GENERAL

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SPECIFICATIONS

[ROPS TYPE]

Model			M4900		M5700	
			2WD	4WD	2WD	4WD
Engine	Model		F2803-ELA		F2803-EA	
	Type		Vertical, water-cooled, 4-cycle diesel engine			
	Number of cylinders		5			
	Total displacement		2746 cm^3 (167.6 cu.in.)			
	Bore and stroke		87 × 92.4 mm (3.4 × 3.6 in.)			
	Net power		37.7 kW (50.5 HP)*		42.5 kW (57 HP)*	
	PTO power (factory observed)		33.6 kw (45 HP)*/2600 min^{-1} (rpm)		38.8 kw (52 HP)*/2800 min^{-1} (rpm)	
	Maximum torque		171 N·m (17.4 kgf·m, 126.1 ft-lbs.)/ 1400 to 1600 min^{-1} (rpm)		183 N·m (18.7 kgf·m, 135 ft-lbs.)/ 1400 to 1600 min^{-1} (rpm)	
	Battery		12 V, CCA 700A			
	Fuel		Diesel fuel No.1 [below –10 °C (14 °F)] Diesel fuel No. 2 [above –10 °C (14 °F)]			
	Fuel tank capacity		65 L (17.2 U.S.gal., 14.4 Imp.gal)			
	Engine crankcase capacity		8.0 L (8.5 U.S.qts., 7.04 Imp.qts)			
	Engine coolant capacity		7.3 L (7.7 U.S.qts., 6.4 Imp.qts)			
Dimensions	Overall length		3495 mm (137.6 in.)	3405 mm (1341 in.)	3495 mm (137.6 in.)	3405 mm (134.1 in.)
	Overall width (Minimum tread)		1706 mm (67.2 in.)		1850 mm (72.8 in.)	
	Overall height (with ROPS)		2357 mm (93.0 in.)		2375 mm (93.5 in.)	
	Wheel base		2000 mm (78.7 in.)			
	Tread	Front	1420 to 1820 mm (55.9 to 71.7 in.)	1330 mm (52.4 in.) 1430 mm (56.3 in.)	1420 to 1820 mm (55.9 to 71.7 in.)	1330 mm (52.4 in.) 1430 mm (56.3 in.)
		Rear	1320 to 1720 mm (52.0 to 67.7 in.)		1420 to 1720 mm (55.9 to 67.7 in.)	
	Minimum ground clearance		430 mm (16.9 in.) (BRACKET DRAWBAR)		460 mm (18.1 in.) (BRACKET DRAWBAR)	
Weight (with ROPS)			1700 kg (3748 lbs.)	1800 kg (3968 lbs.)	1750 kg (3858 lbs.)	1850 kg (4078 lbs.)
Travelling system	Standard tire size	Front	6.5-16	9.5-22	7.5-16	9.5-22
		Rear	14.9-28		16.9-28	
	Clutch		Dry, Single plate			
	Steering		Full hydrostatic power steering			
	Transmission		Shuttle synchromesh, 8F/8R (with creep speed 12F/12R)			
	Brake	Travelling	Wet type, multiple discs (mechanical)			
		Parking	Connected with the travelling brake			
	Differential		Bevel gears (with differential lock)			
Hydraulic system	Hydraulic control system		Position, draft and mix control			
	Pump-up capacity		41.6 L (44.0 U.S.qts., 36.6 Imp.qts.)/min.			
	Three point hitch		Category I & II			
	Maximum lifting force		1900 kg (4200 lbs.) at lower link end 1500 kg (3307 lbs.) at 610 mm (24 in.) behind lifting point			
	System pressure		19.1 MPa (195 kgf/cm^2, 2773 psi)			
PTO	Independent clutch		Wet type, multiple discs			
	Live PTO	Direction of turning	Clockwise, viewed from tractor rear			
		PTO speed	540 min^{-1} (rpm) at 2295 engine min^{-1} (rpm)			
Traction system			Swinging drawbar, adjustabnle in direction			

NOTE : * Manufacturer's estimate The company reserves the right to change the specifications without notice.

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⚠ SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and decals on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.

It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.

⚠ **DANGER : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

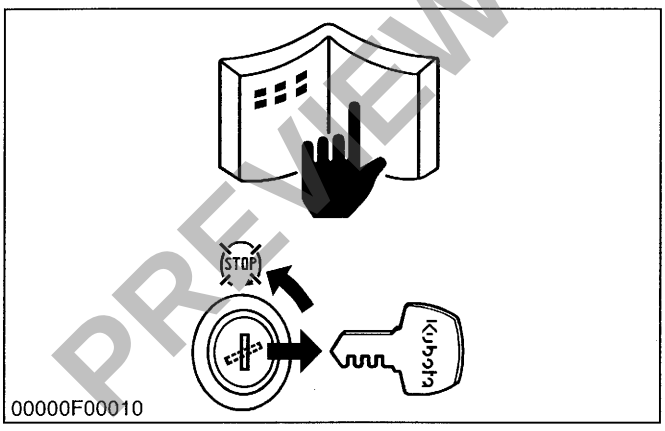
⚠ **WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ **CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

■ **IMPORTANT : Indicates that equipment or property damage could result if instructions are not followed.**

■ **NOTE : Gives helpful information.**

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BEFORE SERVICING AND REPAIRING

(1) Read all instructions and safety instructions in this manual and on your machine safety decals.
(2) Clean the work area and machine.
(3) Park the machine on a firm and level ground, and set the parking brake.
(4) Lower the implement to the ground.
(5) Stop the engine, and remove the key.
(6) Disconnect the battery negative cable.
(7) Hang a **"DO NOT OPERATE"** tag in operator station.

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[6] TIGHTENING TORQUES (GENERAL USE SCREWS, BOLTS AND NUTS)

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

Indication on top of bolt	⬡ 4 No-grade or 4T						⬡ 7 7T						⬡ 9 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6 (6 mm, 0.24 in.)	7.84 to 9.31	0.80 to 0.95	5.79 to 6.87	7.84 to 8.83	0.80 to 0.90	5.79 to 6.51	9.80 to 11.2	1.00 to 1.15	7.24 to 8.32	7.84 to 8.83	0.80 to 0.90	5.79 to 6.51	12.3 to 14.2	1.25 to 1.45	9.05 to 10.5
M8 (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.0 to 15.2	16.7 to 19.6	1.7 to 2.0	12.3 to 14.5	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
M10 (10 mm, 0.39 in.)	39.2 to 45.0	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.1 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.2 to 44.1	4.0 to 4.5	28.9 to 32.5	60.8 to 70.5	6.2 to 7.2	44.9 to 52.1
M12 (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5				77.5 to 90.1	7.9 to 9.2	57.2 to 66.5	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	103 to 117	10.5 to 12.0	76.0 to 86.8
M14 (14 mm, 0.55 in.)	108 to 125	11.0 to 12.8	79.6 to 92.5				124 to 147	12.6 to 15.0	91.2 to 108				167 to 196	17.0 to 20.0	123 to 144
M16 (16 mm, 0.63 in.)	167 to 191	17.0 to 19.5	123 to 141				196 to 225	20.0 to 23.0	145 to 166				260 to 303	26.5 to 31.0	192 to 224
M18 (18 mm, 0.71 in.)	245 to 284	25.0 to 29.0	181 to 210				275 to 318	28.0 to 32.5	203 to 235				343 to 401	35.0 to 41.0	254 to 297
M20 (20 mm, 0.79 in.)	334 to 392	34.0 to 40.0	246 to 289				368 to 431	37.5 to 44.0	272 to 318				490 to 568	50.0 to 58.0	362 to 420

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[7] MAINTENANCE

No.	Item		Period	Service Interval										After purchase		Important		Reference page
				50	50	100	200	300	400	600	800	1500	3000	1 year	2 years			
1	Engine oil		Change	★		☆												G-13
2	Engine oil filter		Replace	★			☆											G-13
3	Hydraulic oil filter		Replace	★				☆										G-14
4	Transmission fluid		Change	★						☆								G-14
5	Front axle case oil		Change	★						☆								G-15
6	Clutch		Adjust	★		☆												G-15
7	Water separator (CAB)		Clean	★					☆									G-15
8	Engine start system		Check		☆													G-16
9	Wheel bolt torque		Check		☆													G-16
10	Greasing		–			☆												G-17
11	Battery condition		Check			☆												G-17
12	Air cleaner element [Double type]	Primary element	Clean			☆										*	@	G-18
			Replace											☆		**		G-18
		Secondary element	Replace											☆				G-18
13	Fuel filter element		Clean			☆												G-18
			Replace						☆								@	G-23
14	Fan belt		Adjust			☆												G-19
15	Brake		Adjust			☆												G-19
16	Radiator hose and clamp		Check				☆											G-20
			Replace												☆			G-20
17	Power steering oil line		Check				☆											G-20
			Replace												☆			G-20
18	Fuel line		Check				☆										@	G-20
			Replace												☆			G-20
19	Toe-in		Adjust				☆											G-21
20	Intake air line		Check				☆										@	G-21
			Replace												☆	***		G-21
21	Inner air filter		Clean				☆											G-22
22	Fresh air filter		Clean				☆											G-22
23	Air conditioner condenser		Clean				☆											G-22
24	Air conditioner drive belt		Adjust				☆											G-23
25	Greasing (2WD front wheel hub)		–						☆									G-23
26	Fuel filter (CAB)		Replace						☆								@	G-23
27	Front axle pivot		Adjust							☆								G-24
28	Engine valve clearance		Adjust								☆							1-S19
29	Fuel injection nozzle injection pressure		Check									☆					@	1-S56
30	Injection pump		Check										☆				@	1-S54
31	Air conditioner pipes and hoses		Check											☆				G-26
32	CAB isolation cushion		Check											☆				G-26
33	Cooling system		Flush												☆			G-28
34	Coolant		Change												☆			G-28

