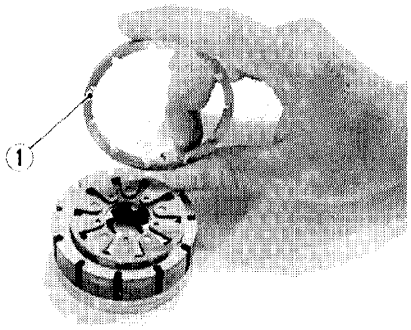
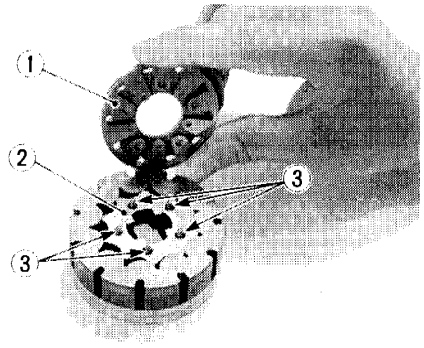


B122P015

Commutator Ring

1. Remove the commutator ring (1).

(1) Commutator Ring



B122P016

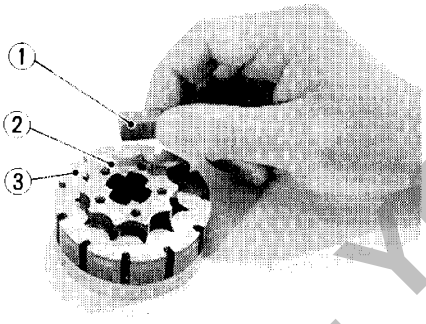
Commutator and Alignment Pins

1. Remove the commutator (1) from the rotor (2).
2. Pull out the five alignment pins (3).

(When reassembling)

- Make sure the five alignment pins (3) are pressed below the surface of the commutator (1).
- Place a few drops of oil into each recess in the commutator (1).

(1) Commutator
(2) Rotor
(3) Alignment Pins



B122P017

Drive Link Spacer and Rotor Set

1. Remove the drive link spacer (1).
2. Remove the rotor (2) and the stator (3) as a unit.

(When reassembling)

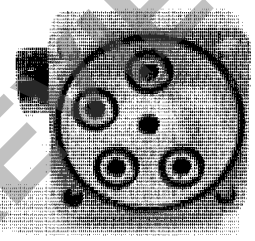
- Apply small amount of clean grease to drive link spacer (1) and insert it into the drive slot in the rotor (2).

■ IMPORTANT

- **Handle the rotor set carefully to avoid nicks and scratches.**

(1) Drive Link Spacer
(2) Rotor
(3) Stator

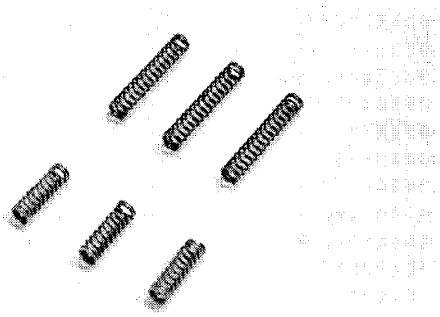
SERVICING



B122P018

Port Cover

1. Inspect the port cover for port fitting sealing surface scratches and thread damage.
2. If these conditions, replace the port cover assembly.



B122P019

Springs

1. Inspect the springs for bent or distorted coils.
2. If a spring is broken or deformed, all six springs in the unit should be replaced.

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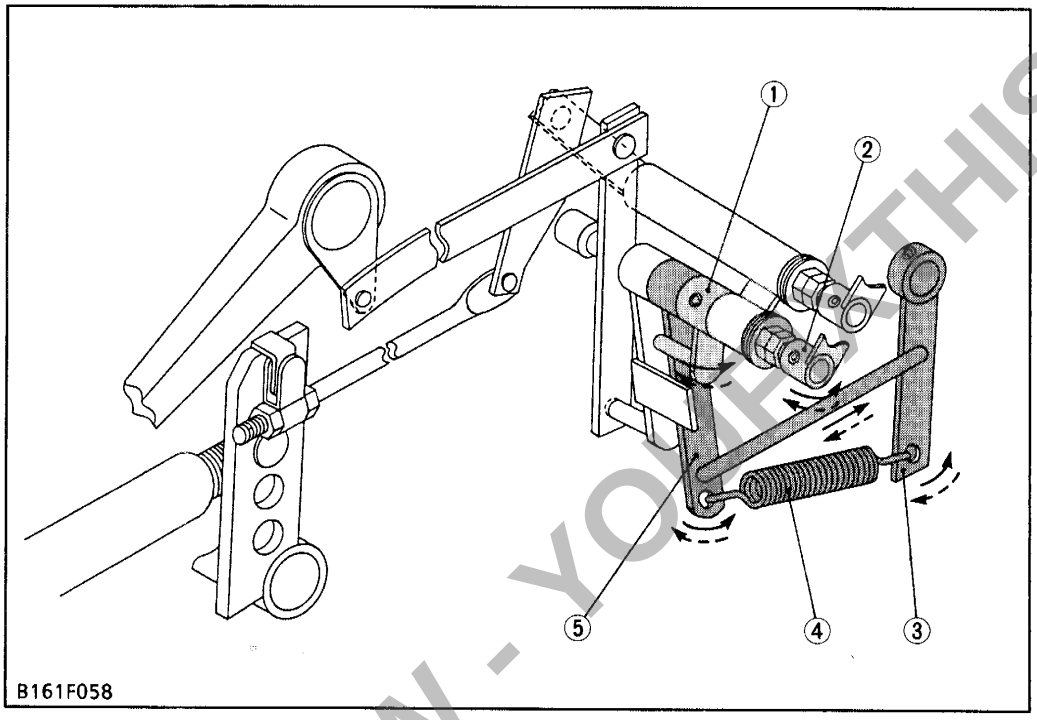
(2) Position Control with Draft Control

Draft control is a system which maintains a constant traction load, and is suited for the work which needs heavy traction load such as plowing.

The implement is automatically raised when its traction load is increased, and lowers when the traction load is decreased. By maintaining a constant load level, it prevents the tractor from slipping and being loaded excessibly. The setting traction load can be adjusted by changing the position of the draft control lever.

