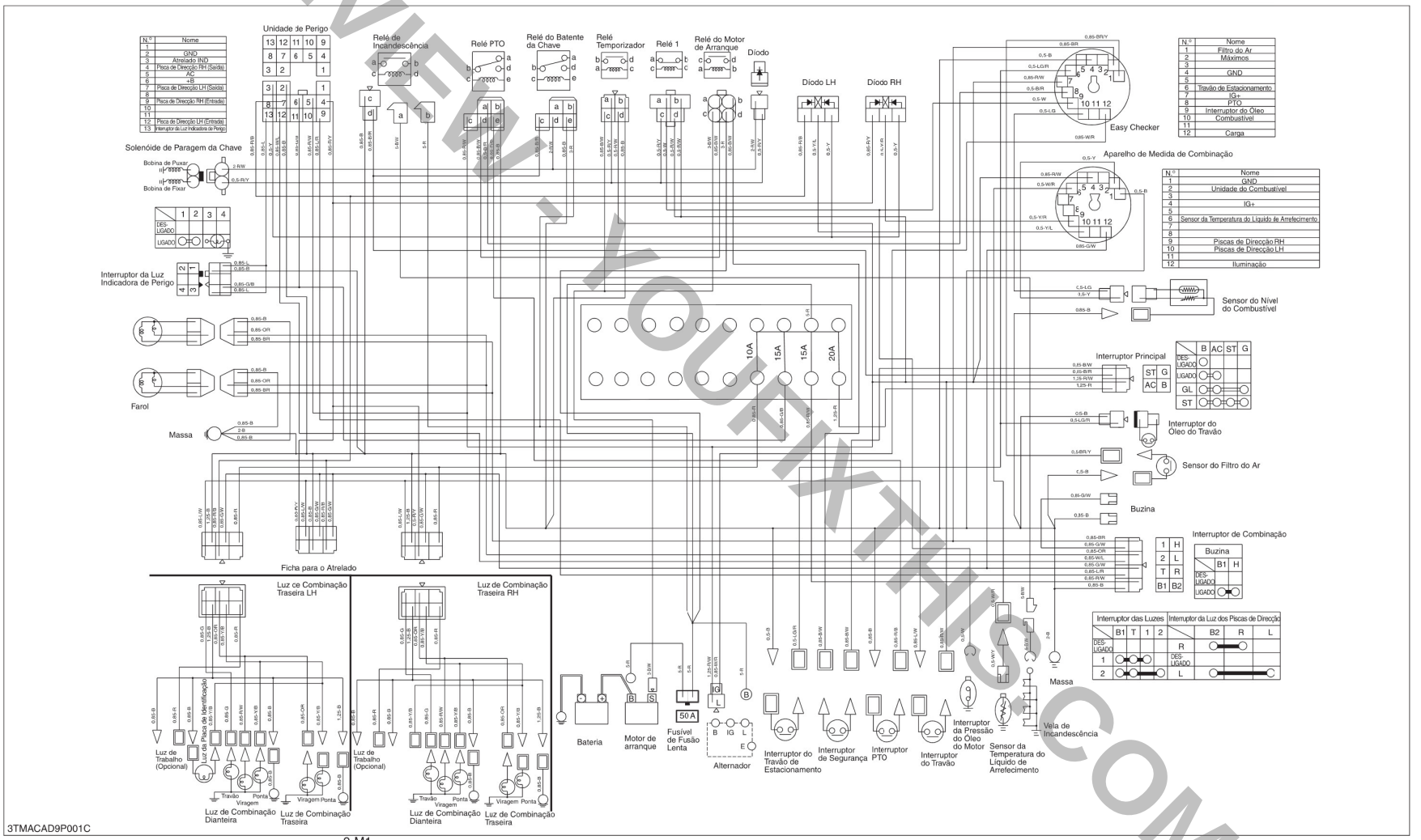
# 1. DIAGRAMA DA CABLAGEM

## [1] TIPO de ROPS



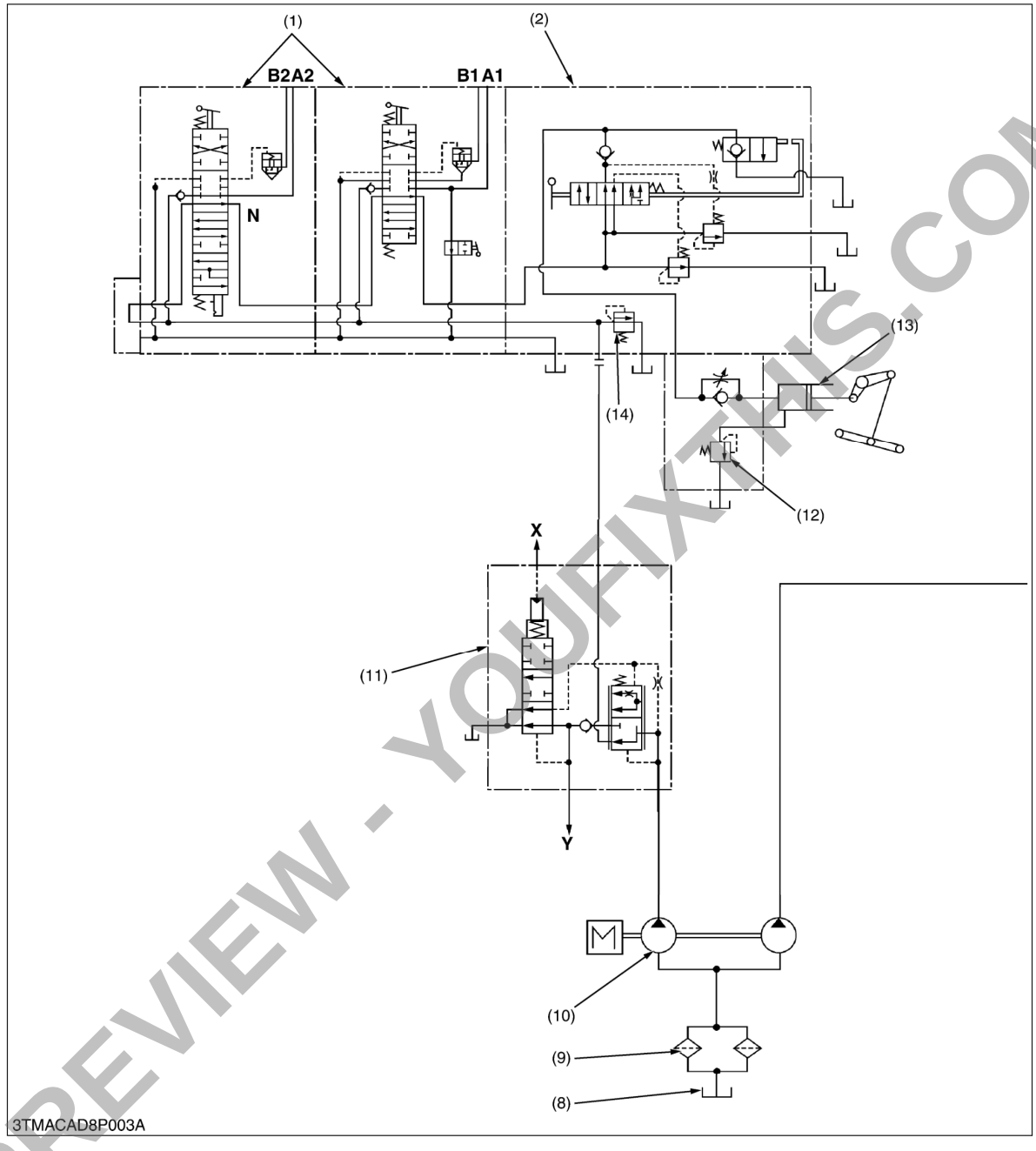



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# 2. HYDRAULIC CIRCUIT




(1) Auxiliary Control Valve
(2) Control Valve
(3) Power Steering
(4) Oil Cooler Check Valve
(5) Oil Cooler
(6) PTO Valve
(7) Shuttle Valve
(8) Oil Tank (Transmission Case)
(9) Hydraulic Oil Filter Cartridge
(10) Hydraulic Pump



