



PC

SERVICE MANUAL

SCREW COMPRESSOR

PDS55S-5B2

PDS75S-5B2

PDS75SC-5B2

PDS100S-5B2

PDS100SC-5B2

PDS130S-5B2

PDS130SC-5B2

PDS175S-5B2

PDS175SC-5B2

PDS55S-5C1

PDS75S-5C1

PDS75SC-5C1

PDS100S-5C1

PDS100SC-5C1

PDS175S-5C1

PDS175SC-5C1

FAC-37B (SHIBAURA)

FAC-37BC (SHIBAURA)

FAC-16B (SHIBAURA)

FAC-21B (SHIBAURA)

FAC-21BC (SHIBAURA)

FAC-28B (SHIBAURA)

FAC-28BC (SHIBAURA)

FAC-52B (NISSAN)

FAC-52BC (NISSAN)

Preface

This service manual explains about the cautions for maintenance jobs and is to serve a guide for the electric system, and troubleshooting for service personnel.

In this book the fundamental matters and other things already mentioned in the “Instruction Manual” and the “Parts Catalogue” are omitted to avoid duplication.

Therefore, for the operation and handling of this unit, we request you to refer to the instruction manual and caution plates, and further for the structure and components of the unit, please refer to the “Parts Catalogue” separately to be supplied with the unit.

If you should find any description which does not coincide with the instruction manual and parts catalog, we request you to make sure to start the job after clarifying it.

Service personnel is required to safely take quick and proper countermeasures as well as to use correct technology of maintenance in case of field services and periodical maintenance. It is important that service personnel should have proper and sufficient knowledge about the structure and function of the unit and should be well familiar with such technique mentioned in them.

Regarding the part numbers mentioned in this manual, we request you to refer to the Parts catalogue separately supplied together with the unit, because the parts numbers in this manual are sometimes changed.

Copies of this service manual are intended to be distributed to limited numbers of our customers. The unauthorized reproduction or distribution of this service manual is prohibited.

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1. Specification

1.1 Specifications

Item	unit	PDS55S-5B2	PDS55S-5C1
●Weight · Mass			
Overall length	mm	1,420	
Overall length (Bonnet only)	mm	1,300	
Overall width	mm	720	
Overall height	mm	820	
Net dry mass	kg	320	
Operating mass	kg	350	
●Compressor			
Free air delivery	m ³ /min	1.56	
Working pressure	MPa	0.7	0.69
Pressure of pressure control valve	MPa	0.39	
Burst pressure of safety valve	MPa	1.0	
Ambient conditions: temperature	°C	-15 - +35	
Ambient conditions: altitude	m	less than 1,500	
●Engine			
Type		IHI SHIBAURA E673L-C-8801	IHI SHIBAURA E673L-D-8801
Rated output	kW/min ⁻¹	10.5/3,200	
Fuel consumption	g/kW·h	307	331
Rated RPM	min ⁻¹	3,200	
RPM at unload conditions	min ⁻¹	2,200	
Net dry mass	kg	74	
●Lubricating oils			
Engine oil capacity (high-low level)	L	3.2-2.3	
Compressor oil capacity (including receiver tank and oil cooler etc.)	L	8	
Compressor oil capacity to be filled		Ambient temperature -15°C- 35°C	
		MOBIL: RARUS 424 SHELL: CORENA OIL RS32 CALTEX: COMPRESSOR OIL RA32	
Coolant capacity	L	3.9	
Fuel tank capacity	L	18	
●Emergency stop devices			
Actuating pressure of oil pressure switch	kPa	※1 39.2 / 98.1	98.1
Actuating temperature of water temperature switch	°C	more than 110	
Actuating pressure of discharge air temperature switch	°C	more than 120	
●Warning devices			
Malfunction of charging		When it will not perform charging.	
●Fuel consumption ratio			
At full load (for reference only)	L/Hr	3.5	
At 70% load (for reference only)	L/Hr	3.0	
At 50% load (for reference only)	L/Hr	2.6	
At no load (for reference only)	L/Hr	1.6	

※1: Oil pressure switches fitted to PDS55S-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~87-5B20468

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. 87-5B20469~

1. Specification

Item	unit	PDS75S[SC]-5B2	PDS75S[SC]-5C1
●Weight · Mass			
Overall length	mm	1,580	
Overall length (Bonnet only)	mm	1,460	
Overall width	mm	750	
Overall height	mm	865	
Net dry mass	kg	425 [435]	
Operating mass	kg	465 [475]	
●Compressor			
Free air delivery	m ³ /min	2.1	
Working pressure	MPa	0.7	0.69
Pressure of pressure control valve	MPa	0.5	
Burst pressure of safety valve	MPa	1.0	
Ambient conditions: temperature	°C	-15 - +35	
Ambient conditions: altitude	m	less than 1,500	
●Engine			
Type		IHI SHIBAURA S753-C-8801	IHI SHIBAURA S753-D-8801
Rated output	kW/min ⁻¹	15.2/3,500	
Fuel consumption	g/kW·h	324	
Rated RPM	min ⁻¹	3,500	
RPM at unload conditions	min ⁻¹	2,000	
Net dry mass	kg	94	
●Lubricating oils			
Engine oil capacity (high-low level)	L	4.5-2.2	
Compressor oil capacity (including receiver tank and oil cooler etc.)	L	11	
Compressor oil capacity to be filled		Ambient temperature -15°C- 35°C	
		MOBIL: RARUS 424 SHELL: CORENA OIL RS32 CALTEX: COMPRESSOR OIL RA32	
Coolant capacity	L	4.3	
Fuel tank capacity	L	28	
●Emergency stop devices			
Actuating pressure of oil pressure switch	kPa	※1 39.2 / 98.1	98.1
Actuating temperature of water temperature switch	°C	more than 110	
Actuating pressure of discharge air temperature switch	°C	more than 120	
●Warning devices			
Malfunction of charging		When it will not perform charging.	
●Fuel consumption ratio			
At full load (for reference only)	L/Hr	5.0	
At 70% load (for reference only)	L/Hr	4.0	
At 50% load (for reference only)	L/Hr	3.2	
At no load (for reference only)	L/Hr	2.3	

※1:Oil pressure switches fitted to PDS75S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~C6-5B20837

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. C6-5B20838~

1. Specification

Item	unit	PDS100S [SC]-5B2	PDS100S [SC]-5C1
●Weight · Mass			
Overall length	mm	1,580	
Overall length (Bonnet only)	mm	1,460	
Overall width	mm	750	
Overall height	mm	865	
Net dry mass	kg	435 [445]	
Operating mass	kg	475 [485]	
●Compressor			
Free air delivery	m ³ /min	2.8	
Working pressure	MPa	0.7	0.69
Pressure of pressure control valve	MPa	0.5	
Burst pressure of safety valve	MPa	1.0	
Ambient conditions: temperature	°C	-15 - +35	
Ambient conditions: altitude	m	less than 1,500	
●Engine			
Type		IHI SHIBAURA S773L-C-8801	IHI SHIBAURA S773L-D-8801
Rated output	kW/min ⁻¹	19/3,500	
Fuel consumption	g/kW·h	321	
Rated RPM	min ⁻¹	3,500	
RPM at unload conditions	min ⁻¹	2,000	
Net dry mass	kg	98	
●Lubricating oils			
Engine oil capacity (high-low level)	L	4.9-2.7	
Compressor oil capacity (including receiver tank and oil cooler etc.)	L	11	
Compressor oil capacity to be filled		Ambient temperature -15°C- 35°C	
		MOBIL: RARUS 424 SHELL: CORENA OIL RS32 CALTEX: COMPRESSOR OIL RA32	
Coolant capacity	L	4.5	
Fuel tank capacity	L	28	
●Emergency stop devices			
Actuating pressure of oil pressure switch	kPa	※1 39.2 / 98.1	98.1
Actuating temperature of water temperature switch	°C	more than 110	
Actuating pressure of discharge air temperature switch	°C	more than 120	
●Warning devices			
Malfunction of charging		When it will not perform charging.	
●Fuel consumption ratio			
At full load (for reference only)	L/Hr	6.0	
At 70% load (for reference only)	L/Hr	4.4	
At 50% load (for reference only)	L/Hr	3.8	
At no load (for reference only)	L/Hr	2.5	

※1:Oil pressure switches fitted to PDS100S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~B6-5B22360

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. B6-5B22361~

1. Specification

Item	unit	PDS130S[SC]-5B2
●Weight · Mass		
Overall length	mm	1,700
Overall length (Bonnet only)	mm	1,580
Overall width	mm	890
Overall height	mm	1,060
Net dry mass	kg	665 [680]
Operating mass	kg	745 [760]
●Compressor		
Free air delivery	m ³ /min	3.7
Working pressure	MPa	0.7
Pressure of pressure control valve	MPa	0.4
Burst pressure of safety valve	MPa	1.0
Ambient conditions: temperature	°C	-15 - +35
Ambient conditions: altitude	m	less than 1,500
●Engine		
Type		IHI SHIBAURA N843L-C-8801
Rated output	kW/min ⁻¹	28/3,000
Fuel consumption	g/kW·h	272
Rated RPM	min ⁻¹	3,000
RPM at unload conditions	min ⁻¹	1,600
Net dry mass	kg	160
●Lubricating oils		
Engine oil capacity (high-low level)	L	6-3
Compressor oil capacity (including receiver tank and oil cooler etc.)	L	14
Compressor oil capacity to be filled		Ambient temperature -15°C - 35°C
		MOBIL: RARUS 424 SHELL: CORENA OIL RS32 CALTEX: COMPRESSOR OIL RA32
Coolant capacity	L	6.6
Fuel tank capacity	L	70
●Emergency stop devices		
Actuating pressure of oil pressure switch	kPa	※1 39.2 / 98.1
Actuating temperature of water temperature switch	°C	more than 110
Actuating pressure of discharge air temperature switch	°C	more than 120
●Warning devices		
Malfunction of charging		When it will not perform charging.
●Fuel consumption ratio		
At full load (for reference only)	L/Hr	8.0
At 70% load (for reference only)	L/Hr	5.5
At 50% load (for reference only)	L/Hr	4.5
At no load (for reference only)	L/Hr	2.8

※1: Oil pressure switches fitted to PDS130S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~B3-5B21393

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. B3-5B21394~

1. Specification

Item	unit	PDS175S [SC]-5B2	PDS175S [SC]-5C1
●Weight · Mass			
Overall length	mm	1,970	2,070
Overall length (Bonnet only)	mm	1,850	1,950
Overall width	mm	950	
Overall height	mm	1,060	
Net dry mass	kg	800 [830]	790 [810]
Operating mass	kg	900 [930]	900 [920]
●Compressor			
Free air delivery	m ³ /min	5.0	
Working pressure	MPa	0.7	0.69
Pressure of pressure control valve	MPa	0.5	0.4
Burst pressure of safety valve	MPa	1.0	
Ambient conditions: temperature	°C	-15 - +40	
Ambient conditions: altitude	m	less than 1,500	
●Engine			
Type		NISSAN DIESEL 2A-TD27	NISSAN DIESEL TD27B-08(VE pump type)
Rated output	kW/min ⁻¹	38.0/2,600	36.0/2,300
Fuel consumption	g/kW·h	286	284
Rated RPM	min ⁻¹	2,600	2,500
RPM at unload conditions	min ⁻¹	1,300	1,250
Net dry mass	kg	240	225
●Lubricating oils			
Engine oil capacity (high-low level)	L	10.0-8.0	
Compressor oil capacity (including receiver tank and oil cooler etc.)	L	16	10
Compressor oil capacity to be filled		Ambient temperature -15°C- 35°C	
		MOBIL: RARUS 424 SHELL: CORENA OIL RS32 CALTEX: COMPRESSOR OIL RA32	
Coolant capacity	L	8.5	9.5
Fuel tank capacity	L	90	
●Emergency stop devices			
Actuating pressure of oil pressure switch	kPa	60	
Actuating temperature of water temperature switch	°C	more than 110	
Actuating pressure of discharge air temperature switch	°C	more than 120	
Increase of condensate in fuel filter	ml	—	Condensate volume : over 120-170
●Warning devices			
Malfunction of charging		When it will not perform charging.	
●Fuel consumption ratio			
At full load (for reference only)	L/Hr	10.0	
At 70% load (for reference only)	L/Hr	7.5	
At 50% load (for reference only)	L/Hr	6.0	
At no load (for reference only)	L/Hr	3.5	

1. Specification

1.2 Set Value

Item	unit	PDS55S-5B2	PDS55S-5C1
●Safety devices			
Discharge air temperature	℃	120	
Engine oil pressure	kPa	※1 39.2 / 98.1	98.1
Engine coolant temperature	℃	110	
Fuel residual level	L	less than about 4	
●Set value			
Pressure control valve	MPa	0.39	
Actuating pressure of safety valve	MPa	1.0	
Unload starting pressure	MPa	0.7	0.69
●Engine RPM			
Rated RPM	min ⁻¹	3,200	
RPM at unload	min ⁻¹	2,200	
●Indications of gauges or instruments during operation			
Discharge pressure gauge (at full load)	MPa (kgf/cm ²)	0.39-0.70 (4.0-7.1)	0.39-0.69 (4.0-7.0)
Discharge pressure gauge (at no load)	MPa (kgf/cm ²)	0.70-0.90 (7.1-9.2)	0.69-0.90 (7.0-9.2)

※1:Oil pressure switches fitted to PDS55S-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~87-5B20468

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. 87-5B20469~

1. Specification

Item	unit	PDS75S[SC]-5B2	PDS75S[SC]-5C1
●Safety devices			
Discharge air temperature	℃	120	
Engine oil pressure	kPa	※1 39.2 / 98.1	98.1
Engine coolant temperature	℃	110	
Fuel residual level	L	less than about 6	
●Set value			
Pressure control valve	MPa	0.5	
Actuating pressure of safety valve	MPa	1.0	
Unload starting pressure	MPa	0.7	0.69
●Engine RPM			
Rated RPM	min ⁻¹	3,500	
RPM at unload	min ⁻¹	2,000	
●Indications of gauges or instruments during operation			
Discharge pressure gauge (at full load)	MPa (kgf/cm ²)	0.50-0.70 (5.1-7.1)	0.50-0.69 (5.1-7.0)
Discharge pressure gauge (at no load)	MPa (kgf/cm ²)	0.70-0.90 (7.1-9.2)	0.69-0.90 (7.0-9.2)

※1:Oil pressure switches fitted to PDS75S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~C6-5B20837

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. C6-5B20838~

1. Specification

Item	unit	PDS100S[SC]-5B2	PDS100S[SC]-5C1
●Safety devices			
Discharge air temperature	℃	120	
Engine oil pressure	kPa	※1 39.2 / 98.1	98.1
Engine coolant temperature	℃	110	
Fuel residual level	L	less than about 6	
●Set value			
Pressure control valve	MPa	72.5 (0.5)	
Actuating pressure of safety valve	MPa	145 (1.0)	
Unload starting pressure	MPa	102 (0.7)	100 (0.69)
●Engine RPM			
Rated RPM	min ⁻¹	3,500	
RPM at unload	min ⁻¹	2,000	
●Indications of gauges or instruments during operation			
Discharge pressure gauge (at full load)	MPa (kgf/cm ²)	0.50-0.70 (5.1-7.1)	0.50-0.69 (5.1-7.0)
Discharge pressure gauge (at no load)	MPa (kgf/cm ²)	0.70-0.90 (7.1-9.2)	0.69-0.90 (7.0-9.2)

※1:Oil pressure switches fitted to PDS100S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~B6-5B22360

(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. B6-5B22361~

1. Specification

Item	unit	PDS130S[SC]-5B2
●Safety devices		
Discharge air temperature	℃	120
Engine oil pressure	kPa	※1 39.2 / 98.1
Engine coolant temperature	℃	110
Fuel residual level	L	less than about 16
●Set value		
Pressure control valve	MPa	0.4
Actuating pressure of safety valve	MPa	1.0
Unload starting pressure	MPa	0.7
●Engine RPM		
Rated RPM	min ⁻¹	3,000
RPM at unload	min ⁻¹	1,600
●Indications of gauges or instruments during operation		
Discharge pressure gauge (at full load)	MPa (kgf/cm ²)	0.40-0.70 (4.1-7.1)
Discharge pressure gauge (at no load)	MPa (kgf/cm ²)	0.70-0.90 (7.1-9.2)

※1:Oil pressure switches fitted to PDS130S[SC]-5B2 are different in part number, depending upon machine serial numbers.

(Old type) Oil pressure switch with no part number. This was supplied together with engines.

Actuating pressure: 39.2kPa SER.NO ~B3-5B21393

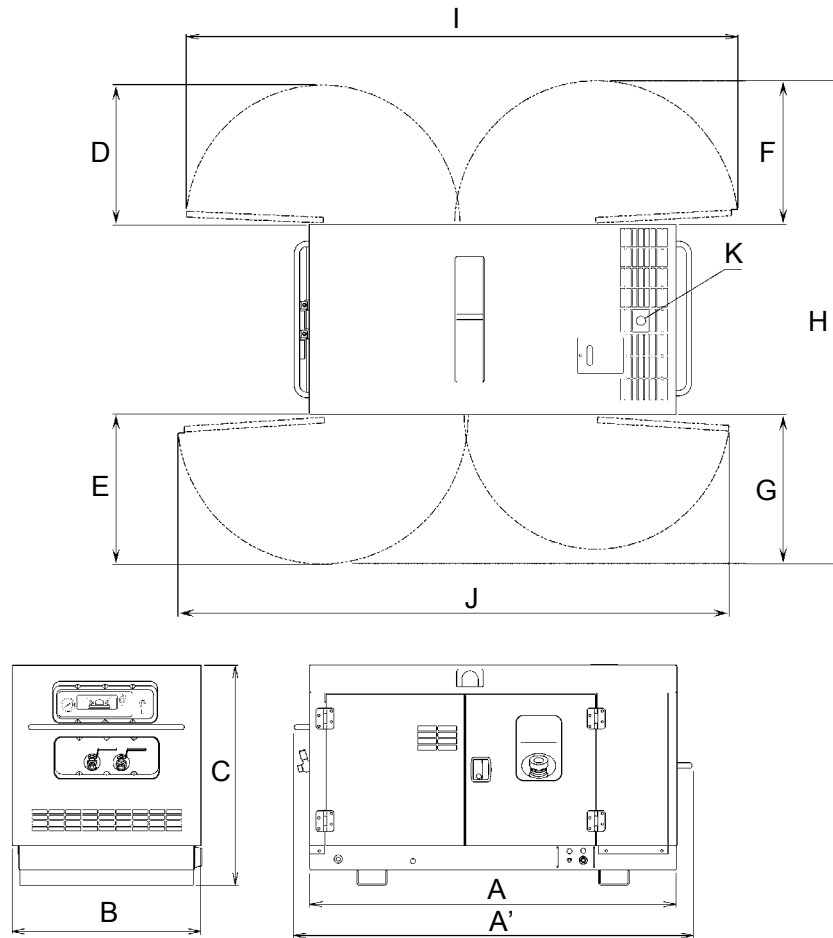
(New type) Oil pressure switch Part No. 44328 06700 Actuating pressure: 98.1kPa SER NO. B3-5B21394~

1. Specification

Item	unit	PDS175S[SC]-5B2	PDS175S[SC]-5C1
●Safety devices			
Discharge air temperature	°C	120	
Engine oil pressure	kPa	60	
Engine coolant temperature	°C	110	
Increase of condensate in fuel filter	ml	—	Condensate volume : over 120-170
●Set value			
Pressure control valve	MPa	0.5	0.4
Actuating pressure of safety valve	MPa	1.0	
Unload starting pressure	MPa	0.7	0.69
●Engine RPM			
Rated RPM	min ⁻¹	2,600	2,500
RPM at unload	min ⁻¹	1,300	1,250
●Indications of gauges or instruments during operation			
Discharge pressure gauge (at full load)	MPa (kgf/cm ²)	0.50-0.70 (5.1-7.1)	0.40-0.69 (4.1-7.0)
Discharge pressure gauge (at no load)	MPa (kgf/cm ²)	0.72-0.90 (7.3-9.2)	

1. Specification

1.3 Outline drawing



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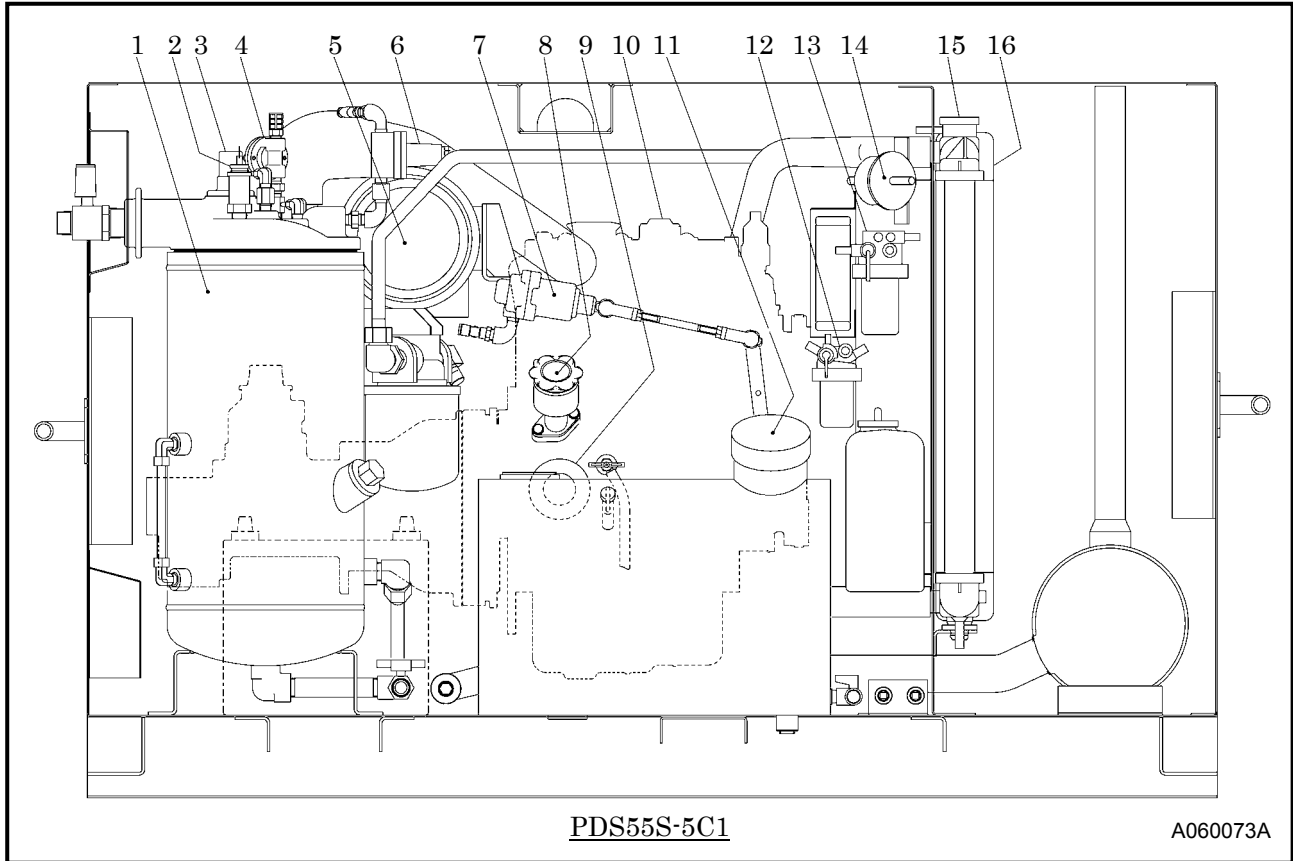
Item	unit	PDS55S -5B2/5C1	PDS75S[SC] -5B2/5C1	PDS100S[SC] -5B2/5C1	PDS130S[SC] -5B2	PDS175S[SC] -5B2/5C1	
●Outline							
Overall length	A	mm	1,300	1,460	←	1,580	1,850/1,950
Overall length	A'	mm	1,420	1,580	←	1,700	1,970/2,070
Overall width	B	mm	720	750	←	890	950
Overall height	C	mm	820	865	←	1,060	←
●Door size							
Door	D	mm	-	545	←	600	690/745
Door	E	mm	515	585	←	635	715/730
Door	F	mm	-	565	←	635	715/770
Door	G	mm	600	525	←	600	690/775
Door	H	mm	1,320	1,900	←	2,160	2,360/2,495
Door	I	mm	-	2,170	←	2,430	2,780/2,980
Door	J	mm	2,200	2,170	←	2,450	2,780/2,980
Exhaust pipe diameter	K	mm	φ 35	φ 42.7	←	φ 50.8	φ 60.5

1. Specification

1.4 Internal Components and Part Names

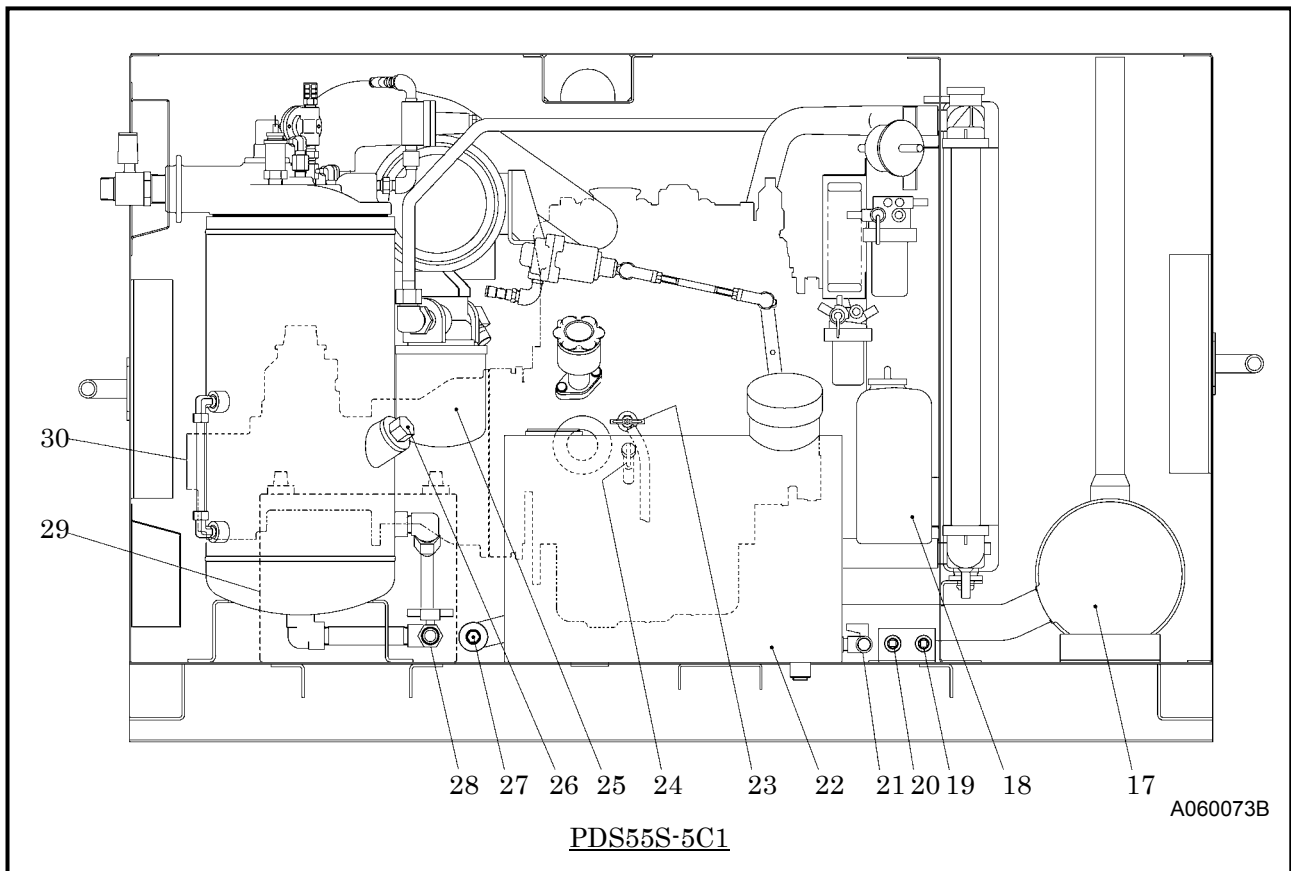
1.4.1 Standard Type

(1) PDS55S-5B2/5C1



No.	Description	Function
1	Separator receiver tank	For separating compressor oil from compressed air sent into the tank.
2	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure.
3	Pressure control valve	For keeping receiver tank pressure above specified one constantly.
4	Auto relief valve	For releasing the compressed air to the atmosphere. When the compressor stops.
5	Air filter	For filtering the dust floating in the intake air.
6	Pressure regulator	For regulating intake air volume.
7	Speed regulator	For regulating compressor revolution speed.
8	Engine oil filler port	For supplying and replenishing engine oil to engine.
9	Engine oil filter	For filtering engine oil.
10	Engine	For driving the compressor.
11	Fuel tank filler port	For supplying and replenishing diesel fuel oil.
12	Sedimenter	For separating water mixed or to be mixed in the fuel oil.
13	Fuel filter	For filtering dust and foreign matter mixed or to be mixed in the fuel oil.
14	Air bleeding electromagnetic pump	For feeding diesel fuel oil to engine.
15	Radiator	For cooling the coolant for engine because it is water-cooled.
16	Oil cooler	For cooling compressor oil circulating in the system.

1. Specification

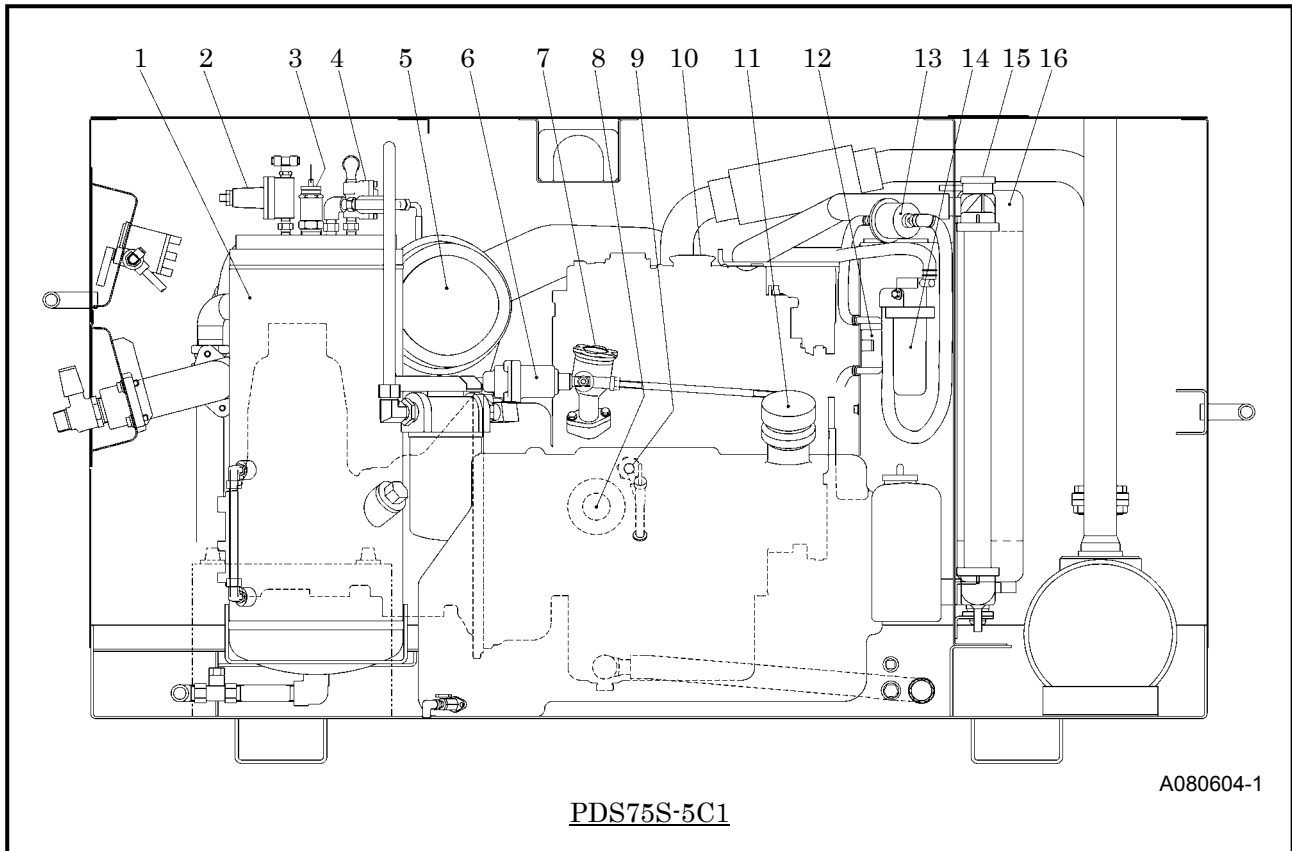


No.	Description	Function
17	Exhaust muffler	For exhausting engine emission gas.
18	Reserve tank	For checking engine cooling water level and for replenishing cooling water.
19	Oil cooler drain plug	For draining compressor oil from oil cooler and also from oil lines.
20	Radiator drain plug	For draining condensate accumulated at the bottom of radiator.
21	Fuel tank drain valve	For draining condensate and water accumulated at the bottom of the fuel tank.
22	Fuel tank	For storing diesel fuel oil.
23	Coolant drain valve	For draining condensate from engine.
24	Engine oil level gauge	For checking engine oil level.
25	Compressor oil filter	For filtering compressor oil circulating in the system.
26	Compressor oil filler port	For supplying and replenishing compressor oil.
27	Engine oil drain plug	For draining engine oil for replacement of it and for maintenance.
28	Compressor oil drain valve	For draining compressor oil from separator receiver tank.
29	Battery	For electrically starting engine.
30	Air-end	For compressing intake air.

※Instrument marked 29 is provided on the other side (opposite side of maintenance).