The draft control system uses the same control valve as the position control system. Therefore it is possible to use the mixed control. The traction load applied to the tractor is sensed and is fed back to the control valve by means of the other linkage mechanism.

■ Position Control Operation



(1) Position Control Link
(2) Position Control Lever
(3) Arm 2
(4) Return Spring
(5) Arm 1

- **Lift (→)**

1. When the position control lever (2) is moved to the **LIFT** side, the position control link (1) is also rotated and pushes the arm 1 (5).
2. At the same time, the arm 2 (3) is moved, the connected position control valve becomes the lift circuit, and the lift arm goes up.

- **Down (⇢)**

1. When the position control lever (2) is moved to the **DOWN** side, the position control link (1) is also rotated.
2. By this action, the arm 2 (3) and the arm 1 (5) are returned by the return spring (4).
3. The position control valve becomes the down circuit and the lift arm is lowered.

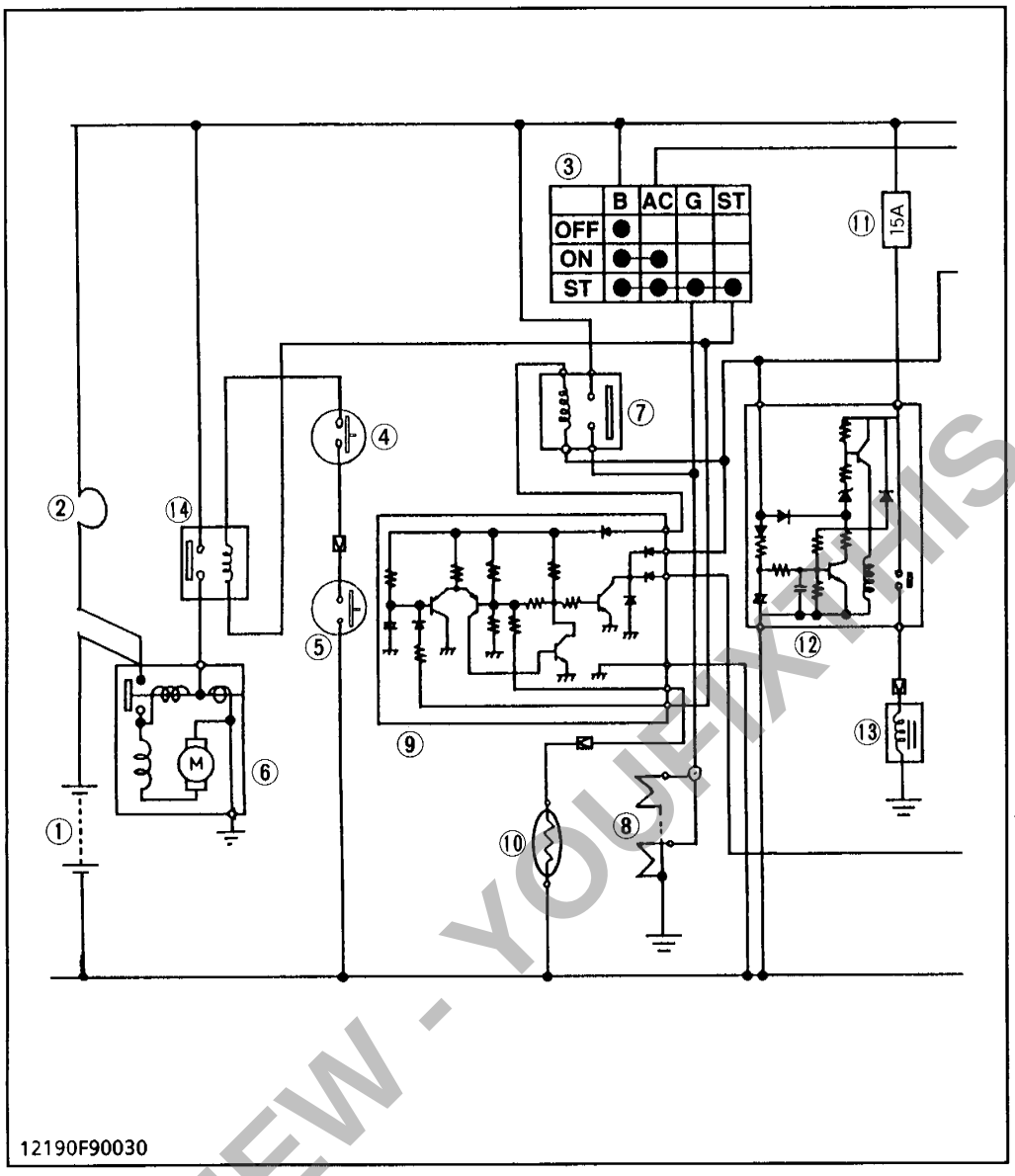
(Reference)

- For the feedback mechanism of the position control, refer to **"(1) Position Control"**.

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[3] STARTING SYSTEM



(1) Battery
(2) Slow Blow Fuse
(3) Main Switch
(4) Shuttle Limit Switch or HST Switch
(5) PTO Limit Switch
(6) Starter Motor
(7) Glow Relay
(8) Glow Plug
(9) Glow Controller
(10) Water Temperature Sensor (for Preheating System)
(11) Fuse
(12) Timer Relay
(13) Key Stop Solenoid
(14) Starter Relay

When the main switch (3) is turned to the **ON** position, the terminal **B** is connected to the terminal **AC** then magnetizes the coil of glow relay (7).

The glow relay (7) is turned **ON**, the glow plugs (8) become red hot, and at the same time, light up the glow lamp on the meter panel.

When the main switch (3) is turned to the **START** position with the shuttle limit switch (4) (Mechanical transmission and GST Mode), HST switch (HST Model) and PTO limit switch (5) **ON**, after the glow lamp is put out light.

The terminal **B** is connected to the terminal **AC**, **ST** and **G** so that the starter motor (6) begins running and the glow plugs (8) are kept red hot.