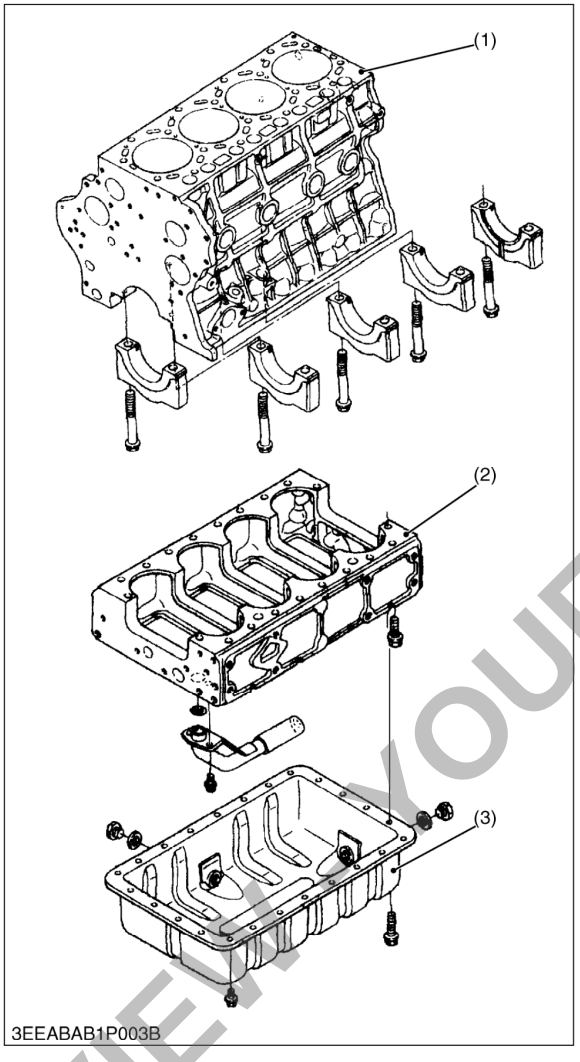


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# 1. ENGINE BODY

## [1] CYLINDER BLOCK



3EEABAB1P003B

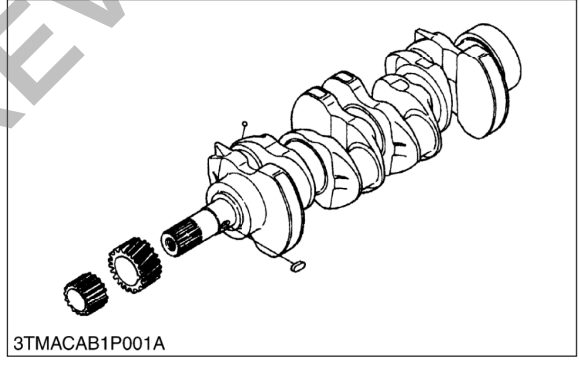
This engine employs separate type crankcases - the crankcase 1 with combustion part and the crankcase 2 which supports the crankcase 1 and reduces noise.

Since it is a hanger type, you can easily assemble / disassemble it. The cylinder is a linerless type which enables good cooling operation, less strain and good abrasion resistance.

(1) Crankcase 1
(2) Crankcase 2
(3) Oil Pan

W1012660

## [2] CRANKSHAFT


3TMACAB1P001A

This engine adopts the half counter system and lightweight moving elements, and optimizes the oil clearance of bearings to reduce noise and vibration.

It also adopts a large diameter journal to improve rigidity and reliability, and enable large capacity P.T.O. (Power take-off).

W1012784



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# 5. TIGHTENING TORQUES

## [1] GENERAL USE SCREWS, BOLT 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 \ Unit | N·m | kgf·m | lbf·ft | N·m | kgf·m | lbf·ft | N·m | kgf·m | lbf·ft | N·m | kgf·m | lbf·ft | N·m | kgf·m | lbf·ft |
| M6 (6 mm, 0.24 in.) | 7.85 to 9.31 | 0.80 to 0.95 | 5.79 to 6.87 | 7.85 to 8.82 | 0.80 to 0.90 | 5.79 to 6.50 | 9.81 to 11.2 | 1.00 to 1.15 | 7.24 to 8.31 | 7.85 to 8.82 | 0.80 to 0.90 | 5.79 to 6.50 | 12.3 to 14.2 | 1.25 to 1.45 | 9.05 to 10.4 |
| M8 (8 mm, 0.31 in.) | 17.7 to 20.5 | 1.8 to 2.1 | 13.1 to 15.1 | 16.7 to 19.6 | 1.7 to 2.0 | 12.3 to 14.4 | 23.6 to 27.4 | 2.4 to 2.8 | 17.4 to 20.2 | 17.7 to 20.5 | 1.8 to 2.1 | 13.1 to 15.1 | 29.5 to 34.3 | 3.0 to 3.5 | 21.7 to 25.3 |
| M10 (10 mm, 0.39 in.) | 39.3 to 45.0 | 4.0 to 4.6 | 29.0 to 33.2 | 31.4 to 34.3 | 3.2 to 3.5 | 23.2 to 25.3 | 48.1 to 55.8 | 4.9 to 5.7 | 35.5 to 41.2 | 39.3 to 44.1 | 4.0 to 4.5 | 29.0 to 32.5 | 60.9 to 70.6 | 6.2 to 7.2 | 44.9 to 52.0 |
| M12 (12 mm, 0.47 in.) | 62.8 to 72.5 | 6.4 to 7.4 | 46.3 to 53.5 | – | – | – | 77.5 to 90.2 | 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 86.7 |
| M14 (14 mm, 0.55 in.) | 108 to 125 | 11.0 to 12.8 | 79.6 to 92.5 | – | – | – | 124 to 147 | 12.6 to 15.0 | 91.2 to 108 | – | – | – | 167 to 196 | 17.0 to 20.0 | 123 to 144 |
| M16 (16 mm, 0.63 in.) | 167 to 191 | 17.0 to 19.5 | 123 to 141 | – | – | – | 197 to 225 | 20.0 to 23.0 | 145 to 166 | – | – | – | 260 to 304 | 26.5 to 31.0 | 192 to 224 |
| M18 (18 mm, 0.71 in.) | 246 to 284 | 25.0 to 29.0 | 181 to 209 | – | – | – | 275 to 318 | 28.0 to 32.5 | 203 to 235 | – | – | – | 344 to 402 | 35.0 to 41.0 | 254 to 296 |
| M20 (20 mm, 0.79 in.) | 334 to 392 | 34.0 to 40.0 | 246 to 289 | – | – | – | 368 to 431 | 37.5 to 44.0 | 272 to 318 | – | – | – | 491 to 568 | 50.0 to 58.0 | 362 to 419 |

