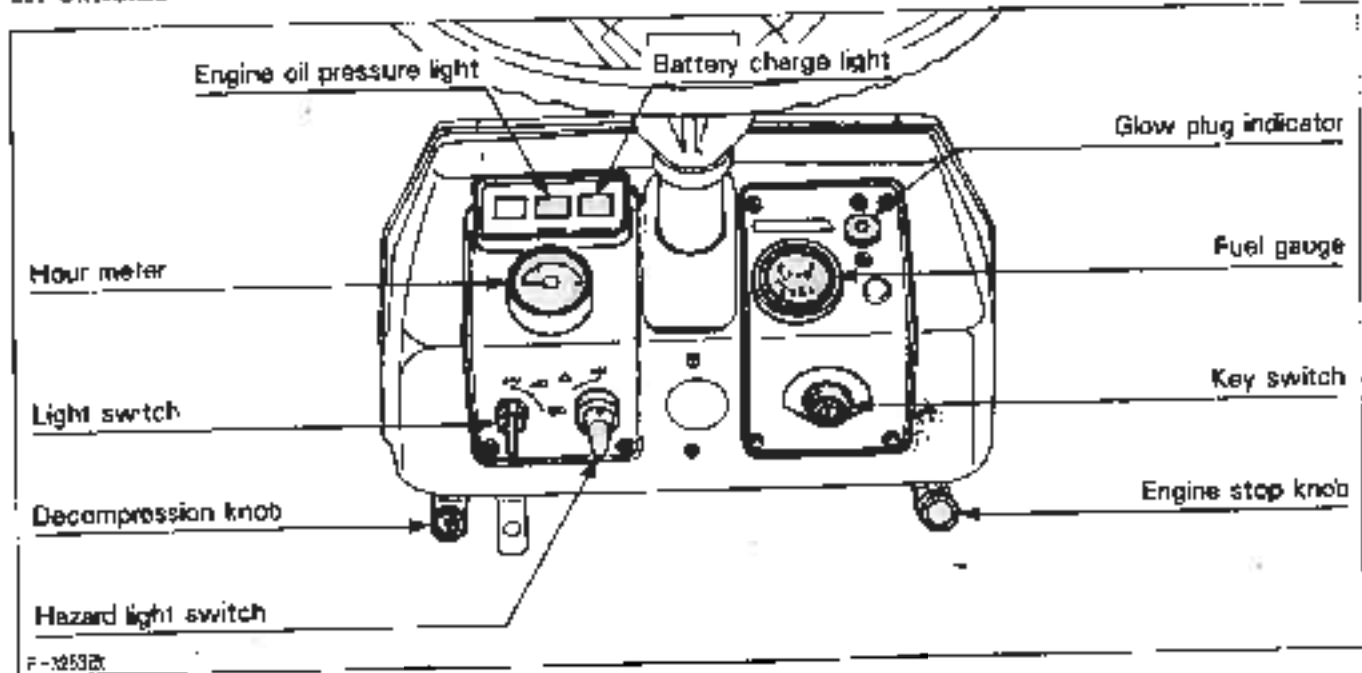
Please read "Safe Operation" before attempting to start or operate the tractor.

4.1 LOADING AND UNLOADING

- (1) When loading (or unloading) a tractor onto a truck or trailer, check the truck or trailer's tires.
- (2) Securely fix a rugged ramp with non-skids to the truck or trailer bed and check to see that there are no people around before starting to load or unload the tractor.

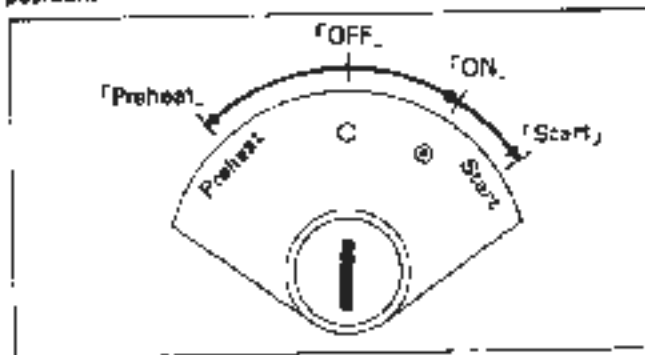
5. INSTRUMENT PANEL AND CONTROLS

5.1 SWITCHES



■ Key Switch

Inserting the key and turning it one click to the right, closes the electrical circuit and lights up the engine oil pressure light and the battery charge light (RED). Depress the clutch pedal to disengage the clutch. Next, turning the key left activates the glow plug (preheating coil), proceeding to preheat the combustion chamber. After the glow plug light has turned red and the engine has been preheated completely, turn the key switch to the far right and the coil starter will start to rotate and the engine should start. Release the key switch and it will return to the OFF position.



IMPORTANT:

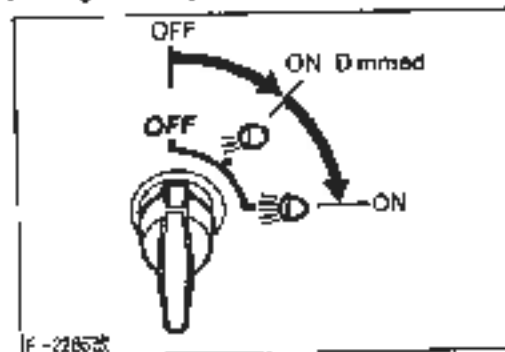
- Because of the safety device, the engine may not be started except when the clutch is disengaged.

■ Glow Plug Indicator (Pre-heating Indicator)

When the starter switch is turned to the left, the glow plug indicator becomes red. This shows the condition of pre-heating in the combustion chamber.

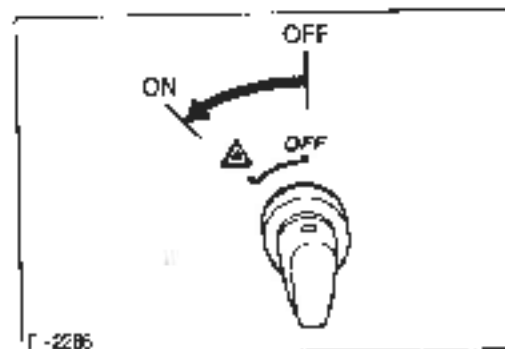
■ Light Switch

Turning the light switch one click to the right illuminates the dim headlights. Next, turning it one more click illuminates the bright headlights.



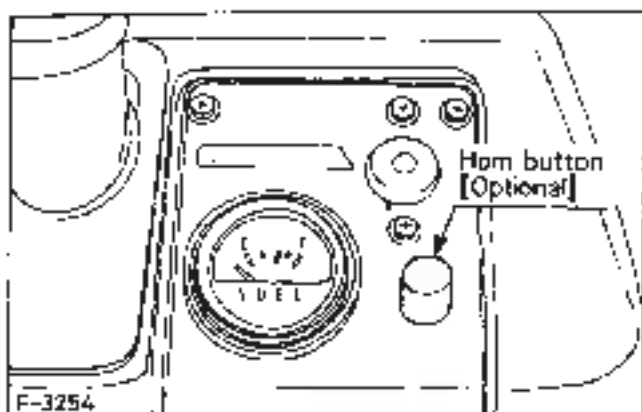
■ Hazard Light Switch

When the hazard lamp switch is turned counter clockwise, the hazard lights flash.



■ Horn Button (Optional)

The horn will sound only when the key is in the "ON" position.

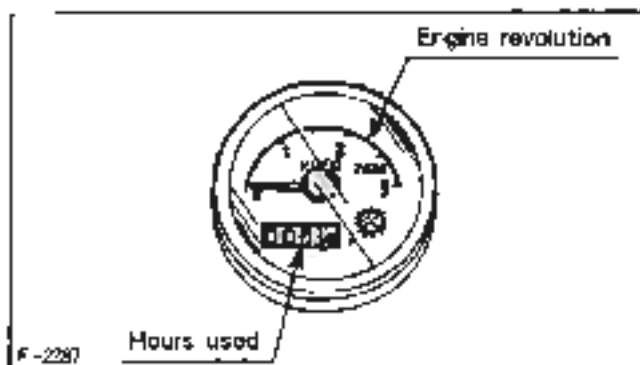


■ Hour Meter

This meter shows the number of hours the tractor has been operated at rated engine rpm.

The last digit (white background) indicates 1/10 of an hour. The time in minutes will be shown by multiplying by six to last digit on white background.

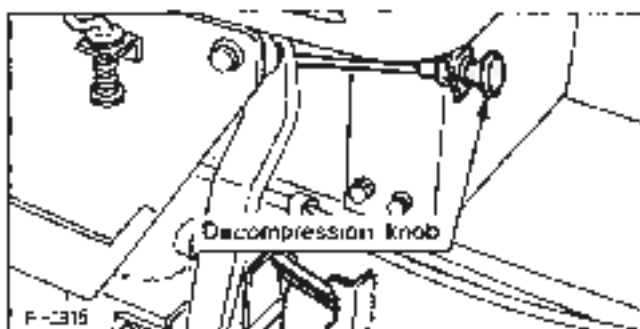
Example **170.2** ... 170 hours 6 minutes used
Moving hand indicates the revolution per minute of the engine.



■ Decompression Knob

To assist in cold weather starting, or starting with a weak battery, the following procedures should be used:

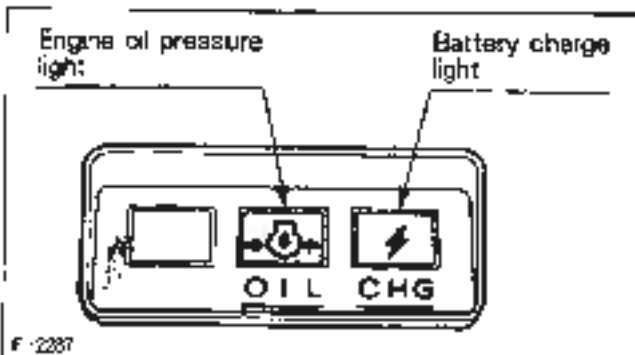
- Set throttle to proper starting position.
- Preheat engine.
- Pull out the decompression knob
- Engage starter and allow engine rpm to build up.
- While cranking engine, push decompression knob back in to allow engine to start.



■ Engine Oil Pressure Light

The engine oil light indicates low engine oil pressure when the light is on and proper engine oil pressure when the lamp is off.

The light goes on when the key switch is turned on. It goes off when the engine starts and engine oil begins to circulate normally. If the light stays on even after the engine starts, immediately stop the engine, and check the cause of the trouble.

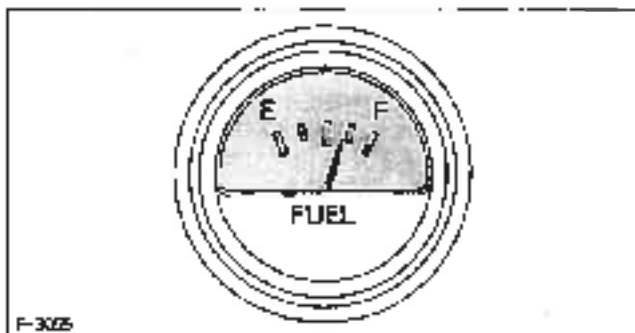


■ Battery Charge Light

The battery charge light will glow red when the main switch is turned on and should go out as engine starts. If the light continues to glow above idle speeds, the battery is being discharged, indicating the electrical system should be checked.

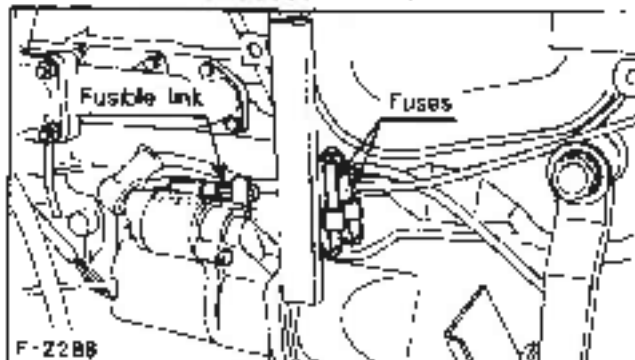
■ Fuel Gauge

When the key switch is on, the fuel gauge indicates the fuel level.

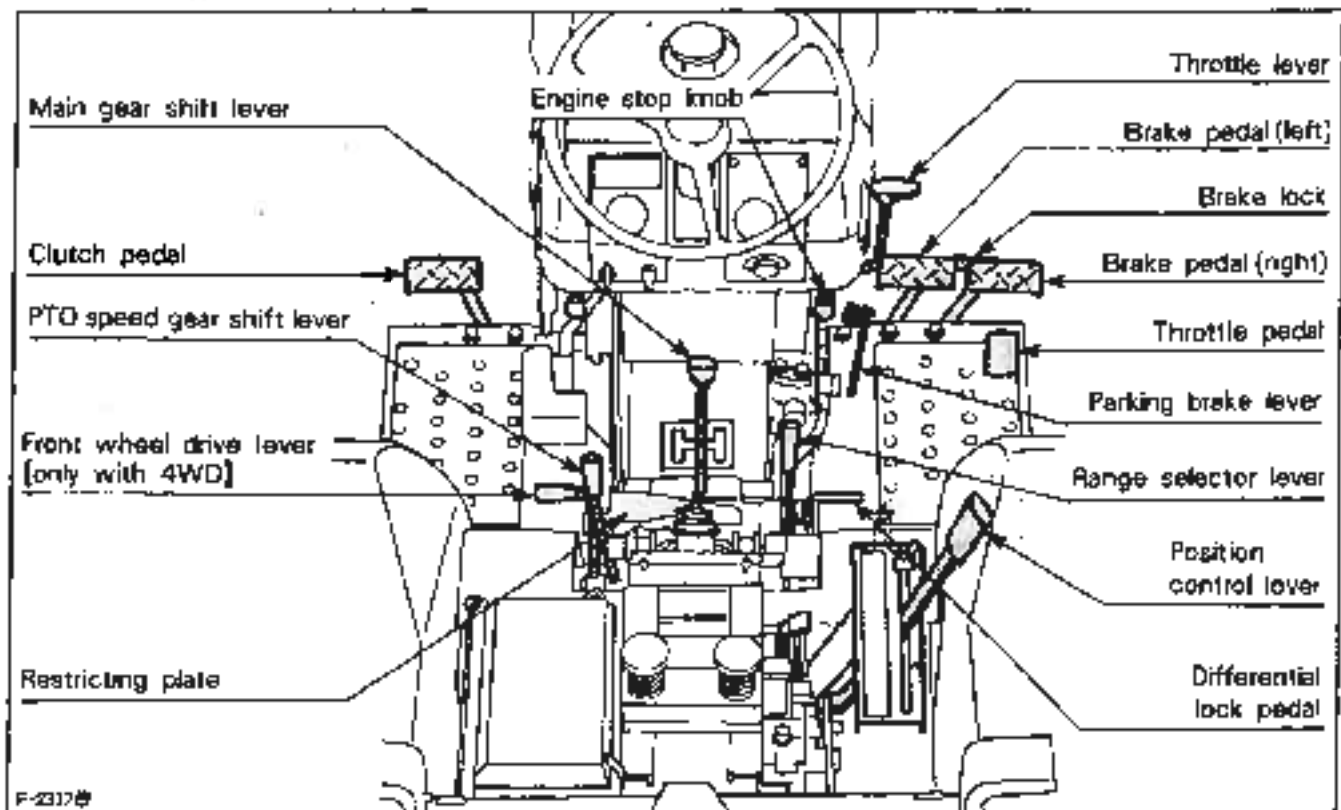


■ Fuses

Fuse	15 ampere
Fusable link	10 ampere
Fusable link	200 ampere

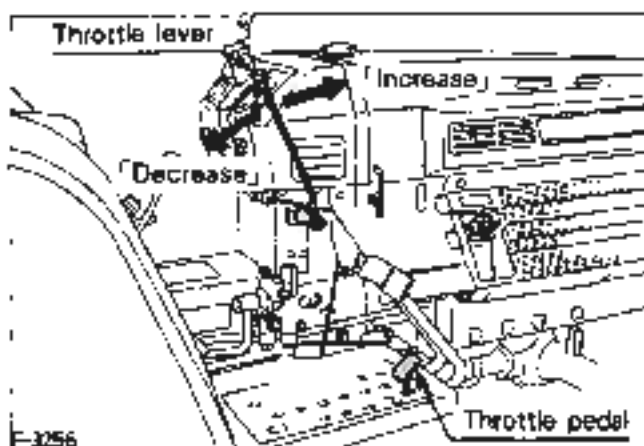


5.2 CONTROLS



■ Throttle Lever

Pulling the throttle lever rearward decreases engine speed, and pushing it forward increases engine speed.

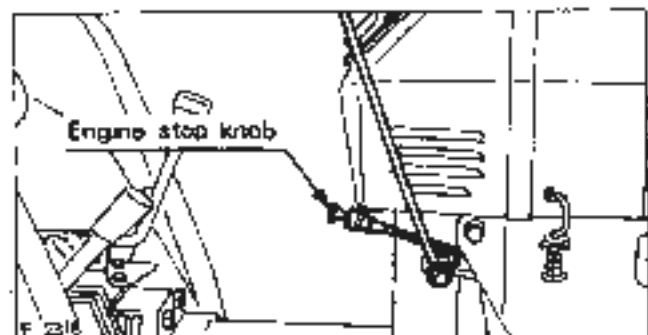


■ Throttle Pedal

Depressing the pedal increases engine speed. The throttle pedal may also be used to increase above engine speed set with the throttle lever.