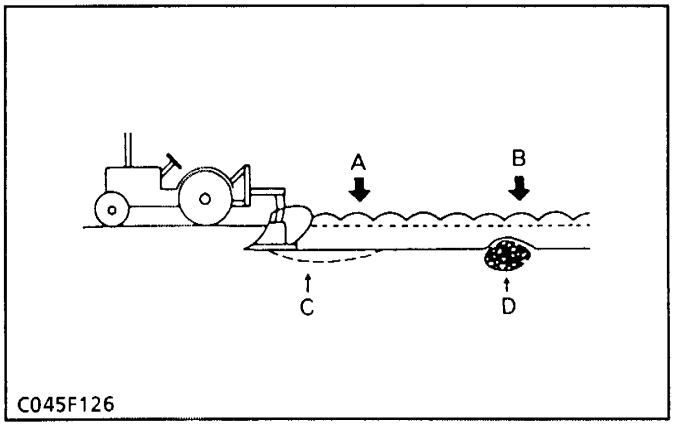
The main switch (3) automatically returns to the **ON** position when it is released after the engine starts.

At the **ON** position, the starting circuit to be opened, stopping the starter motor (6).

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(3) Mixed Control



C045F126

(A) Position Controlled
(B) Draft Controlled
(C) Not Deep Even in Soft Soil
(D) Shallow where Resistance Occurs

Mixed control is a system combining position control with draft control.

When traction load increases, the draft control functions to raise the lift arms (implement). When traction load decreases, the lift arms (implement) lower to the height set by the position control lever.

With the position control only when traction load increases, slippage or engine stop may occur unless the implement is raise.

With the draft control only, plowing depth cannot be kept constant if soil hardness changes greatly.

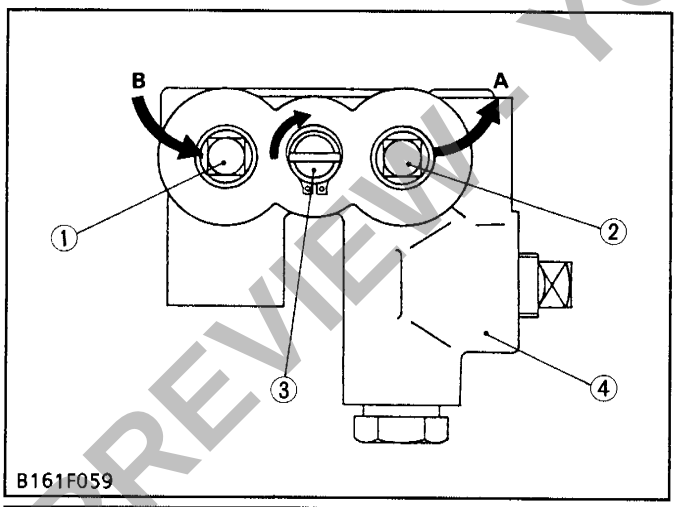
The mixed control serves to eliminate such disadvantages.

[10] HYDRAULIC POWER TAKE OFF

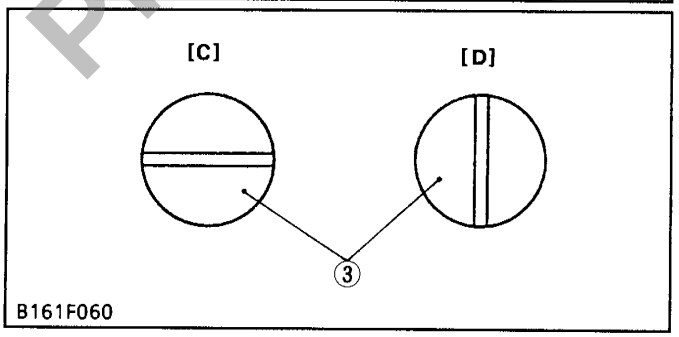
If necessary, hydraulic power for implements can be taken out from front hydraulic block or using auxiliary control valves and quick couplers.

- Hydraulic power for the front loader can be taken out from front hydraulic block.
- On L3010, L3410, L3710 and L4310 tractor's auxiliary control valve assembly is an optional unit. Quick couplers are included in the auxiliary control valve assembly.

(1) Front Hydraulic Block



B161F059



B161F060

■ **IMPORTANT**

- **When taking out hydraulic power, replenish transmission oil in the quantity equal to the flow rate required for the implement cylinder.**

■ **NOTE**

- **Before attaching the implement, check the type and contamination of oil in the implement hydraulic circuit.**

1. Remove the plugs from **OUT** port (2) and **IN** port (1) of the front hydraulic block (4).
2. Install the hydraulic take off adaptors (screw size PT 3/8") to **OUT** port and **IN** port.
3. Connect the hydraulic hose to the adaptor (**OUT** port side) and to the implement control valve **IN** port.
4. Connect the other hydraulic hose to the adaptor (**IN** port side) and to the implement control valve **TANK** (RETURN) port.
5. Turn the slit on the spool (3) end to the arrow side fully as shown in the figure.

■ **NOTE**

- **When implement is not attached, turn the slit on the spool end to the horizontal position fully.**

A : To Implement Control Valve IN Port
B : From Implement Control Valve TANK Port
C : When implement is not attached position
D : When implement is attached position