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## [2] STUD BOLTS

| Material of opponent part | Ordinariness | | | Aluminum | | |
|---|---|---|---|---|---|---|
| Diameter \ Unit | N·m | kgf·m | lbf·ft | N·m | kgf·m | lbf·ft |
| M8 (8 mm, 0.31 in.) | 11.8 to 15.6 | 1.2 to 1.6 | 8.68 to 11.5 | 8.82 to 11.8 | 0.90 to 1.2 | 6.51 to 8.67 |
| M10 (10 mm, 0.39 in.) | 24.6 to 31.3 | 2.5 to 3.2 | 18.1 to 23.1 | 19.7 to 25.4 | 2.0 to 2.6 | 14.5 to 18.8 |
| M12 (12 mm, 0.47 in.) | 29.5 to 49.0 | 3.0 to 5.0 | 21.7 to 36.1 | 31.4 | 3.2 | 23.1 |

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# 1. TROUBLESHOOTING

| Symptom | Probable Cause | Solution | Reference Page |
|---|---|---|---|
| **Engine Does Not Start** | No fuel | Replenish fuel | G-8 |
| | Air in the fuel system | Vent air | G-33 |
| | Water in the fuel system | Change fuel and repair or replace fuel system | – |
| | Fuel pipe clogged | Clean | – |
| | Fuel filter clogged | Replace | G-27 |
| | Excessively high viscosity of fuel or engine oil at low temperature | Use specified fuel or engine oil | G-8 |
| | Fuel with low cetane number | Use specified fuel | G-8 |
| | Fuel leak due to loose injection pipe retaining nut | Tighten retaining nut | 1-S24 |
| | Incorrect injection timing | Adjust | 1-S70 |
| | Injection nozzle clogged | Clean | 1-S72 |
| | Injection pump malfunctioning | Repair or replace | 1-S70 |
| | Seizure of crankshaft, camshaft, piston, cylinder or bearing | Repair or replace | 1-S39, 42, 46 |
| | Compression leak from cylinder | Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder | 1-S21 |
| | Improper valve timing | Correct or replace timing gear | 1-S39 |
| | Piston ring and cylinder worn | Replace | 1-S57, 63 |
| | Excessive valve clearance | Adjust | 1-S23 |
| **(Starter Does Not Run)** | Battery discharged | Charge | – |
| | Starter malfunctioning | Repair or replace | 9-S20 |
| | Key switch malfunctioning | Repair or replace | 9-S12 |
| | Wiring disconnected | Connect | – |

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# 4. LUBRICANTS, FUEL AND COOLANT

| | Place | | Capacity | | Lubricants, fuel and coolant |
|---|---|---|---|---|---|
| | | | ME8200 | ME9000 | |
| 1 | Fuel tank | ROPS Type | 90 L<br>23.8 U.S.gals<br>19.8 Imp.gals | | No. 2-D diesel fuel<br>No. 1-D diesel fuel if temperature is below −10 °C (14 °F) |
| | | CABIN Type | 110 L<br>29.1 U.S.gals<br>24.2 Imp.gals | | |
| 2 | Coolant | Engine block radiator | 9.0 L<br>9.5 U.S.qts<br>7.9 Imp.qts | | Fresh clean water with anti-freeze |
| | | Reserve tank | 1.0 L<br>1.1 U.S.qts<br>0.9 Imp.qts | | |
| 3 | Engine crankcase | | 10.7 L<br>11.3 U.S.qts<br>9.4 Imp.qts | | Engine oil: API service classification CD, CE or CF<br>Below 0 °C (32 °F) :<br>SAE10W, 10W-30 or 10W-40<br>0 to 25 °C (32 to 77 °F) :<br>SAE20, 10W-30 or 10W-40<br>Above 25 °C (77 °F) :<br>SAE30, 10W-30 or 10W-40 |
| 4 | Transmission case | | 55 L<br>58.1 U.S.qts<br>48.4 Imp.qts | | KUBOTA SUPER UDT fluid* |
| 5 | Front differential case oil | | Serial No. :<br>up to 54529<br>5.0 L<br>5.3 U.S.qts<br>4.4 Imp.qts | 6.0 L<br>6.3 U.S.qts<br>5.3 Imp.qts | KUBOTA SUPER UDT fluid or SAE80, 90 gear oil |
| | | | Serial No. :<br>54530 and above<br>6.0 L<br>6.3 U.S.qts<br>5.3 Imp.qts | | |
| 6 | Front axle gear case oil | | 3.5 L<br>3.7 U.S.qts<br>3.1 Imp.qts | | |
| 7 | Brake oil (Reservoir and lines) | | 0.3 L<br>0.32 U.S.qts<br>0.26 Imp.qts | | KUBOTA UDT or SUPER UDT fluid* or Turbine oil 32 (see below)<br>[regular type, multipurpose straight mineral oil<br>Mobile DTE Oil #32<br>TEXACO Regal Oil #32<br>CHEVRON-GST Oil #32<br>TERESSO Oil #32]<br>Never use automotive brake oil |

* KUBOTA original transmission hydraulic fluid.



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# 6. MAINTENANCE

| No. | Item \ Period | | | Indication on hour meter | | | | | | | | | | Important | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | | |
| 1 | Engine oil | | Change | ★ | | | ☆ | | | | ☆ | | | | G-15 |
| 2 | Engine oil filter | | Replace | ★ | | | | | | | ☆ | | | | G-16 |
| 3 | Transmission fluid | | Change | ★ | | | | | | | | | | | G-16 |
| 4 | Front differential case oil | | Change | ★ | | | | | | | | | | | G-17 |
| 5 | Hydraulic oil filter | | Replace | ★ | | | | | ☆ | | | | | | G-16 |
| 6 | Front axle gear case oil | | Change | ★ | | | | | | | | | | | G-17 |
| 7 | Water separator | | Clean | ★ | | | | | | | ☆ | | | | G-18 |
| 8 | Engine start system | | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | G-18 |
| 9 | Wheel nut torque | | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | G-19 |
| 10 | Greasing | | – | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | G-23 |
| 11 | Battery condition | | Check | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | G-19 |
| 12 | Air cleaner element [Double type] | Primary element | Clean | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | *1 | G-20 |
| | | | Replace | | | | | | | | | | | *2 | G-29 |
| | | Secondary | Replace | | | | | | | | | | | *2 | G-29 |
| 13 | Fan belt | | Adjust | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | G-21 |
| 14 | Brake | | Adjust | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | G-21 |
| 15 | Fuel line | | Check | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | G-21 |
| | | | Replace | | | | | | | | | | | | G-32 |
| 16 | Power steering oil line | | Check | | | | ☆ | | | | ☆ | | | | G-24 |
| | | | Replace | | | | | | | | | | | | G-32 |
| 17 | Radiator hose and clamp | | Check | | | | ☆ | | | | ☆ | | | | G-24 |
| | | | Replace | | | | | | | | | | | | G-32 |
| 18 | Toe-in | | Adjust | | | | ☆ | | | | ☆ | | | | G-25 |
| 19 | Intake air line | | Check | | | | ☆ | | | | ☆ | | | | – |
| | | | Replace | | | | | | | | | | | *3 | – |
| 20 | Fuel tank | | Drain | | | | ☆ | | | | ☆ | | | | G-25 |
| 21 | Fuel filter | | Replace | | | | | | | | ☆ | | | | G-27 |
| 22 | Brake oil | | Change | | | | | | | | | | | | G-28 |
| 23 | Front axle pivot | | Adjust | | | | | | | | | | | | G-28 |
| 24 | Engine valve clearance | | Adjust | | | | | | | | | | | | 1-S23 |
| 25 | Fuel injection nozzle | | Check | | | | | | | | | | | | 1-S71 |
| 26 | Injection pump | | Check | | | | | | | | | | | | 1-S70 |
| 27 | Brake hose | | Replace | | | | | | | | | | | | G-32 |
| 28 | Master cylinder kit | | Replace | | | | | | | | | | | | G-33 |
| 29 | Equalizer kit | | Replace | | | | | | | | | | | | G-33 |
| 30 | Brake seal 1 and 2 | | Replace | | | | | | | | | | | | G-33 |
| 31 | Cooling system | | Flush | | | | | | | | | | | | G-31 |
| 32 | Coolant | | Change | | | | | | | | | | | | G-30 |
| 33 | Fuel system | | Bleed | Service as required | | | | | | | | | | | G-33 |
| 34 | Clutch housing water | | Drain | | | | | | | | | | | | G-34 |
| 35 | Fuse | | Replace | | | | | | | | | | | | G-35 |
| 36 | Light bulb | | Replace | | | | | | | | | | | | G-37 |
| 37 | Brake system | | Bleed | | | | | | | | | | | | G-34 |

