# SPECIFICATIONS

| Model | | L35 |
|---|---|---|
| Maximum PTO power | | 19.4 kW (26 HP) |
| Engine NET power | | 24.2 kW (32.5 HP) |
| Engine | Model | D1703 |
| | Type | Indirect injection, Vertical, Water-Cooled, 4-cycle diesel |
| | Number of cylinders | 3 |
| | Bore and stroke | 87 x 92.4 mm (3.42 x 3.63 in.) |
| | Total displacement | 1647 $cm^3$ (100.5 cu.in.) |
| | Rated revolution | 45 r/s (2700 rpm) |
| | Combustion chamber | Spherical type (E-TVCS) |
| | Fuel injection pump | Bosh type mini pump (PFR3M) |
| | Governor | Centrifugal ball mechanical governor |
| | Injection nozzle | Throttle type |
| | Injection timing | Before T.D.C. 0.314 rad (18°) |
| | Injection order | 1-2-3 |
| | Injection pressure | 13.73 MPa (140 $kgf/cm^2$, 1991 psi) |
| | Compression ratio | 23 : 1 |
| | Lubricating system | Forced lubrication by trochoidal pump |
| | Cooling system | Pressurized radiator, Forced circulation with water pump |
| | Starting system | Electric starting with cell starter (12 V, 1.2 kW) |
| | Alternator | 12 V, 360 W (30 AMPS) |
| | Battery | 490- Cold cranking Amps at-18 °C (-0.4 °F) |
| | Fuel | Diesel fuel No. 1 [below - 10 °C (14 °F)] Diesel fuel No.2 [above -10 °C (14 °F)] |
| | Lubricating oil | CC or CD (API grade) |
| | Weight (Dry) | 176 kg (388 lbs) |
| Capacities | Fuel tank | 35 ℓ (9.2 U.S.gals., 7.7 Imp.gals.) |
| | Engine crankcase | 4.8 ℓ (5.1 U.S.qts., 4.2 Imp.qts.) |
| | Engine coolant | 7 ℓ (7.4 U.S.qts., 6.2 Imp.qts.) |
| | Transmission case | 39 ℓ (41.2 U.S.qts., 34.3 Imp.qts.) |
| | Front axle case | 5.5 ℓ (5.8 U.S.qts., 4.8 Imp.qts.) |
| Dimensions | Overall length (without 3P) | 2720 mm (107.1 in.) |
| | Overall length (with 3P) | 3015 mm (118.7 in.) |
| | Overall width (minimum tread) | 1590 mm (62.6 in.) |
| | Overall height (Top of ROPS) | 2400 mm (94.5 in.) |
| | Overall height (Top of steering wheel) | 1460 mm (77.5 in.) |
| | Wheel base | 1700 mm (66.9 in.) |

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## [7] 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 years | |
| 1 | Greasing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | G-14 |
| 2 | Engine starting system checking | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | G-15 |
| 3 | Wheel bolt torque checking | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | G-16 |
| 4 | Battery condition checking | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | G-16 |
| 5 | Engine oil changing | ◎ | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-12 |
| 6 | Air cleaner element cleaning ★ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-17 |
| 7 | Fuel filter element cleaning | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-17 |
| 8 | Fan belt tension adjustment | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-18 |
| 9 | Clutch pedal free travel adjustment | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-18 |
| 10 | Brake pedal free travel adjustment | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | ○ | | | G-18 |
| 11 | Engine oil filter cartridge replacement | ◎ | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-12 |
| 12 | Hydraulic oil filter cartridge replacement | ◎ | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-12 |
| 13 | Radiator hose and clamp checking | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-19 |
| 14 | Power steering oil line checking | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-20 |
| 15 | Fuel line checking | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-20 |
| 16 | Toe-in adjustment | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | G-19 |
| 17 | Transmission fluid changing | ◎ | | | | | | | ○ | | | | | | | | ○ | | | G-13 |
| 18 | Front axle case oil changing | ◎ | | | | | | | ○ | | | | | | | | ○ | | | G-13 |
| 19 | Front axle pivot adjustment | ◎ | | | | | | | ○ | | | | | | | | ○ | | | G-13 |
| 20 | Fuel filter element replacement | | | | | | | | ○ | | | | | | | | ○ | | | G-20 |
| 21 | Engine valve clearance adjustment | | | | | | | | | | | | | | | | ○ | | | G-21 |
| 22 | Air cleaner element replacement | | | | | | | | | | | | | | | | | ○ | | G-22 |
| 23 | Radiator hose and clamp replacement | | | | | | | | | | | | | | | | | | ○ | G-22 |
| 24 | Power steering oil line replacement | | | | | | | | | | | | | | | | | | ○ | G-22 |
| 25 | Fuel line replacement | | | | | | | | | | | | | | | | | | ○ | G-23 |
| 26 | Engine cooling system cleaning | | | | | | | | | | | | | | | | | | ○ | G-23 |
| 27 | Coolant changing | | | | | | | | | | | | | | | | | | ○ | G-24 |

**Note :** **The jobs indicated by ◎ must be done by all means 50 hours after the break-in respectively.**
**The jobs indicated by ☆ service as required.**
**★ Air cleaner should be cleaned more often in dusty conditions than in normal conditions.**

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# TROUBLESHOOTING

| Symptom | Probable Cause | Solution | Reference Page |
|---|---|---|---|
| **Engine Does Not Start** | • No fuel | Replenish fuel | – |
| | • Air in the fuel system | Vent air | – |
| | • Water in the fuel system | Change fuel and repair or replace fuel system | – |
| | • Fuel pipe clogged | Clean | – |
| | • Fuel filter clogged | Change | G-20 |
| | • Excessively high viscosity of fuel or engine oil at low temperature | Use the specified fuel or engine oil | – |
| | • Fuel with low cetane number | Use the specified fuel | G-8 |
| | • Fuel leak due to loose injection pipe retaining nut | Tighten nut | 1-S18 |
| | • Incorrect injection timing | Adjust | 1-S48 |
| | • Fuel camshaft worn | Replace | 1-S31 |
| | • Injection nozzle clogged | Clean | 1-S49 |
| | • Injection pump malfunctioning | Repair or replace | 1-S28, S50 |
| | • Seizure of crankshaft, camshaft, piston, cylinder or bearing | Repair or replace | – |
| | • Compression leak from cylinder | Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder | 1-S16 |
| | • Improper valve timing | Correct or replace timing gear | 1-S29 |
| | • Piston ring and cylinder worn | Replace | 1-S37, S43 |
| | • Excessive valve clearance | Adjust | 1-S17 |
| **Starter Does Not Run** | • Battery discharged | Charge | 9-S6 |
| | • Starter malfunctioning | Repair or replace | 9-S11 to S14 |
| | • Main switch malfunctioning | Repair or replace | 9-S7, S8 |
| | • Wiring disconnected | Connect | – |
| **Engine Revolution Is Not Smooth** | • Fuel filter clogged or dirty | Change | G-20 |
| | • Air cleaner clogged | Clean or change | G-22 |
| | • Fuel leak due to loose injection pipe retaining nut | Tighten nut | 1-S18 |
| | • Injection pump malfunctioning | Repair or replace | 1-S28, S49 |
| | • Incorrect nozzle opening pressure | Adjust | 1-S49 |
| | • Injection nozzle stuck or clogged | Repair or replace | 1-S50 |
| | • Governor malfunctioning | Repair | 1-S28 |
| **Either White or Blue Exhaust Gas Is Observed** | • Excessive engine oil | Reduce to the specified level | G-12 |
| | • Piston ring and cylinder worn or stuck | Repair or replace | 1-S37, S42 |
| | • Incorrect injection timing | Adjust | 1-S47 |
| | • Deficient compression | Adjust top clearance | 1-S18 |
| **Either Black or Dark Gray Exhaust Gas Is Observed** | • Overload | Lessen the load | – |
| | • Low grade fuel used | Use the specified fuel | G-8 |
| | • Fuel filter clogged | Change | G-20 |
| | • Air cleaner clogged | Clean or change | G-22 |
| | • Deficient nozzle injection | Repair or replace the nozzle | 1-S19, S49 |

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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 |
| M 6 ( 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 |
| M 8 ( 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 (16mm, 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 (20mm, 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 |

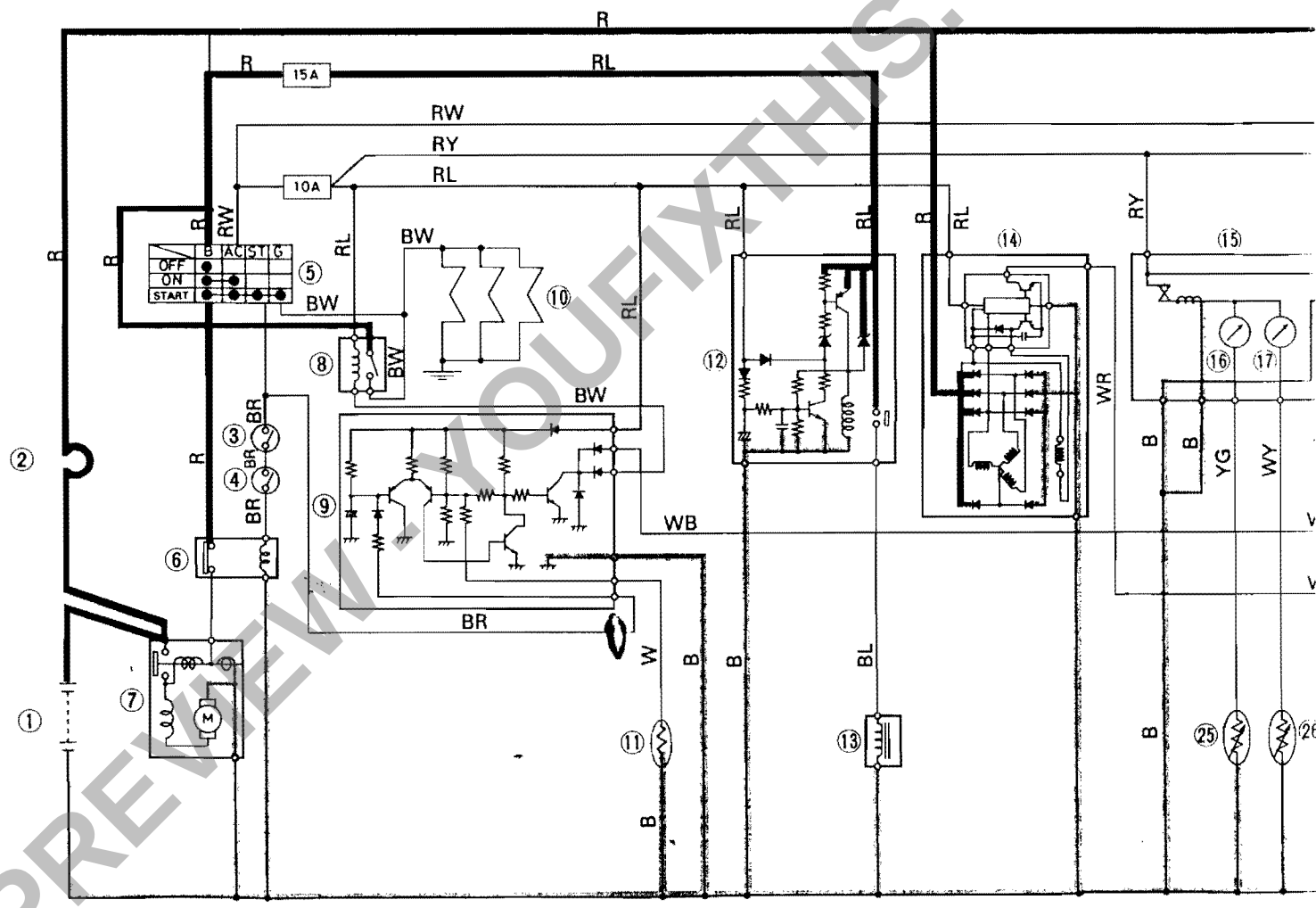
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# [2] ELECTRICAL CIRCUIT

