LUBRICATION & PERIODIC MAINTENANCE

SPECIFICATIONS & CAPACITIES

Engine Oil

Use engine oil of the appropriate SAE viscosity. Oil must meet or exceed; MIL-L-2104C requirements, API Service "CD".

	TM215	TM217	TM223
Capacity (litres)	2.7	2.7	2.7
Recommended Viscosity:			
78 °F (25 °C) and Above	SAE 30 W, 10 W - 30	SAE 30 W, 10 W - 30	SAE 30 W, 10 W - 30
32° - 78 °F (0° - 25 °C)	SAE 20 W, 10 W - 30	SAE 20 W, 10 W - 30	SAE 30 W, 10 W - 30
Below 32 °F (0 °C)	SAE 10 W, 10 W - 30	SAE 10 W, 10 W - 30	SAE 30 W, 10 W - 30
Recommended Change Intervals:			
Initial Oil and Filter Change	50 hours	50 hours	50 hours
Oil and Filter Change, Thereafter	Every 150 hours	Every 150 hours	Every 150 hours

Engine Coolant

Freezing Protection (Original factory Fill)	-34 °C (-30 °F)	-34 °C (-30 °F)	-34 °C (-30 °F)
Recommended Coolant	50/50 mixture ethylene glycol and water	50/50 mixture ethylene glycol and water	50/50 mixture ethylene glycol and water
System Capacity (litres)	5.1	5.1	7.1

Fuel Tank

Capacity (litres)	13.5	13.5	23
Fuel recommended, Above 4 °C (39 °F)	No. 2 or No. 2-D	No. 2 or No. 2-D	No. 2 or No. 2-D
Fuel Recommended, Below 4 °C (39 °F)	No. 1 or No. 1-D	No. 1 or No. 1-D	No. 1 or No. 1-D

Transmission & Differential Housing (Including Hydraulic System)

Capacity (litres)			
F	13.5	13.5	—
FU (with Power-assisted steering)	—	14.0	—
FMU (with Mid-mount PTO and Power-assisted steering)	14.0	14.0	—
FHU (with HST and Power-assisted steering)	15.0	15.0	—
FHMU (with HST, Mid-mount PTO and power-assisted steering)	15.0	15.0	—
FHSME (with HST, Independent PTO, and Mid-mount PTO and Power-assisted steering)			14.0
Recommended Lubricant	Shell DONAX TD or equivalent	Shell DONAX TD or equivalent	Shell DONAX TD or equivalent
Recommended Change Interval	First 50 hours every 200 hours thereafter	First 50 hours every 200 hours thereafter	First 50 hours every 200 hours thereafter

Front Axle

Capacity (Common Reservoir) (litres)	2.7	2.7	2.7
Recommended Change Lubricant	SAE 80 GL-4	SAE 80 GL-4	SAE 80 GL-4
Recommended Change Interval	Every 300 hours	Every 300 hours	Every 300 hours

Grease Fittings

Greaseing Interval (All Fittings)	Every 50 hours	Every 50 hours	Every 50 hours
Recommended Grease	Lithium base grease No. 2	Lithium base grease No. 2	Lithium base grease No. 2

NOTE: Change intervals stated above are for normal usage. Due to adverse operating conditions that may be experienced (extremely dusty of muddy), change intervals may need to be more frequent.

LUBRICATION/FILL POINTS

FIG. 67: General layout of lubrication, fill and drain locations on the tractor:

Ref.	Description:	Type:
1	Fuel Tank	Diesel Fuel
2	Radiator	Engine Coolant
3	Engine	Engine Oil
4	Transmission Case	Hydraulic Oil
5	Front Axle	Hydraulic Oil
6	Axle Pivots	Grease
7	Clutch Shaft	Grease
8	HST pedal	Grease
9	Brake pedal	Grease
10	Drag Rod & Tie-rod	Grease
11	Steering Gearbox	Hydraulic Oil
12	Knuckle Arm	Grease