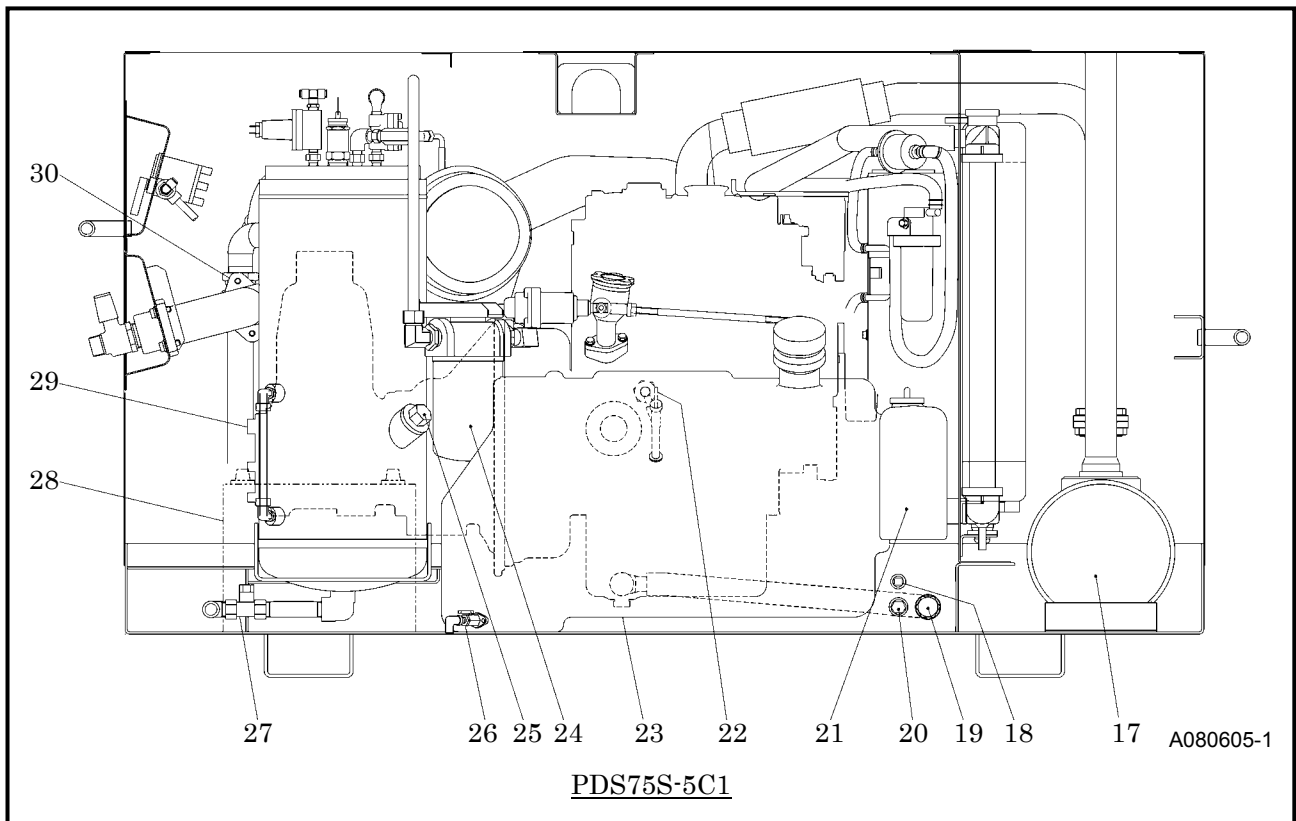
1. Specification

(2) PDS75,100S-5B2/5C1, PDS130S-5B2



No.	Description	Function
1	Separator receiver tank	For separating compressor oil from compressed air sent into the tank.
2	Pressure regulator	For regulating intake air volume.
3	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure.
4	Auto relief valve	For releasing the compressed air to the atmosphere. When the compressor stops.
5	Air filter	For filtering the dust floating in the intake air.
6	Speed regulator	For regulating compressor revolution speed.
7	Engine oil filler port	For supplying and replenishing engine oil to engine.
8	Engine oil filter	For filtering engine oil.
9	Coolant drain plug	For draining condensate from engine.
10	Engine	For driving the compressor.
11	Fuel tank filler port	For supplying and replenishing diesel fuel oil.
12	Filter for electromagnetic pump	For filtering dust and foreign matter mixed or to be mixed in the fuel oil.
13	Air bleeding electromagnetic pump	For feeding diesel fuel oil to engine.
14	Fuel filter (sedimenter built-in type)	For filtering dust and foreign things mixed in fuel oil and also for separating water.
15	Radiator	For cooling the coolant for engine because it is water-cooled.
16	Oil cooler	For cooling compressor oil circulating in the system.

1. Specification

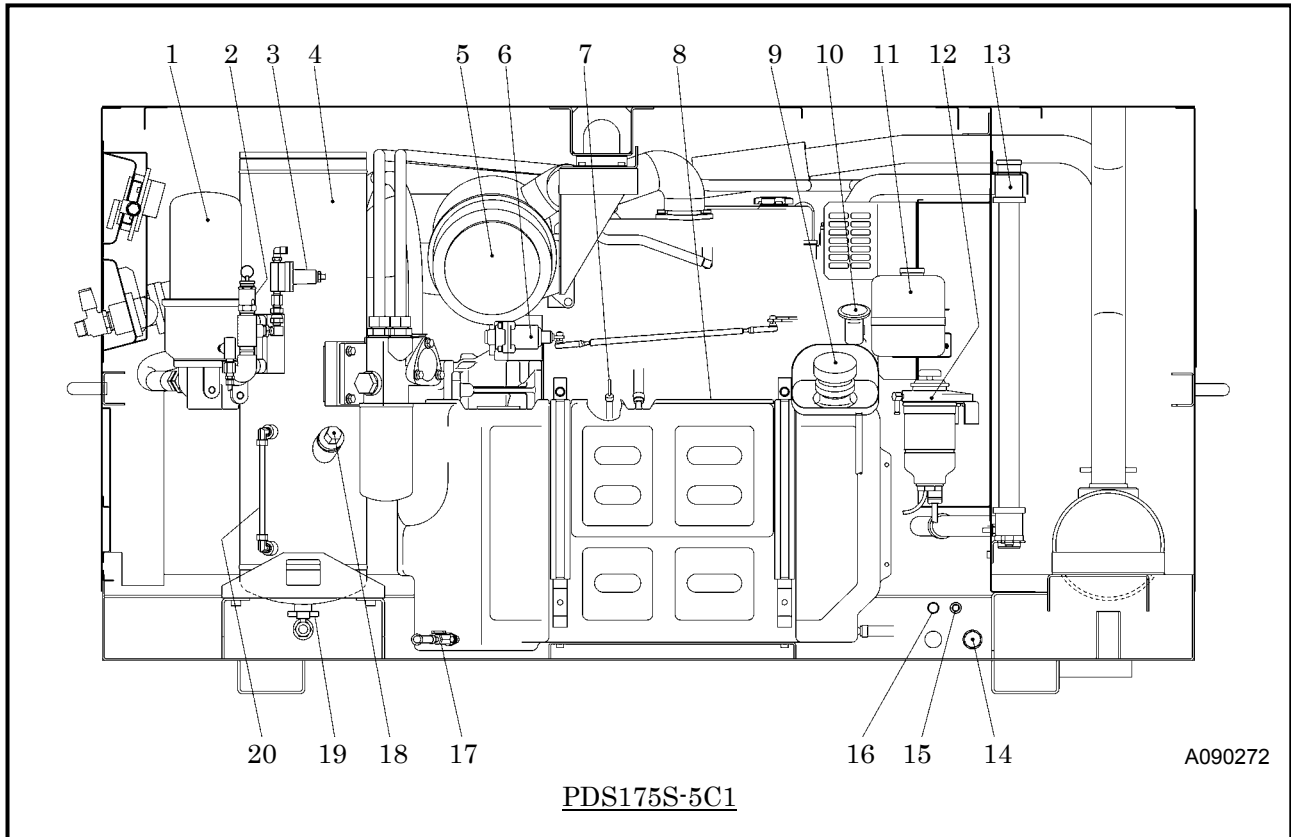


No.	Description	Function
17	Exhaust muffler	For exhausting engine emission gas.
18	Oil cooler drain plug	For draining compressor oil from oil cooler and also from oil lines.
19	Engine oil drain plug	For draining engine oil for replacement of it and for maintenance
20	Coolant drain plug	For draining condensate from engine.
21	Reserve tank	For checking engine cooling water level and for replenishing cooling water.
22	Engine oil level gauge	For checking engine oil level.
23	Fuel tank	For storing diesel fuel oil.
24	Compressor oil filter	For filtering compressor oil circulating in the system.
25	Compressor oil filler port	For supplying and replenishing compressor oil.
26	Fuel tank drain valve	For draining condensate and water accumulated at the bottom of the fuel tank.
27	Compressor oil drain valve	For draining compressor oil from separator receiver tank.
28	Battery	For electrically starting engine.
29	Air-end	For compressing intake air.
30	Pressure control orifice	For keeping receiver tank pressure above specified one constantly.

※Instrument marked 28 is provided on the other side (opposite side of maintenance).

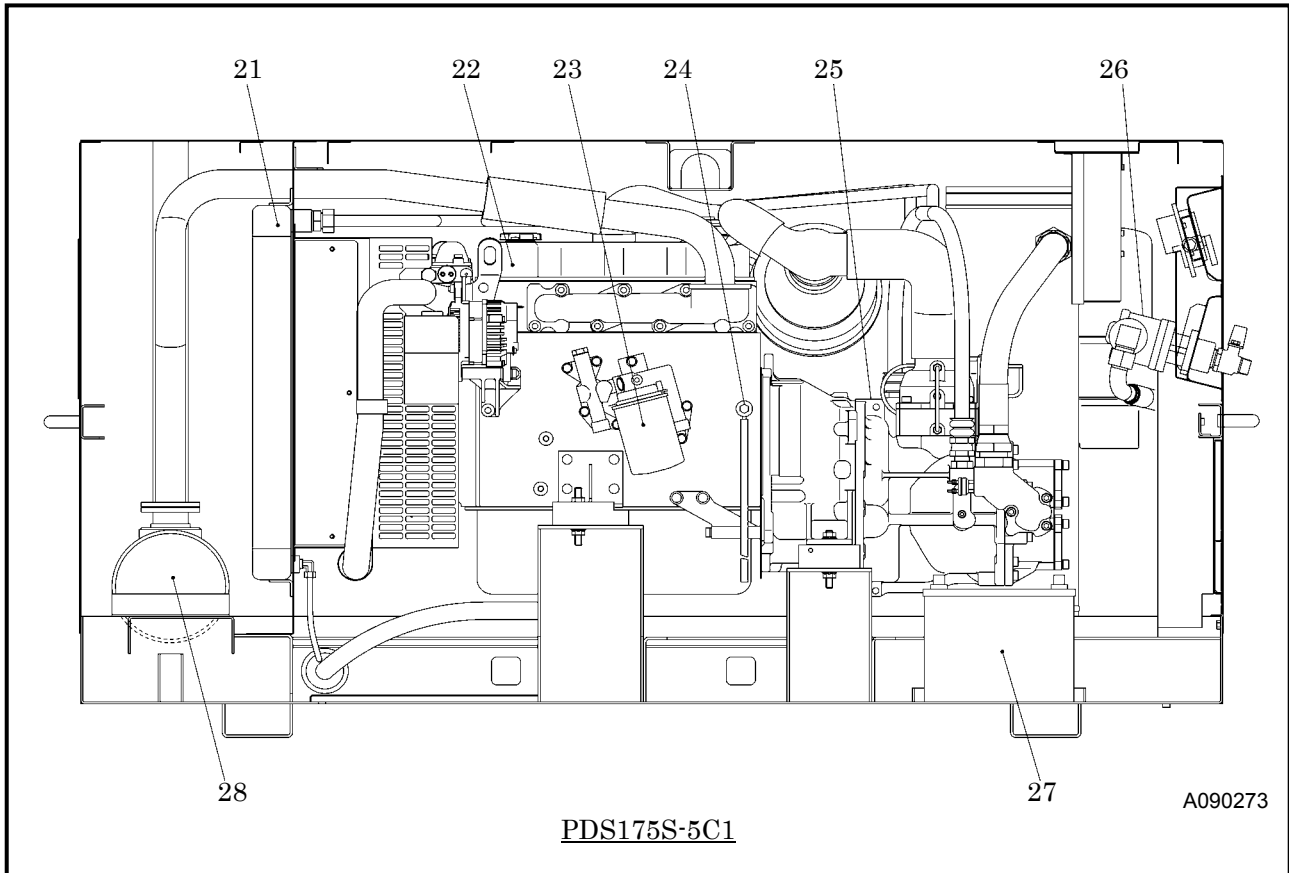
1. Specification

(3) PDS175S-5B2/5C1



No.	Description	Function
1	Oil separator	For separating oil mist mixed in compressed air.
2	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure.
3	Pressure regulator	For adjusting intake air volume (into compressor air-end)
4	Separator receiver tank	For separating compressor oil from compressed air sent into the tank.
5	Air filter	For filtering the dust floating in the intake air.
6	Speed regulator	For regulating revolution speed of engine.
7	Engine oil level gauge	For checking engine oil level.
8	Fuel tank	For storing diesel fuel oil.
9	Fuel tank filler port	For supplying and replenishing fuel oil.
10	Engine oil filler port	For supplying and replenishing engine oil to engine.
11	Reserve tank	For checking engine cooling water level and for replenishing cooling water.
12	Fuel filter (sedimenter built-in type)	For filtering dust and foreign matter mixed or to be mixed in the fuel oil and for separating water mixed or to be mixed in the fuel oil.
13	Radiator	For cooling the coolant for engine because it is water-cooled.
14	Engine oil drain plug	For draining engine oil for replacement of it and for maintenance
15	Radiator drain plug	For draining condensate accumulated at the bottom of radiator.
16	Oil cooler drain valve	For draining condensate accumulated at the bottom of oil cooler.

1. Specification



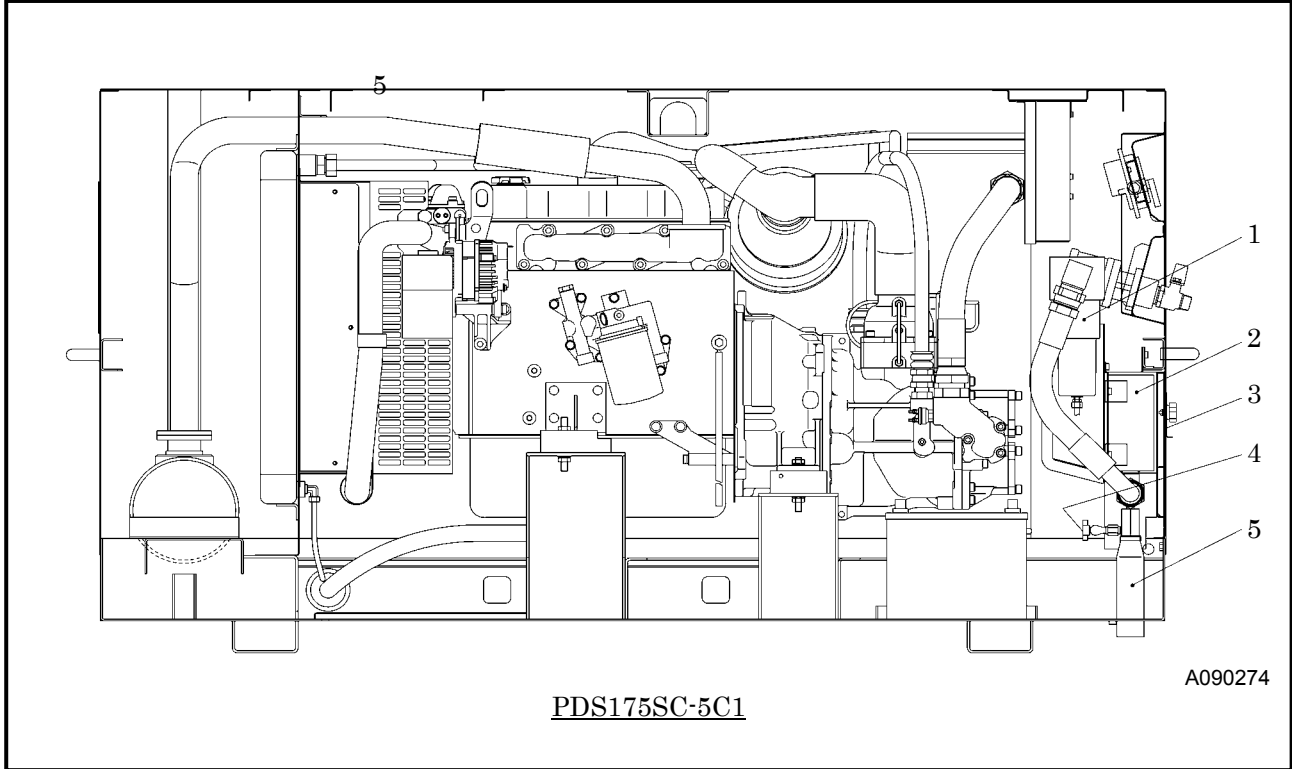
No.	Description	Function
17	Fuel tank drain valve	For draining condensate and water accumulated at the bottom of the fuel tank.
18	Compressor oil filler port	For supplying and replenishing compressor oil.
19	Compressor oil drain valve	For draining compressor oil from separator receiver tank.
20	Compressor oil level gauge	For checking compressor oil level.
21	Oil cooler	For cooling compressor oil circulating in the system.
22	Engine	For driving the compressor.
23	Engine oil filter	For filtering engine oil.
24	Coolant drain plug	For draining condensate from engine.
25	Air-end	For compressing intake air.
26	Pressure control valve	For keeping the receiver tank pressure higher than 0.4MPa in the tank.
27	Battery	For electrically starting engine.
28	Exhaust muffler	Equipment which muffles an engine exhaust sound.

1. Specification

(4) PDS75,100SC-5B2/5C1, PDS130SC-5B2, PDS175SC-5B2/5C1

[Unit equipped with aftercooler]

Only the special devise additionally or optionally attached to the standard unit are shown in the following figure.



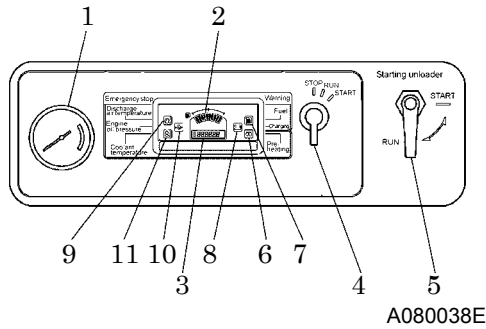
No.	Description	Function
1	Drain separator	For separating water from compressed air cooled through oil cooler.
2	After cooler	For cooling compressed air.
3	Shutter for cold weather	For shutting out atmospheric air from after-cooler to prevent after-cooler from getting frozen during cold season.
4	Drain warming valve	For preventing freezing of water separated through drain separator when exhausting it.
5	Drain port of air pipe	For collecting condensate and draining it.

1. Specification

1.5 Instrument panel

(1)PDS55~130S

1. Discharge air pressure gauge
2. Fuel level gauge
3. Elapsed time indicator
4. Starter switch
5. Starting unloader valve



PDS55,75,100S-5C1

- <Indicator lamp>
- 6. Preheating
- <Warning lamp>
- 7. Fuel residual level
- 8. Charging
- <Emergency stop lamp>
- 9. Discharge air temperature
- 10. Engine oil pressure
- 11. Coolant temperature

Indicator lamp

Turn the starter switch to “RUN” position. Then the lamp will go on.

Item	Trouble	Measures	Monitor
Preheating	Press starter switch “RUN” and the lamp goes on and after preheating is finished, the lamp will be off.	—	

Warning lamp

When some little trouble occurs during operation, the lamp will go on.

When the warning lamp goes on, take appropriate measures to recover the situation swiftly.

Item	Trouble	Measures	Monitor
Fuel residual level	When fuel level of fuel tank becomes lower, the lamp goes on.	Add fuel oil.	
Charging	Lamp goes on when alternator is not charging.	Check wiring. Check alternator.	

Emergency stop lamp

The compressor stops when the emergency stop lamp goes on.

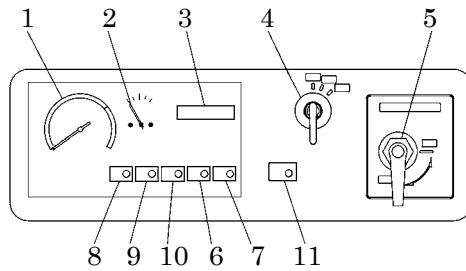
Be sure to follow the measures shown below before starting the unit again.

Item	Trouble	Measures	Monitor
Discharge air temperature	Lamp goes on when the air temperature at the outlet of the air-end reaches the set temperature of 120°C.	See 4.3 “Function of emergency switch”.	
Engine oil pressure	Lamp goes on when engine oil pressure drops. The function pressure is below 98.1kPa.		
Coolant temperature	Lamp goes on when coolant temperature reaches 110°C.		

1. Specification

(2)PDS175S

1. Discharge air pressure gauge
2. Fuel level gauge
3. Elapsed time indicator
4. Starter switch
5. Starting unloader valve



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PDS175S-5C1

<Indicator lamp>

6. Glow

<Warning lamp>

7. Charging

<Emergency stop lamp>

8. Engine oil pressure

9. Coolant temperature

10. Discharge air temperature

11. Fuel drain

Indicator lamp

Turn the starter switch to “RUN” position. Then the lamp goes on.

Item	Contents	Measures	Monitor
GLOW	Press starter switch “RUN” and the lamp goes on and after preheating is finished, the lamp will be off.	—	

Warning lamp

When some little trouble occurs during operation, the lamp will go on.

When the warning lamp goes on, take appropriate measures to recover the situation swiftly.

Item	Contents	Measures	Monitor
CHARGE	Lamp goes on when alternator is not charging.	Check wiring. Check alternator.	

Emergency stop lamp

The compressor stops when the emergency stop lamp goes on.

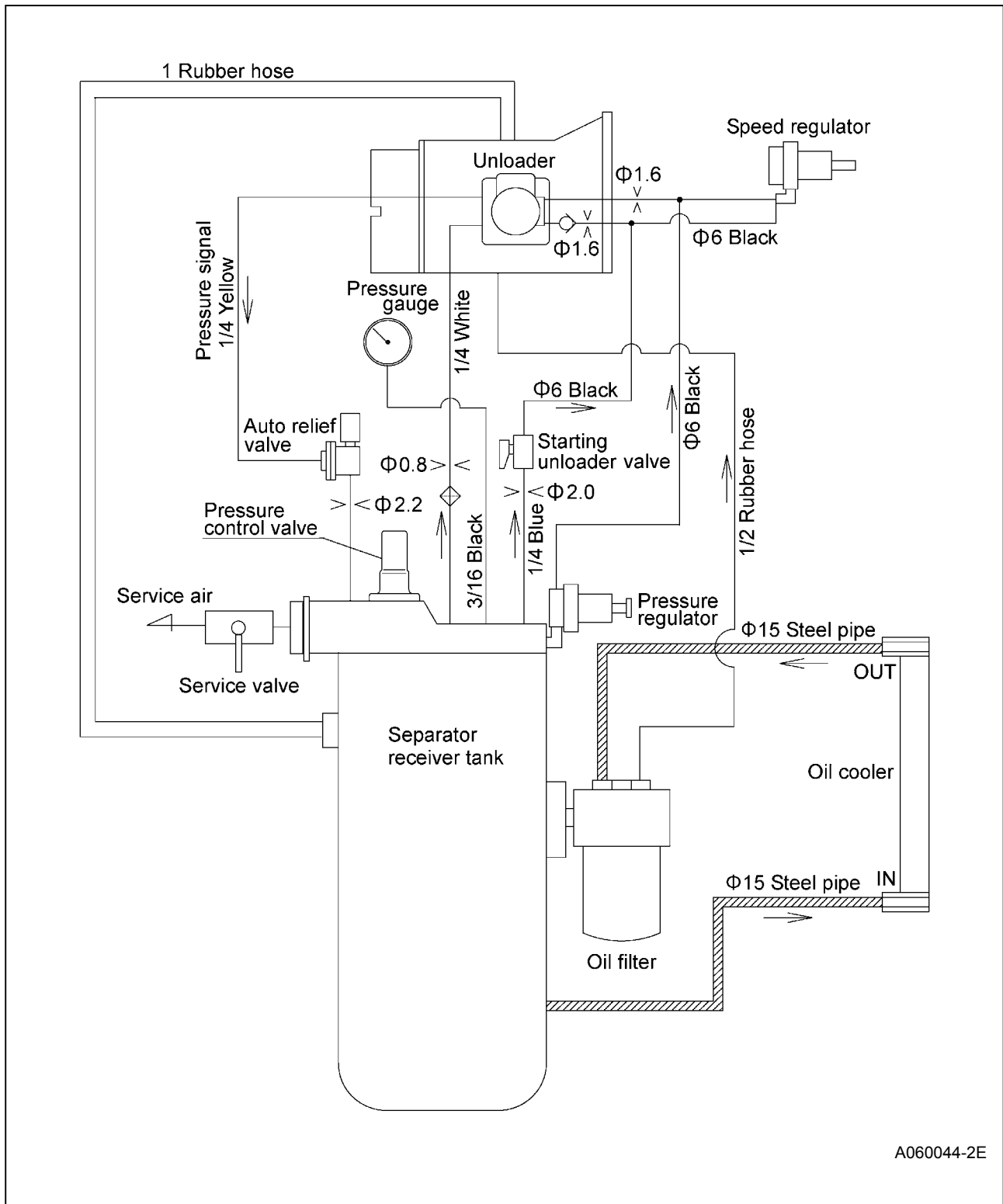
Be sure to follow the measures shown below before starting the unit again.

Item	Contents	Measures	Monitor
ENG. OIL PRESS.	Lamp goes on when engine oil pressure drops. The function pressure is below 60kPa.	See “Troubleshooting”	
WATER TEMP.	Lamp goes on when coolant temperature reaches 110°C.		
DISCHARGE TEMP.	Lamp goes on when the air temperature at the outlet of the air-end reaches the set temperature of 120°C.		
FUEL DRAIN	When the level of fuel condensate accumulated in fuel filter becomes more than the limit, this lamp goes on. Actuating volume of fuel condensate accumulated is between 120 and 170 ml.	Drain fuel condensate.	

1. Specification

1.6 Piping Diagram

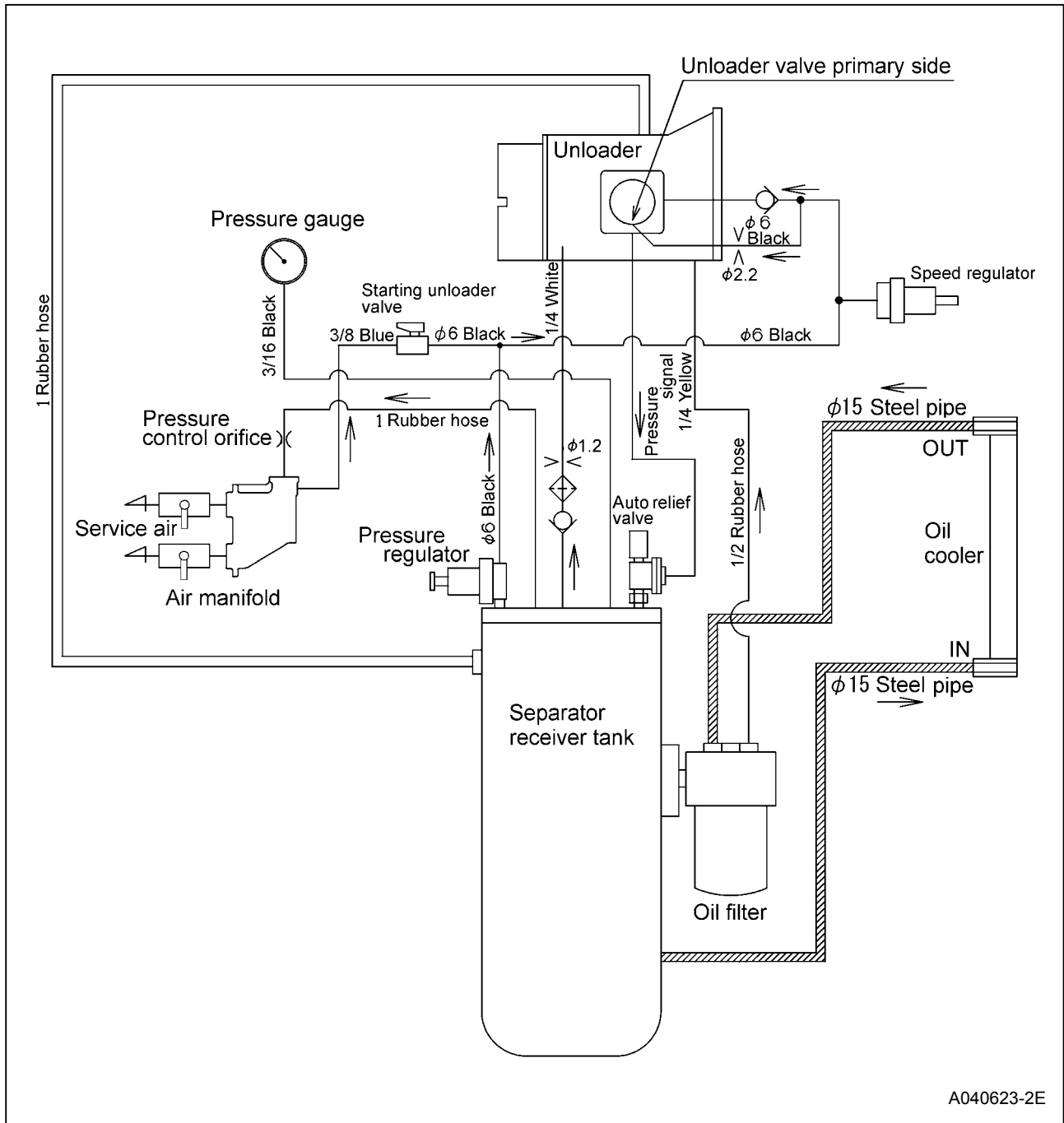
(1) PDS55S-5B2/5C1



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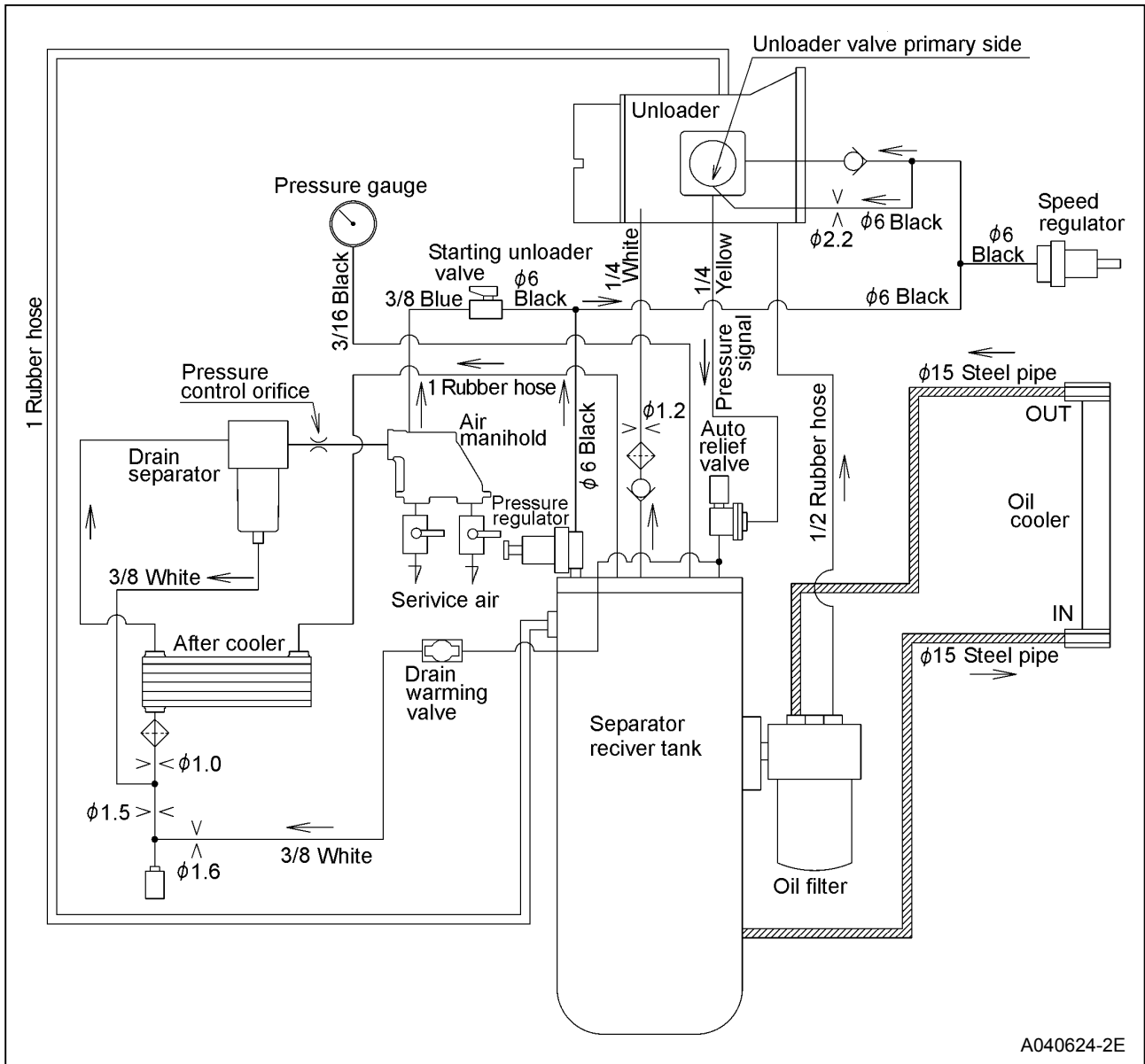
1. Specification

(2) PDS75S-5B2/5C1
PDS100S-5B2/5C1



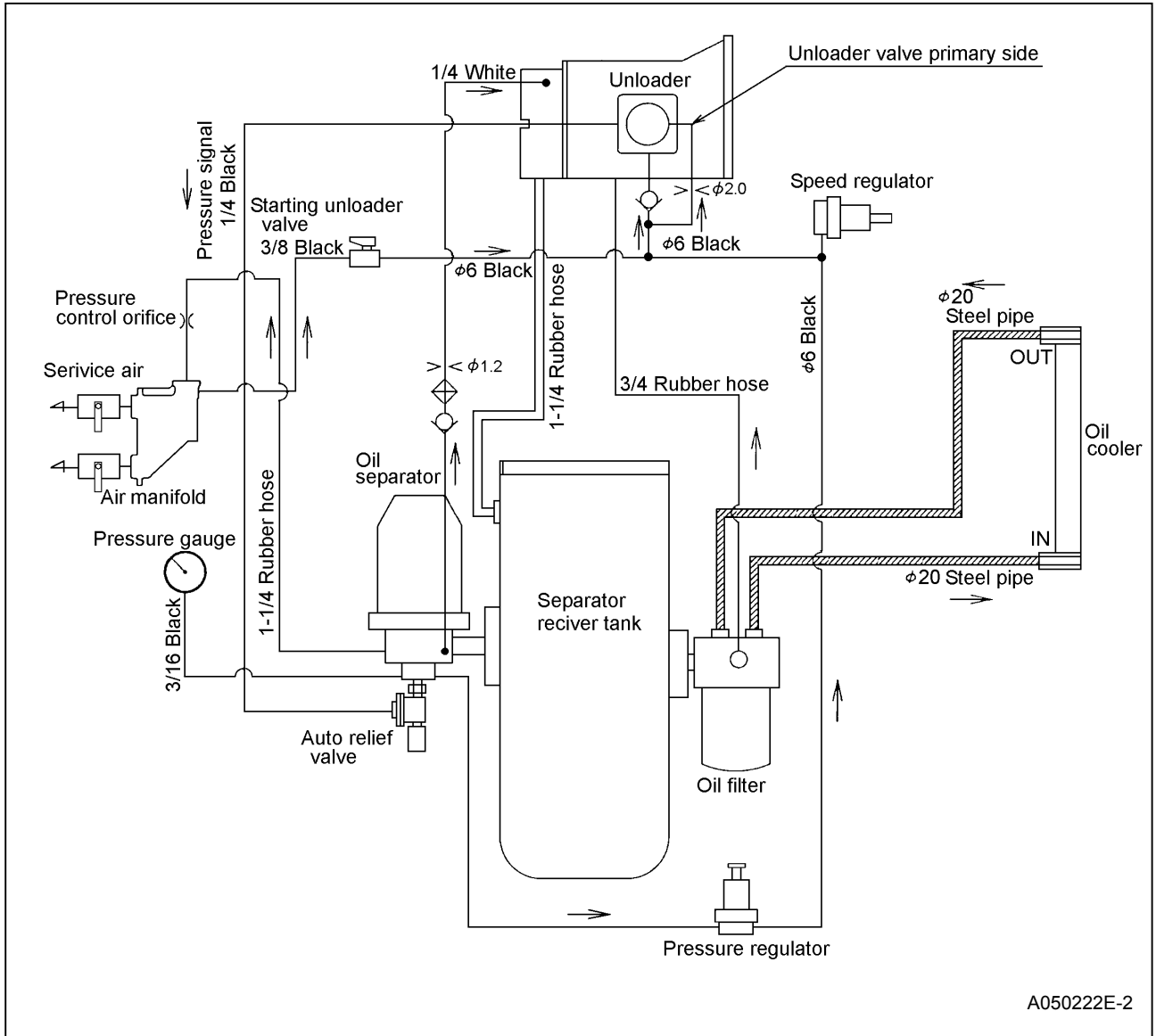
1. Specification

(3) PDS75SC-5B2/5C1 (Aftercooler Type)
 PDS100SC-5B2/5C1(Aftercooler Type)



