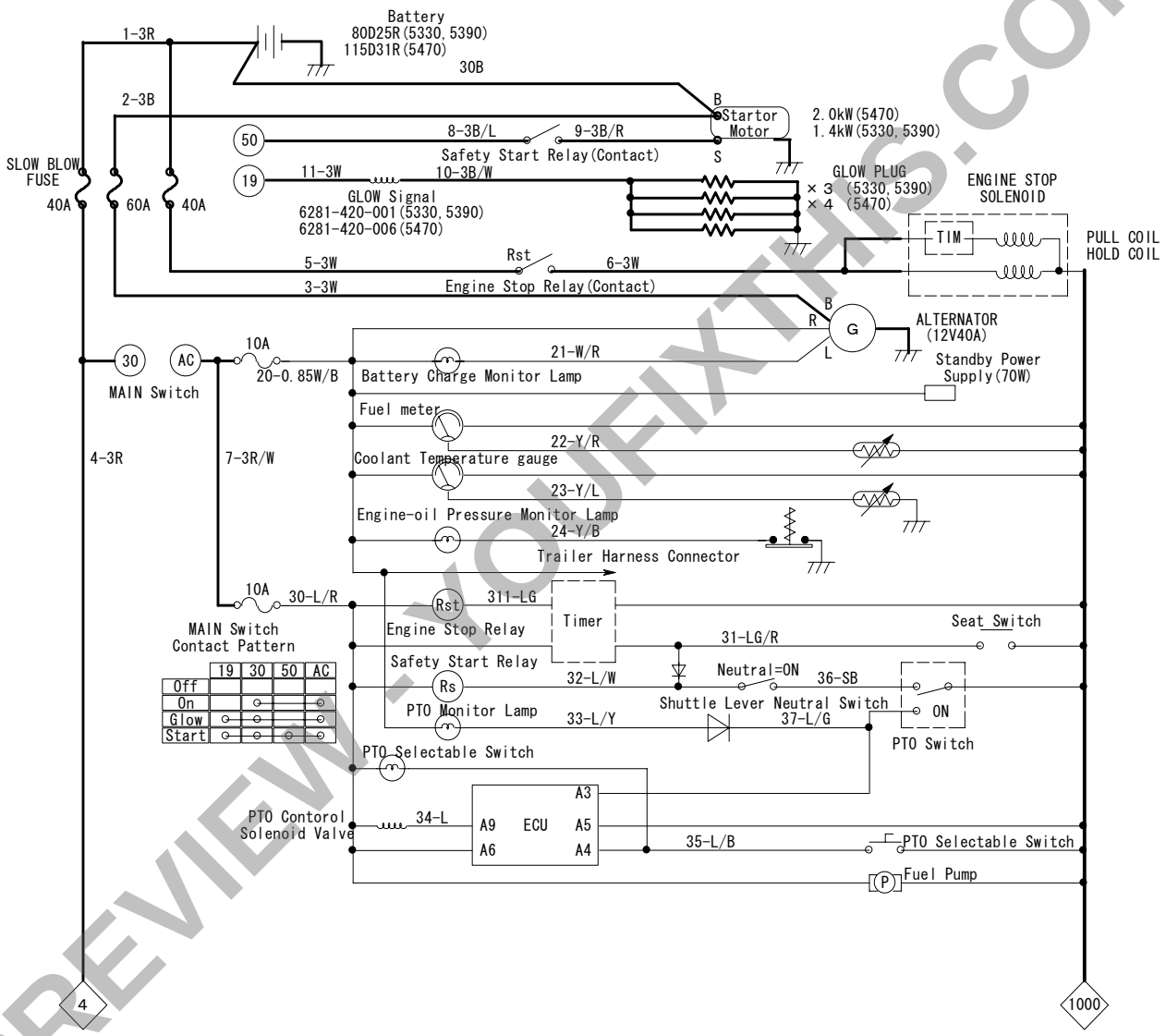
CHAPTER 10. ELECTRICAL SYSTEM

1. Wiring Circuit

1) Standard model

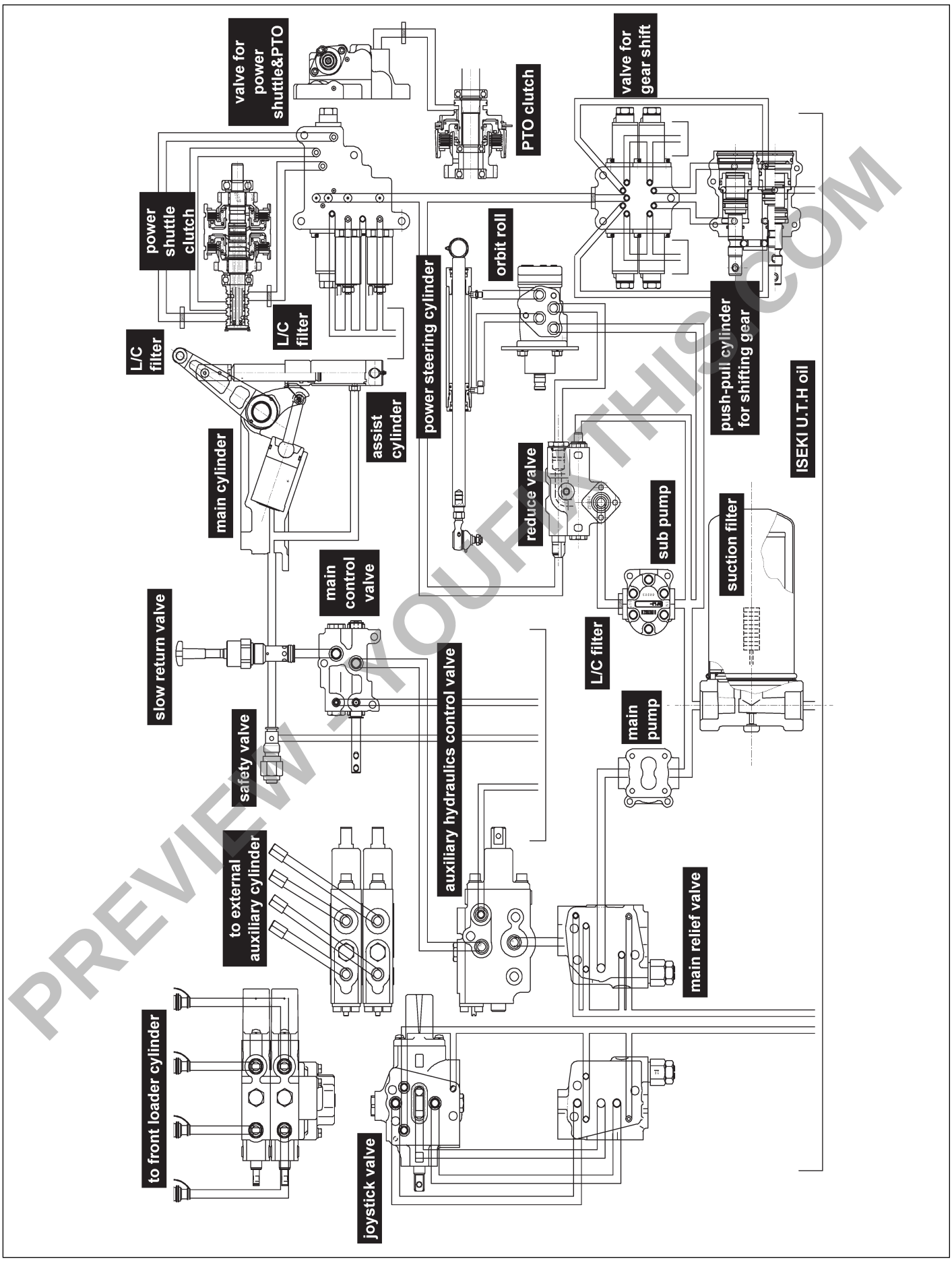
TG5330F, 5390F, 5470F-S (1/2)