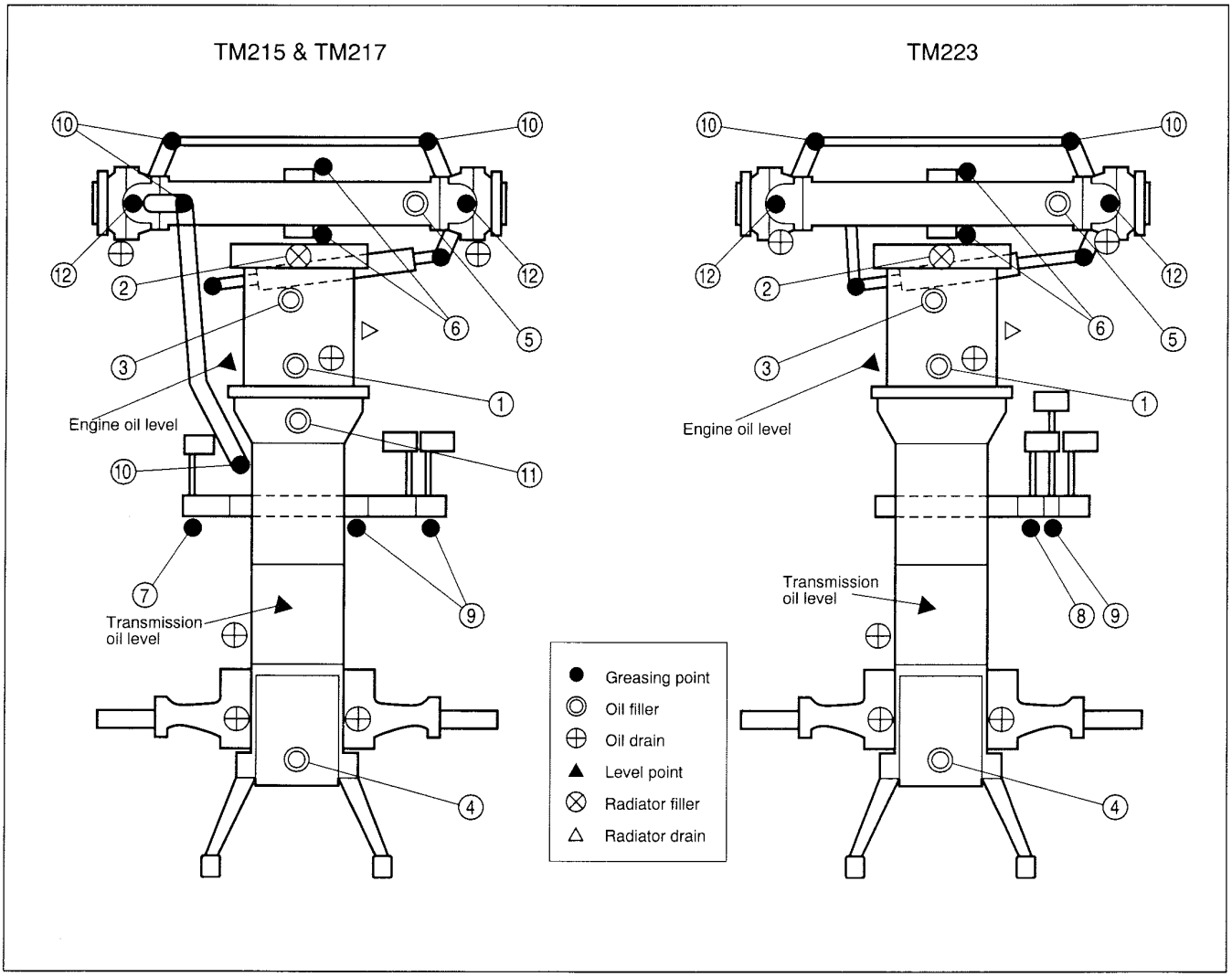

FIG. 67

PERIODIC MAINTENANCE SCHEDULE

Recommended Interval, Each:						Item To Check	Action Required	Pages Ref.
Day	50 hr	150 hr	200 hr	300 hr	Year			
●						All controls, switches	Inspect and repair	—
●						All fasteners, hardware	Check and tighten	—
●						Hoses, fan belt, wiring	Inspect and repair	—
	●					Grease fittings	Lubricate	48, 50
●						Engine oil level	Replace	51
	(*)	●				Engine oil & filter	Check and replenish	51
●						Transmission oil level	Replace and clean	52
	(*)		●			Transmission oil & screen	Replace cartridge	53
	(*)		●			Hydrostatic oil filter	Replace cartridge	54
	●					Front axle oil level	Replace	54
				●		Front axle oil	Clean of debris	54
●						Air screens & radiator	Check and replenish	55
					●	Radiator coolant	Drain, flush & replace	55
●						Fan belt tension	Check and adjust	55
●						Air cleaner dust ejector	Clean	56
	●					Air cleaner elements	Inspect, clean or replace	57
●						Fuel tank level	Fill	—
●						Fuel filter sediment bowl	Inspect, clean and bleed	57, 58, 59
	●					Battery & cables	Check, clean & tighten	60
	●					Battery electrolyte level	Check and replenish	61
●						Lights, flashers & horn	Check and repair	—
●						Clutch pedal free-play (TM215 TM217)	Check and adjust	63
●						Brake adjustment & balance	Check and adjust	64
●						Tyre pressure & condition	Check and adjust	66
●						Wheel bolt torque	Check and adjust	66
●						Steering free-play	Check and repair	67
				●		Front axle end-float	Check and adjust	68
					●	Clutch housing leaks	Remove plug & check	69

Items marked (*) indicate initial service interval only. Subsequent (later) intervals marked "●". Intervals above are for normal usage. Severe operating conditions (wet, dusty, etc.), or when previous servicing has indicated need for more frequent action, intervals may need to be shortened.

SERVICE ACCESS

CAUTION: Shut off the engine before servicing the tractor. Hood side panels and front grille must be installed and secured prior to operating the tractor.

FIG. 68: To gain access to the radiator, battery and engine components, the right and left hood side panels can be easily removed.

To remove; turn locking knobs (1) to unlock. Pull outward on the bottom edge, and then the lift side panel upward to disengage and remove it.

Reinstall in reverse order making sure the top edge of the side panel engages correctly. Push inward on the bottom edge and turn the knobs (1) to lock.

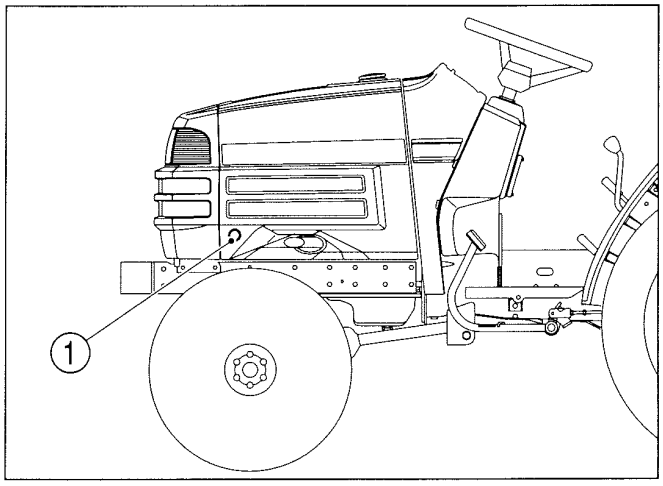

FIG. 68

FIG. 69: To remove the battery, the front grille should be removed.

To remove; give locks (1) one-quarter turn counterclockwise. Tip the top of grille outward and disconnect the headlamp wiring couplers (2). Lift the grille upward to disengage the lower hooks and remove it from the tractor.

Reinstall in reverse order making sure the lower hooks engage on pins. It will be necessary to push inward on the locks (1) and then give them one-quarter turn clockwise to secure.

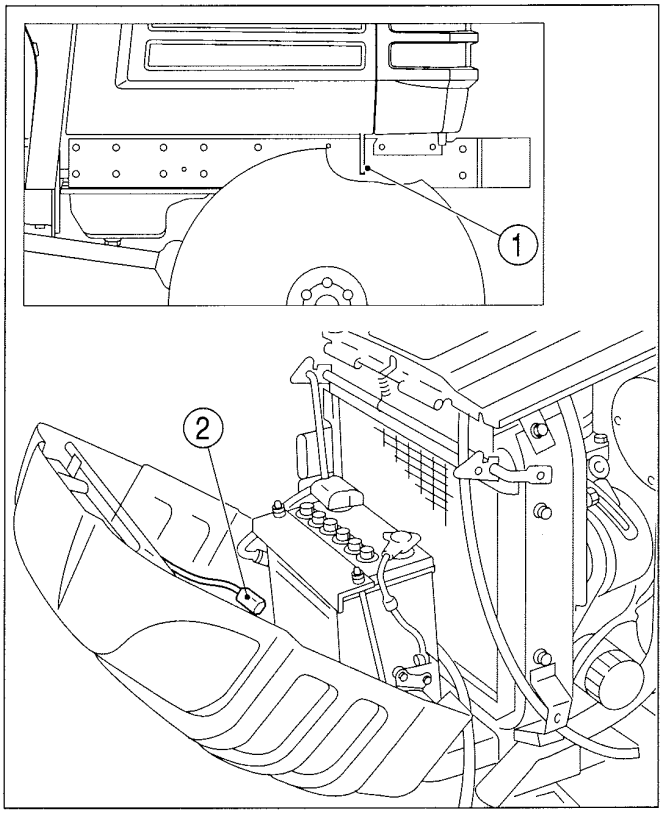

FIG. 69

LUBRICATION DETAILS

Grease Fittings

Lubricate all grease fittings (refer to Fig. 67) every 50 hours of operation using No. 2 multipurpose lithium-base grease. Clean the grease gun and fittings before and after greasing to prevent contamination from dirt.