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SERVICING

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(1) Injection Nozzle 1-S57

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SERVICING SPECIFICATIONS

ENGINE BODY

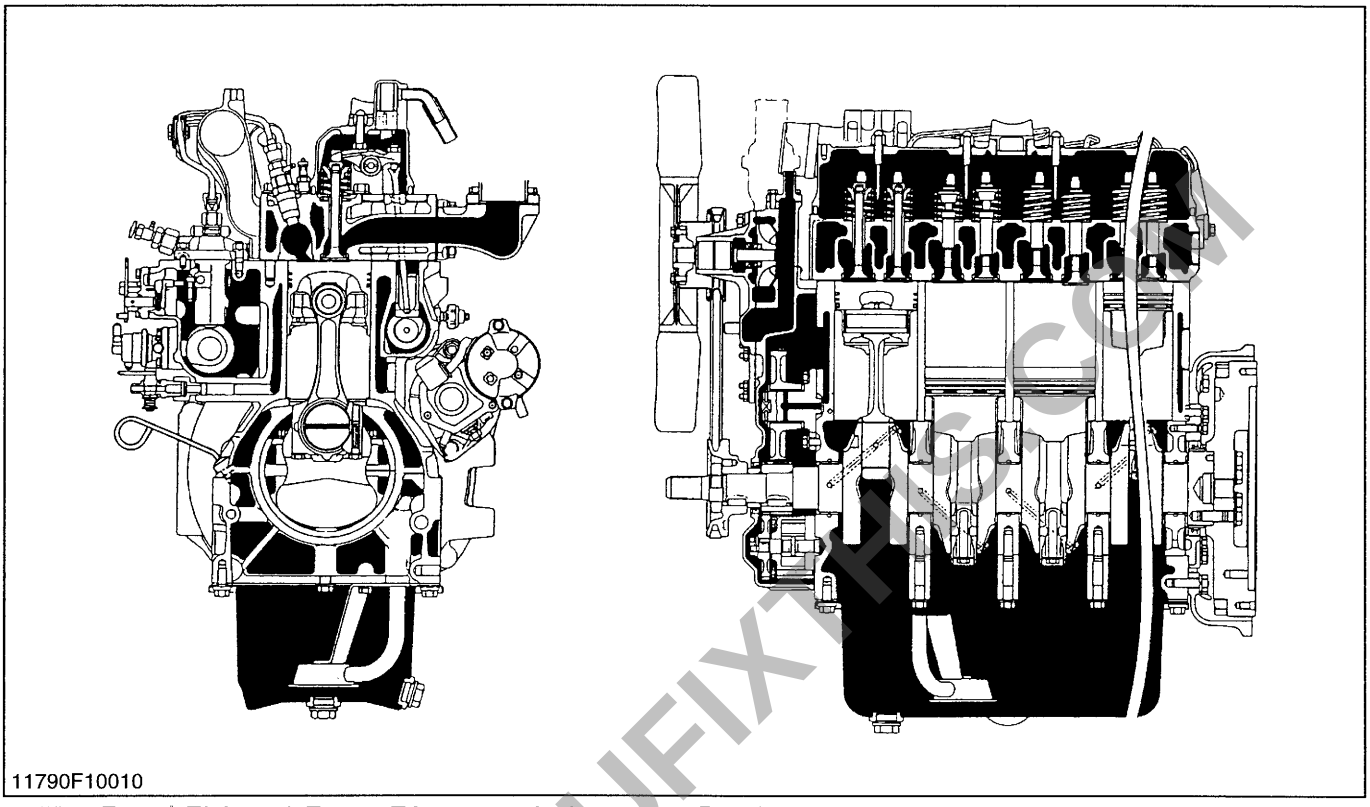
Item		Factory Specification	Allowable Limit
Compression Pressure (When Cranking with Starting Motor)		3.53 to 3.72 MPa 36 to 38 kgf/cm^2 512 to 540 psi	2.55 MPa 26 kgf/cm^2 370 psi
Difference among Cylinders		-	10 % or less
Top Clearance		0.55 to 0.70 mm 0.0217 to 0.0276 in.	–
Cylinder Head Gasket	Thickness (Free)	1.30 to 1.40 mm 0.0512 to 0.0551 in.	–
	Thickness (Tightened)	1.15 to 1.25 mm 0.0453 to 0.0492 in.	–
Valve Clearance (When Cold)		0.18 to 0.22 mm 0.0071 to 0.0087 in.	–
Valve Seat	Width (Intake)	2.12 mm 0.0835 in.	–
	Width (Exhaust)	2.12 mm 0.0835 in.	–
Valve Seat	Angle (Intake)	1.047 rad. 60˚	–
	Angle (Exhaust)	0.785 rad. 45˚	–
Valve Face	Angle (Intake)	1.047 rad. 60˚	–
	Angle (Exhaust)	0.785 rad. 45˚	–
Cylinder Head Surface	Flatness	–	0.05 mm 0.0020 in.
Valve Stem to Valve Guide	Clearance	0.040 to 0.070 mm 0.00157 to 0.00276 in.	0.10 mm 0.0039 in.
Valve Stem	O.D.	7.960 to 7.975 mm 0.31339 to 0.31398 in.	–
Valve Guide	I.D.	8.015 to 8.030 mm 0.31555 to 0.31614 in.	–
Valve Recessing	Protrusion	0.05 mm 0.0020 in.	–
	Recessing	0.15 mm 0.0059 in.	0.40 mm 0.0157 in.

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[1] FEATURES

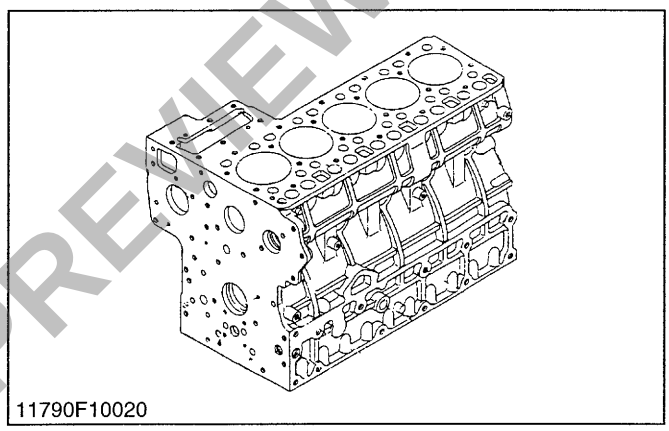

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The F2803-ELA and F2803-EA are vertical, water-cooled, 4 cycle diesel engines. They are incorporated KUBOTA's foremost technologies. With KUBOTA's E-TVCS (Three Vortex Combustion System), well-known Bosch type injection pump and the well-balanced designs, they give greater power, low fuel consumption, little vibration and quiet operation.

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[2] ENGINE BODY

(1) Cylinder Block


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The engine has a high durability tunnel-type cylinder block in which the crank bearing component is a constructed body.

Furthermore, liner less type, allow effective cooling, less distortion, and greater wear-resistance.

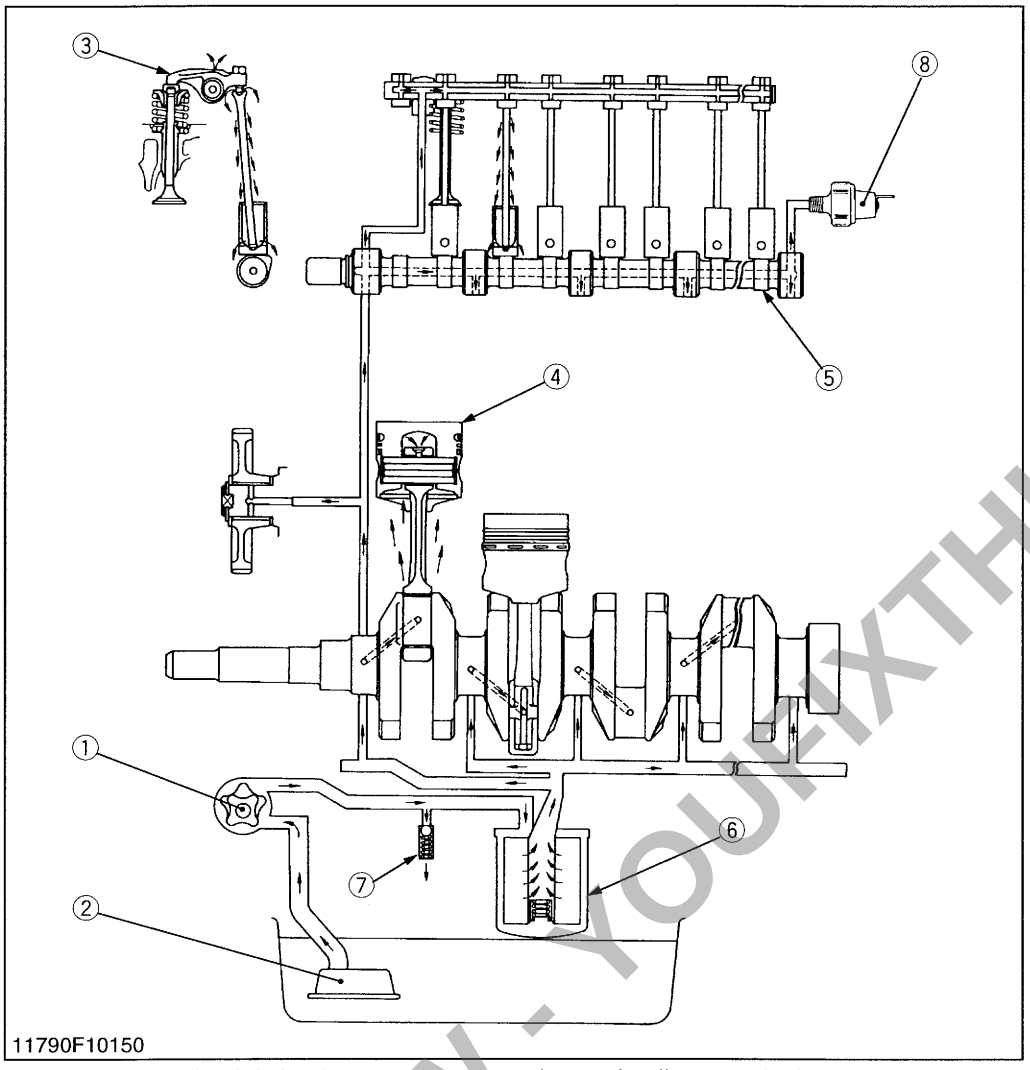
The noise level is reduced to a minimum because each cylinder had its own chamber.