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3.2. Power Shift model



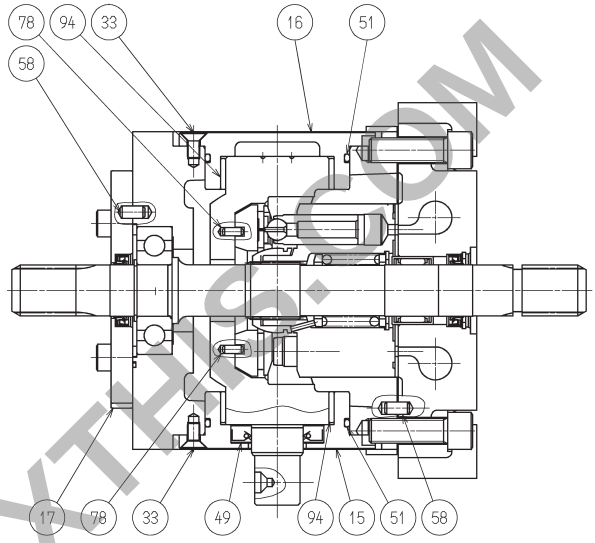
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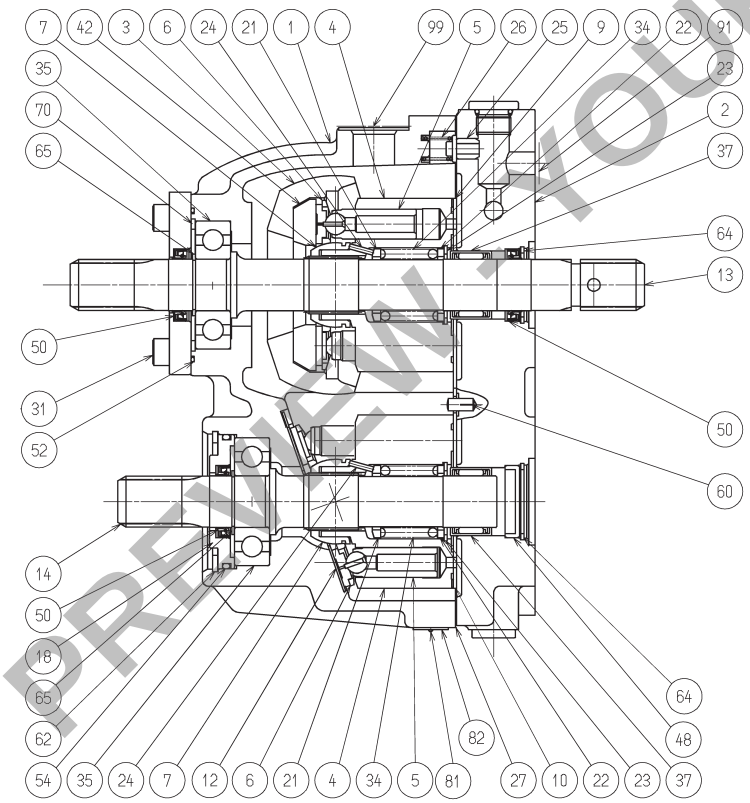
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CHAPTER 7. HYDROSTATIC TRANSMISSION

1. CONSTRUCTION AND NAMES OF MAJOR COMPONENTS (TG5390FH/TG5470FH)

(1) Case
(2) Port Block
(3) Swash Plate
(4) Cylinder Block
(5) Piston Assy
(6) Retainer Plate
(7) Retainer Holder
(9) Valve Plate
(10) Valve Plate
(12) Thrust Plate
(13) Shaft
(14) Shaft
(15) Cover
(16) Cover
(17) Cover
(18) Oil Seal Case
(21) Spring Seat
(22) Washer
(23) Snap Ring
(24) Pin
(25) Valve
(26) Spring
(27) Gasket
(30) Socket Head Bolt
(31) Socket Head Bolt
(33) Screw
(34) Spring
(35) Ball Bearing
(37) Needle Bearing
(38) Valve Assy
(39) Plug
(40) Spring
(41) O-ring
(42) Thrust Plate
(48) Bore Plug
(49) Oil Seal
(50) Oil Seal
(51) O-ring
(52) O-ring
(54) O-ring
(58) Pin
(60) Pin
(62) Snap Ring
(64) Snap Ring
(65) Snap Ring
(66) Plug
(67) Plug
(68) O-ring
(69) O-ring
(70) Collar
(78) Pin
(81) Drive Scerw
(82) Name Plate
(91) Plug
(94) Bush
(99) Plug