NOTE: When operating in muddy or extremely wet conditions, daily lubrication of fittings is recommended.

Engine Oil & Filter

Engine oil and the filter should be changed after the first 50 hours of operation and then every 150 hours thereafter.

FIG. 70: To Check Engine Oil Level - The tractor must be parked on level ground with the engine off. Pull out the dipstick (1) and check that oil level is between upper limit F and lower limit L on the dipstick. Wipe off the dipstick, momentarily reinstall it in the engine and check oil level again.

Add oil through the dipstick/filter opening as required.

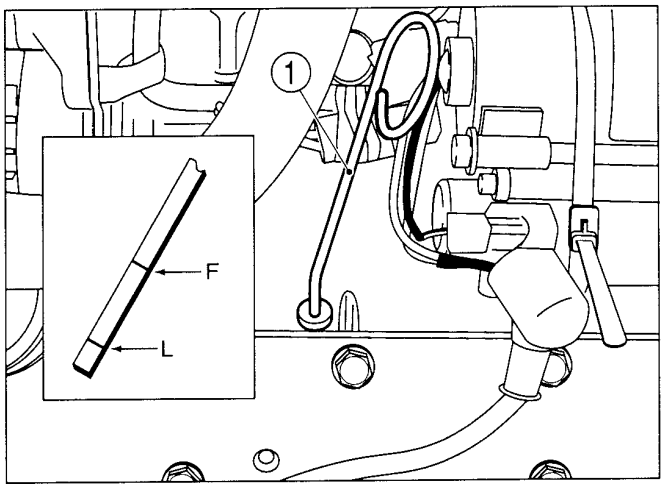

FIG. 70

DANGER: Muffler tail pipe is extremely hot just after operation, so take care not to touch it to avoid burns. Be sure to wear gloves before checking engine oil level.

FIG. 71: To add oil, open the door (2) on the top of the engine hood and remove the filter cap (3). Add oil using a funnel (4) to prevent oil from spilling.

NOTE: Add oil slowly to assist in venting air from the crankcase.

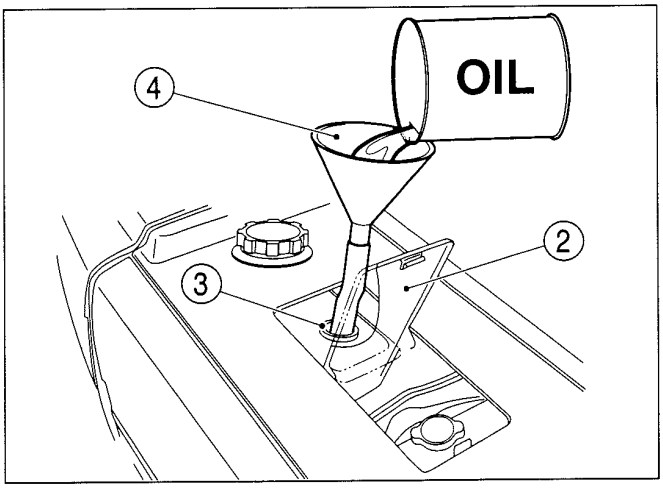

FIG. 71

FIG. 72: To Change Engine Oil - Operate the tractor until oil is adequately warmed. Remove the drain plug (5) from the engine and allow all oil to drain out.

Reinstall the drain plug and fill the engine crankcase to the upper limit on the dipstick.

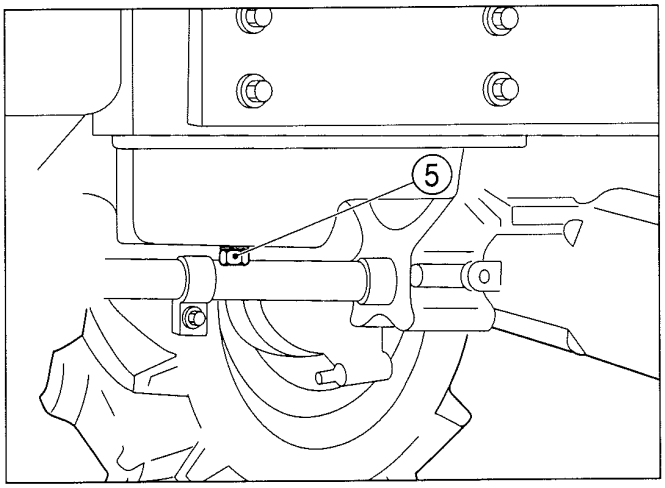

FIG. 72

FIG. 73, 74 & 75: To Replace Engine Oil Filter - Unscrew the element (6) from the engine and discard. Make sure the original filter gasket has been removed.

Lubricate the new gasket on the replacement element with clean engine oil. Screw on the new element until the gasket contacts the adapter and then tighten element by further 2/3 turn.

Clean spilled oil and refill the crankcase. Start the engine, check for leaks and replenish oil level as required.

