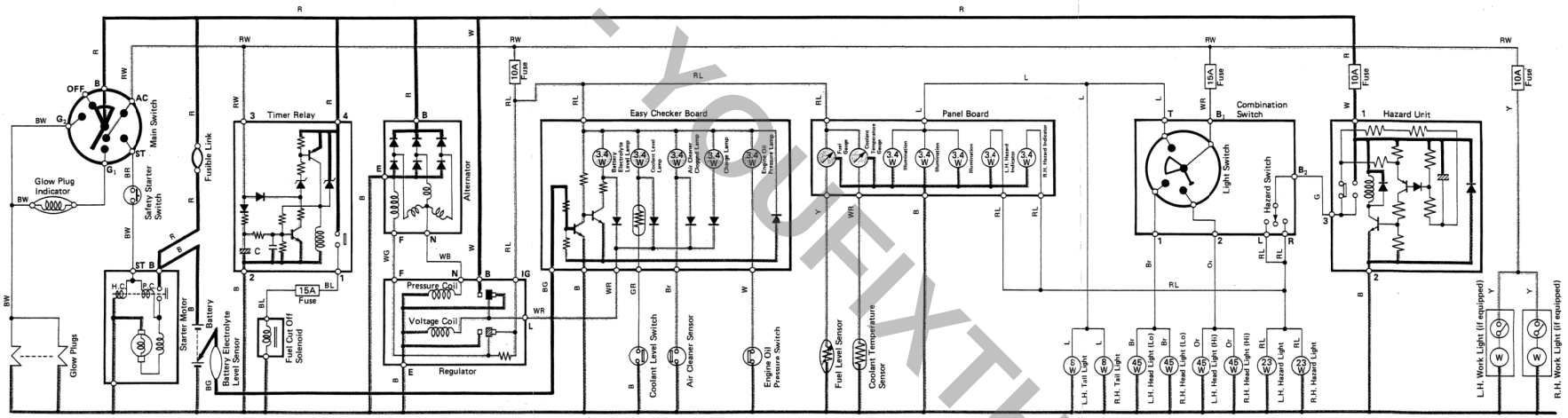
(2) Electrical Circuit of X type

Main Switch Table						
Key Position \ Terminal	B	AC	G1	G2	ST	OFF
OFF						●
ON	●	●				
HEAT	●	●	●			
START	●	●		●	●	

Light Switch Table				
Knob Position \ Terminal	B1	T	1	2
OFF				
LOW-BEAM	●	●	●	
HI-BEAM	●	●		●



0329F055

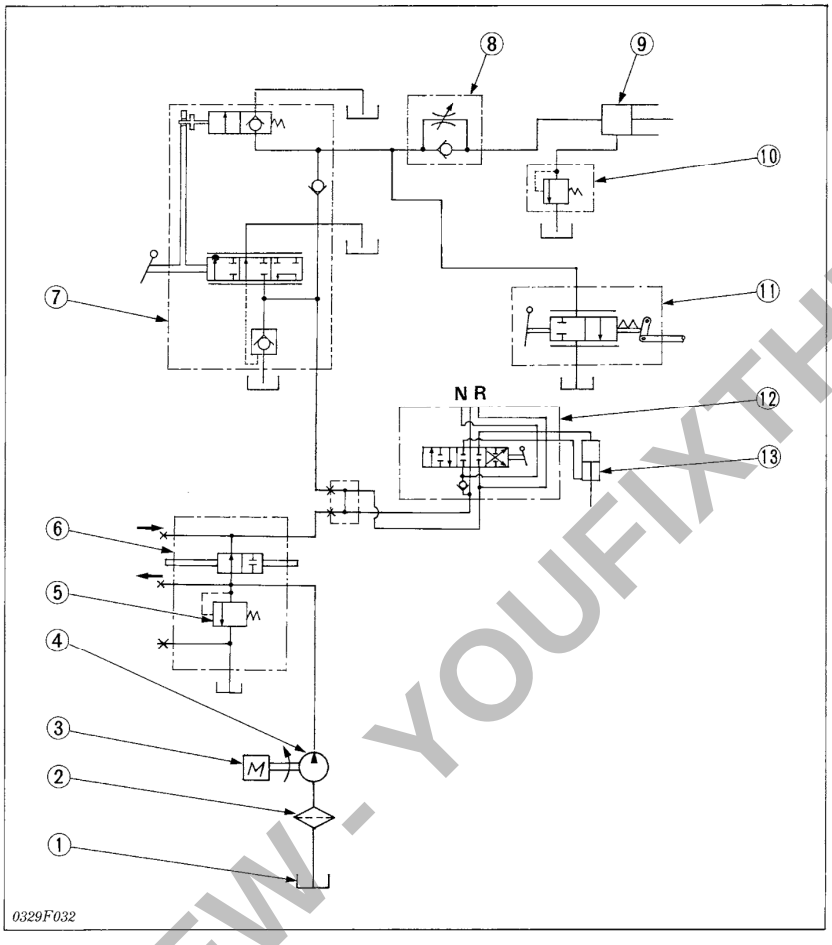
Denotes battery voltage, at any position of main switch.
Denotes battery voltage when turning the main switch to **ON** position from **OFF** position.
Denotes ground line.

● Color of Wiring

B ..... Black	BG ..... Black/Green	Br ..... Brown	RW ..... Red/White
W ..... White	BL ..... Black/Blue	Lg ..... Light Green	GB ..... Green/Black
R ..... Red	BW ..... Black/White	WB ..... White/Black	GW ..... Green/White
G ..... Green	BR ..... Black/Red	WR ..... White/Red	GR ..... Green/Red
Y ..... Yellow	RL ..... Red/Blue	WG ..... White/Green	LR ..... Blue/Red

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[1] HYDRAULIC CIRCUIT



(1) Oil Tank (Transmission Case)
(2) Oil Filter
(3) Engine
(4) Hydraulic Pump
(5) Relief Valve
(6) Front Hydraulic Block
(7) Position Control Valve
(8) Lowering Speed Adjusting Valve
(9) Hydraulic Cylinder (For Three Point Hydraulic System)
(10) Cylinder Safety Valve
(11) Draft Control Valve (if equipped)
(12) Auxiliary Control Valve (if equipped)
(13) Implement Cylinder (if equipped)

N: To Another Auxiliary Control Valve
R: From Another Auxiliary Control Valve

■ Hydraulic Oil Flow

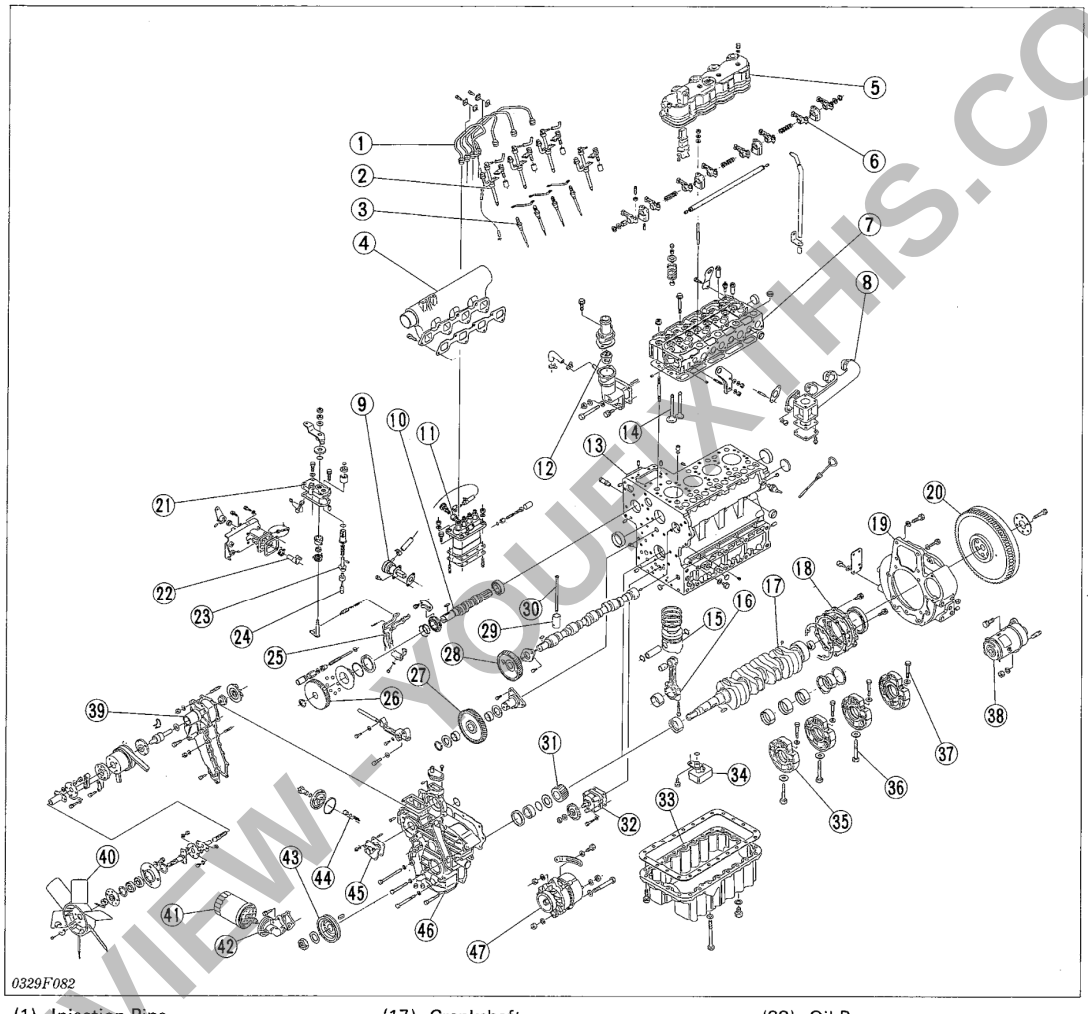
1. When the engine (3) is started, the hydraulic pump (4) is rotated to draw oil from the transmission case (1) through the suction pipe. Supplied oil is filtered by the oil filter (2).
2. Filtered oil is forced out by the hydraulic pump to the position control valve (7) through the delivery pipe.
3. The position control valve (7) switches the oil flow, and oil is channelled to the hydraulic cylinder (9) for the three-point hydraulic system or returned to the oil tank (transmission case).