- **Color of Wiring**

| | | | | |
|---|---|---|---|---|
| W ---------- White | G ---------- Green | WB ---------- White / Black | RL ---------- Red / Blue | BR ---------- Black / |
| R ---------- Red | Br ---------- Brown | WR ---------- White / Red | RG ---------- Red / Green | BY ---------- Black / |
| L ---------- Blue | Or ---------- Orange | WL ---------- White / Blue | RY ---------- Red / Yellow | GW ---------- Green |
| Y ---------- Yellow | Lg ---------- Light Green | WY ---------- White / Yellow | BW ---------- Black / White | GY ---------- Green |
| B ---------- Black | WG ---------- White / Green | RW ---------- Red / White | BL ---------- Black / Blue | GB ---------- Green |




Denotes battery voltage at any position of main switch.
Denotes battery voltage when turning on main switch **"ON"** position from **"OFF"** position.
Denotes ground line.

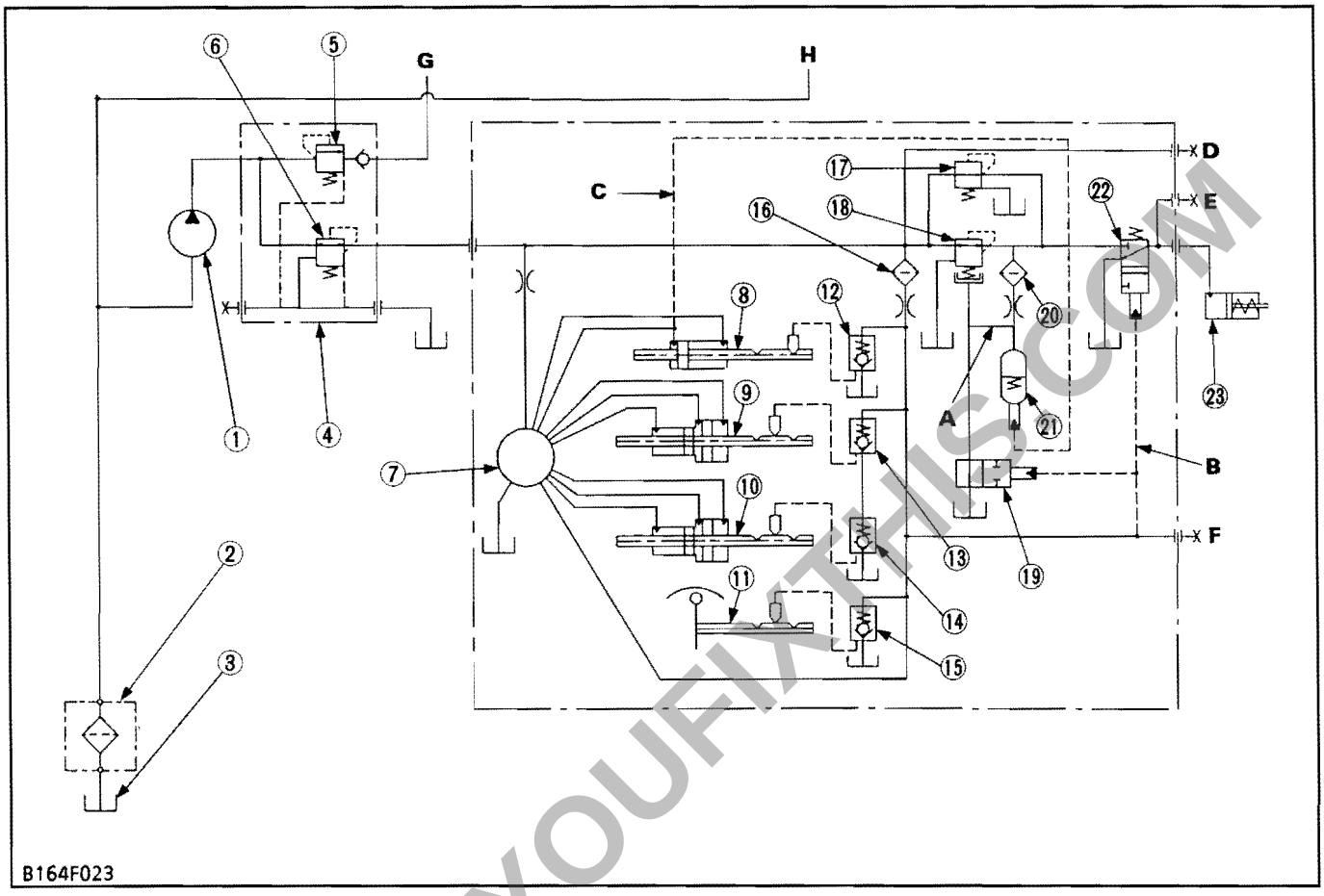
B164F071

(1) Battery
(2) Slow Blow Fuse
(3) PTO Limit Switch
(4) Shuttle Limit Switch
(5) Main Switch
(6) Starter Relay
(7) Starter Motor
(8) Glow Relay
(9) Glow Controller
(10) Glow Plug
(11) Water Temperature Sensor
(12) Key Stop Timer Relay
(13) Fuel Cut Off Solenoid
(14) Alternator
(15) Meter Panel
(16) Fuel Gauge
(17) Coolant Temperature Gauge
(18) Illumination
(19) Hazard Indicator
(20) Glow Lamp
(21) Charge Lamp

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## (2) Hydraulic Circuit




(1) Hydraulic Pump
(2) Oil Filter
(3) Oil Tank
(4) Regulator Valve Assembly
(5) Relief Valve
(6) Reducing Valve
(7) Rotary Valve
(8) Shift Piston (H, L)
(9) Shift Piston (3, 4)
(10) Shift Piston (1, 2)
(11) Shuttle Shift Rod
(12) Shift Check Valve (H, L)
(13) Shift Check Valve (3, 4)
(14) Shift Check Valve (1, 2)
(15) Shift Check Valve (Shuttle)
(16) Line Filter
(17) Low-pass Valve
(18) Modulate Valve
(19) Modulate Check Valve
(20) Line Filter
(21) Accumulator
(22) Clutch Valve
(23) Clutch Pack

**A : Modulate Feedback Circuit**
**B : Pilot Circuit**
**C : Accumulator Pilot Circuit**
**D : Check Port (GST System Pressure)**
**E : Check Port (Clutch Pack Pressure)**
**F : Check Port (Pilot Pressure)**
**G : To Power Steering Circuit**
**H : From Power Steering Circuit**

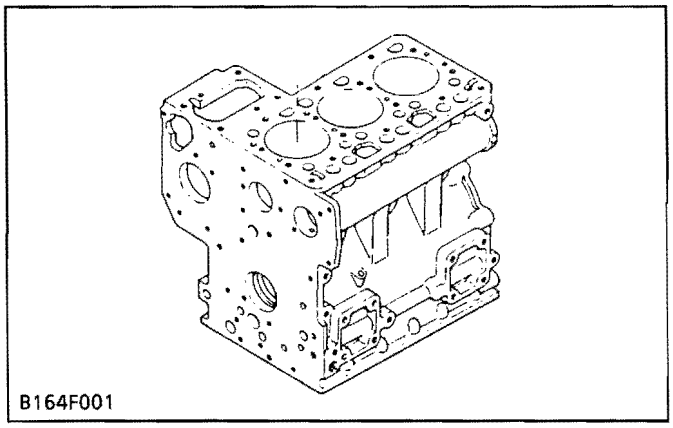
1. When the engine is started, hydraulic pump (1) starts and sucks in the oil from the oil tank (3). The oil is filtered through the oil filter (2).
2. The oil entering the regulator valve (4) flows through the reducing valve (6) to the GST circuit. The oil pressure is maintained at a fixed level by the reducing valve (6).
   Other oils flow through the relief valve (5) to the power steering circuit.
3. When the main gear shift lever is moved, the rotary valve (7) is activated to drain the oil in the pilot circuit (**B**), and the clutch pack (23) is disengaged.
4. Then, the oil is supplied from the rotary valve (7) to the shift pistons (8), (9), (10) to shift the gear. When the gear is shifted, the shift check valves (12), (13), (14), (15) are closed, pressurizing the pilot circuit (**B**). When the gear is shifted to the Hi-speed side (5th, 6th, 7th, 8th speed) during the above oil flow, the accumulator pilot circuit (**C**) is pressurized.
5. The clutch valve (22) is opened and the modulate check valve (19) is closed by the pressure of the pilot circuit (**B**).
6. The clutch valve (22) is opened and the oil flows to the clutch pack (23) through the low-pass valve (17), the modulate valve (18).
   During this period, the pressure is built up gradually by the low-pass valve (17), modulate valve (18), and accumulator (21), causing the clutch to be engaged smoothly.
   When the speed is changed to the Hi-speed side (5th, 6th, 7th, 8th speed), the volume of the accumulator (21) is reduced and the pressurizing time is changed.