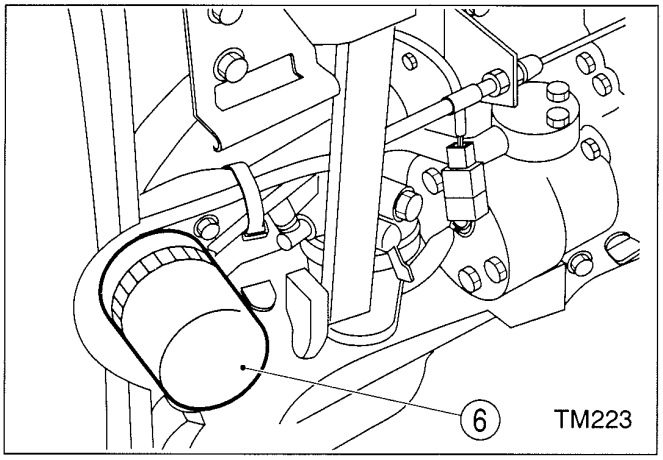

FIG. 75

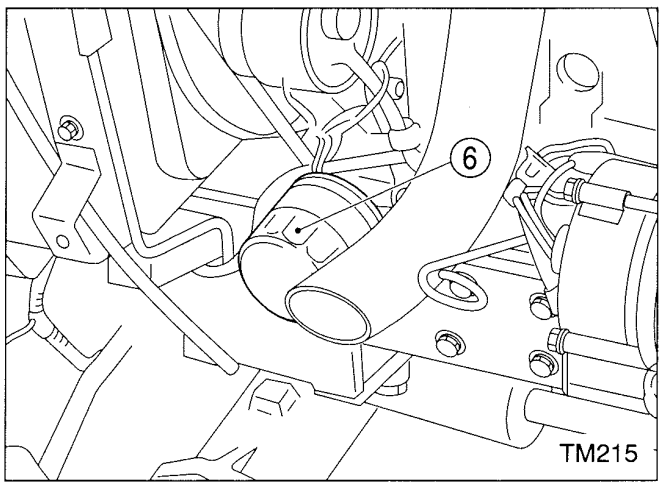

FIG. 73

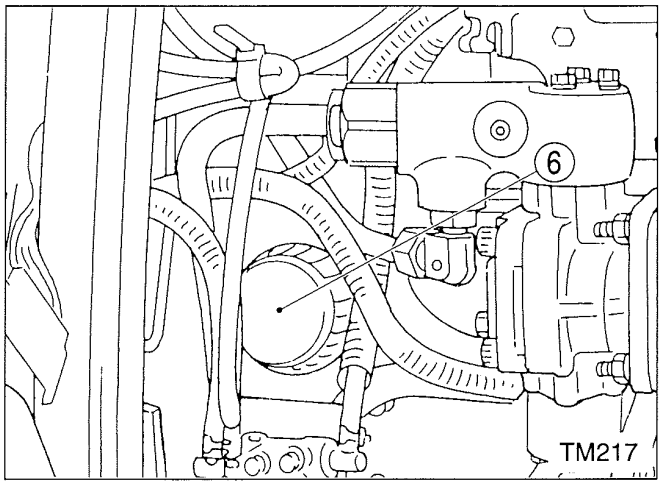

FIG. 74

Transmission Oil & Filters

Transmission oil lubricates the transmission, centre housing, and rear axles and also serves as hydraulic fluid. Transmission oil and the filter should be changed after the first 50 hours of operation and then every 200 hours thereafter.

FIG. 76: To Check Transmission Oil Level - Park the tractor on level ground and remove the dipstick (1). Oil level should be indicated between the upper limit A and the end of dipstick B.

Oil level is replenished, as necessary, by removing the filler plug (2) and adding oil through the filler opening.

NOTE: Adding oil to the transmission will also maintain correct oil level in the centre housing and rear axles.

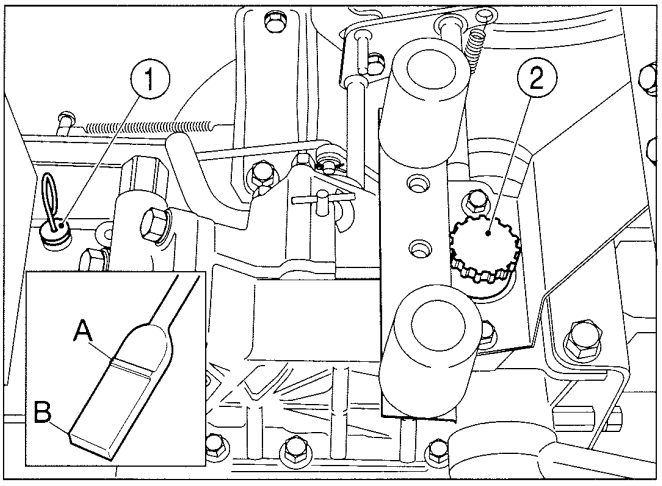

FIG. 76

FIG. 77: To Replace Transmission Oil - Remove the drain plug (1) along with second drain plug (2) below the mid PTO gearbox, and the final drive plugs (3) on each axle. Completely drain oil from the system.

IMPORTANT: Completely lower the three-point hitch prior to draining transmission oil. When completely drained replace and tighten all drain plugs. Refill with oil as outlined above.

To Clean Hydraulic Oil Filter - Clean the hydraulic oil filter while oil is removed. Unscrew the bolt (4) and turn the filter housing (5) downward after having loosened the bolt (6) while holding the spacer (7). Take out the filter (8). Clean it in solvent or kerosene, dry thoroughly and reinstall. Make sure "O" rings are not damaged.

Refill the system with clean oil to level as detailed.

Start the tractor and allow the engine to idle several minutes while operating the hydraulic controls. Shut the engine off, lower the three-point hitch and re-check oil level. Replenish transmission oil as necessary. Check for leaks and correct as necessary.

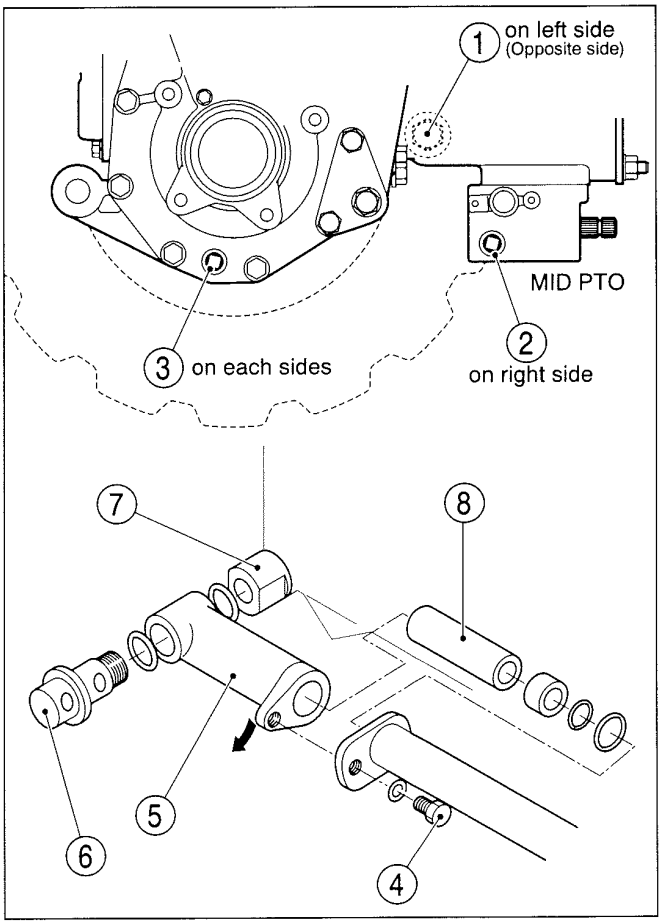

FIG. 77

Caution: After transmission oil has been replaced or, before the tractor is put in motion after a long term of storage, or when the hydraulic system does not function properly, bleed air from the hydraulic oil circuit as follows:

Fig. 78: To bleed air from the hydraulic system– Loosen plug (1) by one turn or one turn and a half. NEVER remove the plug, or oil will be ejected through the plug hole during air-bleeding operation. Start the engine and operate it at full throttle.