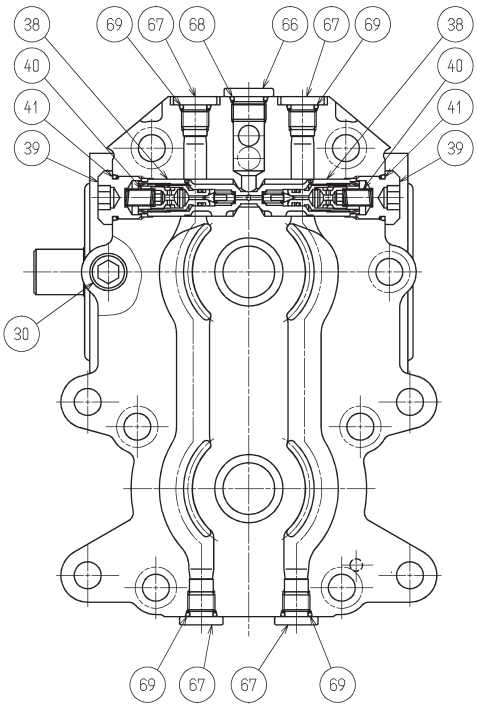


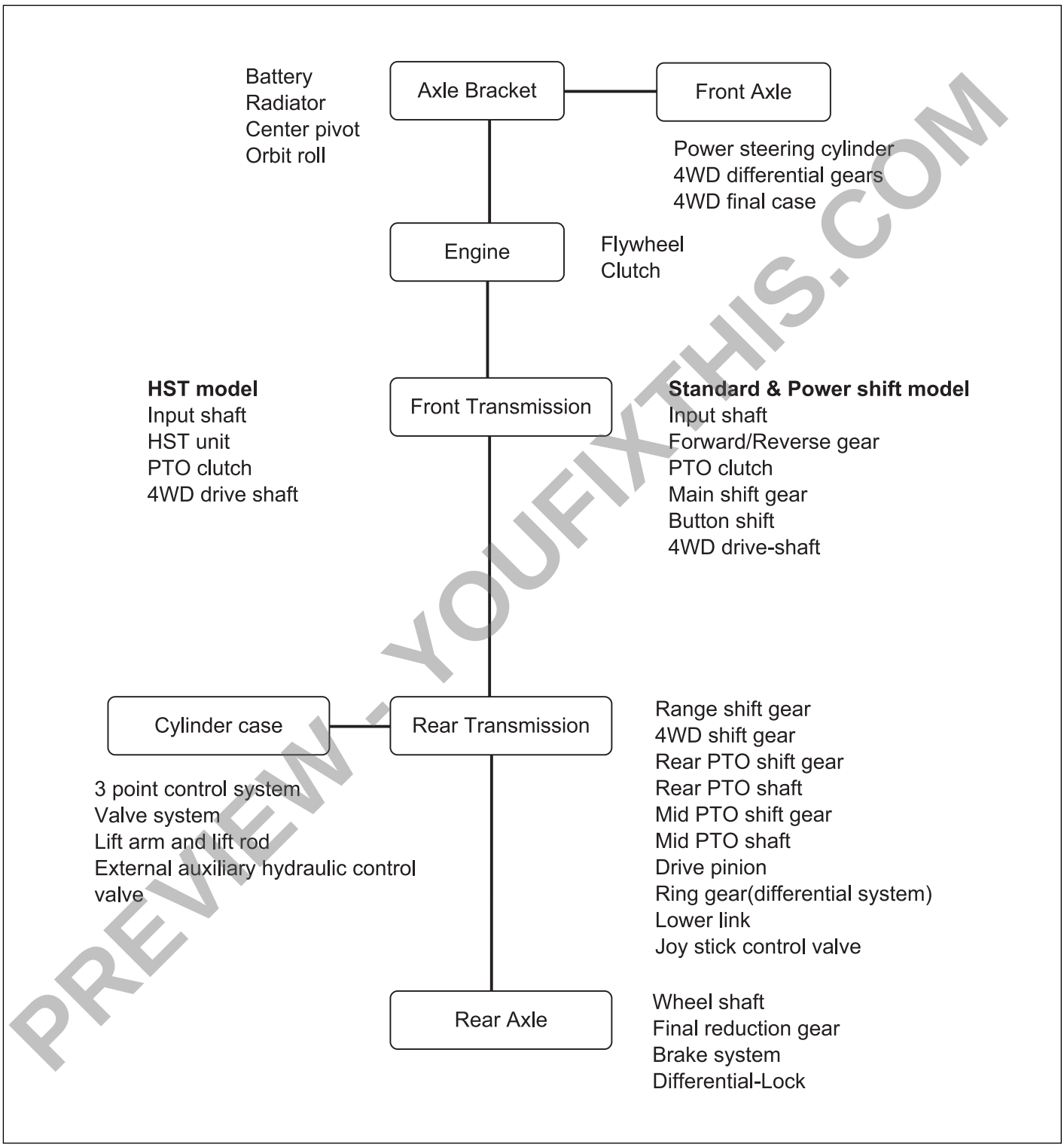
Fig 7-1

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CHAPTER 2. DISASSEMBLING INTO MAJOR FUNCTIONAL COMPONENTS

1. OPERATION CHART FOR DISASSEMBLING AND RE-ASSEMBLING BY MAJOR BLOCKS



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5) Error Message (Power Shift model)

No	Indication Item	Note
1)	Shift Position Sensor Malfunction	Shift location sensor or its wiring harness is malfunctioning.
2)	Shift Position Setting fault	Adjustment of shift location sensor is incorrect.
3)	Shift Position 1 Malfunction	Shifting gear(1st) is malfunctioning.
4)	Shift Position 2 Malfunction	Shifting gear(2nd) is malfunctionig.
5)	Shift Position 3 Malfunction	Shifting gear(3rd) is malfunctioning.
6)	Shift Position 4 Malfunction	Shifting gear(4th) is malfunctioning.

Error warning lamp will blink when digital panel indicates the above error illustration.

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2. DISASSEMBLY OF FUNCTIONAL BLOCKS

2.1 REMOVAL OF EXTERIOR PARTS

2.1.1 ENGINE HOOD, SIDE COVER AND FRONT GRILLE

(1) Turn knob clockwise and open engine hood.



Fig.2-1

(2) Pull top of side cover outwards and remove.



Fig.2-2

(3) Remove nut and snap pin.

(4) Remove engine hood from tractor.

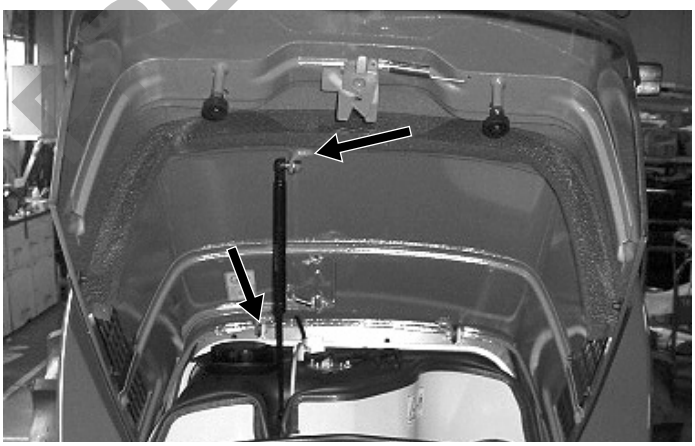


Fig.2-3

(5) Pull top of front grill forwards and remove.



Fig.2-4

2.1.2 BATTERY

(1) Disconnect battery cable(-) from terminal and then disconnect battery cable(+) from terminal.

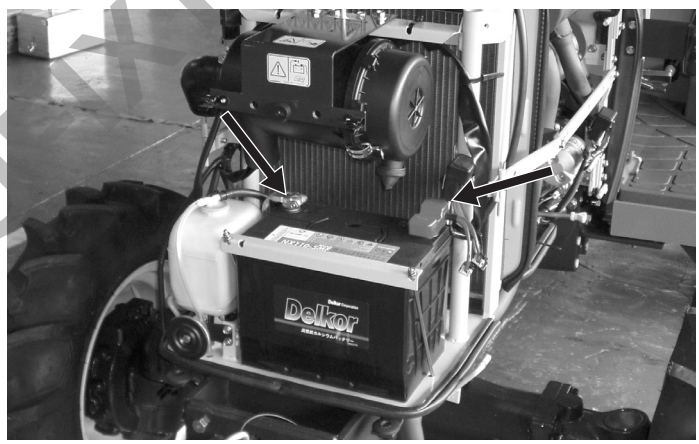


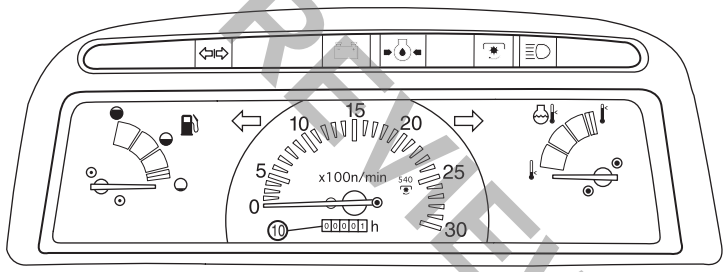
Fig.2-5

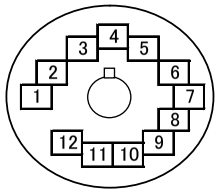
(2) Remove nuts and battery holder and then remove the battery.