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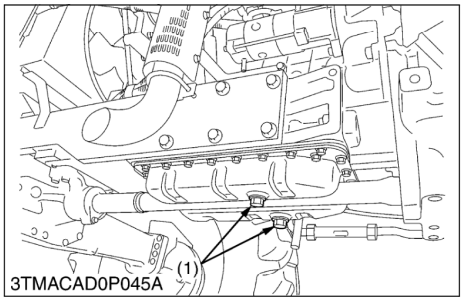
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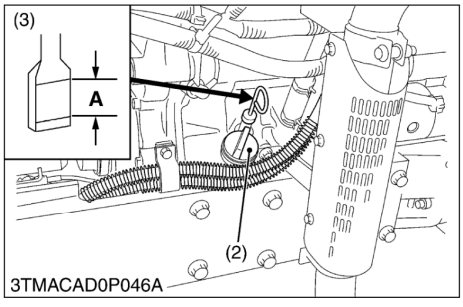


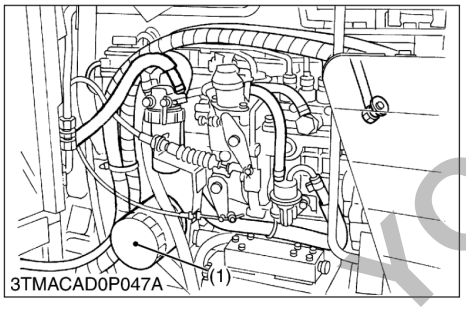


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# [2] CHECK POINTS OF INITIAL 50 HOURS




## Changing Engine Oil

**CAUTION**

- **Before changing oil, be sure to stop the engine.**
- **Allow engine to cool down sufficiently, oil can be hot and can burn.**

1. To drain the used oil, remove the drain plugs (1) at the bottom of the engine and drain the oil completely into the oil pan. All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plugs (1).
3. Fill with the new oil up to the upper notch on the dipstick. Refer to **"LUBRICANTS, FUEL AND COOLANT"**. (See page G-8.)

| | | |
|---|---|---|
| Engine Oil | Capacity | 10.7 L<br>11.3 U.S.qts<br>9.4 Imp.qts |

(1) Drain Plug
(2) Oil Inlet Plug
(3) Dipstick
**(A) Oil level is acceptable within this range.**

W1036664

## Replacing Engine Oil Filter

**CAUTION**

- **Be sure to stop the engine before changing oil filter cartridge.**
- **Allow engine to cool down sufficiently, oil can be hot and can burn.**

1. Remove the oil filter (1).
2. Put a film of clean engine oil on rubber seal of new filter.
3. Tighten the filter quickly until it contacts the mounting surface. Tighten filter by hand an additional 1/2 turn only.
4. After the new filter has been replaced, the engine oil normally decreases a little. Make sure that the engine oil does not leak through the seal and be sure to check the oil level on the dipstick. Then, replenish the engine oil up to the prescribed level.

■ **IMPORTANT**

- **To prevent serious damage to the engine, use only a KUBOTA genuine filter.**

(1) Engine Oil Filter

W1037391



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# SPECIFICATIONS

| Model | | | ME8200 | |
|---|---|---|---|---|
| | | | ROPS TYPE | CABIN TYPE |
| Engine | Model | | V3300-EA | |
| | Type | | Vertical, water-cooled, 4-cycle diesel engine | |
| | No. of cylinder | | 4 | |
| | Total displacement | | 3318 $cm^3$ (202.5 cu.in.) | |
| | Bore and stroke | | 98 × 110 mm (3.9 x 4.3 in.) | |
| | Net power | | 61.2 kW (82 HP)* | |
| | PTO power (factory observed) | | 54.5 kW (73 HP)* / 2600 $min^{-1}$ (rpm) | |
| | Maximum torque | | 285 N·m (29.1 kgf·m, 210.2 lbf·ft) / 1300 to 1500 $min^{-1}$ (rpm) | |
| | Battery | | 12 V, CCA : 799 A | |
| | Fuel | | Diesel fuel No.1 [below −10 °C (14 °F), Diesel fuel No.2-D [above −10 °C (14 °F)] | |
| | Fuel tank | | 90 L (23.8 U.S.gals, 19.8 Imp.gals) | 110 L (29.1 U.S.gals, 24.2 Imp.gals) |
| | Engine crankcase | | 10.7 L (11.3 U.S.qts, 9.4 Imp.qts) | |
| | Engine coolant | | 9.0 L (9.5 U.S.qts, 7.9 Imp.qts) | |
| Dimensions | Overall length | | 3890 mm (153.1 in.) | |
| | Overall width (Minimum tread) | | 1950 mm (78.0 in.) | |
| | Overall height | | 2510 mm (98.8 in.) (with ROPS) | 2540 mm (100.0 in.) (with CABIN) |
| | Wheel base | | 2250 mm (88.6 in.) | |
| | Tread | Front | 1455 mm, 1565 mm (57.3 in., 61.6 in.) | |
| | | Rear | 1575 to 1870 mm (62.0 to 73.6 in.) | |
| | Minimum ground clearance | | 445 mm (17.5 in.) (BRACKET DRAWBAR) | 445 mm (17.5 in.) (COVER TANK) |
| Weight | | | 2865 kg (6317 lbs) | 3115 kg (6869 lbs) |
| Traveling system | Standard tire size | Front | 11.2R24 | |
| | | Rear | 18.4R30 | |
| | Clutch | | Multiple wet disc hydraulic | |
| | Steering | | Full hydraulic power steering | |
| | Transmission | | Hydraulic shuttle shift, fully synchronized main shift, 18F/18R | |
| | Brake | Travelling | Wet type multiple discs (hydraulic) | |
| | | Parking | Wet type multiple discs (mechanical) | |
| | Differential | | Bevel gears with differential lock (Front, Rear) | |
| Hydraulic system | Hydraulic control system | | Position, draft and mix control | |
| | Pump capacity | | 41.6 L/min. (44.0 U.S.gals/min., 36.6 Imp.gals/min.) | |
| | Three point hitch | | Category II | |
| | Max. lifting force | At lifting point | 2500 kg (5560 lbs) at lower link end with link horizontal | |
| | | 24 in. behind lifting point | 2100 kg (4630 lbs) at 610 mm (24 in.) behind lifting point | |
| | System pressure | | 19.6 MPa (200 $kgf/cm^2$, 2847 psi) | |
| PTO system | Independent clutch | | Wet type, multiple discs | |
| | Live PTO | Direction of turning | Clockwise, viewed from tractor rear | |
| | | PTO speed | 540 $min^{-1}$ (rpm) at 2035 engine $min^{-1}$(rpm), 540E $min^{-1}$ (rpm) at 1519 engine $min^{-1}$(rpm) | |
| Traction system | | | Swing drawbar, adjustable in direction | |