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[3] LUBRICATING SYSTEM



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(1) Oil Pump
(2) Oil Strainer
(3) Rocker Arm and Rocker Arm Shaft
(4) Piston
(5) Camshaft
(6) Oil Filter Cartridge
(7) Relief Valve
(8) Oil Pressure Switch

This engine's lubricating system consists of oil strainer, oil pump, relief valve, oil filter cartridge and oil pressure switch. The oil pump sucks lubricating oil from the oil pan through the oil strainer and the oil flows down to the filter cartridge, where it is further filtered. Then the oil is forced to crankshaft, connecting rods, idle gear, camshaft and rocker arm shaft to lubricate each part.

Some part of oil, splashed by the crankshaft or leaking and dropping from gaps of each part, lubricates these parts : pistons, cylinders, small ends of connecting rods, tappets, pushrods, inlet and exhaust valves and timing gears.

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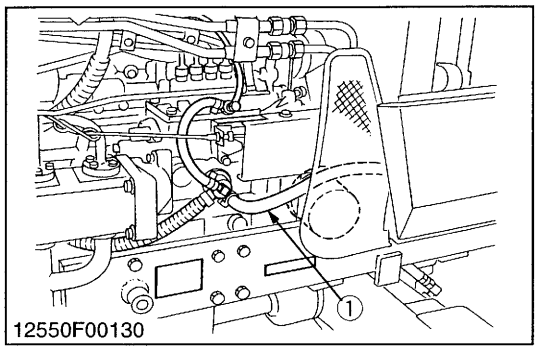
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CHECKING, DISASSEMBLING AND SERVICING

[1] SEPARATING ENGINE FROM TRACTOR DISASSEMBLING AND ASSEMBLING

(1) Draining Coolant, Engine Oil and Transmission Fluid



Draining Coolant

CAUTION

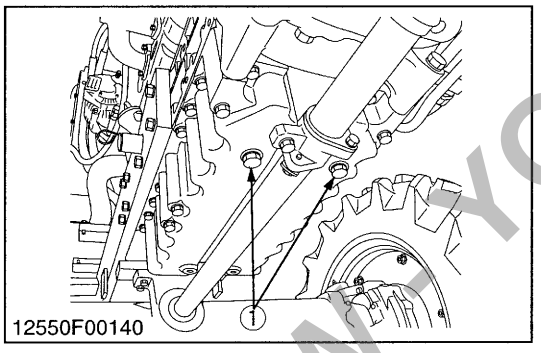
- **Never remove the radiator cap until coolant temperature is well below its boiling point. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

1. Stop the engine and let cool down.
2. Remove the radiator hose (1) from the engine side to drain the coolant.
3. Remove the radiator cap to completely drain the coolant.
4. After all coolant is drained, reinstall the radiator hose.

Draining coolant	Capacity	7.3 L 7.7 U.S.qts. 6.4 Imp.qts.

(1) Radiator Hose

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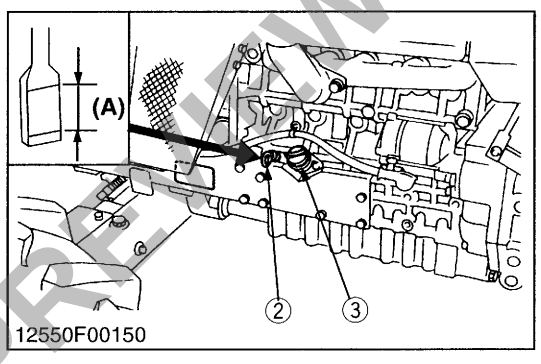
Changing Engine Oil

1. Start and warm up the engine for approx. 5 minutes.
2. Place an oil pan underneath the engine.
3. Remove the drain plug (1) to drain oil.
4. After draining, screw in the drain plugs (1).

(When refilling)

- Fill the engine oil up to the upper line on the dipstick (3).

Engine oil	Capacity	8.0 L 8.5 U.S.qts. 7.0 Imp.qts.



IMPORTANT

- **Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperatures.**
  Refer to "LUBRICANTS, FUEL AND COOLANT". (See page G-9.)

(1) Drain Plug
(2) Dipstick
(3) Oil Inlet

(A) Oil level is acceptable within this range.

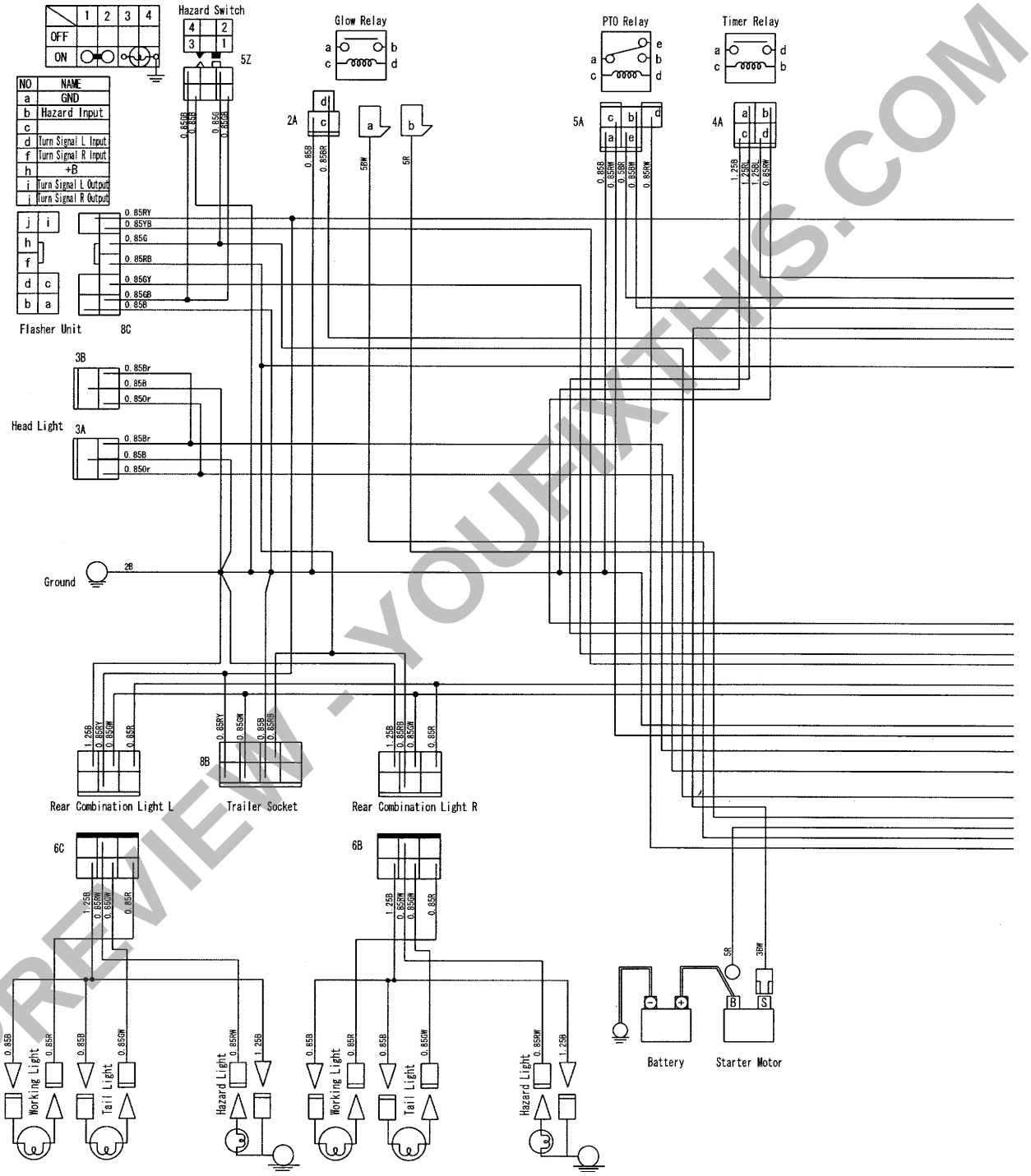
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[1] WIRING DIAGRAM