ATTENTION: When connecting the battery cables, connect the positive cable first.

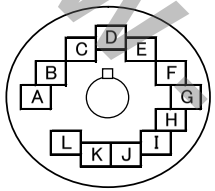
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2.3. Pin layout

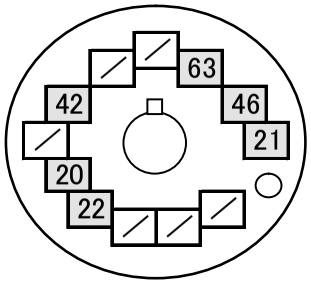




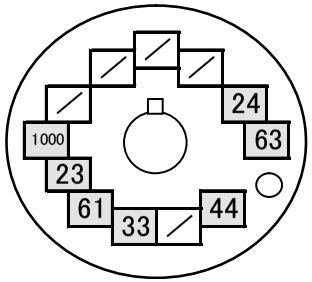
Pins at panel side



Pins at panel side



Pins at harness side



Pins at harness side

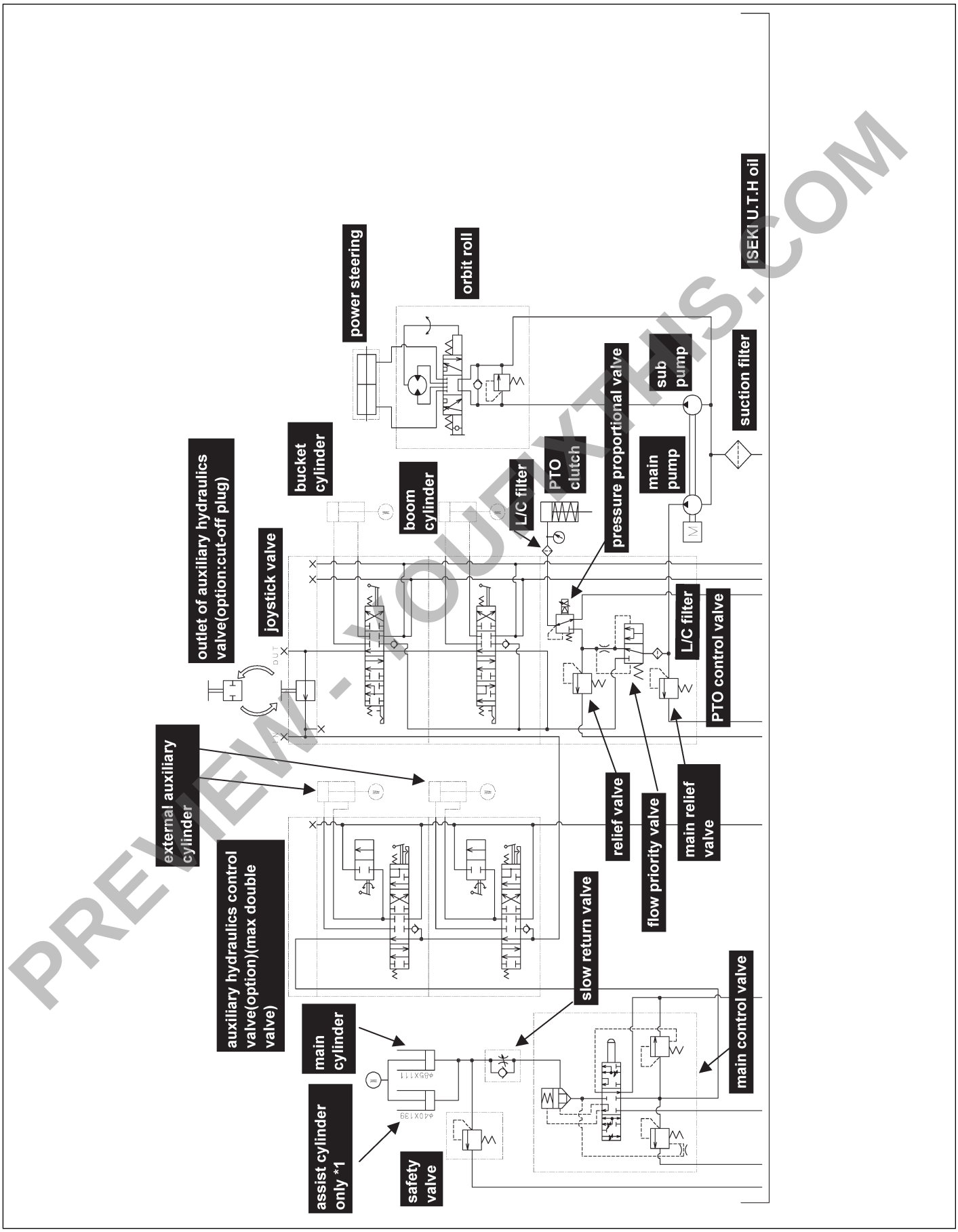
NO	Description	wire color	circuit No.
1	Battery charge	W/R	21
2	Turn signal monitor Lamp(LH)	Y	46
3	Backlight	BR	63
4	-	-	-
5	-	-	-
6	Direct indicator light for trailer	W/G	42
7	-	-	-
8	12V MAIN Switch AC（On Position)	W/B	20
9	Fuel Gauge	Y/R	22
10	-	-	-
11	-	-	-
12	-	-	-
A	Backlight	BR	63
B	Oil Pressure Warning	Y/B	24
C	-	-	-
D	-	-	-
E	-	-	-
F	-	-	-
G	GND	B	1000
H	Coolant Temp. Gauge	Y/L	23
I	High beam monitor Lamp	R/G	61
J	PTO Power take Off	L/Y	33
K	-	-	-
L	Turn signal monitor Lamp(RH)	G/Y	44

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2. HYDRAULIC CIRCUIT

2.1. Standard model



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5. TROUBLESHOOTING

Problems	Causes	Countermeasures
(1) Overheating	1) Low coolant level	Replenish coolant and inspect for water leaks.
	2) Fatigued pressure valve springs	Replace radiator cap.
	3) Loose or broken fan belt	Adjust belt tension or replace.
	4) Oily fan belt	Replace.
	5) Defective thermostat	Replace.
	6) Defective water pump or water leaks	Repair or replace.
	7) Clogged water passages	Clean radiator and water passages.
	8) Improper injection timing	Adjust injection timing.
	9) Clogged air passages	Clean radiator exterior.
	10) Fuel gas enters water jacket due to broken cylinder gasket.	Inspect cylinder head and replace cylinder gasket.
(2) Over-cooling	1) Defective thermostat	Replace.
	2) Excessive low atmospheric temperature	Decrease radiator working area by radiator masking.
(3) Loss of coolant	1) Leaking radiator	Repair or replace.
	2) Loosely clamped or broken water hose	Re-tighten or replace.
	3) Fatigued pressure valve spring	Replace radiator cap.
	4) Leaking water pump	Repair or replace.
	5) Water leakage through cylinder head gasket	Inspect cylinder head and replace gasket.
	6) Cracked cylinder head or body	Replace.
(4) Noisy cooling fan	1) Defective water pump bearing	Replace.
	2) Loose or bent fan	Re-tighten or replace.
	3) Unbalanced fan	Replace.
	4) Defective fan belt	Replace.