- The hydraulic system has a relief valve (5) which restricts the maximum pressure in the circuit. (See page M.8-8).
- The hydraulic cylinder (9) has a cylinder safety valve (10) to relieve shock pressure caused by heavy implement bounce. (See page M.8-9).
- The draft control valve (11) enables to use draft control to maintain a constant traction load. (See page M.8-13).
- When hydraulic power is taken out to use a hydraulically-operated implement, implement's cylinders can be actuated by operating the double-acting auxiliary control valve (12). (See page M.8-17)

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CHECKING, DISASSEMBLING AND SERVICING

ENIGNE DISASSEMBLED VIEW



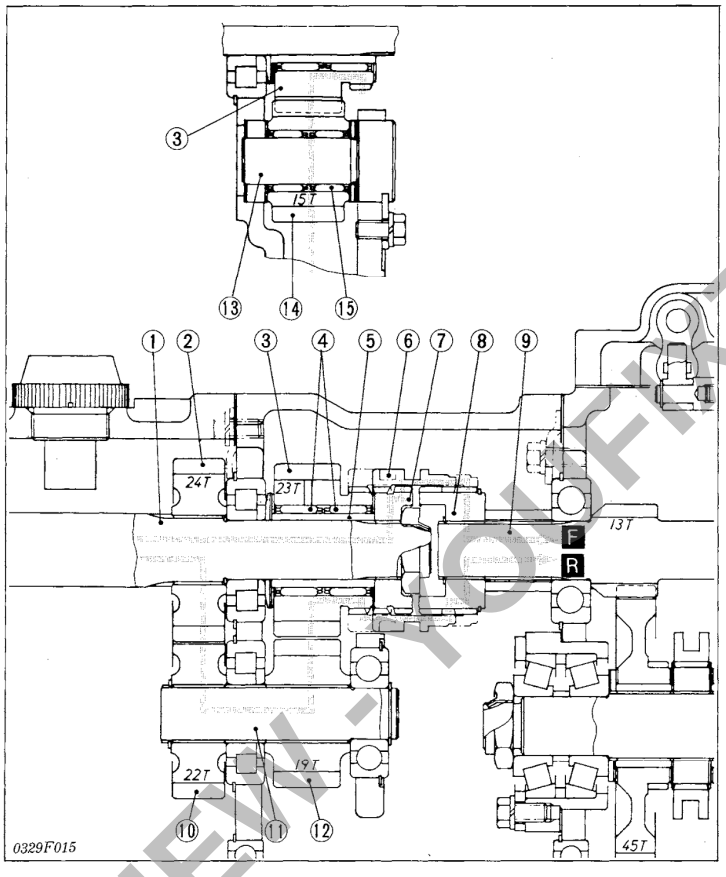
(1) Injection Pipe
(2) Injection Nozzle
(3) Glow Plug
(4) Inlet Manifold
(5) Cylinder Head Cover
(6) Rocker Arm
(7) Cylinder Head
(8) Exhaust Manifold
(9) Fuel Transfer Pump
(10) Fuel Camshaft
(11) Injection Pump
(12) Thermostat
(13) Cylinder Block
(14) Valve
(15) Piston
(16) Connecting Rod
(17) Crankshaft
(18) Bearing Case Cover
(19) Flywheel Housing
(20) Flywheel
(21) Speed Control Plate
(22) Stop Lever
(23) Idle Compensator
(24) Thermostat
(25) Governor Fork Lever
(26) Injection Pump Gear
(27) Idle Gear
(28) Cam Gear
(29) Tappet
(30) Push Rod
(31) Crank Gear
(32) Oil Pump
(33) Oil Pan
(34) Strainer
(35) Main Bearing Case
(36) Bearing Case Screw 2
(37) Bearing Case Screw 1
(38) Starter
(39) Water Pump Housing
(40) Fan
(41) Oil Filter Cartridge
(42) Oil Filter Flange
(43) Fan Drive Pulley
(44) Relief Valve
(45) Hourmeter Unit
(46) Gear Case
(47) Alternator

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[1]-2 SHUTTLE SHIFT SECTION

The shuttle shift section allows the operator to change forward and reverse for each speed from the first to seventh with a single shift lever. (Eighth speed can not be shifted from forward to reverse using the restrictive mechanism.)

It also operates as a reduction unit when shifting from forward to reverse.



(1) Counter Shaft 2
(2) 24T Gear
(3) 23T Gear
(4) Needle Bearing
(5) Inner Race
(6) Shifter
(7) Spline Boss 1
(8) Spline Boss 2
(9) 13T Gear Shaft
(10) 22T Gear
(11) Reverse Shaft 1
(12) 19T Gear
(13) Reverse Shaft 2
(14) 15T Gear
(15) Needle Bearing

The 24T gear (2) and spline boss 1 (7) are splined to the counter shaft 2 (1). The 22T gear (10) and 19T gear (12) are splined to the reverse shaft 1 (11). The 24T gear (2) and 22T gear (10), the 19T gear (12) and 15T gear (14), the 15T gear and 23T gear (3) are constantly meshed with each other. Therefore, the 24T gear (2) and 23T gear (3) rotate in the opposite direction whenever the travelling clutch is engaged.

When the shuttle lever is moved to the forward or reverse position, the shifter (6) is slid to the rear or front by the mechanical linkage to be engaged with the spline boss 1 (7) or spline boss of 23T gear (3). Then, the power is transmitted to the 13T gear shaft (9).

Power is transmitted as follows.

F Forward
Counter Shaft 2 (1) → Spline Boss 1 (7) → Shifter (6) → Spline Boss 2 (8) → 13T Gear Shaft (9).

R Reverse
Counter Shaft 2 (1) → 24T Gear (2) → 22T Gear (10) → Reverse Shaft 1 (11) → 19T Gear (12) → 15T Gear (14) → 23T Gear (3) → Shifter (6) → Spline Boss 2 (8) → 13T Gear Shaft (9).

■ IMPORTANT
- **Do not shift the shuttle lever when the tractor is travelling.**

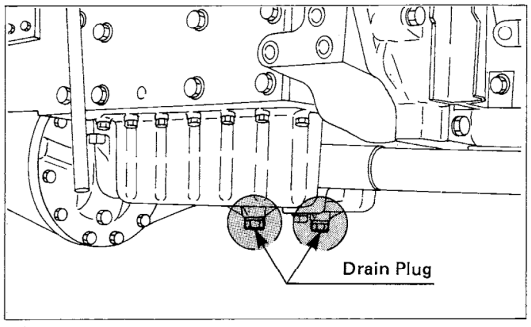
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DISASSEMBLING AND ASSEMBLING

⚠ CAUTION

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

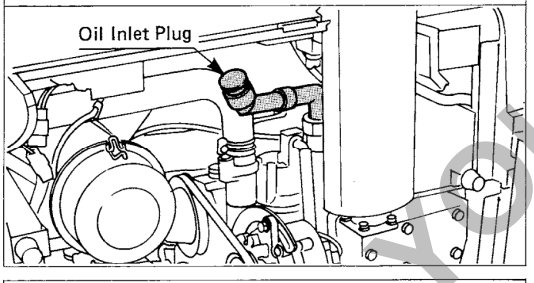
[1] DRAINING OIL AND COOLANT



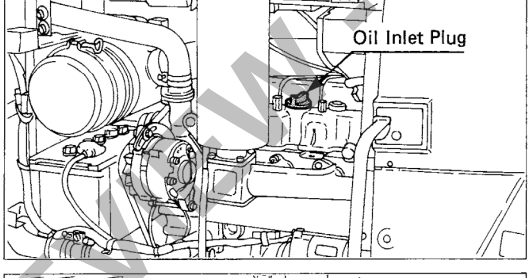
Draining Engine Oil

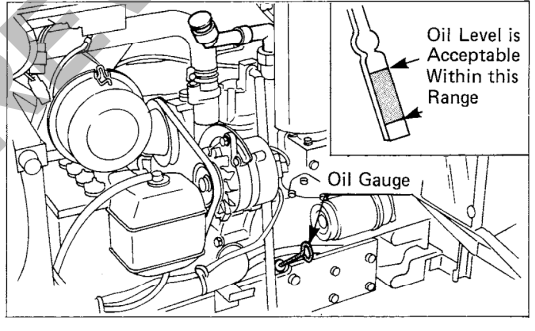
1. Remove the drain plugs at the bottom of engine to drain engine oil. Oil can be drained out easily when the engine is still warm.

[L2250・L2550]



[L2850]





(When refilling)

- Engine oil 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:

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

- Fill with the oil up to the upper notch on the oil gauge (dipstick).