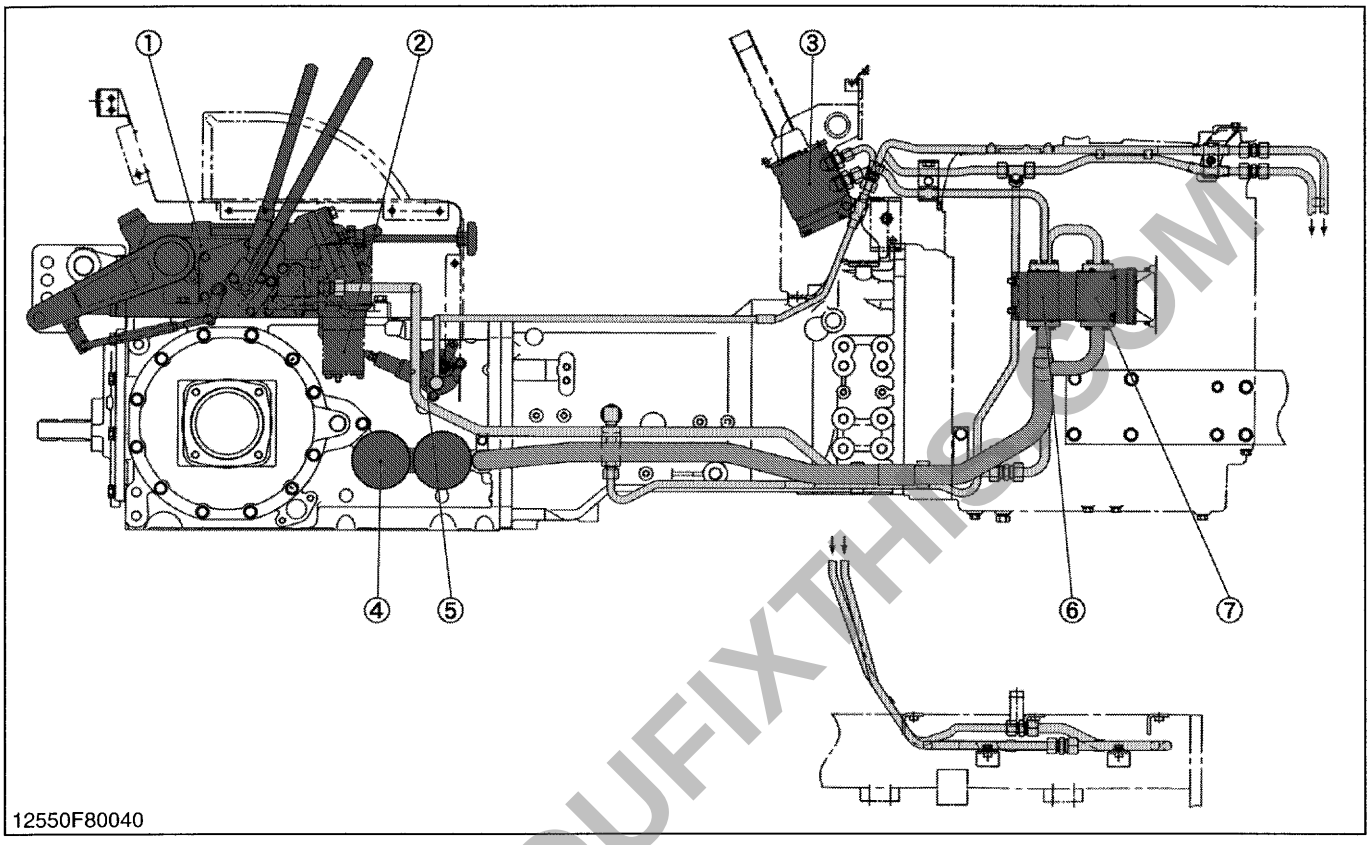
(1) ROPS Type



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[1] THREE POINT HYDRAULIC SYSTEM



(1) Hydraulic Cylinder Body
(2) Auxiliary Control Valve
(3) Power Steering Controller
(4) Oil Filter Cartridge
(5) PTO Control Valve
(6) Hydraulic Pump for Power Steering
(7) Hydraulic Pump for Three Point Hydraulic System

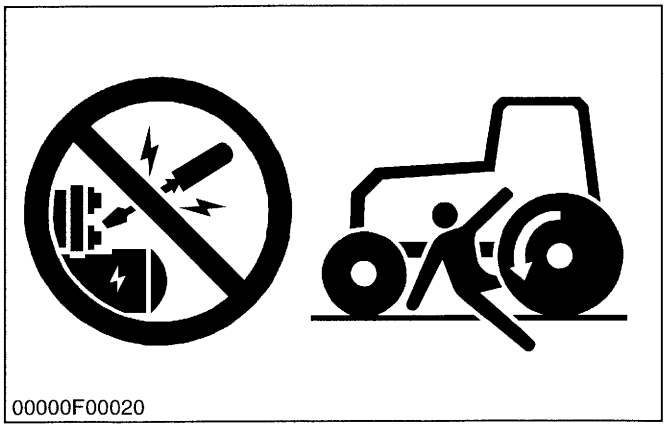
The hydraulic system of these tractors are composed of the main components as shown in the figure.

- To raise and lower the implement connected to the three point hitch. For this motion, the position control valve and the linkage installed on the hydraulic cylinder body provide three different applications : position control, draft control and mix control.
- Take out hydraulic power from the hydraulic cylinder body to operate an implement's hydraulic actuator.
- Takes out hydraulic power from the quick couplers for the implements with either single acting or double acting actuators. In this case, the implement's cylinders can be actuated by operating the auxiliary control valves.

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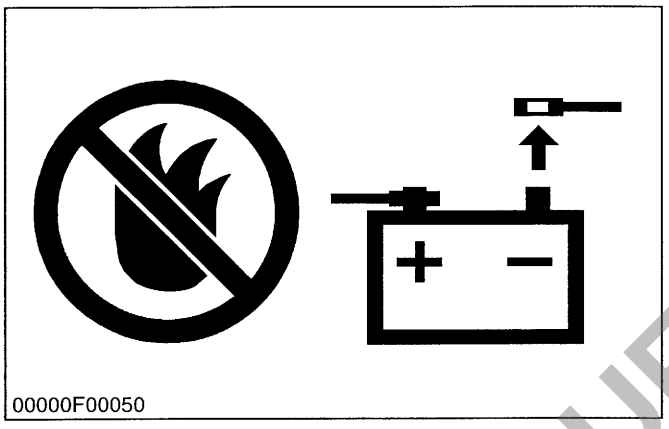
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SAFETY STARTING

(1) Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
(2) Do not alter or remove any part of machine safety system.
(3) Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
(4) Never start the engine while standing on ground. Start the engine only from operator's seat.

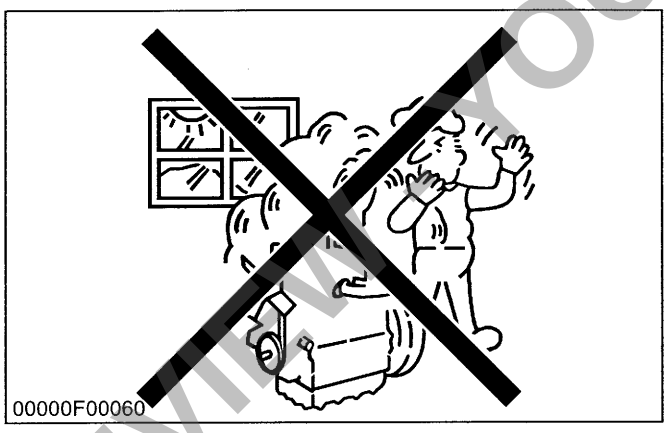
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AVOID FIRES

(1) Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
(2) To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
(3) Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
(4) Make sure that no fuel has been spilled on the engine.

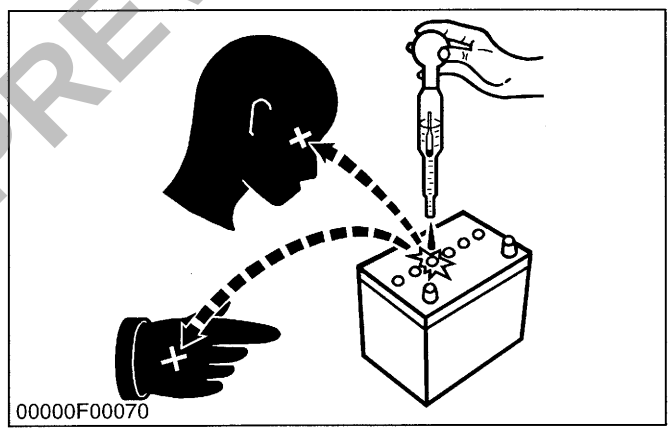
00000Z00050


00000F00060

VENTILATE WORK AREA

(1) If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

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PREVENT ACID BURNS

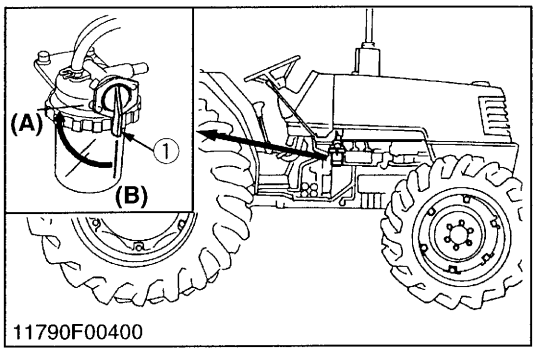
(1) Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.

00000Z00070

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(13) Others



11790F00400

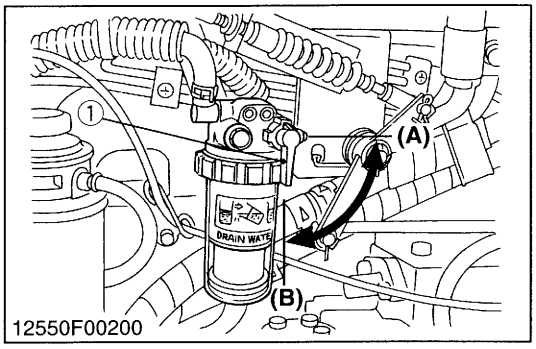
Bleeding Fuel System (ROPS)

Air must removed:
1. When the fuel filter or lines are removed.
2. When tank is completely empty.
3. After the tractor has not been used for a long period of time.

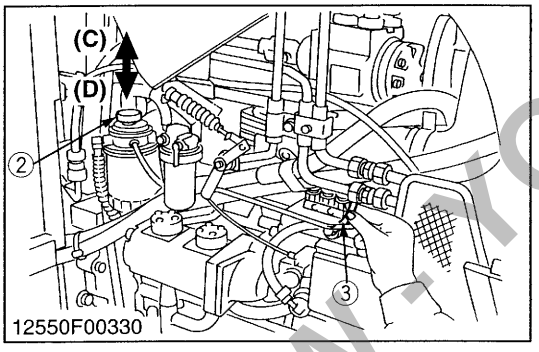
Bleeding procedure is as follows:
1. When the fuel tank with fuel, and open the fuel cock (1).
2. Start the engine and run for about 30 seconds, and then stop the engine.