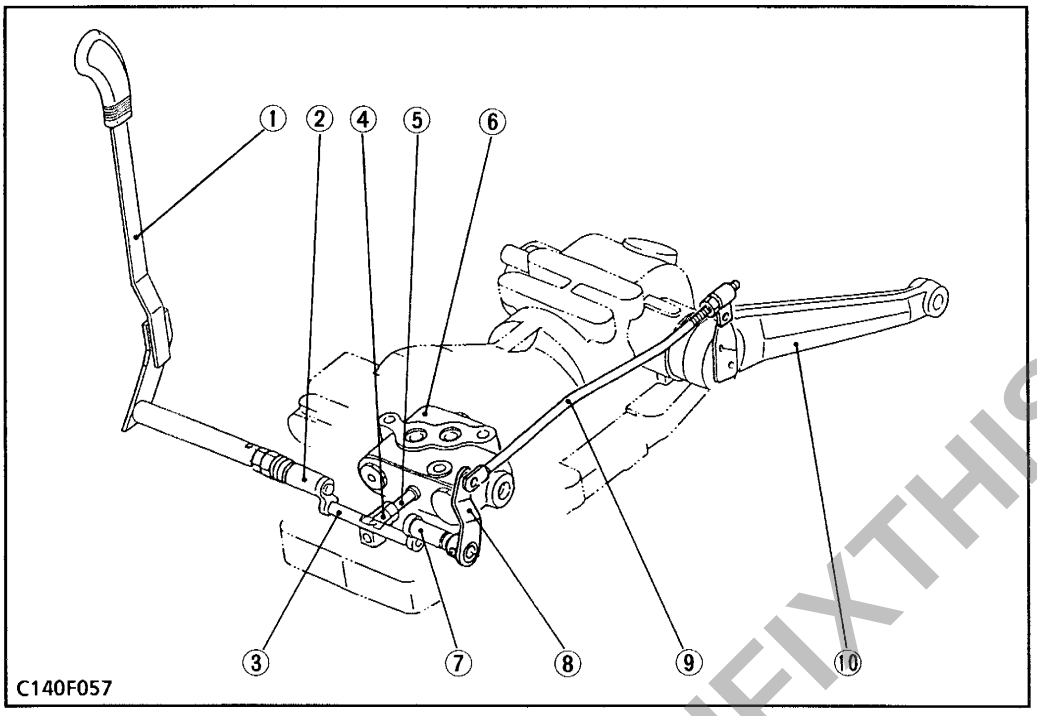
(1) **IN** Port Plug
(2) **OUT** Port Plug
(3) Spool
(4) Front Hydraulic Block

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[9] LINKAGE MECHANISM

(1) Position Control

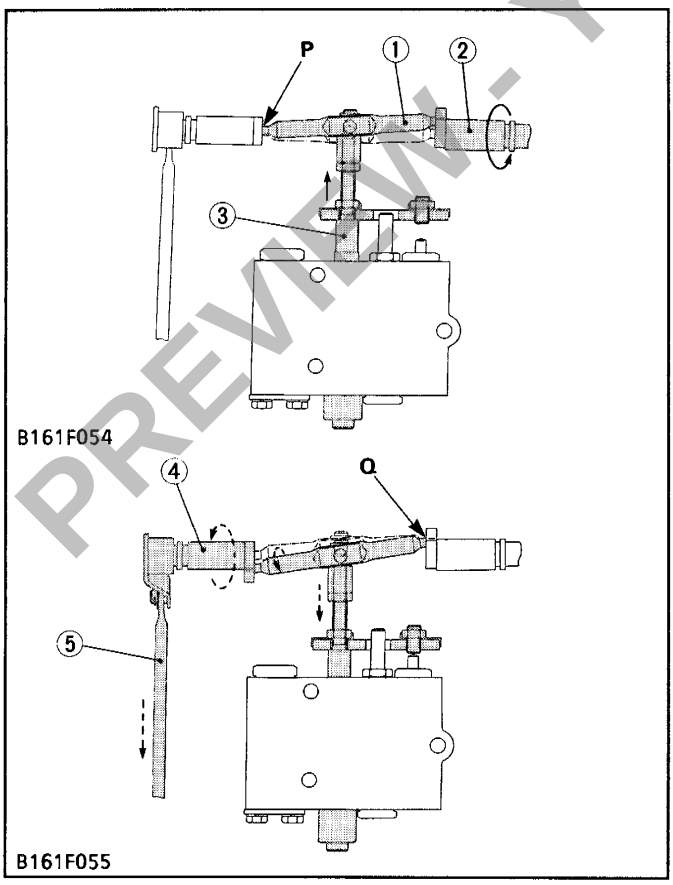


(1) Position Control Lever
(2) Control Arm
(3) Spool Drive Lever
(4) Spool Joint 1
(5) Spool Head
(6) Valve Body
(7) Feedback Lever Shaft
(8) Feedback Lever
(9) Feedback Rod
(10) Lift Arm

Position control is a mechanism to raise or lower the implement attached to the tractor in proportion to the movement of the control lever.

The implement can be positioned at any height by moving the position control lever. Fine position adjustment is also easy.

■ Lift



1. When the position control lever is moved to the **LIFT** position, the control arm (2) rotates to the arrow. Therefore, the spool drive lever (1) moves around the fulcrum **P** and pull the spool (3) opening the **LIFT** circuit.
2. When the lift arm moves upward, the feedback lever shaft (4) is rotated to the arrow, since the feedback rod (5) is actuated. Therefore, the spool drive lever (1) moves around the fulcrum **Q** and pushes the spool (3).
3. The lift arm stops when the spool returns to the neutral position.

(1) Spool Drive Lever
(2) Control Arm
(3) Spool
(4) Feedback Lever Shaft
(5) Feedback Rod

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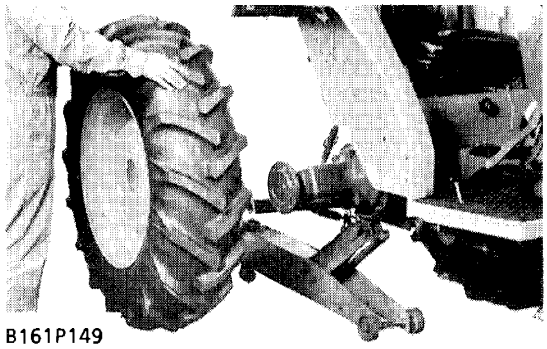
[4] HYDRAULIC CYLINDER AND POSITION CONTROL VALVE

DISASSEMBLING AND ASSEMBLING

(1) Removing Hydraulic Cylinder Assembly

■ **NOTE**

- **If the tractors are cabin specifications, refer to section 10 CABIN [1] SEPARATING CABIN FROM TRACTOR BODY. (See page 10-S20.)**



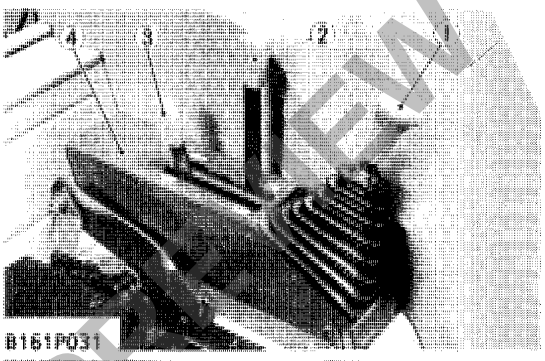
B161P149

ROPS and Rear Wheels

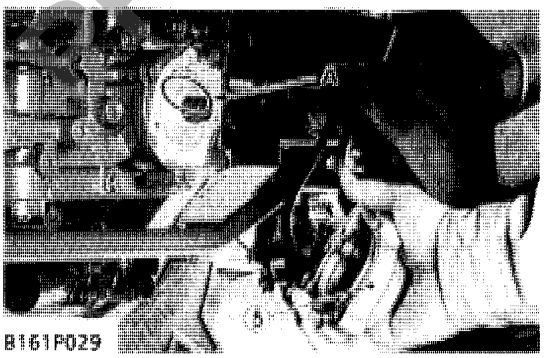
1. Remove the ROPS.
2. Place a jack under the brake case.
3. Loosen and remove the rear wheel mounting screws and nuts.
4. Take out the rear wheel.
5. The other side is same as above.