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TROUBLE-SHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	• No fuel	Replenish fuel	S.G-2
	• Air in the fuel system	Vent air	S.G-21
	• Water in the fuel system	Change fuel and repair or flush fuel system	S.G-21
	• Fuel pipe clogged	Clean	—
	• Fuel filter clogged	Clean or replace	S.G-11, 16
	• Excessively high viscosity of fuel or engine oil at low temperature	Use the specified fuel or engine oil	S.G-2, 3
	• Fuel with low cetane number	Use the specified fuel	S.G-2
	• Fuel leak due to loose injection pipe retaining nut	Tighten nut	S.1-14
	• Incorrect injection timing	Adjust	S.1-49
	• Fuel camshaft worn	Replace	S.1-36
	• Injection nozzle clogged	Clean	S.1-51
	• Injection pump malfunctioning	Repair or replace	S.1-49, 50
	• Fuel transfer pump malfunctioning	Repair or replace	—
	• Seizure of crankshaft, camshaft, piston, cylinder liner or bearing	Repair or replace	—
	• Compression leak from cylinder	Replace head gasket, tighten cylinder head screw and nut, glow plug and nozzle holder	S.1-15, 17, 18, 19
	• Improper valve seating, valve spring broken, valve seized	Repair or replace	S.1-31
	• Improper valve timing	Correct or replace timing gear	S.1-24
	• Piston ring and liner worn	Replace	S.1-38, 44
	• Excessive valve clearance	Adjust	S.1-16
(Starter Does Not Run)	• Battery discharged	Charge	S.9-7
	• Starter malfunctioning	Repair or replace	S.9-12, 13
	• Starter switch malfunctioning	Repair or replace	S.9-10,11,12
	• Wiring disconnected	Connect	S.9-10, 11
Engine Revolution is Not Smooth	• Fuel filter clogged or dirt	Clean or replace	S.G-11, 16
	• Air cleaner clogged	Clean or replace	S.G-12, 19
	• Fuel leak due to loose injection pipe retaining nut	Tighten nut	S.1-14
	• Injection pump malfunctioning	Repair or replace	S.1-49, 50
	• Incorrect nozzle opening pressure	Adjust	S.1-51, 52
	• Injection nozzle stuck or clogged	Repair or replace	S.1-51
	• Fuel over flow pipe clogged	Clean	—
	• Governor malfunctioning	Repair	—
Either White or Blue Exhaust Gas is Observed	• Excessive engine oil	Reduce to the specified level	S.1-3, 6
	• Piston ring and liner worn or stuck	Repair or replace	S.1-38, 44
	• Incorrect injection timing	Adjust	S.1-49
	• Deficient compression	Adjust top clearance	S.1-29
Either Black or Dark Gray Exhaust Gas is Observed	• Overload	Lessen the load	—
	• Low grade fuel used	Use the specified fuel	S.G-2
	• Fuel filter clogged	Clean or replace	S.G-11, 16
	• Air cleaner clogged	Clean or replace	S.G-12, 19

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SPECIFICATIONS

Model				L2250 (2WD)	L2250 (4WD)	L2550 (2WD)	L2550 (4WD)	L2850 (2WD)	L2850 (4WD)
Maximum PTO power				15.7kW (21HP)*		17.5kW (23.5HP)*		20.1kW (27HP)*	
Engine gross H.P.				19.8kW (26.5HP)*		22.0kW (29.5HP)*		25.4kW (34HP)*	
	Model			KUBOTA D1302-DI-A		KUBOTA D1402-DI-A		KUBOTA V1702-DI-A	
	Type			Vertical, water-cooled, 4 cycle diesel engine					
	Number of cylinders			3				4	
	Bore and stroke			82 x 82mm (3.2 x 3.2in.)		85 x 82mm (3.3 x 3.2in.)		82 x 82mm (3.2 x 3.2in.)	
	Total displacement			1299cm³ (79.3cu. in.)		1395cm³ (85.1cu. in.)		1732cm³ (105.7cu. in.)	
	Rated revolution			43.3 r/s (2600 rpm)					
	Maximum torque (Net)			80.61N·m (8.22 kgf·m, 59.46 ft-lbs)		88.26N·m (9.00 kgf·m, 65.10 ft-lbs)		101.11N·m (10.31 kgf·m, 74.57 ft-lbs)	
	Combustion chamber			Direct injection					
	Fuel injection pump			Bosh K type mini pump (NP-PFR3KD 75/2 NP17)				(NP-PFR4KD 75/2 NP6)	
	Governor			Centrifugal ball mechanical governor					
	Injection nozzle			4 hole type (Stanadyne pencil nozzle)					
	Injection timing			0.31 rad. (18°) before T.D.C.					
	Injection order			1 – 2 – 3				1 – 3 – 4 – 2	
	Injection pressure			22.75 MPa (232 kgf/cm², 3300 psi)					
	Compression ratio			18					
	Lubricating system			Forced lubrication by pump					
	Cooling system			Pressurized radiator, Forced circulation with water pump					
	Starting system			Electric starting with cell starter (12V, 1.4kW)					
	Alternator			12V 420W					
	Battery			12V 80 Ah eq.				12V 110 Ah eq.	
	Fuel			Diesel fuel No. 1-D [below-10°C (15°F)] Diesel fuel No. 2-D [above-10°C (15°F)] (ASTM D975)					
	Lubricating oil			MIL-L-2104B or MIL-L-2104C, quality better than CC class (API)					
	Weight (Dry)			176.7 kg (389.6 lbs)				207.1 kg (456.6 lbs)	
Capacities	Fuel tank			29ℓ (7.7 U.S.gals., 6.4 Imp.gals.)					
	Engine crankcase			5.7ℓ (6.0 U.S.qts., 5.02 Imp.qts.)				8.5ℓ (8.9 U.S.qts., 7.48 Imp.qts.)	
	Engine coolant		A	5ℓ (5.3 U.S.qts., 4.4 Imp.qts.)				7ℓ (7.4 U.S.qts., 6.16 Imp.qts.)	
			B	4.6ℓ (4.9 U.S.qts., 4.1 Imp.qts.)				5.6ℓ (5.9 U.S.qts., 4.9 Imp.qts.)	
	Transmission case			28.5ℓ (7.5 U.S.gals., 6.3 Imp. gals.)					
	Steering gear case			0.1ℓ (0.11 U.S.qts., 0.088 Imp. qts.)					
	Steering gear box			0.2ℓ (0.21 U.S.qts., 0.176 Imp. qts.)					
	Front axle case [4WD]			6ℓ (6.3U.S.qts., 5.28Imp.qts.)		6.5ℓ (6.8 U.S.qts., 5.72 Imp.qts.)			
Dimensions	Overall length (without 3P) mm (in.)			2750 (108.3)		2770 (109.1)		2900 (114.2)	
	Overall width mm (in.)			1255 (49.4)		1305 (51.4)		1370 (53.9)	
	Overall height with muffler mm (in.)			2030 (79.9)					
	Wheel base mm (in.)			1640 (64.6)				1735 (68.3)	
	Min. ground clearance mm (in.)			345 (13.6)	305 (12.0)	370 (14.6)	345 (13.6)	355 (14.0)	345 (13.6)
	Tread	Front mm (in.)		1010 (39.8)	1010 (39.8)	960 (37.8) to 1260 (49.6)	1120 (44.1)	1150 (45.3) to 1450 (57.1)	1120 (44.1)
		Rear mm (in.)		1015 (40.0), 1135 (44.7)		1030 (40.6) to 1400 (55.1)		1050 (41.3) to 1515 (59.6)	
	Tire size (Std.)	Front tires		4.00–15	6–14	5.00–15	7–16	5.00–15	7–16
		Rear tires		9.5–24	9.5–24	11.2–24	11.2–24	12.4–24	12.4–24
Travelling system	Clutch			Dry single plate or dual stage (if equipped)				Dry twin plates or dual stage (if equipped)	
	Steering			Recirculating ball type manual steering or integral type power steering (if equipped)					
	Transmission			Mechanical shuttle, 8 forward and 7 reverse					
	Brake	Travelling		Wet disc type					
		Parking		Connected with the travelling brake					
	Differential			Bevel gear					

Tractor serial number

[A] L2250 2WD: ~12830 L2550 2WD: ~12579 L2850 2WD: ~11358
L2250 4WD: ~57288 L2550 4WD: ~57608 L2850 4WD: ~58194

[B] L2250 2WD: 12831~ L2550 2WD: 12580~ L2850 2WD: 11359~
L2250 4WD: 57289~ L2550 4WD: 57609~ L2850 4WD: 58195~

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SERVICING SPECIFICATIONS

[1] ENGINE BODY

CYLINDER HEAD

Item		Factory Specification	Allowable Limit
Cylinder Head Surface Flatness		—	0.05 mm 0.0019 in.
Top Clearance		0.6 to 0.8 mm 0.0237 to 0.0315 in.	—
Cylinder Head Gasket Thickness	Free	1.25 to 1.45 mm 0.0492 to 0.0571 in.	—
	Tightened	1.05 to 1.15 mm 0.0413 to 0.0453 in.	—
Compression Pressure (When cranking with starting motor)		2.75 to 3.04 MPa 28 to 31 kgf/cm^2 398 to 441 psi	2.16 MPa 22 kgf/cm^2 313 psi

VALVES

Valve Clearance (Cold)		0.18 to 0.22 mm 0.0071 to 0.0087 in.	—
Valve Seat Angle		0.7840 to 0.7868 rad. 44°55′ to 45°05′ (44.92 to 45.08°)	—
Valve Face Angle		0.7920 to 0.7962 rad. 45°23′ to 45°37′ (45.38 to 45.62°)	—
Valve Head Thickness	IN.	1.35 mm 0.0472 in.	—
	EX.	1.20 mm 0.0531 in.	—
Valve Recessing		0.65 to 0.85 mm 0.0256 to 0.0335 in.	1.15 mm 0.0453 in.
Clearance Between Valve Stem and Valve Guide		0.040 to 0.070 mm 0.00157 to 0.00276 in.	0.14 mm 0.0055 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.	—

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[5] MAINTENANCE CHECK LIST

No.	Check point	Indication on hour meter (Change or check every interval shown below)															After purchase		Reference Page
		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	1 year	2 year	
1	Engine oil change	@			O				O				O				O			S.G-6
2	Hydraulic oil filter cartridge replacement	@			O				O				O				O			S.G-7
3	Hydraulic oil filter cartridge	@			O				O				O				O			S.G-7
4	Transmission fluid change	@							O								O			S.G-8
5	Engine oil filter cartridge replacement	@							O								O			S.G-9
6	Front differential case and front wheel case oil change [4WD Type]	@							O								O			S.G-9
7	Greasing	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O			S.G-9, 10
8	Clutch pedal play check		O		O		O		O		O		O		O		O			S.G-10
9	Brake pedal play check		O		O		O		O		O		O		O		O			S.G-11
10	Fuel filter element cleaning		O		O		O		O		O		O		O		O			S.G-11
11	Air cleaner element cleaning		O		O		O		O		O		O		O		O			S.G-12
12	Battery electrolyte level check				O				O				O				O			S.G-13
13	Toe-in check				O				O				O				O			S.G-13
14	Radiator hose check				O				O				O				O			S.G-13
15	Fan belt tension check				O				O				O				O			S.G-14
16	Front axle rocking force check								O								O			S.G-14
17	Fuel line check				O				O				O				O			S.G-15
18	Power steering oil line check				O				O				O				O			S.G-15
19	Front wheel hub bearing greasing [2WD Type]						O						O							S.G-15
20	Fuel filter element replacement								O								O			S.G-16
21	Steering gear case oil check								O								O			S.G-16
22	Steering gear box oil check [Manual Steering]								O								O			S.G-16
23	Engine cooling system cleaning																O			S.G-17
24	Valve clearance check																O			S.G-18
25	Fuel injection pressure check																O			S.G-19
26	Radiator cleaning																O			S.G-17
27	Air cleaner element replacement																	* O		S.G-19
28	Power steering rubber hose replacement																		** O	S.G-20
29	Fuel line replacement																		** O	S.G-20
30	Radiator hose replacement																		** O	S.G-20
31	Magnetic plug cleaning [GST only]	@							O								O			G.S.G-3
32	Hydraulic oil paper filter cartridge [GST only]	★			O				O				O				O			G.S.G-3

■ NOTE

- **The jobs indicated by @ must be done at 50 hours respectively.**
  The jobs indicated by ★ must be done at 25 hours respectively.