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

W10281170



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# SAFETY FIRST

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

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

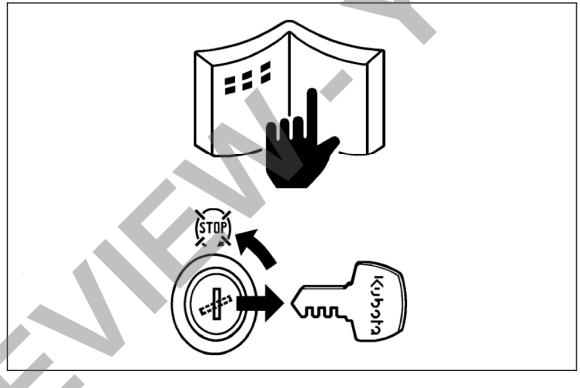
**DANGER** : **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

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

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

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

■ **NOTE** : **Gives helpful information.**




## BEFORE SERVICING AND REPAIRING

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

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# GENERAL

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   [5] TIRE LIQUID INJECTION ..... G-68
10. IMPLEMENT LIMITATIONS ..... G-72


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# WSM

## WORKSHOP MANUAL
## TRACTOR

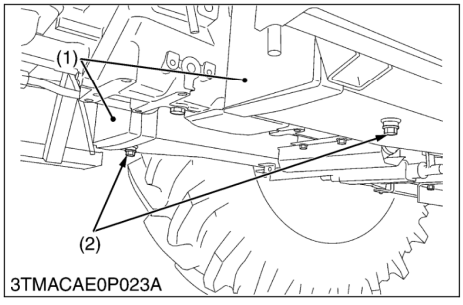
# ME8200,ME9000

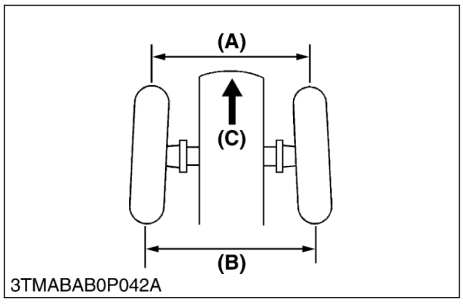
Kubota

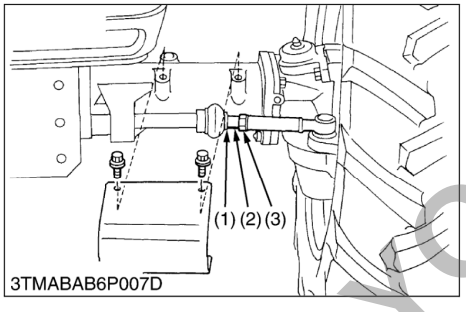
KiSC issued 02, 2018 A

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## Draining Fuel Tank Water

1. Loosen the drain plugs (2) at the bottom of the fuel tanks (1) to let sediments, impurities and water out of the tanks (1).
2. Finally tighten up the plugs (2).

■ **IMPORTANT**

- **If the fuel contains poor qualities with much water in it, drain the fuel tank at shorter intervals.**
- **Drain the fuel before operating the tractor after a long period of storage.**

(1) Fuel Tank (2) Drain Plug

W1042886

## Adjusting Toe-in

1. Park tractor on a flat place.
2. Turn steering wheel so front wheels are in the straight ahead position.
3. Lower the implement, lock the park brake and stop the engine.
4. Measure distance between tire beads at front of tire, hub height.
5. Measure distance between tire beads at rear of tire, hub height.
6. Front distance should be shorter than rear distance.
7. If not, adjust tie-rod length.

| | | |
|---|---|---|
| Toe-in (**B**-**A**) | Factory spec. | 2 to 8 mm<br>0.08 to 0.31 in. |

■ **Toe-in Adjustment**

1. Detach the circlip (1).
2. Loosen the tie-rod joint lock nut (3).
3. Turn the tie-rod joint (2) to adjust the rod length until the proper toe-in measurement is obtained.
4. Retighten the tie-rod joint lock nut (3).
5. Attach the circlip (1) of the tie-rod joint.

| | | |
|---|---|---|
| Tightening torque | Tie-rod joint lock nut | 166.7 to 196.1 N·m<br>17.0 to 20.0 kgf·m<br>123.0 to 144.7 lbf·ft |

(1) Circlip
(2) Tie-rod Joint
(3) Tie-rod Joint Lock Nut

**A : Wheel-to-wheel distance at front**
**B : Wheel-to-wheel distance at rear**
**C : Front**

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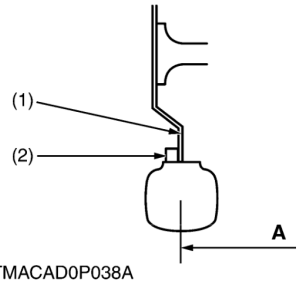
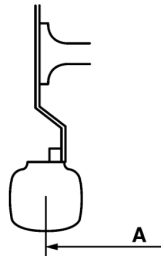
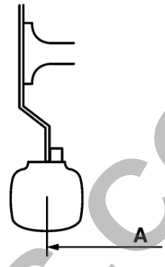


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# [2] TREAD ADJUSTMENT

## (1) Front Wheels

Front tread width can be adjusted as shown with the standard equipped tires.

| | | | | |
|---|---|---|---|---|
|  3TMACAD0P038A | | |  3TMACAD0P039A |  3TMACAD0P040A |
| ME8200 | 11.2R24 | – | 1455 mm (57.28 in.) | 1565 mm (61.61 in.) |
| ME9000 | 11.2R24 | 1505 mm (59.25 in.) | 1580 mm (62.20 in.) | – |
| | 320 / 70R24 | 1505 mm (59.25 in.) | 1565 mm (61.61 in.) | – |
| | 12.4R24 | 1505 mm (59.25 in.) | 1560 mm (61.42 in.) | 1615 mm (63.58 in.) |

(1) Front Wheel Disc (2) Front Wheel Rim **(A) Tread**

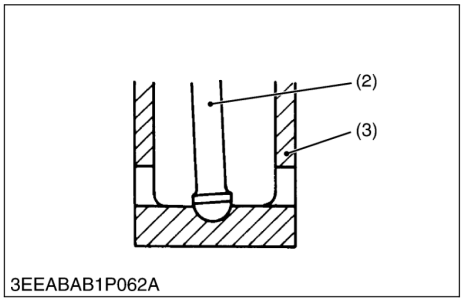
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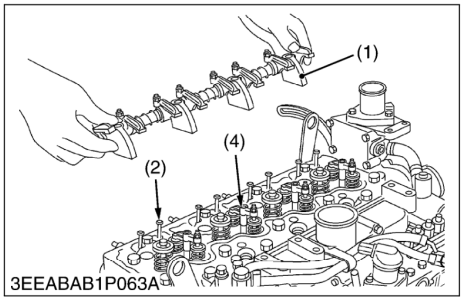




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3EEABAB1P062A



3EEABAB1P063A

**Rocker Arm and Push Rod**

1. Remove the rocker arm (1) as a unit.
2. Remove the push rods (2).
3. Detach the bridge arm (4).

**(When reassembling)**

- When putting the push rods onto the tappets, check to see if their ends are properly engaged with the grooves.