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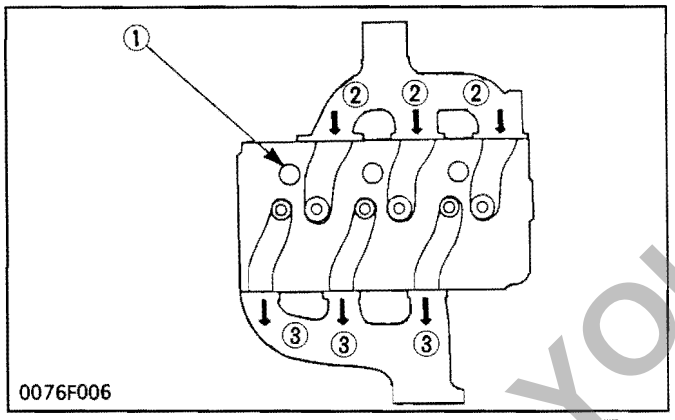
# [2] ENGINE BODY

## (1) Cylinder Block

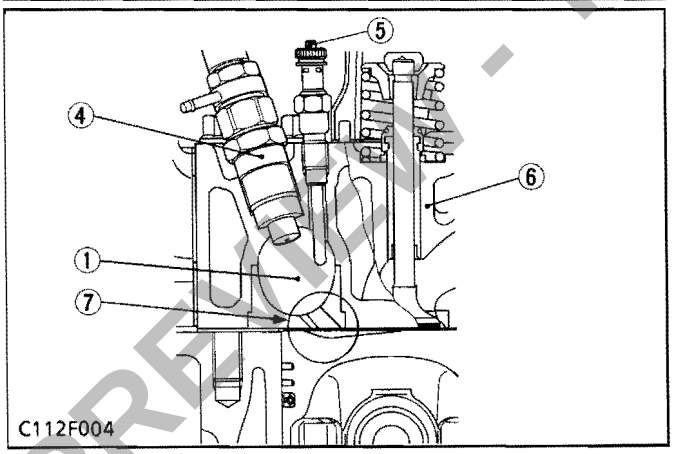

B164F001

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 has its own chamber.

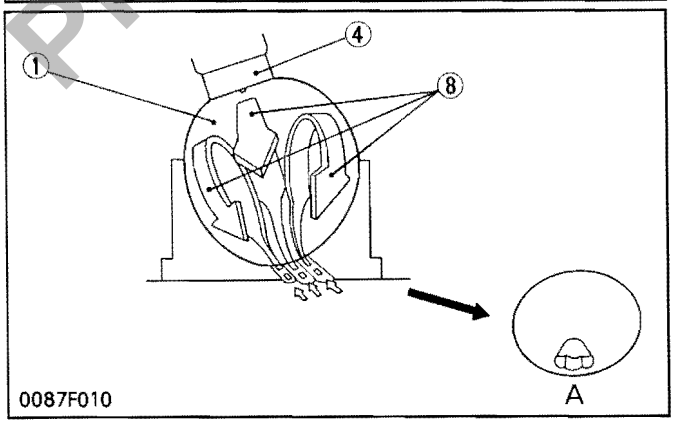
## (2) Cylinder Head



0076F006



C112F004



0087F010

The cross-flow type intake / exhaust ports in this engine have their openings at both sides of the cylinder head. Because overlaps of intake / exhaust ports are smaller than in ports of other types which have openings on one side, the suction air can be protected from being heated and expanded by heated exhaust air. The cool, high density suction air has high volume efficiency and raises the power of the engine. Furthermore, distortion of the cylinder head by heated exhaust gas is reduced because intake ports are arranged alternately. The combustion chamber is of KUBOTA's exclusive E-TVCS combustion chamber type. Suction air is whirled to be mixed effectively with fuel, prompting combustion and reducing fuel consumption.

In the combustion chamber are installed throttle type injection nozzle and rapid heating sheathed type glow plug. This glow plug assures easier than ever engine starts even at −15 °C (5 °F).

**[A] Connect to Combustion Chamber**

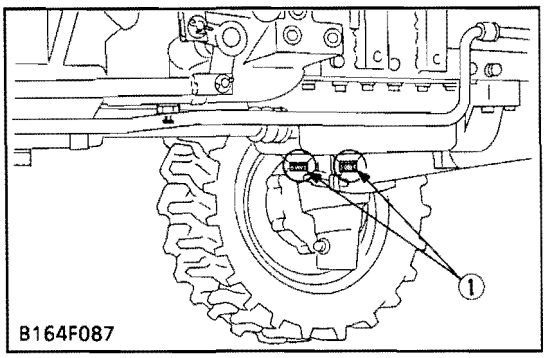
(1) Combustion Chamber
(2) Intake Port
(3) Exhaust Port
(4) Nozzle Assembly
(5) Glow Plug
(6) Cylinder Head
(7) Depression
(8) Compressed Air

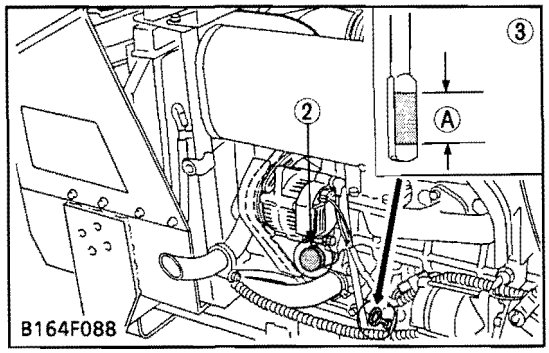
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## (2) Check Points of Initial 50 Hours




### Changing Engine Oil

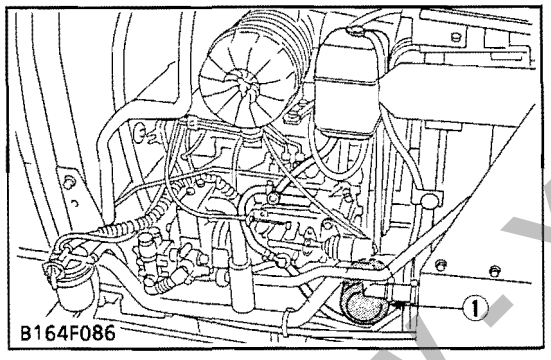
1. Start and warm up the engine for approx. 5 minutes.
2. Place an oil pan underneath the engine.
3. To drain the used oil, remove the drain plugs (1) at the bottom of the engine and drain the oil completely.
4. Screw in the drain plug.
5. Fill new oil up to upper line on the dipstick.

**■ IMPORTANT**

- **When using an oil of different manufacture or viscosity from the previous one, remove all of the old oil. Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperatures. Refer to "LUBRICANTS, FUEL AND COOLING WATER". (See page G-8.)**

**[A] Oil level is acceptable within this range.**

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



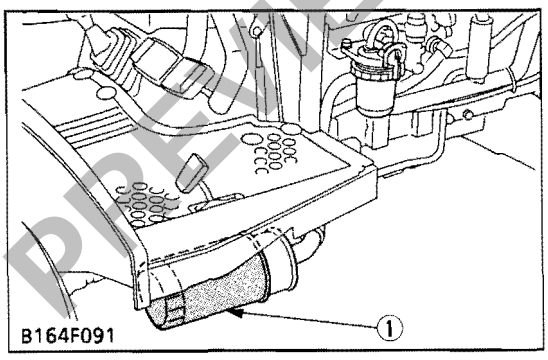

(1) Engine Oil Filter Cartridge

### Replacing Engine Oil Filter Cartridge

1. Remove the engine oil filter cartridge (1).
2. When installing, apply the clean engine oil slightly to the rubber gasket.
3. Tighten the filter cartridge (1) quickly until it contacts the mounting surface. Tighten filter cartridge (1) by hand an additional 1/2 turn only.
4. After the new cartridge has been replaced the engine oil level normally decreases a little. Add engine oil to proper level. Check for oil leaks around filter gasket.

**■ IMPORTANT**

- **To prevent serious damage to the engine, replacement oil filter cartridge must be highly efficient. Use only a genuine KUBOTA filter.**




(1) Hydraulic Oil Filter Cartridge

### Replacing Hydraulic Oil Filter Cartridge

1. Remove the hydraulic oil filter cartridge (1).
2. When installing, apply the clean transmission oil slightly to the rubber gasket.
3. Tighten the hydraulic oil filter cartridge (1) quickly until it contacts the mounting surface. Tighten hydraulic oil filter cartridge (1) by hand an additional 1/2 turn only.
4. After the new cartridge has been replaced, the transmission fluid level normally decreases a little. Add KUBOTA SUPER UDT fluid to proper level. Check for oil leaks around filter gasket.

**■ IMPORTANT**

- **To prevent serious damage to the hydraulic system, replacement oil filter cartridge must be highly efficient. Use only a genuine KUBOTA filter.**

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# SERVICING SPECIFICATIONS

## ENGINE BODY

| Item | | Factory Specification | Allowable Limit |
|---|---|---|---|
| Cylinder Head Surface | Flatness | – | 0.05 mm / 100 mm<br>0.0019 in. / 4 in. |
| Compression Pressure<br>(When Cranking with Starting Motor) | | 35.3 to 37.2 MPa / 250 rpm<br>36 to 38 kgf/cm² / 250 rpm<br>512 to 540 psi / 250 rpm | 24.5 MPa / 250 rpm<br>26 kgf/cm² / 250 rpm<br>355 psi / 250 rpm |
| Difference among Cylinders | | – | 10 % or less |
| Top Clearance | | 0.55 to 0.70 mm<br>0.0217 to 0.0276 in. | – |
| Cylinder Head Gasket | Thickness (Free) | 1.30 to 1.40 mm<br>0.0512 to 0.0551 in. | – |
| | Thickness (Tightened) | 1.15 to 1.25 mm<br>0.0453 to 0.0492 in. | – |
| Valve Clearance (When Cold) | | 0.18 to 0.22 mm<br>0.0071 to 0.0087 in. | – |
| Valve Seat | Width (Intake) | 2.12 mm<br>0.0835 in. | – |
| | Width (Exhaust) | 2.12 mm<br>0.0835 in. | – |
| Valve Seat | Angle (Intake) | 1.047 rad.<br>60° | – |
| | Angle (Exhaust) | 0.785 rad.<br>45° | – |
| Valve Face | Angle (Intake) | 1.047 rad.<br>60° | – |
| | Angle (Exhaust) | 0.785 rad.<br>45° | – |
| Valve Stem to Valve Guide | Clearance | 0.040 to 0.070 mm<br>0.00157 to 0.00276 in. | 0.1 mm<br>0.0039 in. |
| Valve Stem | O.D. | 7.960 to 7.975 mm<br>0.31339 to 0.31398 in. | – |
| Valve Guide | I.D. | 8.015 to 8.030 mm<br>0.31555 to 0.31614 in. | – |
| Valve Recessing | Protrusion | 0.05 mm<br>0.0020 in. | – |
| | Recessing | 0.15 mm<br>0.0059 in. | 0.4 mm<br>0.0157 in. |