■ Engine Stop Knob

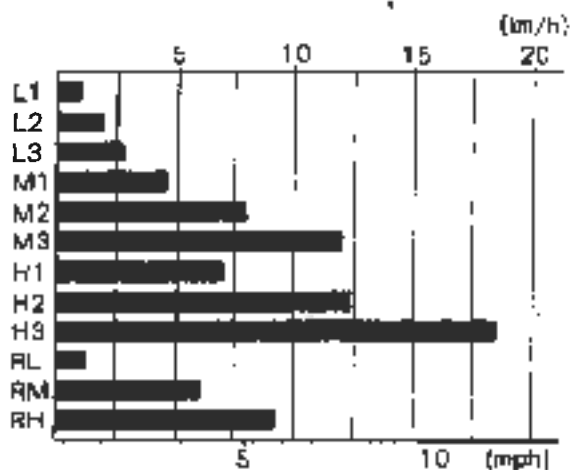
Pull engine stop knob rearward and hold it until the engine stops.



■ Main Gear Shift Lever & Range Selector Lever

The main gear shift lever pattern is in the form of "H". The range selector lever moves in the form of a "U" in 3 stages, "Middle", "High" and "Low". By combination of using the main gear shift lever and the range selector lever, 9 forward speeds and 3 reverse speeds are obtained.

Traveling speed ranges are as shown below.



Notes

- L1 "L" means the range selector lever is in the low position.
 "1" means the main gear shift lever is in the first position.

IMPORTANT:

- (1) H1 speed is slower than M2 speed or M3 speed.
- (2) To change speed, press the clutch pedal completely down and stop the tractor before attempting to proceed with speed change.

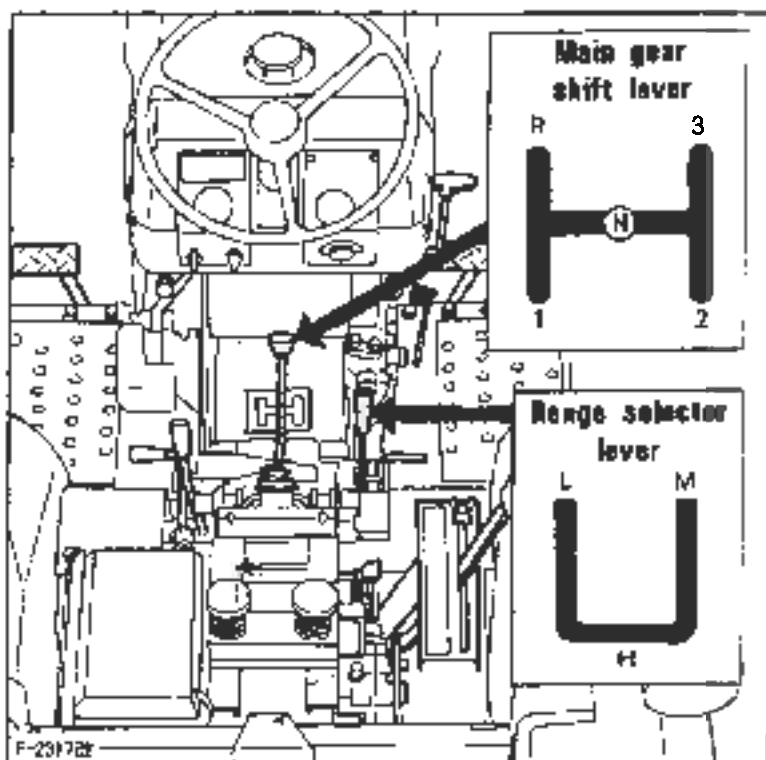
■ Clutch Pedal

The clutch is disengaged when the clutch pedal is fully pressed down.

IMPORTANT:

To help prevent premature clutch wear:

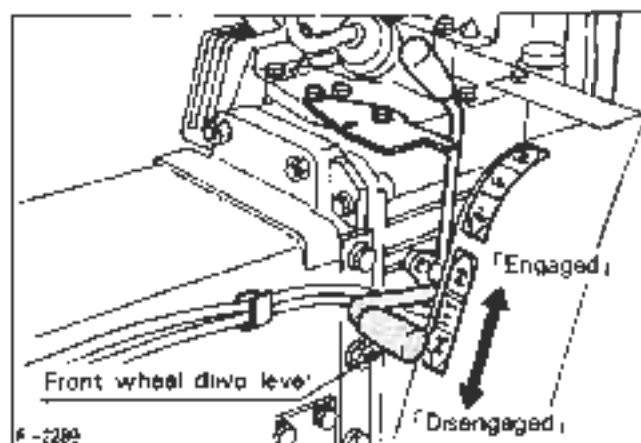
- (1) The clutch pedal must be quickly disengaged and be slowly engaged.
- (2) Avoid operating the tractor with your foot resting on the clutch pedal.



■ Front Wheel Drive Lever (4 WD)

The front wheel drive is used only when greater traction power is required or to prevent the tractor from lunging during rotary tilling hard soil.

Pulling up the lever engages the front wheels for 4 wheel drive.



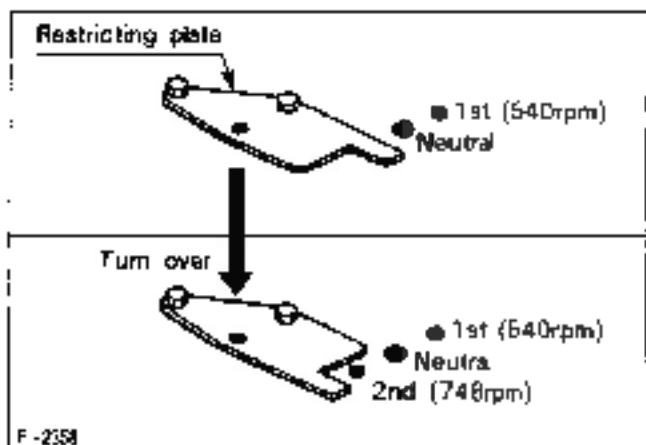
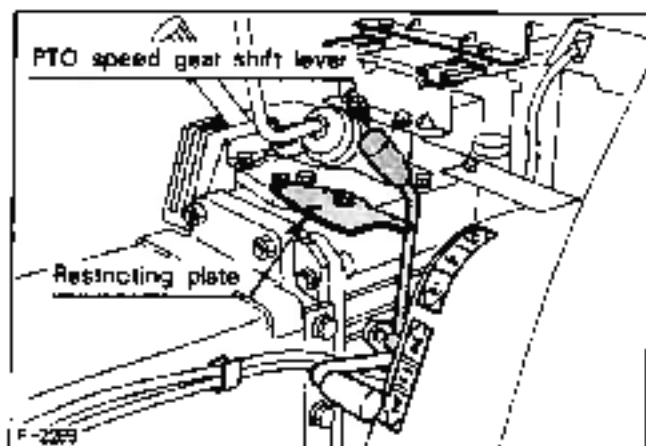
■ PTO Speed Gear Shift Lever



CAUTION:

- To prevent from overspeeding a PTO driven implement and possibly causing personal injury, use the 2nd PTO speed (748 rpm) only when this higher rpm is specifically recommended by the implement manufacturer.

The tractor has two speeds — 640 & 748 rpm. To use 748 rpm, loosen the two bolts and turn over the restricting plate. Replace restricting plate to original position following use of 748 rpm.

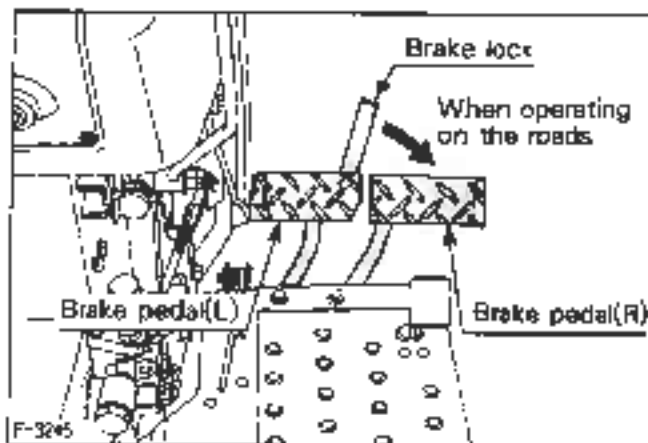


■ Brake Pedals (Right and Left)



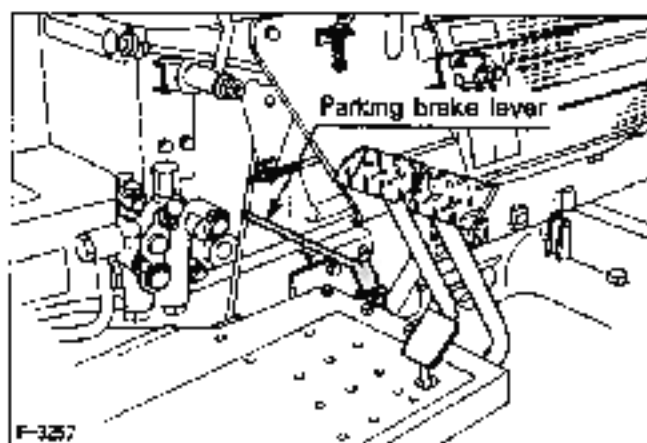
WARNING:

- Applying only one rear wheel brake at high speeds could cause the tractor to swerve or roll-over.
- (1) Before operating the tractor on a road, be sure to interlock the right and left pedals as illustrated below.
 - (2) Use individual brakes to assist in making sharp turns in field operation only. Disengage the brake lock and depress only one brake pedal.



■ Parking Brake Lever

- (1) To set the parking brake;
 - Interlock the brake pedals.
 - Depress the brake pedals.
 - Latch the brake pedals with the parking brake lever.
- (2) To release the parking brake, depress the brake pedals again.



■ Differential Lock Pedal

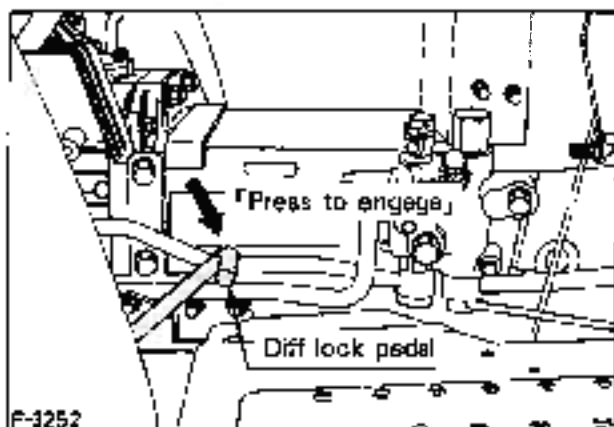


CAUTION:

- Never apply the differential lock when traveling at high speeds. Doing so could cause the tractor to swerve out of control.

Differential lock is applied only in cases where: the wheels are likely to slip, or only one of the rear wheel slips.

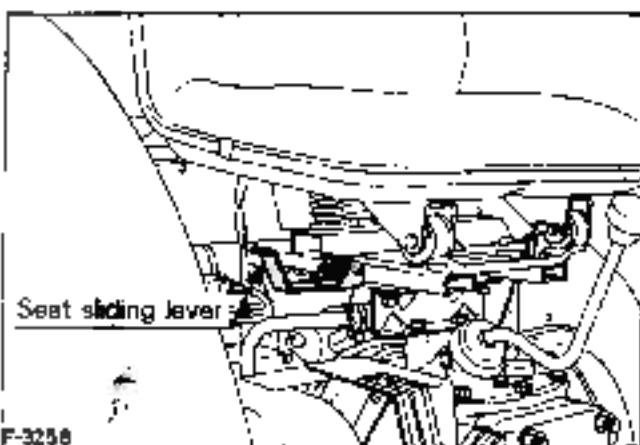
Lightly stepping on the differential lock pedal with the heel makes the rear wheels run at equal speed. To unlock, just release the pedal.



F-3252

■ Adjustable Sliding Seat

The operator's seat position can be adjusted forward and backward in 100 mm (4 in.) range by pulling the seat sliding lever.



F-3250

■ How to Open the Hood

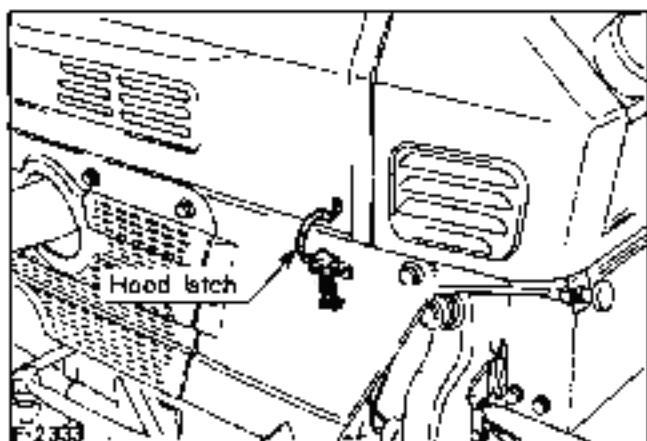
To open the hood, remove the hood latches located on both sides.

Lift the hood from the rear.



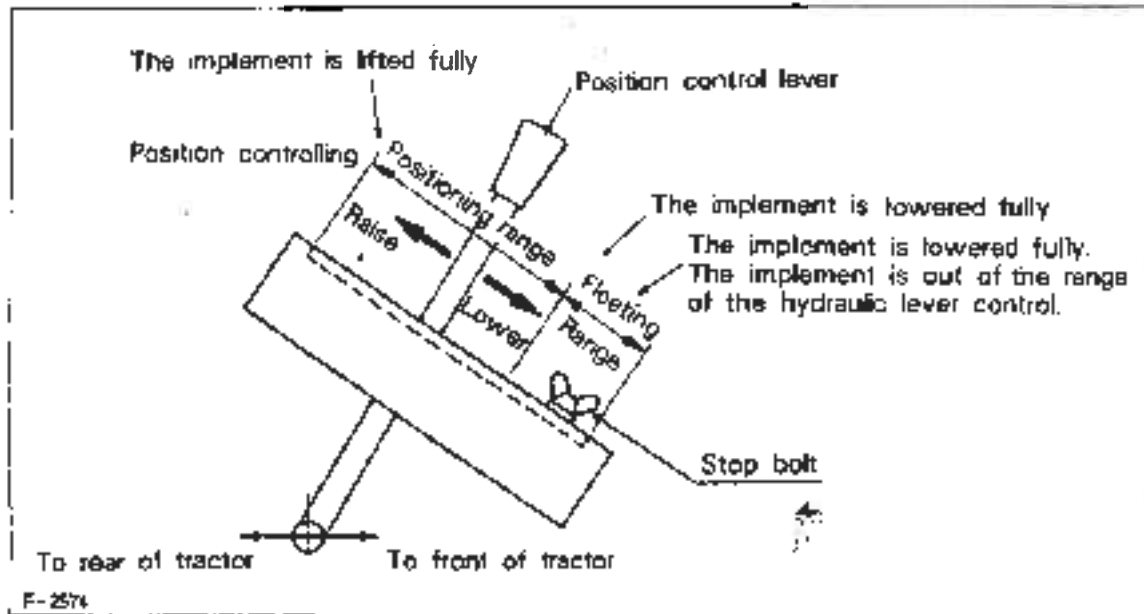
CAUTION:

- Never open the hood while the engine is running.



F-3253

■ Position Control

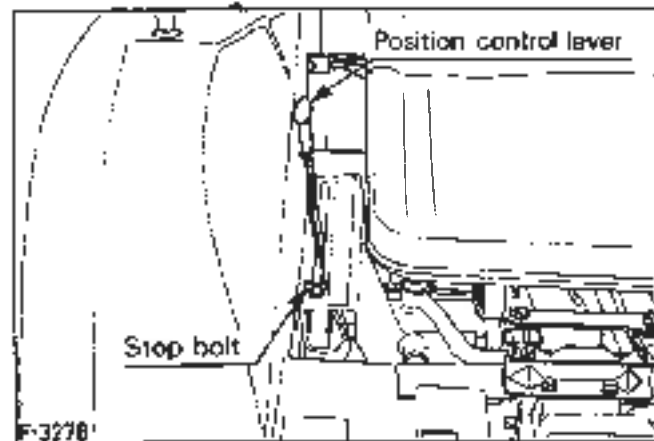


[Operation with position control]

- (1) To raise implement, pull the lever back fully. When the relief valve is activated, push the position control lever forward a little to prevent the system from operating at relief pressure.
- (2) To lower implement, push the lever forward.

IMPORTANT:

- (1) Do not operate until the engine is well warmed up. If operation is attempted while the engine is still cold, the hydraulic mechanism will not properly function and its service life will be shortened.
- (2) If noises are heard when the implement is lifting after the hydraulic control lever has been activated, the hydraulic mechanism is not adjusted properly. Unless corrected the unit will be damaged. Contact your Kubota dealer for adjustment.



■ Implement Lowering Speed Control

Adjust down speed of implement by turning the grip under the seat. The lowering speed depends on weight of implement and operating speed.

Adjust grips clockwise for slow lowering speed, counter-clockwise for faster lowering speed.

Do not overtighten the grip.