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2. SPECIFICATIONS

ENGINE	TG5330	TG5390	TG5470
Make	Iseki Diesel	Iseki Diesel	Iseki Diesel
Model	E3CD	E3CDT	E4CG
Type Indirect Injection,	Indirect Injection	Indirect Injection	Indirect Injection
	Overhead Valve	Overhead Valve	Overhead Valve
Aspiration	Natural	Exhaust-turbo charger	Natural
Displacement	1498 ml	1498 ml	2197 ml
Number of Cylinders	3	3	4
Bore	87 mm	87 mm	87 mm
Stroke	84 mm	84 mm	92.4 mm
Engine Horsepower (Gross)	33 @ 2600 min-1	40.1 @ 2600 min-1	46 @ 2600 min-1
PTO Horsepower (Estimate)			
Standard and Power shift type	26.8 @ 568 PTO min-1	31 @ 568 PTO min-1	38@ 568 PTO min-1
HST type	24.5 @ 568 PTO min-1	29.5 @ 568 PTO min-1	36.5@ 568 PTO min-1
Firing Order	1-3-2	1-3-2	1-3-4-2
Compression Ratio	21.7-1	21.7-1	21.8-1
Low Idle Speed	980-1020 min-1	980-1020 min-1	1010-1050 min-1
High Idle Speed	2760-2860 min-1	2760-2860 min-1	2810-2910 min-1
Valve Clearance (Cold);Intake	0.35 mm	0.35 mm	0.35 mm
Air Cleaner	Dry element	Dry element	Dry element
Engine Cooling	Liquid, forced circulation	Liquid, forced circulation	Liquid, forced circulation
Cold Starting Aid	Glow plugs (3)	Glow plugs (3)	Glow plugs (4)

TRANSMISSION-STANDARD type	TG5330/5390	TG5470
Type: Primary	4-speed synchronized mesh	4-speed synchronized mesh
Gear control	manual	manual
Range	3-speed sliding mesh	3-speed sliding mesh
Mechanical Shuttle	Synchronized, 95% reverse reduction	Synchronized, 95% reverse reduction
Gear Speeds	12 gears forward, 12 reverse	12 gears forward, 12 reverse
Clutch	single stage dry with 240 mm disc.	single stage dry with 275 mm disc.

TRANSMISSION-POWER SHIFT type		
Type: Primary	4-speed synchronized mesh	4-speed synchronized mesh
Gear control	Electro hydraulic control	Electro hydraulic control
Range	3-speed sliding mesh	3-speed sliding mesh
Power Shuttle	Hydraulically engaged, multi-plate wet disc	Hydraulically engaged, multi-plate wet disc
Gear Speeds	12 gears forward, 12 reverse	12 gears forward, 12 reverse
Clutch	single stage dry with 240 mm disc.	single stage dry with 275 mm disc.

TRANSMISSION-HST TYPE		
Type: Primary	Infinite	Infinite
Range	3-speed sliding mesh	3-speed sliding mesh
Gear Speeds	3 gears forward, 3 reverse	3 gears forward, 3 reverse
Clutch	None	None

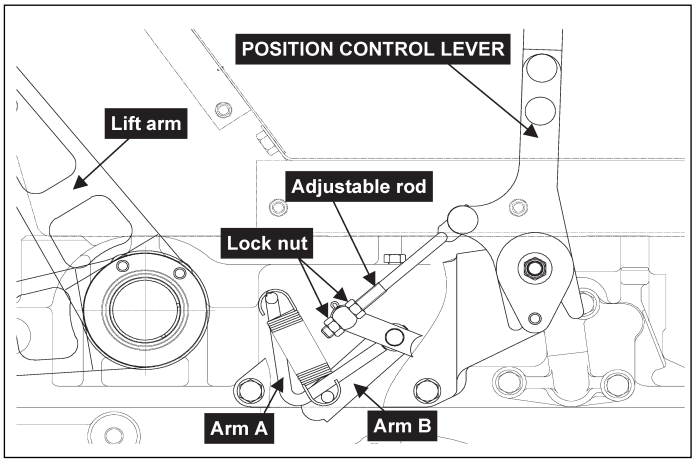
POWER TAKE OFF (PTO)		
Type	Independent, engine driven	Independent, engine driven
Control	Electro hydraulic control	Electro hydraulic control
Clutch	Hydraulically engaged, multi-plate wet disc	Hydraulically engaged, multi-plate wet disc
Rear PTO Shaft	35 mm diameter, six spline	35 mm diameter, six spline
Output	Clockwise rotation	Clockwise rotation
Engine Speed @ 540 PTO rpm	2430min-1	2430min-1
@ 1000 PTO rpm	2500min-1	2500min-1
Mid-PTO Shaft (Option)	25.4 mm diameter, fifteen spline	35 mm diameter, six spline
Output	Clockwise rotation	Clockwise rotation
Mid-PTO Speed @ engine rpm	1916 @ 2600 min-1	1916 @ 2600 min-1

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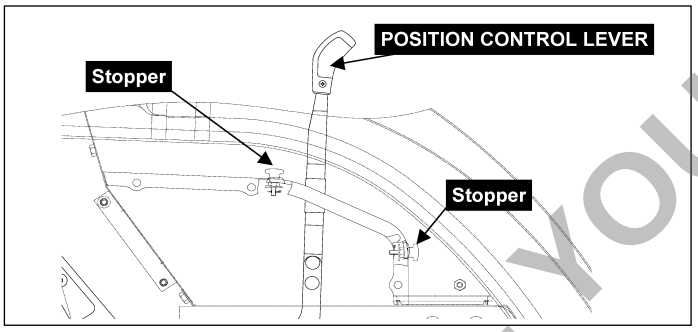
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4.10.2. Adjustment

1) Set the adjustable rod so that the free play of the position lever is 0-1 mm (at the top of the position lever). Make sure that the relief valve isn't working.
2) After adjusting, tighten the lock nut securely.

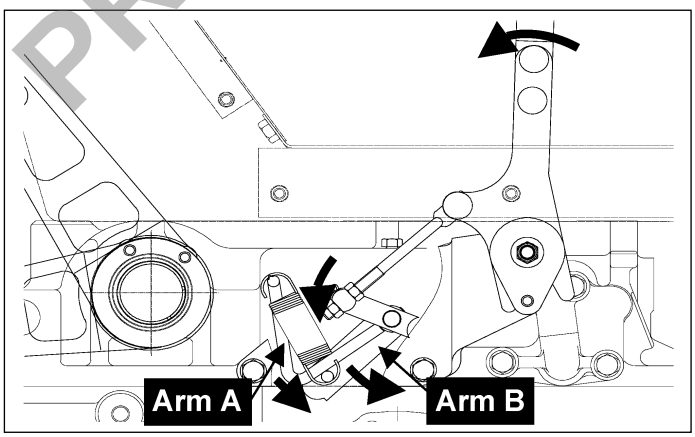


3) The stroke of the 3P linkage can be adjusted by the stopper.