■ **IMPORTANT**

- **After reassembling the rocker arm, be sure to adjust the valve clearance.**

| | | |
|---|---|---|
| Tightening torque | Rocker arm bracket screw | 49.0 to 55.9 N·m<br>5.0 to 5.7 kgf·m<br>36.2 to 41.2 lbf·ft |

(1) Rocker Arm
(2) Push Rod
(3) Tappet
(4) Bridge Arm

W1021546

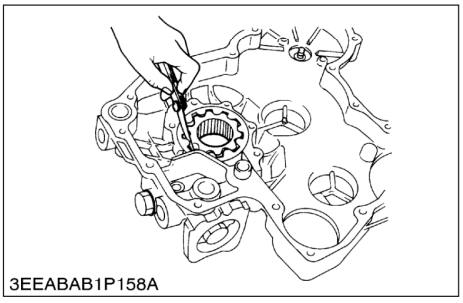
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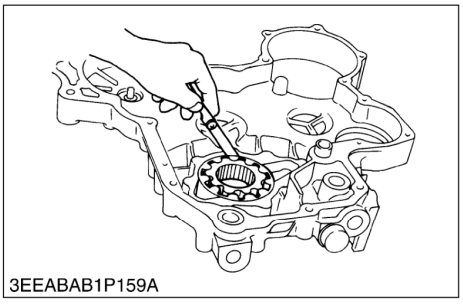


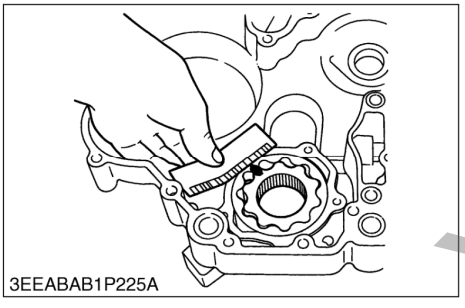


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## (3) Servicing


3EEABAB1P158A


3EEABAB1P159A


3EEABAB1P225A

**Rotor Lobe Clearance**

1. Measure the clearance between lobes of the inner rotor and the outer rotor with a feeler gauge.
2. If the clearance exceeds the allowable limit, replace the oil pump rotor assembly.

| | | |
|---|---|---|
| Clearance between inner rotor and outer rotor | Factory spec. | 0.04 to 0.16 mm<br>0.0016 to 0.0063 in. |
| | Allowable limit | 0.3 mm<br>0.0118 in. |

W1042096

**Clearance between Outer Rotor and Pump Body**

1. Measure the clearance between the outer rotor and the pump body with a feeler gauge.
2. If the clearance exceeds the allowable limit, replace the oil pump rotor assembly.

| | | |
|---|---|---|
| Clearance between outer rotor and pump body | Factory spec. | 0.100 to 0.184 mm<br>0.0039 to 0.0072 in. |
| | Allowable limit | 0.3 mm<br>0.0118 in. |

W1042212

**Clearance between Rotor and Cover**

1. Put a strip of plastigage (Code No. 07909-30241) onto the rotor face with grease.
2. Install the cover and tighten the screws with the specified torque.
3. Remove the cover carefully, and measure the amount of the flattening with the scale and get the clearance.
4. If the clearance exceeds the allowable limit, replace oil pump rotor assembly and the cover.

| | | |
|---|---|---|
| Clearance between rotor and cover | Factory spec. | 0.025 to 0.075 mm<br>0.0010 to 0.0030 in. |
| | Allowable limit | 0.225 mm<br>0.0089 in. |

| | | |
|---|---|---|
| Tightening torque | Oil pump cover screw | 7.9 to 9.3 N·m<br>0.80 to 0.95 kgf·m<br>5.8 to 6.9 lbf·ft |

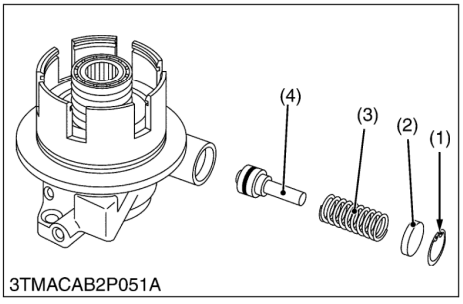
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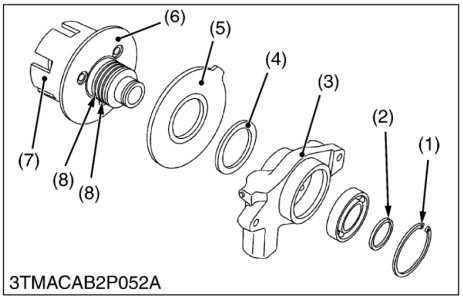
3TMACAB2P051A

**Modulating Valve**

1. Remove the internal circlip (1).
2. Remove the spring seat (2).
3. Draw out the spring (3) and piston (4).

(1) Internal Circlip
(2) Spring Seat
(3) Spring
(4) Piston

W1026732



3TMACAB2P052A

**Clutch Case**

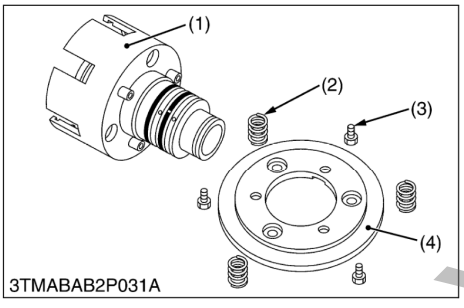
1. Remove the internal circlip (1).
2. Remove the external circlip (2).
3. Remove the clutch case (7) and brake disc (5).

**(When reassembling)**

- Direct the contact part of the brake disc (5) to the brake plate (6).
- Apply small amount of the grease to the seal rings (8).

(1) Internal Circlip
(2) External Circlip
(3) Clutch Holder
(4) Collar
(5) Brake Disc
(6) Brake Plate
(7) Clutch Case
(8) Seal Ring

W1026902



3TMABAB2P031A

**Brake Plate**

1. Remove the brake plate mounting screws (3) and then take out the brake plate (4) and the springs (2).

**(When reassembling)**

- Apply liquid lock (Three Bond 1372 or equivalent) to the brake plate mounting screws (3).

| | | |
|---|---|---|
| Tightening torque | Brake plate mounting screw | 9.8 to 11.3 N·m<br>1.00 to 1.15 kgf·m<br>7.2 to 8.3 lbf·ft |

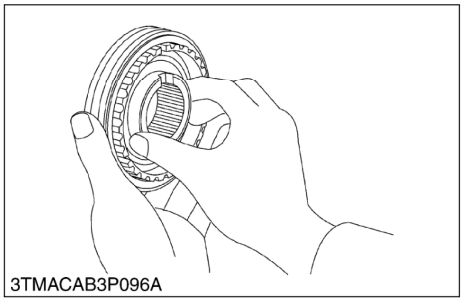
(1) Clutch Case
(2) Spring
(3) Brake Plate Mounting Screw
(4) Brake Plate

W1027169

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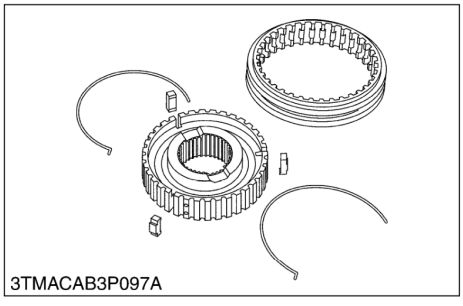
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3TMACAB3P096A

**Checking Contact between Coupling and Shifter**

1. Check to see if there is flaw or wear on the spline of the coupling and shifter, and the key groove on the coupling.
2. Engage the shifter with the coupling, and check that they slide smoothly.
3. Similarly, check that there is any flaw or wear on the gear splines.
4. If there is any defect, replace them.