(1) Fuel Cock
(A) Close
(B) Open

12550G00300



12550F00200



12550F00330

Bleeding Fuel System (CAB)

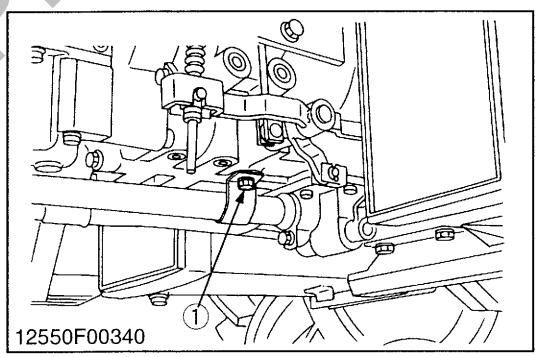
Air must be removed:
1. When the fuel filter or lines are removed.
2. When water is drained from water separator.
3. When tank is completely empty.
4. After the tractor has not been used for a long period of time.

■ **Bleeding Procedure is as Follows:**
1. Make sure the fuel cock is in the **"OPEN"** position.
2. Pump the fuel pump knob (2) located on the top of the fuel filter. The fuel pump knob (2) will pump easily at first and with added resistance as air is purged from the system. To make sure air is completely purged, pinch the fuel overflow hose with fingers, if a pulsation is felt when the knob is pumped, then, no air remains.
3. Set the hand throttle lever at the maximum speed position, turn on the key switch to the start the engine, and then reset the throttle lever at the mid speed (around 1500 min^{-1} (rpm)) position.
   If engine doesn't start, try it several times with 30 seconds intervals.
4. Accelerate the engine to remove the small portion of air left in the fuel system.
5. If air still remains and the engine stops, repeat the above steps.
6. Close the air vent cock.

■ **IMPORTANT**
- **Do not hold key witch at engine start position for more than 10 seconds continuously. If more engine cranking is needed, try again after 30 seconds.**

(1) Fuel Cock
(2) Fuel Pump Knob
(3) Fuel Overflow Hose
(A) Close
(B) Open
(C) Up
(D) Down

12550G00310



12550F00340

Draining Clutch Housing Water

1. The tractor is equipped with drain plug (1) under the clutch housing.
2. After operating in rain, snow or tractor has been washed, water may get into the clutch housing.
3. Remove the drain plug (1) and drain the water, then install the plug (1) again.

(1) Water Drain Plug

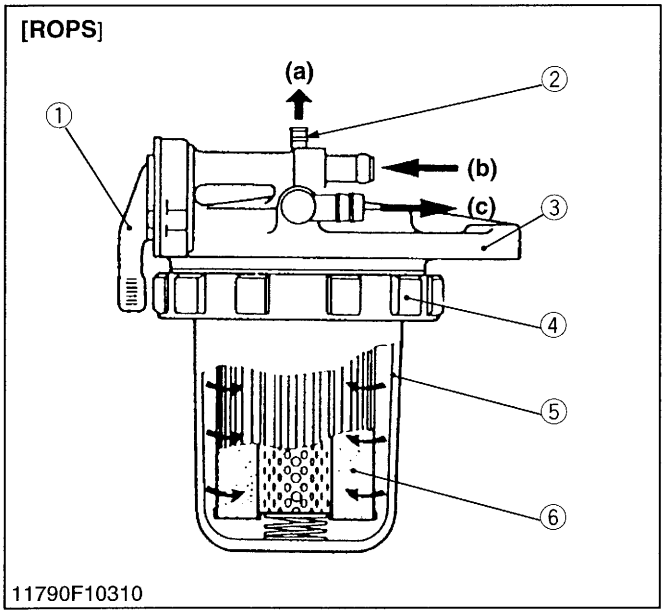
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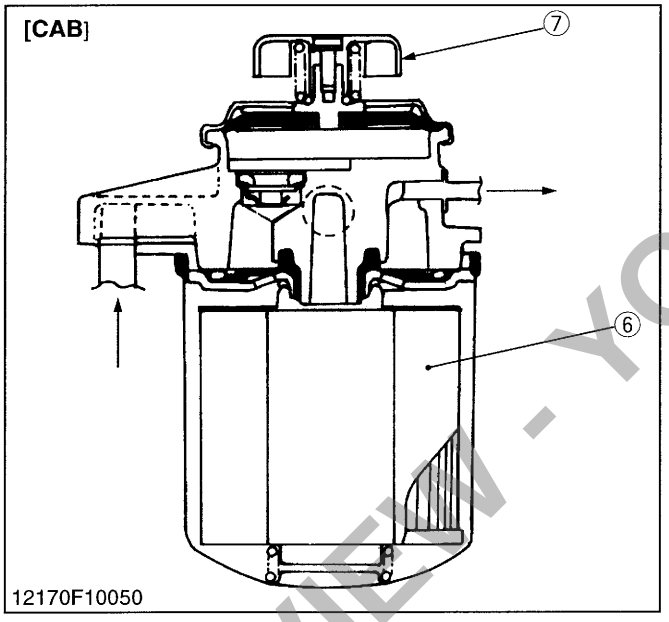
(4) Fuel Filter

[ROPS]



11790F10310

[CAB]



12170F10050

[ROPS]

The fuel filter removes dirt and water with its fine filter paper, which collects particles of 15 microns (0.00059 in.) at 20 kPa (0.2 kgf/cm^2, 3 psi).

The fuel from the fuel tank is filtered by the filter element (6), while flowing through the filter element from its outside to inside.

The filter bracket (3) has an air vent (2) to take off air in the fuel line.

[CAB]

The fuel filter is installed between the fuel tank and fuel lift pump, and serves to remove dirt and impurities from the fuel.

Fuel from the fuel tank enters the outside of the filter element (6) and passes through the filter element under its own pressure. As it passes through, the dirt and impurties in the fuel are filtered out, allowing only clean fuel to enter the interior of the filter element.

The feed pump (1) sends fuel from the fuel tank to the injection pump by applying pressure to fuel.

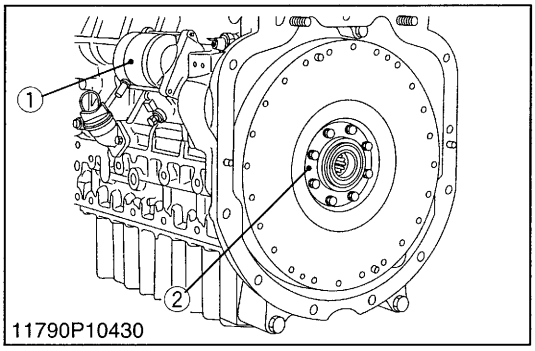
(1) Cock
(2) Air Vent
(3) Filter Bracket
(4) Retainer Ring
(5) Pot
(6) Filter Element
(7) Fuel Pump

(a) To Fuel Tank
(b) From Fuel Tank
(c) To Fuel Lift Pump

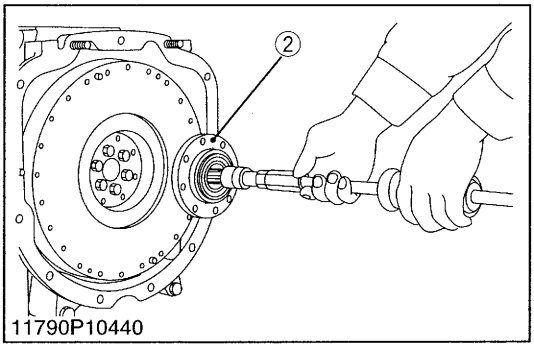
12550M10020

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11790P10430



11790P10440

PTO Propeller Shaft Spline Hub and Flywheel

1. Remove the starter motor (1).
2. Lock the flywheel not to turn using the flywheel stopper.
3. Remove the PTO propeller shaft spline hub screws.
4. Draw out the PTO propeller shaft spline hub (2) with a knuckle spindle bushing replacement tool.
5. Remove the flywheel screws, except for two which must be loosened and left as they are.
6. Set a flywheel puller, and remove the flywheel.

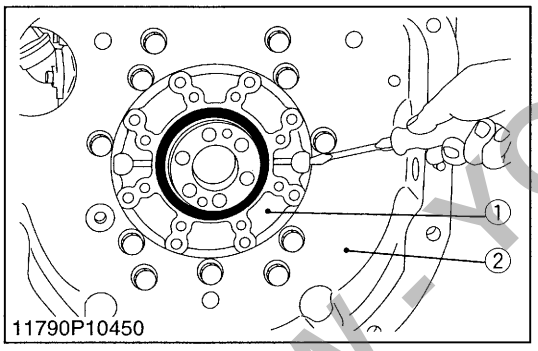
(When reassembling)

- Apply engine oil to the flywheel screws.
- Check to see that there are no metal particles left on the flywheel mounting surface.
- To ease alignment of the crankshaft and the flywheel, bring the crank of No.1 cylinder to TC (top dead center). Make sure of the flywheel 1TC, align it in the window on flywheel housing.

Tightening torque	PTO propeller shaft spline hub screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft-lbs
	Flywheel screw	98.0 to 107.8 N·m 10.0 to 11.0 kgf·m 72.3 to 79.5 ft-lbs

(1) Starter Motor (2) PTO Propeller Shaft Spline Hub

11790S10470



11790P10450

Bearing Case Cover and Flywheel Housing Case

1. Remove the bearing case cover mounting screws first inside and next outside.
2. Remove the bearing case cover (1).
3. Remove the flywheel housing case (2).

(When reassembling)

- Apply grease to the oil seal lip and take care that it is not rolled when installing.
- Tighten the bearing case cover mounting screws with even force on the diagonal line.