Overflowing of oil through the plug shows air-bleeding has been completed. Stop the engine and retighten the plug.

Note: When no oil overflows through the plug, try loosening the plug by another half turn.

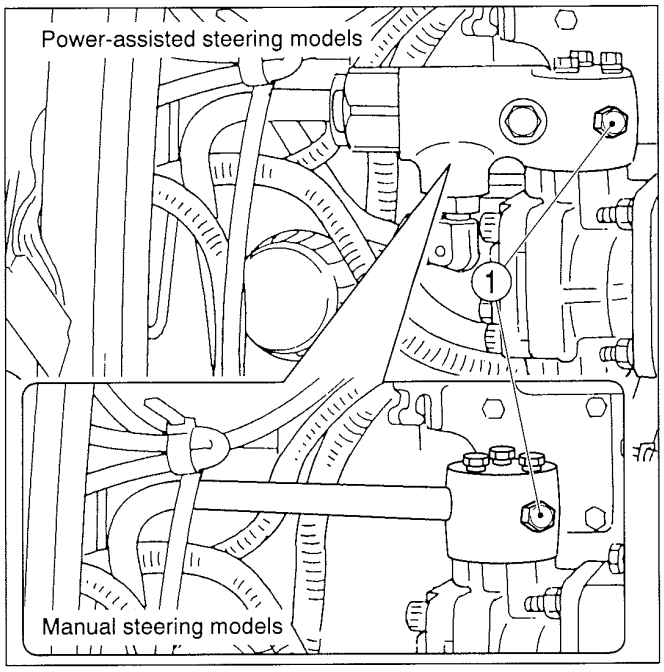

FIG. 78

Hydrostatic Cartridge Oil Filter Replacement

The hydrostatic cartridge oil filter is located under the left step.

FIG. 79: Always replace the hydraulic oil filter while oil is removed. Carefully unscrew the oil filter (1) from its adapter. Use of a filter wrench may be necessary.

Clean the filter adapter and lubricate the gasket on the replacement filter with clean hydraulic oil. Install the new filter until gasket contacts the adapter and tighten additional 2/3 turn by hand. Do not use a filter wrench to install the filter.

Replace the cartridge after the first 50 hours, and then every 200 hours.

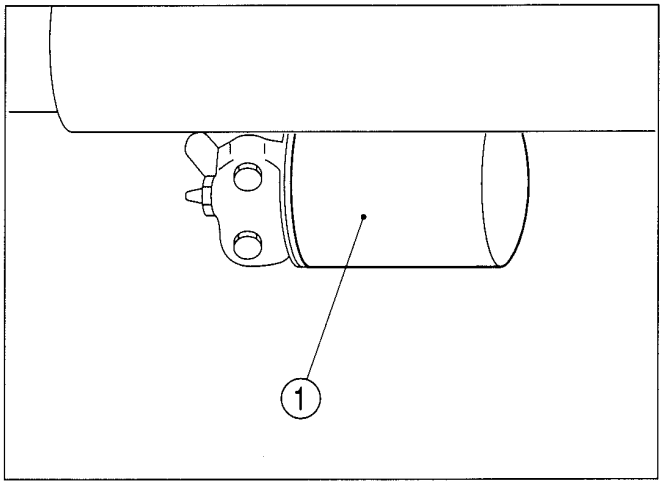

FIG. 79

Front Axle Oil

Front drive axle has a common oil level for front differential housing and each wheel reduction unit. Oil level should be checked every 50 hours of tractor operation and replaced after every 300 hours.

FIG. 80: To Check Oil Level - Park the tractor on level ground and then remove the oil level plug (1). Oil should be level with or slightly below the level plug opening. Remove the fill plug (2) and add oil until oil is expressed from the level plug opening. Replace the level plug and fill plug.

To Change Oil - Remove the drain plug (3) from both wheel reduction units. When all oil has drained out, replace the drain plugs and fill the housing to the level plug opening. Replace the level plug and filling plug.

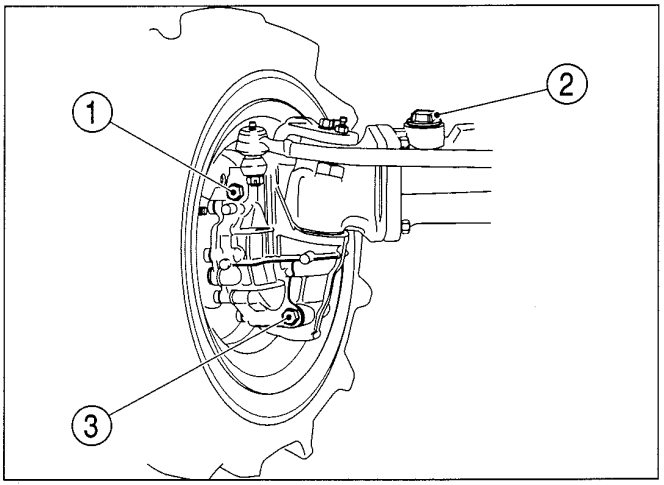

FIG. 80

COOLING SYSTEM

CAUTION: DO NOT remove the radiator cap when the engine is hot. After engine has cooled down, rotate the cap slowly to release pressure. Then the cap can be safety removed.

FIG. 81: Cooling system is filled at factory with anti-freeze solution to protect the engine and radiator to -34°C (-30°F). Cooling level should be maintained to 12 mm (1/2") below the filler neck opening (1). Check coolant annually as a precaution against freezing.

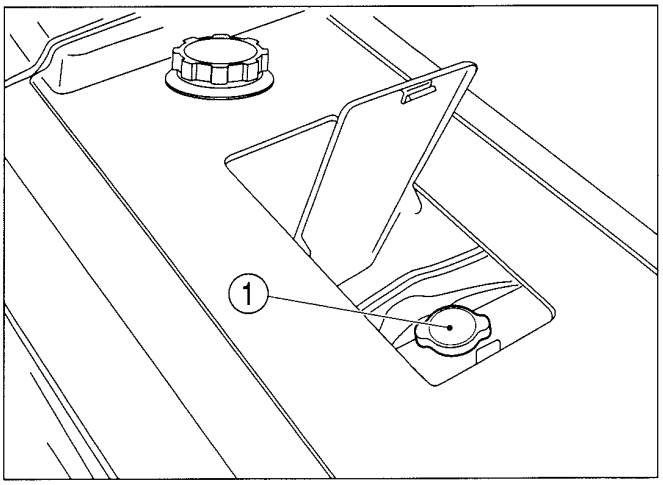

FIG. 81

NOTE: After adding coolant, start the engine and let it run until thoroughly warmed so coolant is mixed.