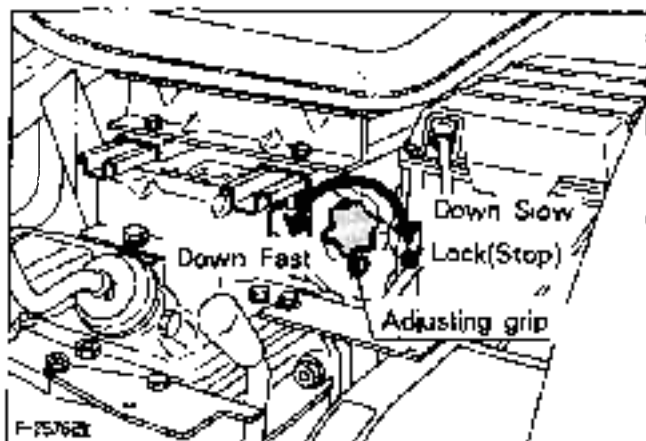


CAUTION:

- When transporting, on the road, set the implement lowering speed control in the "lock" position to hold the implement in the raised position.

IMPORTANT:

- Note that the proper lowering speed of a rotary tiller is such that it takes two or three seconds to descend from the top position to the ground.



■ Power Steering (Optional)

- (1) The power steering system is actuated only while the engine is running. As long as the engine is off, the tractor with power steering functions in the same manner as the ones without power steering.
- (2) Do not turn the steering wheel carelessly while the tractor is stopped or steer the tractor forcibly with a front wheel in a ditch. Otherwise the front wheels and the front axle will wear out quickly.
- (3) Avoid operating the tractor continuously with the steering wheel turned all the way to either side. Keeping the relief valve activated causes oil to deteriorate, and the pump and link will be damaged or worn very quickly.



CAUTION:

- Power steering makes the steering wheel easy to turn. Drive the tractor with care especially when traveling on a road.

5.3 AUXILIARY HYDRAULICS



CAUTION:

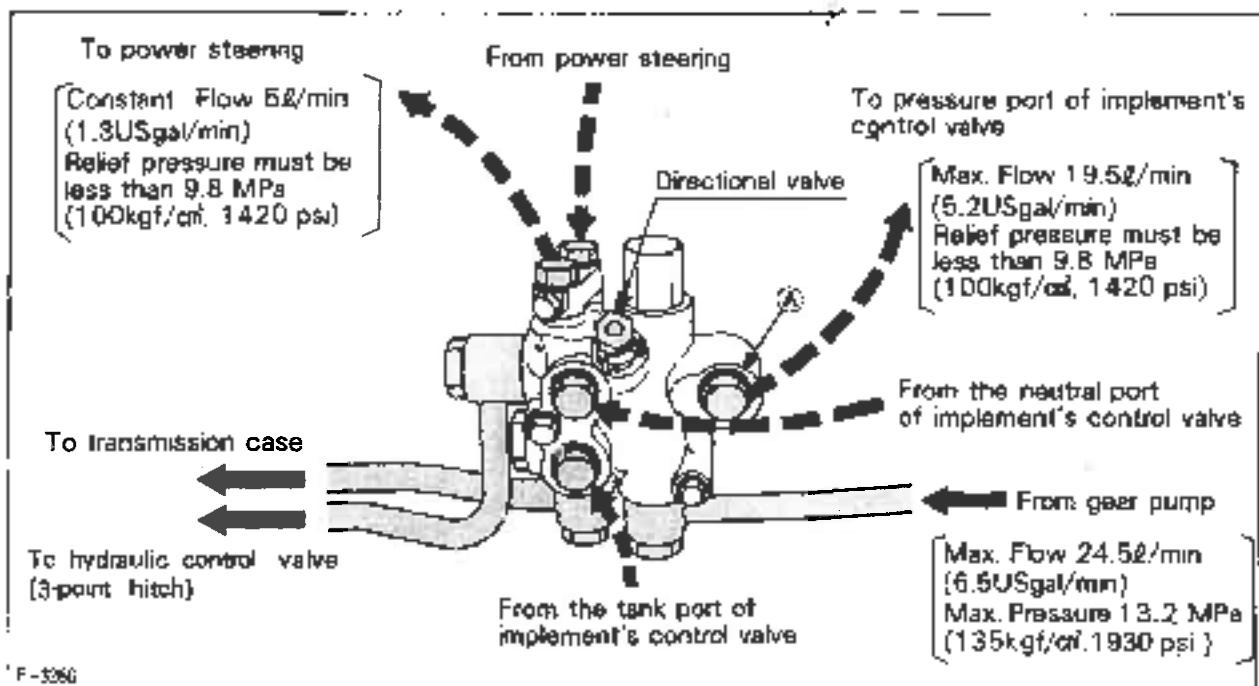
- Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to system, be sure all connections are tight and that lines, pipes, and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Hydraulic Block Type Outlet

Hydraulic block type outlet is useful when adding hydraulic operated equipment such as: power steering, front end loader, front blade, etc.

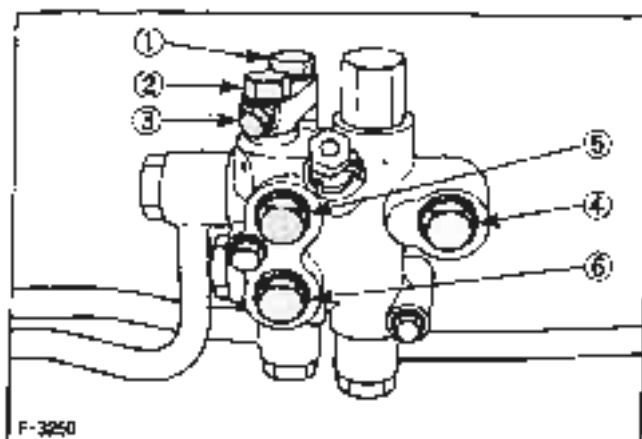
IMPORTANT:

- When the hydraulic outlet **A** is not in use, turn the directional valve counterclockwise completely. If not, the relief valve will operate.



(When using power steering)

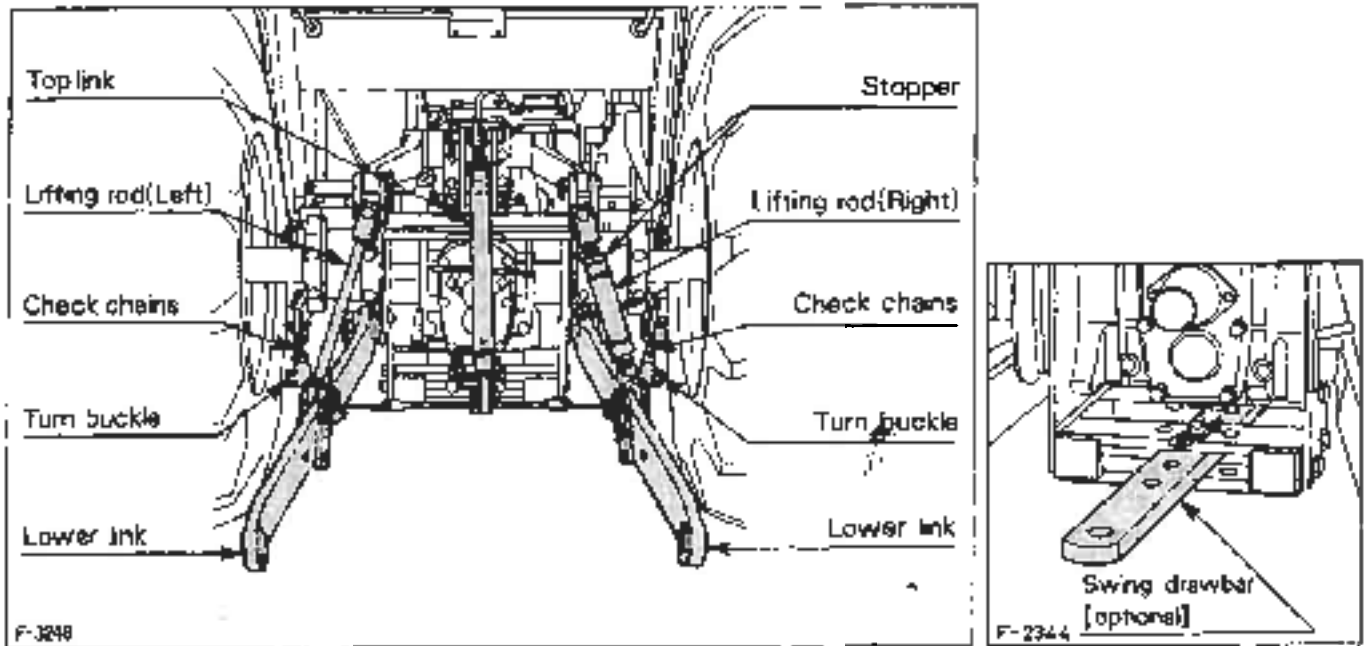
Loosen the two plugs ① ② and detach the cap ③ and connect the pipes from the hydraulic block to power steering.



(When using other implement's control valve)

- (1) Loosen the plugs ④ ⑤ ⑥ and connect the pipes from hydraulic block to other implement.
 - ④ to pressure port
 - ⑤ to neutral port
 - ⑥ to tank port
- (2) Turn the directional valve clockwise completely.

6. THREE-POINT HITCH & DRAWBAR

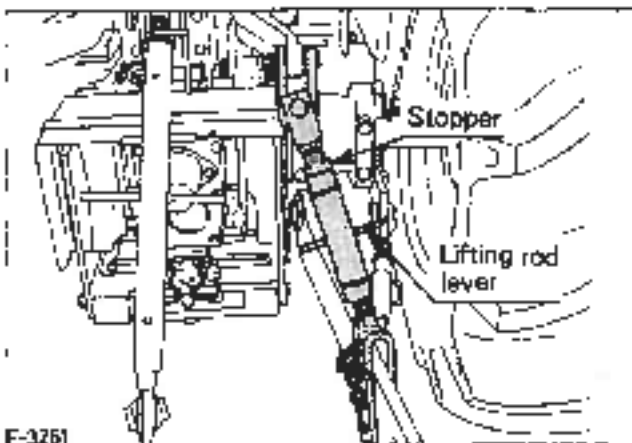


■ Adjustment of Top Link

- (1) Adjust the angle of the implement to the desired position by shortening or lengthening the Top Link.
- (2) The proper length of the top-link varies according to the type of implement being used.

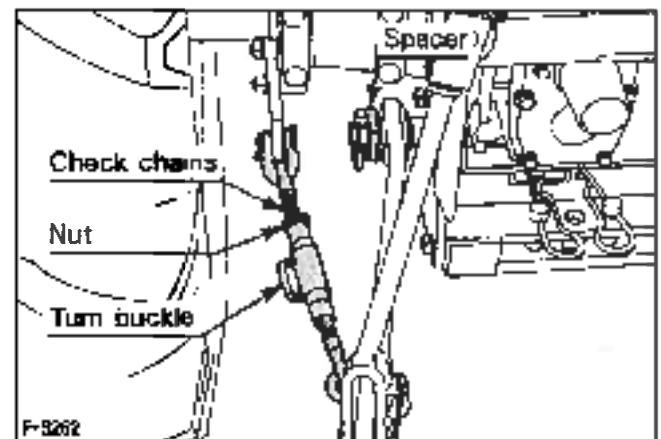
■ Adjustment of Lifting Rod

- (1) Level a 3-point mounted implement from side to side by turning the lifting rod lever to shorten or lengthen the adjustable lifting rod.
- (2) After the adjustment is completed, secure with the stopper.
- (3) Correct positioning of the lifting rod to the lower link is shown below. Positioning varies according to the type of implement being used.



■ Adjustment of Check Chains

- (1) Adjust the turn-buckle to control horizontal sway of the implement.
- (2) Check to see that the spacers are outside of lower links.



Type of implement	Chain adjustment
Plow, furrower, subsoiler, cultivator, ditcher	Loosen until the implement can be moved 50~80 mm (2~2.5 in.) horizontally.
Rotary, mower, hayrakes, tedder, ridger	Tighten.

7. WHEELS, TIRES AND BALLAST



CAUTIONS:

Never operate tractor with a loose rim, wheel, or axle.

- (1) Any time bolts are loosened, retighten to specified torque.
- (2) Check all bolts frequently and keep them tight.

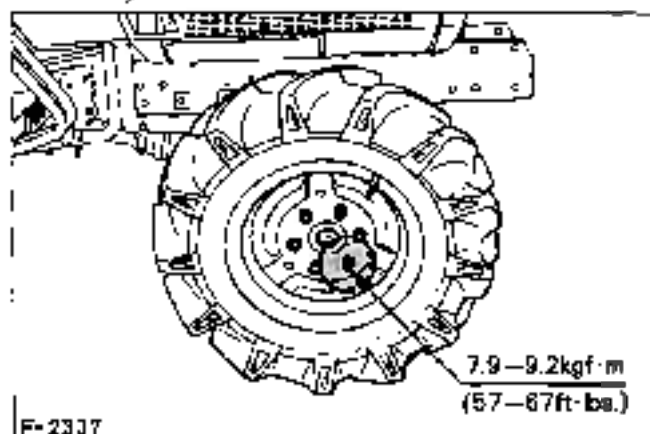
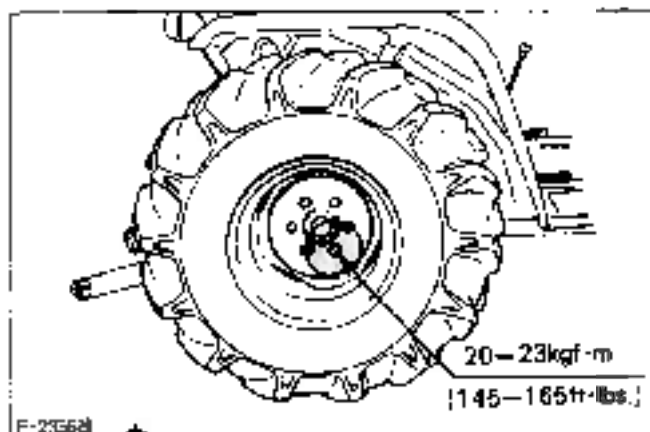
IMPORTANT:

- Follow same checking procedure when tractor is first used.

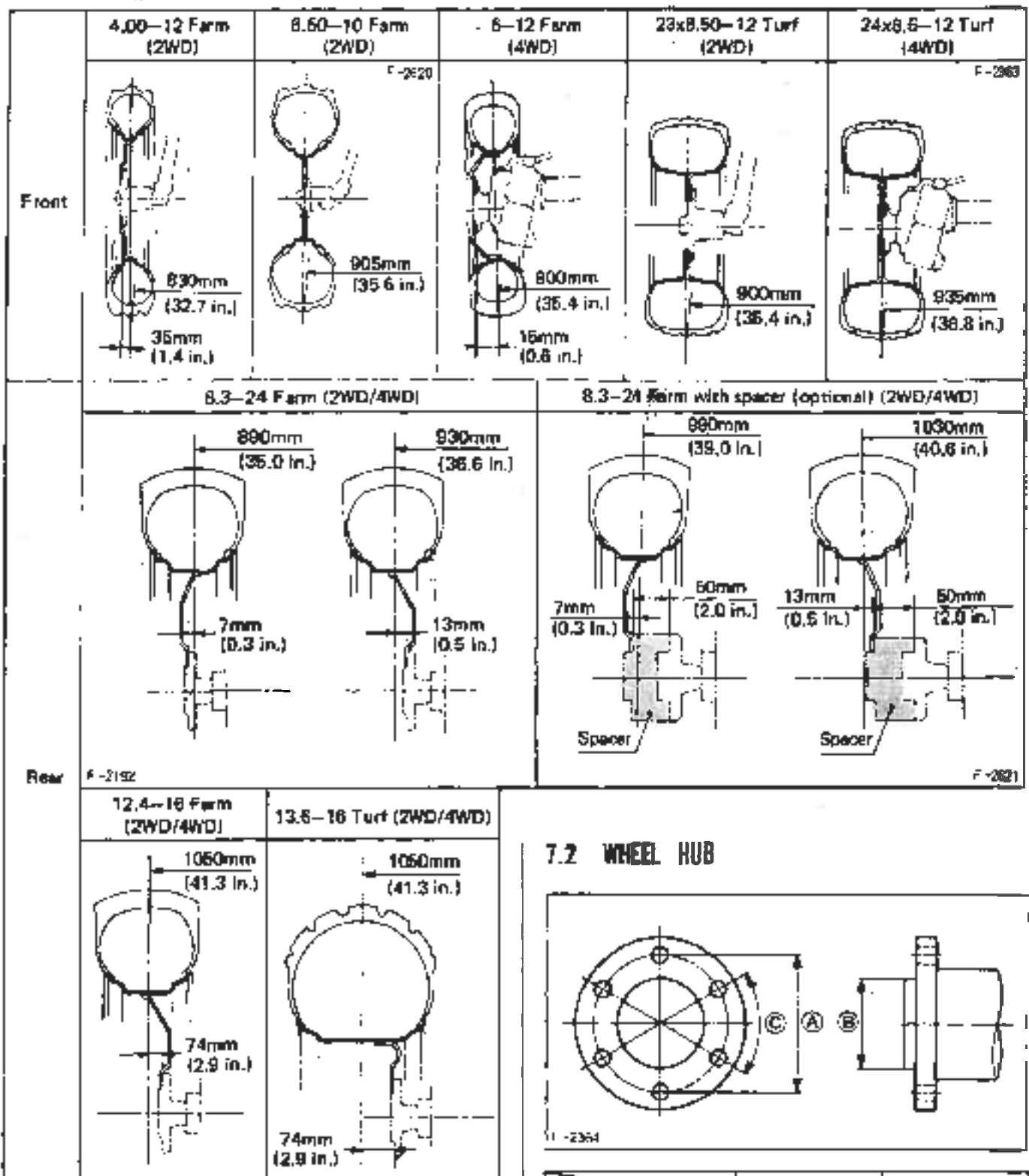


CAUTION:

- When working on slopes or when working with trailer, set the wheel tread as wide as practical for the job for maximum stability.