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⑨ Part No. 35260-3491-3

**⚠CAUTION** 35260-34913⑨

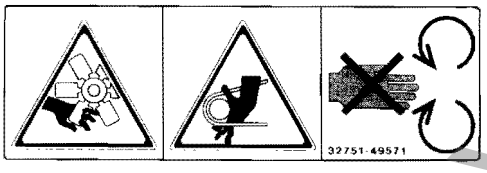
TO AVOID PERSONAL INJURY:
1. Read and understand the operator's manual before operation.
2. Before starting the engine, make sure that everyone is at a safe distance from the tractor and that the PTO is OFF.
3. Do not allow passengers on the tractor at any time.
4. Before allowing other people to use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

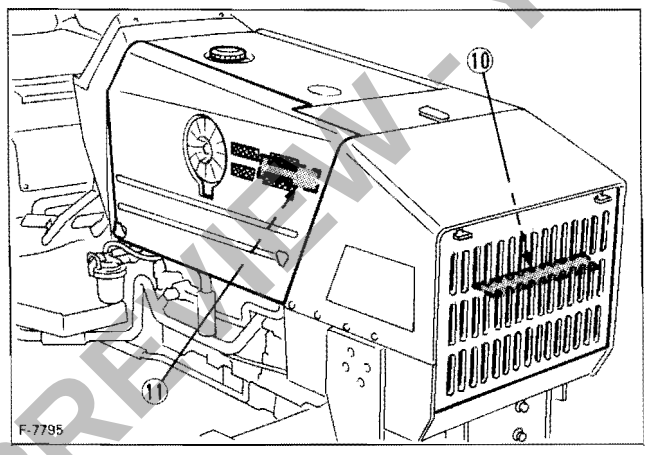
⑩ Part No. TA040-3015-1

**DANGER** EXPLOSIVE GASES
Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training.
**KEEP VENT CAPS TIGHT AND LEVEL**

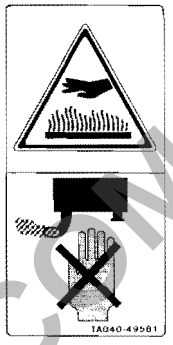
**POISON** CAUSES SEVERE BURNS
Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately.
**KEEP OUT OF REACH OF CHILDREN**

⑪ Part No. 32751-4957-1
Stay clear of engine fan and fan belt.



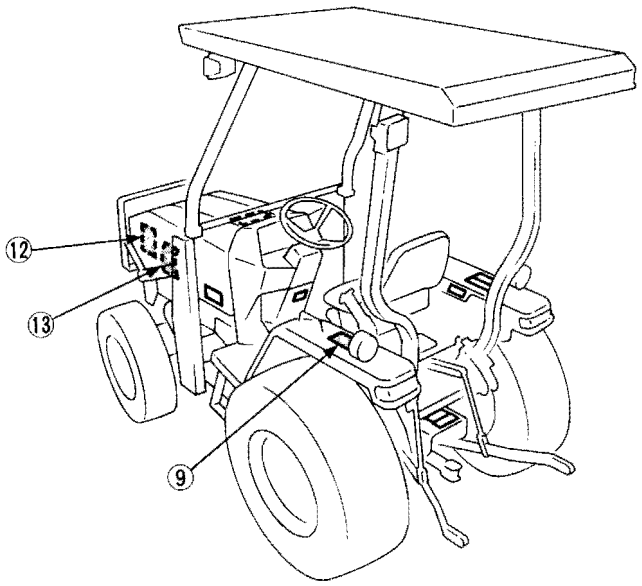




⑫ Part No. TA040-4958-1
Do not touch hot surface like muffer, etc.




⑬ Part No. 32751-4958-1
Stay clear of engine fan and fan belt.




## CARE OF DANGER, WARNING AND CAUTION LABELS

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

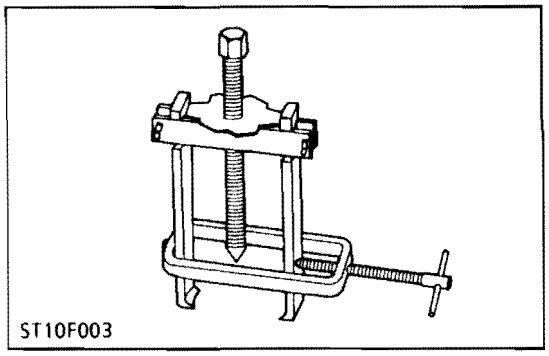
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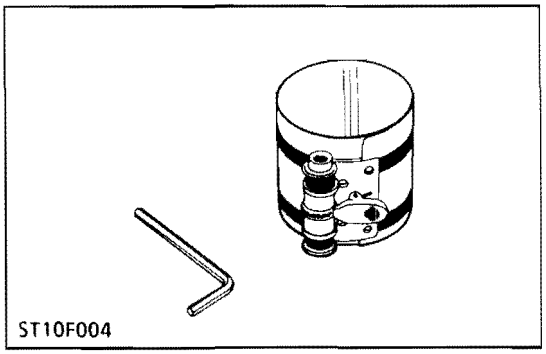
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## [9] SPECIAL TOOLS



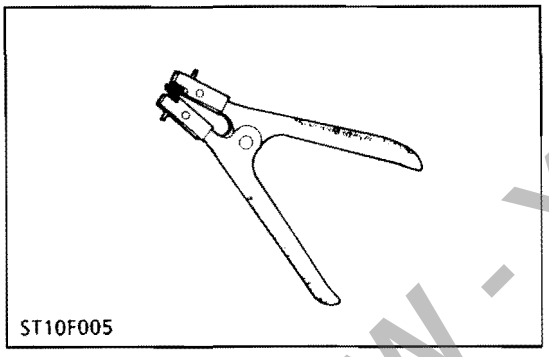

**Special Use Puller Set**

Code No : 07916-09032
Application : Use exclusively for pulling out bearings, gears and other parts with ease.



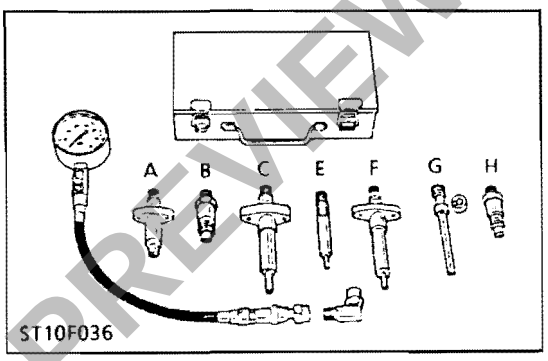

**Piston Ring Compressor**

Code No : 07909-32111
Application : Use exclusively for pushing in the piston with ease.



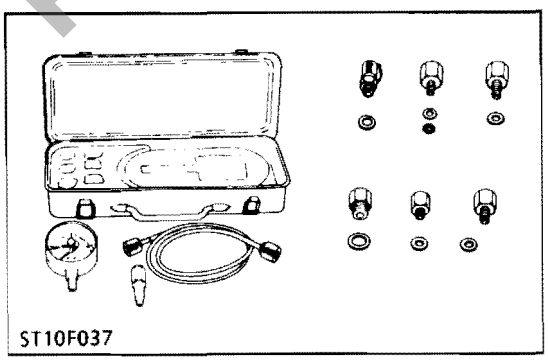

**Piston Ring Tool**

Code No : 07909-32121
Application : Use exclusively for removing or installing the piston ring with ease.




**Diesel Engine Compression Tester**

Code No : 07909-30208 (Assembly)
07909-30934 (A to F)
07909-31211 (E and F)
07909-31251 (G)
07909-31231 (H)
07909-31271 (I)
Application : Use for measuring diesel engine compression pressure.

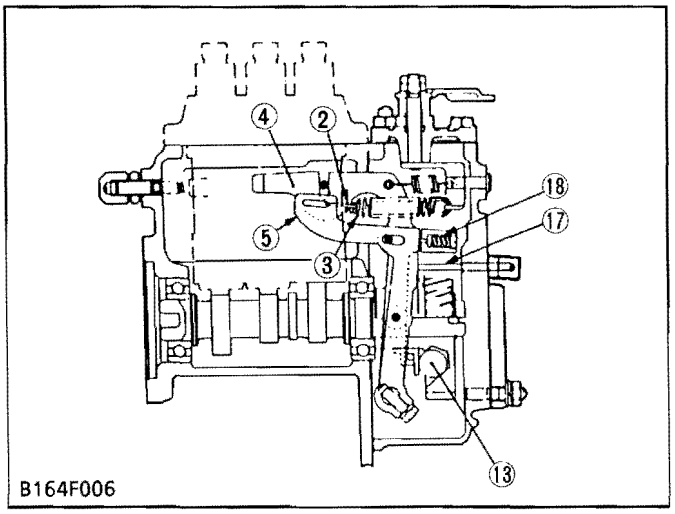



**Diesel Engine Oil Pressure Tester**

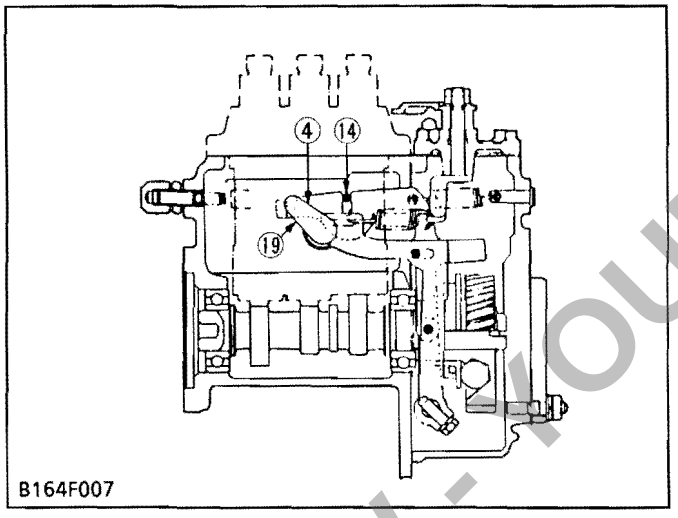
Code No : 07916-32032
Application : Use to measure lubricating, for all kinds of diesel engines.
Reference : Code No. of adaptor 7 (07916-32591)

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B164F006



B164F007

### ■ At High Speed Running with Overload

When an overload is applied to the engine running at a high speed, the centrifugal force of steel ball (13) becomes small as the engine speed is dropped, and fork lever 2 (5) is pulled to the right by the governor springs 1 (2) and 2 (3), increasing fuel injection. Though, fork lever 2 becomes ineffective in increasing fuel injection when it is stopped by the adjusting bolt (17).