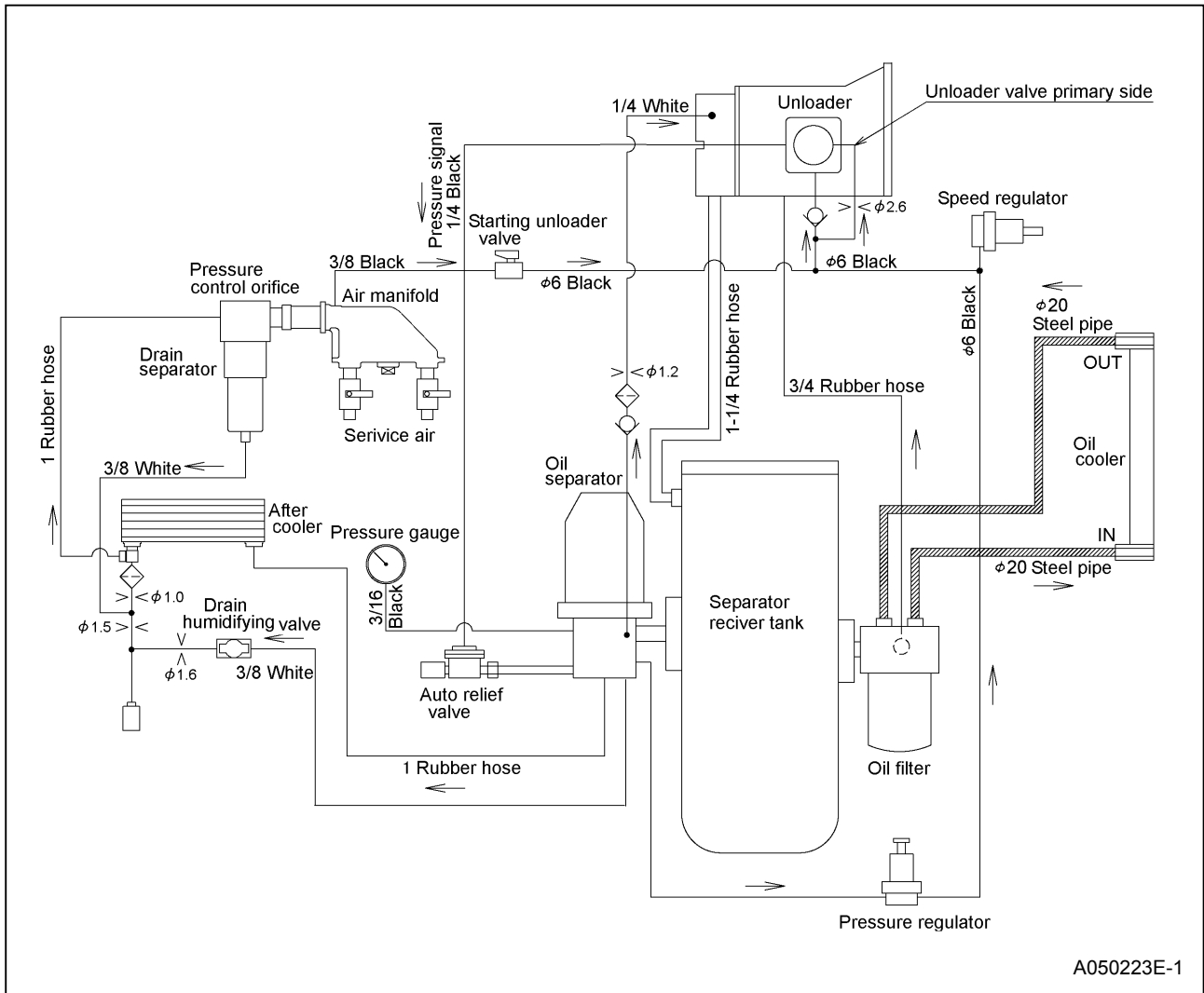
1. Specification

(4) PDS130S-5B2



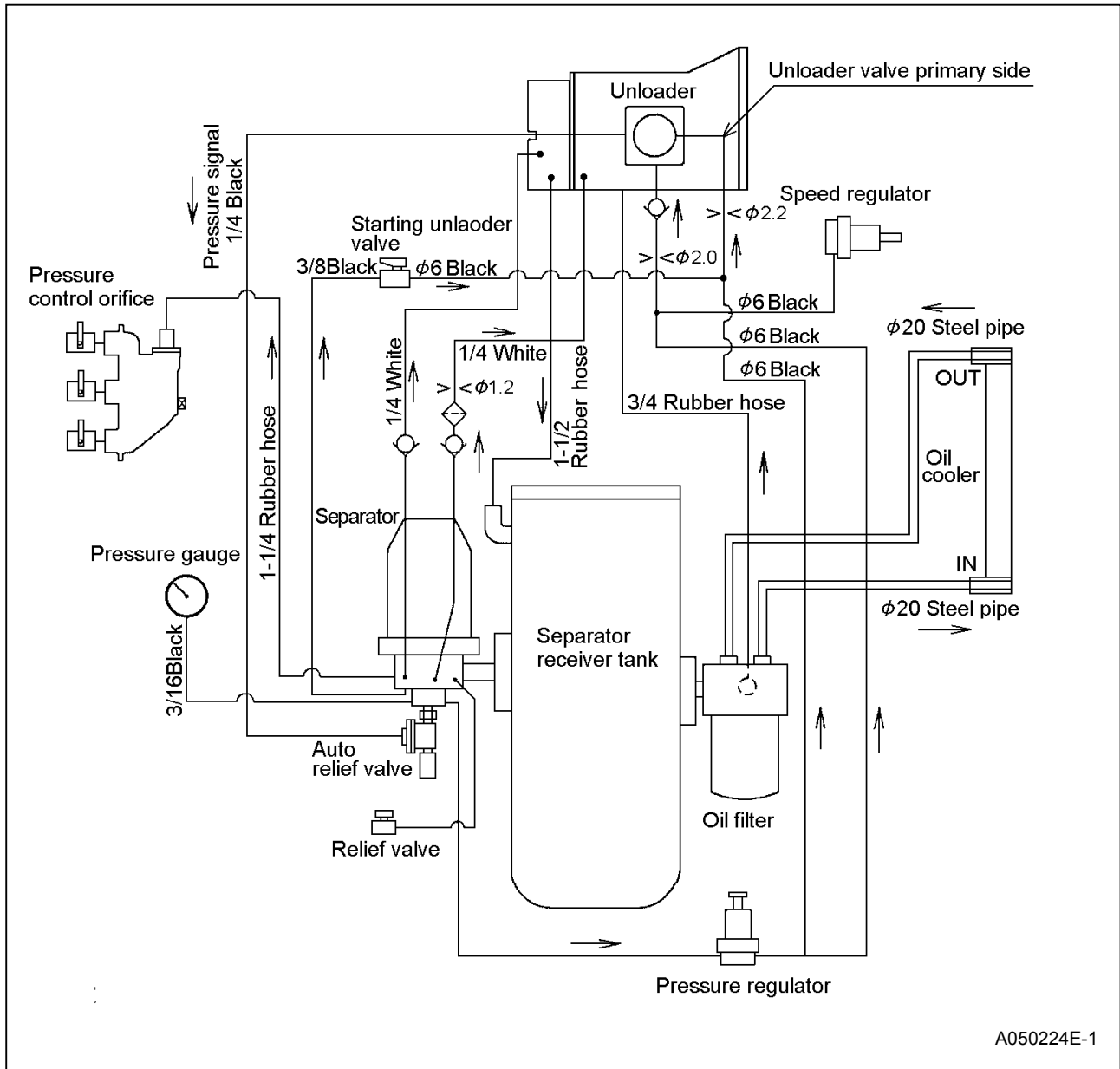
1. Specification

(5) PDS130SC-5B2 (Aftercooler Type)



1. Specification

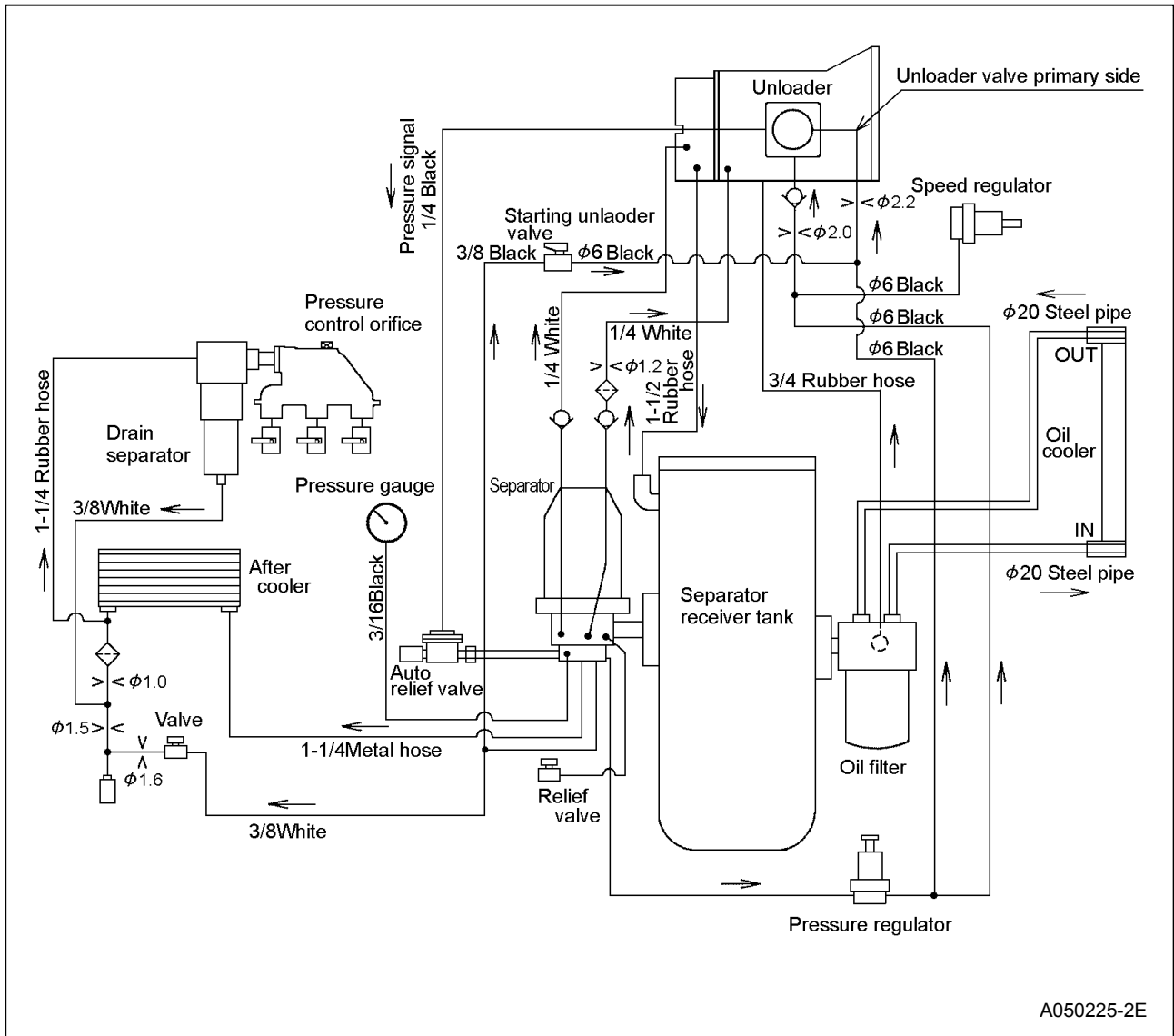
(6) PDS175S-5B2



A050224E-1

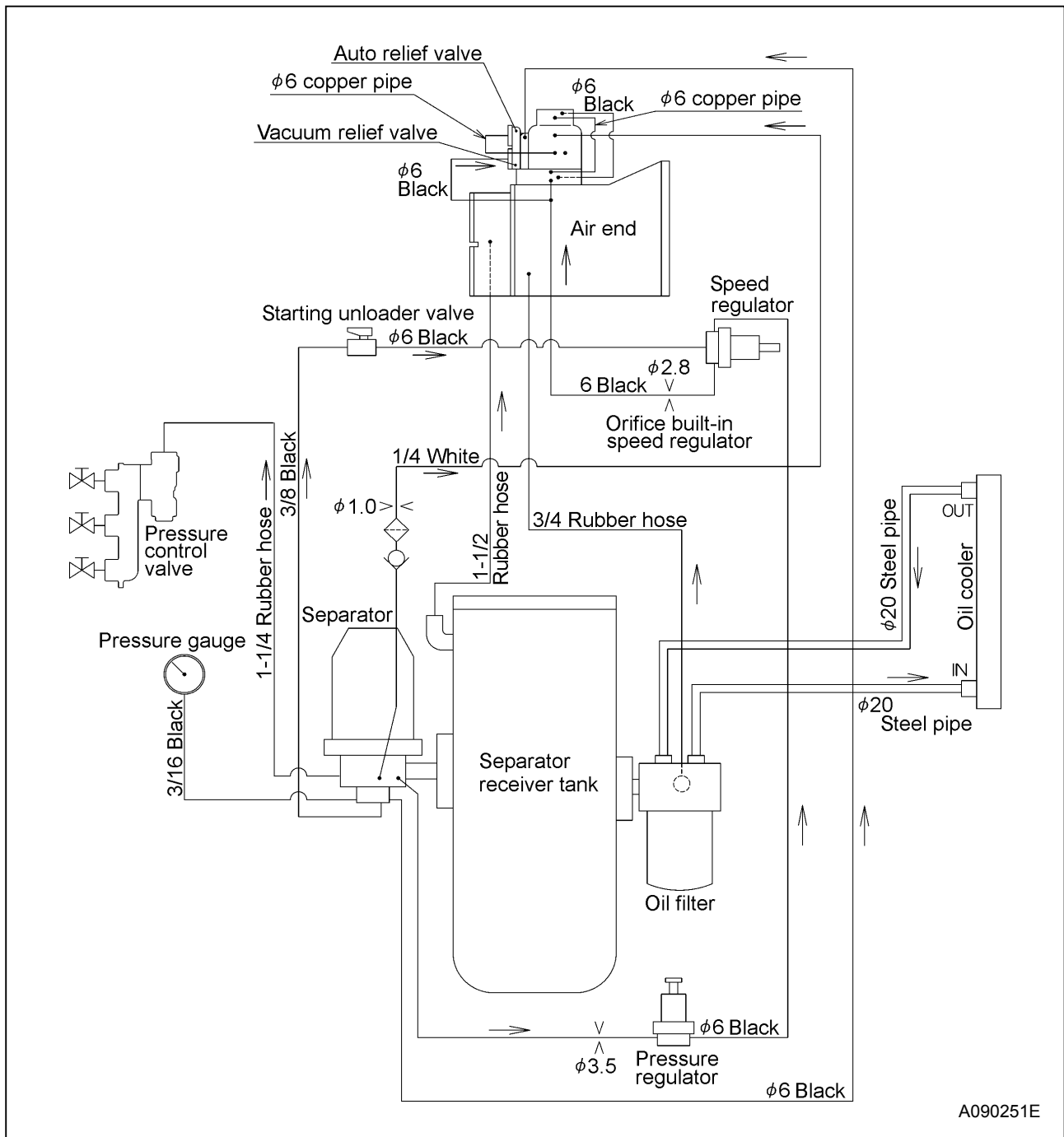
1. Specification

(7) PDS175SC-5B2 (Aftercooler Type)



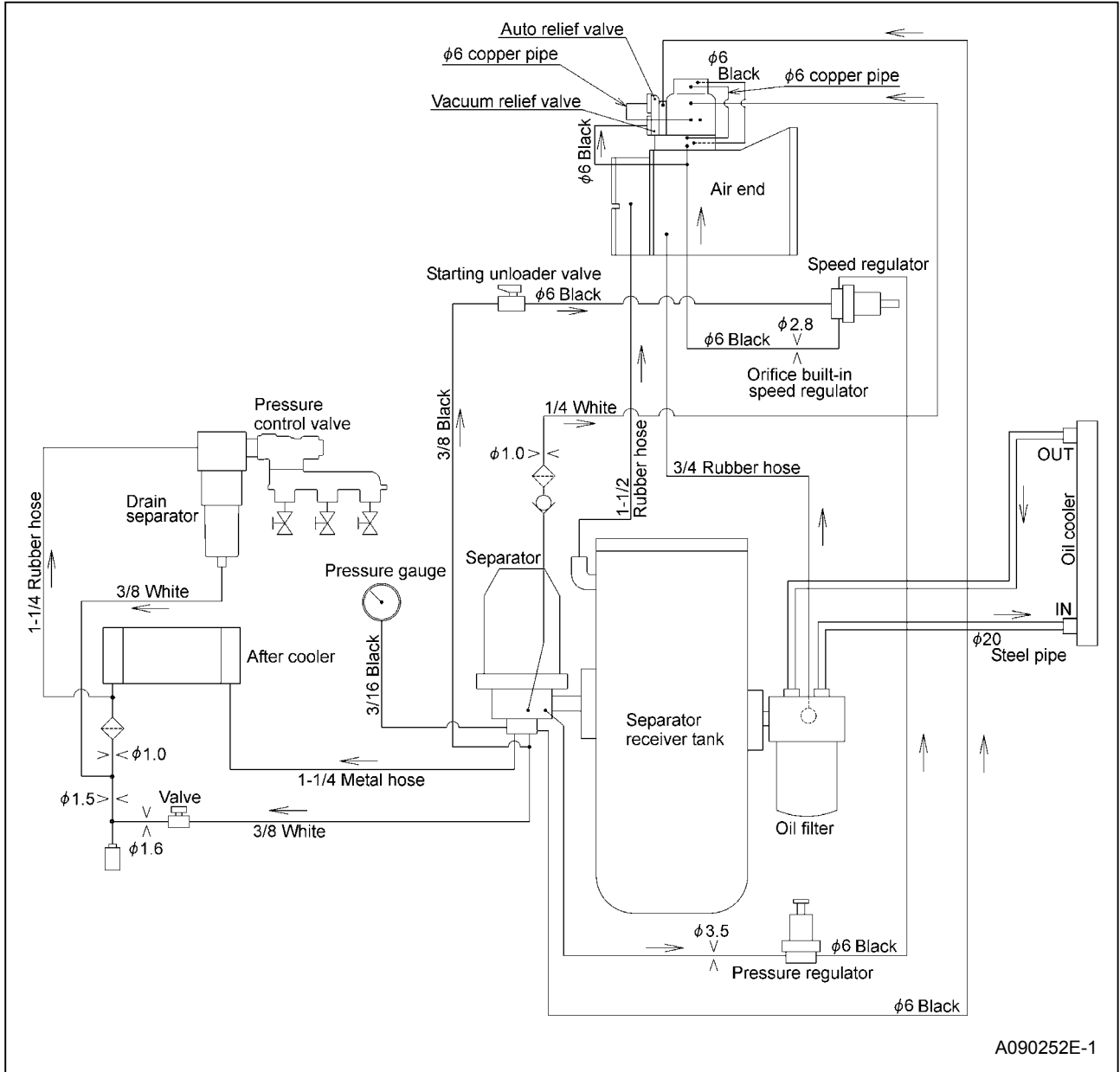
1. Specification

(8) PDS175S-5C1



1. Specification

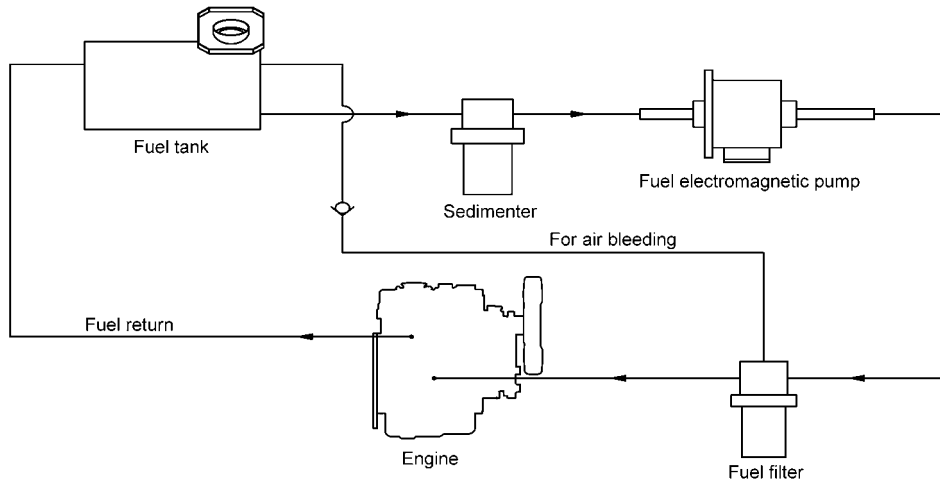
(9) PDS175SC-5C1 (Aftercooler Type)



1. Specification

1.7 Fuel piping

PDS55S-5B2/5C1



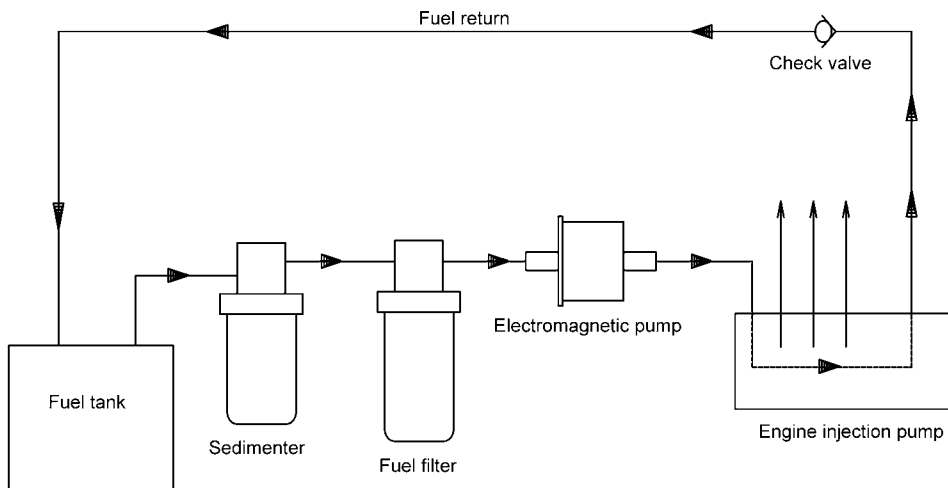
PC08080E

PDS75,100S[SC]-5B2

PDS75S[SC]-5C1 : SER.NO.~C6-5C10155

PDS100S[SC]-5C1 : SER.NO.~B6-5C10144

PD130S[SC]-5B2 : SER.NO.~B3-5B22153

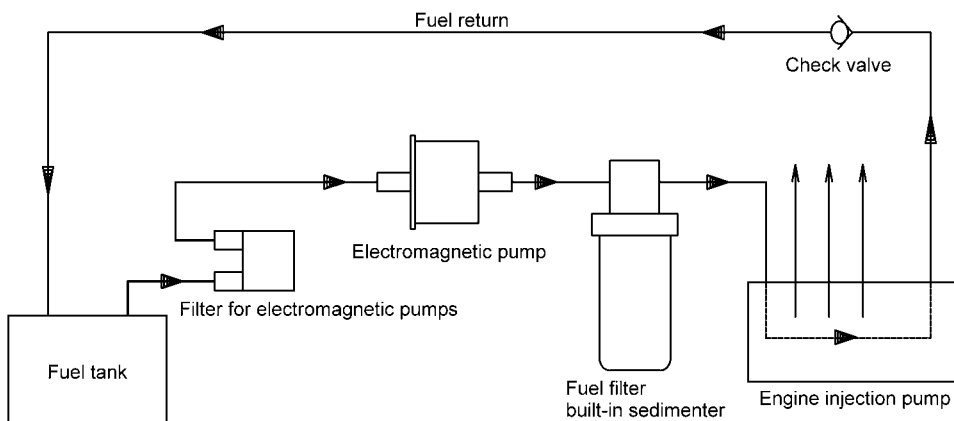


PC08081E

PDS75S[SC]-5C1 : SER.NO.C6-5C10156~

PDS100S[SC]-5C1 : SER.NO.B6-5C10145~

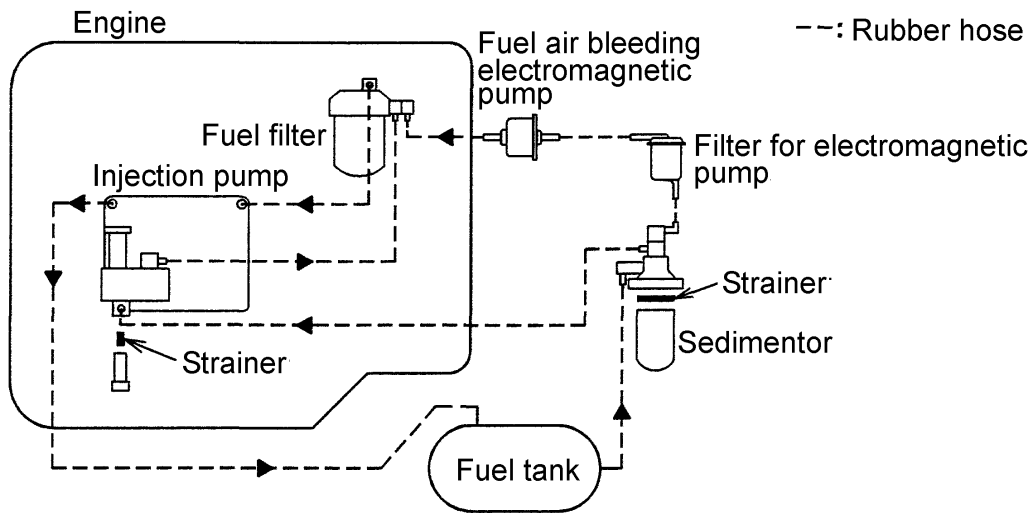
PD130S[SC]-5B2 : SER.NO.B3-5B22154~



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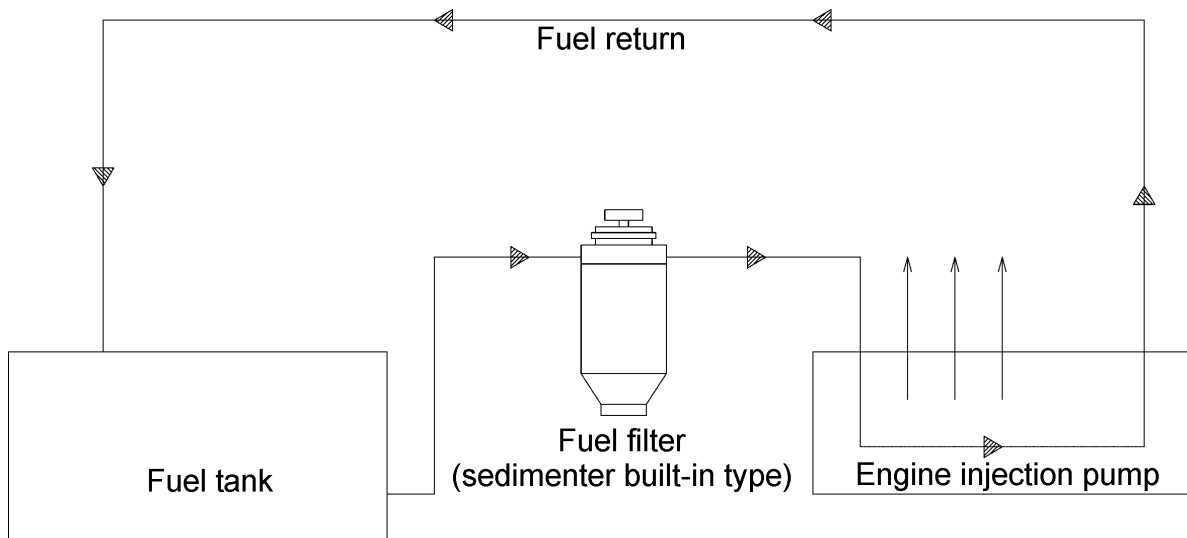
1. Specification

PD175S[SC]-5B2



A070414E

PD175S[SC]-5C1



A090460E

2. Maintenance

2.1 Cautions for Overhauling

2.1.1 Precautions before starting work

- (1) Work to be performed

It is very important to always plan in advance what facilities, tools, instruments, materials, oil, etc. you will need to use; the exact locations and methods of performing inspection, adjustment, or disassembly; and the key points of any repair work to be performed.

- (2) Care not to spill oil

Use a pan to collect used compressor oil, engine oil when changing the oil or attaching or detaching an oil line. If a large volume of oil is expected to flow out make, sure to drain any accumulated oil from the reserve tank, engine oil pan in advance.

- (3) Care when detaching parts

When disassembling a complicated part, put a matching mark to indicate the position of detached parts for future reference. Make sure that the negative cable is detached from the battery terminals before starting repair work.

- (4) Tools to be prepared

- ① Measuring instruments (e. g. tester, insulation resistance gauge etc.)
- ② Tools
- ③ Torque wrenches
- ④ Jigs and specialized tools
- ⑤ Sealing tape
- ⑥ Molybdenum sulfide (tube type)
- ⑦ Lithium extreme pressure type grease (CALTEX MULTIFAK EP1)
- ⑧ Diesel oil
- ⑨ Compressor oil
- ⑩ Cleaning cloths
- ⑪ Literatures (such as manuals etc.)

2.1.2 Disassembly and assembly

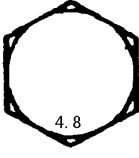
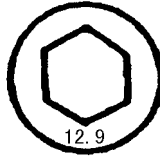
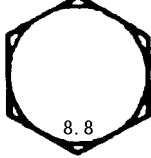
- (1) Before removing nylon tubes, hydraulic/fuel hoses, it is necessary to clean the inside of machine to prevent from entrance of dirt and foreign matters.
- (2) Perform disassembly work in a dust-free location whenever possible.
- (3) When disassembling parts, wash their outer surfaces and place them on a clean sheet of paper or cloth, taking care not to contaminate or damage them.
- (4) Wash disassembled parts with diesel oil (cleaning solvent) after checking for contamination or discoloration. However, do not wash rubber parts with diesel oil.
- (5) Be careful not to damage disassembled parts, they are precision built.
- (6) Replace consumables such as oil seals, O-rings, filters, oil, etc. with new items when reassembling parts.
- (7) Install O-ring and oil seal which should be coated with clean lithium extreme pressure type grease (**CALTEX MULTIFAK EP1**).
- (8) When reassembling parts, place each part in the order of assembly and take care that no parts are missing or misassembled.
- (9) When reassembling an assembled part (set part), be sure to replace it as an assembly.
- (10) Contamination or rusting may occur due to dust or humidity if parts are left in disassembled or partly disassembled condition for a long time. Therefore, be careful to prevent dust or rust from affecting parts if you have to leave the repair incomplete for a long period of time.
- (11) Check tightening torque and clearance when assembling parts.
- (12) Check the direction of rotation, speed, and oil leakage after assembly.
- (13) Before starting the machine after disassembly, run it at low idle to check for unusual noises, etc. to prevent engine or generator damage.

2. Maintenance

2.2 Tightening torque

General bolts and nuts tightening torque

Fasten all the bolts and nuts with the specified tightening torque when assembling.

Kind	Low or Middle carbon steel bolt (SS400B etc...)		High tensile strength bolt (SCM435 etc...)		
	4.6~6.8 (4T~6T)		8.8~12.9 (7T~12T)		
Strength and sorting	 Hexagon bolts		 Socket bolts		 Hexagon bolts
Width of across flat · Tightening torque					
Bolt diameter mm	Hexagon bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)	Socket bolts Width of across flat (mm)	Hexagon bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)
6	10	5 (51)	5	10	10 (100)
8	13	12 (124)	6	13	25 (245)
10	17	25 (245)	8	17	49 (485)
12	19	43 (425)	10	19	85 (845)
14	22	68 (675)	12	22	135 (1350)
16	24	106 (1055)	14	24	210 (2100)
18	27	145 (1450)	14	27	290 (2900)
20	30	205 (2050)	17	30	410 (4100)
22	32	280 (2800)	17	32	560 (5600)
24	36	345 (3450)	19	36	710 (7100)
Applied sections.	For general sections such as bonnet and frame.		For specified sections.		

IMPORTANT

- Generally, the abovementioned tightening torques should be followed, but in some points different torque is specified. So use the tightening torque without fail. (See following pages.)
- Make sure to remove rust and dust before tightening.

2. Maintenance

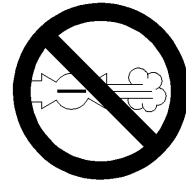
2.3 How to adjust regulator and how to replace diaphragm

2.3.1 Method of adjustment



CAUTION — Operation with compressed air supply port opened is prohibited

- When adjusting regulator system, install a silencer to the air delivery port and wear earplugs for protection of hearing damage.



D003

- The speed regulator is already adjusted prior to delivery ex.works. Never change the setting of the regulator by turning bolt and rod recklessly.
- If it is necessary to re-adjust the speed regulator due to overhauling or any trouble, adjust it in accordance with the following procedures.

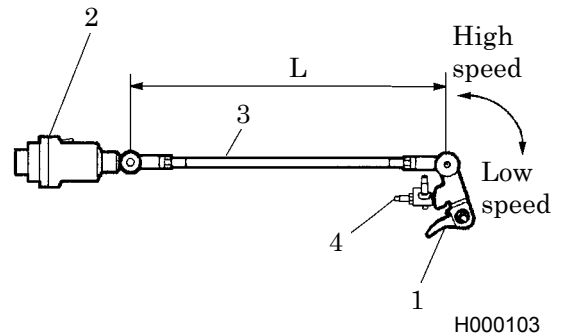
<Adjustment procedure>

- ① Adjust the length of rod “2” connecting speed regulator “2” with compressor being stopped so that engine governor lever “1” can be pulled towards high speed side. (Shortening rod “L” length, it causes increase of speed.)