*** Every year or every 6 times of cleaning.**

**** Replace only if necessary.**

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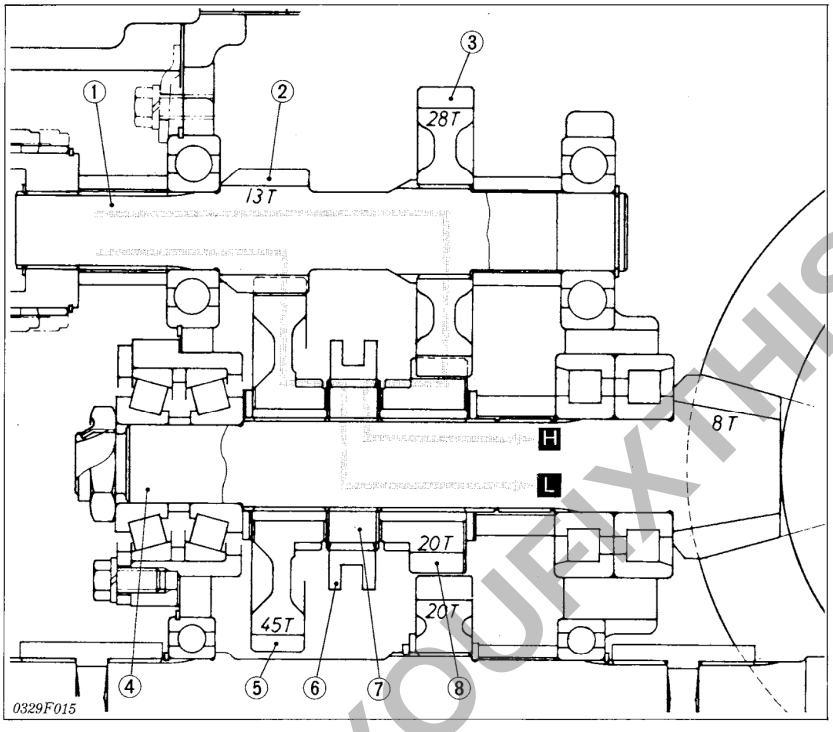
Model			L2250 (2WD)	L2250 (4WD)	L2550 (2WD)	L2550 (4WD)	L2850 (2WD)	L2850 (4WD)
Hydraulic system	Hydraulic control system		Position control and draft control (if equipped)					
	Pump capacity		25.4ℓ/min (6.7 GPM)				29.4ℓ/min (7.7 GPM)	
	Three point hitch		Category 1					
	Max. lifting force (24in. behind lower link end)		700kg (1540 lbs)		900kg (1980 lbs)			
Rear PTO	PTO shaft		SEA 1-3/8 6-splines (with overrunning clutch on single clutch tractor)					
	Revolution	with single stage clutch	2 speeds 9r/s (540 rpm)/engine 40.5r/s (2430 rpm), 16.7r/s (1000 rpm)/engine 40.6r/s (2438 rpm)					
		with dual stage clutch	2 speeds 9r/s (540 rpm)/engine 38.3r/s (2298 rpm), 16.7r/s (1000 rpm)/engine 40.6r/s (2438 rpm)					
Mid PTO (if equipped)	PTO shaft		USA No. 5 Involute spline					
	Revolution	with singl stage clutch	2 speeds 18r/s (1080 rpm)/engine 40.5r/s (2430 rpm), 33.3r/s (2000 rpm)/engine 40.6r/s (2438 rpm)					
		with dual stage clutch	2 speeds 18r/s (1080 rpm)/engine 38.3r/s (2298 rpm), 33.3r/s (2000 rpm)/engine 40.6r/s (2438 rpm)					
Min. turning radius m (feet)			2.3 (7.5)	2.2 (7.2)	2.3 (7.5)	2.3 (7.5)	2.4 (7.9)	2.4 (7.9)
Traction system			Fixed drawbar or Swing drawbar (if equipped)					
Weight kg (lbs)			984 (2170)	1080 (2380)	1020 (2250)	1120 (2470)	1125 (2480)	1230 (2710)

NOTE: *Manufacture's estimate.

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[1]-3 HI-LO RANGE SHIFT SECTION



(1) 13T Gear Shaft
(2) 13T Gear
(3) 28T Gear
(4) 8T Spiral Bevel Pinion
(5) 45T Gear
(6) Shifter
(7) Spline Boss
(8) 20T Gear

Besides neutral, two ways of power flow from the 13T gear shaft (1) to the 8T spiral bevel pinion (4) are available by operating the auxiliary gear shift lever to shift the shifter (6).

Power is transmitted as follows.

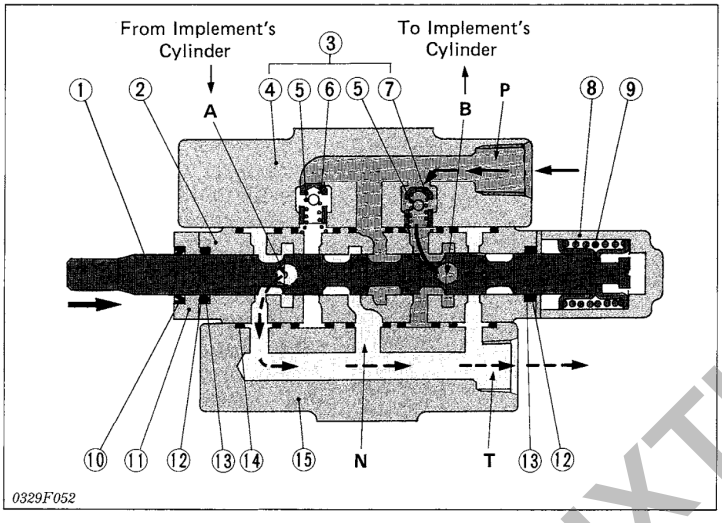
L Low Speed
13T Gear Shaft (1)·13T Gear (2) → 45T Gear (5) → Shifter (6) → Spline Boss (7) → 8T Spiral Bevel Pinion (4).

H High Speed
13T Gear Shaft (1) → 28T Gear (3) → 20T Gear (8) → Shifter (6) → Spline Boss (7) → 8T Spiral Bevel Pinion (4).

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■ Down (When Cylinder Shorten)



(1) Spool
(2) Valve Body
(3) Inlet Section Assembly
(4) Inlet Section
(5) Spring
(6) Check Valve
(7) Check Valve
(8) Rear End Cover
(9) Spring
(10) Scraper Seal
(11) Front End Cover
(12) Back-up Ring
(13) Oil Seal
(14) O-ring
(15) Carry Over Section

A, B : **A, B** Port (To Implement Cylinder or From Implement Cylinder)
T : **T** Port (To Transmission Case)
P : **P** Port (From Hydraulic Pump)
N : **N** Port (To Another Auxiliary Control Valve or To **T** Port)

When the auxiliary control valve operating lever is moved to the **DOWN** position, the spool (1) moves to the right, and oil pressure-fed to the **P** port opens the check valve (7) and flows from the **B** port to the implement's one cylinder.

Oil from the implement's another cylinder flows from the **A** port to the transmission case through the **T** port.

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S SERVICING

S.G GENERAL
S.S SEPARATION
S.1 ENGINE
S.2 CLUTCH
S.3 TRANSMISSION
S.4 REAR AXLE
S.5 BRAKES
S.6 FRONT AXLE
S.7 STEERING
S.8 HYDRAULIC SYSTEM
S.9 ELECTRICAL SYSTEM

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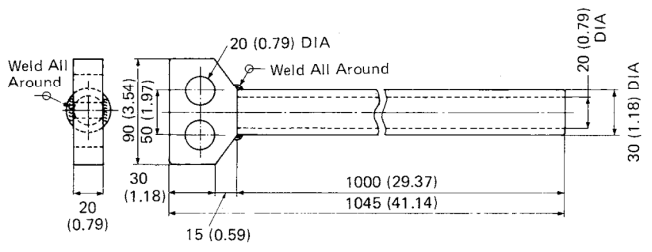
KiSC issued 07, 2016 A

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■ NOTE

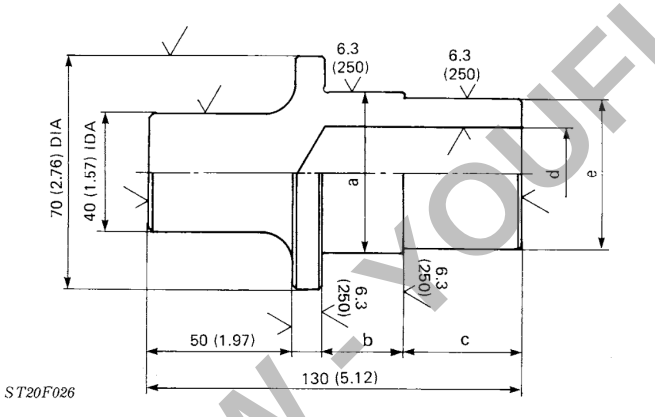
- **Following special tools are not provided, so make them refering to the figures.**

Unit: mm (in.)



ST20F025

Unit: mm or μm (in. or μin.)