Tightening torque	Bearing case cover mounting screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft-lbs

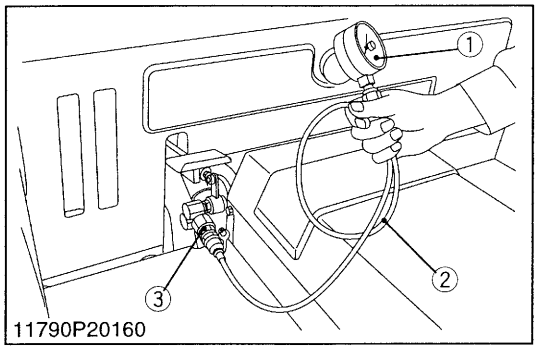
(1) Bearing Case Cover (2) Flywheel Housing Case

12550S10240

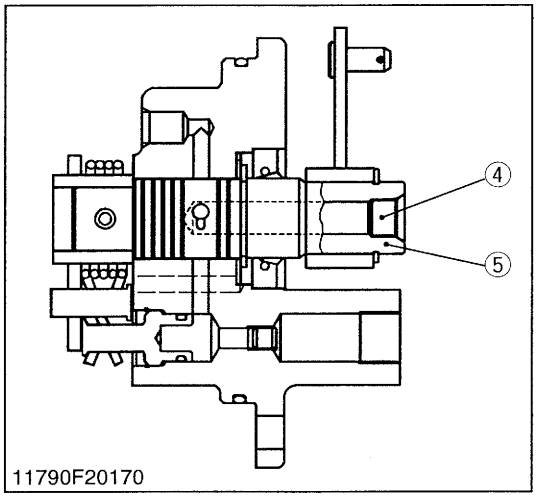
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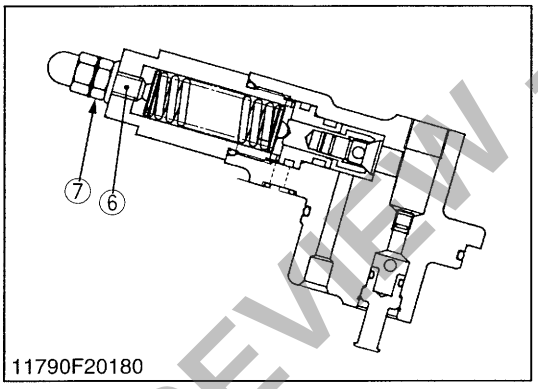
[2] HYDRAULIC PTO CLUTCH
[2]-1 PTO CLUTCH VALVE CHECKING AND ADJUSTING



11790P20160



11790F20170



11790F20180

Relief Valve Setting Pressure

1. Start the engine and warm up the transmission fluid, and then stop the engine.
2. Remove the plug (4) (PT 1/8) on the PTO valve spool (5).
3. Set the adaptor (PT 1/8) (Use the oil pressure tester for diesel engines, Code No. 07916-32032), threaded joint (3), cable (2) and pressure gauge (1).
4. Start the engine and set the engine speed maximum.
5. Move the PTO clutch lever to the **"ON"** position, and measure the pressure.
6. If only the pressure in the PTO clutch engaged position is low, check the hydraulic PTO clutch system.
7. If the measurement is not within the factory specifications, loosen the lock nut (7) and turn the screw (6) to adjust.

■ IMPORTANT

- **Do not connect the universal joint of the implement to the tractor PTO shaft while testing.**

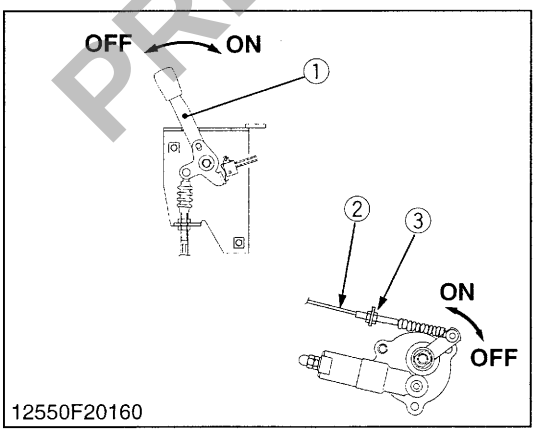
PTO pressure (When PTO shift lever is **"Engaged"** position)	Factory spec.	2.45 to 2.55 MPa 25.0 to 26.0 kgf/cm^2 355 to 370 psi
PTO pressure (When PTO shift lever is **"Disengaged"** position)	Factory spec.	No pressure

Condition
- Engine speed .....Maximum
- Oil temperature ...45 to 55 ˚C
  113 to 131 ˚F

(Reference)
- Turn the screw (6) to clockwise direction → Pressure increase
- Turn the screw (6) to counterclockwise direction → Pressure decrease

(1) Pressure Gauge
(2) Cable
(3) Threaded Joint
(4) Plug (PT 1/8)
(5) Spool
(6) Screw
(7) Lock Nut

11790S20160



12550F20160

PTO Clutch Lever Movement

1. Stop the engine and remove the key.
2. Check the PTO clutch lever (1) on the **"ON"** and **"OFF"** position of PTO clutch lever guide.
3. If adjustment is needed, loosen the lock nuts (3) and adjust the clutch control cable (2) length.
4. Retighten the lock nuts (3) firmly.

■ IMPORTANT

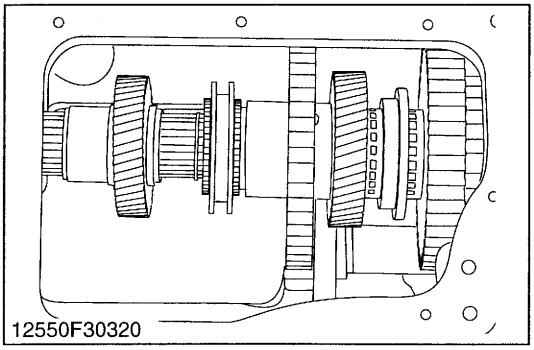
- **Do not connect the universal joint of the implement to the tractor PTO shaft while testing.**

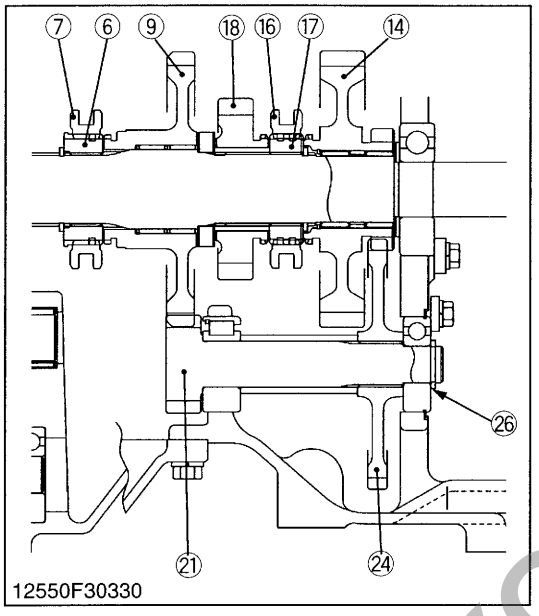
(1) PTO Clutch Lever
(2) Clutch Control Cable
(3) Lock Nut

12550S20140

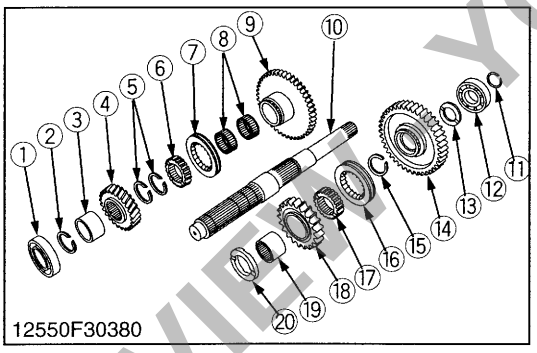
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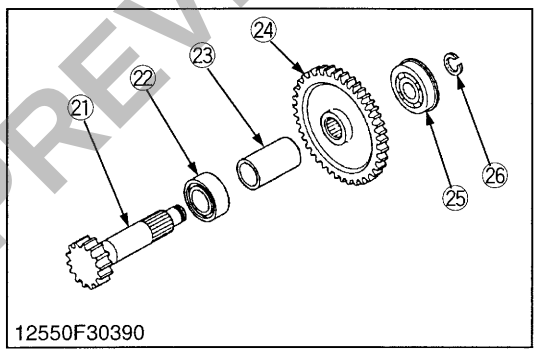

12550F30320



12550F30330



12550F30380



12550F30390

Creep Gear and 3rd Shaft

1. Tap out the 3rd shaft (10) with gears to the front.
2. Remove the external snap ring (26).
3. Tap out the 15T gear shaft (21).
4. Take out the 43T gear and collar (24).

(1) Ball Bearing
(2) External Snap Ring
(3) Collar
(4) 26T Gear
(5) External Snap Ring
(6) Hub
(7) Shifter
(8) Needle Bearing
(9) 47T Gear
(10) 3rd Shaft
(11) External Snap Ring
(12) Ball Bearing
(13) Thrust Collar
(14) 41T-19T Gear
(15) External Snap Ring
(16) shifter
(17) Hub
(18) 21T Gear
(19) Inner Ring
(20) Spacer
(21) 15T Gear Shaft
(22) Ball Bearing
(23) Collar
(24) 43T Gear
(25) Ball Bearing
(26) External Snap Ring

12550S30170

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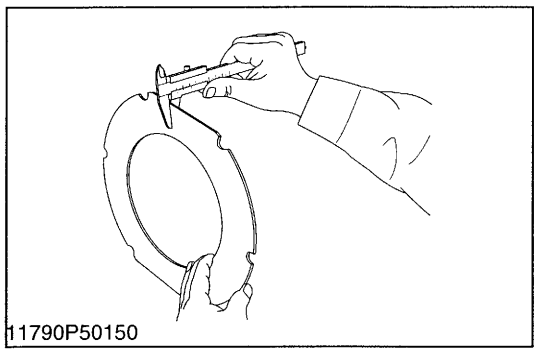
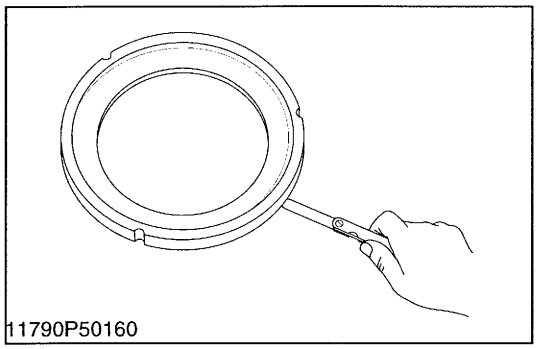

11790P50150

Plate Wear

1. Measure the plate thickness with vernier calipers.
2. If the measurement is less than the allowable limit, replace it.