W1055203


3TMACAB3P097A

**Flaw on Synchronizer Key and Spring**

1. Check the projection in the center of the synchronizer key for wear.
2. Check the spring for fatigue or wear on the area where the spring contacts with the keys.
3. If there is any defect, replace them.

W1055554

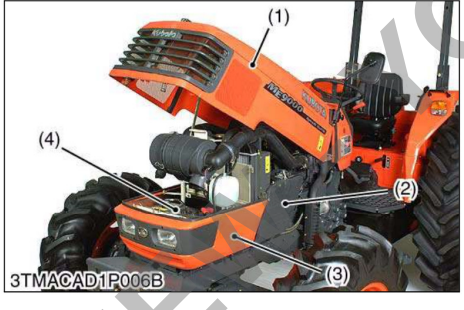
# [2] TRANSMISSION CASE

## (1) Disassembling and Assembling

### (A) Draining the Transmission Fluid and Fuel

See page 3-S5.

### (B) Separating Transmission Case (ROPS Type)



3TMACAD1P006B

**Muffler and Bonnet**

1. Remove the bonnet (1).
2. Disconnect the battery's cable.
3. Disconnect the head light **3P** connectors.
4. Remove the front cover (3) and side cover (2).
5. Remove the muffler.

■ **IMPORTANT**

- **When disconnecting the battery cords, disconnect the grounding cord first. When connecting, positive cord first.**

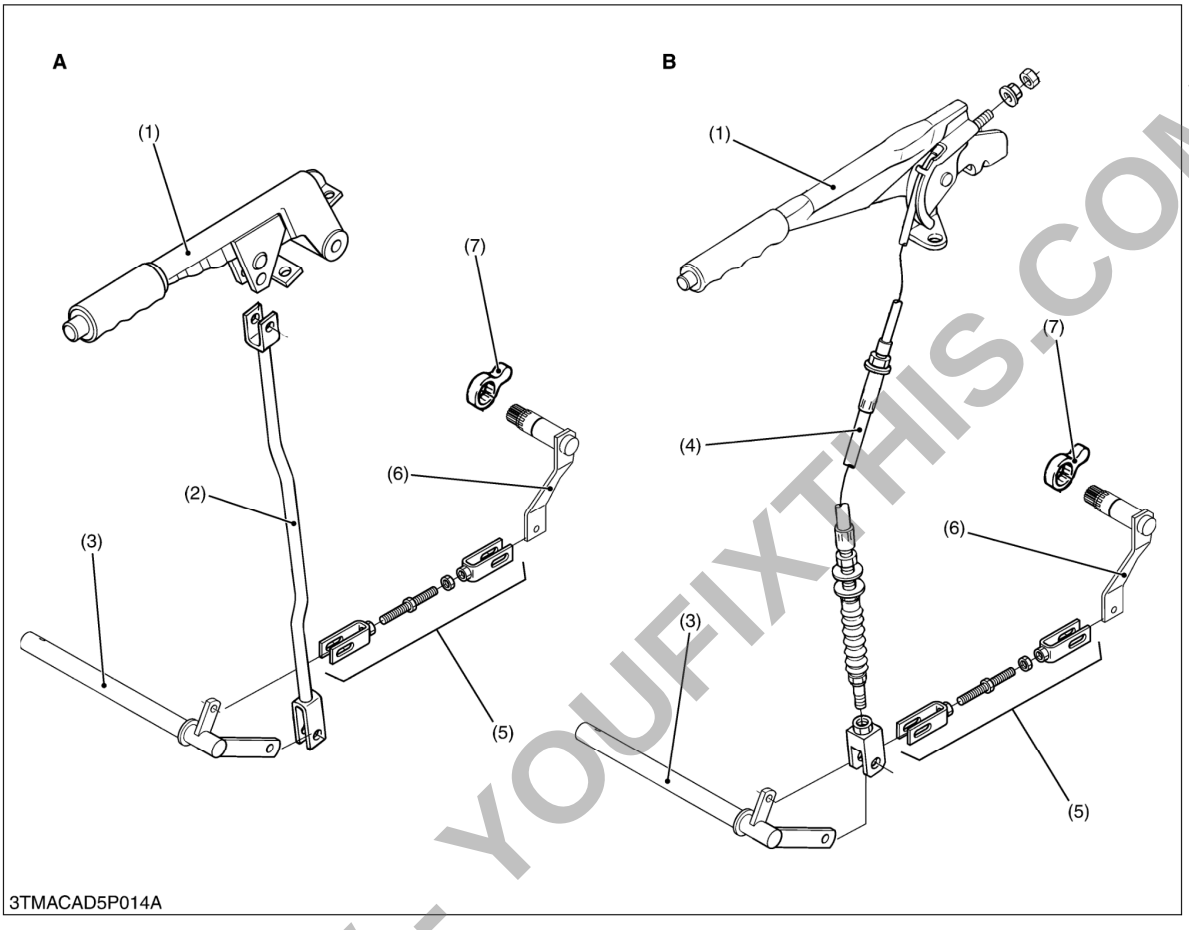
(1) Bonnet
(2) Side Cover
(3) Front Cover
(4) Battery

W1055776



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# 2. PARKING BRAKE




(1) Parking Brake Lever
(2) Parking Brake Rod
(3) Brake Shaft
(4) Parking Wire
(5) Parking Brake Rod (Turnbuckle)
(6) Brake Cam Lever
(7) Brake Cam

**A : ROPS Type**
**B : CABIN Type**

The parking brake is mechanical wet disc type.

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# MECHANISM

## CONTENTS

1. STEERING MECHANISM ..... 7-M1

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**HYDRAULIC PUMP FOR THREE POINT HYDRAULIC SYSTEM [ME8200]**

| Item | | Factory Specification | Allowable Limit |
|---|---|---|---|
| Hydraulic Pump | Delivery | Above<br>38.3 L/min<br>10.1 U.S.gals/min<br>8.43 Imp.gals/min | 31.9 L/min<br>8.4 U.S.gals/min<br>7.0 Imp.gals/min |
| Housing Bore | Depth of Scratch | – | 0.09 mm<br>0.0035 in. |
| Bushing to Gear Shaft | Clearance | – | 0.15 mm<br>0.0059 in. |
| Gear Shaft | O.D. | – | 17.968 mm<br>0.7074 in. |
| Bushing | Length | – | 18.965 mm<br>0.74665 in. |