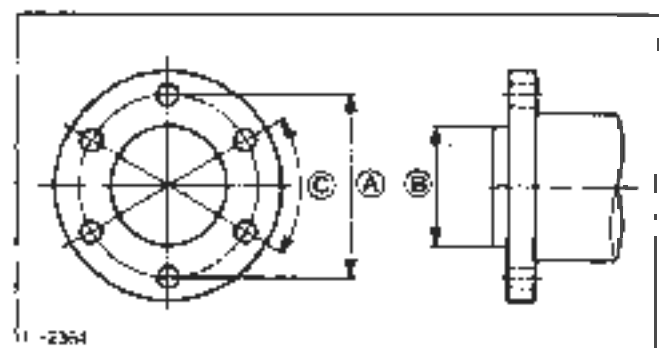
7.1 TREAD

**IMPORTANTES:**

- (1) Always attach tires as shown in the above drawings.
- (2) If not attached as illustrated, transmission parts may be damaged.

Do not use tires larger than specified.

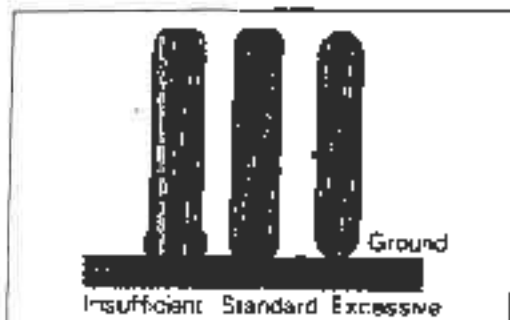
7.2 WHEEL HUB



	Front wheel hub	Rear wheel hub
Bolt circle diameter (A)	115mm (4.53in.)	150mm (5.9in.)
Number of bolts	6	6
Bolt specifications (mm)	M12 x Pitch 1.25	M16 x Pitch 1.5
Pilot bore diameter (B)	69.5mm (2.74in.)	110mm (4.33in.)
Hole spacing (C)	Equal 60 deg.	Equal 60 deg.

7.3 TIRES

Though the tire pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time. Thus, check it everyday and inflate as necessary.



CAUTION:

- Do not attempt to mount a tire. This should be done by a qualified person with the proper equipment.

Qualified persons with the proper tire mounting equipment should recognize the following warning.



WARNING:

- Never exceed the pressure shown below (maximum limit) when attempting to seat a bead. If beads have not been seated by the time the pressure reaches maximum limit, deflate the assembly, reposition the tire on the rim, lubricate and reinflate. After seating the bead, adjust inflation pressure as recommended in the inflation pressure chart.

Maximum Limit of Inflation Pressure (In seating a bead)

Farm tire	8.3-24, 4PR	345kPa (3.6 kgf/cm ² , 50psi)
	12.4-16, 4PR	
	4.00-12, 4PR	
	6-12, 4PR	
	6.5-10, 4PR	
Turf tire	13.6-16, 4PR	288kPa (3.0 kgf/cm ² , 43psi)
	23x8.5-12, 4PR	
	24x8.5-12, 4PR	

7.4 BALLAST

(1) Selecting Front Ballast

Add weight to front and if needed for stability. Heavy pulling and heavy rear mounted implements tend to lift front wheels. Add enough ballast to maintain steering control and prevent tip over. Remove weight where it is no longer needed. Front weights are available from your Kubota Dealer. Your dealer can help you decide how much is required for your particular application.



CAUTION:

- Additional ballast may be needed for transporting heavy integral implements. When implement is raised, drive slowly over rough ground, regardless of how much ballast is used.

(2) Select rear ballast carefully.

Add weight to rear wheels if needed to improve traction or for stability. Amount of rear ballast should be matched to job and ballast should be removed when it is not needed. Rear wheel weights are available or liquid may be added to the tires. Consult your Kubota Dealer for the correct ballasting necessary for your particular application.

(2-1) Using liquid weight in rear tires.

Water and calcium chloride solution provides safe economical ballast. Used properly, it will not damage tires, tubes or rims. The addition of calcium chloride is recommended to prevent the water from freezing.

Use of this method of weighting the wheels has the full approval of the tire companies. See your tire dealer for this service. Do not fill any tire more than 75% full (to valve stem level).

Liquid weight per tire (75 Percent filled)

Tire sizes	8.3-24	12.4-16
Slush free at 10°C (13°F) Solid at -30°C (-23°F) [Approx. 1 kg (2 lbs.) CaCl ₂ per 4ℓ (1 gal) of water]	68 kg (123 lbs.)	86 kg (187 lbs.)
Slush free at -24°C (-12°F) Solid at -47°C (-52°F) [Approx. 1.6 kg (3.6 lbs.) CaCl ₂ per 4ℓ (1 gal) of water]	80 kg (132 lbs.)	89 kg (198 lbs.)
Slush free at 47°C (122°F) Solid at -52°C (-62°F) [Approx. 2.26 kg (5 lbs.) CaCl ₂ per 4ℓ (1 gal) of water]	83 kg (183 lbs.)	94 kg (207 lbs.)

IMPORTANT:

- Do not fill the following tires with water.
4.00-12 6-12 23x8.50 12
6.50-10 24x8.50-14

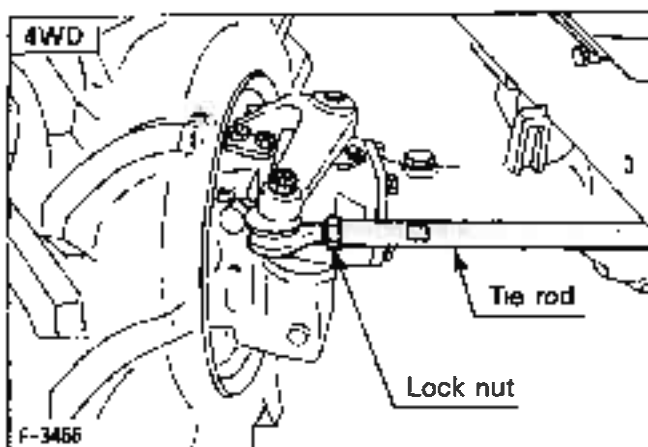
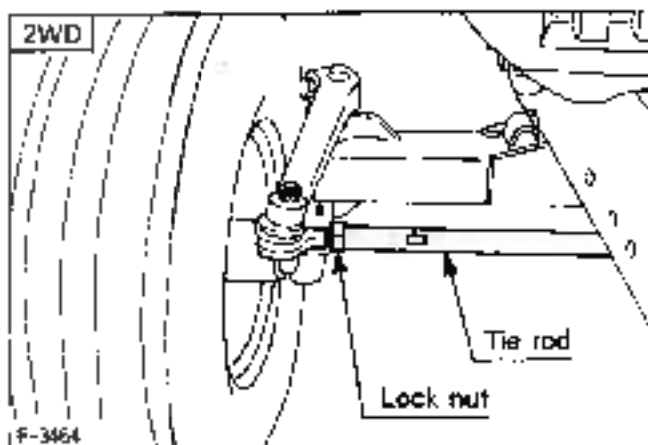
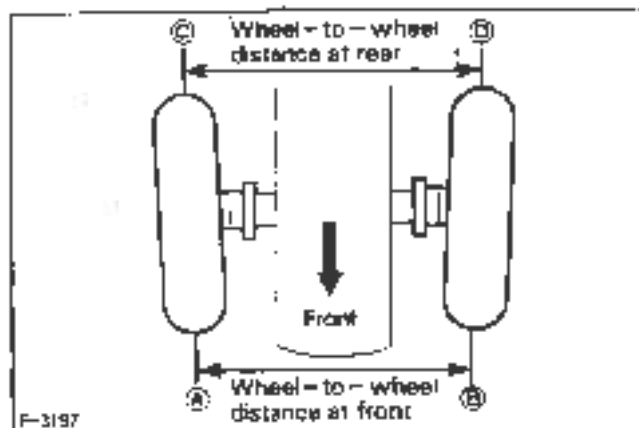
■ Inflation Pressure

Rear	8.3-24, 4PR	160kPa (1.6kgf/cm ² ; 23 psi)
	12.4-16, 4PR	120kPa (1.2kgf/cm ² ; 17 psi)
	13.6-16, 4PR	100kPa (1.0kgf/cm ² ; 14 psi)
Front	4.00-12, 4PR	310kPa (3.2kgf/cm ² ; 48 psi)
	6-12, 4PR	200kPa (2.0kgf/cm ² ; 28 psi)
	6.5-10, 4PR	200kPa (2.0kgf/cm ² ; 28 psi)
	23x8.5-12, 4PR	160kPa (1.6kgf/cm ² ; 23 psi)
	24x8.5-12, 4PR	160kPa (1.6kgf/cm ² ; 23 psi)

7.5 TOE-IN

Toe-in equals distances (C)(D) - (A)(B), or 0 to 5mm (0 to 0.2 in.).

To adjust toe-in loosen the lock nut and adjust the length of the tie rod until the proper toe-in measurement is obtained. Retighten the lock nut.



8. OPERATING INSTRUCTIONS

Pre-Start Checks

Prior to starting the engine, make pre-start checks according to the Maintenance Check List on page 30 to 31.



CAUTIONS:

- (1) Read "Safe Operation" in the front of this manual.
- (2) Read the warning and caution label located on the tractor.

8.1 OPERATING THE ENGINE



CAUTIONS:

- (1) To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.
- (2) Make it a rule to set main gear shift lever and PTO speed gear shift lever to the "neutral" positions before starting the engine.

■ Starting

- (1) Sit in the operator's seat. If the tractor is equipped with a ROPS, fasten the seat belt.
- (2) Set the parking brake.
- (3) Place Main gear shift lever and PTO speed gear shift lever in the "neutral" positions.
- (4) Place hydraulic control lever in lowest position.
- (5) Push in the engine stop knob.
- (6) Insert the key into the key switch and turn it on.
- (7) Make sure that the engine oil pressure light is on.
- (8) Fully depress the clutch pedal and turn the key switch left, until the glow plug light turns red. Though the glow plug light turns red in about 30 seconds, it takes at least 20 seconds until the preheating coil in the combustion chamber is fully heated. The lower the ambient temperature, the longer the preheating time. For the necessary preheating time, refer to the table below:

Temperature	Preheating Time
Over 0°C (32°F)	20 - 30 sec.
0 to -6°C (32 to 23°F)	40 - 80 sec.

- (9) Turn the key switch to the start position and the starter will turn and the engine should start.
- (10) Make sure that the engine oil pressure lamp has gone off. If the lamp is still on, immediately stop the engine and check the lubrication system.
- (11) Perform warm-up operations by running the engine at the medium speed.

IMPORTANT:

- (1) Do not turn the key switch to start position while the engine is running.
- (2) When the temperature is below 0°C (32°F), place the main gear shift lever in the neutral position and keep the engine at medium speed to warm up the lubricant of engine and transmission at least 10 minutes. If the tractor is operated before the lubricant of engine and transmission is warm enough, the tractor life will be shortened.
- (3) Don't operate the tractor under full load condition until it is sufficiently warmed up.
- (4) Don't use starting fluid.

■ Starting with Weak Battery or in Cold Weather

Perform the following procedure between the steps (6) and (10) on Starting:

- (1) Pull out the decompression knob.
- (2) Depress the clutch pedal all the way and turn the key switch to the start position.
- (3) After the flywheel starts to run at full speed in 3 to 5 seconds, push the decompression knob back. If necessary, operate preheating before pulling out the decompression knob.

IMPORTANT:

- When the ambient temperature is less than -15°C (5°F), remove the battery from the tractor and store it somewhere warm until next operation.

■ Stopping

- (1) Pull the engine stop knob completely and hold it until the engine stops.
- (2) Turn the key switch off and pull the key out of the switch.

IMPORTANT:

- Although engine can be stopped by pulling out the decompression knob, this should never be done except in such an emergency case that the engine cannot be stopped by pulling the engine stop knob. Especially, if the decompression knob is pulled out while the engine is running at high speed, there is the danger that the valve seat may be damaged or that the decompression device may malfunction. For this reason, be absolutely sure not to pull out the decompression knob when the engine is running except in emergency cases.

8.2 OPERATING THE TRACTOR

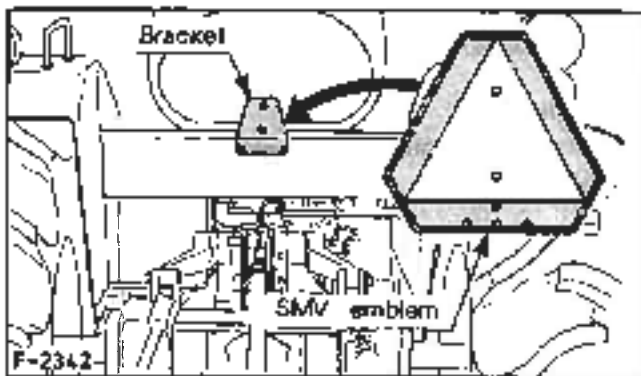
■ Starting

- (1) Depress the clutch pedal to disengage the clutch.
- (2) Shift levers to the desired speed position.
- (3) Unlock the parking brake.
- (4) Speed up the engine by moving the throttle lever forward.
- (5) Slowly release the clutch pedal.



CAUTIONS:

- (1) Interlock the right and left brake pedals before starting. Uneven braking results in a sharp turn, which may even turn over the tractor.
- (2) Do not allow any person other than the driver to ride on the tractor.
- (3) Do not drive the tractor close to the edges of ditches or banks which may break under the weight of the tractor, especially when the ground is loose or wet.
- (4) Slow the tractor down to a safe speed before turning.
- (5) Do not drive the tractor on the road with the implement in motion.
- (6) After the differential lock has been used, be sure to see that it has been released.
- (7) When traveling on a road, attach the SMV emblem to the tractor to identify it as a low speed vehicle.



IMPORTANT:

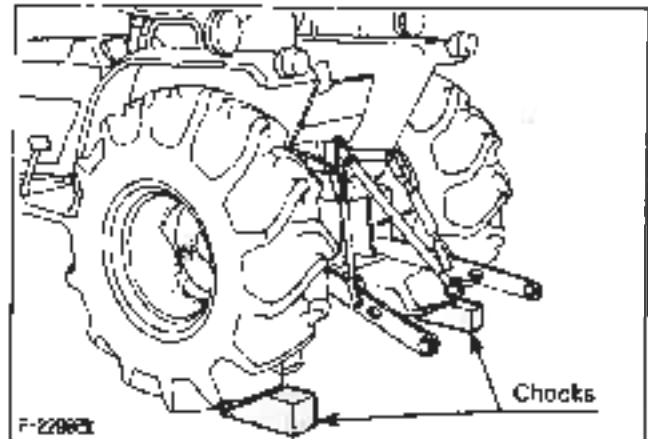
- (1) Do not move the tractor with the parking brake on.
- (2) Do not operate the tractor with your foot resting on the clutch pedal. This may contribute to premature clutch wear.
- (3) Gear shift levers cannot be shifted while the tractor is moving. To shift levers be sure to stop the tractor and depress the clutch pedal.

■ Stopping

- (1) Slow down the engine.
- (2) Interlock the right and left brake pedals and put on the parking brake.

■ Parking

- (1) When parking, be sure to put on the parking brake.
- (2) If necessary to park on an incline, be sure to chock the wheels to prevent accidental rolling of the machine.



- (3) Before getting off the tractor, be sure to stop the engine and lower the implement to the ground.

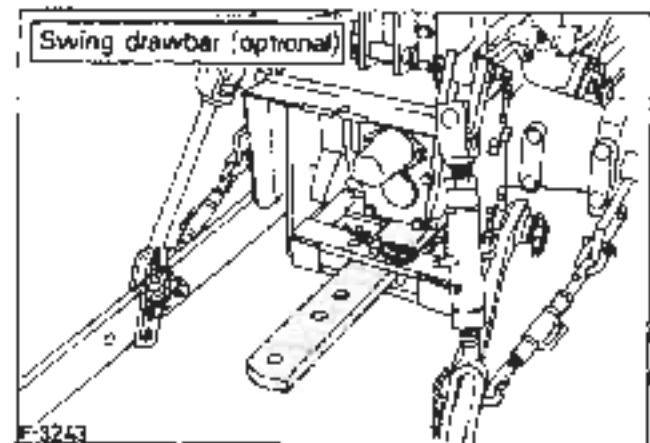
8.3 PULLING



CAUTION:

- Never pull from the top link, the rear axle or any point above the drawbar. Doing so could cause the tractor to tip over rearward causing personal injury.

For pulling, attach to the drawbar. Use the 3-point hitch only with equipment designed for 3-point hitch usage.



8.4 CHECK DURING DRIVING

While driving, make the following checks to see that all the parts are functioning normally.

■ Coolant



CAUTION:

- Do not remove radiator filler cap until coolant temperature is below its boiling point. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.

If the temperature of the coolant rises above 100°C (212°F), the overheat alarm whistles. Immediately stop the engine and determine the cause, with the safety caution in mind.

- (1) Shortage or leakage of the coolant.
- (2) Foreign matter on the radiator net and dust and dirt between the radiator fins and tube.
- (3) Loose fan drive belt
- (4) Blockage in the radiator tube.