Plate thickness	Factory spec.	2.25 to 2.35 mm 0.0886 to 0.0925 in.
	Allowable limit	1.5 mm 0.059 in.

11790S50200


11790P50160

Brake Plate Flatness

1. Place the brake plate on the surface plate.
2. Measure the flatness of brake plate with a feeler gauge at four points on a diagonal line.
3. If the measurement exceeds the allowable limit, replace it.

Brake Plate Flatness	Allowable limit	0.3 mm 0.012 in.

11790S50210

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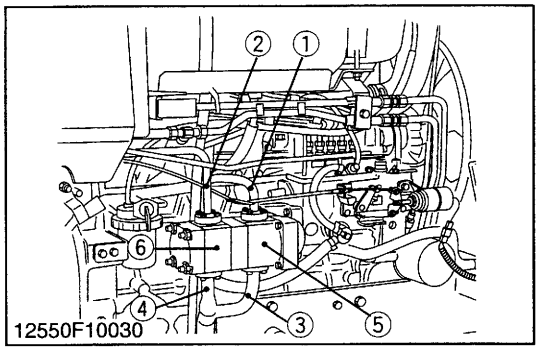
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CHECKING, DISASSEMBLING AND SERVICING

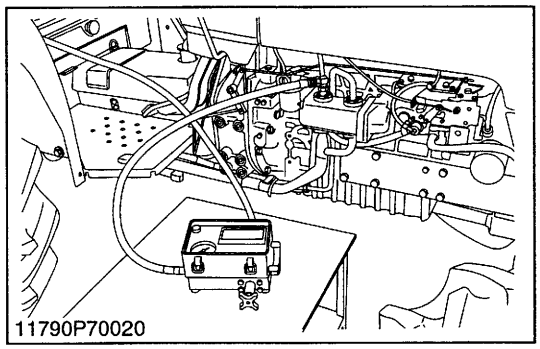
[1] POWER STEERING HYDRAULIC PUMP

CHECKING

(1) Pump Test Using Flowmeter



12550F10030


11790P70020

Condition

- Engine speed
  M4900 : Approx. 2600 min^{-1} (rpm)
  M5700 : Approx. 2800 min^{-1} (rpm)
- Rated pressure : 16.8 MPa
  170 kgf/cm^2
  2418 psi
- Oil temperature : 45 to 55 ˚C
  13 to 131 ˚F

Hydraulic Flow Test

■ **IMPORTANT**

- **When using a flowmeter other than KUBOTA specified flowmeter (Code No. 07916-52792), be sure to use the instructions with the flowmeter.**
- **Do not close the flowmeter loading valve completely, before testing, because it has no relief valve.**

1. Disconnect the delivery pipe which is connected from hydraulic pump to steering controller.
2. Install the adaptor **53** and **54** to the pump discharge port. [Adaptor **53** and **54** are included in adaptor set (Code No. 07916-54301).]
3. Connect the hydraulic test hose to the adaptor **53** and flowmeter inlet port.
4. Connect the other hydraulic test hose to the flowmeter outlet and put the end of the hose into the transmission oil port.
5. Open the flowmeter loading valve completely. (Turn counterclockwises.)
6. Start the engine and set the engine speed at 2000 to 2200 rpm.
7. Slowly close the loading valve to generate pressure approx. 9.8 MPa (100 kgf/cm^2, 1422 psi). Hold in this condition until oil temperature reaches approx. 50 ˚C (122 ˚F).
8. Open the loading valve completely.
9. Set the engine speed. (Refer to condition.)
10. Read and note the pump delivery at no pressure.
11. Slowly close the loading valve to increase rated pressure. (Refer to condition.) As the load is increased, engine speed drops, therefore, reset the engine speed.
12. Read and note the pump delivery at rated pressure.
13. Open the loading valve completely and stop the engine.
14. If the pump delivery does not reach the allowable limit, check the pump suction line, oil filter or hydraulic pump.

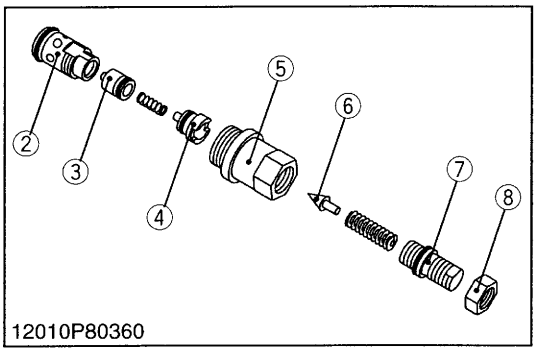
Hydraulic pump delivery at no pressure	Factory spec.	M4900	23.2 L/min. 6.13 U.S gal/min. 5 10 U.S Imp gal/min.
		M5700	22.4 L/min 5 92 U S gal/min. 4.93 Imp.gal/min
Hydraulic pump delivery at rated pressure	Factory spec	M4900	21.8 L/min. 5.76 U S.gal/min 4.80 Imp.gal/min
		M5700	21.1 L/min 5 57 U S gal/min. 4 64 Imp gal/min.
	Allowable limit	M4900	17.8 L/min 4 70 U S gal/min. 3.92 Imp gal/min
		M5700	17 2 L/min. 4 54 U.S gal/min. 3.78 Imp gal/min.

12550S70040

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DISASSEMBLING AND ASSEMBLING



12010P80360

Relief Valve

1. Remove the relief valve assembly from the hydraulic block.
2. Remove the lock nut (7).
3. Remove the adjuster (6) and draw out the spring and the pilot valve (5).
4. Remove the valve seat (1), and draw out the valve seat (3), the spring and the main valve (2).

(When reassembling)

- Take care not to damage the O-rings.

Tightening torque	Relief valve assembly	34.3 to 39.2 N·m 3.5 to 4.0 kgf·m 25.3 to 28.9 ft-lbs

■ IMPORTANT

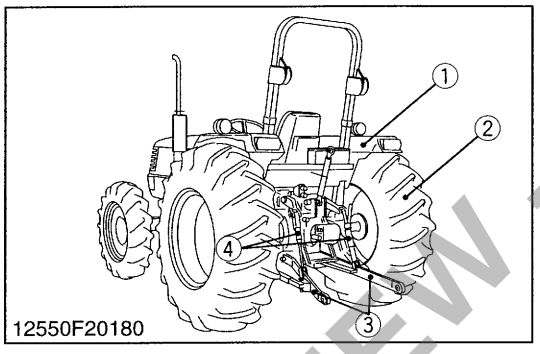
- **After disassembling and assembling the relief valve, be sure to adjust the relief valve setting pressure.**

(1) Valve Seat
(2) Main Valve
(3) Valve Seat
(4) Valve Body
(5) Pilot Valve
(6) Adjuster
(7) Lock Nut

12550S80080

[4] HYDRAULIC CYLINDER AND POSITION CONTROL VALVE DISASSEMBLING AND ASSEMBLING

(1) Removing Hydraulic Cylinder Assembly



12550F20180

Rear Wheel and Fenders

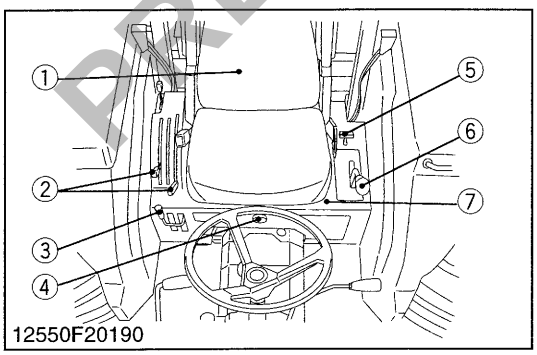
1. Remove the three point linkage, lift rods (4), lower link (3), and drawber.
2. Place disassembly stand under the transmission case.
3. Remove the rear wheels (2).
4. Disconnect the jumper leads for hazard and tail light.
5. Disconnect the jumper leads for PTO safety switch.
6. Remove the fender (1).

(When reassembling)

Tightening torque	Rear wheel mounting nut	260 to 304 N·m 26.5 to 31.0 kgf·m 192 to 224 ft-lbs

(1) Fender
(2) Rear Wheel
(3) Lower Link
(4) Lift Rod

12550S80090



12550F20190

Seat and Center Frame

1. Remove the seat (1).
2. Remove the draft and position control lever grips (2).
3. Remove the auxiliary speed change lever grip (6), DT shift lever grip (5) and 3-point hitch lowering speed control grip (4).
4. Remove the auxiliary control valve lever assembly (3).
5. Remove the center frame (7).

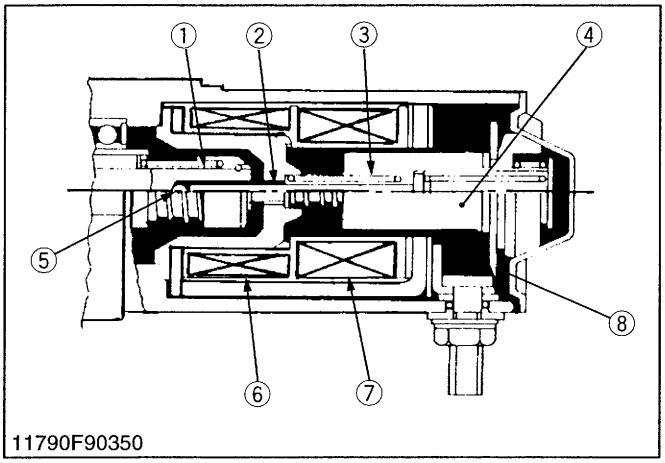
(1) Seat
(2) Lever Grip
(3) Auxiliary Control Valve Lever Assembly
(4) 3-Point Hitch Lowering Speed Control Grip
(5) DT Shift Lever Grip
(6) Auxiliary Speed Change Lever Grip
(7) Center Frame

12550S20170

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(1)-2 Magnet Switch



11790F90350

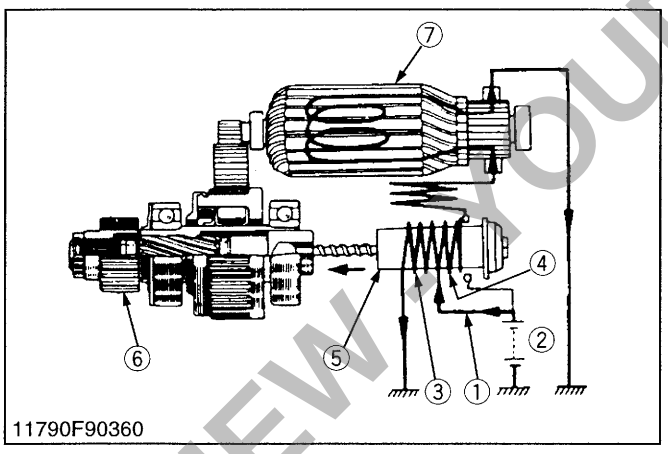
The magnet switch series as a relay to drive the armature. It consists of a pull-in coil, a holding coil and a plunger. It works as follows.