(When reassembling)

Tightening torque	ROPS mounting screws	M12, grade 7 screws	77.5 to 90.2 N·m 7.9 to 9.2 kgf·m 57.1 to 66.5 ft-lbs
		M14, grade 9 screws	166.7 to 196.1 N·m 17.0 to 20.0 kgf·m 123 to 144 ft-lbs
		M16, grade 11 screws	260.9 to 304.0 N·m 26.6 to 31.0 kgf·m 192 to 224 ft-lbs
		9/16-18 UNF, grade 8 screws	149.1 to 179.5 N·m 15.2 to 18.3 kgf·m 110 to 132 ft-lbs
	Rear wheel mounting stud bolts		98.1 to 112.7 N·m 10.0 to 11.5 kgf·m 72.3 to 83.1 ft-lbs
	Rear wheel mounting screws and nuts		197 to 226 N·m 20 to 23 kgf·m 145 to 166 ft-lbs



B161P031



B161P029

Preparation 1

1. Remove the seat.
2. Loosen and remove the main gear shift (GST shift) lever grip (1).
3. Take out the Hi-Lo shift lever grip (2).
4. Take out the creep speed shift lever grip (3). (If equipped.)
5. Remove the shift lever guide (4).
6. Remove the GST shift cable (5) . (GST type only.)
7. Disconnect the jumper leads for hazard light and tail light.

(When reassembling)

- Apply liquid gasket (Three Bond 1208D or equivalent) to the joint face between rotary valve cover and GST shift cable (5).
- 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 (5). (GST type only.)

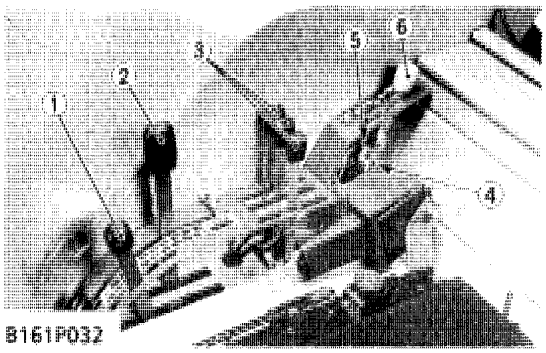
Tightening torque	GST shift cable mounting screws	7.8 to 8.8 N·m 0.8 to 0.9 kgf·m 5.8 to 6.5 ft-lbs

[A] Punched Marks

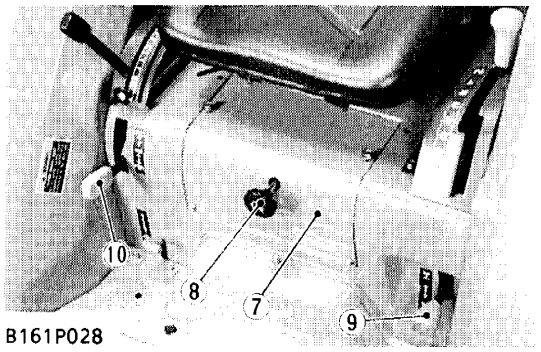
(1) Main Gear Shift (GST Shift) Lever Grip
(2) Hi-Lo Shift Lever Grip
(3) Creep Speed Shift Lever Grip (If Equipped)
(4) Shift Lever Guide
(5) GST Shift Cable (GST Type Only)

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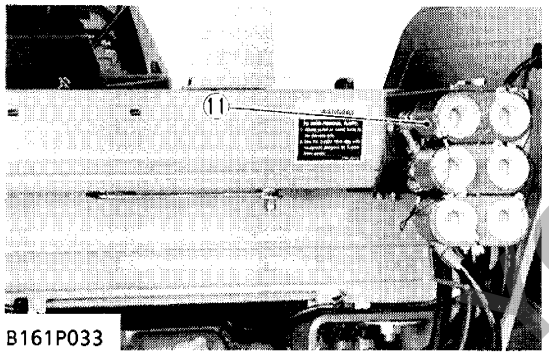
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B161P032



B161P028



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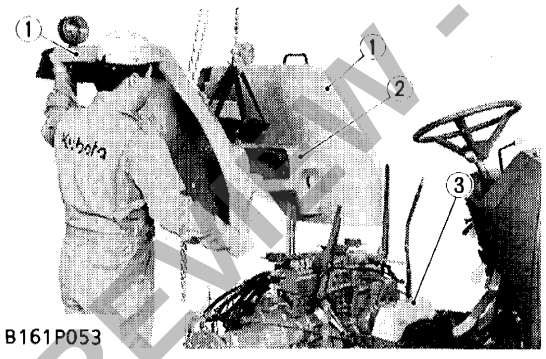
Preparation 2

1. Take out the position control lever grip (2).
2. Take out the draft control lever grip (1). (If equipped.)
3. Take out the auxiliary control lever grips (3). (If equipped.)
4. Disconnect the PTO shift cable (4) from the PTO shift lever (6).
5. Disconnect the PTO limit switch (5) leads.
6. Take out the lowering speed adjusting knob (8), and then remove the seat under cover (7).
7. Remove the mid PTO shift lever (10). (Mid PTO type only.)
8. Loosen and remove the front wheel drive shift lever grip (9). (4WD type only.)
9. Disconnect the jumper leads for hazard light and tail light.
10. Remove the quick coupler assembly (11). (If equipped.)