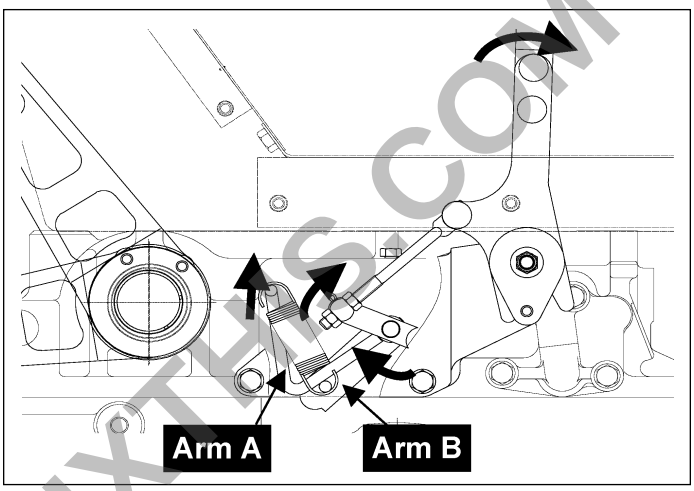


4.10.3. Operation Mechanism

1) When you pull the position control lever rearwards, arm (A) is turning counterclockwise.
2) Arm (A) pushes arm (B) and the main control valve moves into up position. Fluid goes to the cylinder and the 3P linkage rises.
3) The lift arm rises to the designate position, controlled by the position control lever. The main spool is returned to the neutral position by the link mechanism.

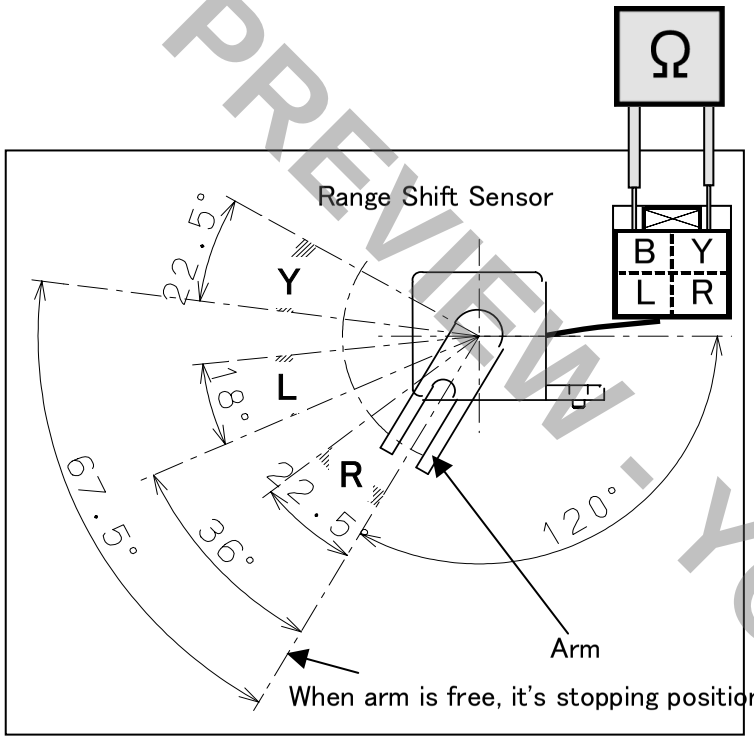


4) When you push the position control lever forward, arm (A) turns clockwise.
5) Arm (A) pulls arm (B) and the main control valve moves into down position. The 3P linkage goes down.
6) The lift arm lowers to the designate position controlled by the position control lever, the main spool is returned to the neutral position by the link mechanism.



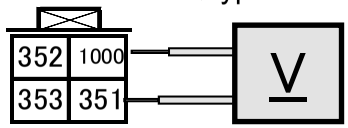
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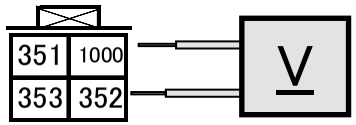
<Inspection at harness side>

Harness side: Q type.



Circuit Tester		Normal Range
+	-	Voltage
351	GND	About 11V
352	GND	About 11V
353	GND	About 11V
351	1000	About 11V
352	1000	About 11V
353	1000	About 11V

Harness side: H type.



Circuit Tester		Normal Range
+	-	Voltage
351	GND	About 11V
352	GND	About 11V
353	GND	About 11V
351	1000	About 11V
352	1000	About 11V
353	1000	About 11V

<Inspection of sensor side>

Position		Normal Range	Lever Position		Important
Arm	Terminal	Resistance	Power Shift	HST	
R	R-B	About 0 Ω	Rabbit	Rabbit	When the lever is in each position, never disconnect the contact point of sensor by the play of the lever.
L	L-B	About 0 Ω	Snail	Tortoise	
Y	Y-B	About 0 Ω	Tortoise	Snail	
Except R, L and Y	R-B	Infinity Ω	Neutral	Neutral	When the lever is in neutral position, never connect the contact point of sensor by the play of the lever.
	L-B	Infinity Ω			
	Y-B	Infinity Ω			

NOTE: When this adjustment is ihas not been done correctly, the power shift model may have problems driving.

<Digital panel Check Mode>

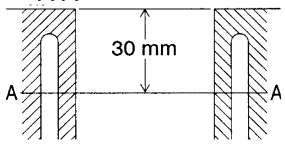
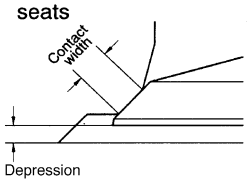
The sensor value can also be checked in the check mode of the digital panel

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2. SERVICE STANDARDS

-: Repair instructions
•: Remarks

mm (in)

Part names and inspection items	Nominal dimensions	Values requiring service	Standard values for reassembly	Usable limits	Service instructions and remarks
CYLINDER Cylinder compression Kg /cm2(psi)	31(441) or more				at 200rpm
Cylinder bore wear at A-A 	ϕ87(3.43)	0.2 (0.008) or more	0.01 (0.0004)		• Honing after boring • Bore should be finished within a tolerance of, $^{+40\mu}_{0}$ against nominal diameter of oversize piston.
Boring - size			0.5 (0.020)		- Use over-size pistons and ring.
Flatness of cylinder block top surfaces		0.15 (0.006) or more	0.08 (0.003) or less		• Correct on a surface grinder. - Ground down limit:0.4(0.016)
CYLINDER HEAD Depression of valve seats 		1.4 (0.055) or more	0.7 (0.028)		• Correct valve seats. - Valve seat angles: E3CD: 60° E4CG: 45°
Contact width of valve seats		2.0 (0.0079) or more	1.3 - 1.6 (0.051 - 0.063)		• Correct with valve seat cutter of 60° for E3CD and 45° for E4CG.
Flatness of cylinder head bottom surface		0.15 (0.006) or more	0.08 (0.003) or less		• Correct on a surface grinder. - Ground down limit:0.4(0.016)
Tightening torque of cylinder head bolts kgm (ft·lb)			6.5 - 7.0 (47.0 - 50.6)		
PISTON Piston pin wear	ϕ25(0.984)			ϕ24.97 (0.983)	• Replace.