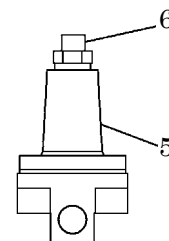
At the same time, adjust the rod “3” length so that rpm’s at full load and at no load can be equalized with rated rpm and rpm at no load respectively.

(See 1.1 of specifications.)

- ② Adjust this system so that when pressure exceeds 0.7MPa by turning pressure adjusting screw, speed regulator “2” can start to function to lower engine RPM. (Tightening the screw, the pressure rises, and loosening it, the pressure drops.)



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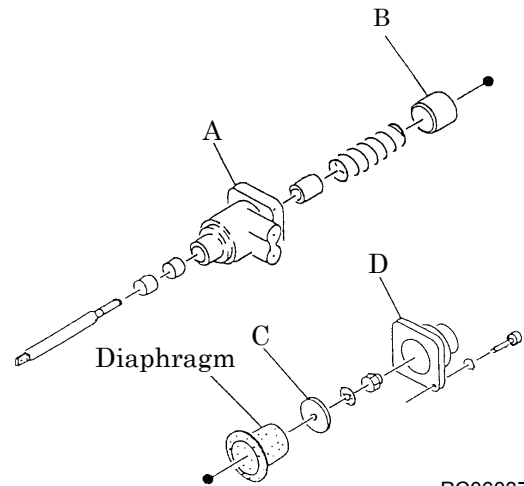
※When separator receiver tank pressure drops below 0.3MPa at full load operation with engine speed set lower than rated set speed, discharge air temperature rises and it will result in a serious trouble.

2. Maintenance

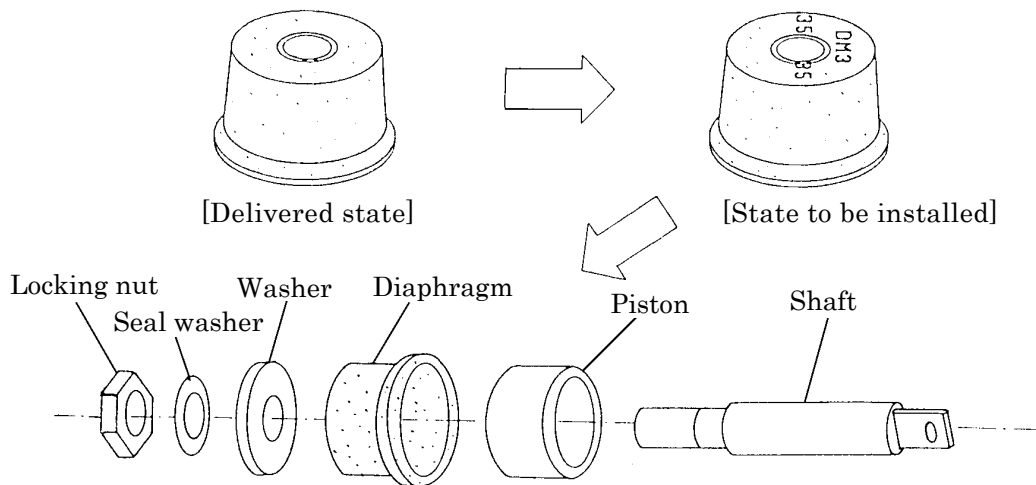
2.3.2 Change Diaphragm Speed Regulator

<Procedure>

- ① Remove the speed regulator from the bracket and disassemble it.
- ② Replace diaphragms with new ones.
- ③ Check A to D shown in figure for any burrs.
- ④ Diaphragm is delivered in different state from the state in which it should be installed. So install diaphragm which should be turned inside out, as shown in the following Fig.

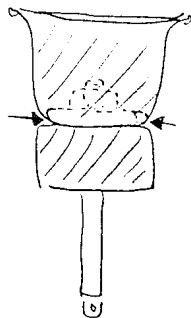


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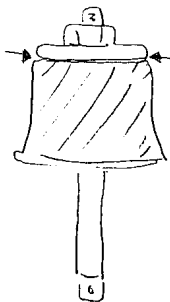
- ⑤ Internal face of body and cap and also both internal face and external face of diaphragm should be coated with molybdenum oxide spray.
How to spray molybdenum oxide paste : The areas in oblique line should be sprayed with this paste.

Diaphragm should be rolled up and back face and piston should be sprayed.

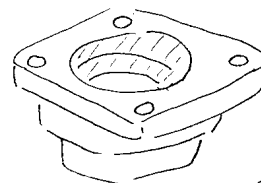


※ Jointed portion should be sprayed enough.

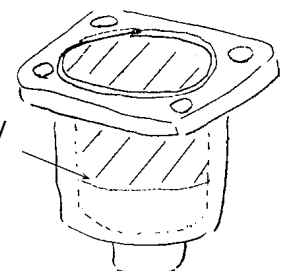
Then it should be returned and be sprayed.



Inside of body should be sprayed.



Inside face of body should be sprayed till middle line.



2. Maintenance

- ⑥ Install diaphragm to shaft and piston and fasten it with a locking nut.

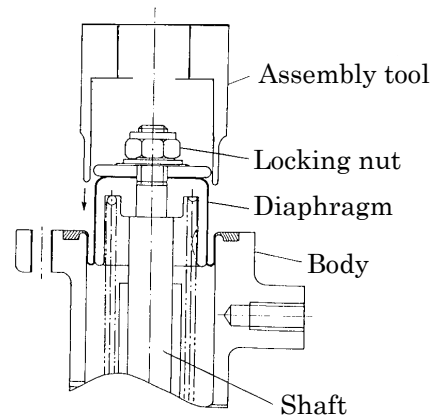
Tightening torque : $8\text{N}\cdot\text{m}$ ($80\text{kgf}\cdot\text{cm}$)

Important : Be careful not to tighten the locking nut excessively. Excessive tightening can cause washer to turn together and twisting diaphragm. The diaphragm will be damaged in shorter period.

- ⑦ Put in diaphragm to be settled equally in the body using an assembly tool.

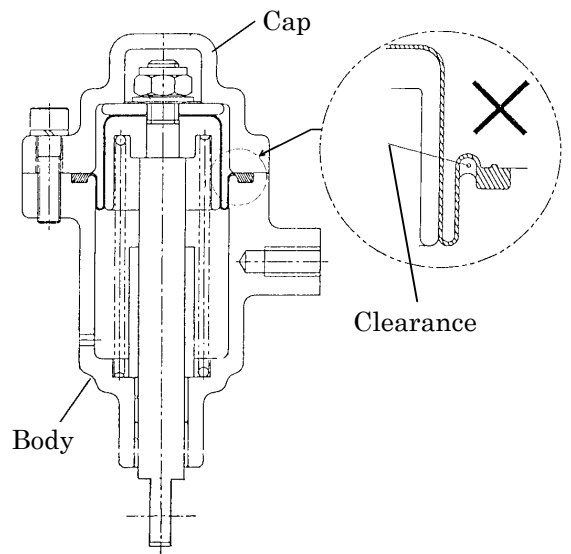
Important : Once diaphragm is settled in, turn slowly the tool for secure installation. When turning the tool, hold the diaphragm not to be afloat.

Important : The diaphragm will be damaged easily if the shaft twists when the rod connects under the above condition.



- ⑧ After diaphragm is set in, install the cap and then assemble speed regulator.

Important : Before installing the cap, make sure again that the portion of diaphragm shown in right figure is seated intact. If diaphragm is afloat, it can cause diaphragm to be caught in when installing cap.



- ⑨ After re-assembling the speed regulator, adjust it according to the adjustment method of speed regulator (See 2.3.1).

2. Maintenance

2.4 Replacement of unloader spare parts

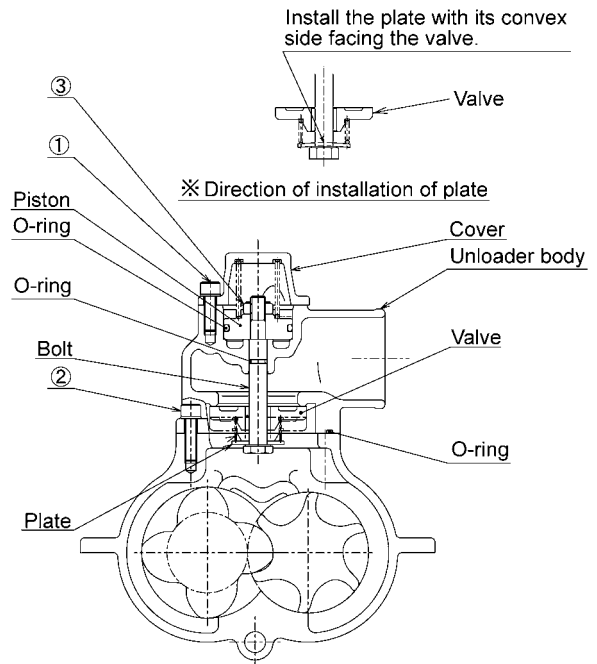
PDS55S-5B2/5C1

<Procedure>

- ① Disassemble unloader valve and change O-rings.
(3 points)
- ② When changing O-rings, fully coat O-rings, O-ring groove, sliding portions of valve and piston with Lithium base extreme pressure grease.

IMPORTANT

- When reassembling, apply sufficient grease to O-ring slot, sliding surface of piston, O-ring.
Use CALTEX MULTIFAK EP1 grease.



PC07004E

Tightening torque of unloader assembling bolts and locking nuts

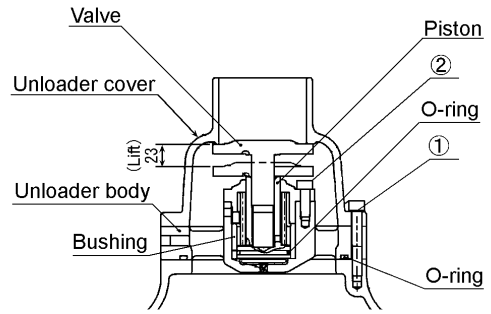
No.	Item	Bolt diameter (mm)	Socket bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)
①	Tightening torque of unloader cover assembling bolts	8	6 (Socket bolts)	25 (245)
②	Tightening torque of unloader body assembling bolts	8	6 (Socket bolts)	25 (245)
③	Locking nuts for valve and piston	10	17	12.1 (123.5)

2. Maintenance

PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2, PDS175S[SC]-5B2

<Procedure>

- ① Disassemble unloader, and replace O-rings (2 points) and bushing with new ones.
- ② When changing O-rings, fully coat O-rings, O-ring groove, sliding portions of valve and piston with Lithium base extreme pressure grease.
- ③ When re-assembling it, coat the seating faces of unloader body and cover with liquid sealing packing LOCTITE FMD127 and retighten them according to the specified torque mentioned in the following table.



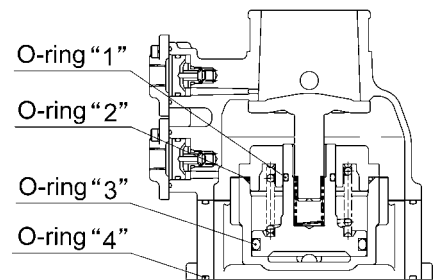
PC07006-1

PDS75S-5C1

PDS175S[SC]-5C1

<Procedure>

Supply grease to O-ring "1", "2", "3", "4" after replacement.



PC09008E

IMPORTANT

- When reassembling, apply sufficient grease to O-ring slot, sliding surface of piston, O-ring. Use CALTEX MULTIFAK EP1 grease.

Tightening torque of unloader assembling bolts

No.	Item	Bolt diameter (mm)	Socket bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)
①	Tightening torque of unloader cover assembling bolts	10	8	49 (485)
②	Unloader inner cover assembling bolts	8	6	25 (245)

2. Maintenance

2.5 Pressure adjustment procedure of pressure control valve and replacement of spare parts

PDS55S-5B2/5C1

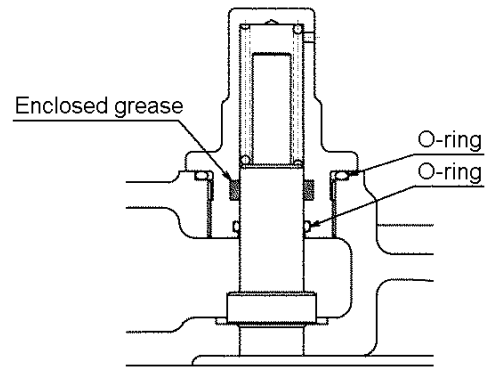
- Pressure drop below 0.39MPa during operation can be owing to deterioration of O-ring. So change the O-ring even before predetermined change interval.

< Procedure >

- ① Disassemble the upper of pressure control valve and change O-ring.
- ② After replacement of O-ring, make sure that there is no abnormality found during operation.

IMPORTANT

- When reassembling, apply sufficient grease to O-ring slot, sliding surface of piston, O-ring.
Use CALTEX MULTIFAK EP1 grease.



PC07001E

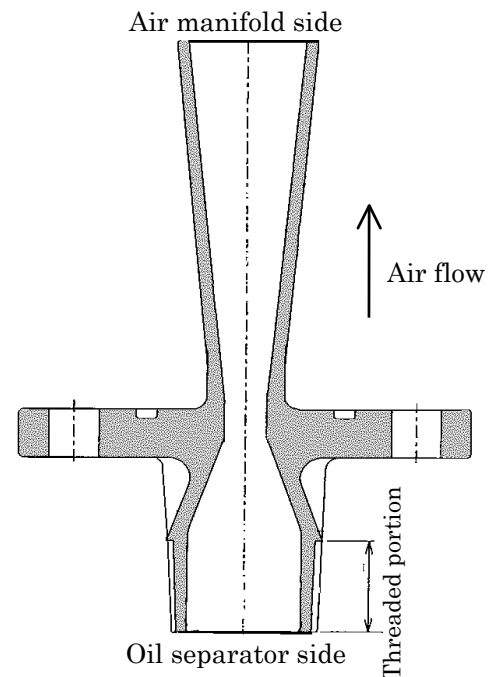
Venturi tube orifice type pressure control valve

PDS75,100S[SC]-5B2/5C1, PDS130,175S[SC]-5B2

Item	PDS75,100S,175S[SC]	PDS130S[SC]
Set pressure	0.5MPa	0.4MPa
Screw size	R1	R1

< Note >

- Make sure to fully open service valve when stopping operation.
If air in connected line flows in reverse direction into receiver tank, auto-relief valve will continue working.
- At start-up, close service valve fully.
If you start with valve open, at start position where starting unloader is placed, starting unloader valve will not work and it will raise engine speed.

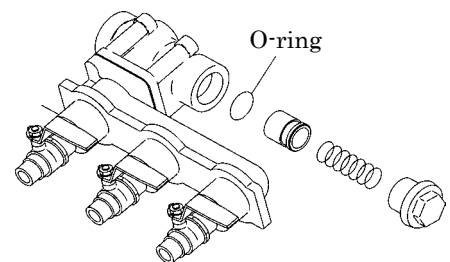


PDS175S[SC]-5C1

- Pressure drop below 0.34MPa during operation can be owing to deterioration of O-ring. So change the O-ring even before predetermined change interval.

< Procedure >

- ① Disassemble pressure control valve and change O-ring.
- ② After replacement of O-ring, make sure that there is no abnormality found during operation.



PC09004

2. Maintenance

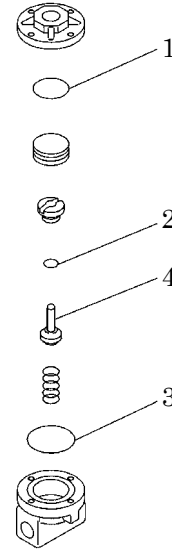
2.6 Inspection/replacement of auto relief valve spare parts

PDS55~100S[SC]-5B2/5C1, PDS130,175S[SC]-5B2

Disassemble and clean the component, and check O-ring "1", "2", "3" and needle valve "4". Then, replace O-ring "1", "2", "3" and needle valve "4" if its rubber is hardened.

IMPORTANT

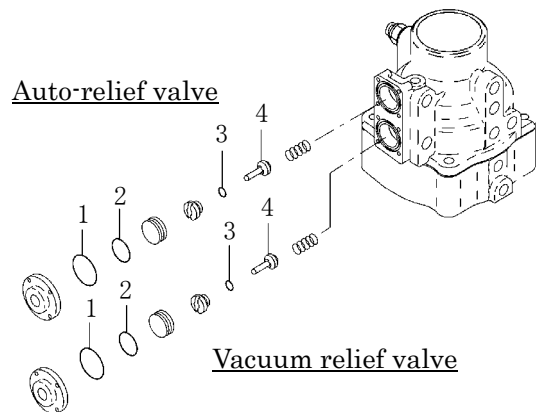
- When reassembling, apply sufficient grease to O-ring slot, sliding surface of piston, O-ring.
Use CALTEX MULTIFAK EP1 grease.



H000057

PDS175S[SC]-5C1

Disassemble and clean the component, and check O-ring "1", "2", "3" and needle valve "4". Then, replace O-ring "1", "2", "3" and rubber on the needle valve "4", if hardened.



PC08057

2. Maintenance

2.7 Change Oil Separator


PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1


- Even before the periodic interval time of replacement, replace the oil separator whenever the oil consumption increases and also oil is found mixed in the discharge air.

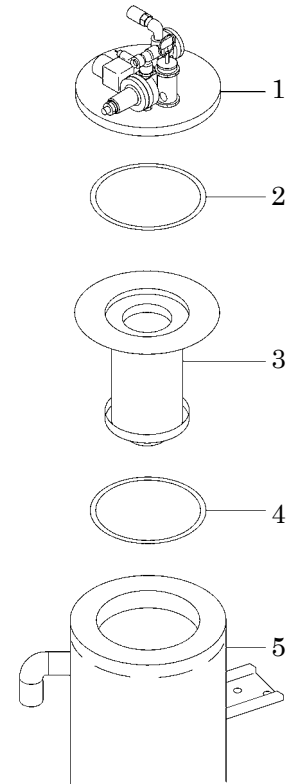
When replacing oil separator “3”, do not fail to replace gasket “2” “4” also.

<Procedure>

- ① Remove all the pipes fitted on separator cover “1” .
- ② Remove all the fixing bolts of separator cover “1” .
- ③ Replace the oil separator “3” and gaskets “2” “4” by new ones.
- ④ Clean and degrease the connecting portion between separator cover “1” and separator receiver tank “5” and check and confirm that there are no damages nor abnormalities.
- ⑤ Tighten the fixing bolts of separator cover “1” according to the specified torque. (Tighten the bolts diagonally and after tightening all the bolts, ultimately tighten them again in full circumference.)

 : 17 mm

 : 49 N·m (485kgf·cm)



PC08058


PDS75,100S-5B2/5C1


PDS130S[SC]-5B2, PDS175S[SC]-5B2/5C1

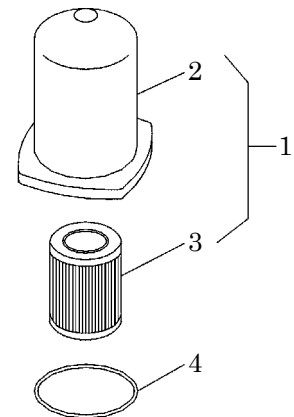
- When replacing oil separator “1”, do not fail to replace cover “2”, an element “3”, and the O-ring “4” .

<Procedure>

- ① Stop operation, and confirm that there is no residual pressure both in separator receiver tank and air line.
- ② Remove all the bolts for installing the cover “2” of oil separator “1” .
- ③ Replace cover “2”, element “3” and O-ring “4” with new ones.
- ④ Supply grease to O-ring “4” after replacement.
- ⑤ Tighten the fixing bolts of separator cover “1” according to the specified torque. Tighten the bolts diagonally and after tightening all the bolts, ultimately tighten them again in full circumference.

 : 17 mm

 : 49 N·m (485kgf·cm)



H000056

IMPORTANT

- Clean dust, paints and traces of paint, if any from O-ring fitting face, and install O-ring after coating it with enough grease.
Use CALTEX MULTIFAK EP1 grease.

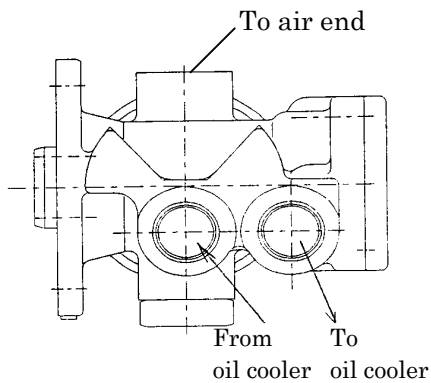
2. Maintenance

2.8 Change of pellet assembly of by-pass valve (PDS175S only)

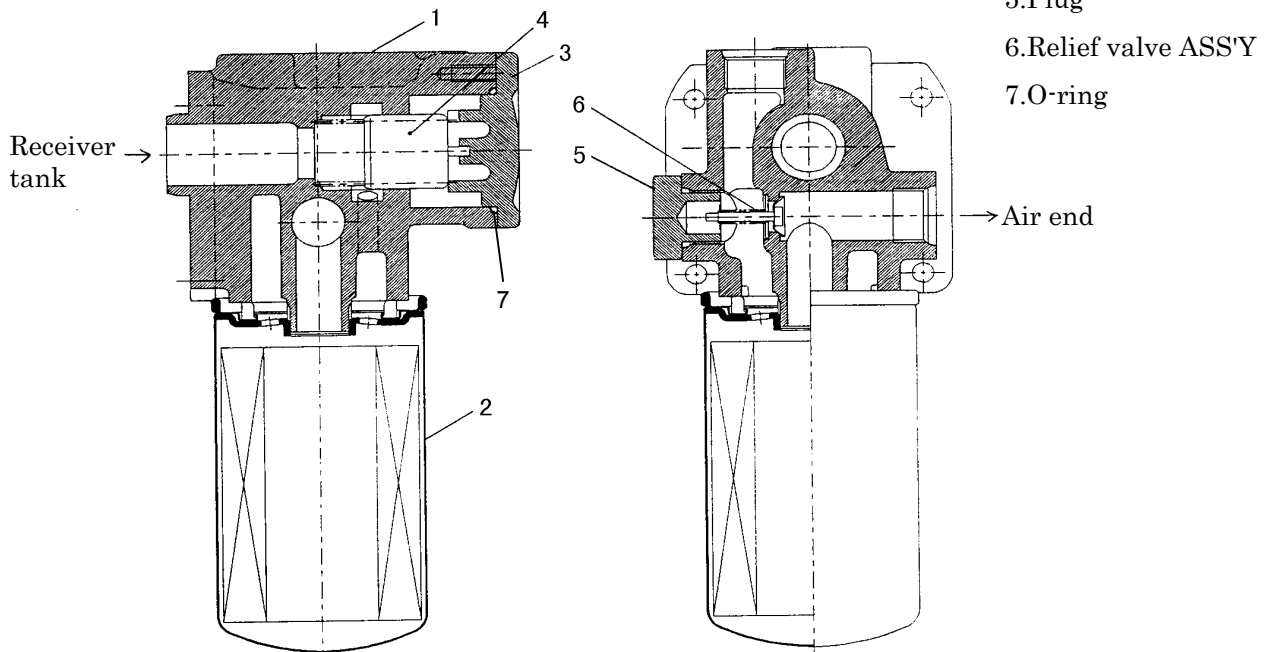
- By-pass valve fitted on this unit is of full bore type. While the unit is used for normal operation, it is not to perform periodical replacement of the Inner pellet assembly, but when such trouble as excessive rise of compressor oil temperature, it becomes necessary to replace it, in accordance with the following procedures.

<Procedure>

- ① First stop the unit and make sure that there is no residual pressure left in the separator receiver tank.
- ② After confirming that temperature of compressor oil is lowered enough, take off the cover and remove pellet assembly and O-ring.
- ③ Replace the pellet assembly and O-ring by new ones.
Install O-ring coated thinly with compressor oil.
- ④ Start operation and check the function of by-pass valve.
(It functions well when delivery air temperature will not rise abnormally.)



Actuating temperature	By-pass valve fully closing temperature
$82 \pm 3^{\circ}\text{C}$	$89 \pm 2^{\circ}\text{C}$



- 1.Oil filter body
- 2.Oil filter
- 3.Cover
- 4.Pellet ASS'Y
- 5.Plug
- 6.Relief valve ASS'Y
- 7.O-ring

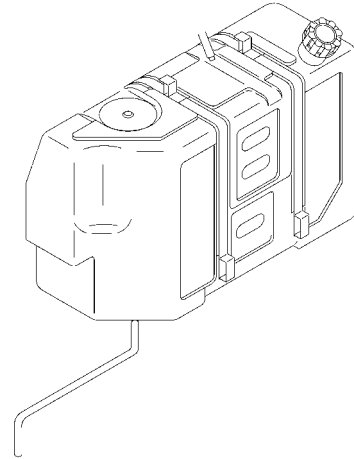
2. Maintenance

2.9 Clean inside of Fuel Tank

- Condensate is caused and accumulated at the bottom of fuel tank, owing to churning of dust or dirt mixed when fuel oil is fed and water drop caused while fuel oil tank is used for a long time. When any condensate is found afloat and fuel filter gets clogged too fast, fuel oil tank should be cleaned after condensate is removed from fuel oil tank even before the specified cleaning interval time.

<Procedure>

- ① Open drain valve to remove fuel oil from fuel tank.
- ② Dismantle the door and side covers of bonnet.
- ③ Remove fuel pipes and wires connected to fuel tank.
- ④ Remove belt holding fuel tank and remove tank.
- ⑤ Insert cleansing nozzle through fuel filler port or drain port for cleaning tank.
- ⑥ After cleaning job is finished, install fuel tank from which water or the like should be completely removed.



PDS130S-5B2

PC08059

2. Maintenance

2.10 Values of Various Adjustments of Engine

Item		unit	PDS55S-5B2/5C1
Engine model			IHI SHIBAURA E673L-C / E673L-D
Tightening torque of head bolts		N·m (kg·m)	34-39 (3.5-4.0)
Valve clearance	Air intake	mm	0.2 (in cold season)
	Discharge	mm	0.2 (in cold season)
Firing order			1-2-3
Injection timing (BTDC)		°	20±1
Nozzle injection pressure		MPa (kgf/cm ²)	12.0(122)
Compression		MPa (kgf/cm ²)	2.94(30) (Rotation speed 300min ⁻¹)
Thermostat	Temperature for start of release	°C	75±2
	Full open temperature	°C	87
	Valve lift	mm	6

Item		unit	PDS75S[SC]-5B2/5C1
Engine model			IHI SHIBAURA S753-C / S753-D
Tightening torque of head bolts		N·m (kg·m)	49-52 (5.0-5.3)
Valve clearance	Air intake	mm	0.2 (in cold season)
	Discharge	mm	0.2 (in cold season)
Firing order			1-2-3
Injection timing (BTDC)		°	23±1
Nozzle injection pressure		MPa (kgf/cm ²)	12.0(122)
Compression		MPa (kgf/cm ²)	2.94(30) (Rotation speed 300min ⁻¹)
Thermostat	Temperature for start of release	°C	75±2
	Full open temperature	°C	87
	Valve lift	mm	6

2. Maintenance

Item		unit	PDS100S[SC]-5B2/5C1	PDS130S[SC]-5B2
Engine model			IHI SHIBAURA S773L-C / S773L-D	IHI SHIBAURA N843L-C
Tightening torque of head bolts		N·m (kg·m)	49-52 (5.0-5.3)	98-103 (10-10.5)
Valve clearance	Air intake	mm	0.2 (in cold season)	
	Discharge	mm	0.2 (in cold season)	
Firing order			1-2-3	
Injection timing (BTDC)		°	24±1	22±1
Nozzle injection pressure		MPa (kgf/cm ²)	13.9(142)	14.7(150)
Compression		MPa (kgf/cm ²)	2.94(30) (Rotation speed 300min ⁻¹)	
Thermostat	Temperature for start of release	°C	75±2	71±2
	Full open temperature	°C	87	82
	Valve lift	mm	6	8

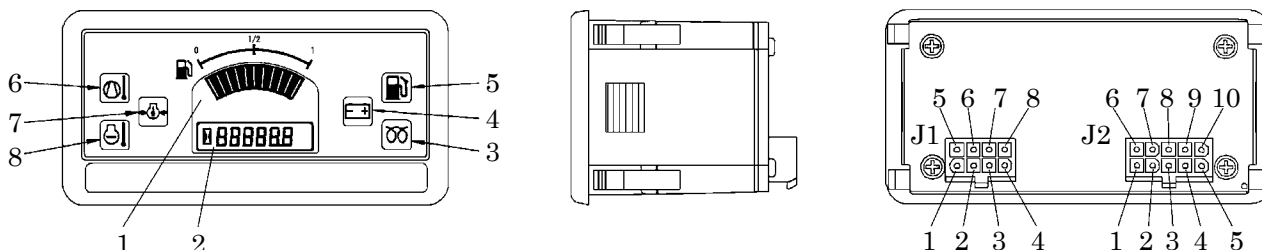
Item		unit	PDS175S[SC]-5B2/5C1	
Engine model			NISSAN DIESEL 2A-TD27/TD27B-08	
Tightening torque of head bolts		N·m (kg·m)	First time	49.0 - 58.8 (5.0 - 6.0)
			Second time	98.1 - 107.9 (10.0 - 11.0)
Valve clearance	Air intake	mm	0.35 (in warm season)	
	Discharge	mm	0.35 (in warm season)	
Firing order			1-3-4-2	
Injection timing (BTDC)		°	16 / 5	
Nozzle injection pressure		MPa (kgf/cm ²)	9.81(100)	
Compression	Standard	MPa (kgf/cm ²)	2.94(30) (Rotation speed 200min ⁻¹)	
	Working limit	MPa (kgf/cm ²)	Limited value	2.45(25)
			Each cylinder limit value	0.29(3)
Thermostat	Temperature for start of release	°C	71	
	Full open temperature	°C	85	
	Valve lift	mm	8	

3. Electric System

3.1 Engine electric appliances

3.1.1 Instrument panel ASS'Y

PDS55~130S[SC] ; Part Number:36100 07200



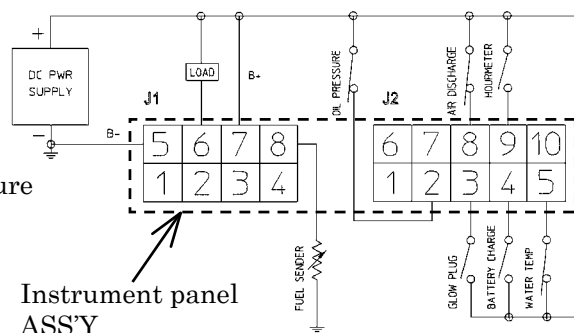
A08060

<Instruments>

- 1. Fuel level gauge
 - 2. Elapsed time indicator
- <Indicator lamp>
- 3. Preheating

<Warning lamp>

- 4. Charging
 - 5. Fuel residual level
- <Emergency stop lamp>
- 6. Discharge air temperature
 - 7. Engine oil pressure
 - 8. Coolant temperature



Instrument panel ASS'Y

Cable connection

A08061

(1) Residual fuel oil in fuel gauge

Pointer position	Resistance (Ω)	Remaining fuel (%)
1/10	95.2	10
2/10	70.3	20
3/10	54.4	30
4/10	43.1	40
5/10	32.6	50
6/10	24.5	60
7/10	19.1	70
8/10	12.4	80
9/10	6.9	90
10/10	3	100

3. Electric System

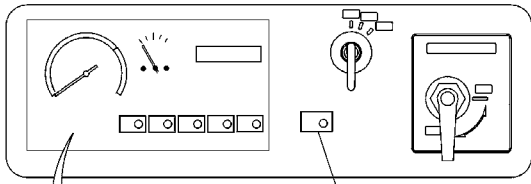
(2) List of functions

Pin No.	Line color	Connection	Remark	
Connector J1	1	—	NIL	
	2	—	NIL	
	3	—	NIL	
	4	—	NIL	
	5	B	Earth	
	6	Y/G	Solenoid No.2 terminal	It is electrically connected during normal operation. When emergency stop system works, internal contact between J1-5 (ground connection) and J1-6 terminal will be "OFF" and power supply to stop solenoid will be cut and it will cause engine emergency stop.
	7	G/Y	10A Fuse	Power supply
	8	L/Y	Sending unit No.1 terminal	It detects residual fuel.
Connector J2	1	—	NIL	
	2	L/R	※1 Engine oil pressure switch	It is electrically connected during normal operation. When engine oil pressure drops and oil pressure switch is "OFF", power supply to J2-2 terminal will be cut. Then emergency stop system functions to break internal contact between J1-5 (ground connection) and J1-6 terminal to cut power supply to stop solenoid, causing engine emergency stop. ●Set pressure of emergency stop oil pressure below 98.1kPa.
	3	G	Glow plug	During preheating operation, it supplies power to light preheat lamp.
	4	Y/B	Dynamo regulator Male terminal	Bad charging, Charging lamp is caused to light on. During normal operation, warning lamp for bad charging will not go on because both poles of warning lamp (J2-4 terminal) are equally potential. When there is no voltage coming from female connector of dynamo regulator, current flows to dynamo regulator to make warning lamp light on.
	5	L/B	Coolant temp. switch	It is electrically connected during normal operation. When engine water temperature switch becomes "OFF" with rise of engine coolant temperature, power supply is cut to J2-5 terminal. It actuates emergency stop circuit to break the internal contact between J1-5 (ground connection) and J1-6 terminal and then power supply is cut to stop solenoid to cause engine emergency stop. ●Emergency stop set temperature 110°C.
	6	—	NIL	
	7	—	NIL	
	8	L/W	Discharge air temp. switch	It is electrically connected during normal operation. When discharge air temperature switch becomes "OFF" with rise of discharge air temperature, power supply is cut to J2-8 terminal. It actuates emergency stop circuit to break the internal contact between J2-5 (ground connection) and then power supply is cut to stop solenoid to cause engine emergency stop. ●Emergency stop set temperature 120°C.
	9	W/G	Dynamo regulator No.4 terminal	Generating signal inputted Inputting of generating signal actuates both hour-meter and detection circuit (timer built-in) for abnormal oil pressure.
	10	—	NIL	

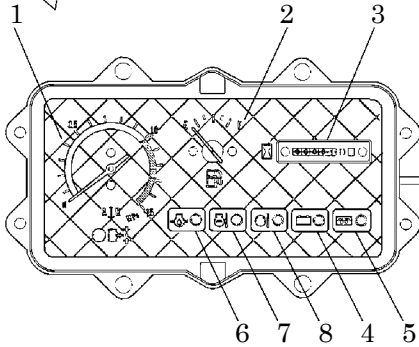
※1:Detection circuit for abnormal oil pressure will start to work 10 seconds after detecting generating signal of alternator with J2-9 terminal.