■ Engine Oil Pressure Light

The pressure light signals to the operator that the engine oil pressure is below the prescribed level. If the light should go on during operation, immediately stop the engine and check:

- (1) The level of the engine oil. (See page 33)
- (2) The conditions of the lubrication system.

■ Battery Charge Light

The charge light signals to the operator that alternator is not charging the battery.

If the light goes on during operation, immediately stop the engine and check:

- (1) Wiring failure.
- (2) Connection failure of alternator and regulator
- (3) Alternator drive belt failure.

■ Fuel

Do not allow the fuel tank to empty completely. Doing so will allow air to enter into the fuel system. Should this happen, the fuel system must be bled. (See page 32)

■ Exhaust Fumes

- (1) Exhaust fumes are colorless at normal output drive.
- (2) If the exhaust turns dark continuously during driving, this probably indicates an overburden on the engine. In such a case, corrective action should be applied to conditions of operation so that subsequent damage to the engine can be avoided.

■ Urgent Stop

Should the following abnormally take place, immediately stop the engine.

- (1) The engine suddenly slows down or speeds up.
- (2) Unusual noises are suddenly heard.
- (3) Exhaust fumes suddenly become very dark.
- (4) The engine oil pressure light goes on while operating.
- (5) The battery charge light goes on while operating.

For checks and remedies in the above situations, consult your dealer for instruction.

8.5 DIRECTIONS FOR OPERATING

■ Differential Lock Pedal

Observe the following precautions when applying the differential lock.

- (1) Apply the differential lock moderately. Limit its use to the below situations.
 - When the tractor enters or leaves the farm field, it cannot move straight because of excessive individual wheel-spin under difficult or slippery field conditions.
 - One rear wheel is caught in a loose area of the field and the tractor cannot move due to wheel-spin.
 - In the case of plowing, the rear wheel closer to the ridge is caught in the loose soil and is affected by wheel-spin.
- (2) The use of the differential lock must be limited to a particular period of time and should not be applied continuously.
- (3) When the rear wheel is subjected to excessive loads, even releasing the pedal sometimes may not unlock the differential although the pedal springs back. Should the differential not unlock when turning the tractor, lightly step on the brake pedal opposite to the turn side or turn back the steering wheel and run the tractor straight. By doing so, the differential can be unlocked. If the brake pedal of the turn side is depressed during turning, the differential lock system takes on an undue load. Avoid such improper operation.



CAUTION:

- The tractor cannot turn with the differential locked and attempting to could be very dangerous.

9. MAINTENANCE

9.1 DAILY CHECK

To prevent trouble from occurring, it is important to know the conditions of the tractor well. Check it before starting.



CAUTION:

- Be sure to check and service the tractor on a flat place with the engine shut off and the parking brake on.

- (1) Check areas where previous trouble was experienced.
- (2) Walking around the tractor;
 - 1) Check the tire pressure, and check for wear and damage. (See page 25)
 - 2) Check for oil and water leaks.
 - 3) Check the engine oil level. (See page 33)
 - 4) Check the amount of transmission fluid. (See page 34)
 - 5) Check if there is enough fuel. (See page 32)

- 6) Check if there is enough coolant in the radiator. (See page 37)
- 7) Check for dust in the air cleaner dust cup. (See page 38)
- 8) Check the tractor body for damage and check that all bolts and nuts are tight.
- 9) Check the SMV emblem for damage and clean or replace as necessary.
- (3) While sitting in the operator's seat;
 - 1) Check the throttle pedal, brake pedals and clutch pedal. (See page 41)
 - 2) Check the parking brake.
 - 3) Check the steering wheel. (See page 41)
- (4) Turning the key switch on;
 - 1) Check the performance of the pilot lights.
 - 2) Check headlights, tail lights and hazard lights clean if necessary.
- (5) Starting the engine;
 - 1) Check the color of the exhaust fumes.

9.2 LUBRICANTS

To prevent serious damage to hydraulic systems, use only genuine KUBOTA fluid or its equivalent.

Place	Capacity	Lubricants
Engine crankcase	3.1 ℓ (3.3 U.S.qts.)	<ul style="list-style-type: none"> • Engine oil: API Service CC or CD Below 0°C (32°F) SAE10W or 10W-30 0 to 25°C (32 to 77°F) SAE20 or 10W-30 Above 25°C (77°F) SAE30 or 10W-30
Transmission	18 ℓ (19 U.S.qts.)	<ul style="list-style-type: none"> • See Page 46
Front axle differential case [4WD]	2.1 ℓ (2.2 U.S.qts.)	<ul style="list-style-type: none"> • Gear oil SAE80 or SAE90
Front axle gear case [Right & left] [4WD]	0.5 ℓ (0.5 U.S.qt.)	<ul style="list-style-type: none"> • Gear oil SAE80 or SAE90
Steering gear box (Manual steering)	0.2 ℓ (0.2 U.S.qt.)	<ul style="list-style-type: none"> • Gear oil SAE80 or SAE90
King pins [2WD] Center pin [2WD] Pedal shaft Clutch release hub Seat adjuster	moderate amount	<ul style="list-style-type: none"> • SAE multi-purpose type grease

9.3 MAINTENANCE CHECK LIST

Frequency of Checks	Check Points	Reference Pages
Initial operation (Initial 50 hours)	During this period, pay special attention to the following. (1) After the initial 35 hours of use, change the engine oil. (2) After the initial 50 hours of use, change the transmission fluid and clean the transmission strainer. (3) Quick starts or sudden braking should be avoided	33 to 34 34 to 35 -
Every 75 hours	Change engine oil	34
Every 100 hours	Lubricate the following points. King pins, Pedal shaft, Center pin, Range selector lever.	36 to 36
	Check the following points to be connected securely. Hydraulic inlet pipe clamps, Fuel pipe clamps	32
	Clean air cleaner element.	38
	Clean fuel filter.	33
	Check battery electrolyte level.	39
	Check fuel pipe.	32
	Check fan drive belt tension.	41
	Check clutch play.	41
	Check brake play.	41
Every 150 hours	Check steering wheel play.	41
	Change engine oil filter cartridge.	34
Every 150 hours	Check radiator hose.	37
	Change transmission fluid. Transmission case, front axle differential case (4WD), front axle gear case (right and left) (4WD). * Clean transmission strainer.	34 to 35
Every 400 hours	Change fuel filter.	-
Every 500 hours	Flush radiator.	38
Every one to two months	Recharge battery if necessary.	40
Every 3 months	Change scale inhibitor and coolant.	37
Every year or every 8 times of cleaning	Change air cleaner element.	39
Every year	Change anti-freeze and coolant.	38
2 years after purchase	Change battery, if necessary.	-
	Change radiator hose and clamps, if necessary.	37
	Change fuel line and clamps, if necessary.	32
	Change hydraulic hoses and clamps, if necessary.	-

10. CHECK AND MAINTENANCE

10.1 FUEL

■ Checking and Refueling



CAUTION:

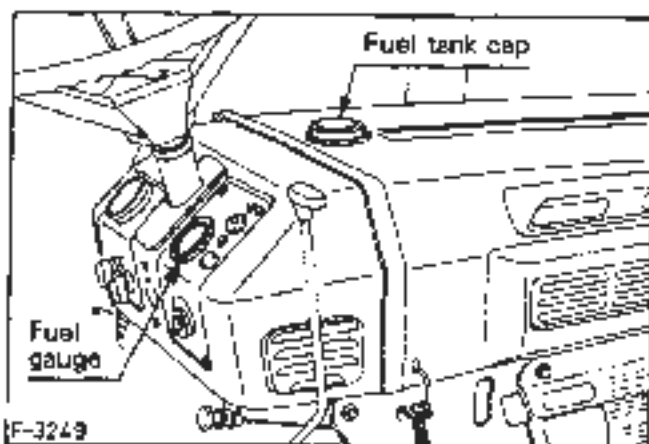
- Stop the engine before adding fuel. Keep away from sparks and flames.

- (1) Check the fuel level. Take care that the fuel level does not fall under the prescribed lower limit.

Fuel tank capacity	20 ℓ (5.3 U.S. gals.)
--------------------	-----------------------

- (2) Use diesel fuel No. 2-D.

- (3) Use No. 1 diesel fuel, if temperature is below -10°C (14°F).



IMPORTANT:

- (1) Always use a strainer in refueling to prevent fuel injection pump contamination.
- (2) Once the fuel tank becomes empty, air is admitted to the fuel system. In such case, it will be necessary to bleed the fuel system before the engine will start.

■ Bleeding the Fuel Line

Air must be removed:

- (1) When the fuel filter and lines are removed.
- (2) When tank is completely empty.
- (3) After the tractor has not been used for a long period of time.

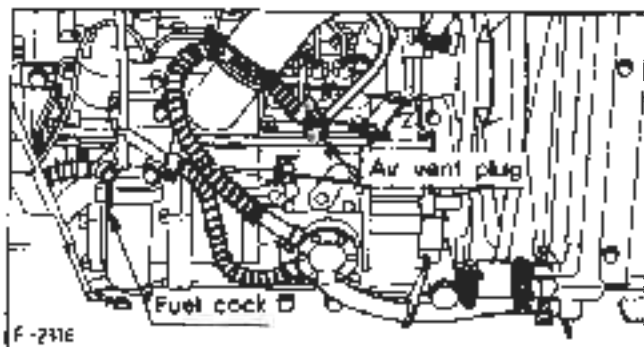
Bleeding procedure is as follows:



CAUTION:

- Do not bleed the fuel system when the engine is hot.

- (1) Fill the fuel tank with fuel, and open the fuel cock.



- (2) Open the bleeding screws at the top of the filter with two turns.
- (3) When bubbles disappear from fuel coming out of the plug, tighten the bleeding screws.
- (4) Open the air vent plug on the fuel injection pump.
- (5) Pull the engine stop knob back completely to prevent the engine from starting while turning the key to rotate the engine for about 10 seconds.



CAUTION:

- For above procedure, pull out the engine stop knob before engaging the starter.

- (6) Close the air vent plug when air bubbles disappear from the fuel flowing out.

■ Checking Fuel Line



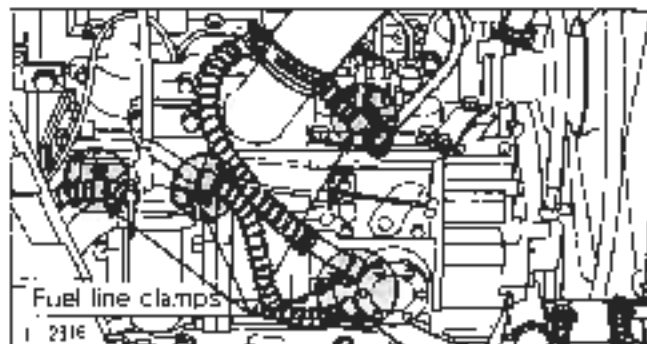
CAUTIONS:

- (1) Stop the engine when attempting the check and change as prescribed below.
- (2) Never fail to check the fuel line periodically.

The fuel line is subject to wear and aging, fuel may leak out onto the running engine, causing a fire.

Check the fuel line connections every 100 service hours or every 8 months, whichever occurs first.

- (1) If the clamp is loose, apply a slight coat of lubricant onto the threads and securely retighten it.



- (2) The fuel line is made of rubber and ages regardless of period of service. Change the fuel line together with the clamp whenever worn and securely tighten.
- (3) After the fuel line and clamp have been changed, bleed the fuel system.

IMPORTANT:

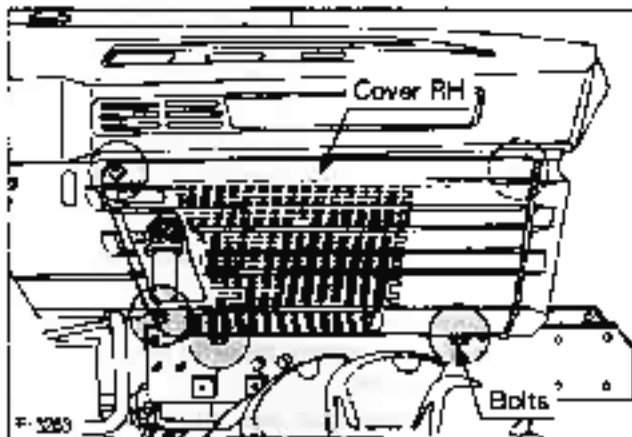
- When the fuel line is disconnected for change, close both ends of the fuel line with a piece of clean cloth or paper to prevent dust and dirt from entering. Entrance of dust and dirt causes malfunction of the fuel injection pump. In addition, particular care must be taken not to admit dust and dirt into the fuel pump.

■ **Cleaning the Fuel Filter Bowl**

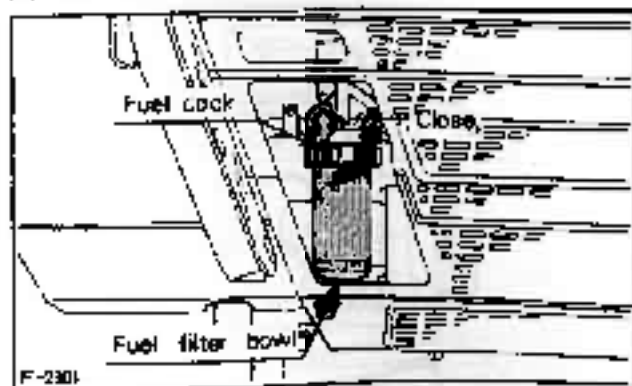
When period of operation reaches approx. 100 hours, clean the fuel filter.

This job should not be done in the field, but in a clean place so as to prevent dust intrusion.

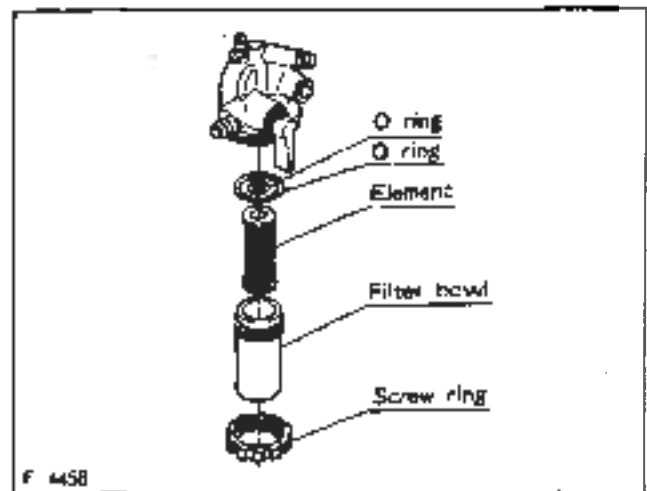
- (1) Unscrew the 6 bolts which fasten the cover RH, and remove the cover RH



- (2) Close the fuel filter bowl cock.



- (3) Unscrew and remove the screw ring, and rinse the inside with kerosene.
- (4) Take out the element and dip it in the kerosene to rinse.



- (5) After cleaning, reassemble the fuel filter, keeping out dust and dirt.
- (6) Bleed the injection pump.

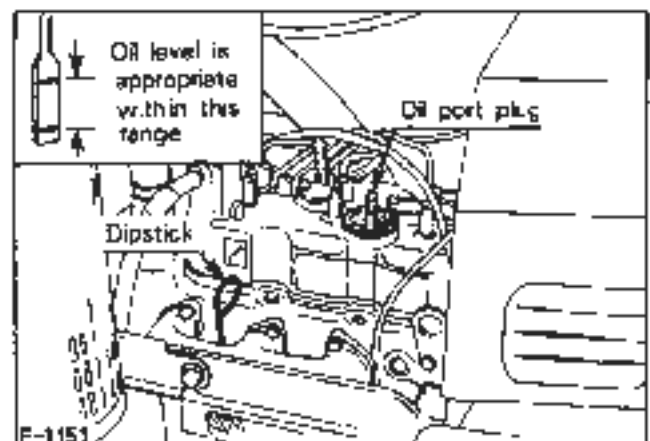
IMPORTANT:

- If dust and dirt enter the fuel, the fuel pump and injection nozzle are subject to quick wear. To prevent this, be sure to clean the fuel filter bowl periodically.

10.2 ENGINE OIL

■ **Oil Level Check and Replenishment (See page 30)**

- (1) Check engine oil before starting the engine and 5 minutes or more after the engine has stopped.
- (2) To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level lies between the two notches.
- (3) If the level is too low, add new oil to the prescribed level at the oil port.



- (4) When using an oil of different brand or viscosity from the previous one, remove all of the old oil. Never mix two different types of oil.
- (5) Use the proper SAE Engine Oil according to the ambient temperatures.

Refer to 9.2 "LUBRICANTS."

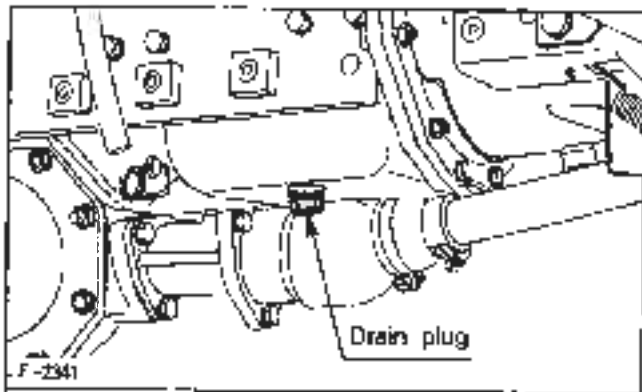
■ Engine Oil Change



CAUTION:

- Before changing the oil, be sure to stop the engine.