Periodically check the condition of hoses, belt and clamps and tighten or replace as necessary.

Keep the radiator, radiator screen and hood screens clean to permit maximum cooling.

IMPORTANT: Use care when cleaning the radiator to prevent cooling fin damage.

FIG. 82: Drain cock (2) will drain coolant from the cylinder block and radiator. The drain cock is located on the right side of the engine. Coolant should be replaced if it becomes contaminated with rust or sludge. Loosening the radiator cap will assist draining.

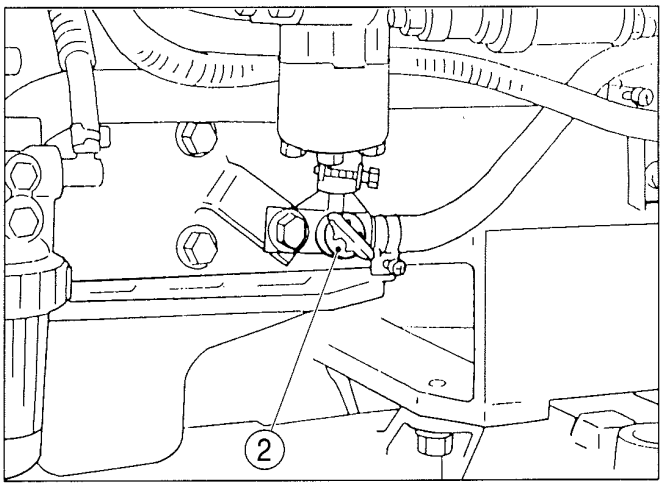

FIG. 82

NOTE: Before adding new coolant, flush inside of the radiator and engine block with clean water.

The radiator and engine must be drained if freezing temperatures are expected and the cooling system is not filled with sufficient to provide adequate protection from freezing.

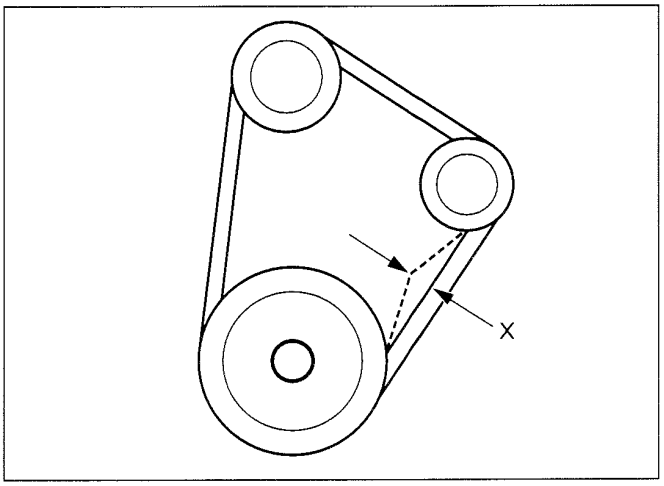

FIG. 83

FIG. 83: Correct fan belt tension helps to insure adequate coolant flow through the cylinder block and radiator. The belt is correctly tensioned when belt deflection is approximately 12 mm (1/2") as shown at

"x" when thumb pressure is exerted at the centre of belt span.

CAUTION: Due to muffler position, allow it to cool before checking or adjusting fan belt tension.

FIG. 84: To adjust belt tension, loosen the alternator pivot bolt and nut (1) and tensioning bracket bolt (2). Pull outward on top of the alternator to correctly tension belt and tighten the bolt (2) first and then tighten the pivot bolt (1).

IMPORTANT: Do not pry against the alternator housing or pulley. Carefully pry against the alternator mounting flange to prevent damage.

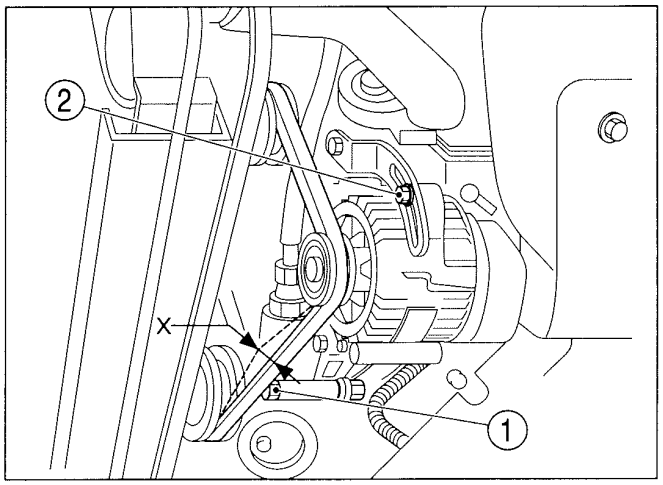

FIG. 84

ENGINE AIR CLEANER

IMPORTANT: Never operate the engine with the air filters removed.

FIG. 85: The engine air cleaner is located above the engine. To gain access remove the right side panel.

The dust ejector (1) should be squeezed daily to open it and allow dust to drop out. This will reduce amount of material which collects on the main filter.

To service the main filter, release the retaining band (2) over the air cleaner and pull the air cleaner inlet tube to rear to release it from the retaining hooks, then turn the air cleaner out for servicing.

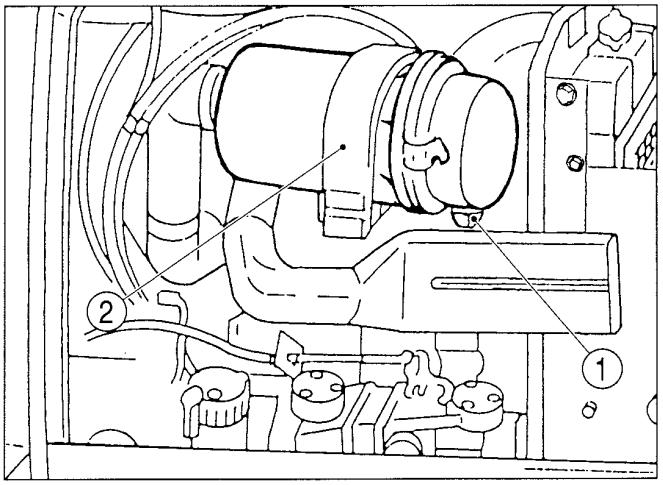

FIG. 85

FIG. 86: Release clips and uncover. Remove the element. Examine the element and seals for damage and brittleness. If the element is damaged in any way it must be replaced.

NOTE: Fit the seal ring of the filter correctly when reinstalling.