3. Electric System

PDS175S[SC]



Part Number:36100 06700

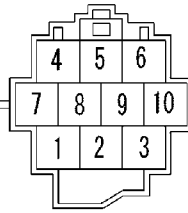


< Instruments >

- 1. Discharge air pressure gauge
- 2. Fuel level gauge
- 3. Elapsed time indicator
- < Indicator lamp >
- 4. Preheating

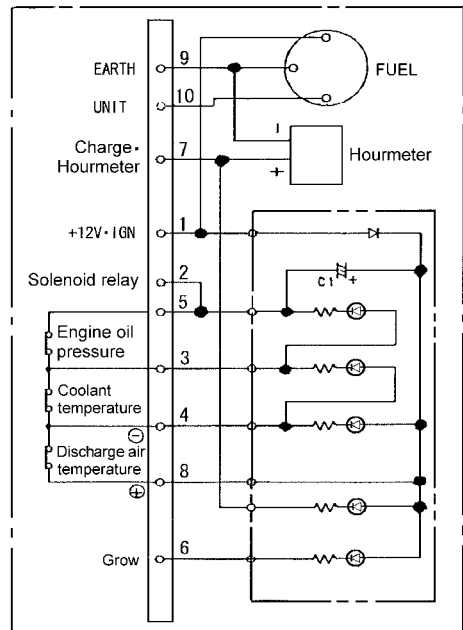
< Warning lamp >

- 5. Charging
- < Emergency stop lamp >
- 6. Engine oil pressure
- 7. Coolant temperature
- 8. Discharge air temperature
- 9. Fuel drain



PC09006-1

[Wiring diagram inside instrument panel]



PC09013

(1) Specification

Range of voltage in use	DC10~16V(at12V type)
Temperature range in use	-20°C~ +60°C

3. Electric System

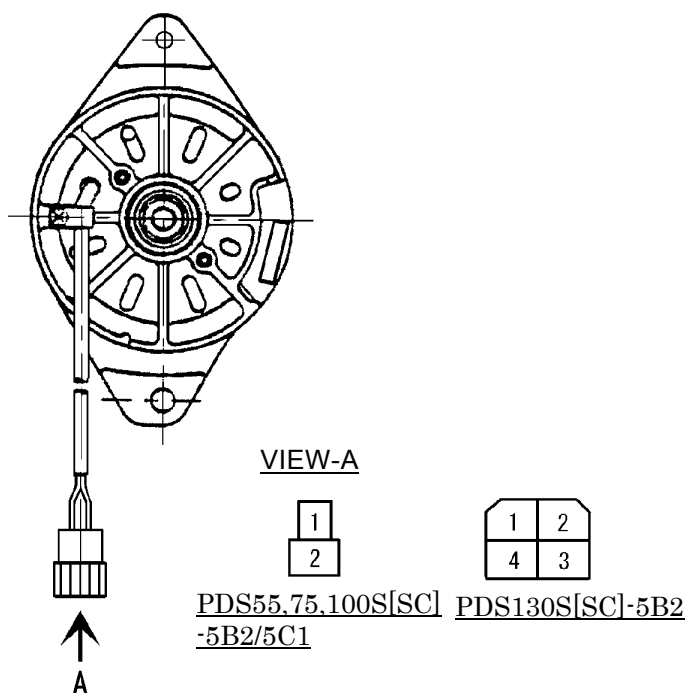
(2) List of functions

Pin No.	Line color	Connection	Remark
1	W/R	10A Fuse	Power supply for instrument panel ASS'Y.
2	G/W	Solenoid relay No.1 terminal	When starter switch is "ON", voltage is applied to No.1 terminal of solenoid relay. When "OFF", it is not electrically supplied. Electricity is cut when emergency stop switch is "ON".
3	G/R	Engine oil pressure switch Coolant temperature switch	During normal operation there is no electrical flow. When engine oil pressure switch is "ON", electricity flows between No.3 terminal and No.8 terminal and when cooling water temperature switch is "ON", it flows between No.3 terminal and No.5 terminal. Thus emergency stop lamp goes on and engine is brought to an emergency stop.
4	G/Y	Coolant temperature switch Discharge air temperature switch	During normal operation there is no electrical flow. When discharge air temperature switch is "ON", electricity flows between No.4 terminal and No.5 terminal and when cooling water temperature switch is "ON", it flows between No.4 terminal and No.8 terminal. Thus emergency stop lamp goes on and engine is brought to an emergency stop.
5	G/W	Engine oil pressure switch	During operation electricity is supplied between No.5 terminal and No.8 terminal. When power is not supplied to No.5 terminal, engine oil pressure drop emergency stop lamp goes on and engine is brought to emergency stop.
6	L/R	Glow controller No.4 terminal	During preheating operation, it causes preheat lamp to go on.
7	R	Alternator No.1 terminal	Bad charging → Charging lamp is caused to light on.
8	W/R	Discharge air temperature switch	During operation electricity is supplied between No.5 terminal and No.8 terminal. When power is not supplied to No.8 terminal, discharge air temperature rise emergency stop lamp goes on and engine is brought to emergency stop.
9	B	Earth	
10	Y/B	Sending unit No.1 terminal	When starter switch is switched "ON", it shows residual fuel in the fuel tank.

3. Electric System

3.1.2 Alternator (Dynamo)

PDS55~130S[SC]



PC08062

(1) List of functions

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1

Pin No.	Line color	Connection	Remark
1	R/B	Dynamo regulator No.1 terminal	Outputting charging voltage to dynamo regulator.
2	R/W	Dynamo regulator No.3 terminal	

PDS130S[SC]-5B2

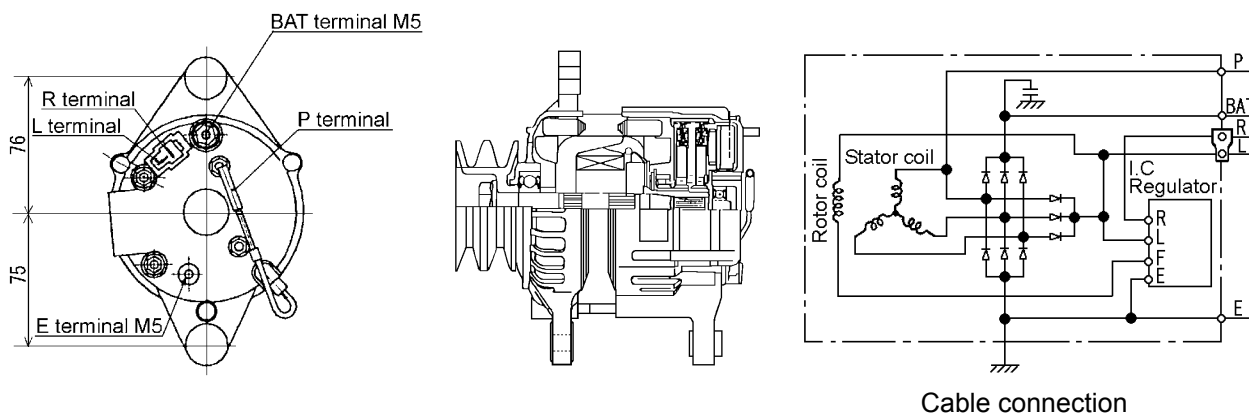
Pin No.	Line color	Connection	Remark
1	R/B	Dynamo regulator CN2-2 terminal	Outputting charging voltage to dynamo regulator.
2	R/B	Dynamo regulator CN2-1 terminal	
3	R/W	Dynamo regulator CN2-4 terminal	
4	R/W	Dynamo regulator CN2-3 terminal	

(2) Judgement of alternator (Dynamo) functions

Test method	Normal value
Measure voltage at no load condition during operation (at full speed). (Measure AC current between 2 dynamo lead lines.)	Above AC30V
Check for electric conductivity of coiled line while stopping. (Check for electric conductivity between 2 dynamo lead lines.)	Electric conductivity found.
Measure insulation resistance. (Measure insulation resistance between 1 dynamo lead line and coil plate.)	More than 3MΩ
Remove V-belt, and turn pulley by hand.	Due to magnetism repulsion occurs 12 times reactions per one turn, but it turns comparatively smoothly.

3. Electric System

PDS175S[SC]-5B2/5C1 [Dynamo regulator (IC type)]



(1)List of functions

Pin No.	Line color	Connection	Remark
BAT	R	Starter motor B terminal	Power for charging voltage.
R	R/W	10A Fuse (Through joint connector)	Detect output voltage from alternator and adjust the current flowing to rotor coil.
L	W	Hour meter	Signal output for hour meter.
※ P	Y/G	Controller CN2-17 terminal	For separating starter motor. When frequency of P terminal exceeds $190 \pm 10\text{Hz}$, starter relay contact is switched through controller, and it disengages starter motor.
E	B	Earth	

※:For diagnosing P terminal, check the generating voltage between P-E terminal and it is normal if the voltage detected is about DC7.2V.

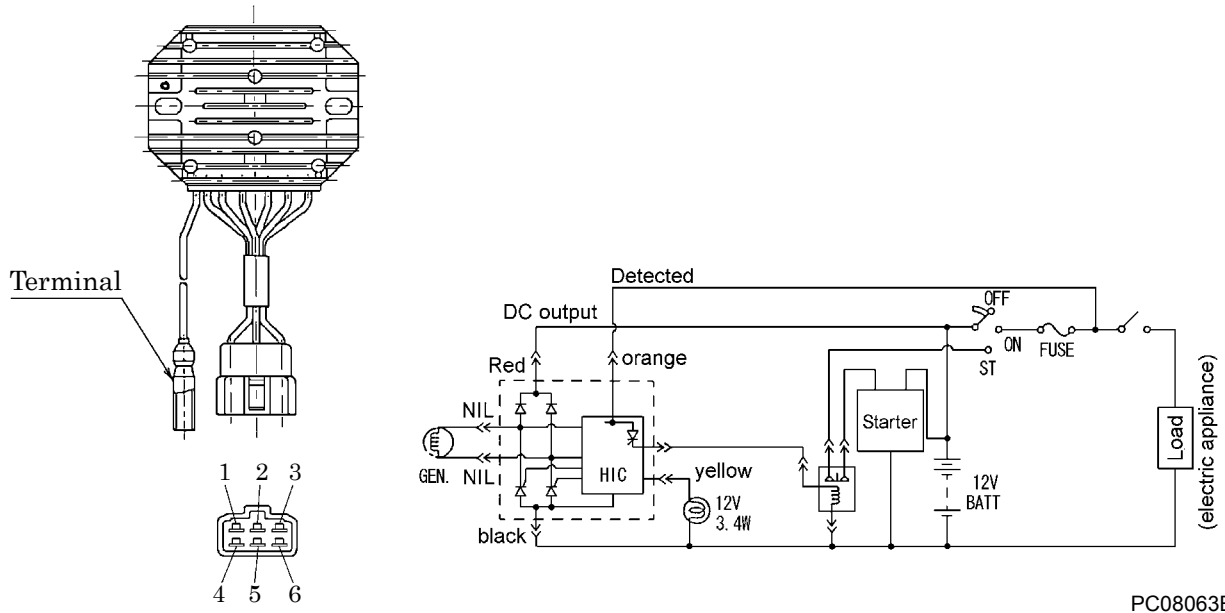
(2) Judgement of alternator functions

Checking method by measuring battery terminal at full load operation	Normal Value
Measure the battery terminal voltage at full load operation.	$14.4 \pm 0.3\text{V}$

3. Electric System

3.1.3 Dynamo regulator

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1 ; Part Number:44323 06600



(1) Specification

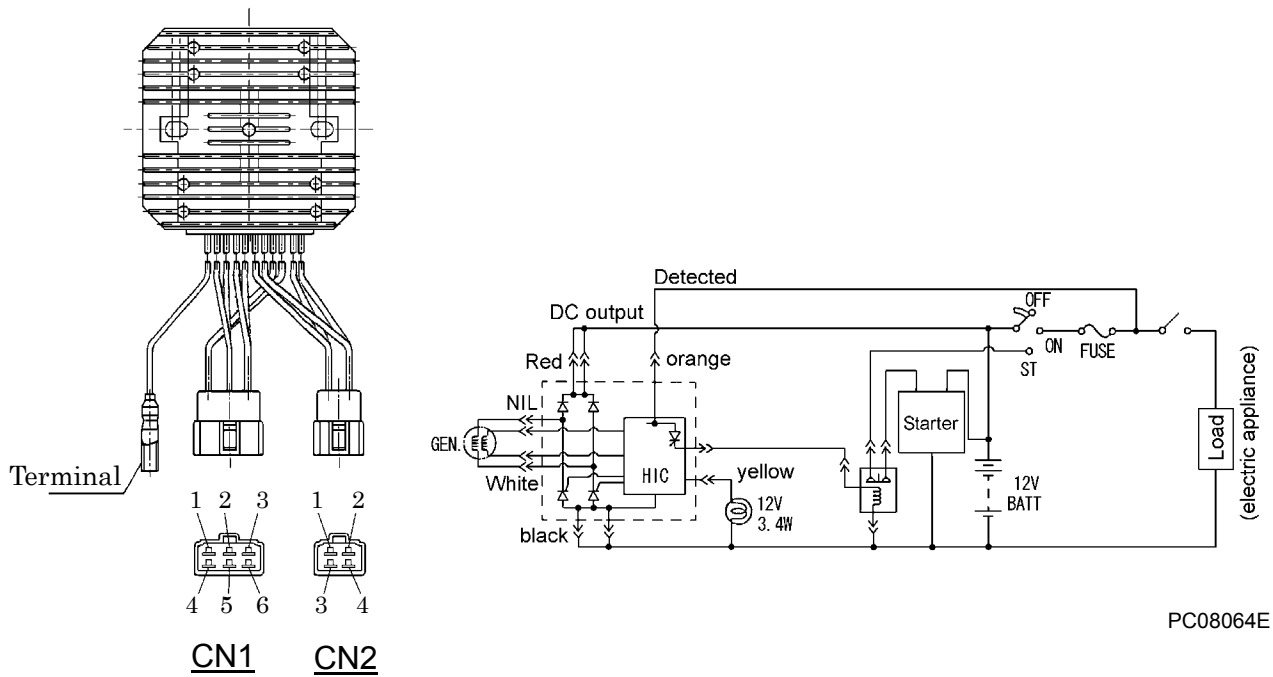
Combination battery	12V
Adjusted voltage	14.5±0.5V
Allowable output current	16A
Actuating RPM of safety relay	1,700±140min ⁻¹ (Dynamo RPM)

(2) List of functions

Pin No.	Line color	Connection	Remark
Terminal 1	Y/B	Instrument panel J2-4 terminal	Bad charging causes warning lamp to go on.
1	R/B	Dynamo No.1 terminal	Power source of dynamo regulator. (between pin No.1 and 3)
2	B	Earth	
3	R/W	Dynamo No.2 terminal	Power source of dynamo regulator. (between pin No.1 and 3)
4	W/G	Safety relay No.3 terminal	Generator signal output.
5	G/Y	10A Fuse	Detection of output voltage of dynamo regulator.
6	R	Starter switch B terminal	Power for charging voltage.

3. Electric System

PDS130S[SC]-5B2 ; Part Number:44323 06900



(1) Specification

Combination battery	12V
Adjusted voltage	14.5±0.5V
Allowable output current	27A
Actuating RPM of safety relay	2,150±140min ⁻¹ (Dynamo RPM)

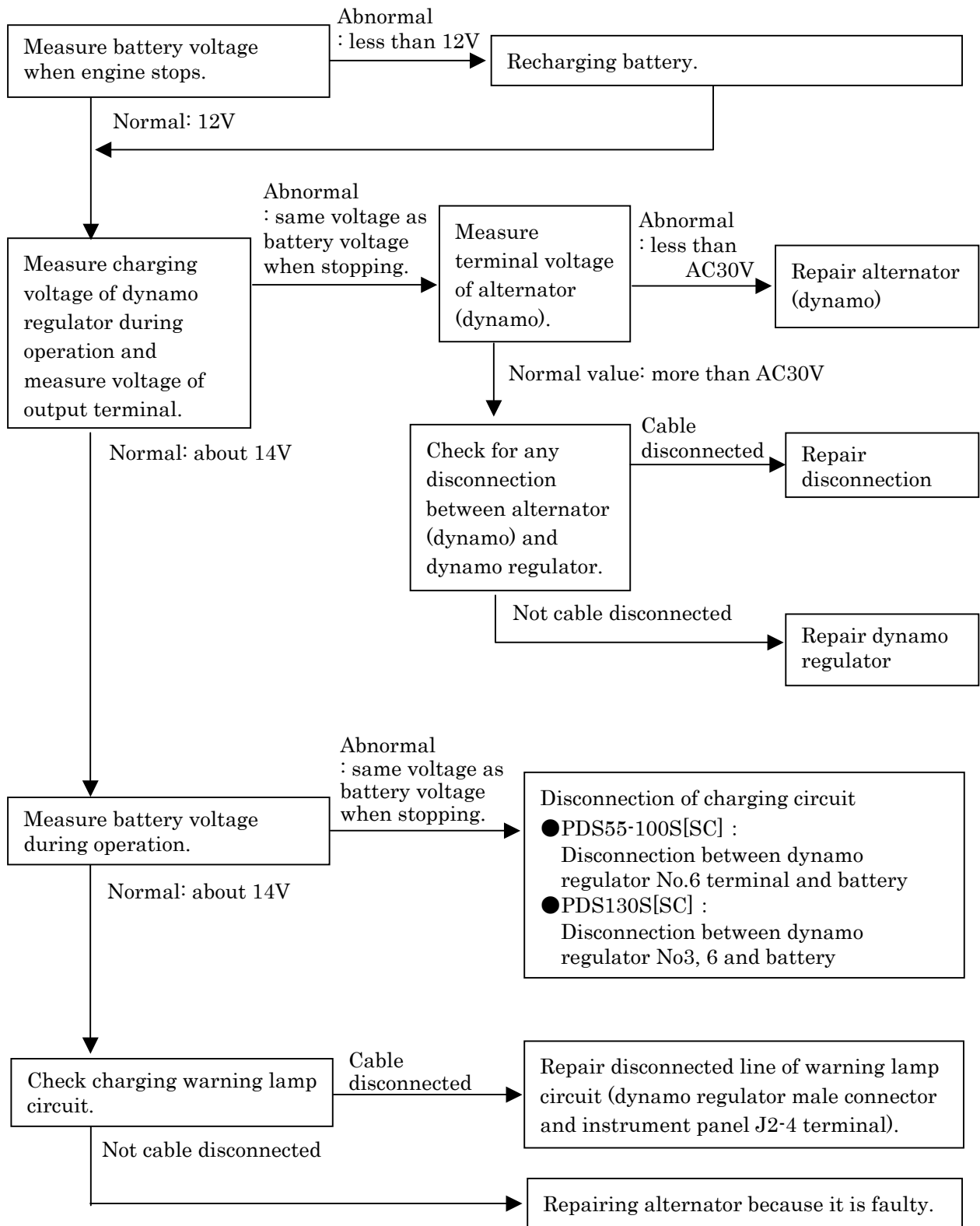
(2) List of functions

Pin No.	Line color	Connection	Remark	
Terminal	Y/B	Instrument panel J2-4 terminal	Bad charging causes warning lamp to go on.	
Connector CN1	1	B	Earth	
	2	G/Y	10A Fuse	Detection of output voltage of dynamo regulator.
	3	R	Starter switch B terminal	Power for charging voltage.
	4	B	Earth	
	5	W/G	Safety relay No.3 terminal	Generator signal output.
	6	R	Starter switch B terminal	Power for charging voltage.
Connector CN2	1	R/B	Dynamo No.2 terminal	Power source of dynamo regulator.
	2	R/B	Dynamo No.1 terminal	
	3	R/W	Dynamo No.4 terminal	
	4	R/W	Dynamo No.3 terminal	

3. Electric System

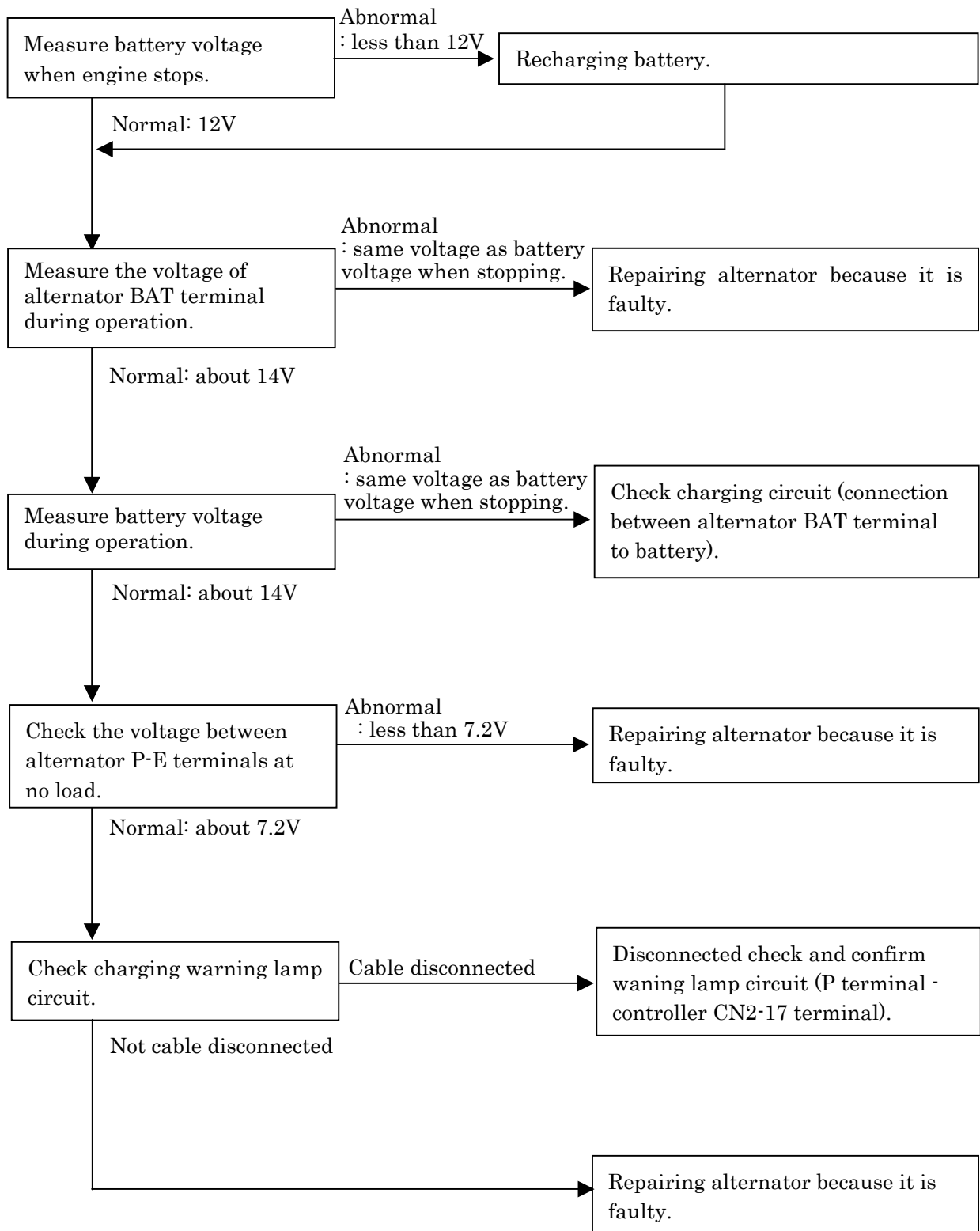
(3) Diagnosing when battery charging warning lamp lights

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2



3. Electric System

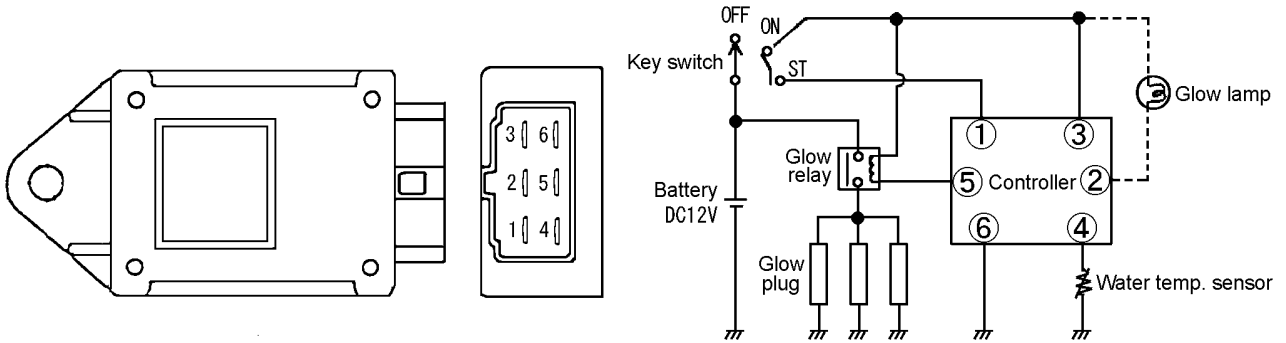
PDS175S[SC]-5B2/5C1



3. Electric System

3.1.4 Glow controller

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2 ; Part Number:44346 12500



PC08065E

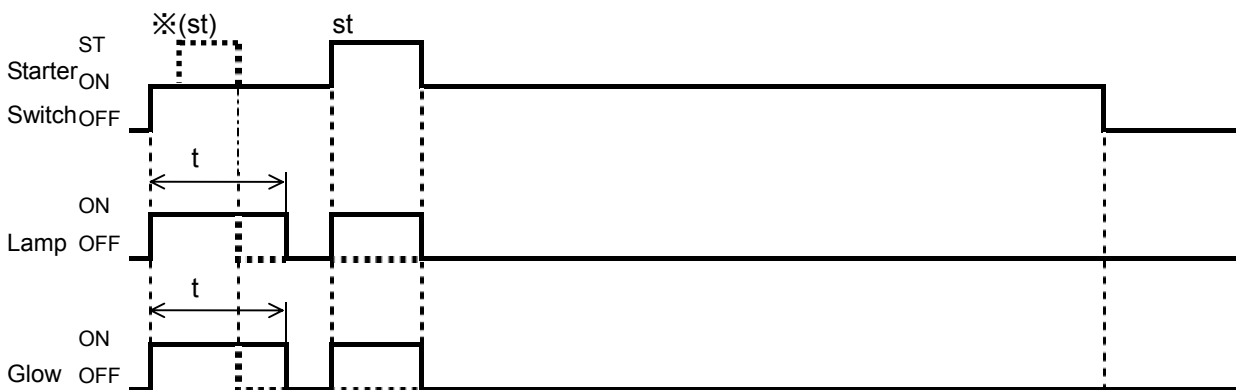
(1) Coolant temperature · glow instantaneous characteristic (at the time of key-OFF-ON)

Water temp. °C	Lamp lights · glow time t (sec)
-15	8.9
0	5.8
20	2.7

(2) List of functions

Pin No.	Line color	Connection	Remark
1	W/B	Starter switch R2 terminal	Detection of starter signal
2	—	NIL	
3	G/Y	10A Fuse	Power supply
4	G/R	Water temperature sensor	Detection of water temperature
5	G/W	Glow relay No.3 terminal	Power supply for glow relay. During preheating operation, connect to No.6 ground connection and it will be magnetically excited. When the start signal is inputted to No.1 terminal, it preheats, regardless of coolant temperature.
6	B	Earth	

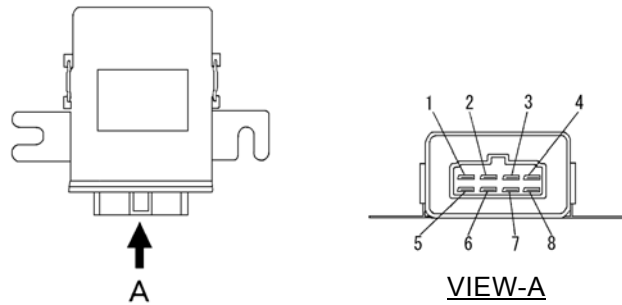
(3) Chart of function



※:The chart marked ※ 1 shows the function chart at which the starter switch is placed at “ST” position.

3. Electric System

PDS175S[SC]-5B2/5C1 ; Part Number:44327 04100



(1) Coolant temperature · glow instantaneous characteristic (at the time of key-OFF-ON)

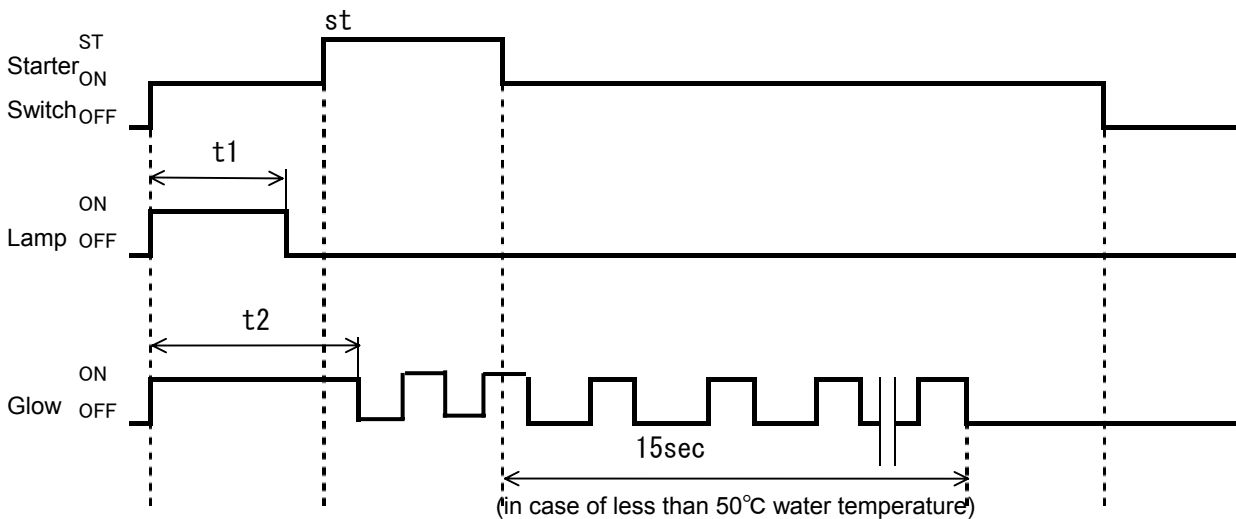
Water temp. °C	Lamp lights time t1 (sec)
-15	5.0
0	3.5
40	1.8

Voltage of No.6 terminal (V)	Glow time t2 (sec)
9.5	14.0
11.0	6.0
13.0	2.4

(2)List of functions

Pin No.	Line color	Connection	Remark
1	B/W	Starter switch C terminal	Detection of starter signal
2	G/W	Water temperature sensor	Detection of water temperature
3	B	Earth	
4	L/W	Controller CN2-14 terminal	Ignition of pre-heating pre-glow (pre-glow) lamp.
5	Y/R	Glow relay No.3 terminal	Power supply for glow relay. When voltage is applied to No.7 terminal, it pre-heats for a certain time in accordance with the voltage applied to the water temperature and glow plug. When water temperature is lower than 50°C, it repeats after glow for 15 seconds.
6	L	Glow plug	Detection of glow plug voltage.
7	W/R	10A Fuse	Power supply
8	—	NIL	

(3) Chart of function



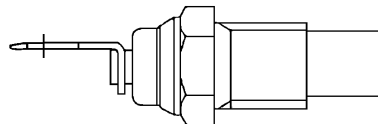
3. Electric System

3.1.5 Water temperature sensor for preheating

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2 ; Part Number:44334 14800

Coolant temperature · Resistance characteristics

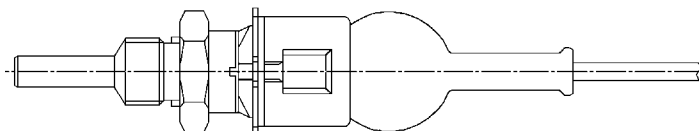
Water temp. °C	Resistance (k Ω)
-10	10.0
20	2.5
50	0.785



PDS175S[SC]-5B2/5C1 ; NISSAN DIESEL Part Number:22630-10G00

Coolant temperature · Resistance characteristics

Water temp. °C	Resistance (k Ω)
-10	9.2
20	2.5
50	0.84



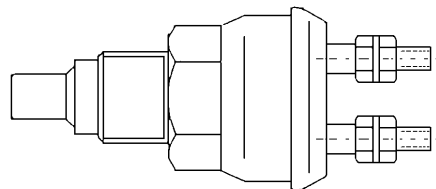
PC09007

3.1.6 Discharge air temperature switch

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130,175S[SC]-5B2 ; Part Number:44334 16500

Specification

Setting temp. °C	OFF	120 ± 2
	ON	110 ± 2
Contact type		B contact switch (Contact "OFF" in excess of set pressure)



3.1.7 Engine coolant temperature switch

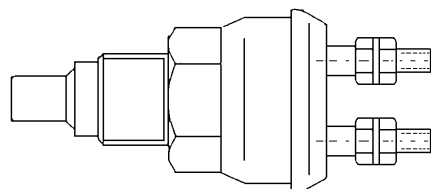
PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2 ; Part Number:44334 17500

PDS175S[SC]-5B2

; Part Number:44334 09300

Specification

Setting temp. °C	OFF	110 ± 2
	ON	103 ± 2
Contact type		B contact switch (Contact "OFF" in excess of set pressure)



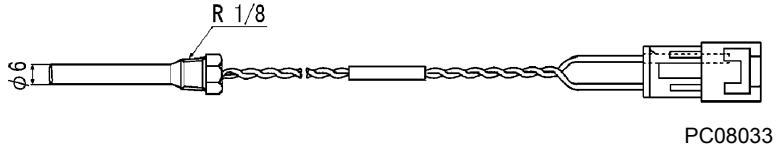
3. Electric System

3.1.8 Discharge air temperature sensor, Coolant temperature sensor

PDS175S[SC]-5C1 ; Part number:44364 06500

Characteristic of temperature resistance

Water temp. °C	Resistance (kΩ)	Permissible Value (%)
80	1,300	±7
95	840	±6
110	560	±5
115	490	±6



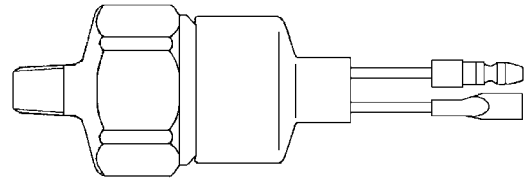
《Note》 Take care not to tighten excessively.
Less than 1.96N·m(20kgf·cm)

3.1.9 Engine oil pressure switch

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2 ; Part Number:44328 06700

Specification

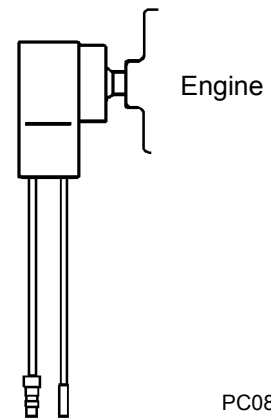
Setting pressure	98.1kPa(1.0kgf/cm ²)
Contact type	A contact switch (Contact "ON" in excess of set pressure)



PDS175S[SC]-5B2/5C1 ; Part Number:44328 19100

Specification

Setting pressure	0.06MPa(0.6kgf/cm ²)
Contact type	A contact switch (Contact "ON" in excess of set pressure)
Time lag	<ul style="list-style-type: none"> • 10 seconds after engine starts. • 2 seconds during operation