1. When the main switch is at the **START** position, the armature is rotated at a small amperage as the pull-in coil (7) and the holding coil (6) attract the plunger (4) to the left.
2. When the main circuit from the contact plate (8) to armature is closed by the plunger (4), the armature starts rotating at a strong torque.
3. At the same time, a current stops flowing into the pull-in coil and the plunger is kept attracted by the holding coil alone.
4. When the main switch is released from the **START** position after starting the engine, it returns to the **ON** position so that the flow of a current to the holding coil also stops. Thus, the armature stops rotating.

(1) Clutch Pinion Shaft
(2) Plunger Shaft
(3) Return Spring
(4) Plunger
(5) Steel Ball
(6) Holding Coil
(7) Pull-in Coil
(8) Contact Plate

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(1)-3 Opetation of Starter Motor



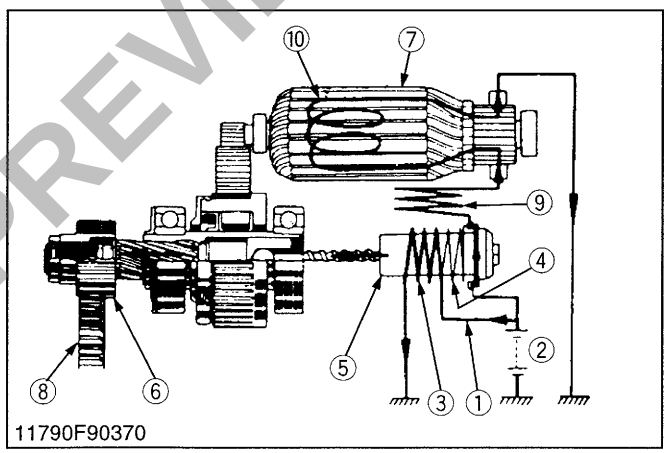
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■ When Main Switch is Turned to "START" Position

With the main switch (1) is at the **START** position, current flows, from the battery (2) to the holding coil (3) and pull-in coil (4). This moves the plunger (5) electromagnetically and pushes out the pinion gear (6). At the same time, current flowing through the pull-in coil (4) rotates the armature (7) at low speeds.

(1) Main Switch
(2) Battery
(3) Holding Coil
(4) Pull-in Coil
(5) Plunger
(6) Pinion Gear
(7) Armature

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■ When Pinion Gear Meshes with Ring Gear

When the pinion gear (6) comes into mesh with the ring gear (8) on the flywheel, a large current flows from the battery directly into the field coil (9) and armature coil (10), but not through the pull-in coil (4). This rotates the armature (7) at a high speed, which in turn drives the ring gear through the pinion gear at 200 to 300 rpm.

(1) Main Switch
(2) Battery
(3) Holding Coil
(4) Pull-in Coil
(5) Plunger
(6) Pinion Gear
(7) Armature
(8) Ring Gear
(9) Field Coil
(10) Armature Coil

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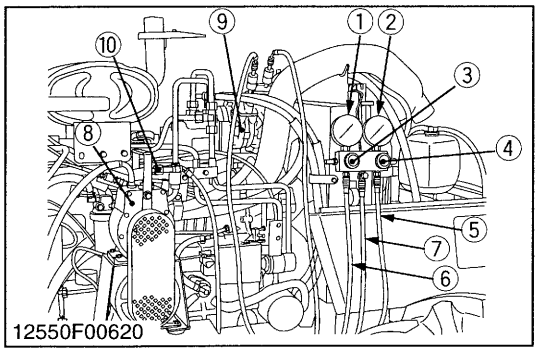
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10 CABIN

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Evacuating the System

1. Discharge refrigerant from the system by R134a refrigerant recovery and recycling machine. (Refer to **"Discharging the system"**.)
2. Connect the charging hose (5) (red) to the **HI** pressure side charging valve and connect the charging hose (6) (blue) to the **LO** pressure side charging valve.
3. Connect the center charging hose (7) (green) to a vacuum pump inlet.
4. Open both valves (3), (4) of manifold gauge fully. Then run the vacuum pump (8) to evacuate the refrigerant cycle. (For approx. **15 minutes**.)
5. When **LO** pressure gauge (1) reading is more than **2.20 MPa (750 mmHg, 319 psi)**, stop the vacuum pump (8) and close both valves (3), (4) of manifold gauge fully.
6. Wait for over **5 minutes** with the **HI** and **LO** pressure side valves (4), (3) of gauge manifold closed, and then check that gauge indicator does not return to **0**.
7. If the gauge indicator is going to approach to **0**, check whether there is a leaking point and repair if it is, and then evacuate it again.

(1) **LO** Pressure Gauge
(2) **HI** Pressure Gauge
(3) **LO** Pressure Side Valve (Close)
(4) **HI** Pressure Side Valve (Open)
(5) Red Hose
(6) Blue Hose
(7) Green Hose
(8) Vacuum Pump (Running)
(9) Compressor
(10) Vacuum Pump Adaptor

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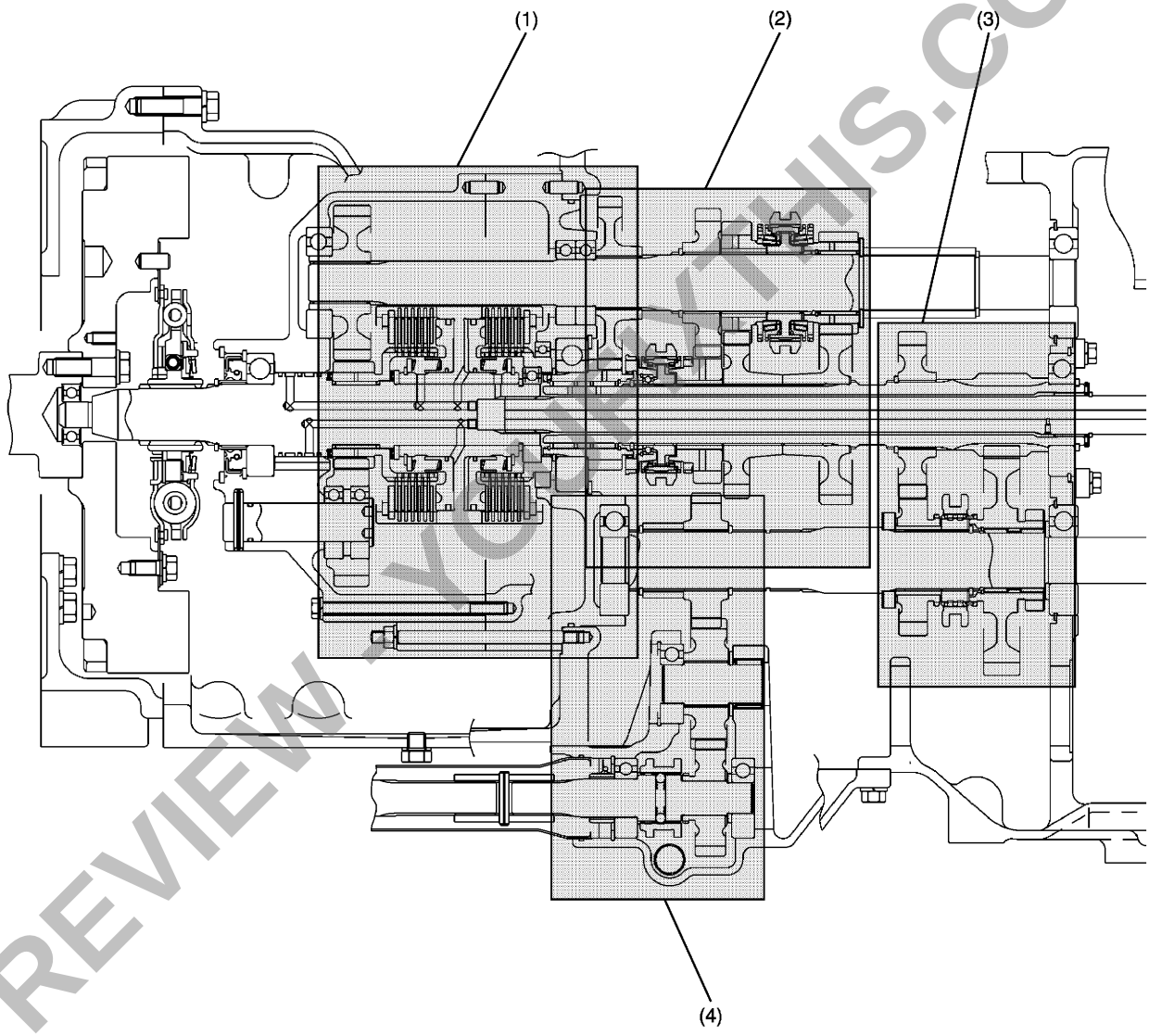
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3. TRANSMISSION

[1] MECHANISM

(1) Structure



T12553TR00101

(1) Shuttle Shift Section (Forward-Reverse)
(2) Main Gear Shift Section
(3) Hi-Low Section
(4) Front Wheel Drive Section

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