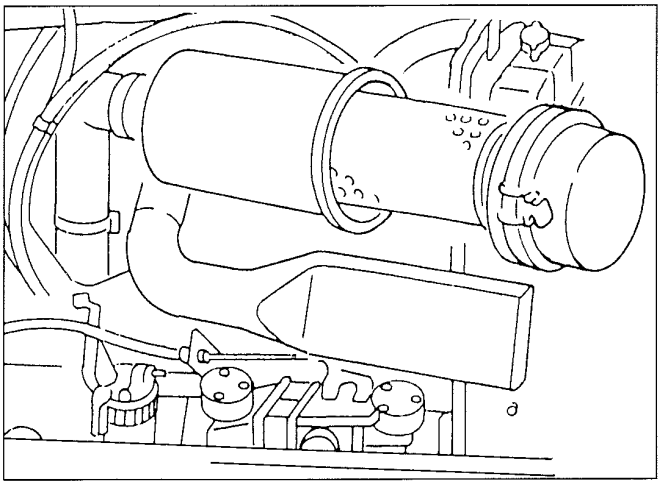
FIG. 86

FIG.87: Element may be cleaned (if in serviceable condition) using following procedures:

- Using compressed air not to exceed 200 kPa (30 psi) from the inside of the element, remove loose dirt, grass, chaff, etc. Be careful not to damage element pleats with air flow.
- If the element is coated with oil or soot:
  1. Prepare solution of warm water and non-foaming detergent .
  2. Soak the element for thirty minutes.
  3. Agitate the element in solution until oil and soot are loosened.
  4. Rinse the element until rinse water is clear.
  5. Allow the element to completely dry. Do not dry by using compressed air or heat.
- After cleaning (or washing) the element examine for pin holes, punctures, or tears. If the element paper, canister or seal show any signs of physical damage, the element must be replaced.

NOTE: Replaced an element which has already been washed five times.

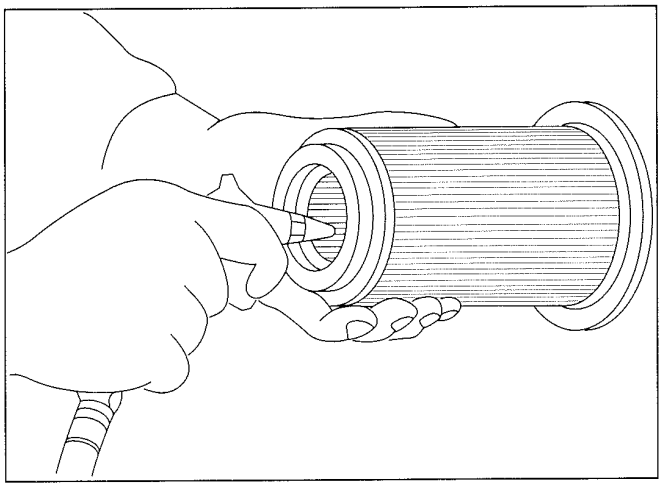

FIG. 87

FUEL SYSTEM

Use only clean diesel fuel of correct grade. Introduction of water or dirt into the fuel tank or other part of the fuel system can cause repeated plugging of the fuel filter and possible injection pump and injector damage.

IMPORTANT: Do not tamper with the injection pump of injector adjustments as doing so may render the engine and/or tractor warranty void and may cause severe engine damage. Refer to a local ISEKI Dealer.

Fuel Filter

FIG. 88: Fuel filter assembly (1) is located at the right side of the engine, and is used to strain impurities from fuel before fuel reaches the injection pump. The fuel filter incorporates the valve (2) to aid in filter servicing.

Check the filter bowl for accumulation of sediment or water and clean as required.

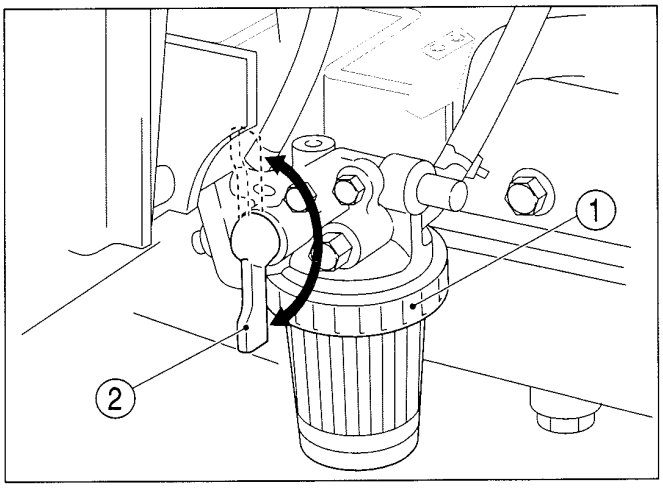

FIG. 88

FIG. 89: To replace the fuel filter element or clean sediment, turn the fuel valve to the OFF position (top).

Carefully loosen the spanner nut (1) and remove the nut, sediment bowl (2) and "O"-ring (3). Sediment bowl can be cleaned at this time. Pull downward on the filter element (4) and discard. Examine the small "O"-ring (5) in the filter head and replace as necessary. Install new element, pushing upward until seated.

Install sediment bowl "O"-ring and nut. Tighten the nut and wipe up spilled fuel.

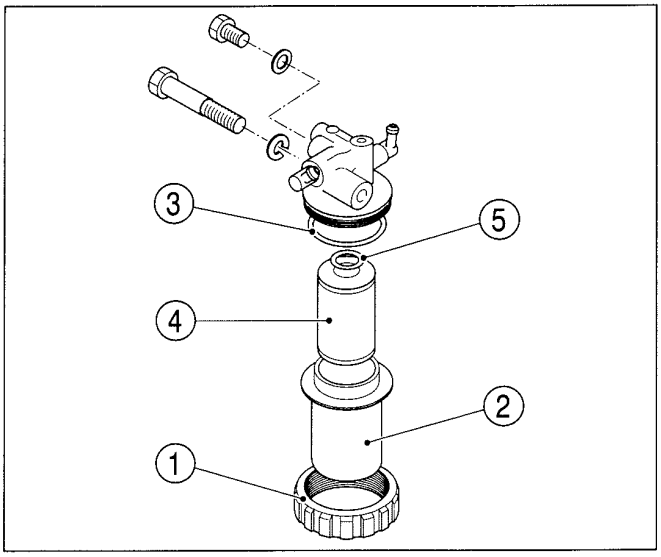

FIG. 89

Air-bleeding Procedure

Fuel system should be bled of air after following cases.