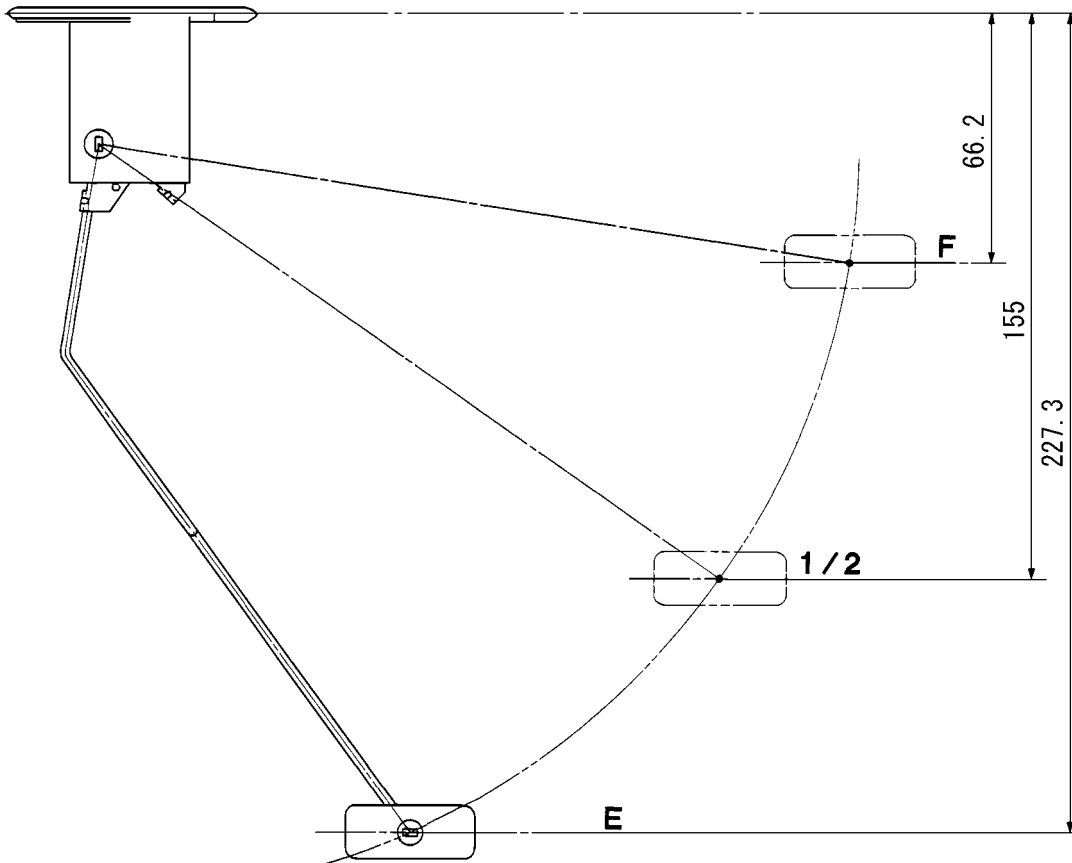
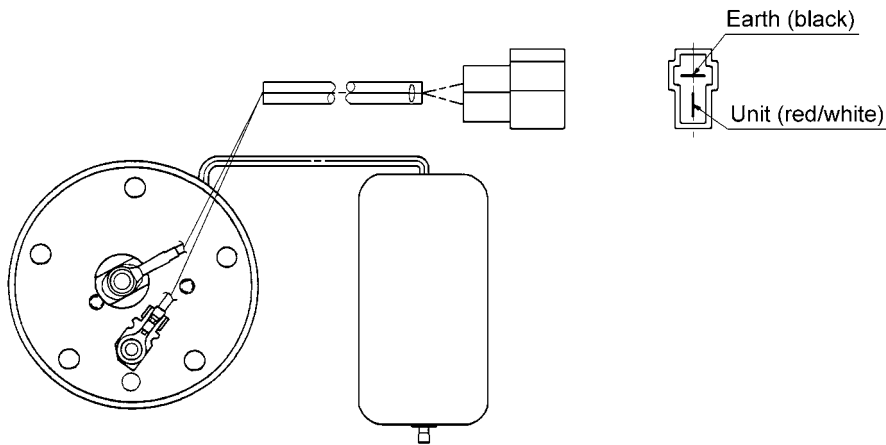


3. Electric System

3.1.10 Sending unit

Pointer position	PDS55S-5B2/5C1	PDS75S[SC]-5B2/5C1 PDS100S[SC]-5B2/5C1	PDS130S[SC]-5B2 PDS175S[SC]-5B2/5C1	Resistance (Ω)
	Remaining fuel (L)	Remaining fuel (L)	Remaining fuel (L)	
E	3.0	3.5	11.5	110.0
1/2	8.5	16.5	38.0	32.5
F	15.0	25.0	63.5	3.0

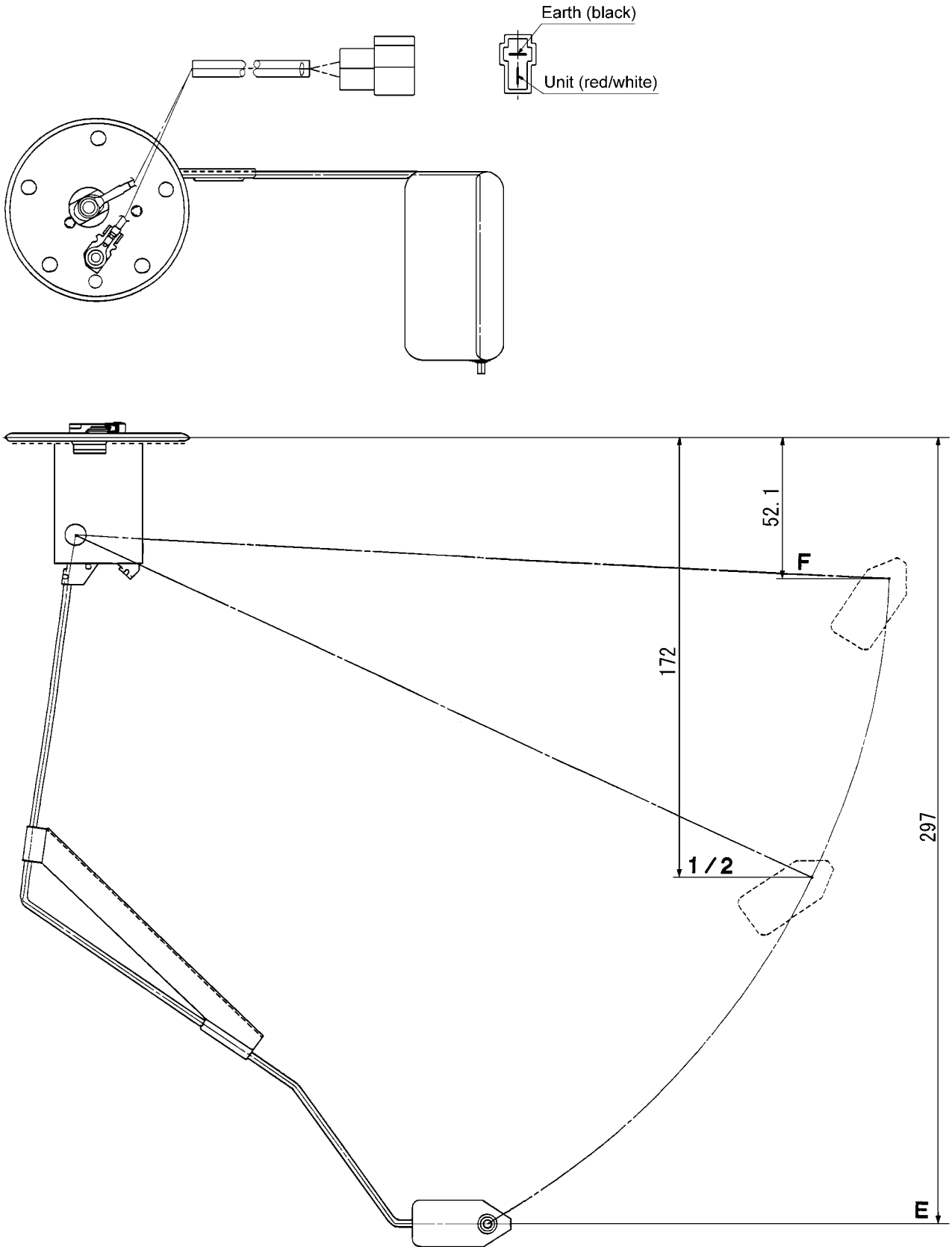
PDS55S-5B2/5C1 ; Part Number:36159 02101



PC08067E

3. Electric System

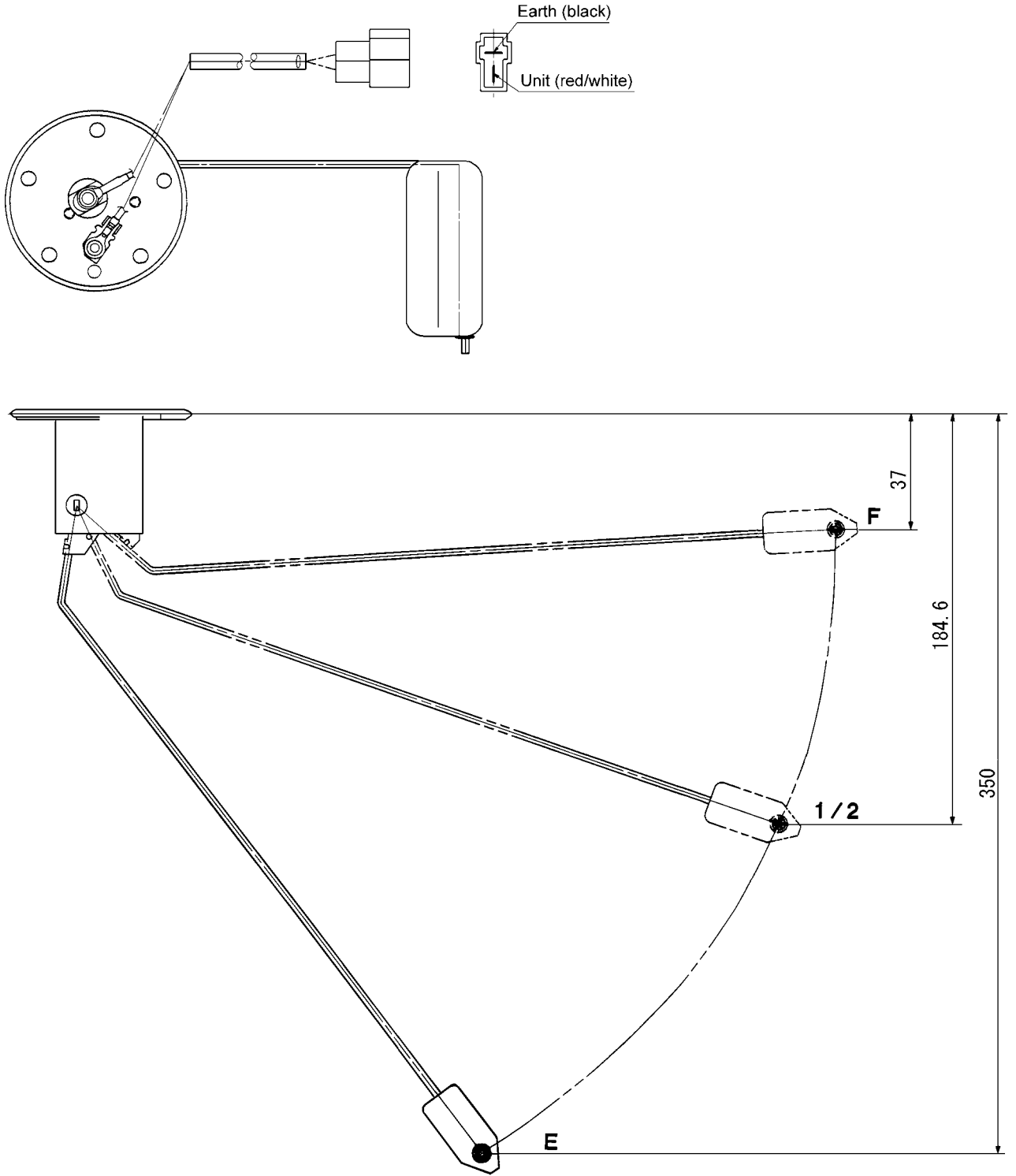
PDS75,100S[SC]-5B2/5C1 ; Part Number:36159 03000



PC08068E

3. Electric System

PDS130S[SC]-5B2, PDS175S[SC]-5B2/5C1 ; Part Number:36159 02202

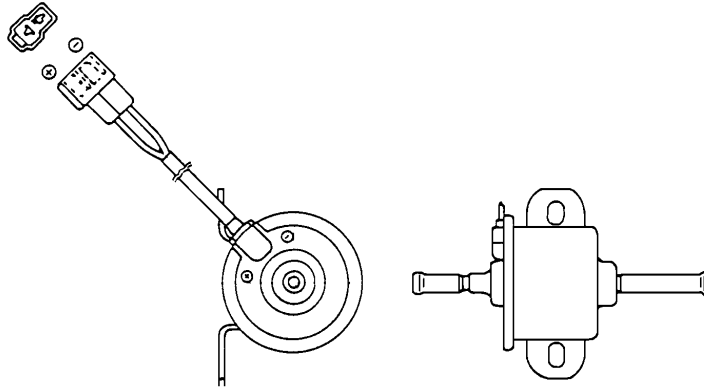


PC08069E

3. Electric System

3.1.11 Fuel air-bleeding electromagnetic pump

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2 ; Part Number:43650 01500
 PDS175S[SC]-5B2/5C1 ; Part Number:43650 01900



PC08087

(1) Specification

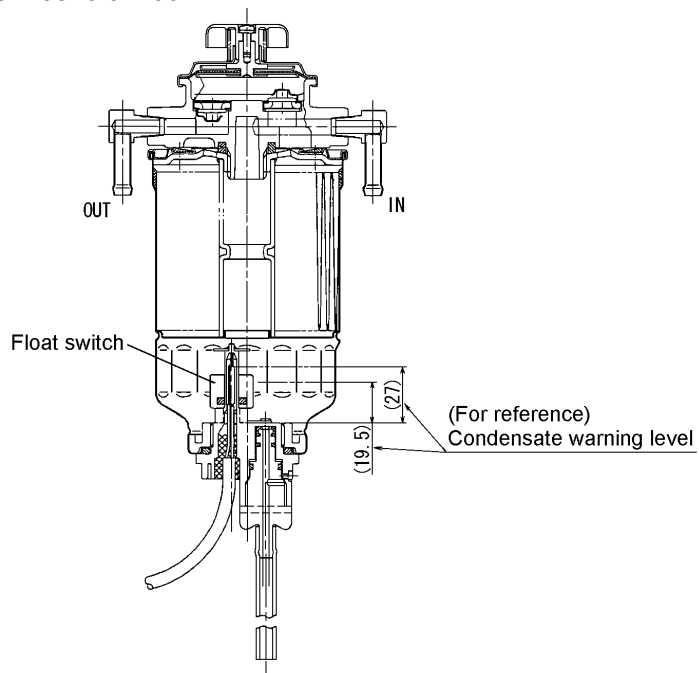
	PDS55~130S	PDS175S
Rated voltage	12V	
Operating current	1.5A(MAX)	
Delivery capacity	More than 0.8L/min	More than 0.4L/min

(2) Functions

When the key switch is turned “ON”, electromagnet pump No.2 terminal will be electrically conducted to work. On the contrary, when “OFF” or emergency stop circuit works, solenoid relay No.3 is switched to cut connection to electronic pump solenoid.

3.1.12 Fuel filter

PDS175S[SC]-5C1 ; Part number:43540 07400

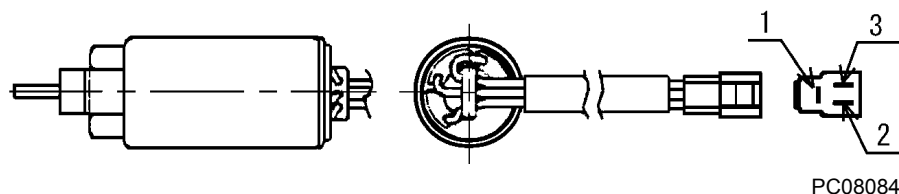


PC08038E

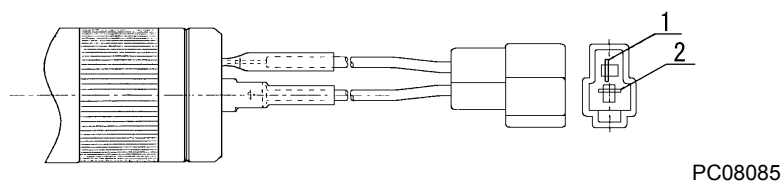
3. Electric System

3.1.13 Stop solenoid

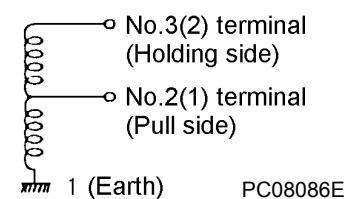
PDS55,75,100,130S[SC]-5B2



PDS55S,75,100S[SC]-5C1



Cable connection



Numbers in parenthesis show connector pin numbers of PDS55,75,100S[SC]-5C1.

(1) Specification

		PDS55S-5B2 PDS75,100,130S[SC]-5B2	PDS55S-5C1 PDS75,100S[SC]-5C1
Maker		HITACHI	TDS
Rated voltage		12V	12V
Rated current	Pull side	Less than 25A	3.75A
	Holding side	less than 1A	0.566A

(2) List of functions

Pin No.	Line color	Connection	Remark
1 (-)	B	Earth	
2 (1)	L	Starter switch R2 terminal	Pull coil
3 (2)	Y/L	Solenoid relay No.3 terminal	Holding coil

() show the pin number, also connection of PDS55,75,100S[SC]-5C1.

PDS55, 75,100S[SC]-5C1 are not equipped with stop solenoid because they are connected to ground.

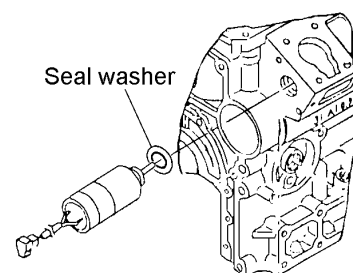
(3) Functions

When key switch is "ON", stop solenoid No.3 terminal (holding circuit) is electrically conducted. [For PDS55, 75,100S/SC-5C1, No.2 terminal is electrically conducted.] When key switch is turned to "START", stop solenoid No.2 terminal is electrically conducted. [For PDS55, 75,100S/SC-5C1, No.1 terminal is electrically conducted.] And the plunger inside stop solenoid is pulled to open the rack of engine fuel filler port. After engine starts, rack of fuel filler port is kept open because stop solenoid No.3 terminal (holding circuit) is electrically conducted [for PDS55, 75,100S/SC-5C1, No.2 terminal is electrically conducted.] When key switch is "OFF" or emergency stop circuit functions, contact of solenoid relay No.3 terminal is switched to cut electric conduction to stop solenoid. Thus fuel supply to engine is cut to make engine stop.

Caution upon installation of stop solenoid

- Replace seal washer with new one, which is to be fitted on the fitting face of stop solenoid.
- Screw in stop solenoid from the back of cylinder block (back of No.3 injection pump rack) and tighten it according to the set torque.

Tighten torque 15.0-20.0 N·m (1.5-2.0 kg·m)

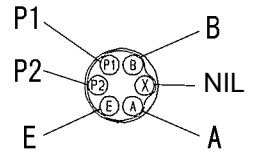
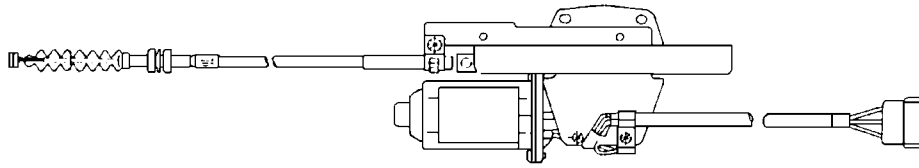


PC08082

3. Electric System

3.1.14 Stop motor

PDS175S[SC]-5B2 ; Part number:44358 01200



PC08040-1

List of functions

Pin No.	Line color	Connection
P1	LY	Stop motor relay No.6 terminal (NC)
P2	LW	Stop motor relay No.5 terminal (NO)
E	B	Earth
A	L	Stop motor relay No.3 terminal (COM)
X	—	NIL
B	LR	20A Fuse (Power supply)

3. Electric System

[Function of stop motor]

1. Before engine starts

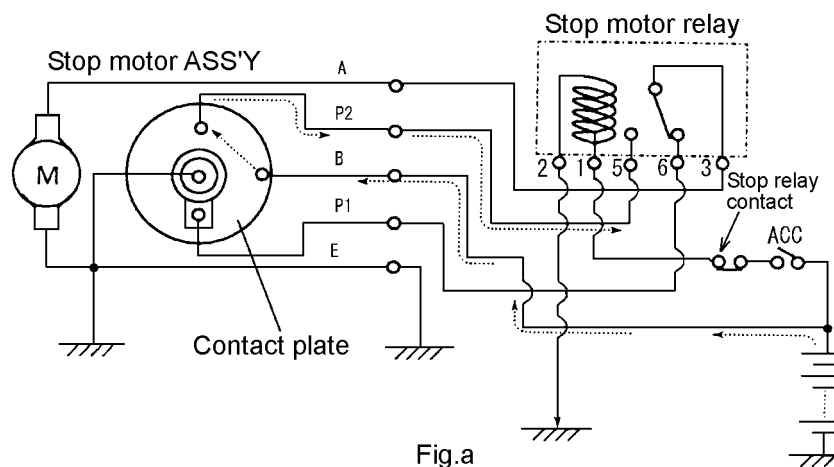


Fig.a

PC08041E-1

- ① As the ACC contact is open before starting engine, the exciting current is not provided, but internal contact is as shown in fig a.
- ② When the contact plate inside the stop motor assembly is positioned as shown in fig a, there is a conduction between B terminal and P2 terminal. Accordingly, the voltage of the battery is applied to No.5 terminal of stop motor relay.

2. Engine starts

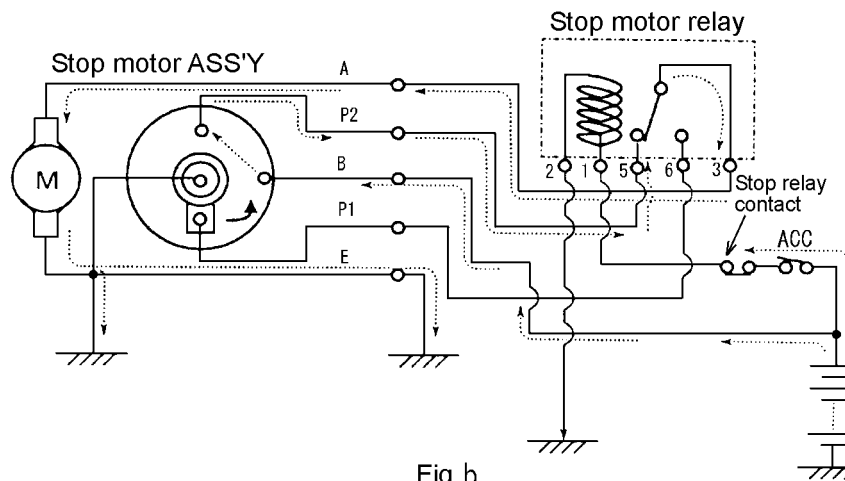


Fig.b

PC08042E-1

- ① When closing the ACC contact by handling the starter switch ("Operation" position), the circuit of controller inside contact between CN1-8 terminal and CN1-4 terminal → stop motor relay No.1 terminal → exciting coil → stop motor relay No.2 terminal → grounding is formed and the stop motor relay is excited. Accordingly, stop motor relay contact functions.
- ② As the voltage of battery is already applied to the stop motor relay CN3-5, the circuit of stop motor relay No.5 terminal → stop motor relay No.3 terminal → stop motor A terminal → motor → grounding is formed and the motor starts.

3. Electric System

3. Rotation of contact plate

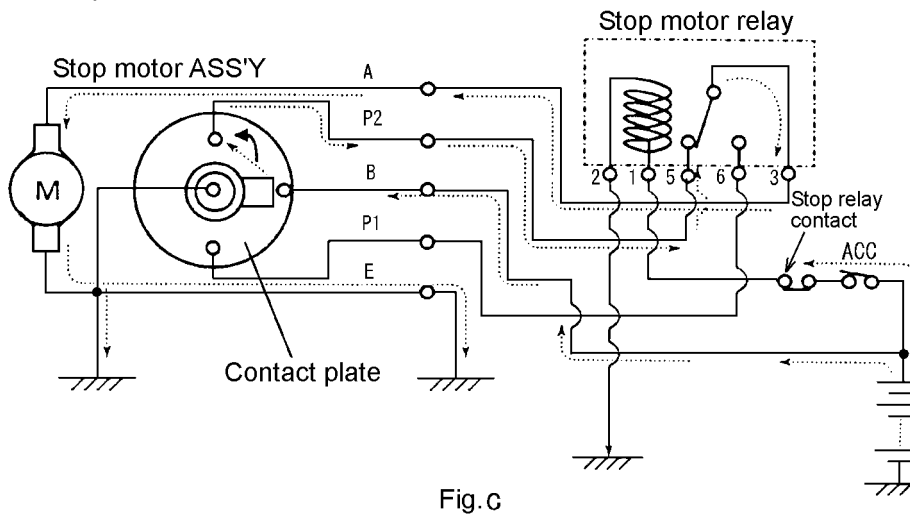


Fig.c

PC08043E-1

- ① When motor begins to rotate, the worm fitted to the motor shaft rotates and at the same time worm wheel rotates.
- ② The worm wheel and contact plate are interconnected and so it continues to rotate as shown in Fig C.

4. Stop of contact plate rotation

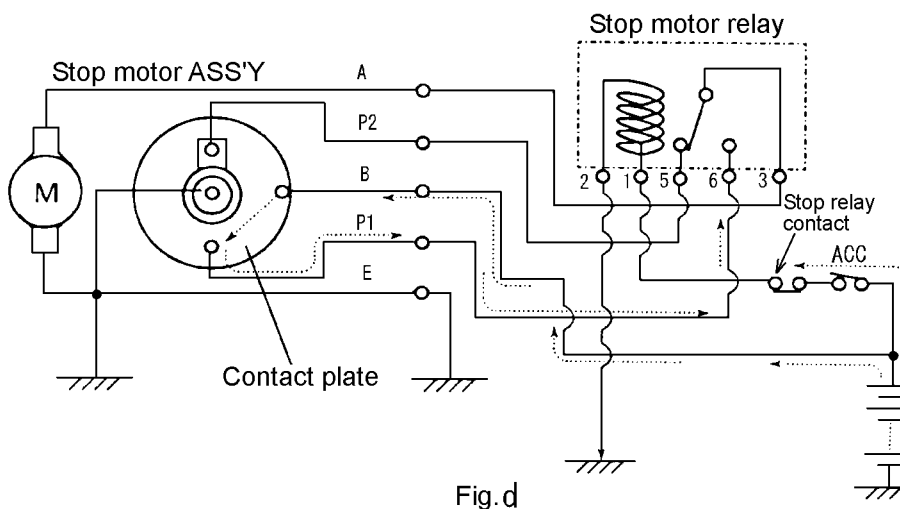


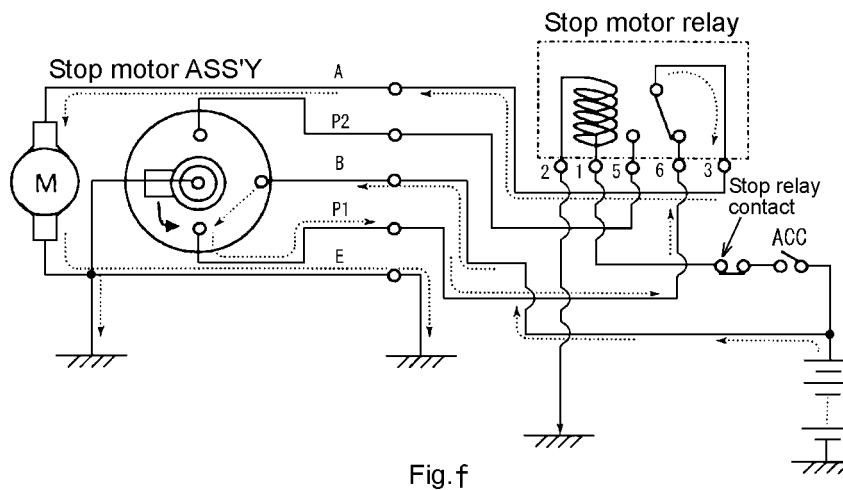
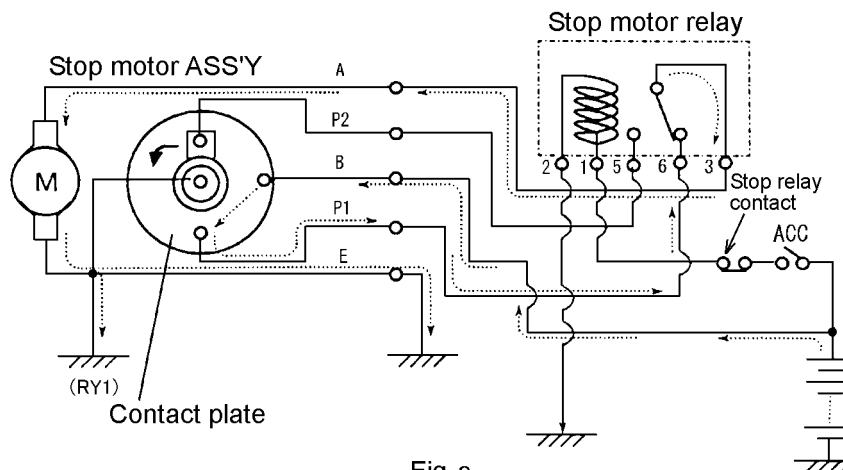
Fig.d

PC08044E-1

- ① When the contact plate turns 180° degree from the state at which it stays, the electrical conduction disappears between B and P2 terminal as shown in Fig.d, P2 terminal is connected to the grounding side. Further, it follows that the armature of the motor gets short-circuited and so it is electrically braked so that the contact plate stops surely at the constant position
- ② At the same time worm rotation is reduced by worm wheel, and further the rotation will be changed for reciprocal movement via the lever. The stroke extends the wire to move the fuel lever fitted at the injection pump to open the fuel circuit.
- ③ When the contact plate stays at the position shown in fig d, the conduction appears between B and P1 terminal and so the voltage of battery is applied to stop motor relay No.6 terminal.

3. Electric System

5. Engine stops (normal stop)



PC08045E-1

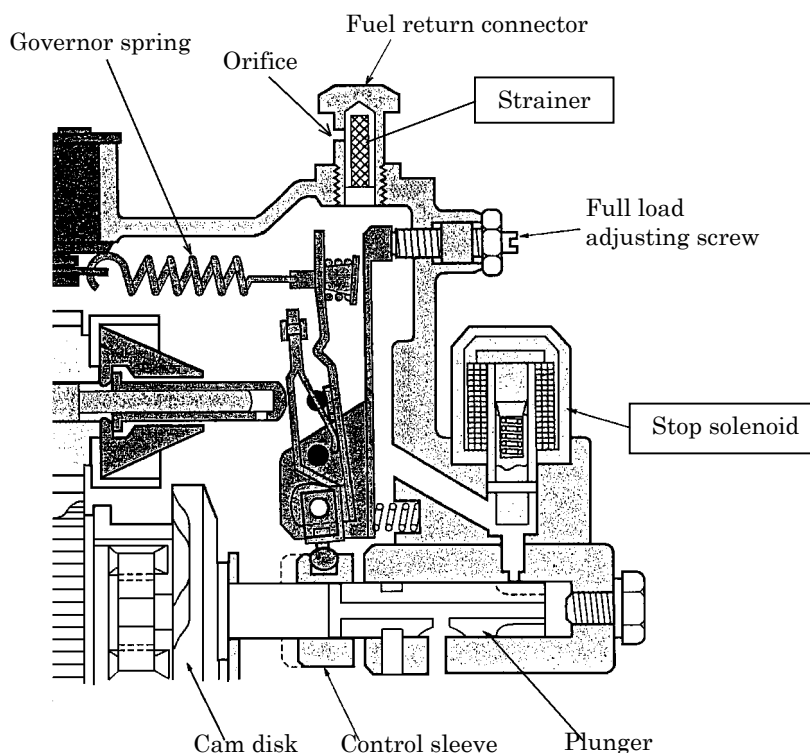
- ① To stop engine, handle starter switch to open ACC contact (“Stop” position) so that excitation circuit of stop motor relay may be released to move the contact point as shown in Fig e.
- ② As the voltage of battery is already applied to stop motor relay No.6 terminal, the circuit of stop motor relay No.3 terminal → stop motor A terminal → motor → grounding is formed and so the motor turns and at the same time the contact plate also turns as shown in the fig f.
- ③ The contact plate continues to turns from 180° position shown Fig e to the 360° position in Fig a via Fig f position. At the same time when the contact plate rotates the wire is pulled to close fuel line circuit by the fuel line connected to injection pump to close the fuel circuit to stop engine.
- ④ Motor and contact plate stop to rotate at specified position in Fig a, and return to the position in the clause “ 1. Before engine starts ”.

6. Emergency stop

When any abnormalities are found in engine oil pressure, water temperature and discharge air temperature, controller emergency stop circuit functions, interior contact (RY1) starts to function to open the switch and to release stop motor relay exciting circuit. The process till “5.engine stops” is same after engine stop (normal stop).

3. Electric System

PDS175S[SC]-5C1



PC08039

(1) Specification

Rated voltage		DC12V
Power consumption		16W
Pull·Holding	Current	1.33A
	Resistance	9.02Ω

1. Replacement of stop solenoid

Stop solenoid may intervene with dumper proof (full load adjusting portion) when it is being replaced. Therefore, it is impossible to remove stop solenoid only. When it is necessary to remove it, it is better to contact Bosch Service Department or injection pump assembly.

2. Position of strainer installment inside VE pump

Injection pump is equipped with a strainer in connector of fuel return pipe. This strainer is provided to prevent clogging of the orifice (about 0.5mm) provided to keep the fuel pressure in the pump constant (Installation: one position).

4. Troubleshooting

4.1 Repairing Procedures

When performing failure diagnosis, pay special attention to the followings, observing general cautions.

4.1.1 Safety caution

- (1) Removing such cap and/or plug for receiver tank, fuel tanks and pipes where pressure is loaded, stop the machine and relieve all the interior pressure. Install measuring instruments connected firmly.
- (2) When doing the job with co-worker(s) together, make sure to give signal to the other person(s) and do not allow other persons to come near to the job site.
- (3) Take care not to touch hot portions and not to be involved in turning portions.

4.1.2 Caution during failure diagnosis

- (1) Do not make haste to disassemble the unit

If the unit is disassembled urgently.

- ① You may disassemble the other portions which are not related with the trouble.
- ② The cause of trouble may be missing.

The unnecessary reparations require more spare parts and man-hours, and reparation costs will increase more. What is worse, you will lose reliance or trust from clients, operators and users.

Therefore, it is absolutely necessary to investigate the trouble more carefully in advance and to follow the required procedures for failure diagnosis.

- (2) Ask the clients about the trouble in details

In order to prevent misunderstanding and incorrect judgment about the trouble, it is necessary to ask users or operators about the following questions.