ST20F026

(Reference)

- Unless otherwise specified: All surface 12.5 (500)

Test Bar

Application: Use for checking the lift range and floating range of hydraulic draft control.
(See page S.8-25)

Hydraulic Arm Shaft Bushing Press-Fitting Tool

Application: Use for replacing the hydraulic arm shaft bushings in the hydraulic cylinder body.
(See page S.8-23)

Dimensions of hydraulic arm shaft bushing press-fitting tool.

[L2250]

	Right	Left
a	49.7 to 49.9 mm 1.9567 to 1.9646 in.	43.7 to 43.9 mm 1.7205 to 1.7283 in.
b	21.50 to 22.50 mm 0.8465 to 0.8858 in.	16.25 to 17.25 mm 0.6398 to 0.6791 in.
c	30 mm 1.18 in.	30 mm 1.18 in.
d	30 mm 1.18 in.	26 mm 1.02 in.
e	44.7 to 44.9 mm 1.7598 to 1.7677 in.	39.7 to 39.9 mm 1.5630 to 1.5709 in.

[L2550·L2850]

	Right	Left
a	54.7 to 54.9 mm 2.1535 to 2.1614 in.	49.7 to 49.9 mm 1.9567 to 1.9646 in.
b	26.50 to 27.50 mm 1.0433 to 1.0827 in.	21.75 to 22.75 mm 0.8563 to 0.8957 in.
c	40 mm 1.57 in.	40 mm 1.57 in.
d	32 mm 1.26 in.	30 mm 1.18 in.
e	49.7 to 49.9 mm 1.9567 to 1.9646 in.	44.7 to 44.9 mm 1.7598 to 1.7677 in.

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RADIATOR

Item	Factory Specification	Allowable Limit
Radiator Tightness	No leak (at 137 KPa, 0.4 kgf/cm², 20 psi)	—
Radiator Cap Tightness	10 seconds or more for pressure falling (from 88 to 59 KPa, from 0.9 to 0.6 kgf/cm², from 13 to 9 psi)	—
Fan Belt Tension [Deflection at 98 N (10 kgf, 22 lbs) of Force]	7 to 9 mm 0.28 to 0.35 in.	—

[4] FUEL SYSTEM

INJECTION PUMP

Injection Timing	0.30 to 0.33 rad. 17° to 19° before T.D.C.	—
Fuel Tightness of Pump Element	Pressure builts more than nozzle opening pressure (22.41 to 23.44 MPa, 228.5 to 239.0 kgf/cm², 3250 to 3400 psi)	—
Fuel Tightness of Deliver Valve	Pressure builts more than nozzle opening pressure (22.41 to 23.44 MPa, 228.5 to 239.0 kgf/cm², 3250 to 3400 psi)	981 kPa (10 kgf/cm², 142 psi) of pressure drop from nozzle opening pressure in 5 seconds

INJECTION NOZZLE

Fuel Injection Pressure	22.41 to 23.44 MPa 228.5 to 239.0 kgf/cm² 3250 to 3400 psi	—
Fuel Tightness of Nozzle Valve Seat	No fuel leak for 5 sec. at pressure (18.96 to 20.00 MPa, 193.3 to 203.9 kgf/cm², 2750 to 2900 psi)	—

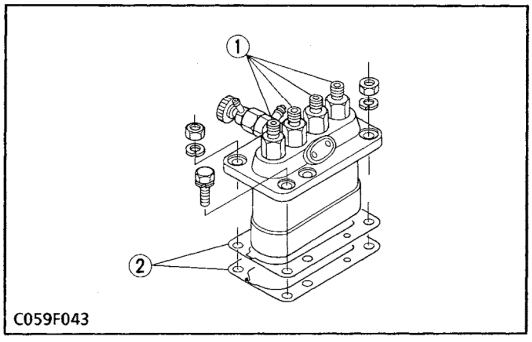
■ NOTE
- **Injection Sequence**
  Three Cylinders: 1 → 2 → 3
  Four Cylinders: 1 → 3 → 4 → 2
  (The cylinder number is given in order from the gear case end)

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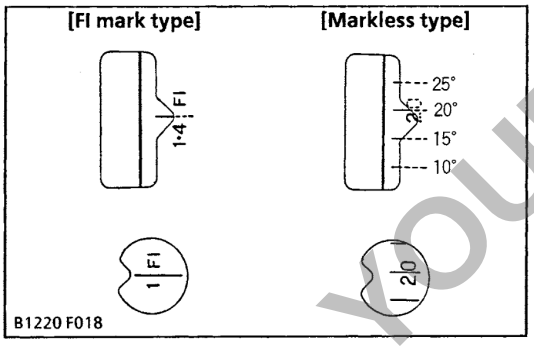
[5] FUEL SYSTEM

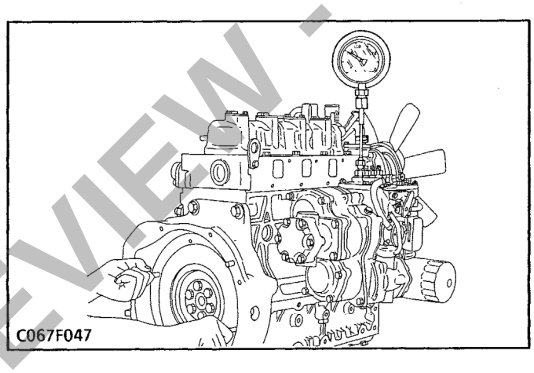
CHECKING AND ADJUSTING

(1) Injection Pump



(1) Delivery Valve Holder for 1st Cylinder (2) Shim





Injection Timing

1. Remove the injection pipes.
2. Set the speed control lever to maximum fuel discharge position.
3. Turn the flywheel counterclockwise (facing the flywheel) until the fuel fills up to the hole of the delivery valve holder (1) for 1st cylinder.
4. Turn the flywheel further and stop turning when the fuel begin to flow over, to get the present injection timing.
5. [FI mark type] (The flywheel has marks **TC** and **FI** for each cylinder on its outer rim.) If the **FI** mark does not align with the mark of the window on flywheel housing, add or remove the shim (2) to adjust.
6. [Markless type] (The flywheel has mark **1TC** and four lines indicating every 0.087 rad. (5°) of crank angle from 0.175 rad. (10°) to 0.436 rad. (25°) before mark **1TC**.) Calculate the angle which the mark of the window points out. If the calculation differs from specified injection timing, add or remove the shim (2) to adjust.

Injection timing	Factory spec.	0.30 to 0.33 rad. 17° to 19° before T.D.C.

■ **NOTE**

- **Apply liquid gasket (Three Bond 1215 or equivalent) to the shim, when reassembling.**

(Reference)

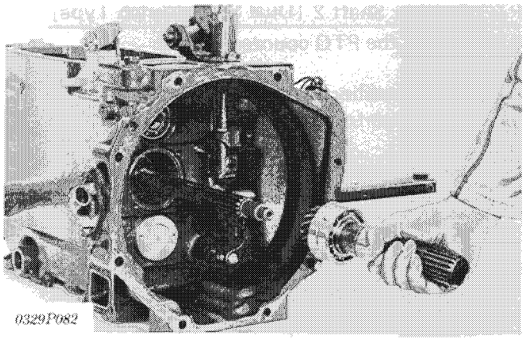
- The timing advances by removing 0.15 mm (0.006 in.) of shim and retards by adding one, approx. 0.26 rad. (1.5°) of crank angle.
- Approx. 3.6 mm (0.142 in.) of turn at outer rim of flywheel equals 0.26 rad. (1.5°) of crank angle.

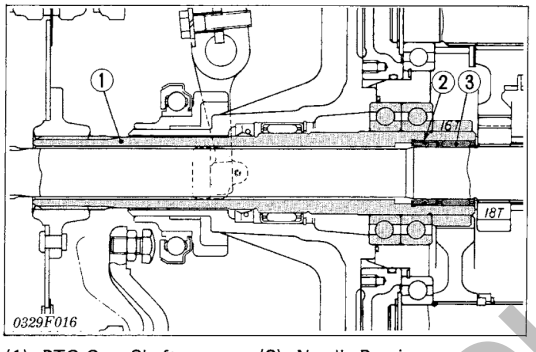
Delivery Valves Fuel Tightness

1. Remove the injection pipes, glow plugs and the inlet manifold, and install the pressure tester (See page S.G-28).
2. With the speed control lever at the fuel injection position, turn the crankshaft counterclockwise (facing the flywheel) until the pressure build up to the fuel injection pressure.
3. Release the pressure in the delivery chamber by moving down the plunger to bottom dead center (turn the crankshaft clockwise approx. 1.57 rad. (90°) from the **FI** timing).
4. If the pressure drop for 5 seconds exceeds the allowable limit, replace the delivery valve or pump assembly.
5. If the pressure does not built up, replace the pump element with new one and test again.

Fuel injection pressure	Factory spec.	22.41 to 23.44 MPa 228.5 to 239.0 kgf/cm² 3250 to 3400 psi
Pressure drop	Allowable limit	981 kPa 10 kgf/cm² 142 psi

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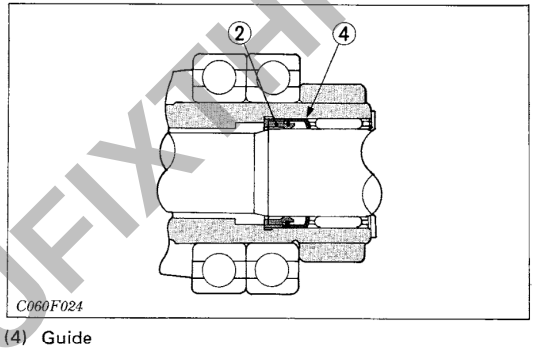
(1) PTO Gear Shaft
(2) Oil Seal
(3) Needle Bearing

16T Gear Shaft [Dual Stage Clutch Type]

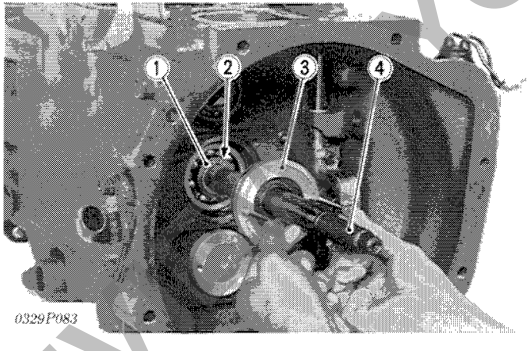
1. Draw out the 16T gear shaft (1) to the front.