(When reassembling)

- Check and adjust the PTO shift cable. (See page 10-S28.)

(1) Draft Control Lever Grip (If Equipped)
(2) Position Control Lever Grip
(3) Auxiliary Control Lever Grips (If Equipped)
(4) PTO Shift Cable
(5) PTO Limit Switch
(6) PTO Shift Lever
(7) Seat Under Cover
(8) Lowering Speed Adjusting Knob
(9) Front Wheel Drive Shift Lever Grip (4WD Type Only)
(10) Mid PTO Shift Lever (Mid PTO Type Only)
(11) Quick Coupler Assembly (If Equipped)



B161P053

Fender and Floor Seat

1. Loosen and remove the fenders and floor seat mounting screws to the platform (3).
2. Loosen and remove the floor seat mounting two bolts and nuts.
3. Support the floor seat with nylon lift strap and hoist.
4. Remove the fenders (1) and floor seat (2) as a unit.

(When reassembling)

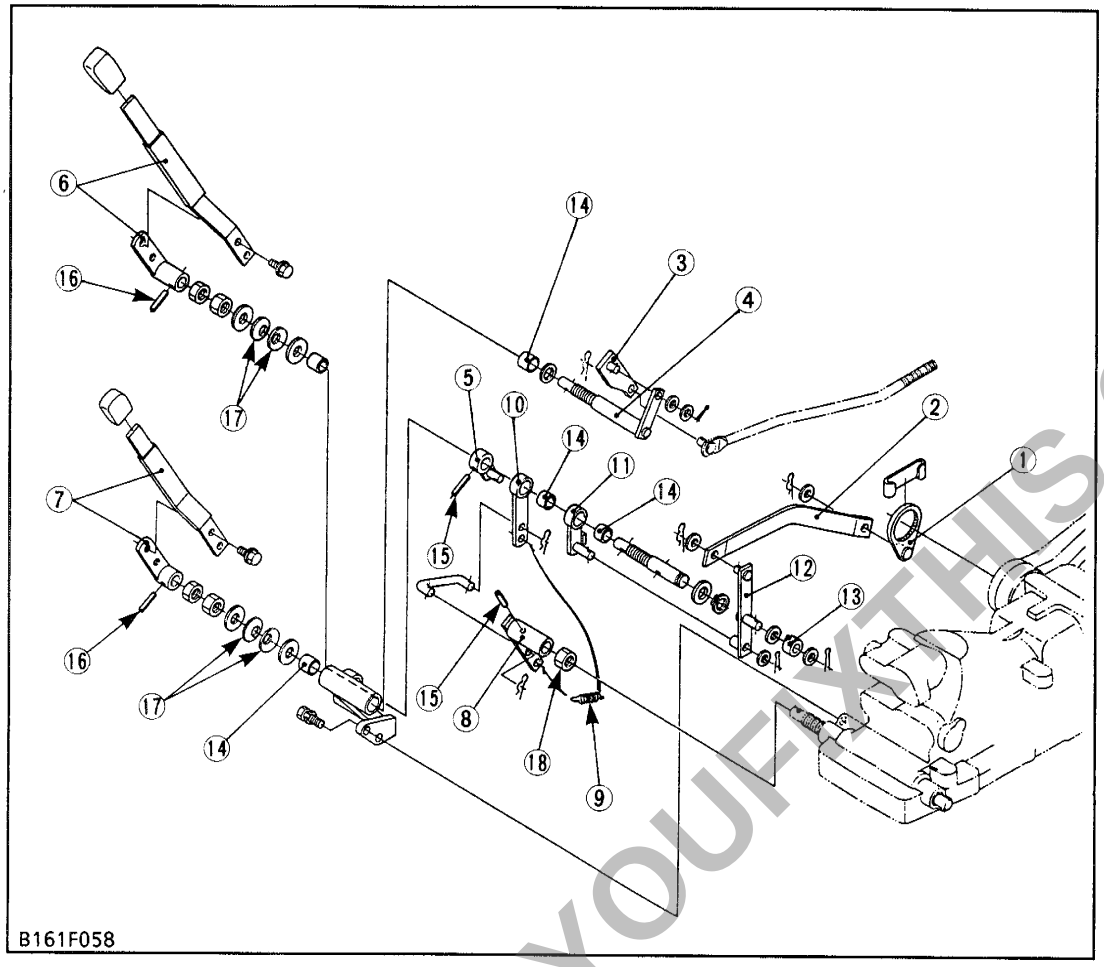
Tightening torque	Floor seat mounting bolts and nuts	197 to 226 N·m 20 to 23 kgf·m 145 to 166 ft-lbs

(1) Fenders
(2) Floor Seat
(3) Platform

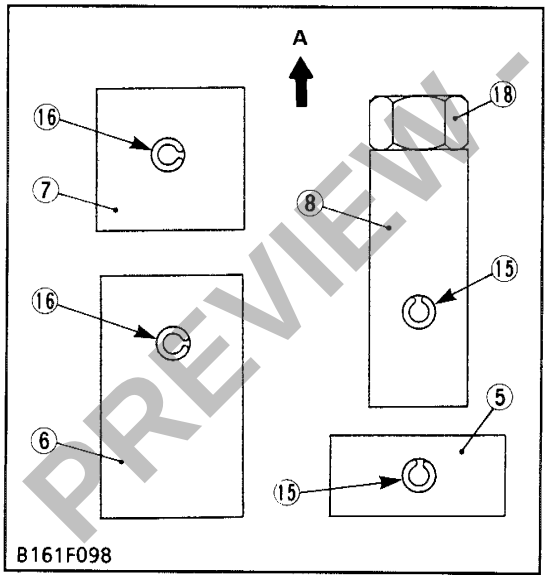
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Disassembling Position and Draft Control Linkage



(1) Feedback Rod Stay
(2) Feedback Rod
(3) Draft Cam
(4) Draft Control Lever Shaft
(5) Position Control Link
(6) Position Control Lever
(7) Draft Control Lever
(8) Arm 2
(9) Return Spring
(10) Arm 1
(11) Draft Control Link 1
(12) Draft Control Link 2
(13) Roller
(14) Bushings
(15) Spring Pins
(16) Spring Pins
(17) Disc Springs
(18) Lock Nut



■ It is possible to disassemble as shown in the figure above.