- ① Is there any other disorder than the trouble he has informed?
- ② Anything abnormal occurred before this trouble?
- ③ Did this trouble happen unexpectedly? Or the unit had been operated in bad conditions before?
- ④ When and how did this trouble occur?
- ⑤ Had he repaired the unit before this trouble occurred?
- ⑥ Did he not experience similar trouble before?

- (3) Inspection items before starting diagnosis

Sometimes such trouble may be caused owing to routine mishandling of the unit. Before starting failure diagnosis, check the following items.

- ① The engine runs short of engine oil or its oil is not dirty?
- ② Check each wire connection for any disconnection.
- ③ Check the other portions for any damage.

- (4) Confirmation of trouble

Discuss with user(s) and/or operator(s) sufficiently about the trouble. As a result, judge whether their judgment is based on the numerical comparison or sentimental basis. Make him (them) understand well the reparation or correction you have finished.

Then check and confirm by yourself the cause of the trouble.

Note) Never proceed any investigation or measurement which may cause further greater damage.

4. Troubleshooting

(5) Procedures of diagnosis

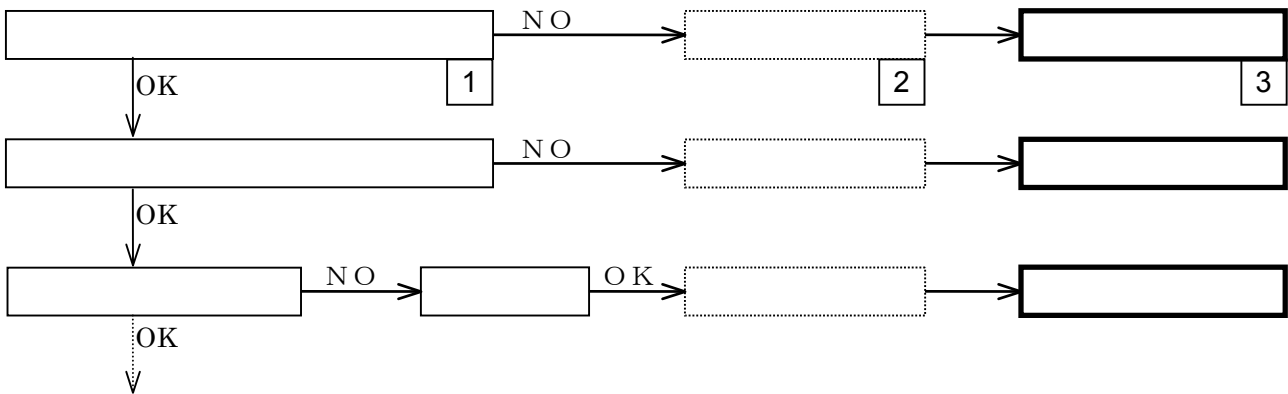
When you become well experienced, you can find out the cause easily during the process of confirmation (4). But easy understanding could cause unexpected failure. So check and judge it according to the following procedures.

- ① Check the easiest thing or portion first.
- ② Investigate the most possible cause.
- ③ Check the other things connected to the trouble.
- ④ Check for the possibility of any other troubles.
- ⑤ Start proper and careful investigation on this trouble.

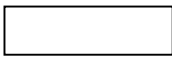
(6) Prevention of repeated occurrence of similar trouble

Even if you have repaired the trouble, unless you get rid of the fundamental cause of the trouble, it will repeatedly occur. Therefore, perform full investigation of the trouble, and it is absolutely necessary to remove the basis of the trouble.

4.1.3 How to use the failure diagnosis



① In the troubleshooting column something abnormal is mentioned in lined parenthesis.



② In the troubleshooting column the cause of the said trouble is mentioned in dotted parenthesis.



③ In the troubleshooting column the countermeasures or treatment are mentioned in the double lined parenthesis.



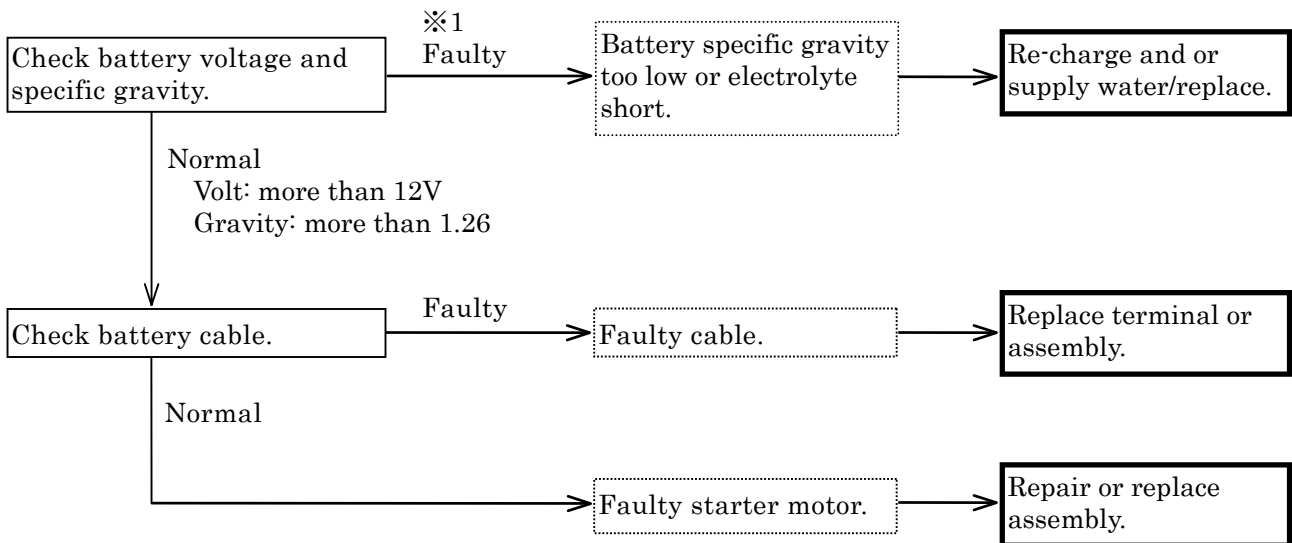
④ 1 under each column means the index of explanation.

For details, see 4.5 “Explanation of trouble diagnosis”

4. Troubleshooting

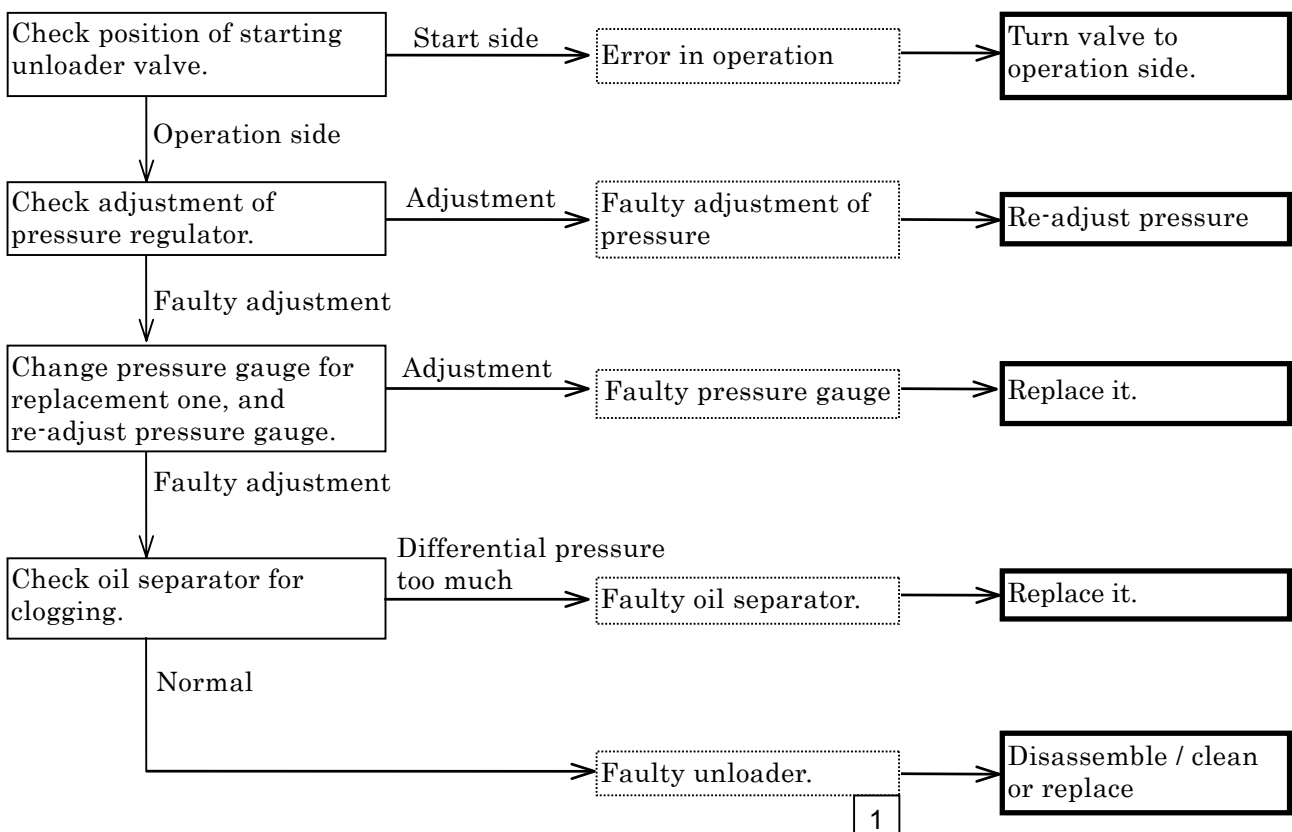
4.2 Failures of compressor and engine

4.2.1 At start-up, starter rotates slowly



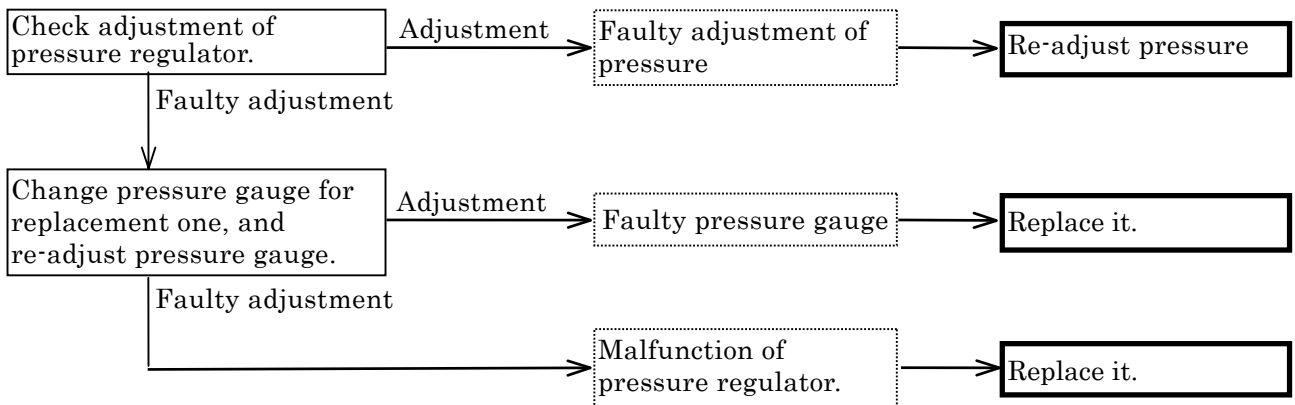
※1 : When starter switch is placed at the “START” position, the battery is not normal if B terminal voltage decreases by 10V.

4.2.2 Receiver tank gauge pressure will not rise up to rated pressure during unloaded operation



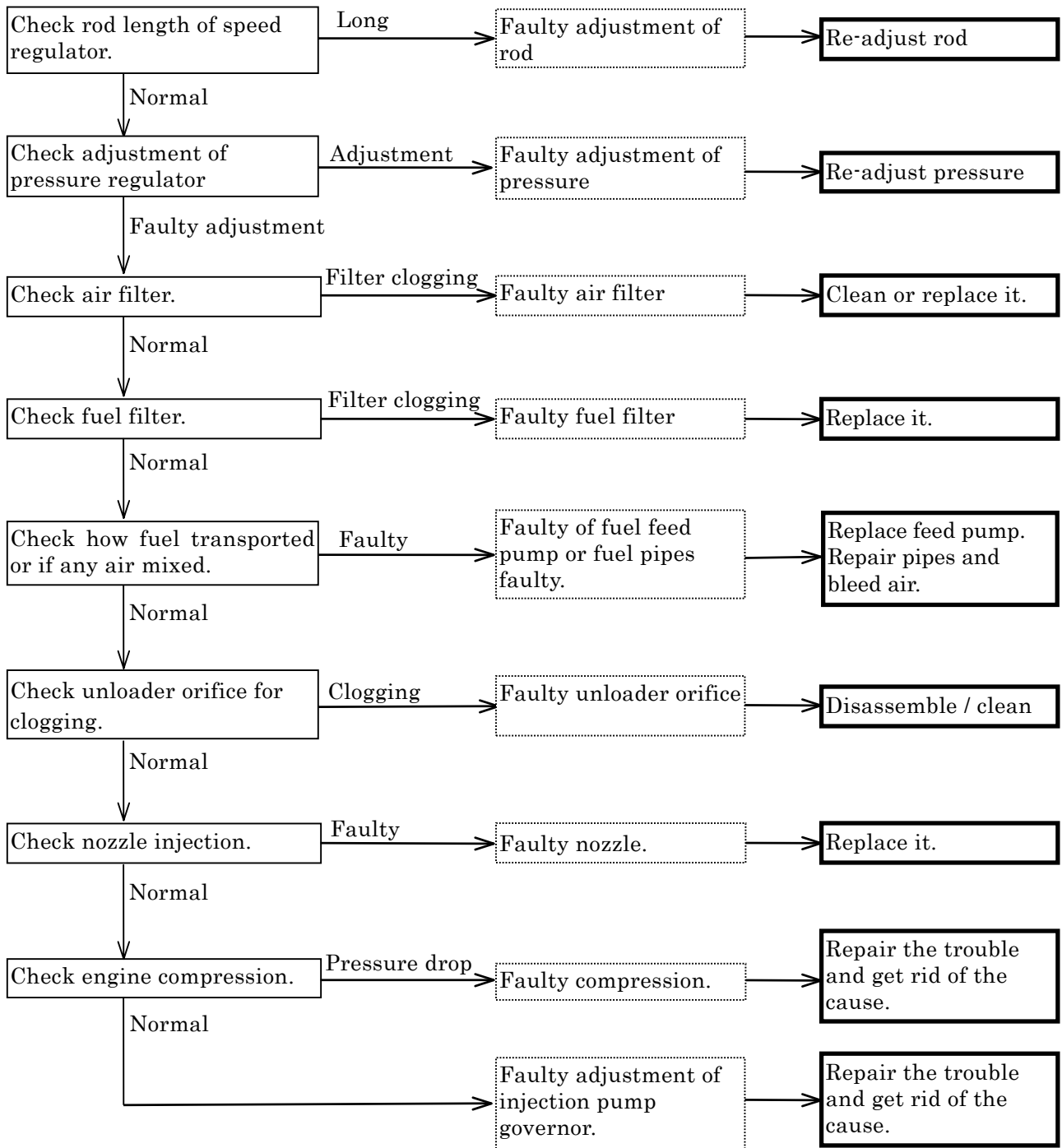
4. Troubleshooting

4.2.3 Engine revolutions will drop before pressure rises up to rated one



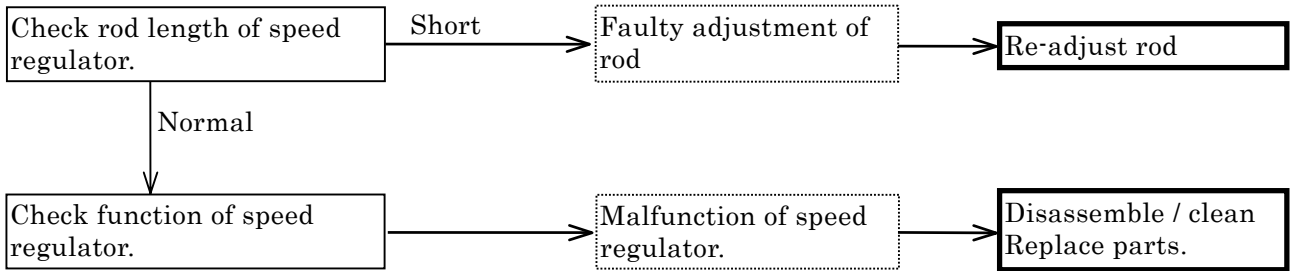
4. Troubleshooting

4.2.4 Engine will not turn to meet rated revolutions

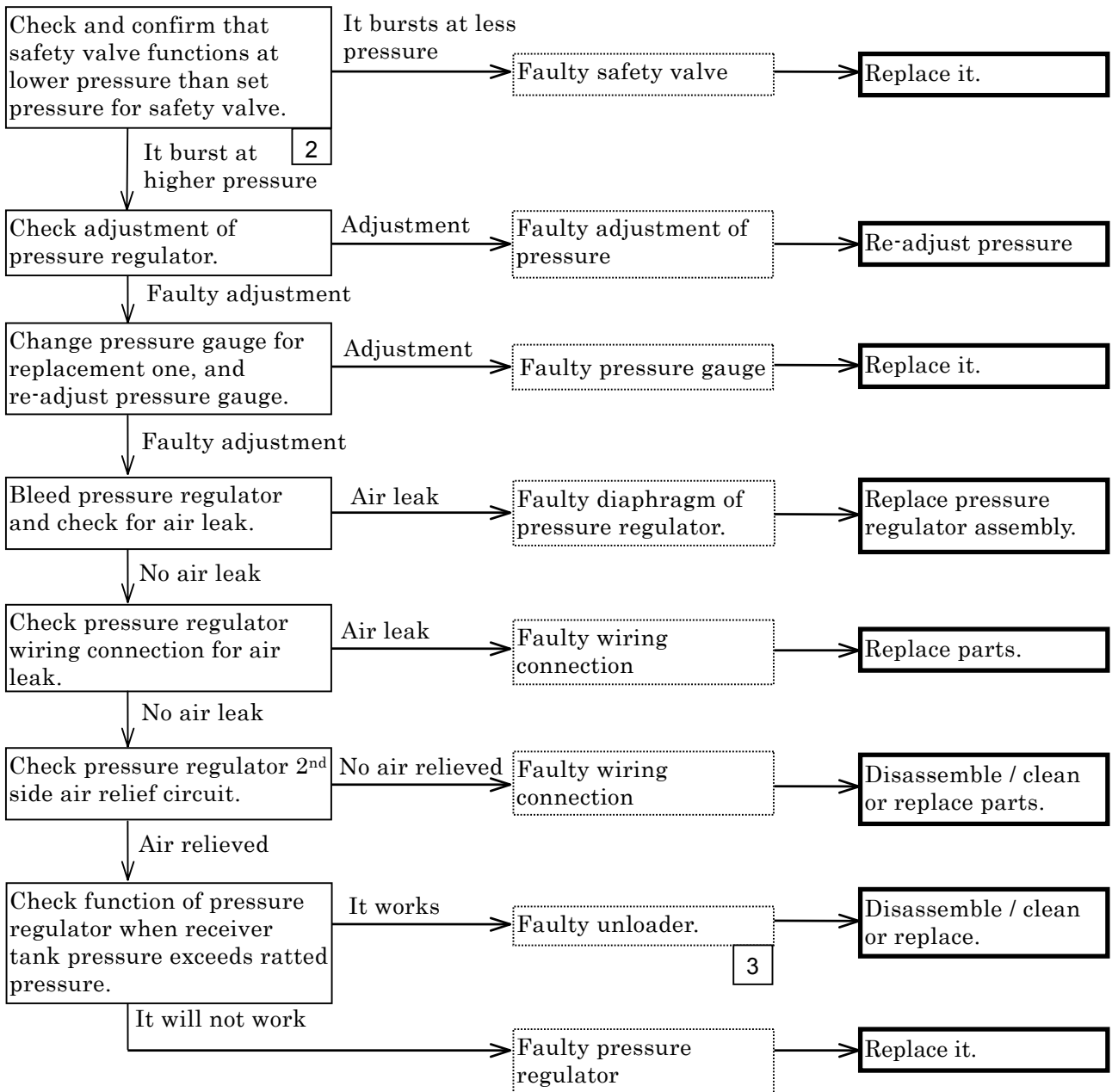


4. Troubleshooting

4.2.5 Engine RPM will not drop to lowest RPM during unloaded operation

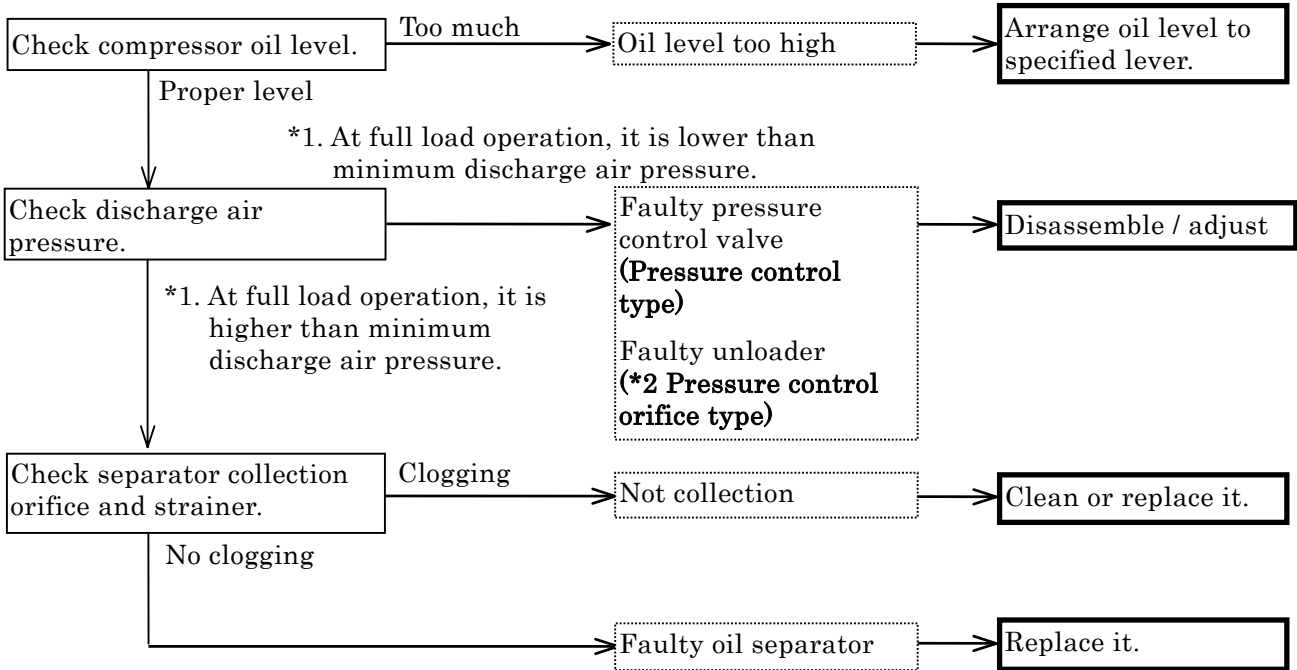


4.2.6 Safety valve bursts out during unloaded operation



4. Troubleshooting

4.2.7 Oil mixed found in delivery air

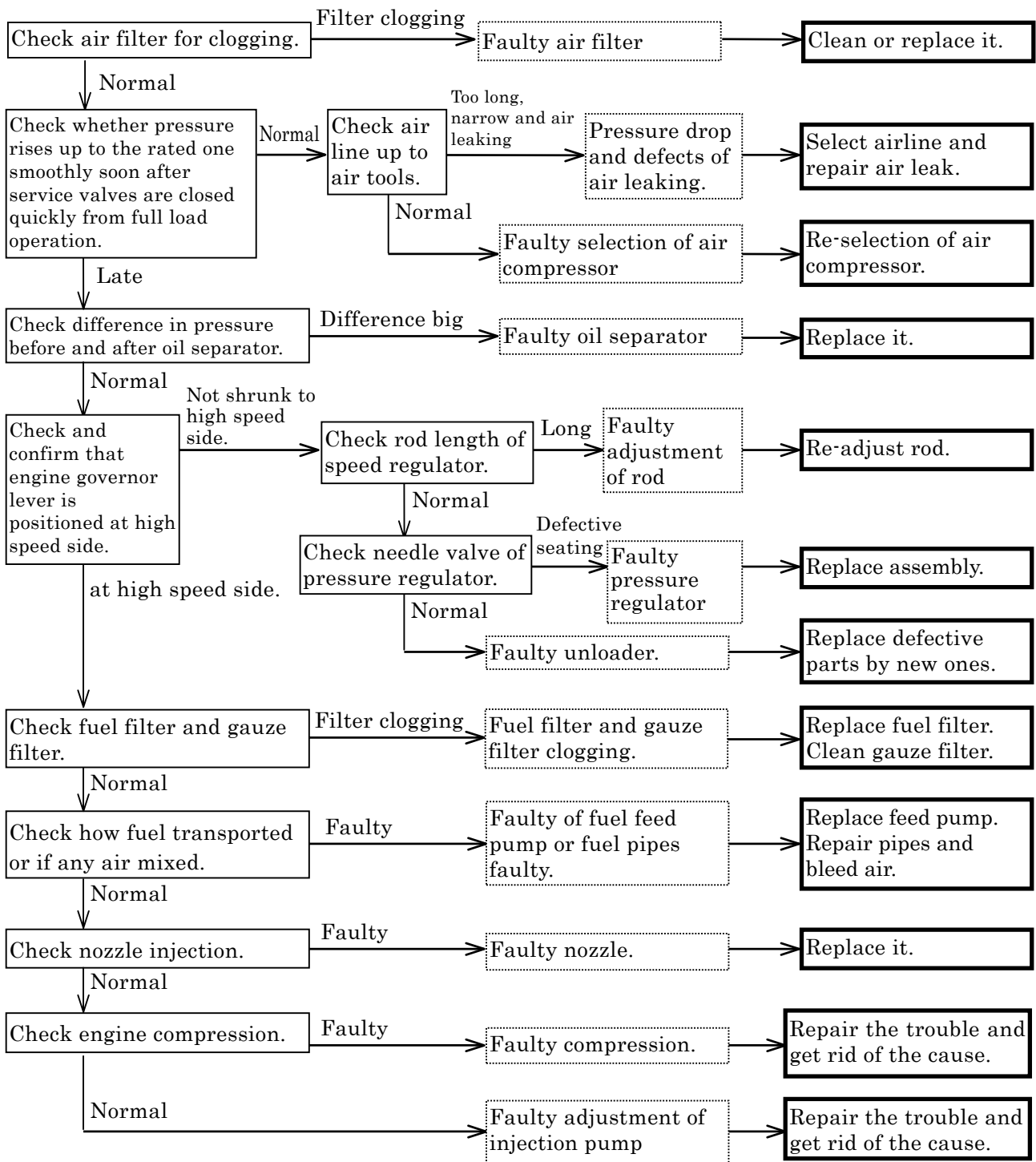


*1: For minimum discharge air pressure at full load operation, see 1.2 Set Value “Indications of gauges or instruments during operation” of 1.Specifications.

*2: In case of pressure control orifice (venture) type [PDS75, 100S[SC]-5B2/5C1, PDS130, 175S[SC]-5B2], fully open service valves and stop operation. Otherwise, oil could be mixed in delivery air when starting operation next time.