W1012083

**HYDRAULIC PUMP FOR THREE POINT HYDRAULIC SYSTEM [ME9000]**

| | | | |
|---|---|---|---|
| Hydraulic Pump | Delivery | Above<br>59.1 L/min<br>15.6 U.S.gals/min<br>13.0 Imp.gals/min | 48.2 L/min<br>12.7 U.S.gals/min<br>10.6 Imp.gals/min |
| Housing Bore | Depth of Scratch | – | 0.09 mm<br>0.0035 in. |
| Bushing to Gear Shaft | Clearance | – | 0.15 mm<br>0.0059 in. |
| Gear Shaft | O.D. | – | 17.968 mm<br>0.7074 in. |
| Bushing | Length | – | 18.965 mm<br>0.74665 in. |

W1012160

**POSITION CONTROL AND DRAFT CONTROL LINKAGE**

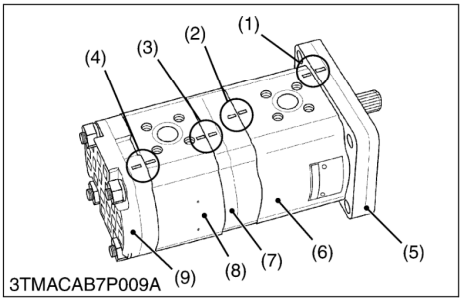
| | | | |
|---|---|---|---|
| Position Rod (CABIN Type) | Length | Approx. 264 mm<br>10.39 in. | – |
| Draft Rod (CABIN Type) | Length | Approx. 264 mm<br>10.39 in. | – |
| Stopper to Top Link Bracket | Clearance | 7.5 to 8.5 mm<br>0.295 to 0.335 in. | – |

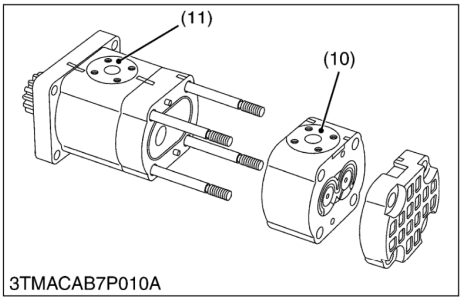
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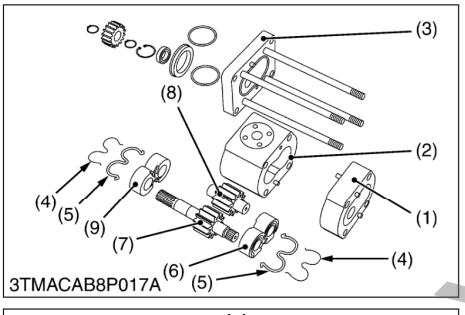
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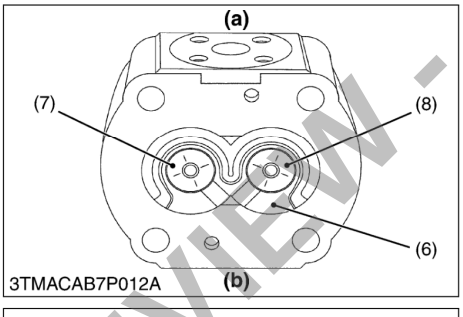


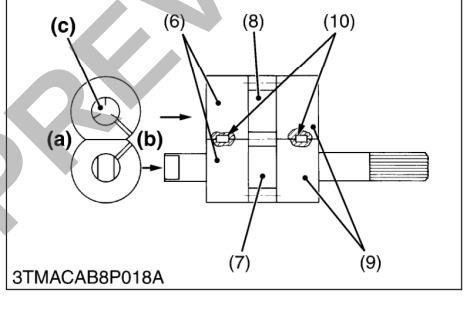
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## Separating Three Point System Hydraulic Pump (ME8200)

1. Put the parting marks (1), (2), (3), (4) on the flange (5), front housing (6), center plate (7), housing (8) and housing cover (9).
2. Unscrew the housing cover mounting nuts and separate the three point system hydraulic pump (11) from the power steering pump (10).

**(When reassembling)**

| | | |
|---|---|---|
| Tightening torque | Housing cover mounting nut | 39.2 to 44.1 N·m<br>4.0 to 4.5 kgf·m<br>28.9 to 32.5 lbf·ft |

(1) Parting Mark
(2) Parting Mark
(3) Parting Mark
(4) Parting Mark
(5) Flange
(6) Front Housing (Three Point System Hydraulic Pump)
(7) Center Plate
(8) Housing (Power Steering Pump)
(9) Housing Cover
(10) Power Steering Pump
(11) Three Point System Hydraulic Pump

W1014912

## Disassembling Three Point System Hydraulic Pump (ME8200)

1. Remove the flange (3) and center plate (1).
2. Remove the backup element (4) and seal element (5).
3. Remove the bushings (6) and (9).
4. Remove the drive gear (7) and driven gear (8).

**(When reassembling)**

- When installing the bushing (6) and (9), be sure to reassemble them to the each original position and direct bushing grooves to inlet side as shown in the figure.
- Install the driven gear (8) in the correct direction as shown in the figure.
- Take care not to damage the seal element (5), backup element (4) and O-ring.
- Take care not to lose or damage the keys (10) joining the two bushings.

(1) Center Plate
(2) Housing
(3) Flange
(4) Backup Element
(5) Seal Element
(6) Bushing
(7) Drive Gear
(8) Driven Gear
(9) Bushing
(10) Key

**(a) Inlet**
**(b) Outlet**

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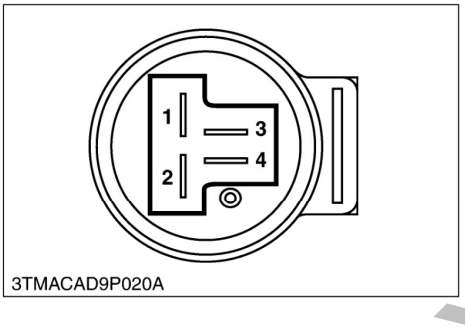


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**Relay 1**

1. Remove the relay 1 (1).
2. Apply battery voltage across **1** and **3** terminals, and check for continuity across **2** and **4** terminals.
3. If continuity is not established across **2** and **4** terminal, renew the relay 1.

(1) Relay 1

**A : ROPS Type**
**B : CABIN Type**

W1015751

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# 2. SERVICING SPECIFICATIONS

| Item | | Factory Specification | Allowable Limit |
|---|---|---|---|
| A/C Compressor Magnet Clutch | Air-gap | 0.25 to 0.50 mm<br>0.01 to 0.02 in. | – |
| Refrigerating Cycle<br>(Refrigerating Cycle is Normal Operating) | Pressure<br>(**LO** Pressure Side) | 0.15 to 0.20 MPa<br>1.5 to 2.0 kgf/cm$^2$<br>21 to 28 psi | – |
| | Pressure<br>(**HI** Pressure Side) | 1.27 to 1.66 MPa<br>13 to 17 kgf/cm$^2$<br>185 to 242 psi | – |
| Pressure Switch (Dual Type)<br>(When pressure switch is turned **OFF**) | Setting Pressure<br>(**LO** Pressure Side) | Less than<br>approx. 0.196 MPa<br>2.0 kgf/cm$^2$<br>28.4 psi | – |
| | Setting Pressure<br>(**HI** Pressure Side) | More than<br>approx. 3.14 MPa<br>32 kgf/cm$^2$<br>455 psi | – |
| Air Conditioner Drive Belt | Tension | 10 to 12 mm<br>(0.39 to 0.47 in.)<br>deflection at 98 N<br>(10 kgf, 22 lbf) of force | – |
| Hydraulic Control Rod<br>Position and Draft Rod | Length | Approx. 264 mm<br>10.39 in. | – |

W1013874

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