(When reassembling)
- Apply grease to the oil seal (2) and needle bearing (3).

(When replacing oil seal)
■ IMPORTANT
- **Apply grease to the outside of oil seal (2). Install the oil seal as shown in the figure below, noting its direction, and press-fit it to 18 mm (0.709 in.) inside of shaft end using guide (4).**



(4) Guide

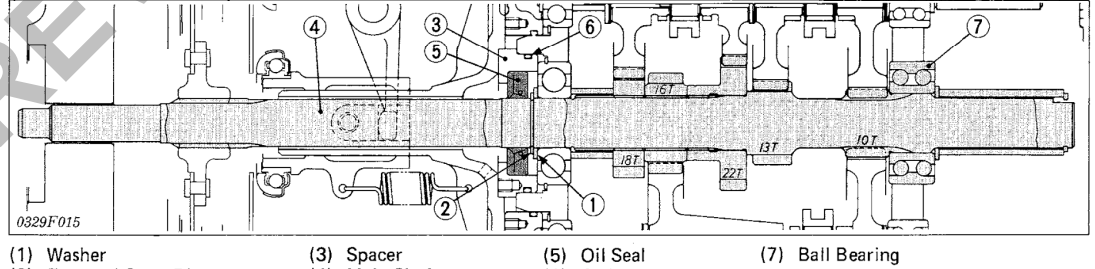


Main Shaft [Single Stage Clutch Type]

1. Remove the spacer (3) using screws (6 mm, 0.236 in. DIA.).
2. Remove the external snap ring (2) on the front of main shaft (4), and take out the washer (1).
3. Tap out the main shaft to the rear.

(When reassembling)
- Direct the ball groove of ball bearing (7) to the rear.
- Apply grease to O-ring (6) and oil seal (5).

(Reference)
- Thickness of washer (1): 2.0 mm, 0.079 in.



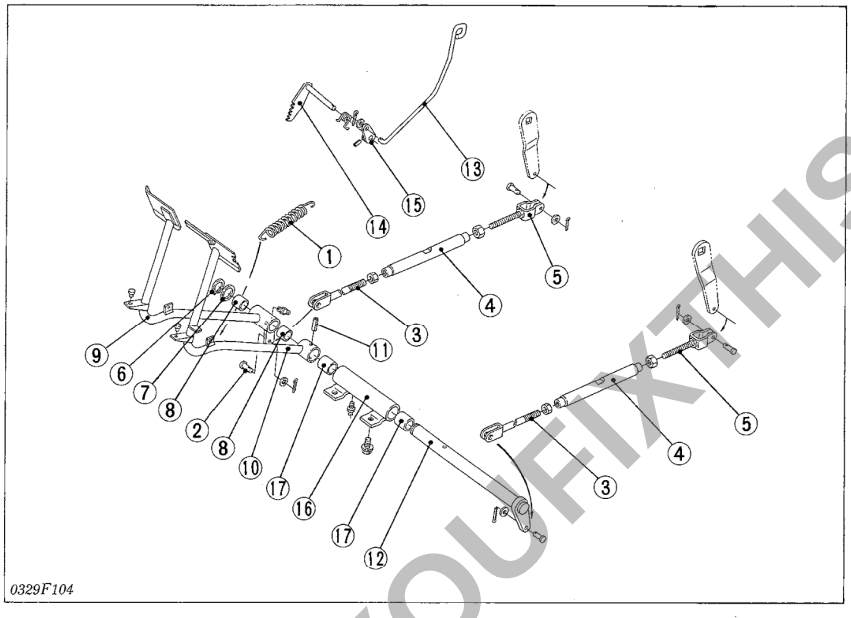
(1) Washer
(2) External Snap Ring
(3) Spacer
(4) Main Shaft
(5) Oil Seal
(6) O-ring
(7) Ball Bearing

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DISASSEMBLING AND ASSEMBLING

Removing Brake Pedal

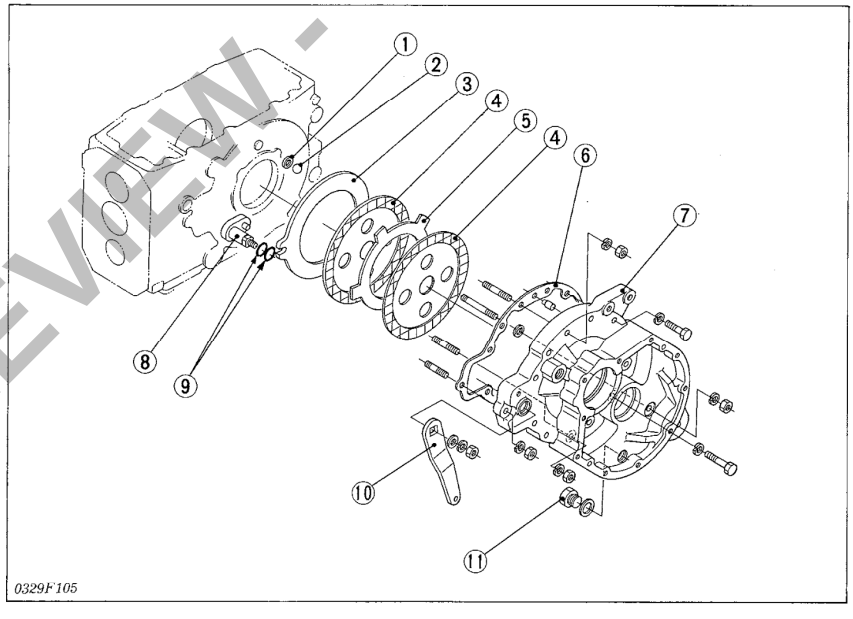
- See page S.S-14.



(1) Return Spring
(2) Clevis Pin
(3) Brake Rod 1
(4) Turnbuckle
(5) Brake Rod 2
(6) External Snap Ring
(7) Collar
(8) Bushing
(9) Brake Pedal RH
(10) Brake Pedal LH
(11) Spring Pin
(12) Brake Pedal Shaft
(13) Parking Rod
(14) Brake Lock
(15) Parking Lever
(16) Pedal Shaft Support
(17) Bushing

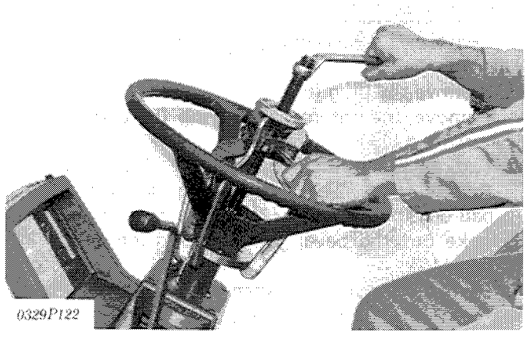
Removing Brake Case

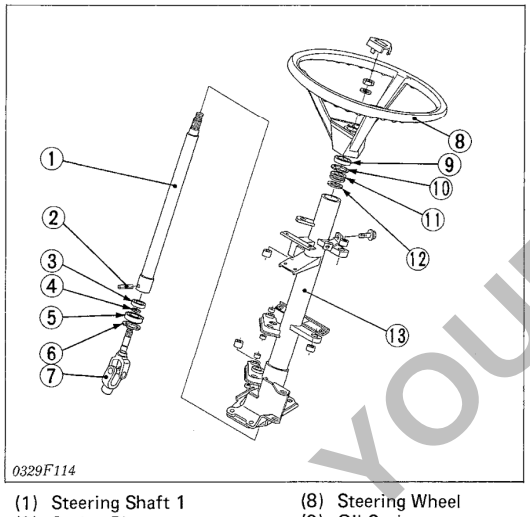
- See page S.S-19.



(1) Ball Seat
(2) Ball
(3) Cam Plate
(4) Brake Disc
(5) Plate
(6) Gasket
(7) Brake Case
(8) Brake Cam
(9) O-ring
(10) Brake Cam Lever
(11) Drain Plug

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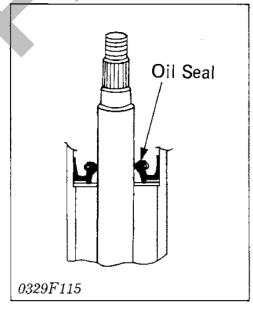
(1) Steering Shaft 1
(2) Spring Pin
(3) Oil Seal
(4) External Snap Ring
(5) Ball Bearing
(6) Internal Snap Ring
(7) Steering Shaft 2
(8) Steering Wheel
(9) Oil Seal
(10) Internal Snap Ring
(11) Rubber
(12) Washer
(13) Steering Post

Steering Wheel

1. Remove the steering wheel (8) with a steering wheel puller (Code No: 07916-51091).
2. Remove the steering post (13).
   (See page S.S-17).
3. Remove the internal snap ring (6) and tap out the steering shaft 1 (1) to downward.
4. Remove the spring pin (2) and separate the steering shaft 2 (7) from the steering shaft 1 (1).
5. Remove the oil seal (3) of the steering shaft 2 (7).
6. Remove the external snap ring (4) and then, remove the ball bearing (5).
7. Remove the oil seal (9) of the steering post (13).
8. Remove the snap ring (10).
9. Remove the vibration proof rubber (11).
10. Remove the washer (12).

(When reassembling)

- Replace the oil seal and snap ring with new ones.
- Apply grease to the oil seals, bearing (5) and vibration proof rubber (11).
- Install the oil seal (9) as shown in the figure below. Direct the spring of oil seal to upward.