- Emptied fuel tank
- Removal of the fuel filter or fuel piping

FIG. 90 & 91 **TM215 & TM217**

1. Fill the fuel tank.
2. Turn the fuel cock (1) to "ON."
3. Loosen the air-bleeding screw (2) and let air bubbles out.
4. Loosen the air-bleeding screw (3) of the fuel injection pump and let air bubbles out of the pump.

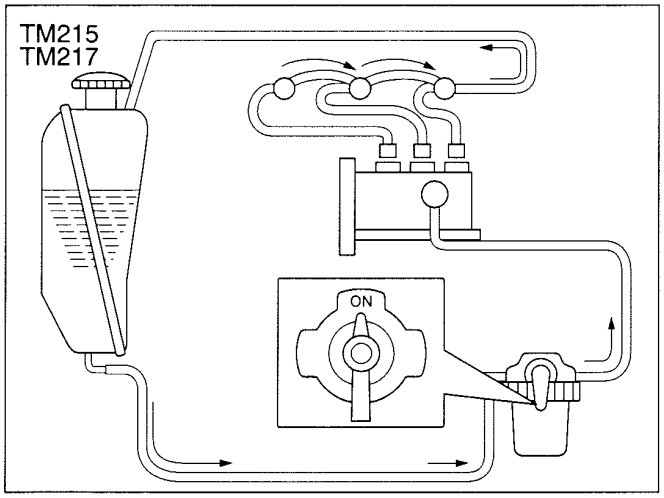

FIG. 90

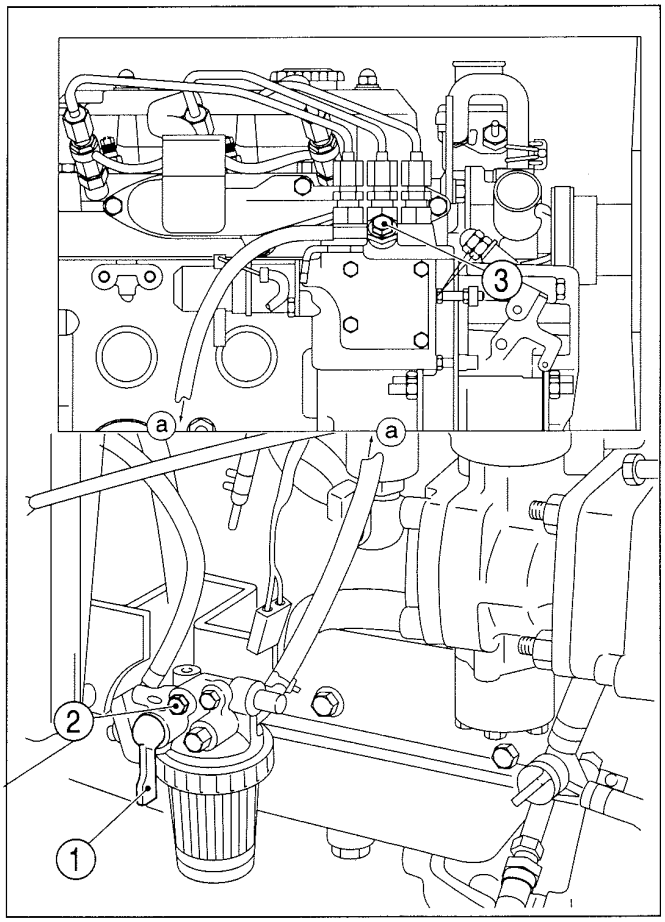

FIG. 91

FIG. 92: **TM223**

1. Fill the fuel tank.
2. Turn the fuel cock (1) to "ON."
3. Turn the starter switch to the "ON" (⚷) position. Hold the key in this position for about 10 to 15 seconds, and the fuel system is bled automatically.

NOTE: Normally, further air-bleeding is not required due to electric fuel pump operating when starter switch in instrument panel is ON. If engine will not start after several attempts, check fuel pump fuses (see Electrical System) and then proceed as necessary.

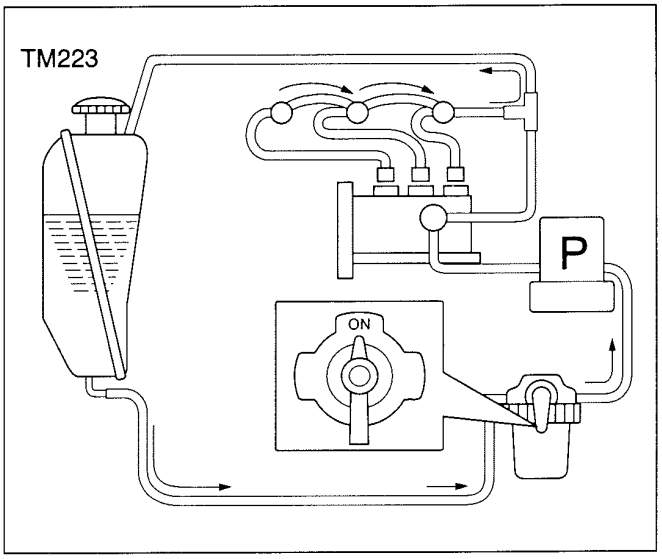

FIG. 92

CAUTION: Fuel emitted from loosened injection lines is under high pressure. Keep hands and face away when the engine is cranked. Clean all spilled fuel following air-bleeding procedure(s).

Throttle Lever

FIG. 93: The throttle lever should remain in the position selected by the operator. Through normal use, friction against the lever may decrease, causing the lever to move out of the selected position. Turn the adjusting nut (1) as required to retain the throttle lever in the position selected.

NOTE: Throttle lever friction adjustment nut is reached by removing the steering column cover, and instrument panel.

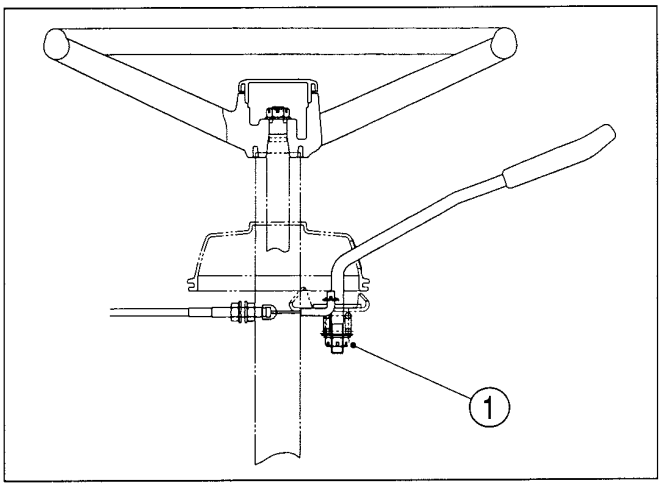

FIG. 93