(When reassembling)

- Apply grease to the bushings (14), roller (13), draft control link 1 (11) and disc springs (17).
- Tap in the spring pins (15), (16) so that their split portion as shown in the figure left.
- Tighten the lock nut (18) to the arm 2 (8) side.

Tightening torque	Arm 2 lock nut	29.4 to 39.2 N·m 3.0 to 4.0 kgf·m 21.7 to 28.9 ft-lbs

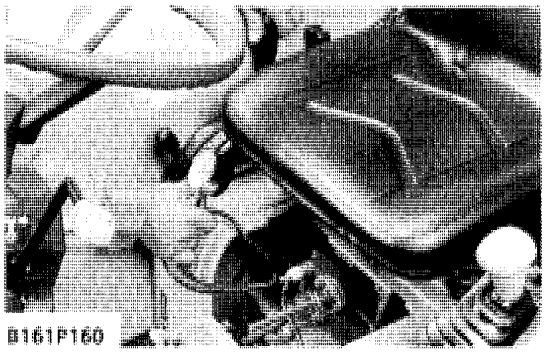
[A] Hydraulic Cylinder Block Side

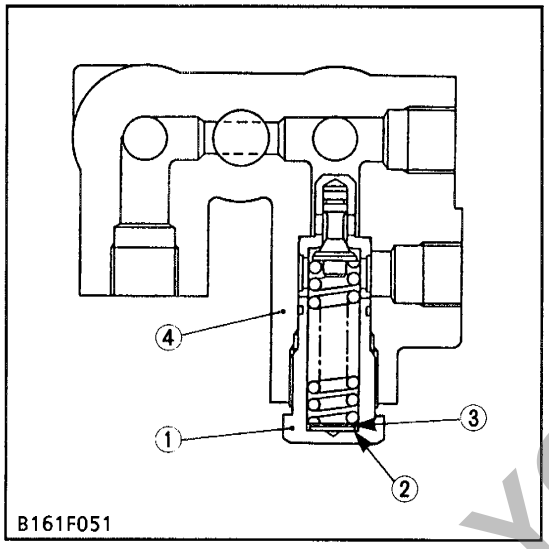
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[3] RELIEF VALVE

CHECKING AND ADJUSTING





(1) Plug
(2) Washer
(3) Adjusting Shim
(4) Front Hydraulic Block

Relief Valve Setting Pressure Test Using Pressure Tester

1. Remove the seat under cover.
2. Remove the plug (screw head size : 17 mm) from front of hydraulic cylinder block.
3. Install the adaptor **58** (screw size : PT 1/4). Then connect the cable and pressure gauge to adaptor **58**.
4. Remove the position control lever stopper.
5. Start the engine and set at maximum speed.
6. Move the position control lever all way up to operate the relief valve and read the gauge.
7. If the pressure is not within the factory specifications, remove the plug (1) of front hydraulic block (4) and adjust with the adjusting shims (3).
8. After the relief valve setting pressure test, reset the position control lever stopper firmly.

Relief valve setting pressure	Factory spec.	16.2 to 17.2 MPa 165 to 175 kgf/cm² 2347 to 2489 psi

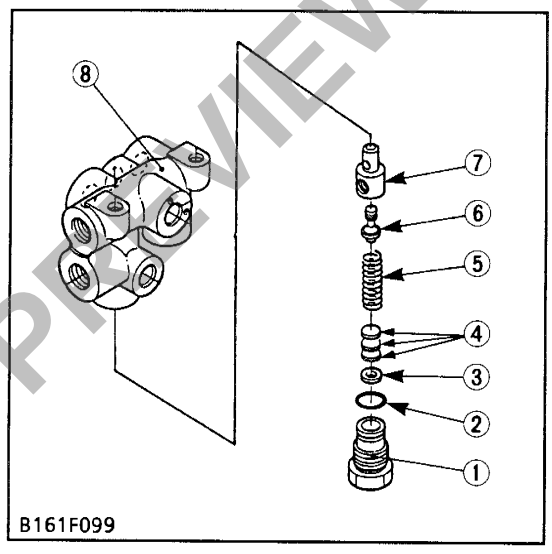
Condition

- Engine speed ..... Maximum
- Oil temperature ..... 40 to 60 °C
  104 to 140 °F

(Reference)

- Thickness of shims (3) : 0.1 mm (0.0039 in.)
  0.2 mm (0.0078 in.)
  0.4 mm (0.0157 in.)
- Pressure change per
  0.1 mm (0.0039 in.) shim : Approx. 264.8 kPa
  2.7 kgf/cm²
  38.4 psi

DISASSEMBLING AND ASSEMBLING



(1) Plug
(2) O-ring
(3) Washer
(4) Adjusting Shims
(5) Spring
(6) Poppet
(7) Valve Seat
(8) Front Hydraulic Block

Relief Valve

1. Remove the plug (1), and draw out the spring (5) and the poppet (6).
2. Take out the valve seat (7).

(When reassembling)

- Take care not to damage the O-ring.

Tightening torque	Relief valve plug	49.0 to 68.6 N·m 5.0 to 7.0 kgf·m 36.2 to 50.6 ft-lbs

■ IMPORTANT

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

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SAFETY DECALS

- **The following safety decals are installed on the machine.**
  If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

■ **NOTE**

- **Only labels applied to places other than where they are applied on tractors with no cabin are mentioned.**

⑨Part No. 35260-3491-3

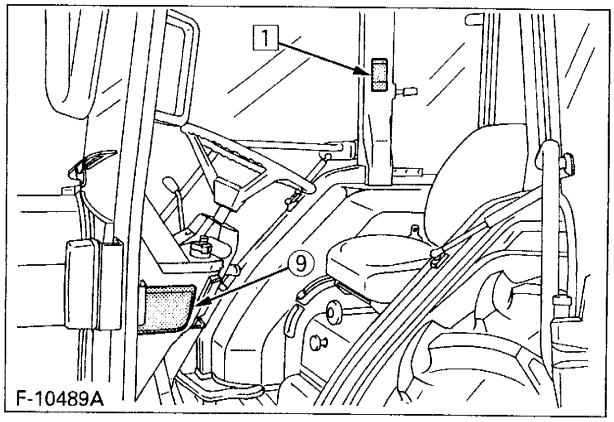
⚠ CAUTION

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.