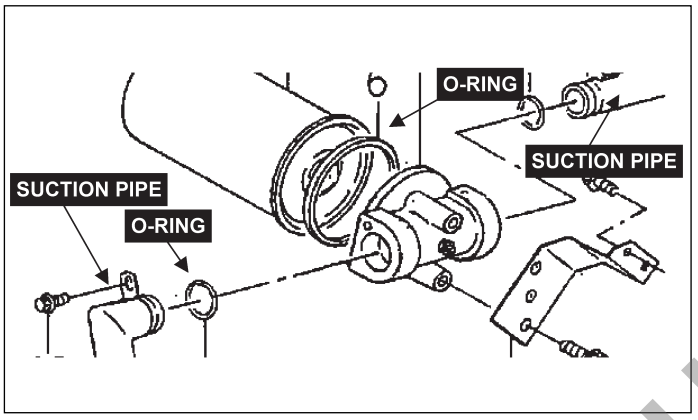
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6. Maintenance

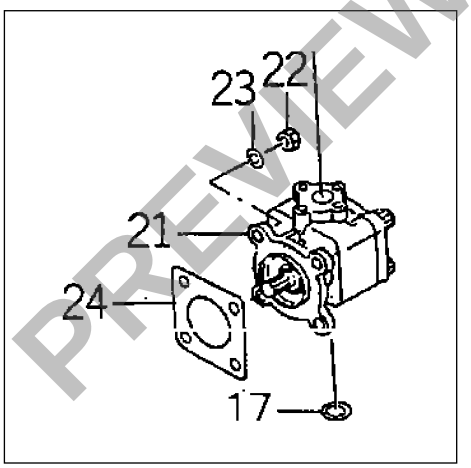
6.1. SUCTION FILTER

1) The cartridge should be replaced regularly. Replacement should be done after the first 50, 200 and 400 hours of use and for every succeeding 200 hours of use thereafter.
2) The hydraulic components may malfunction if the cartridge is not replaced regularly.
3) When replacing the cartridge, remove dust and dirt that have adhered to the magnet with compressed air.
4) When installing the suction pipe, apply clean grease over the pipe's O-Ring before insertion.



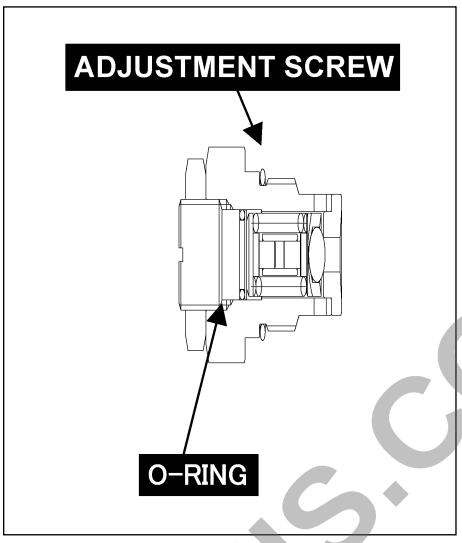
6.2. GEAR PUMP

1) Seal the installation contact surface by using a gasket and apply heat resistant bond to the same surface.
2) Check the rotation orientation when replacing the components.



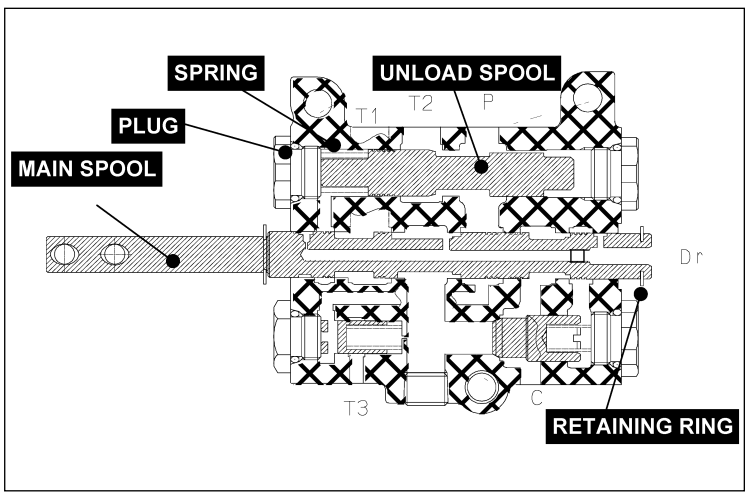
6.3. MAIN RELIEF VALVE

1) The tightening torque when installing the main relief valve is 63.8±0.5 Nm (650±50 kgfcm).
2) Do not use an impact wrench as its impact may loosen the adjustment screw.
3) Always apply clean grease to the O-Ring.
4) Do not disassemble the adjustment screw.



6.4. MAIN CONTROL VALVE

1) The tightening torque, when installing the main control relief valve is 11.8~17.2 Nm (120~175 kgfcm).
2) Do not use an impact wrench as the force it applies is uneven.
3) Bind the 3 designated points evenly to avoid any jumbling in the main spool.
4) Apply clean grease to the O-Ring of the contract surface.
5) When replacing the main spool, be careful not to damage the sliding surface.
6) Check for any slipping in the retaining rings. Remove the retaining ring on the Dr side.



7) Remove the plug in the spring side when disassembling the unload spool.
8) To remove the spools, plumb the spools so that they fall off easily on their own weight. When re-installing the spools, use a cleaning agent to remove all foreign substances and apply clean oil to the spool.

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3. GENERAL PRECAUTIONS FOR SEPARATION AND RE-INSTALLATION

3.1. BEFORE OPERATION

1) Always be safety-conscious in selecting clothes and use suitable tools.

2) Before disassembly, make sure that you familiarize yourself with the assembled condition for subsequent reference during reassembly.

3) Keep parts and tools in proper order during operations.

4) Before servicing electrically charged parts, make sure to disconnect the negative battery terminal.

5) To prevent oil or water leaks, use liquid gasket as required.

6) When reassembling the disassembled parts, discard used gaskets, O-rings, or oil seals and install new ones.

7) When lifting up only the front or rear part of the tractor, be sure to wedge the grounded wheels.

8) When the tractor is jacked up, be sure to support the entire tractor with something like a stand. Holding it up with a jack only is a dangerously unstable procedure.

9) When replacing parts, use authorized, genuine ISEKI parts only. ISEKI assumes no responsibility for accidents, operating problems or damage caused by the use of imitation parts. Also, the use of unauthorized parts will result in relatively poor machine performance.

3.2. PRECAUTIONS TO BE FOLLOWED WHEN INSTALLING STANDARDIZED PARTS

(1) Roller or ball bearings

1) When a bearing is fitted in by the outer race, use an installer which is specially designed to push only the outer race and vice versa.

2) The installer must be designed to install the bearing on the shaft in a parallel position.

3) When installing a bearing which appears the same on both sides, install it so that the face which has the identification number faces in a direction for easy visual identification. All the bearings which are to be installed in the transmission case should be placed so that their identification number faces outward.

4) If a shaft or a hole where bearing is to be installed has a stopper, the bearing should be pushed in completely until it is seated against the stopper.

5) Installed bearings should turn smoothly.

(2) Oil seals

1) Oil seal installer should be designed so as not to deform the oil seals.

2) During installation of an oil seal, be careful not to damage the lips, and assure that it is pushed in parallel to the shaft or hole.

3) When oil seals are installed, there should be no turnover of the lips nor dislocation of the springs.

4) When a multi-lip seal is installed, the grooves between lips should be filled with grease, not adhesive.

5) Use a lithium-based grease.

6) There should be no oil or water leaks through the installed oil seals.

(3) O-rings

1) O-rings should be coated with grease before installing.

2) Installed O-rings should not be twisted or slack.