After that, when the force of torque spring (18) becomes greater than the centrifugal force of the steel ball, fork lever 1 (4) moves rightward to increase fuel injection, causing the engine to run continuously at a high torque.

(2) Governor Spring 1
(3) Governor Spring 2
(4) Fork Lever 1
(5) Fork Lever 2
(13) Steel Ball
(17) Adjusting Bolt
(18) Torque Spring

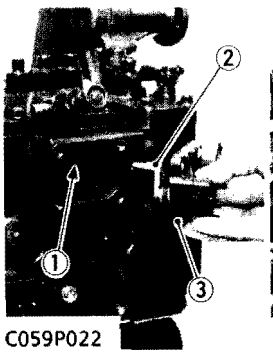
### ■ To Stop Engine

When the stop lever (19) is moved to STOP position, fork lever 1 (4) is moved leftward and the control rack (14) is moved to the non-injection position, stopping the engine.

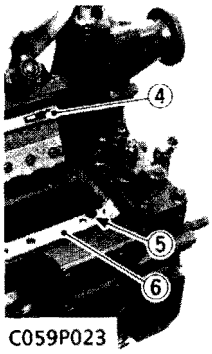
(4) Fork Lever 1
(14) Control Rack
(19) Stop Lever

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C059P022



C059P023

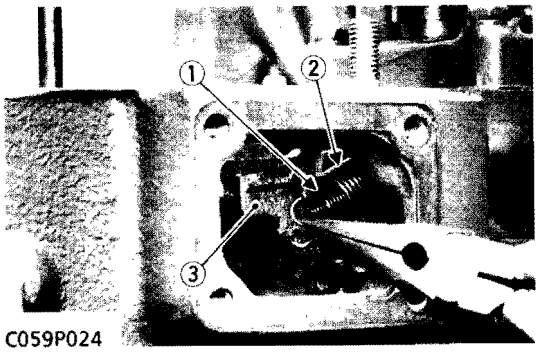
(1) Fork Lever 1
(2) Engine Stop Lever
(3) Injection Pump Cover
(4) Control Rack Pin
(5) Groove
(6) Shims

## Injection Pump

1. Remove the injection pump cover (3) with the engine stop lever (2).
2. Remove the injection pump.

**(When reassembling)**

- Apply liquid gasket (Three Bond 1215 or equivalent) to the both sides of injection pump cover gasket and shims (6) and install them.
- Install the injection pump so that its control rack pin (4) engages with the groove (5) of fork lever 1.
- Install the injection pump cover with the arm of engine stop lever (2) at the right of the arm of fork lever 1 (1).



C059P024

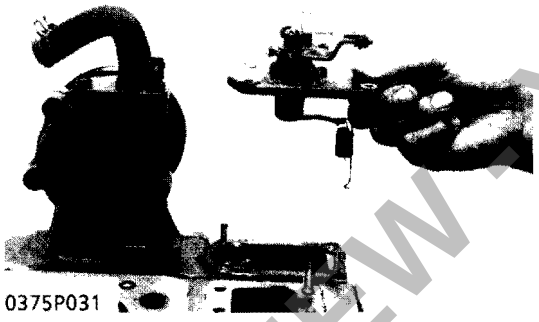
## Governor Spring

1. Disconnect the governor spring 1 (1) and 2 (2) from the fork lever 2 (3).

**(When reassembling)**

- Fix the governor spring to the speed control lever, and pull the spring or wire through the window of the injection pump, and spring will be able to be hooked on the governor fork with ease.
  Bend the end of the governor spring to prevent if from falling off.

(1) Governor Spring 1
(2) Governor Spring 2
(3) Fork Lever 2

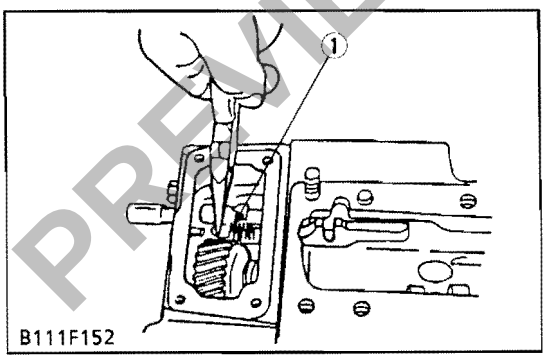

0375P031

## Speed Control Plate

1. Remove the speed control plate and governor spring.

**(When reassembling)**

- Be careful not to drop the governor spring in the gear case.



B111F152

## Start Spring

1. Remove the start spring (1) from the gear case.

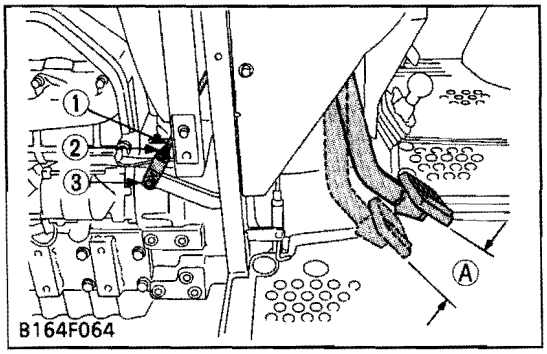
(1) Start Spring

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# CHECKING, DISASSEMBLING AND SERVICING

## CHECKING AND ADJUSTING



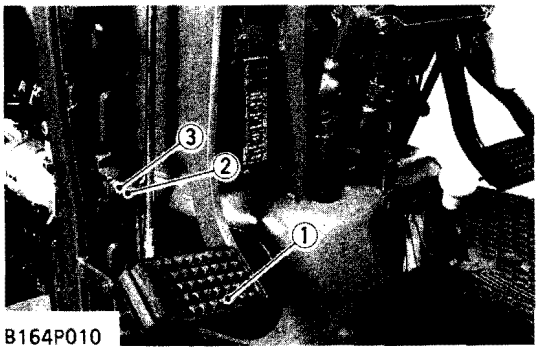
B164F064

### Clutch Pedal Free Travel

1. Measure the free play by depressing the clutch pedal.
2. If the measurement is not within the factory specifications, adjust the play by changing the length of clutch rod (2).
3. After adjustment, tighten the lock nut (1) on the clutch rod (2) firmly.

| | | |
|---|---|---|
| Clutch pedal free play (A) | Factory spec. | 20 to 30 mm<br>0.79 to 1.20 in. |

(1) Lock Nut
(2) Clutch Rod
(3) Clevis Pin



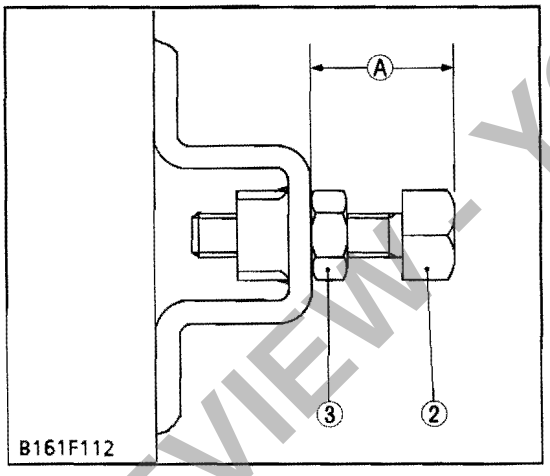
B164P010

### Clutch Pedal Stopper Bolt

1. Measure the height (A) of stopper bolt (2).
2. If the measurement is not within the factory specifications, adjust it.
3. After adjustment, tighten the lock nut (3) firmly.

| | | |
|---|---|---|
| Height (A) of clutch pedal stopper bolt | Factory spec. | 18 to 22 mm<br>0.70 to 0.87 in. |

(1) Clutch Pedal
(2) Stopper Bolt
(3) Lock Nut



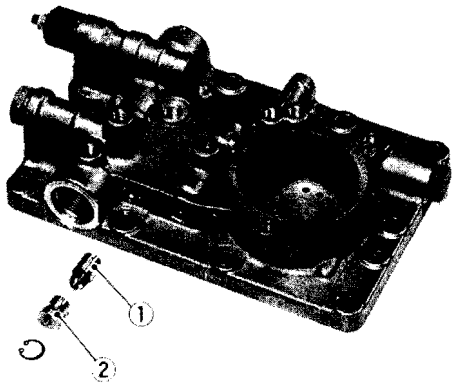
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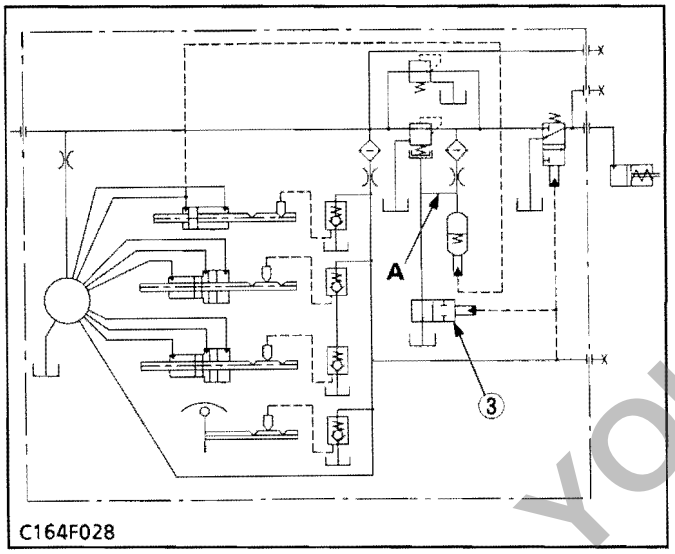


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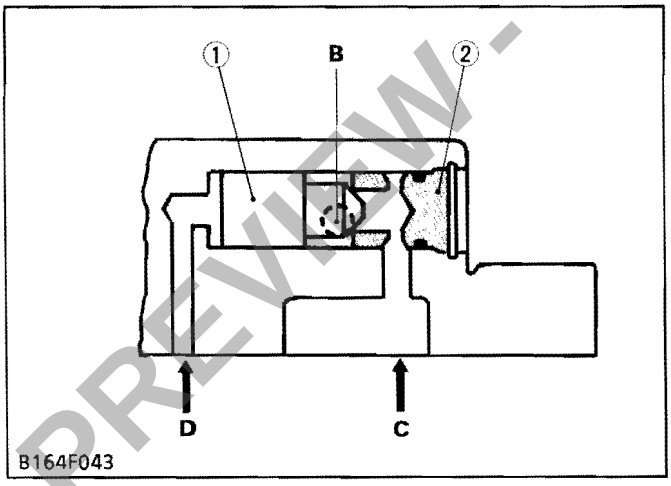
## (4)-8 Modulate Check Valve




C143P069




C164F028




B164F043

### ■ Function

From the start to the end of gear shifting, the modulate check valve (3) drains the oil of the modulate feedback circuit (A). By this action, the pressure rise pattern of the clutch pack is made the same regardless of the speed of operating the shift lever.