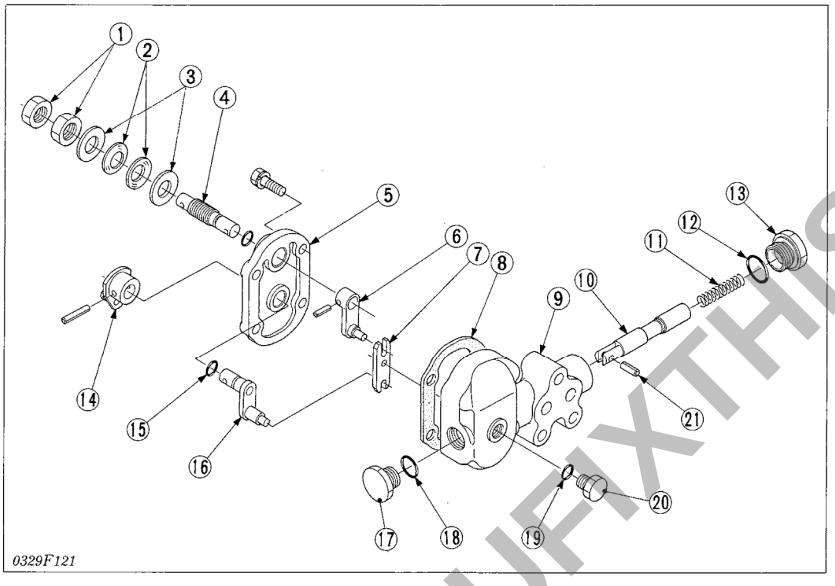
Tightening torque	Steering wheel mounting nut	29.4 to 49.0 N·m 3.0 to 5.0 kgf·m 21.7 to 36.2 ft-lbs

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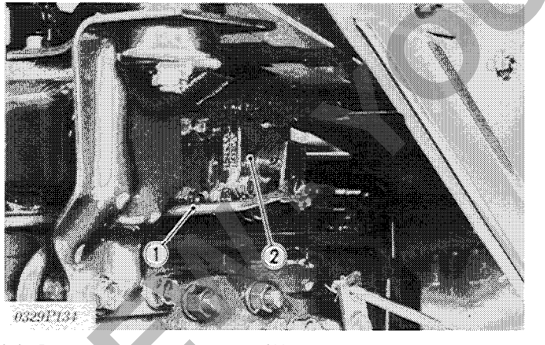
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[4] DRAFT CONTROL VALVE

DISASSEMBLING AND ASSEMBLING



(1) Nut
(2) Disc Spring
(3) Washer
(4) Control Lever Shaft
(5) Valve Cover
(6) Control Lever
(7) Spool Drive Lever
(8) Gasket
(9) Valve Body
(10) Spool
(11) Spring
(12) O-ring
(13) Plug
(14) Feedback Lever
(15) O-ring
(16) Feedback Lever Shaft
(17) Plug
(18) O-ring
(19) O-ring
(20) Plug
(21) Spring Pin



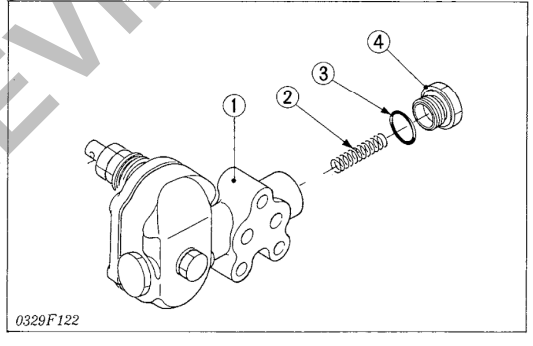
(1) Draft Control Rod (2) Draft Control Valve

Removing Draft Control Valve

1. Remove the draft contrl lever.
2. Disconnect the draft control rod (1) from draft control valve.
3. Remove the draft control valve (2).

(When reassmbling)

- Install the draft control valve, noting O-ring.



Spool Return Spring

1. Remove the plug (4).
2. Remove the spool return spring (2).

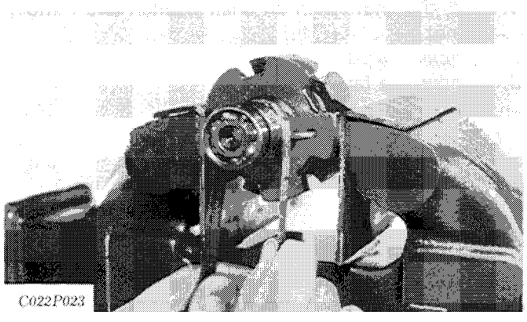
(When reassembling)

- Install the plug (4), noting O-ring (3).

(1) Valve Body
(2) Spring
(3) O-ring
(4) Plug

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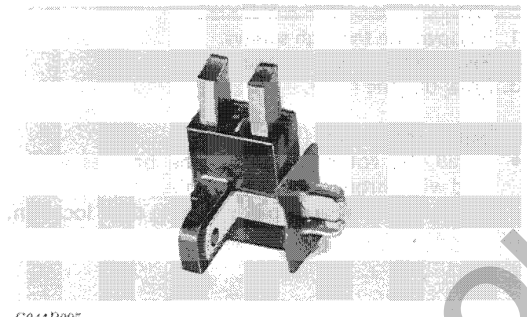
SERVICING (ALTERNATOR)


C022P023

Alternator

1) Slip Ring

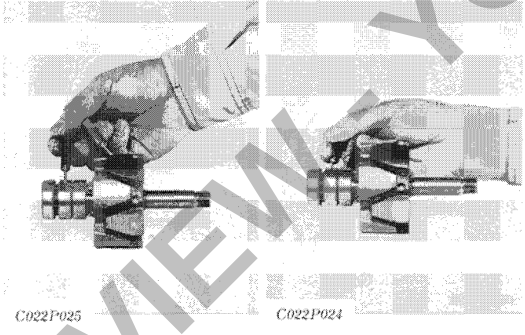
1. Check the slip ring for scoring.
2. If scored, correct with sandpaper or a lathe.


C044P095

2) Brush Wear

1. Check the length of the brush. If the length is shorter than the allowable limit, replace it.
2. Make sure that the brush moves smoothly.
3. If the brush is defective, replace it.

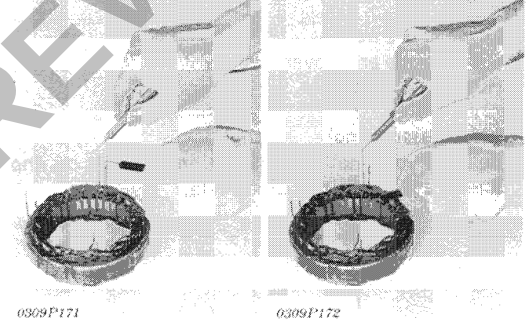
Brush length	Factory spec.	15.5 mm 0.610 in.
	Allowable limit	10 mm 0.394 in.


C022P025 C022P024

3) Rotor Coil

1. Measure the resistance with an ohmmeter across the slip ring and the core.
2. If infinity is not indicated, replace them as a unit.
3. Measure the resistance with an ohmmeter across the slip rings.
4. If the reference value is not indicated, replace them as a unit.

Resistance	Reference value	Slip ring – Core	Infinity
		Across slip ring	Approx. 4 ohms


0309P171 0309P172

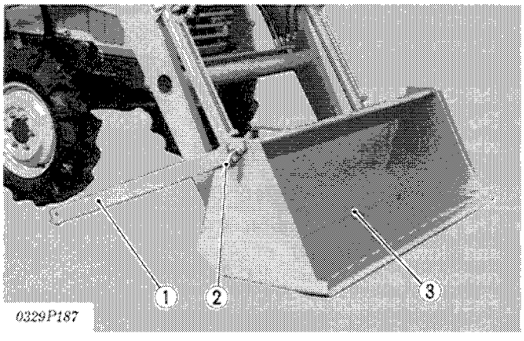
4) Stator Coil

1. Measure the resistance with an ohmmeter across each lead of the startor coil.
2. If 0 ohm is not indicated, replace the stator coil and core as a unit.
3. Measure the resistance with an ohmmeter across each stator coil lead and core.
4. If infinity is not indicated, replace them as a unit.

Resistance	Across stator coil leads	0 ohm
	Stator coil lead – Core	Infinity

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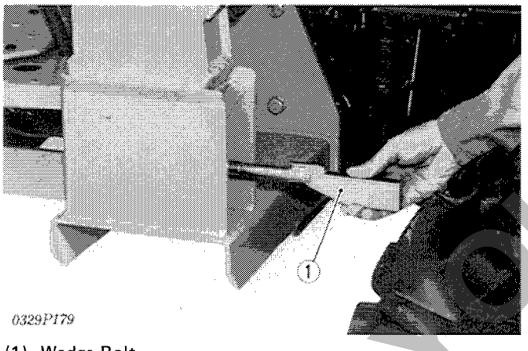
[2] DISMOUNTING LOADER



(1) Connecting Bar
(2) L-Bolt
(3) Bucket

Connecting Bar

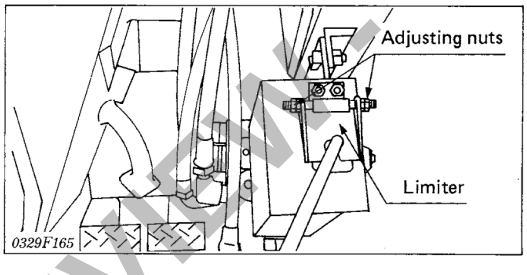
1. Lower the boom and level the bucket.
2. Stop the engine.
3. Remove the connecting bar from the top of each side frame.
4. Attach the connecting bar (1) to each side of the bucket (3) with the L-screw (2) removed from the front brace.



(1) Wedge Bolt

Wedge Bolt

1. Remove the jam nuts and collar nuts.
2. Remove the wedge bolts (1) from the bottom of each main frame.



Limiter

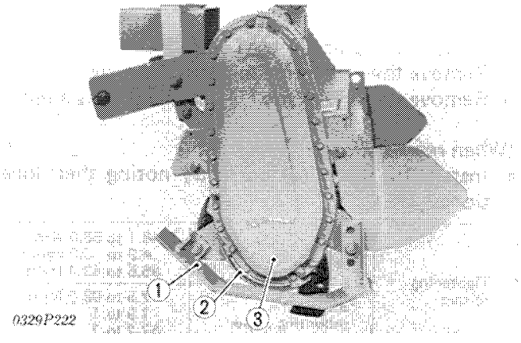
1. Place the limiter on the valve cover.