- (1) To change the used oil, remove the drain plug at the bottom of the engine and drain the oil completely. All the used oil can be drained out easily when the engine is still warm.



- (2) Reinstall the drain plug.
- (3) Fill with the new oil up to the upper notch on the dipstick.

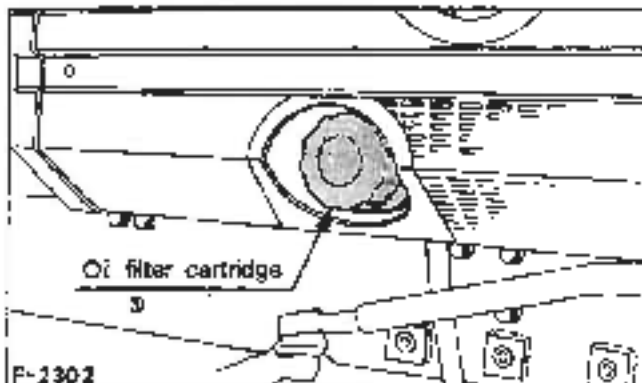
■ Engine Oil Filter Cartridge Change



CAUTION:

- Be sure to stop the engine before changing the oil filter cartridge.

- (1) The oil filter cartridge must be changed every 160 service hours.
- (2) Apply a slight coat of oil onto the cartridge gasket.
- (3) To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
- (4) After the new cartridge has been replaced, the engine oil normally decreases a little. Thus see that the engine oil does not leak through the seal and be sure to read the oil level on the dipstick. Then, replenish the engine oil up to the prescribed level.



IMPORTANT:

- To prevent serious damage to the engine, replacement element must be highly efficient. Use only a genuine KUBOTA filter or its equivalent.

10.3 TRANSMISSION FLUID



CAUTION:

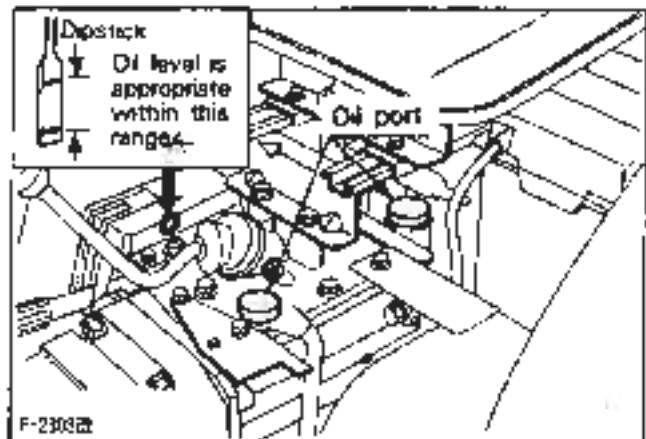
- Be sure to stop the engine before checking and changing the transmission fluid.

■ Transmission Fluid Check and Replenishment

To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw out it again. Check to see that the oil level lies between the two notches.

If short, replenish through the port.

Use multi-grade transmission fluid. (See page 46)

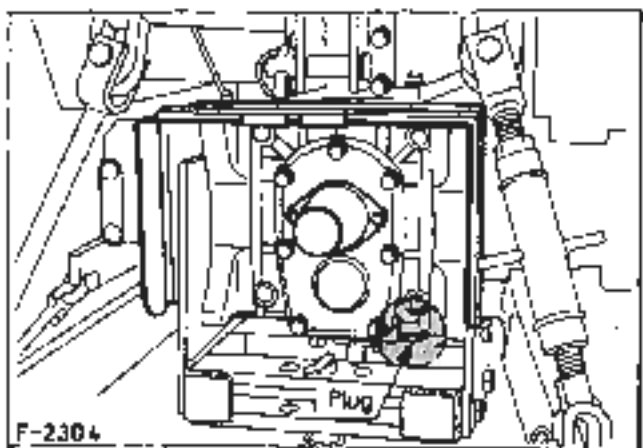


■ Transmission Fluid Change

The fluid in the transmission case is also used for the hydraulic system.

To drain the transmission case, place oil pan underneath the transmission case and remove the drain plug at the bottom of the transmission case.

After draining, disassemble and clean the transmission strainer. After reassembling, fill with new multi-grade transmission fluid.

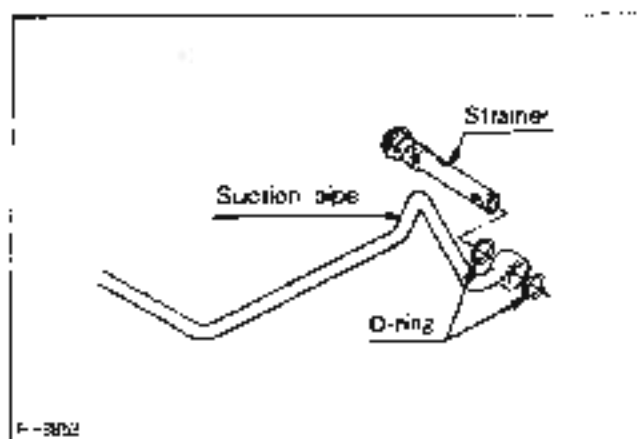
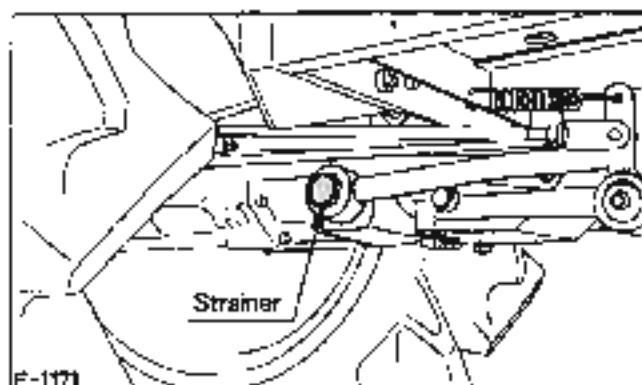


IMPORTANT:

- Never operate the tractor immediately after changing the transmission fluid and cleaning the transmission strainer. Keeping the engine at medium speed for a few minutes prevents damage to the transmission.

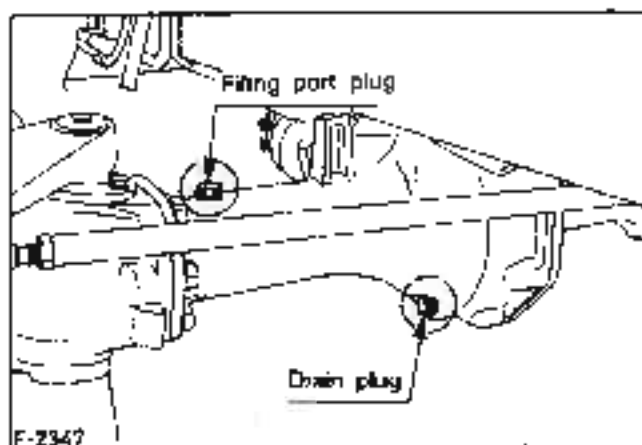
■ Cleaning Transmission Strainer

Since the fine filings in the oil could impair the component parts of the hydraulic system which is precision built to withstand high pressure, the suction line end is provided with an oil strainer. When changing the transmission fluid, disassemble and rinse the strainer with kerosene to completely clean off filings. For reassembly, be careful not to damage the parts.



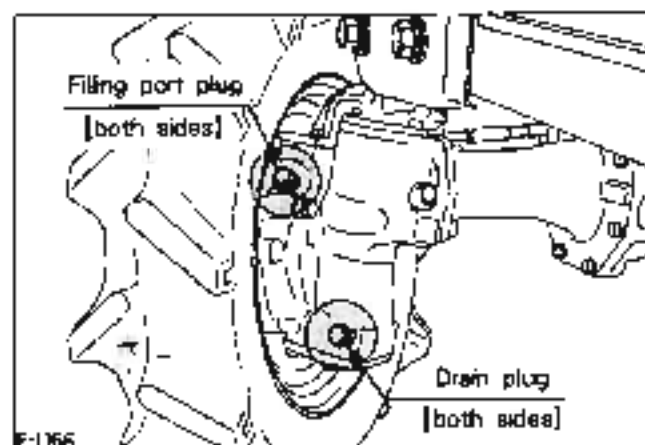
10.4 CHANGING FRONT AXLE DIFFERENTIAL CASE OIL {4WD} {See page 30}

Remove the drain and filling port plug. After draining, replace the drain plug and fill with new oil.



10.5 CHANGING FRONT AXLE GEAR CASE OIL {RIGHT AND LEFT} {4WD} {See page 30}

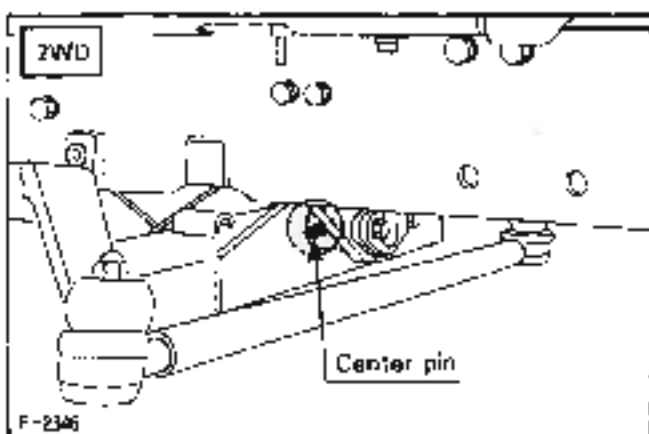
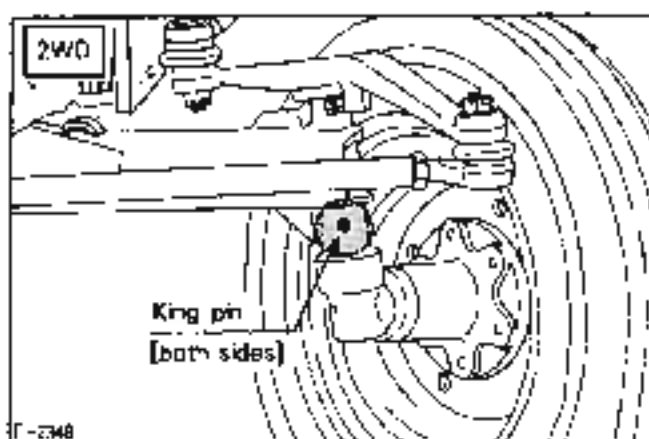
Remove the drain and filling port plugs to drain the used oil. After draining, replace the drain plug and fill with new oil.



10.6 OILING AND GREASING POINTS BEFORE STARTING

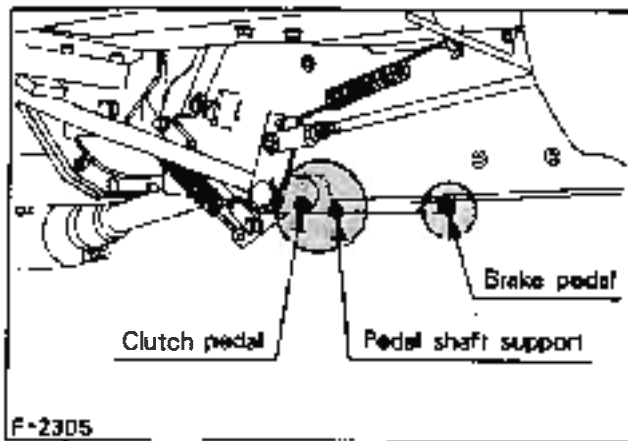
Oil or grease the following points before starting.

- King Pins {2WD} and Center Pin {2WD}
- Grease the king pins and center pin with grease gun.



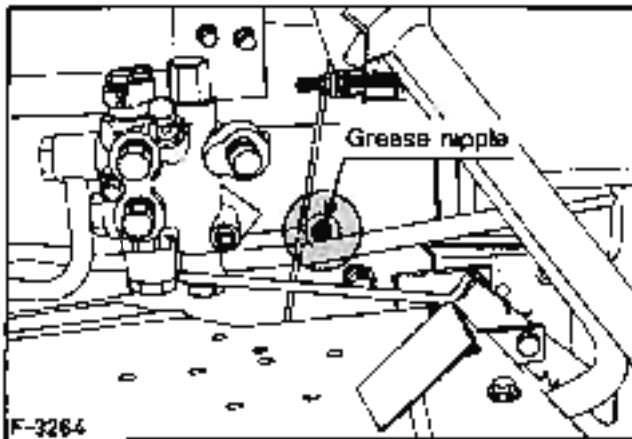
■ Pedal Shaft

Grease brake, clutch pedal and pedal shaft support.



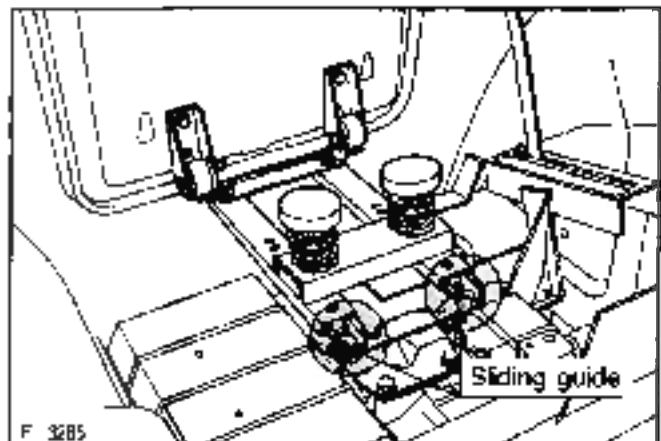
■ Clutch Release Hub

Sparingly lubricate the clutch release hub (throwout bearing). Too much grease will adversely effect the clutch performance.



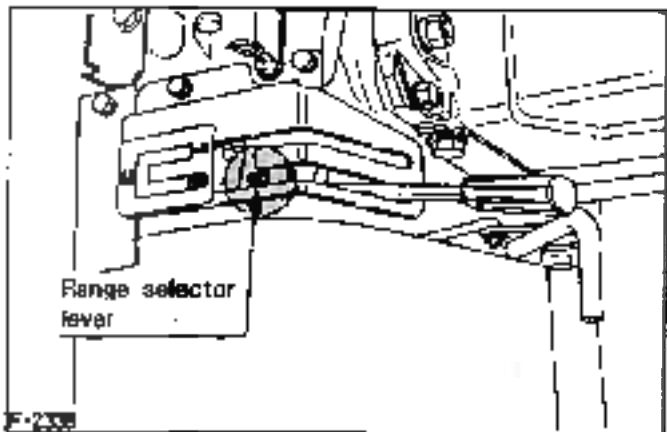
■ Seat Adjuster

Apply the grease on the surface of sliding guide.



■ Range Selector Lever

Grease the range selector lever with grease gun.



10.7 RADIATOR



CAUTION:

- Do not remove radiator filler cap until coolant temperature is below its boiling point. Then loosen cap slightly to the stop to release any excess pressure before removing cap completely.

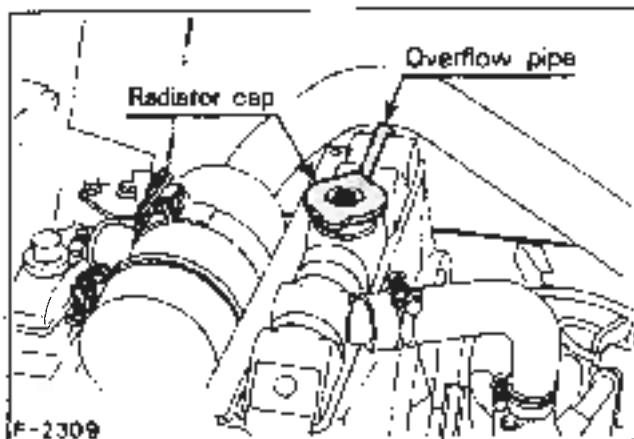
■ Checking, Replenishing and Changing Coolant

- Remove the radiator pressure cap and check to see that the coolant level is just below the port. If low, add clean water and anti-freeze.

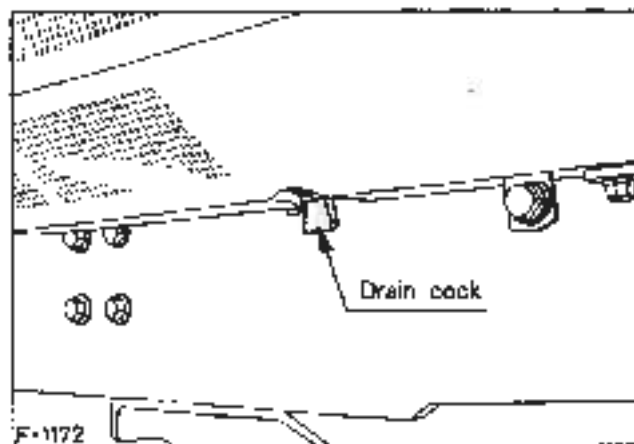
Prescribed quantity	4 ℓ (4.2 U.S. qts.)
---------------------	---------------------

IMPORTANT:

- Use clean, fresh water and anti-freeze to fill the radiator.
- Securely tighten the radiator cap.



- To drain the used coolant, open the radiator drain cock and remove radiator cap. The radiator cap must be removed to completely drain the radiator.