### ■ Oil Flow

The oil of the modulate feedback circuit (A) flows in from the C-port. The oil of the pilot circuit flows in from the D-port. Therefore, when the pressure is present in the pilot circuit, the poppet (1) is closed, and when the pressure is not present in the pilot circuit, the poppet (1) is pushed open.

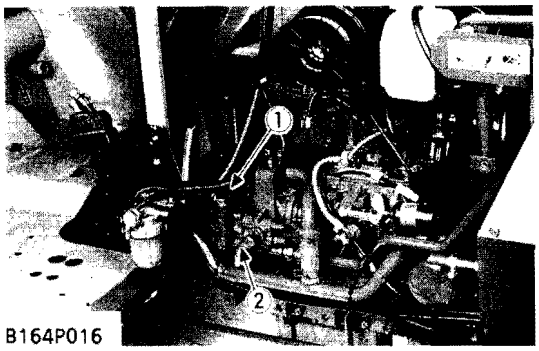
**A : Modulate Feedback Circuit**
**B : Tank-Port**
**C : C-Port**
**From Modulate Feedback Circuit**
**D : D-Port**
**From Pilot Circuit**

(1) Poppet
(2) Valve Seat
(3) Modulate Check Valve

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B164P016

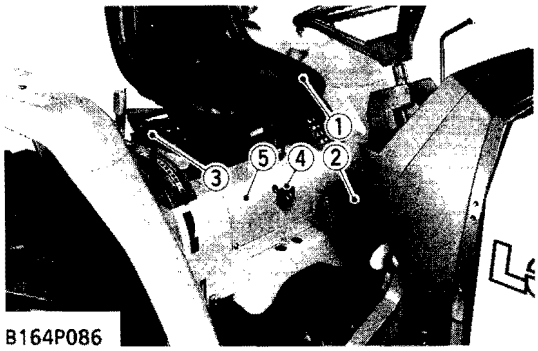
## GST Delivery Pipe

1. Remove the GST delivery pipe joint bolt (1).
2. Disconnect the return hose (2).

**(When reassembling)**

| | | |
|---|---|---|
| Tightening torque | Delivery pipe joint bolt | 34.5 to 39.2 N·m<br>3.5 to 4.0 kgf·m<br>25.3 to 28.9 ft-lbs |

(1) Delivery Pipe Joint Bolt (2) Return Hose

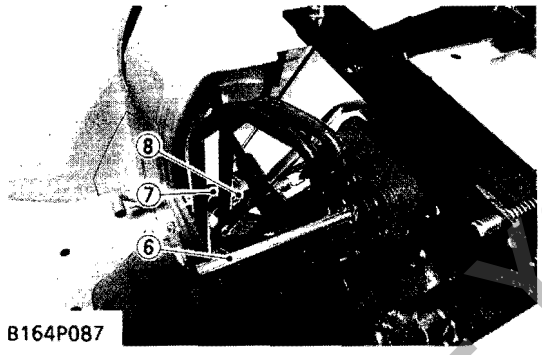


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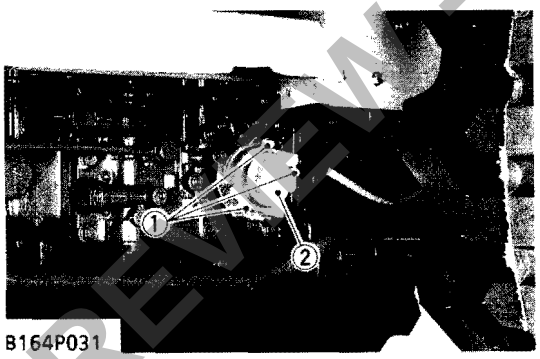
## Grips

1. Remove the seat (1).
2. Remove the grips (2), (3) and (4).
3. Remove the floor seat front cover (5).
4. Remove the lowering speed adjusting valve extension shaft (6).
5. Remove the snap pin (7) of the differential lock pedal and disconnect the rod (8).

(1) Seat
(2) Front Wheel Drive Lever Grip
(3) Position Control Lever Grip
(4) Lowering Speed Adjusting Grip
(5) Front Cover
(6) Lowering Speed Adjusting Valve Extension Shaft
(7) Snap Pin
(8) Rod



B164P087



B164P031

## Shift Cable

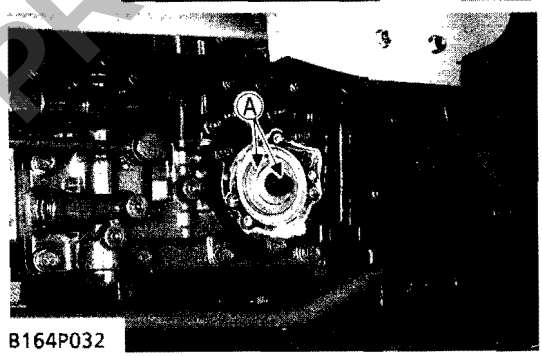
1. Remove the shift cable mounting screws (1) and take off the GST shift cable (2).

**(When reassembling)**

- Apply liquid gasket (Three Bond 1208D or equivalent) to the joint face between rotary valve cover and GST shift cable (2).
- GST shift lever to neutral position then align the punched marks (A) of the rotary valve case and rotary valve shaft when install the GST shift cable (2).

| | | |
|---|---|---|
| Tightening torque | GST shift cable mounting screws | 7.8 to 8.8 N·m<br>0.8 to 0.9 kgf·m<br>5.8 to 6.5 ft-lbs |

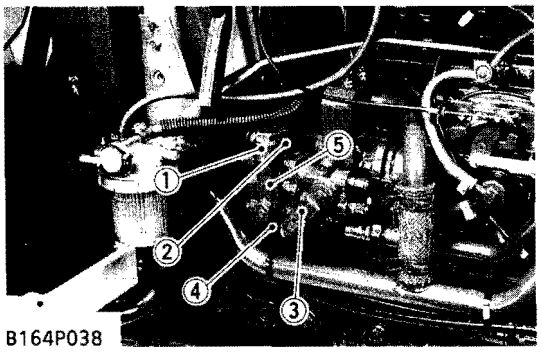
(1) Screws (2) GST Sift Cable



B164P032

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B164P038

(1) GST Delivery Pipe
(2) Power Steering Delivery Hose
(3) Return Hose
(4) Delivery Pipe
(5) Regulator Valve

## Hydraulic Pipes

1. Remove the side cover RH.
2. Disconnect the GST delivery pipe (1), power steering delivery hose (2) and return hose (3).
3. Remove the delivery pipe (4) between hydraulic pump to regulator valve.

**(When reassembling)**

- Apply grease to the O-rings and take care not to damage them.
- Install the copper washers firmly.

| | | |
|---|---|---|
| Tightening torque | GST delivery pipe joint bolt | 34.5 to 39.2 N·m<br>3.5 to 4.0 kgf·m<br>25.3 to 28.9 ft-lbs |
| | Power steering delivery hose joint bolt | 49.0 to 58.8 N·m<br>5.0 to 6.0 kgf·m<br>36.2 to 43.4 ft-lbs |

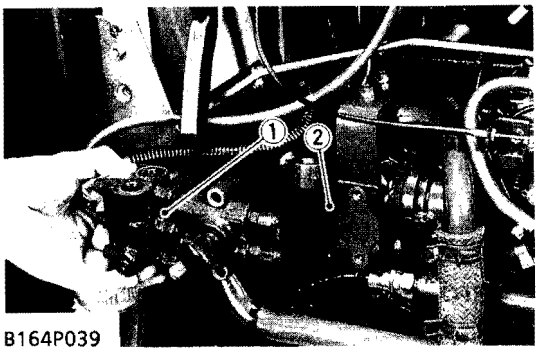
## Regulator Valve Assembly

1. Loosen and remove the regulator valve mounting screws.
2. Take out the regulator valve (1).

**(When reassembling)**

- Apply grease to the O-ring and take care not to damage it.

| | | |
|---|---|---|
| Tightening torque | Regulator valve mounting screws | 23.5 to 27.5 N·m<br>2.4 to 2.8 kgf·m<br>17.4 to 20.3 ft-lbs |




B164P039

(1) Regulator Valve
(2) Power Steering Hydraulic Pump

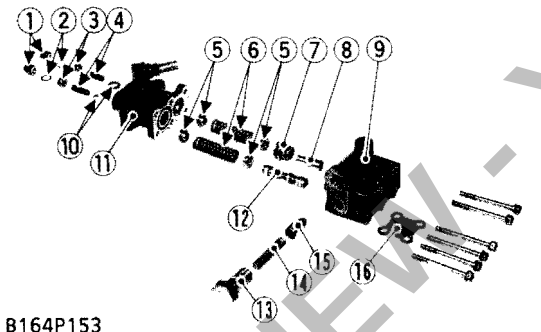
## Regulator Valve

1. Remove the plate (16) and take out reducing spool (12), spring retainer (5) and spring (6).
2. Separate the regulator valve case (9) and regulator support (11).
3. Take out the bush (7) and poppet (8).
4. Remove the joint bolt (13), then take out the spring (14) and the poppet (15).
5. Take out the spring retainer (5), and spring (6).