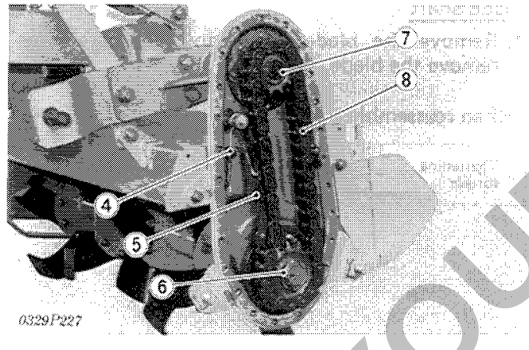
Side Frame

1. Start the engine and run at a low idle.
2. Slowly move the hydraulic control lever to the rollback position to raise the side frame up and out of the main frame sockets.
3. Stop the engine.

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(1) Skid
(2) Chain Case Protecting Cover
(3) Chain Case Cover



(4) Tightener Spring
(5) Chain Tightener
(6) Staking Nut
(7) External Snap Ring
(8) Chain

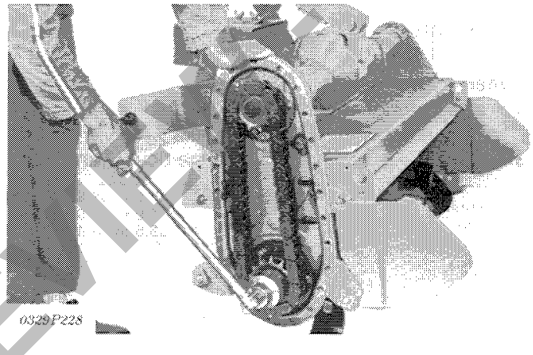
Tightener, Chain and Sproket

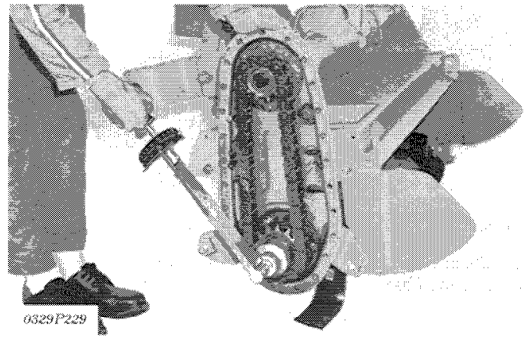
1. Remove the skid (chain case side) (1).
2. Remove the chain case protecting cover (2).
3. Remove the chain case cover mounting screws and remove chain case cover (3).
4. Remove the chain tightener spring (4) and chain tightener (5).
5. Remove the stake of staking nut (screw size: 40mm, 1.57 in. DIA.) (6) and remove the staking nut.
6. Remove the external snap ring (7) from the bevel gear shaft.
7. Remove the drive sproket and driven sproket together with chain (8).

(When reassmbling)

- Be sure to direct the drive sproket boss and driven sproket boss to the ball bearing side.
- Install the chain tightener to the tightener shaft.
- Replace cotter pin with new one and bend it firmly.
- Replace staking nut with new one.
- After tightening the staking nut to the specified torque, stake it firmly.
- Apply liquid lock (Three Bond 1324B or equivalent) to the chain case cover mounting screws.

Tightening torque	Staking nut	196 to 225 N•m 20.0 to 23.0 kgf•m 144.6 to 166.3 ft-lbs
	Chain case cover mounting screw	28.4 to 39.2 N•m 2.9 to 4.0 kgf•m 21.0 to 29.0 ft-lbs





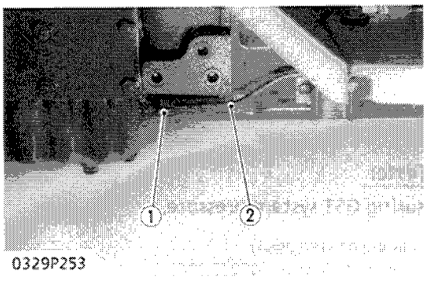
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S SEPARATION

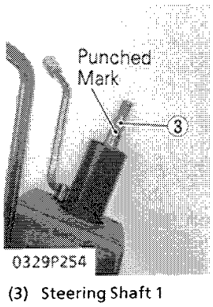
■ As for the L2550-DT except for the following additional instructions.

[1] SEPARATING ENGINE FROM CLUTCH HOUSING



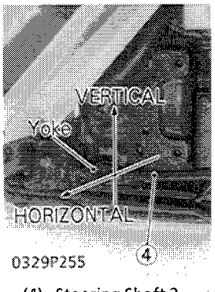
0329P253

(1) Delivery Pipe 2 (2) Delivery Pipe 1



0329P254

(3) Steering Shaft 1



0329P255

(4) Steering Shaft 3

Preparation 4 (Removing at Right Side)

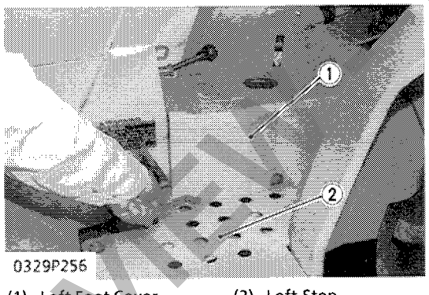
1. Separate the delivery pipe 2 (1) and the delivery pipe 1 (2).

(When reassembling)

- Reassemble the steering shaft 1 (3) with its punch mark positioned on the side so that the yoke of the steering shaft 3 (4) is vertical.

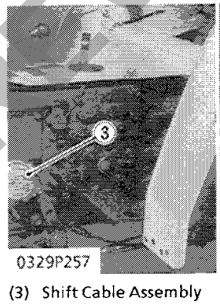
Tightening torque	Steering joint shaft 3 locking screw	29.4 to 34.3 N·m 3.0 to 3.5 kgf·m 21.7 to 25.3 ft-lbs

[2] SEPARATING CLUTCH HOUSING FROM TRANSMISSION

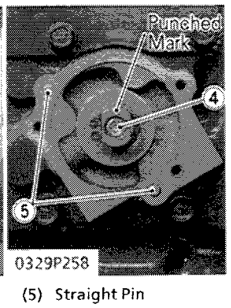


0329P256

(1) Left Foot Cover (2) Left-Step



0329P257



0329P258

(3) Shift Cable Assembly (5) Straight Pin
(4) Rotary Valve Shaft

Preparation

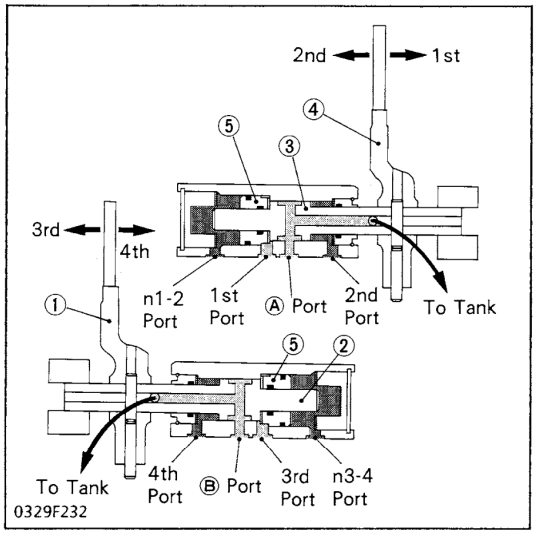
1. Remove the left foot cover (1).
2. Remove the left step (2).
3. Remove the shift cable.

(When reassembling)

- Lock the shift lever in neutral position, point the punch mark of the rotary valve shaft upwards, and assemble the shift lever assembly by setting the punch mark to align with the straight pin.
- After assembly, adjust the shift cable.
(For adjustment, refer to page G.S.3-13)

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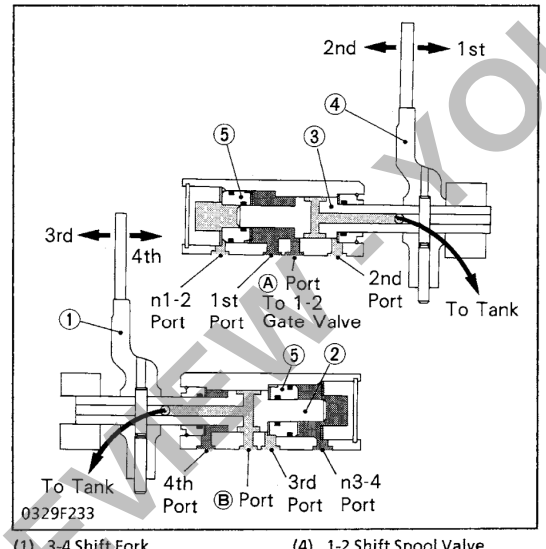
(4)-2 Main Shift Valve Assembly



(1) 3-4 Shift Fork
(2) 3-4 Shift Spool Valve
(3) 1-2 Shift Fork
(4) 1-2 Shift Spool Valve
(5) Neutral Piston

■ Neutral

1. The shift oil flows into the 2 port, n1-2 port, 4 port, and n3-4 port.
2. The shift oil in the n1-2 port and n3-4 port moves and presses the neutral pistons (5) toward the direction of arrows.
3. The shift oil in port 2 and port 4 moves shift spool valves (2) and (3) until they contact the neutral positions (5).
4. The shift spool valve contacts the neutral piston is the neutral position, and this position is secured by the difference in area under pressure.
5. The shift oil is closed by shift spool valves (2) and (3) and does not flow to the gate valve.



(1) 3-4 Shift Fork
(2) 3-4 Shift Spool Valve
(3) 1-2 Shift Fork
(4) 1-2 Shift Spool Valve
(5) Neutral Piston

■ 1st (5th) Speed Position

1. The shift oil flows into port 1, and the other oil in port n1-2 and port 2 are drained. To move the 1-2 shift spool valve (3) toward the 1st side.
2. When shifting is completed, the shift oil flows from port (A) to the gate valve.
3. The 3-4 shift spool valve (2) remains held at the neutral position.

■ 2nd (6th) Speed Position

1. The shift oil flows into port 2, and the other oil in port n1-2 and port 1 are drained to move the 1-2 shift spool valve (3) toward the 2nd side.
2. When shifting is completed, the shift oil flows from port (A) to the gate valve.
3. The 3-4 shift spool valve (2) remains held at the neutral position.

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