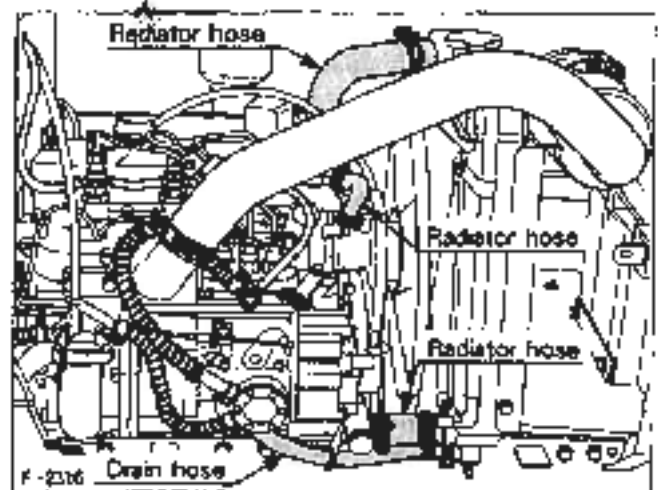
- Be sure to close the pressure cap securely. If the cap is loose or improperly closed, water may leak out and the engine could overheat.

- Radiator should be filled with 50/50 parts of anti-freeze and water at all times as recommended by the anti-freeze manufacturer. The anti-freeze contains a corrosion inhibitor and will allow a higher operating temperature in the radiator during the hot season.
- Do not use an anti-freeze and scale inhibitor at the same time.

■ Checking Radiator Hose

Checking radiator hose tightness is prescribed about every 150 service hours or every 8 months, whichever occurs first.

- If the clamp is loose, apply a slight coat of oil and securely retighten.
- The radiator hose is made of rubber and tends to age. It should be changed when worn. Also change the clamp and securely tighten.



■ Kubota Scale Inhibitor No. 11

- The Kubota Scale Inhibitor No. 11 or equivalent prevents scale formation in the coolant. Scale which builds up in either hard or soft water, sharply reduces cooling efficiency.
- The Scale Inhibitor is effective for 3 months so a complete change of coolant must be done every 3 months.

■ Remedying Water Leakage

- A small water leak can be eliminated with the Kubota Radiator Cement No. 40 or equivalent.
- If water leakage should become excessive, consult your local dealer.

■ Cleaning Cooling System

- (1) The water cooling system should be cleaned on the following occasions:
 - Every 500 service hours
 - When adding an anti-freeze solution.
- (2) When cleaning the water cooling system, the Kubota Scale Inhibitor No. 20 or equivalent is recommended to effectively wash away the scale built-up.

■ Anti-Freeze

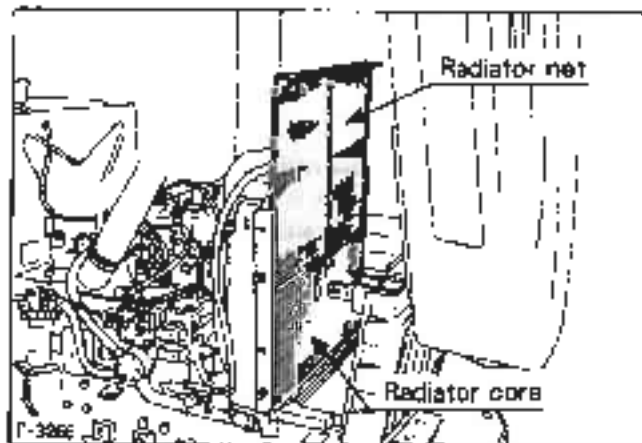
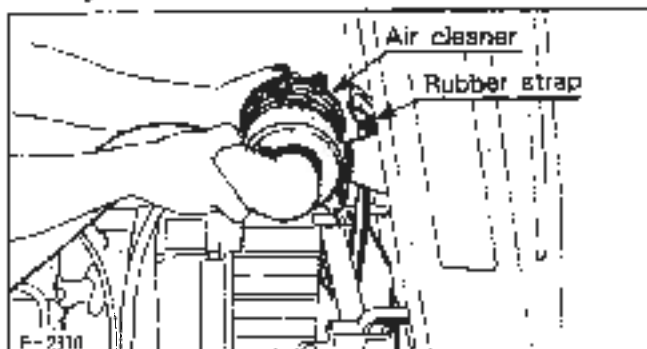
If the cooling water freezes, the engine cylinder and radiator may crack. In cold weather before the temperature drops below 0°C (32°F), drain out the water or add a proper amount of anti-freeze when the tractor is shut down.

- (1) There are two types of anti-freeze solutions, permanent type (PT) and semi-permanent type (SPT). For the Kubota Engine, be sure to use the permanent type.
- (2) When anti-freeze is used for the first time, drain and flush the cooling system completely.
- (3) Radiator should be filled with 50/50 parts of anti-freeze and water solution as recommended by the anti-freeze manufacturer. The anti-freeze contains a corrosion inhibitor and will allow a higher operating temperature in the radiator during the hot season.
- (4) Mix the anti-freeze and the water, then pour the mixture into the radiator.
- (5) When the coolant mixed with anti-freeze decreases due to evaporation, replenish with water only. If loss has been due to leaking, refill with water and anti-freeze mixture with the same mix ratio as the original preparation.
- (6) Anti-freeze solutions absorb moisture, so be sure to securely close the container after use.
- (7) Anti-freeze and water should be changed every year.
- (8) Do not use an anti-freeze and a scale inhibitor at the same time. This may cause sludge to form, adversely affecting the engine parts.

■ Checking and Cleaning Radiator

Daily or every 5 hours of operation, check to be sure the radiator net and radiator core are clean. Dirt or chaff on the radiator net or radiator core decrease cooling performance.

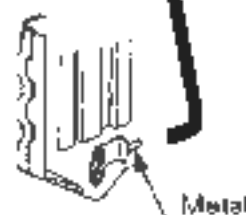
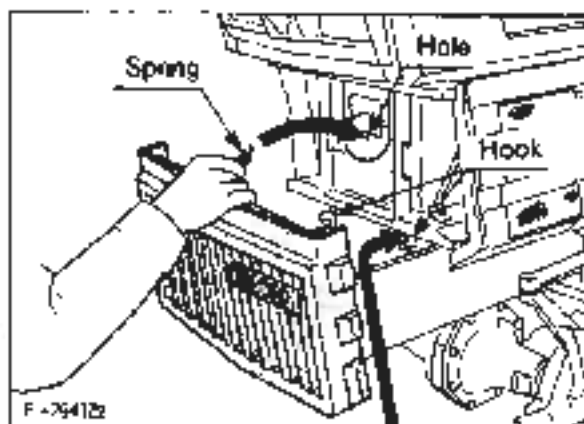
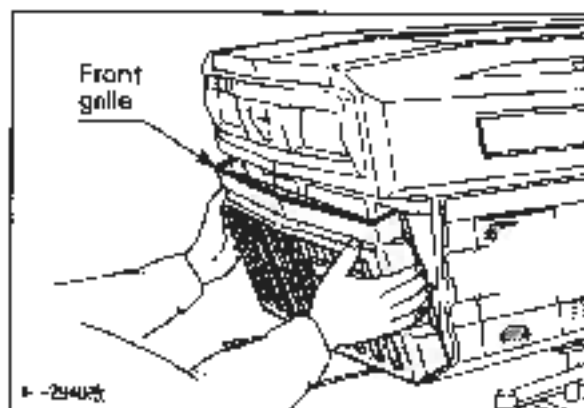
- (1) In that case, detach the air cleaner (that is fixed with rubber strap), lift out the net, and remove all the foreign materials from them.



- (2) Remove the dust from between the fins and the tube
- (3) Tighten the fan drive belt as necessary. For this, refer to page 41.
- (4) If scale forms in the tube, clean with KUBOTA scale inhibitor or equivalent.

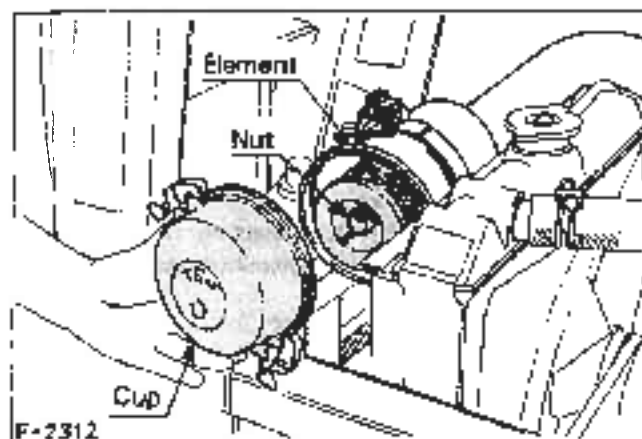
Note: The front grille may be tilted forward for easy removal.

To remove the front grille, disconnect the spring and lift the grille up and away from the tractor.




10.8 AIR CLEANER

- (1) The air cleaner uses a dry element, never apply oil.
- (2) Do not let dust build up to more than the half level in the dust cup. Detach the dust cup and clean out the dust—normally once a week, but everyday if working conditions are especially dusty.
- (3) Do not touch the filter element except in cases where cleaning is required.
- (4) When cleaning the element, refer to the instructions attached.
- (5) If the element is stained with carbon or oil, replace the filter.
- (6) Change the element once yearly or after every sixth washing, whichever comes first.



IMPORTANT:

- (1) Be sure to refit the dust cup with the arrow  (on the right) upright. If the dust cup is improperly fitted, dust passes by the dust cup and directly adheres to the element.
- (2) Do not run the engine with filter element removed.

10.9. CLEANING AIR FILTER ELEMENT

- (1) To clean the element, use clean dry compressed air on the inside of the element.
Air pressure at the nozzle must not exceed 205 kPa [2.1 kgf/cm²; 30 psi].
Maintain reasonable distance between the nozzle and the filter.
- (2) To wash the element, use KUBOTA Filter cleaner, Donaldson ND-1500 Filter Cleaner or its equivalent, which is especially effective on oily and soot-laden filters.
Follow instructions that are supplied with the filter cleaner.

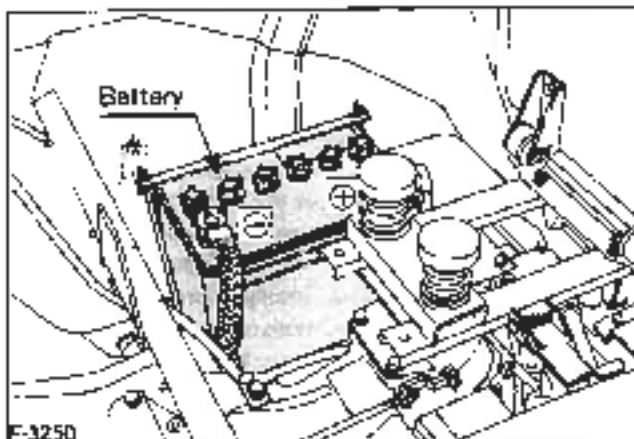
10.10 BATTERY



CAUTION:

- Never remove the battery cap while the engine is running.
Keep electrolyte away from eyes, hands and clothes. If you are splattered with it, wash it away completely with water.

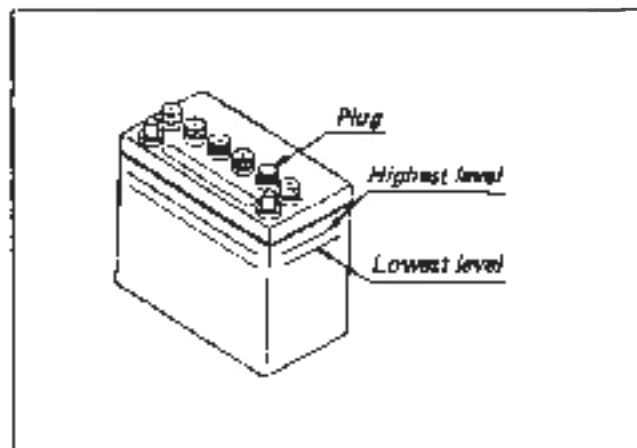
Mishandling the battery shortens the service life and adds to maintenance costs. Be sure to handle it correctly so that it will develop its full potential performance.



CAUTION:

- After the battery is activated, hydrogen and oxygen gases in the battery are very explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.

- (1) If the battery is weak, the engine is difficult to start and the lamps become dim. It is important to check the battery daily and recharge before trouble occurs.
- (2) The water in the electrolyte evaporates during recharging. Liquid shortage damages the battery and excessive liquid spills over and damages the tractor body. If low, be sure to fill up the battery with distilled water.



- (3) To slow charge the battery connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
- (4) A boost charge is only for emergencies. It partially charges the battery at a high rate and in a short time. When using a boost-charged battery, it is necessary to recharge the battery as early as possible after the operation has been finished. Failure to do this extremely affects the service life due to overdischarge.

**CAUTION:**

- To avoid accidental short circuit, be sure to attach the positive cable to the positive terminal before the ground cable is attached to the negative terminal.

IMPORTANT:

- If the tractor is to be operated for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the key switch before stopping the engine by means of fuel pump shut off cable. Use additional current (lights) while engine is running. Insulate terminal of battery cable before starting by means of slave battery. If this advice is disregarded, damage to alternator and regulator may result.

Directions for Storage

- (1) When shutting down the tractor for long periods of time, remove the battery from the tractor, adjust the electrolyte to the proper level and store in a dry place out of direct sunlight.
- (2) The battery self-discharges even while it is stored. Recharge it once a month in hot seasons and once every two months in cold seasons.

IMPORTANT:

- The tractor has been shipped with dry-type battery. Your dealer will fill it with electrolyte and charge it for initial use.

Charging Dry Type Battery

- Remove vent plugs and discard temporary sealing cardboard and tapes.
- Fill each cell with electrolyte having a specific gravity given in Table 1 up to highest level marked on the battery case side.

Table 1

	AIR TEMPERATURES	
	TEMPERATE Ordinarily below 20°C (68°F)	TROPICAL Frequently above 20°C (68°F)
sp.gr. of Electrolyte for Filling	1.260	1.240
sp.gr. of Electrolyte when fully charged	1.260 to 1.275	1.240 to 1.255

- After standing 2 or 3 hours correct the electrolyte to former level.
- Connect positive terminal (+) of battery, with positive terminal of D.C. charging unit, and negative terminal (-) with negative terminal.
- Batteries are preferably charged by current shown in Table 2. Keep vent plugs removed during charging.

Table 2

TYPE	Volts (V)	Number of plate per cell	Capacity at 20 H.R. (A.H.)	Volume of Electrolyte (l)	Normal Charging Rate (A)
85D28R (NS70)	12	11	65	4.5	6

- Check temperature of electrolyte, if it reaches 40°C (106°F) lower the charging rate. When temperature is too high, reduce charging rate and charge for a proportionately longer period.
- If the tractor is stored after original charge, periodically recharge as shown below:

Table 3

Period of storage from manufactured (months)	refreshing charge (hours)
0 - 6	about 3 - 5 hours
6 - 12	10
over 12	30

A battery is fully charged when the cell are all gassing freely and the specific gravity ceases to rise for three consecutive readings taken at hour intervals. Specific gravity shall then be adjusted to that shown in Table 1.

- Check electrolyte level two hours after charging is finished and correct it if necessary by adding distilled water.

11. ADJUSTMENTS



CAUTION:

- When making adjustments, park the tractor on flat ground and apply the parking brake.

11.1 FAN DRIVE BELT

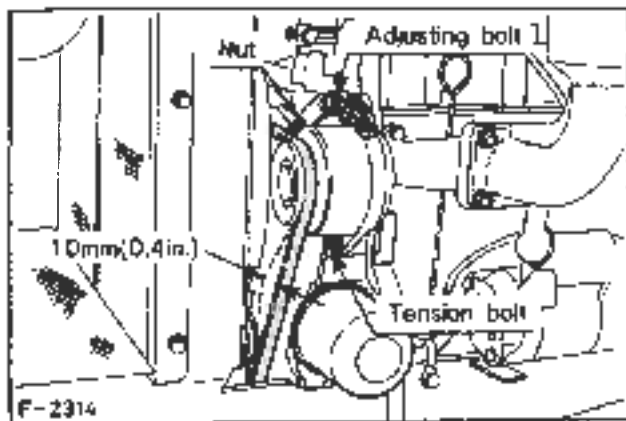
If the fan drive belt becomes loose, the engine may overheat.

Check the belt tension as shown below.

To adjust, loosen the adjusting bolt and tighten the tension bolt to stretch the belt. After adjustment, securely tighten the adjusting bolt.

Moderate belt tension:

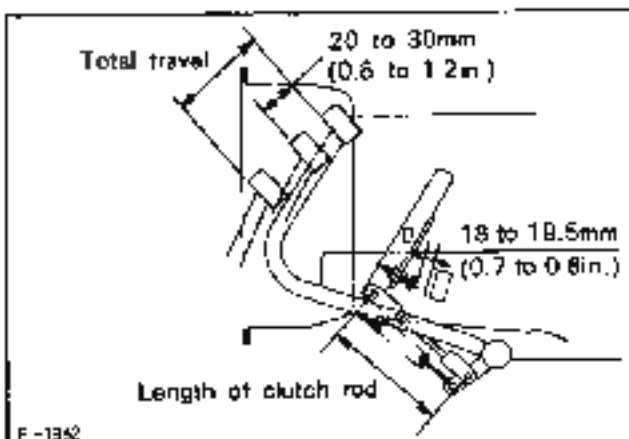
The belt should deflect approx. 10 mm (0.4 in.) when the center of the belt is depressed with a finger pressure of 88N (10 kgf, 22 lbs.).