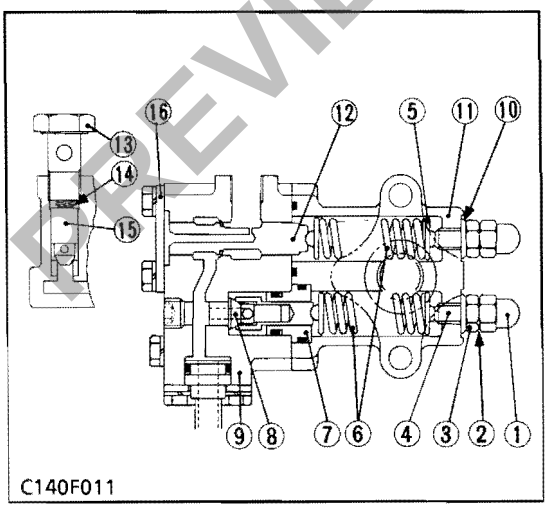
**(When reassembling)**

- Take care not to damage the 0-rings.

| | | |
|---|---|---|
| Tightening torque | Joint bolt (13) | 49.0 to 58.8 N·m<br>5.0 to 6.0 kgf·m<br>36 to 43 ft-lbs |
| | Plate (16) | 9.8 N·m<br>1.0 kgf·m<br>7.2 ft-lbs |
| | Regulator valve case and regulator support mounting screws | 9.8 N·m<br>1.0 kgf·m<br>7.2 ft-lbs |




B164P153




C140F011

(1) Cap Nuts
(2) Gaskets
(3) Nuts
(4) Adjustor
(5) Spring Retainer
(6) Spring
(7) Bush
(8) Poppet
(9) Regulator Valve Case
(10) Wash with Rubber
(11) Regulator Support
(12) Reducing Spool
(13) Joint Bolt
(14) Spring
(15) Poppet
(16) Plate

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# MECHANISM

## CONTENTS

[1] STRUCTURE ..... 6-M1
[2] FRONT WHEEL ALIGNMENT ..... 6-M2

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# SERVICING SPECIFICATIONS

## POWER STEERING HYDRAULIC PUMP

| Item | | Factory Specification | Allowable Limit |
|---|---|---|---|
| Hydraulic Pump<br>**Condition**<br>● Engine Speed ···· Approx. 2700 rpm<br>● Rated Pressure ·· 10.7 to 11.7 MPa<br>109 to 119 kgf/cm²<br>1550 to 1693 psi<br>● Oil Temperature ··· 40 to 60 °C<br>104 to 140 °F | Delivery at No Pressure<br><br><br><br>Delivery at Rated Pressure | Above<br>23.3 ℓ / min<br>6.15 U.S.gal / min<br>5.12 Imp.gal / min<br><br>Above<br>22.6 ℓ / min<br>5.97 U.S.gal / min<br>4.97 Imp.gal / min | –<br><br><br><br>20.3 ℓ / min<br>5.36 U.S.gal / min<br>4.46 Imp.gal / min |
| Housing | Depth of Scratch | – | 0.09 mm<br>0.0035 in. |
| Bushing to Gear Shaft | Clearance | – | 0.12 mm<br>0.0047 in. |
| Bushing | Length | 22.99 to 23.00 mm<br>0.9051 to 0.9055 in. | 22.80 mm<br>0.8976 in. |

## STEERING CONTROLLER

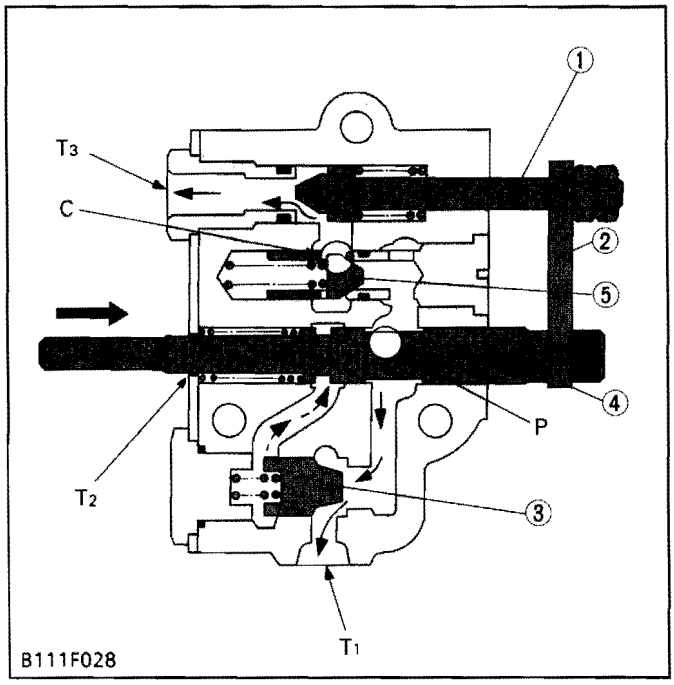
| | | | |
|---|---|---|---|
| Relief Valve<br>**Condition**<br>● Engine Speed ····· Maximum<br>● Oil Temperature ··· 40 to 60 °C<br>104 to 140 °F | Setting Pressure | 10.7 to 11.7 MPa<br>109 to 119 kgf/cm²<br>1550 to 1693 psi | – |
| Rotor Set | Clearance | – | 0.08 mm<br>0.0031 in. |

## STEERING CYLINDER

| | | | |
|---|---|---|---|
| Cylinder Tube | I.D. | 55.000 to 55.046 mm<br>2.16535 to 2.16717 in. | 55.100 mm<br>2.16929 in. |
| Rod to Cylinder End Bushing | Clearance | 0.016 to 0.114 mm<br>0.00062 to 0.00449 in. | 0.2 mm<br>0.00787 in. |
| Rod | O.D. | 17.957 to 17.984 mm<br>0.7067 to 0.70803 in. | – |
| Cylinder End Bushing | I.D. | 18.00 to 18.071 mm<br>0.70866 to 0.71146 in. | – |

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## ■ Down

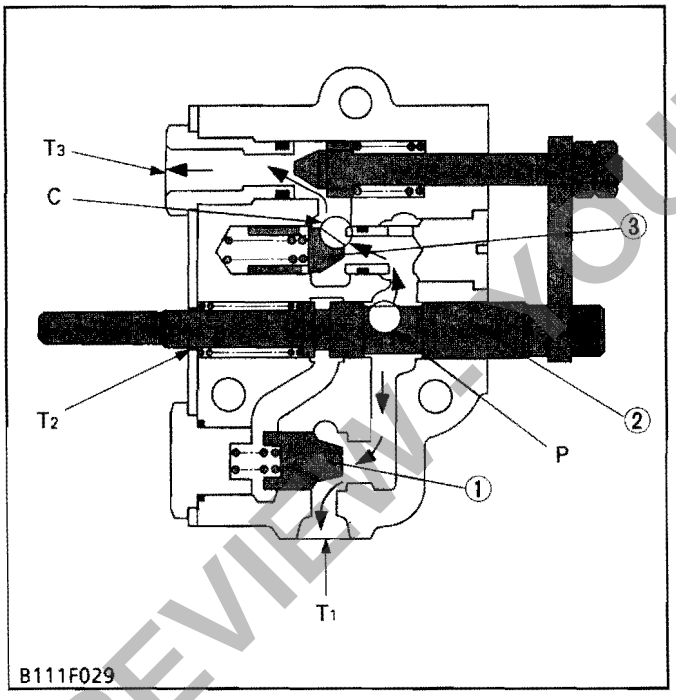
When the control lever is moved to **DOWN** position, the spool (4) is pulled out to the right, and the poppet valve 1 (1) is also pulled out by the plate (2).

Oil in the hydraulic cylinder is forced out to the transmission case through the **T3** port by the weight of the implement, causing the implement to lower.

Oil forced into the control valve through the **P** port pushes open the unload poppet valve (3) as in neutral and returns to the transmission case through the **T1** port.

**P : Pump Port** **T1, T2, T3 : Tank Port**
**C : Cylinder Port**

(1) Poppet Valve 1
(2) Plate
(3) Unload Poppet Valve
(4) Spool
(5) Poppet Valve 2




## ■ Lifting to Neutral

When the control lever is moved to its lowest position, the spool (2) is maintained at the **DOWN** position.

When the implement is at its lowest position, the hydraulic cylinder is in no-load condition, and oil forced out by the hydraulic pump pushes open both the unload poppet valve (1) and poppet valve 2 (3). Thus, oil flows freely in the valves.

**P : Pump Port** **T1, T2, T3 : Tank Port**
**C : Cylinder Port**

(1) Unload Poppet Valve
(2) Spool
(3) Poppet Valve 2

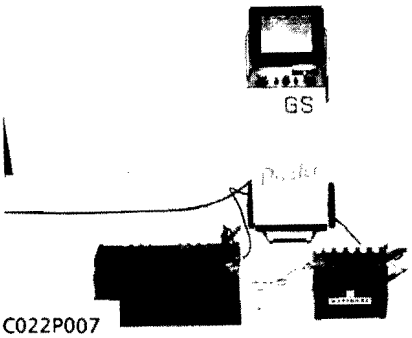
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### Recharging-Quick Charging

1. Add distilled water if electrolyte is insufficient. The amount of electrolyte should be slightly lower than the specified level to prevent overflow while charging.
2. Connect the battery and the charging unit, following the manufacturer's instructions.
3. Determine the proper charging amperage and charging time using the tester provided with the quick charger, or following the manufacturer's instructions.
4. As the electrolyte generates gas while charging, remove all port caps.
5. The electrolyte temperature must not exceed 40 °C (105 °F) during charging. If it exceed 40 °C (105 °F), decrease the charging amperage or stop charging for a while.
6. When charging several batteries in series, charge at the rate of the smallest battery in the line.

■ **NOTE**

- **Quick charger operation differs with the type used. For details, refer to the manufacturer's instructions.**

**(Reference)**

- Generally, the ratio of the charging amperage to the battery ampere-hour rate is 1:1. However, if the battery ampere-hour rate exceeds 50 Ah, the maximum charging amperage must be 50 Ah.

| | | |
|---|---|---|
| Battery 20 ampere-hour rate (75D26R-MF) | Factory spec. | 65 Ah |

**(Reference)**

Self-discharge Rate

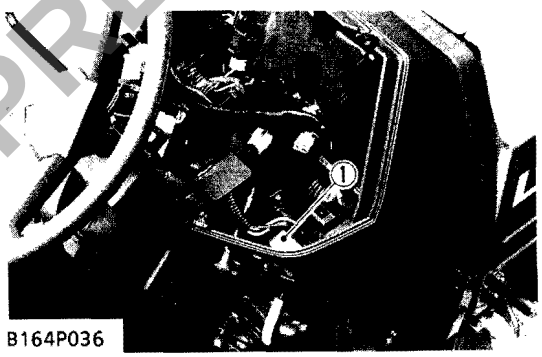
| Temperature | Self-discharge rate |
|---|---|
| 30 °C (86 °F) | Approx. 1.0 % per day |
| 20 °C (68 °F) | Approx. 0.5 % per day |
| 10 °C (50 °F) | Approx. 0.25 % per day |

### Directions for Storage

1. When shutting down the tractor for long periods of time, remove the battery from the tractor, adjust the electrolyte to the proper level, and after fully charging, store the battery in a well ventilated placed where it is not exposed to direct sunlight.
2. Since the battery self-discharges by approx. 0.5 % per day even in storage, it must be once every two months in cold season.
3. When storaging the battery mounted on the tractor, disconnect the ground cable from the battery's negative terminal post.