1Part No. TA040-4902-1



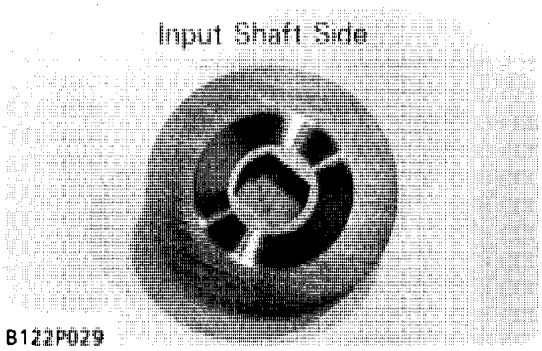


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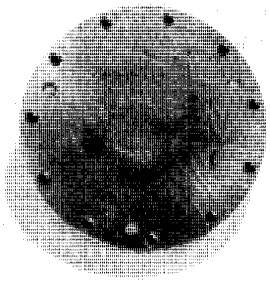
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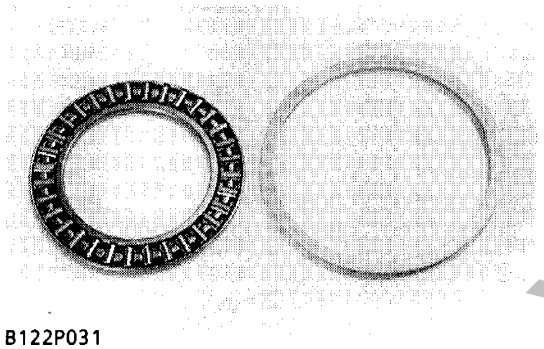
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Rotor Side


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B122P031

Drive Plate

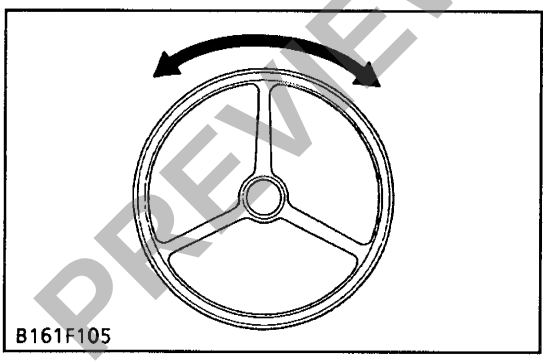
1. The rotor side of the drive plate should shows the **"normal"** spiral pattern due to rotor movement.
2. Inspect the thrust bearing side of the plate for brinelling (dents) or spalling (flaking).
3. The flat sides of the input shaft engagement hole should not be grooved or worn.
4. If any of these conditions are present, replace the steering controller assembly.

Bearing and Spacers

1. Inspect the thrust bearing for brinelling (dents) or spalling (flaking).
2. If either exists, or if one or more of the rolls are lost or broken, replace the steering controller assembly.
3. If the seal spacer or bearing spacer are worn or broken, replace the steering controller assembly.

[4] STEERING CYLINDER AND PITMAN ARM

CHECKING


B161F105

Steering Wheel Free Play

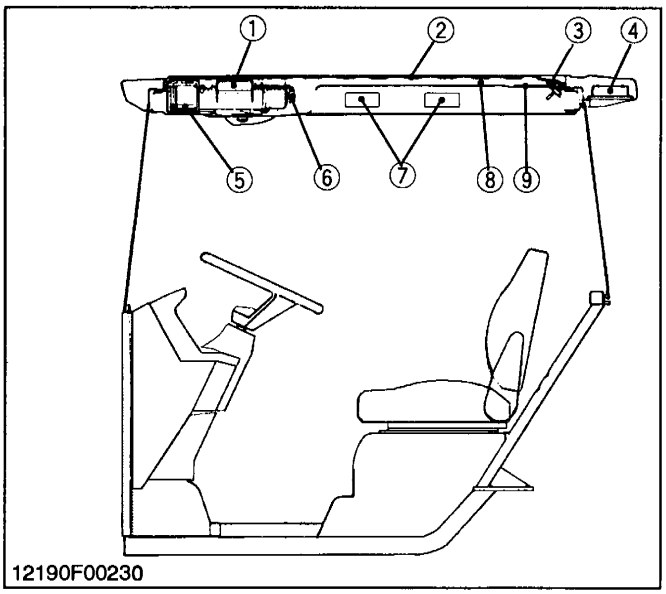
1. Start the engine, and set the engine speed at idling.
2. Rotate the steering wheel lightly by hand, and measure the play.
3. If the play is not within factory specifications, check the steering linkage.

Steering wheel free play	Factory spec.	20 to 50 mm 0.79 to 1.97 in.

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(2) Outline of Air Conditioning System



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The machine is equipped with a thin large-capacity air conditioner with outside air intake. Through the inside air filter (9) as well as the outside air filter (4), the air flows along between the outer roof (2) and the inner roof (8) and reaches the air conditioner unit (1). The air is then cooled and dehumidified by this unit.

The resulting air is heated to a comfortable level. In this way, the air being blown via the blow port can be kept at comfortable temperature and humidity.

The 3 front blow ports (5) can be opened and closed using the center knob of each port. The 4 side blow ports (7) are opened and closed using the mode lever on the control panel (6). With these ports open or closed, you can feel your head cool and your feet warm.

Capcaity (Cooling)	Factory spec.	2.10 to 2.56 kw
Capacity (Warming)	Factory spec.	3.14 to 3.84 kw
Kinds of refrigerant (Charge amount)	Factory spec.	R134a 0.9 to 1.0 kg 1.98 to 2.21 lbs.
Pressure sensor (Low)	Factory spec.	0.196 MPa 2.0 kgf/cm^2 28.4 psi
Pressure sensor (High)	Factory spec.	3.14 MPa 32.0 kgf/cm^2 455 psi

(1) Air Conditioner Unit
(2) Outer Roof
(3) Inside/Outside Air Selection Damper
(4) Outside Air Filter
(5) Front Blow Port
(6) Control Panel
(7) Side Blow Port
(8) Inner Roof
(9) Inside Air Filter

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