11.2 CLUTCH

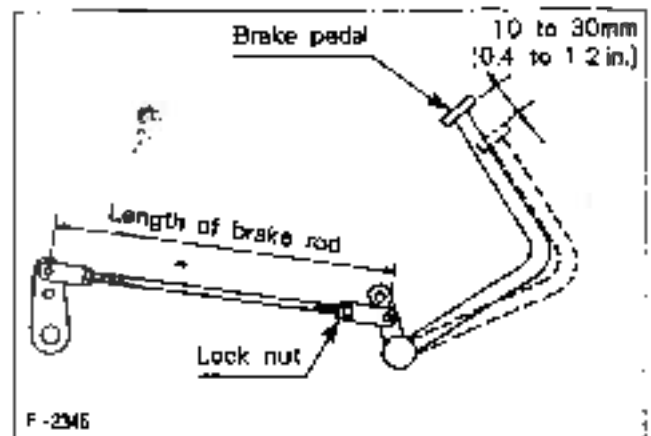
Moderate clutch free travel ranges from 20 to 30 mm (0.8 to 1.2 in.).

If the clutch becomes difficult to disengage or pedal free travel decreases, adjust the length of the clutch rod after removing the pin. When the clutch is difficult to disengage, shorten the rod. When the clutch free travel is too little, extend the rod.



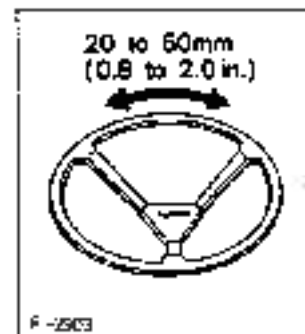
11.3 BRAKE

If brake pedal free travel becomes too great or travel varies too greatly between the right and left pedals, loosen the lock nut and adjust the length of the brake rod after removing the pin. Moderate right and left pedal free travel ranges from 10 to 30 mm (0.4 to 1.2 in.). After adjustment, interlock the right and left brake pedals and finally tighten the lock nut securely.



11.4 STEERING WHEEL

Moderate steering wheel play is 20 to 50 mm (0.8 to 2.0 in.). If excessive, consult KUBOTA dealers.



12. TROUBLESHOOTING

12.1 ENGINE TROUBLESHOOTING

■ When engine is difficult to start

Cause	Countermeasures
Fuel is thick and doesn't flow	<ul style="list-style-type: none"> * Check the fuel oil tank and fuel oil filter. * Remove water, dirt and other impurities * As all fuel oil will be filtered by the filter, if there should be water or other foreign matters on the filter, replace the filter. * See your KUBOTA dealer.
Air or water mixed in fuel system	<ul style="list-style-type: none"> * If air is in the fuel filter or injection lines, the fuel pump will not work properly. To attain proper fuel injection pressure, check carefully for loosened fuel lines, nut nut, etc. * Loosen air vent screws atop fuel filter and fuel injection pump to eliminate all the air in the fuel oil system
Thick carbon deposits on orifice of injection nozzle.	<ul style="list-style-type: none"> * This is caused when water or dirt is mixed in the fuel. Clean the nozzle injection piece, being careful not to damage the orifice. * Check to see if nozzle is working properly or not. If not, install a new nozzle.
Valve clearance is wrong	<ul style="list-style-type: none"> * Adjust valve clearance. See your KUBOTA dealer.
Leaking valves	<ul style="list-style-type: none"> * Grind valve.
Fuel injection timing is wrong	<ul style="list-style-type: none"> * Adjust injection timing. See your KUBOTA dealer.
Engine oil becomes thick in cold weather and engine cranks slow.	<ul style="list-style-type: none"> * Change grade of oil according to the weather (temperature).
Low compression	<ul style="list-style-type: none"> * Bad valve or excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts.
Battery is discharged and the engine will not crank.	<ul style="list-style-type: none"> * Charge battery * Use decompression device. * In winter, always remove battery from tractor, charge fully and keep indoors. Install in tractor at time of use.

■ When output is insufficient

Cause	Countermeasures
Air cleaner is dirty Fuel filter is dirty	<ul style="list-style-type: none"> * Clean the element every 100-200 hours of operation.
Carbon around orifice of nozzle piece	<ul style="list-style-type: none"> * Clean orifice and needle valve, being very carefully not to damage the nozzle orifice. * Check nozzle. If defective, replace with new parts.
Compression is insufficient. Leaking valves	<ul style="list-style-type: none"> * Bad valve and excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts. * Grind valves.
Fuel is insufficient	<ul style="list-style-type: none"> * Check fuel system.
Overheating of moving parts	<ul style="list-style-type: none"> * Check lube oil system. * Check to see if lube oil filter is working properly. * Filter screens or elements deposited with impurities would cause poor lubrication. Clean screens. * Check to see if bearing clearance are within factory specs * Check engine timing.
Valves out of adjustment	<ul style="list-style-type: none"> * Adjust to proper valve clearance. See your KUBOTA dealer.
Fuel injection pressure is wrong	<ul style="list-style-type: none"> * Adjust to proper pressure. See your KUBOTA dealer.

■ When color of exhaust is dark

See your KUBOTA dealer.

■ When engine suddenly stops

Cause	Countermeasures
Leak of fuel	<ul style="list-style-type: none"> • Check the fuel tank and refill if necessary. • Also check the fuel system for air or leaks.
Bad nozzle	<ul style="list-style-type: none"> • If necessary, replace with a new nozzle.
Moving parts are overheated due to shortage of lube oil or improper lubrication	<ul style="list-style-type: none"> • Check amount of engine oil with dipstick. • Check lubricating oil system. • Check to see if element inside the lubricating oil filter (2) has become old and clogged. If necessary, replace with new element. • Check to see if the engine bearing clearances are within factory specs.

IMPORTANT:

- When the engine has suddenly stopped, decompress the engine by the decompression knob and turn the engine lightly by pulling on the fan belt. If the engine turns easily without abnormalities, the cause of the trouble is usually lack of fuel or bad nozzle.

■ When engine must be stopped immediately

Cause	Countermeasures
Speed suddenly decreases or increases	<ul style="list-style-type: none"> • Check the adjustments and timing of injection and the fuel system.
Unusual sound is heard suddenly.	<ul style="list-style-type: none"> • Check all moving parts carefully.
Color of exhaust suddenly turns dark	<ul style="list-style-type: none"> • Check the fuel injection system, especially the fuel injection nozzle.
Bearing parts are overheated	<ul style="list-style-type: none"> • Check the lubricating system.
Oil lamp lights up during operation	<ul style="list-style-type: none"> • Check lubricating system. • Check to see if the engine bearing clearance is within factory specs. • Check the function of the regulating valve inside the oil filter (2). • Check pressure switch. • Check filter base gasket.

12.2 TRACTOR TROUBLESHOOTING

■ When 3 point hitch does not move

Cause	Countermeasure
Transmission number is clogged	<ul style="list-style-type: none"> • Clean the strainer
3 point hitch does not lower	<ul style="list-style-type: none"> • Check the implement lowering speed control grip

12.3 BATTERY TROUBLESHOOTING

Condition of Battery	Cause	Countermeasure	Precaution
Starter does not function	Key is not "ON" Battery over-used until light becomes dim Charging of battery neglected Defective Alternator rectifier. Dirty or corroded terminal contacts Bd brushes, armature or field Life of battery expired	Turn key "ON" Charge for long period by ordinary charging method until specific gravity of 1.25 is reached. Repair Alternator and replace defective rectifier. Charge battery well. Wash terminal with hot water and tighten well. Replace Replace battery	Do not overuse the battery and charge before fully discharged. (Refrain from overdischarging) Check Alternator rectifier. Keep terminals clean, tighten well and grease to prevent corrosion.
From beginning, starter does not function, and lights become dim quickly.	Battery not charged well	Charge battery for long period by ordinary charging method.	Battery must be serviced properly before initial use
Low electrolyte level.	Battery used with shortage of electrolyte. Battery over-used. Moreover, charging was neglected. (Refrain from over-discharging.) Defective Alternator rectifier. Defective terminal contacts causing sulphation of electrodes.	Add distilled water and charge battery Charge for long period. Check Alternator and rectifier and charge for long period by ordinary charging method.	Make routine checks of electrolyte Do not overuse the battery and fully discharge. Make routine checks of terminals, to make sure they are clean and tight.
Battery cannot be charged.	The current of the Alternator during operation is too high causing plates to drop, warp or short-circuit. Life of battery expired.	Decrease the charging current of Alternator. Exchange defective battery Exchange battery.	Check charging current of Alternator.
Corrosion of terminals severe.	 Current of the Alternator during operation is too high,	Clean scale from terminals and tighten well. Adjust charging current of Alternator.	Keep terminals clean and well tightened. Apply grease to prevent corrosion. Check charging current of Alternator.
Electrolyte decreases rapidly	Over heating due to over charging. Storage battery cracked or has small holes.	Check charging output. Replace battery	 Secure battery to tractor so it will not move.

13. LONG-TERM STORAGE



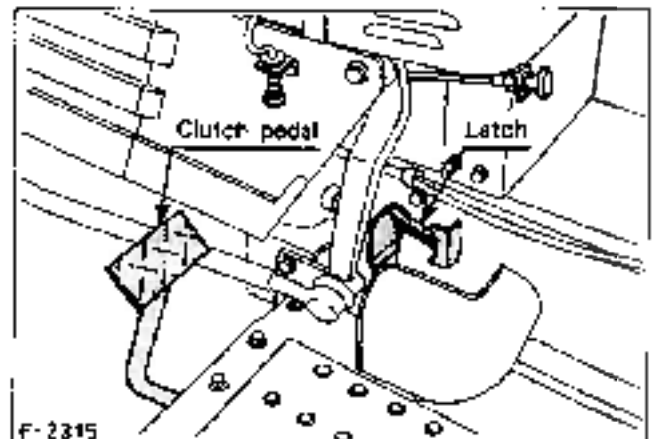
CAUTIONS:

- (1) When storing, remove the key from the key switch to avoid unauthorized persons from operating the tractor and getting injured.
- (2) To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.

When the tractor will not be operated for two or three months or longer, clean the tractor and perform the following treatment before storage.

- (1) Repair the parts as needed.
- (2) Check nuts and bolts, tighten as necessary.
- (3) Apply grease or engine oil to the parts most likely to rust.
- (4) Remove any ballast weight.
- (5) Inflate the tires to a little above the standard pressure levels.
- (6) Change the engine oil and run the engine for five minutes so that the oil circulates through the entire system.
- (7) Stop the engine by fully pulling the engine stop knob.
- (8) Drain the radiator. Flush and refill with new coolant.
- (9) Lock the clutch pedal with the latch.

If the tractor is stored for a long period with the clutch left engaged, the clutch disc may rust, rendering it inoperative.



- (10) Lower the implement to the ground.
- (11) Remove the battery from the tractor, recharge it, adjust the electrolyte to the proper level, and store in a dry place out of direct sunlight.
- (12) The battery runs down over time even while in storage. Recharge it once a month in hot seasons and once every two months in cold seasons.
- (13) Store the tractor where dry and sheltered from rain. Further cover the tractor with a tarpaulin.
- (14) When leaving the tractor outdoors, protect the muffler from the rain.

IMPORTANT:

- To clean the tractor stop the engine. If you must clean the tractor with the engine going, utmost care should be taken not to allow water to enter the air cleaner. Engine trouble may occur if water enters the engine.

14. OPTIONS

Consult your KUBOTA dealer for detail.

- SMV (Slow Moving Vehicle) Emblem
To warn overtaking traffic of tractor's presence.
- Engine Block Heater
For extremely cold weather starting.
- Front Bumper Weight
55 lbs. each for front ballast.
- Swing Drawbar
- Horizontal Muffler

15. LUBRICANT SPECIFICATIONS

■ Engine Oil

Oil used in the engine should have an American Petroleum Institute (API) / SAE Classification of service CC or CD. The chart below shows the correct weight oil to be used at various temperature conditions:

ENGINE OIL VISCOSITY CHART

Below 0°C (32°F)	SAE 10W or 10W-30
0~25°C (32~77°F)	SAE 20 or 10W-30
Above 25°C (77°F)	SAE 30 or 10W-30

■ Others

Power steering	Multi-grade transmission fluid (Same as transmission oil)
Front Wheel Bearings [2WD]	SAE lithium based grease
Chassis grease fittings	Multipurpose type grease
Front Wheel Drive Unit [4WD]	SAE 80 or 90 weight gear oil

■ Transmission Oil

The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and complete lubrication of the transmission, it is important that a multi-grade transmission fluid be used in this system. We recommend the use of Kubota UDT fluid for optimum protection and performance.

Also the following are recommended oils, by brand name, that may be used in the transmission hydraulic system.

Maker	Brand Name
Atlantic Richfield (Arco)	Arco Tractor Fluid
Chevron	Tractor Hydraulic Fluid
Exxon	Torque Fluid 58
Penzoil	Hydra-Trans and Wet Br.
Phillips	H.T. Fluid
Shell	Donax TD, TT, TM
Texaco	T.D.H. Oil
Union	Hydraulic / Tractor Fluid
Gulf	Universal Fluid 426,350
Mobil	Mobil Fluid 423,350

KUBOTA LUBRICANTS

THE BEST CHOICE SINCE BUYING YOUR KUBOTA



When you think of Kubota diesel tractors, you think of quality, performance and service. Now you can also think of Kubota lubricants.

Now, Kubota offers a lubricant line to use with all the Kubota tractors from 10 to 85 PTO horsepower. The Kubota lubricant line consists of a 15W-40 or 10W-30 engine oil and a universal transmission fluid called "UDT." A variety of sizes are available to meet your small and larger needs, in 1 quart, 2 gallon, 5 gallon and 55 gallon containers.

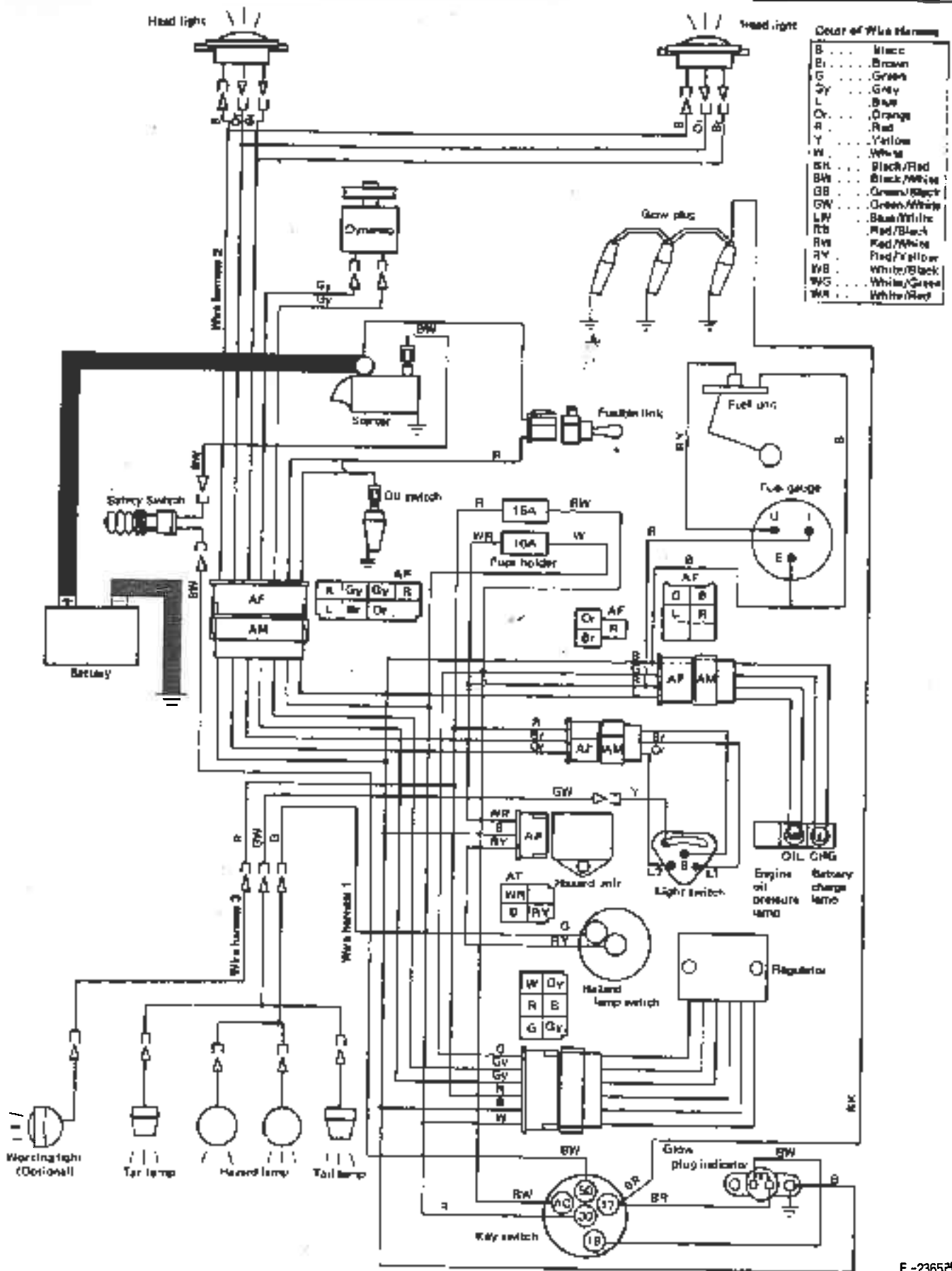
Next time you need to pour it on, pour it in with Kubota lubricants.

Kubota lubricants, tractor tough quality.

 **KUBOTA**

Nothing like it on earth.™

16. WIRING DIAGRAM



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