## [2] STARTING SYSTEM

## CHECKING



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### Main Switch

1. Remove the meter panel, and disconnect the main switch connectors after turning the main switch off.
2. Perform the following checking.

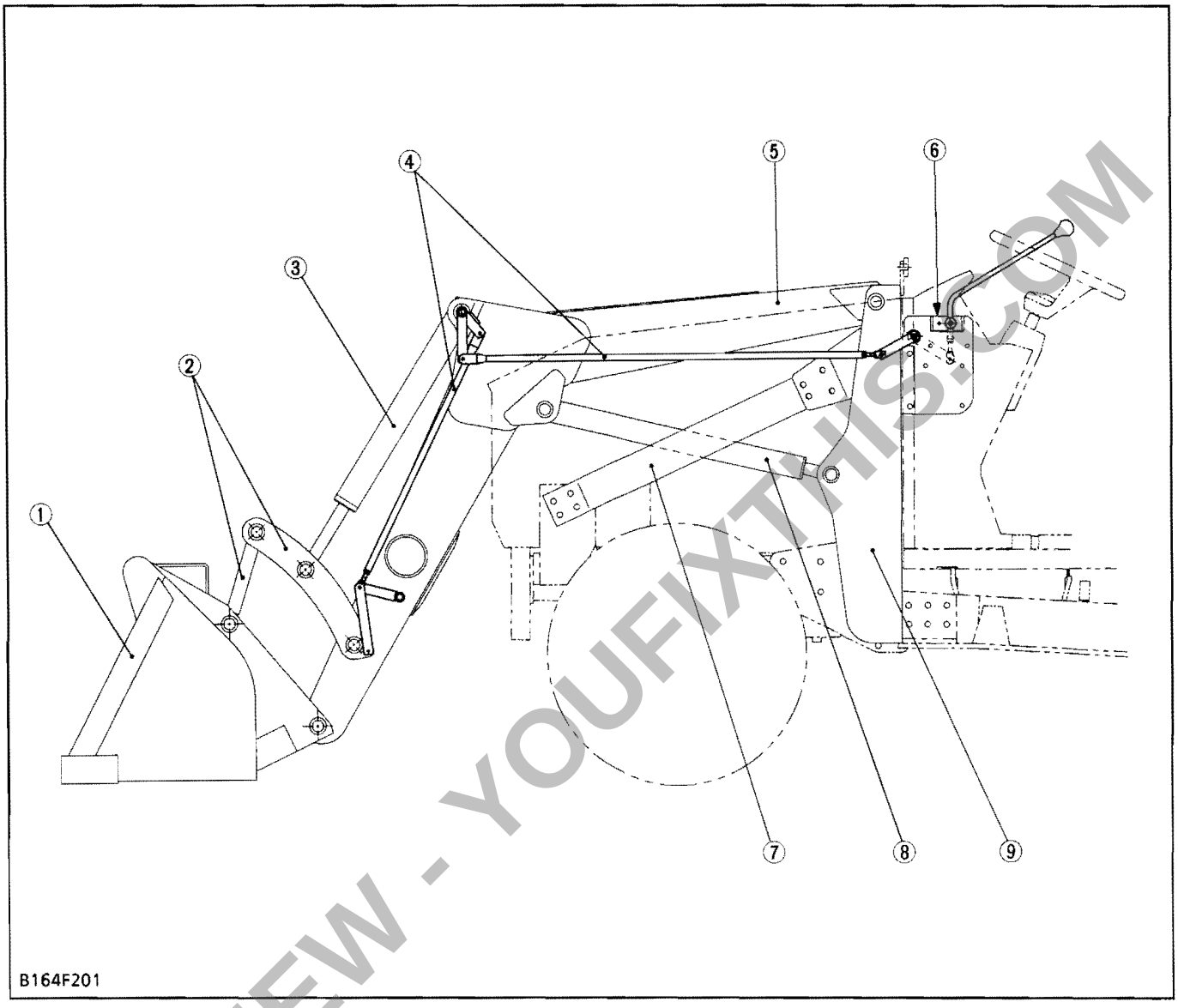
(1) Main Switch

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# FRONT LOADER TERMINOLOGY

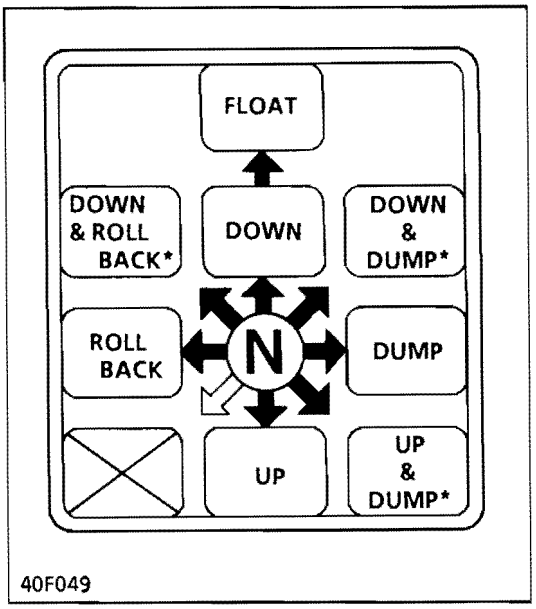



(1) Bucket
(2) Bucket Link
(3) Bucket Cylinder
(4) Self-leveling Link
(5) Boom
(6) Hydraulic Control Valve
(7) Brace
(8) Boom Cylinder
(9) Loader Main Frame

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## Test Operation

**⚠ CAUTION**

- **Keep engine speed at low idle during the test operation.**
- **Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.**

1. To begin test operation, slightly move the hydraulic control lever from the "**N**" position. Slowly raise the loader boom just enough for the bucket to clear the ground when fully dumped. Slowly work through the dump and roll back cycles.

**■ IMPORTANT**

- **If the boom or bucket does not work in the directions indicated in the label, lower the bucket to the ground, stop the engine, and relieve all hydraulic pressure. Recheck and correct all hydraulic connections.**

**■ NOTE**

- **When the lever is at each corner position marked by "*", boom and bucket cylinders are connected in line to be available for combined motion of both cylinder. However, the position marked by cross is not recommended for scooping because of insufficient lift force through series connection.**

## Removing Air from Hydraulic System

1. Repeat raising and lowering the boom and bucket operations until all the air is removed from the system and system responds properly.

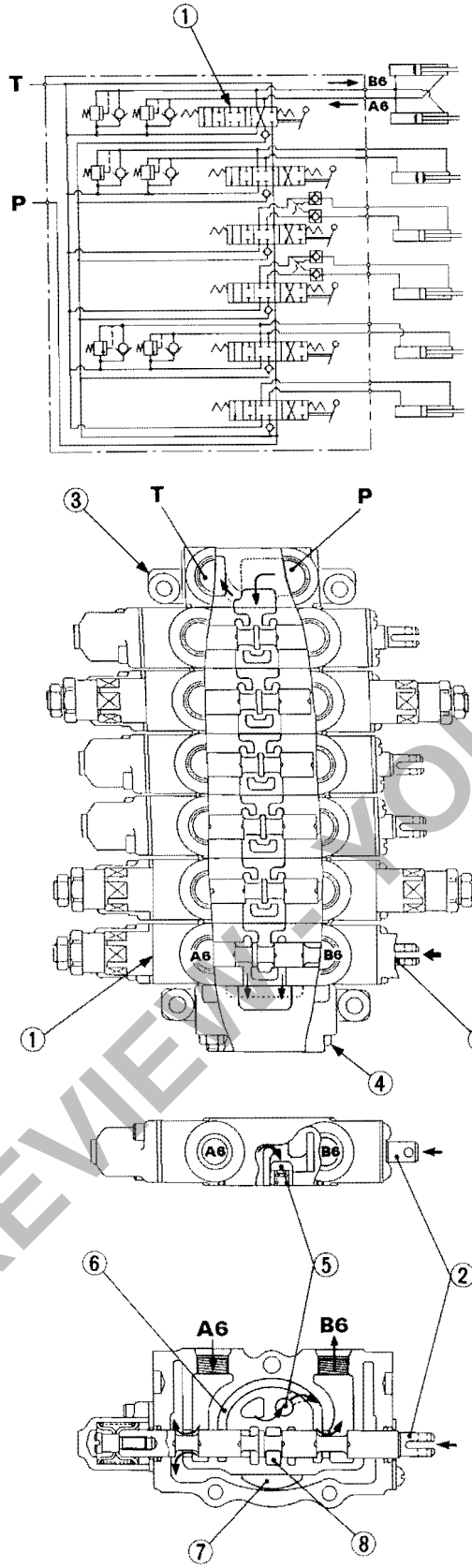
**■ IMPORTANT**

- **Do not move the hydraulic control lever into float position when the bucket is off the ground.**

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## ■ Swing (Left)




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1. When the boom and swing lever is moved to the left to set to the "**LEFT**" position, the spool (2) of the swing control valve (1) moves to the left, which forms oil passage between bridge passage (6) and **B6** port, and between **A6** port and **T** port.
2. The pressure-fed oil from the **P** port opens the load check valve (5) and flows to **B6** port to extend the right swing cylinder. (Retract the left swing cylinder)
3. Return oil from the swing cylinders return to the transmission case through the **A6** port, low pressure passage (7) and **T** port.

(1) Swing Control Valve
(2) Spool
(3) Inlet Section
(4) Outlet Section
(5) Load Check Valve
(6) Bridge Passage
(7) Low Pressure Passage
(8) Neutral Passage
(9) Swing Cylinder RH
(10) Swing Cylinder LH

**P** : **P** Port
**T** : **T** Port
**A6** : **A6** Port (From Swing Cylinders)
**B6** : **B6** Port (To Swing Cylinders)

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