3) Installed O-rings should maintain proper air tightness.

(4) Snap rings

1) Snap ring installers should be designed so as not to permanently deform the snap rings.

2) Installed snap rings should be seated securely in the groove.

3) Be careful not to overload the snap ring to the extent that it is permanently deformed.

4) How to install the snap ring.When installing a snap ring, install it as shown in the figure with its round edge side turned toward the part to be retained. This round edge is formed when the snap ring is pressed out.

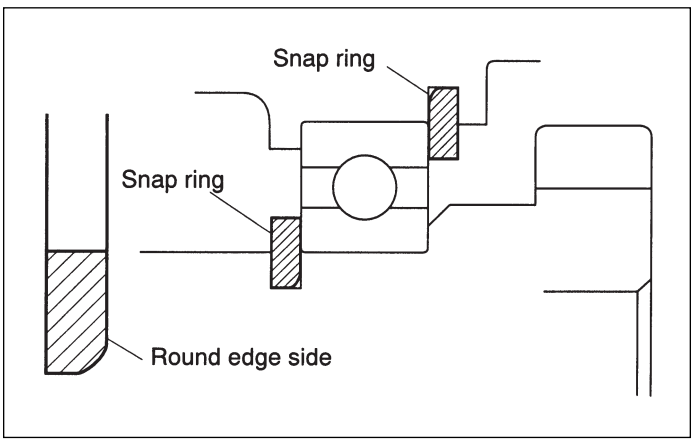
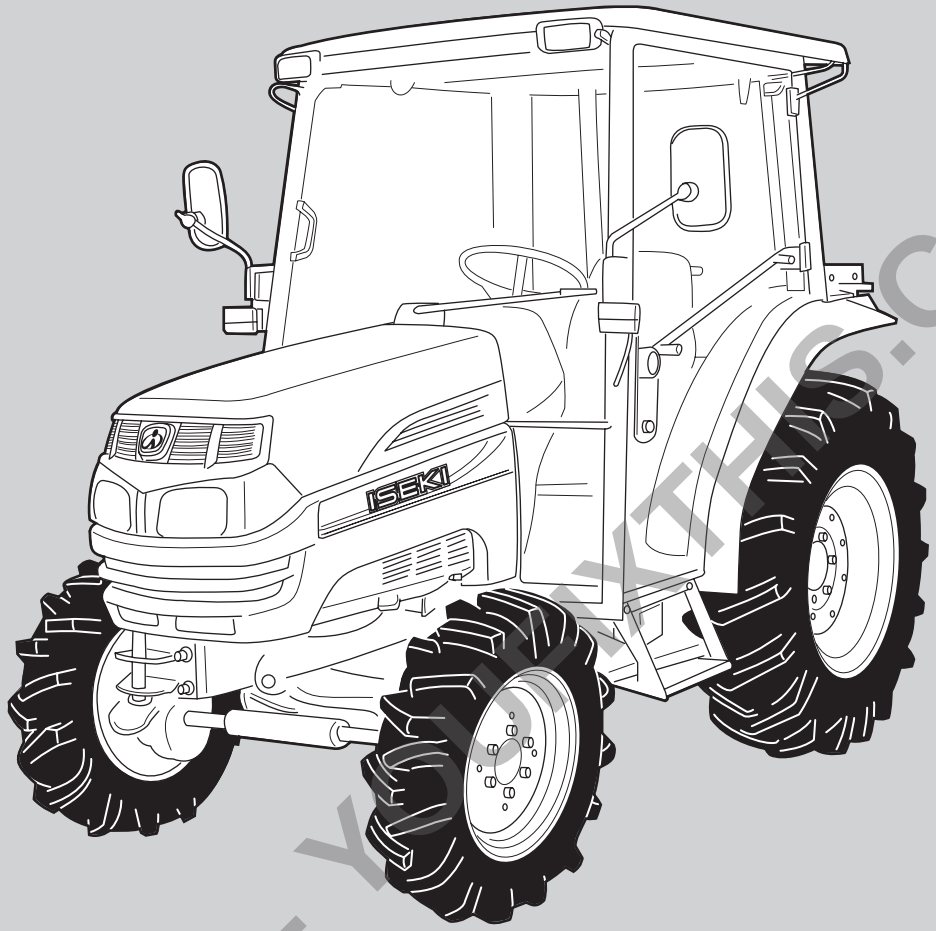


Fig.1-4

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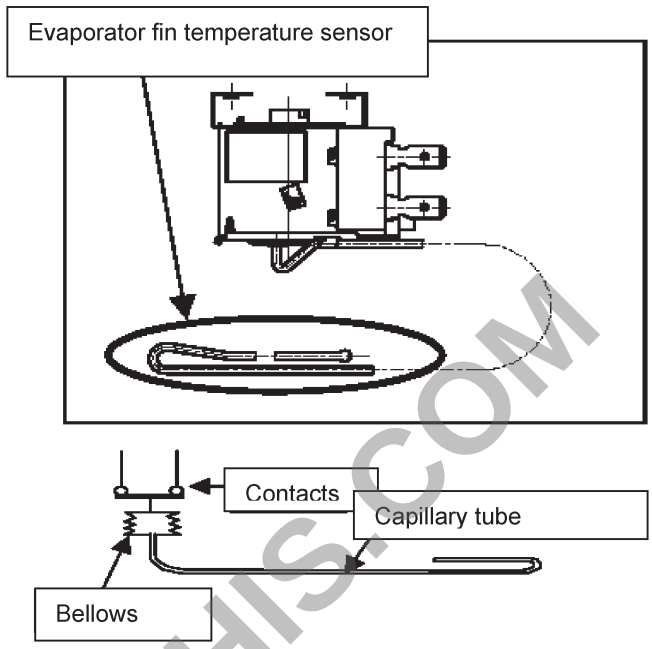
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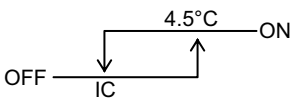
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2.1.7. Thermostat

Thermostat detects the temperature of the evaporator fins and stops the compressor when the temperature becomes excessively low to prevent the evaporator from freezing. The temperature of the evaporator fins is detected by the capillary tube filled with refrigerant. When the temperature becomes lower than a specific temperature, the pressure in the internal bellows lowers to break the contact points. Thus the power supply to the compressor switch is turned off.



Preset temperature	Operation checking method	Cause of abnormal generation
	Check the continuity between the terminals.	• Defective contact points. • Gas leakage by defective capillary tube

2.2. Operation and control of air conditioner

2.2.1. Operation

a. Start the engine.
b. Turn on the fan switch. The blower turns.
c. Turn on the air conditioner switch (A/C). The clutch is energized.
d. Select the air outlet by the air outlet changeover lever.
e. Move the temperature-adjusting lever.
f. Chill wind blows out through the air outlet grille.

For heating: turn off the air conditioner switch and move the temperature-adjusting lever to the right.
For cooling and Dehumidication:turn on the air conditioner switch and move the temperature-adjusting lever to the left.

2.2.2. Control

a. When the gas pressure exceeds 3.14MPa;
The magnetic clutch of the compressor is turned off by the high-pressure pressure switch.
b. When the gas pressure drops to 0.2 MPa or less;
The magnetic clutch of the compressor is turned off by the low-pressure pressure switch, to protect the compressor.

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