4. Troubleshooting

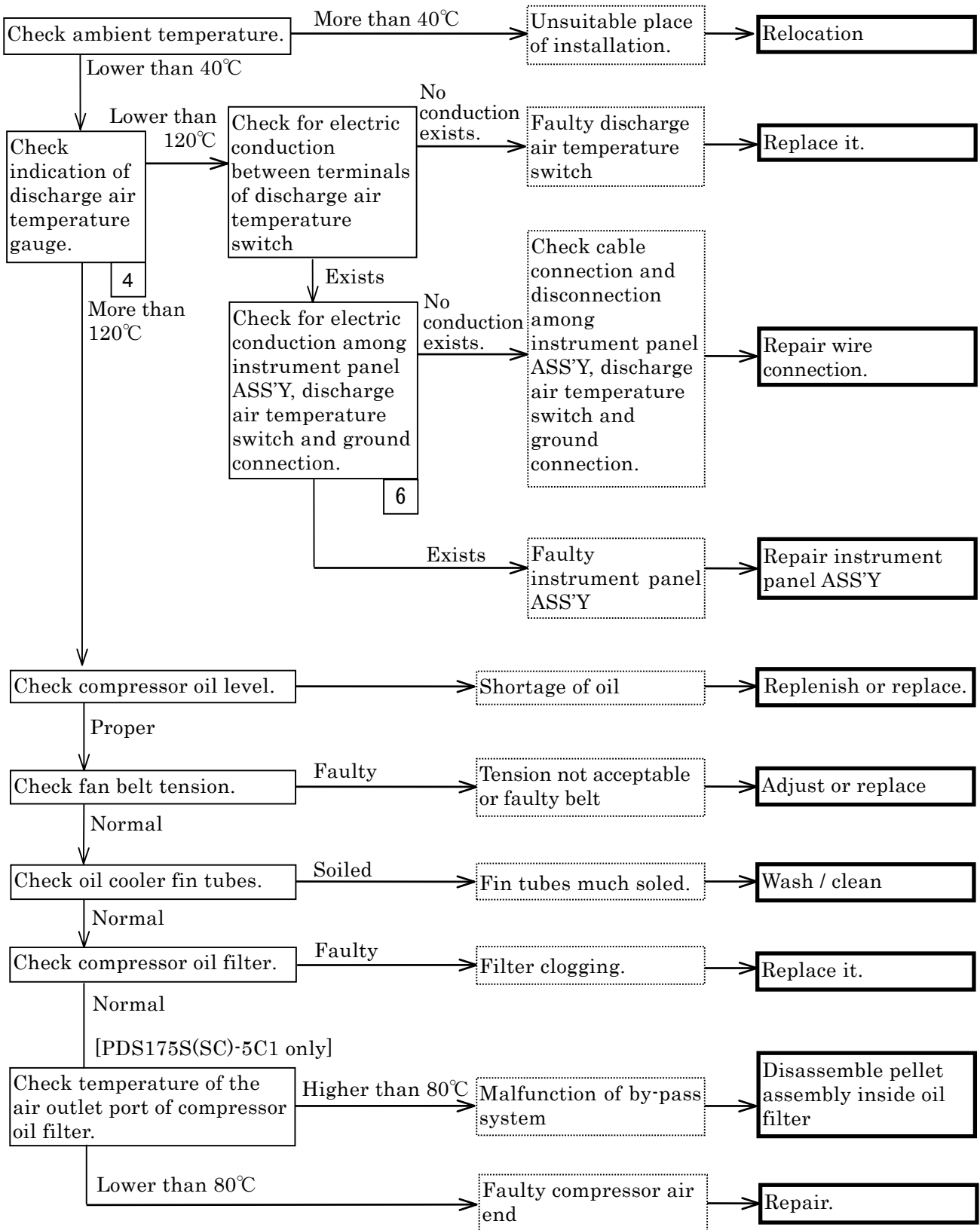
4.2.8 Discharge air is insufficient



4. Troubleshooting

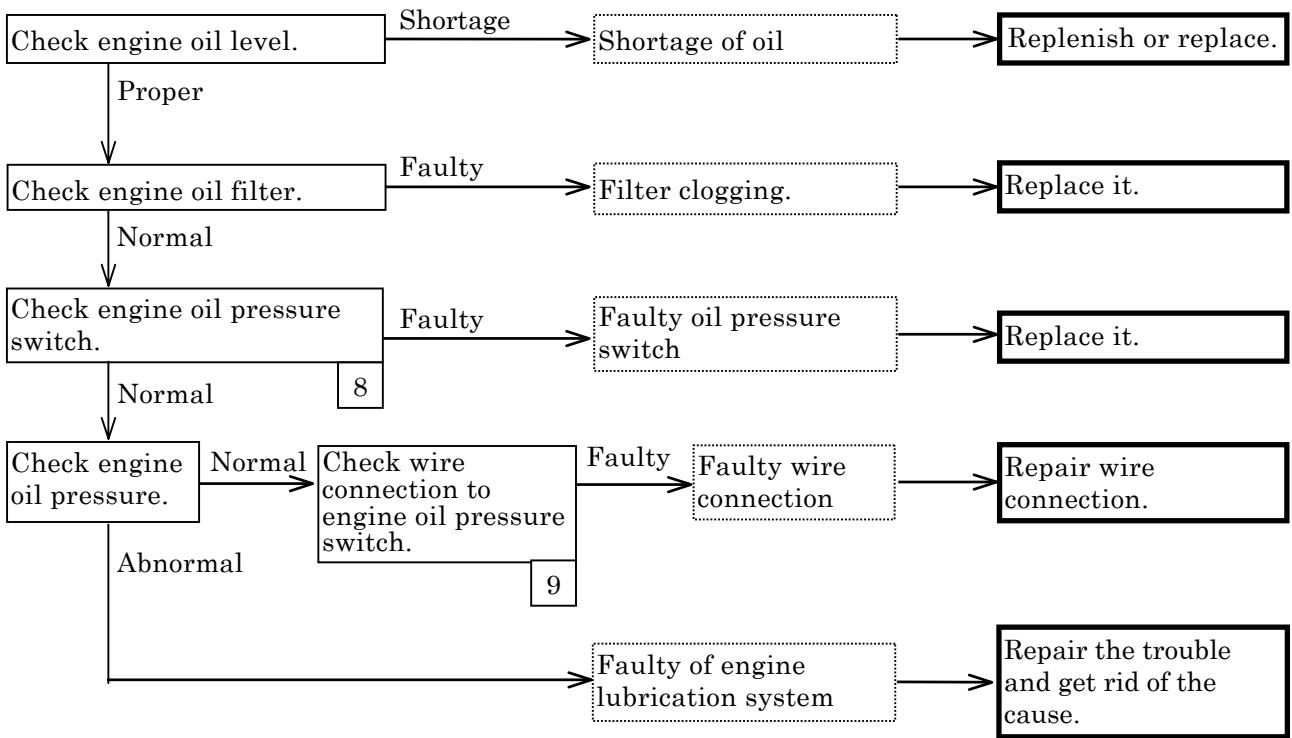
4.3 Operation of emergency switch

4.3.1 Discharge air temperature warning lamp glows and engine stops.



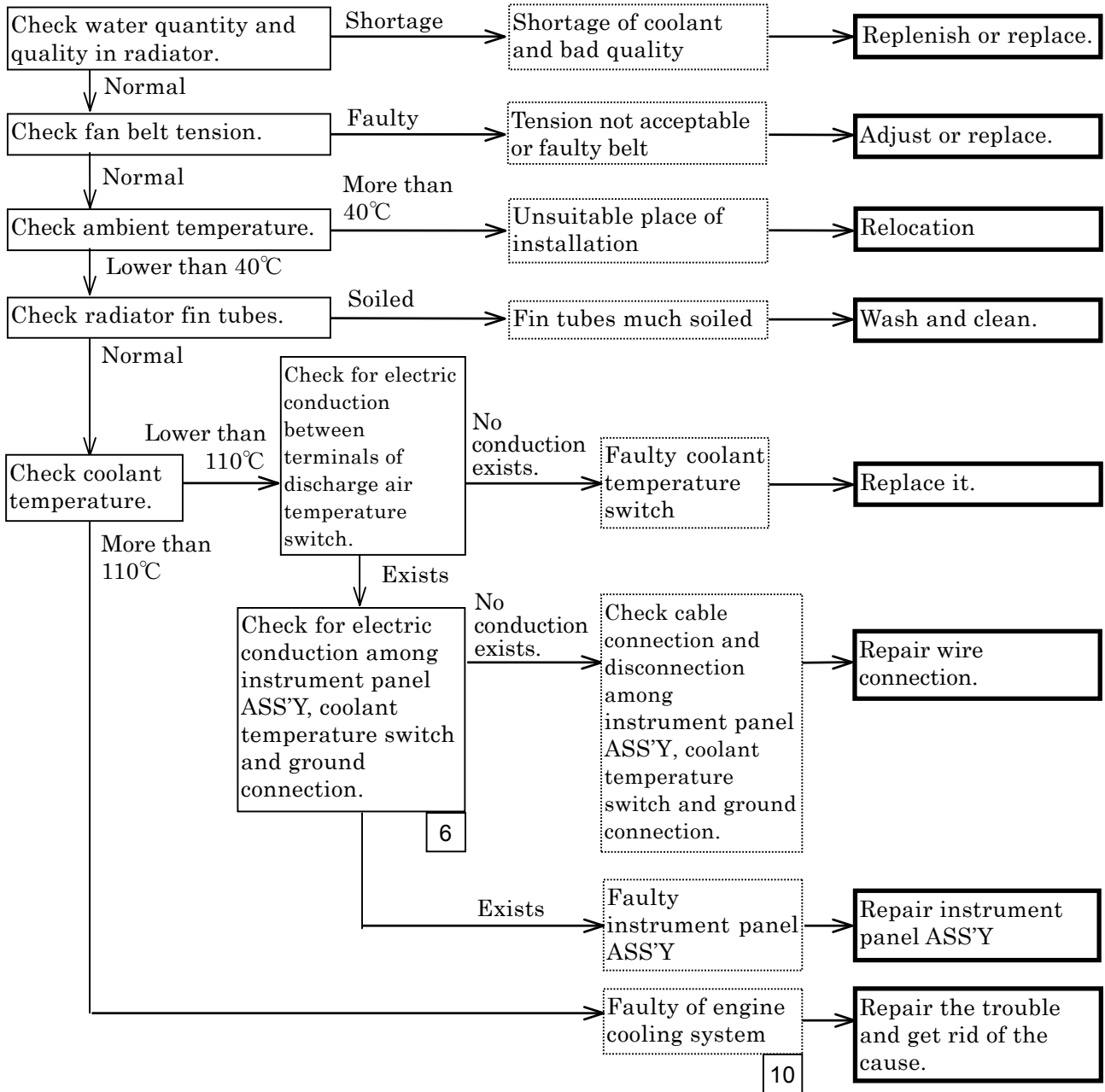
4. Troubleshooting

4.3.2 Engine oil pressure warning lamp glows and engine stops

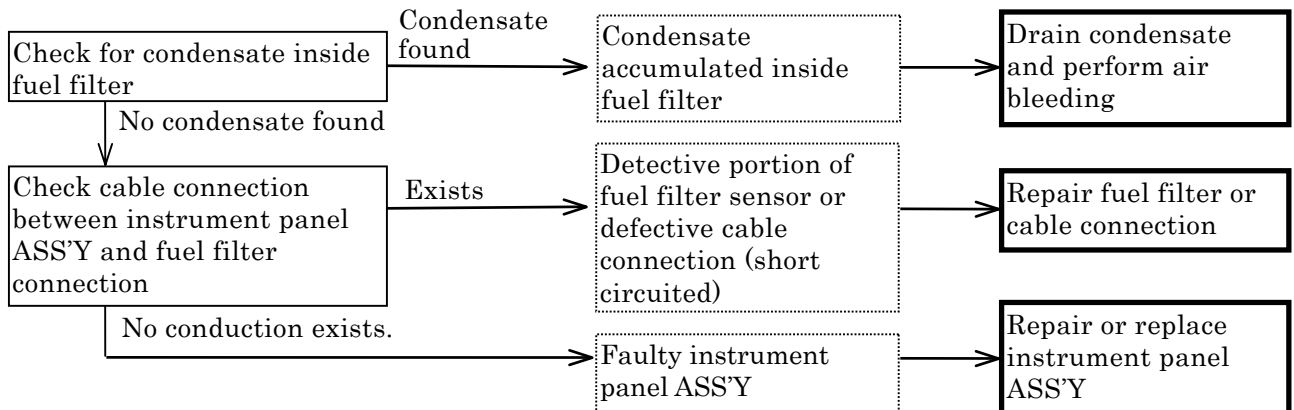


4. Troubleshooting

4.3.3 Engine coolant temperature warning lamp glows and engine stops

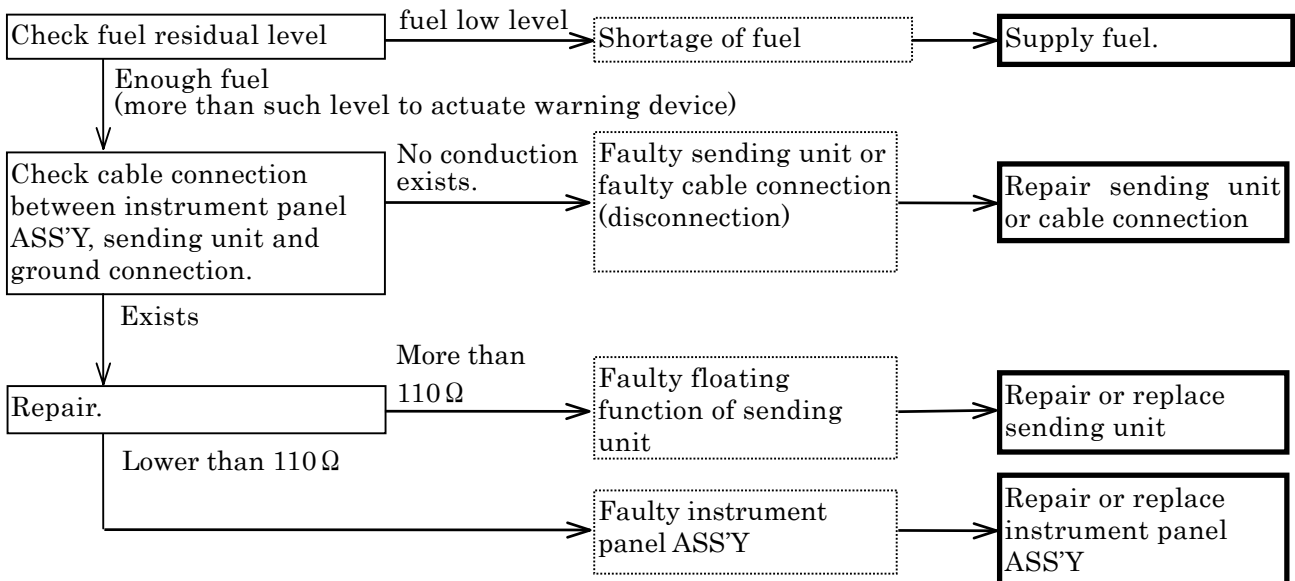


4.3.4 Fuel filter drain emergency stop lamp glows and engine stops (PDS175S(SC)-5C1 only)



4. Troubleshooting

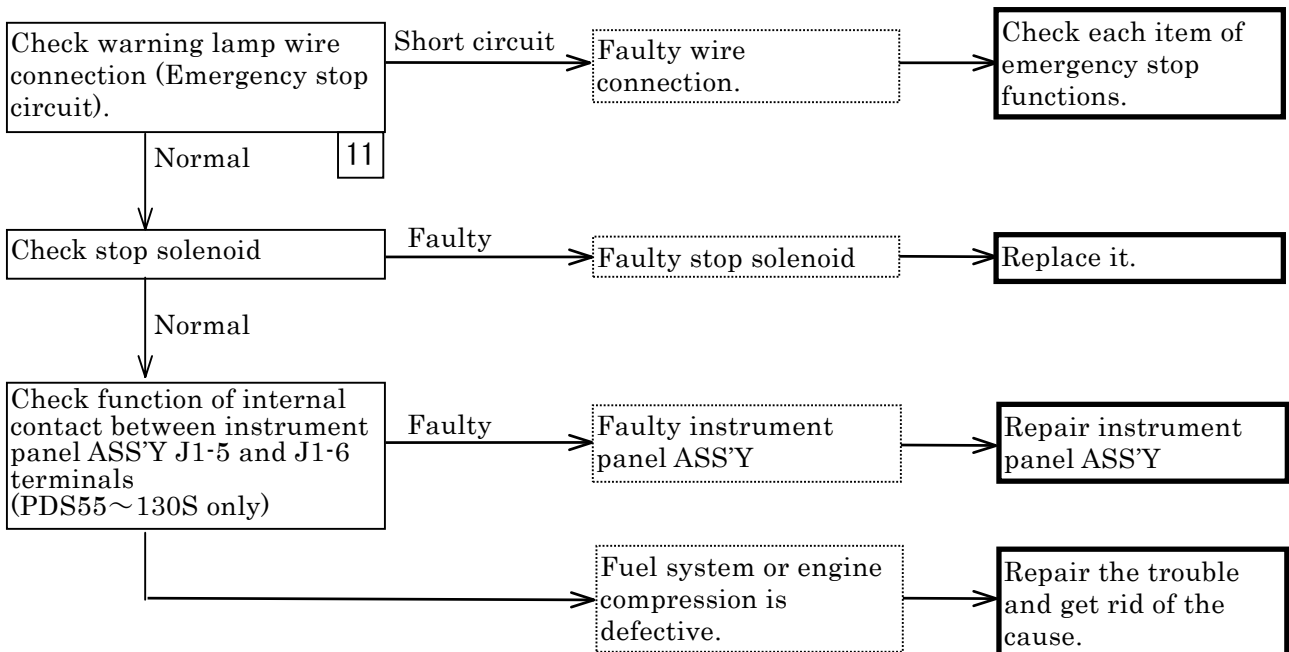
4.3.5 Residual fuel level warning lamp goes on



4.4 Others

4.4.1 Warning lamps will not glow, but engine stops.

(Starter switch is not set in contact, and primary circuit of battery relay is not connected properly. Blown fuse trouble is exempted.)



4. Troubleshooting

4.5 Explanation of trouble diagnosis

No.	Item	Cause	Remedy
1	Faulty unloader.	Unloader valve cannot be open.	Disassemble unloader valve, and check the function of valve and piston. Further check unloader orifice for any clogging.
2	Check and confirm that safety valve functions at lower pressure than set pressure for safety valve.	Check and locate pressure maladjustment or defective safety valve.	In case of malfunction of safety valve, safety valve assembly should be replaced.
3	Faulty unloader.	Faulty seat of unloader valve or faulty sliding function of valve and piston.	Disassemble unloader valve, and clean seat surface and check function of valve and piston.
4	Check discharge air temperature.	Check whether actual rise of discharge air temperature stops engine or any failure of electrical circuit stops engine.	
6	Check for electric conduction between instrument panel ASS'Y, discharge air temperature switch / coolant temperature switch and ground connection.	<p>Check for disconnection among instrument panel ASS'Y, discharge air temperature switch and ground connection. Judge whether trouble is caused to disconnection between each line or trouble of instrument panel ASS'Y.</p> <p>〈PDS55~130S(SC)〉</p> <p>When discharge air temperature / coolant temperature becomes higher than the set temperature (120°C/110°C), the internal contact between J1-5 and J1-6 terminal becomes "OFF" to cut electric supply to stop solenoid to cause engine emergency stop.</p> <p>〈PDS175S(SC)-5B2〉</p> <p>When discharge air temperature/coolant temperature becomes higher than set values (120°C/110°C) respectively, electricity flows between No.4 terminal and No.5 terminal. (in case of discharge air temperature) and electricity flows between No.4 terminal and No.8 terminal (in case of coolant temperature) to release electronic circuit stop motor relay. Then engine will be brought to emergency stop.</p> <p>〈PDS175S(SC)-5C1〉</p> <p>When discharge air temperature/coolant temperature becomes higher than set values (120°C/110°C) respectively, electricity flows between No.4 terminal and No.5 terminal. (in case of discharge air temperature) and electricity flows between No.4 terminal and No.8 terminal (in case of coolant temperature) to release electronic circuit stop motor relay. Then engine will be brought to emergency stop.</p>	

4. Troubleshooting

No.	Item	Cause	Remedy
8	Check engine oil pressure switch.	For actuation pressure of oil pressure switch, See 1.2 "List of set values".	
9	Check for any defective connection.	Check and make sure that no disconnection has been found for engine oil pressure switch (Switching "OFF" engine oil pressure switch enables engine emergency stop.)	
10	Faulty of engine cooling system.	When any trouble is not found in thermostat, coolant pump can be in disorder.	For the temperature at which thermostat valve opens, refer to 2.6.
11	Check warning lamp wire connection.	It sometimes happens that emergency stop circuit is active, but warning lamp will not light on because its circuit is in trouble. Try to locate its cause.	
12	Check function of internal contact between instrument panel ASSY J1-5 and J1-6.	During normal operation, internal contact between J1-5 and J1-6 terminal instrument panel ASSY becomes "ON" and when it is "OFF", it causes emergency stop.	

5. References

5.1 Comparison between consumable parts and electrical appliances

PDS55S-5B2/5C1, PDS75,100S[SC]-5B2/5C1, PDS130S[SC]-5B2

Item	PDS55S-5B2 <PDS55S-5C1>	PDS75S[SC]-5B2 PDS75S[SC]-5C1	PDS100S[SC]-5B2 <PDS100S[SC]-5C1>	PDS130S[SC]-5B2
●Element				
Air filter ASS'Y	32100 40500	32100 38701	32100 38701 <32100 40900>	32100 40900
Air filter element	32143 11500	32143 11700	32143 11700 <32143 11800>	32143 11800
Oil Separator	34220 15900	34220 12301	←	34220 13001
Gasket (O-ring)	Gasket : 03737 16802×2	←	←	O-ring : 03402 15140
Compressor oil filter ASS'Y	37400 10600	37400 12700	←	37400 13000
Oil filter cartridge	37438 02300	37438 05300	←	37438 05201
Engine oil filter element	SHIBAURA: 140517030	SHIBAURA: 140517020	←	←
Fuel filter element	SHIBAURA: 360720020	SHIBAURA: 360720060	←	←
O-ring (Small)	SHIBAURA: 052100100	—	—	—
O-ring (Big)	SHIBAURA: 052100400	SHIBAURA: 052100440	←	←
Sedimenter element	—	SHIBAURA: 130366110	←	←
O-ring	—	SHIBAURA: 052100440	←	←
●Air control				
Speed regulator ASS'Y	36400 18901	←	←	←
Diaphragm	36437 01500	←	←	←
Pressure regulator ASS'Y	36400 19000	←	←	←
Auto relief valve ASS'Y	36600 03501	←	←	←
Needle valve	36429 00800	←	←	←
O-ring (Small)	03402 25008	←	←	←
O-ring (Medium)	03402 25021	←	←	←
O-ring (Big)	21221 02100	←	←	←
Unloader valve ASS'Y	22100 40100	22100 37303	←	←
Bushing	23124 08700	23124 14400	←	←
O-ring (Big)	03402 15095	—	—	—
O-ring (Medium)	21441 03700	21441 03000	←	←
O-ring (Small-1)	03402 25009	—	—	—
O-ring (Small-2)	—	—	—	—
Pressure control valve ASS'Y	—	— (Pressure control orifice)	←	←
O-ring (Big)	03402 25042	—	—	—
O-ring (Small)	03402 20020	—	—	—
Spring	22144 09900	—	—	—
Piston	35303 03001	—	—	—

5. References

Item	PDS55S-5B2 <PDS55S-5C1>	PDS75S[SC]-5B2 PDS75S[SC]-5C1	PDS100S[SC]-5B2 <PDS100S[SC]-5C1>	PDS130S[SC]-5B2
●Instruments on panel				
Starter switch	44322 07200	←	←	←
Pressure gauge	36141 15503	←	←	←
●Electrical appliances				
Instrument panel ASS'Y	36100 07200	←	←	←
Glow controller	44346 12500 (SHIBAURA: 385870960)	←	←	←
Coolant temp. sensor (for glow)	44334 14800	←	←	←
Glow relay	44346 14800	←	←	←
Starter relay	44346 12700	←	←	←
Solenoid relay (Stop motor relay)	44346 06300 <44346 15800>	←	←	44346 06300
Stop relay (a)	—	—	—	—
Stop relay (b)	—	—	—	—
Dynamo regulator	44323 06600 (SHIBAURA: 185516170)	←	←	44323 06900 (SHIBAURA: 185516180)
Fuel air bleeding solenoid pump	43650 01500 (SHIBAURA: 130506240)	←	←	←
Sending unit	36159 02101	36159 03000	←	36159 02202
Fuse (10A)	46934 03200	←	←	←
Discharge air temp. switch	44334 16500	←	←	←
Coolant temp. switch	44334 17500	←	←	←
Engine oil pressure switch	44328 06700 (SHIBAURA: 185246160)	←	←	←
Fuse (20A)	—	—	—	—
Fuse (1A)	—	—	—	—
Fuse (5A)	—	—	—	—
Charge relay	—	—	—	—
Fuel drain relay	—	—	—	—

5. References

PDS175S[SC]-5B2/5C1

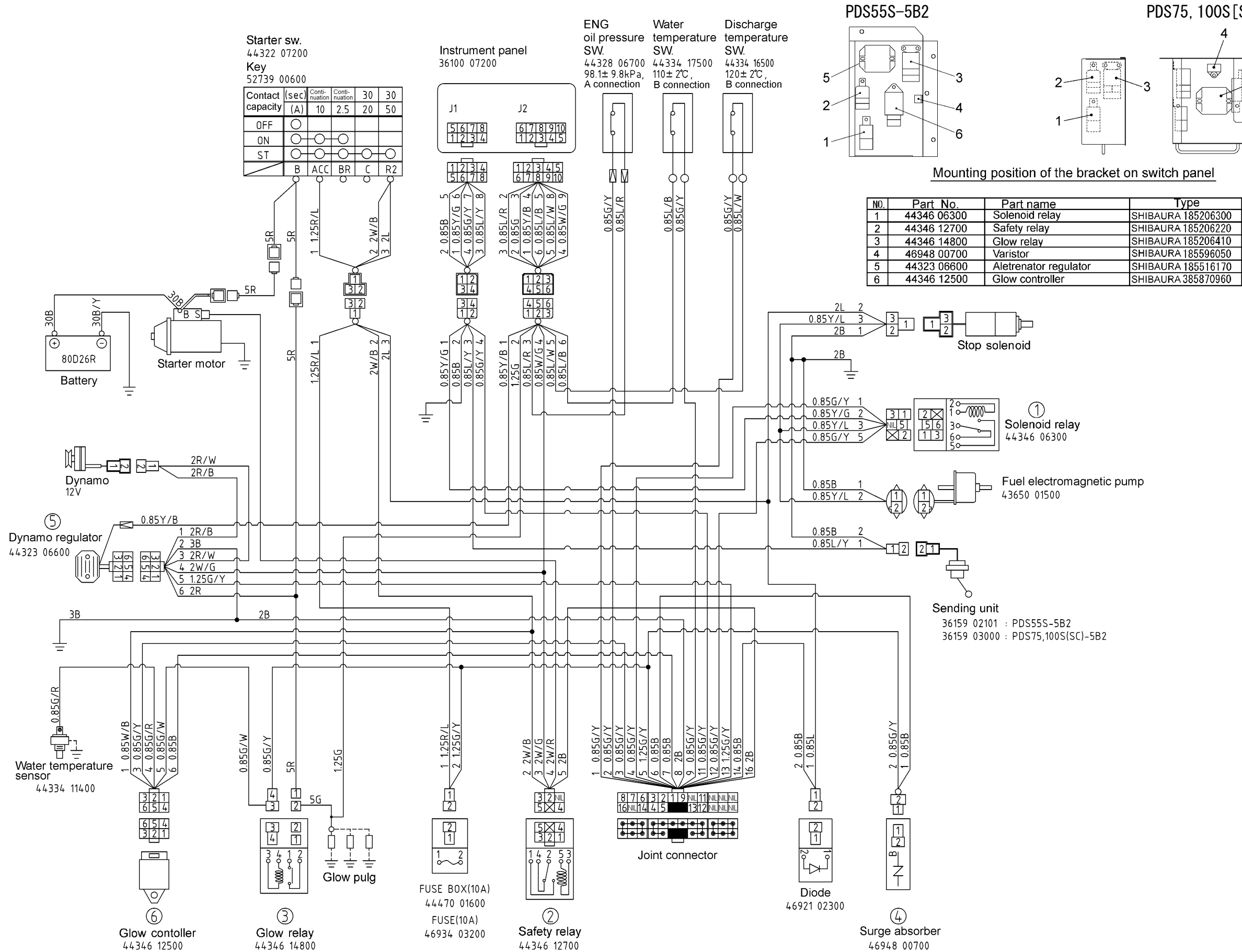
Item	PDS175S[SC]-5B2	PDS175S[SC]-5C1
●Element		
Air filter ASS'Y	32100 41001	←
Air filter element	32143 12700	←
Oil Separator	34220 13001	←
Gasket (O-ring)	O-ring : 03402 15140	←
Compressor oil filter ASS'Y	37400 12900	←
Oil filter cartridge	37438 05201	←
Engine oil filter element	NISSAN DIESEL :1520843G0A	←
Fuel filter element	NISSAN DIESEL :16403J5500	43543 01100
O-ring (Small)	—	—
O-ring (Big)	—	—
Sedimenter element	NISSAN DIESEL :1640095006	—
O-ring	—	—
●Air control		
Speed regulator ASS'Y	36400 19200	36400 22300
Diaphragm	36437 01500	←
Pressure regulator ASS'Y	36400 19000	←
Auto relief valve ASS'Y	36600 03501	—
Needle valve	36429 00800	←
O-ring (Small)	03402 25008	←
O-ring (Medium)	03402 25021	←
O-ring (Big)	21221 02100	←
Unloader valve ASS'Y	22100 37303	22100 40301
Bushing	23124 14400	23124 15600
O-ring (Big)	—	03402 10125
O-ring (Medium)	21441 03000	03402 10125
O-ring (Small-1)	—	21441 04800
O-ring (Small-2)	—	21441 04900
Pressure control valve ASS'Y	— (Pressure control orifice)	35307 16102
O-ring (Big)	—	03402 20036
O-ring (Small)	—	—
Spring	—	35304 02500
Piston	—	35303 04800

5. References

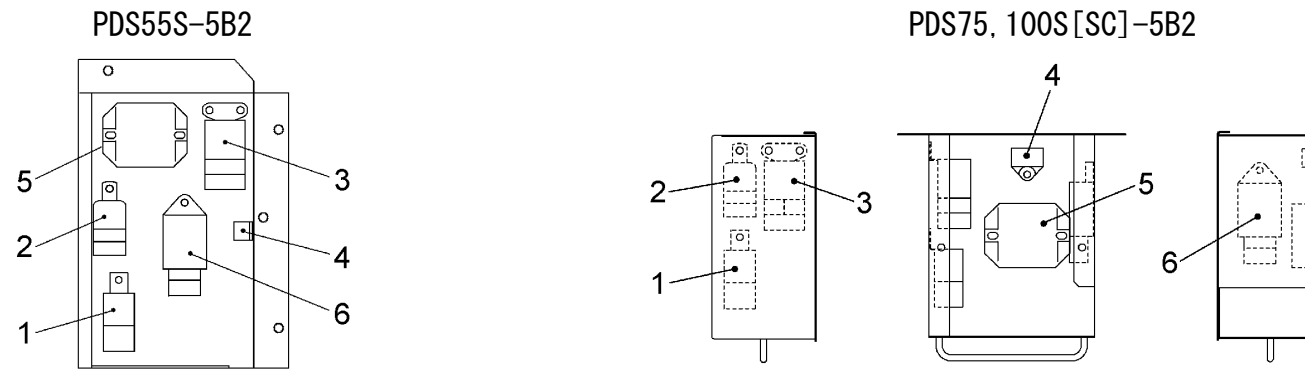
Item	PDS175S[SC]-5B2	PDS175S[SC]-5C1
●Instruments on panel		
Starter switch	44322 07200	←
Pressure gauge	36100 06700	←
●Electrical appliances		
Instrument panel ASS'Y	36100 06700	←
Glow controller	44327 04100	←
Coolant temp. sensor (for glow)	NISSAN DIESEL :22630-10G00	←
Glow relay	44346 07200	←
Starter relay	44324 05400	←
Solenoid relay (Stop motor relay)	44346 07300	—
Stop relay (a)	—	44346 08400
Stop relay (b)	—	44346 07300
Dynamo regulator	—	—
Fuel air bleeding solenoid pump	43650 01900	—
Sending unit	36159 02202	←
Fuse (10A)	—	46934 03200
Discharge air temp. switch	44334 16500	←
Coolant temp. switch	44334 09300	←
Engine oil pressure switch	44328 07900	44328 19100
Fuse (20A)	—	—
Fuse (1A)	46934 04500	←
Fuse (5A)	—	46934 05000
Charge relay	—	44346 08400
Fuel drain relay	—	44346 07300

5.2 Engine Wiring Diagram

(1)PDS55S-5B2, PDS75,100S[SC]-5B2 [Engine Wiring Diagram]

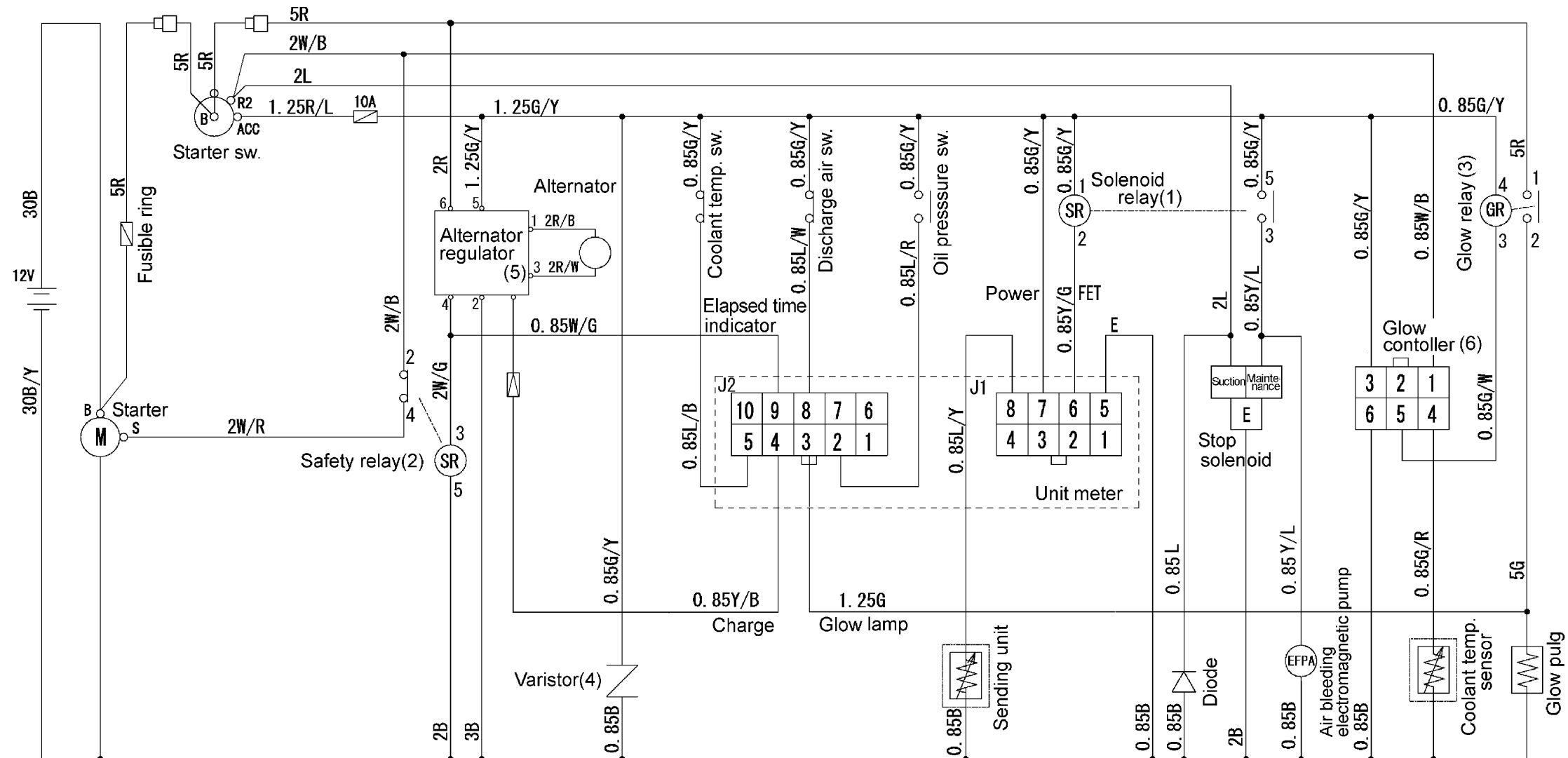


(2) PDS55S-5B2, PDS75,100S[SC]-5B2 [Sequence]

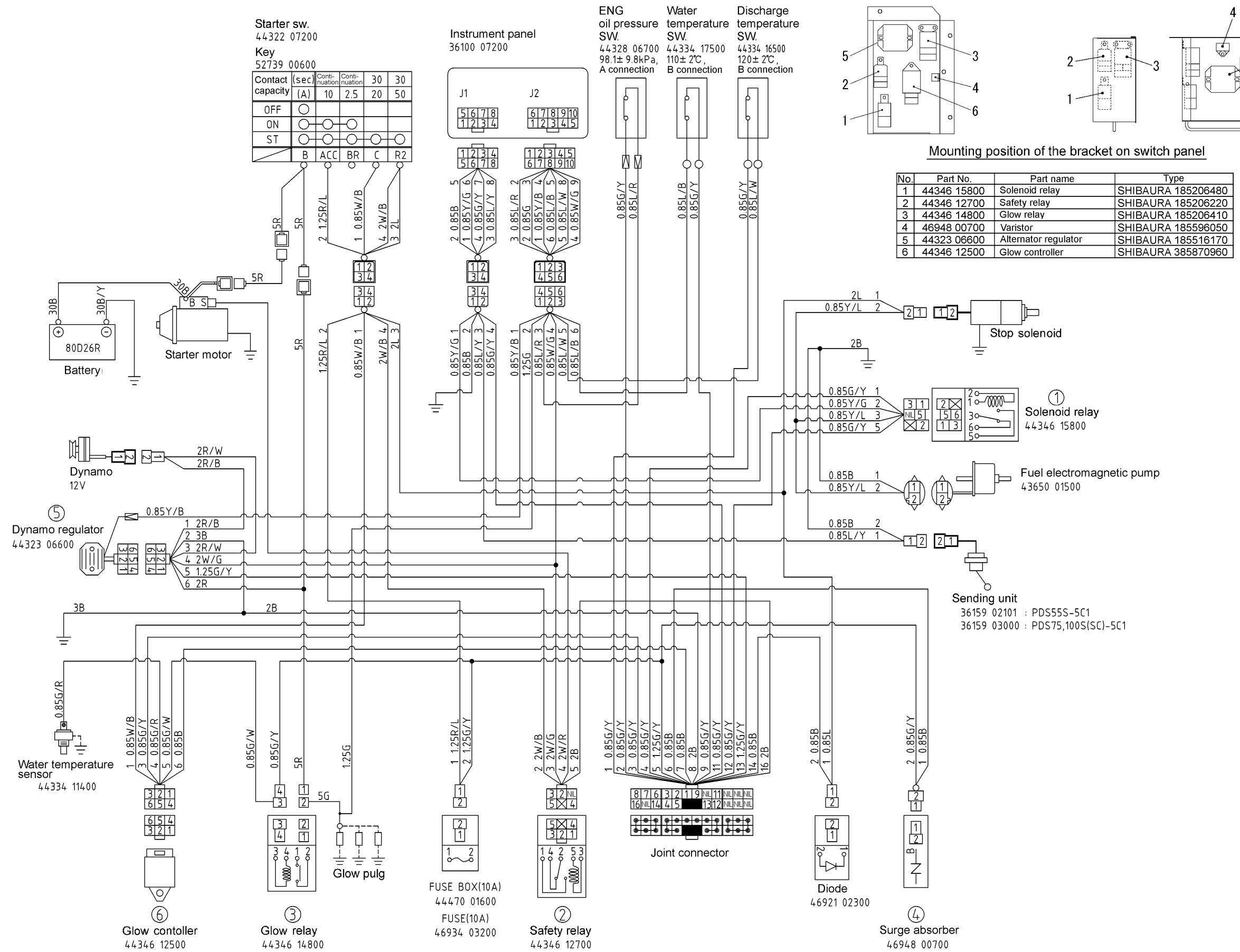


Mounting position of the bracket on switch panel

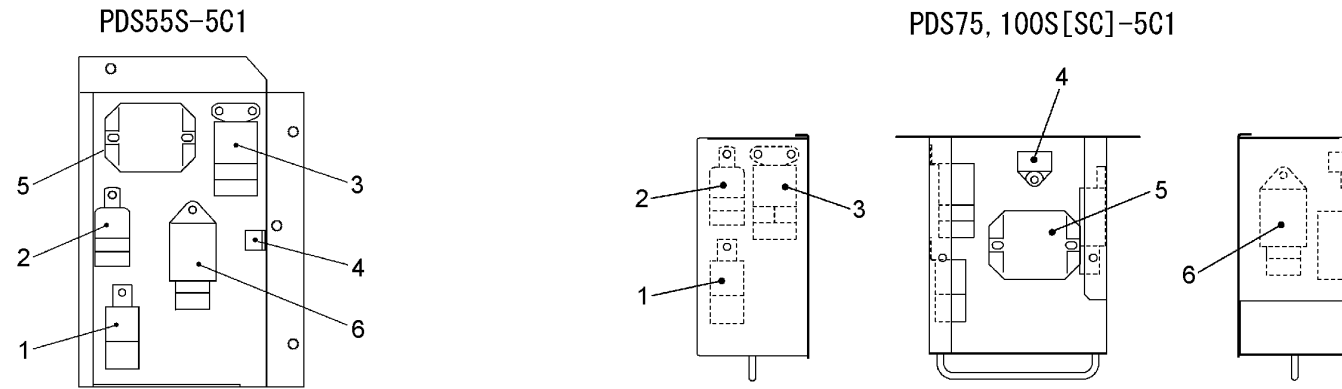
NO.	Part No.	Part name	Type
1	44346 06300	Solenoid relay	SHIBAURA 185206300
2	44346 12700	Safety relay	SHIBAURA 185206220
3	44346 14800	Glow relay	SHIBAURA 185206410
4	46948 00700	Varistor	SHIBAURA 185596050
5	44323 06600	Alternator regulator	SHIBAURA 185516170
6	44346 12500	Glow controller	SHIBAURA 385870960



(3)PDS55S-5C1, PDS75,100S[SC]-5C1 [Engine Wiring Diagram]



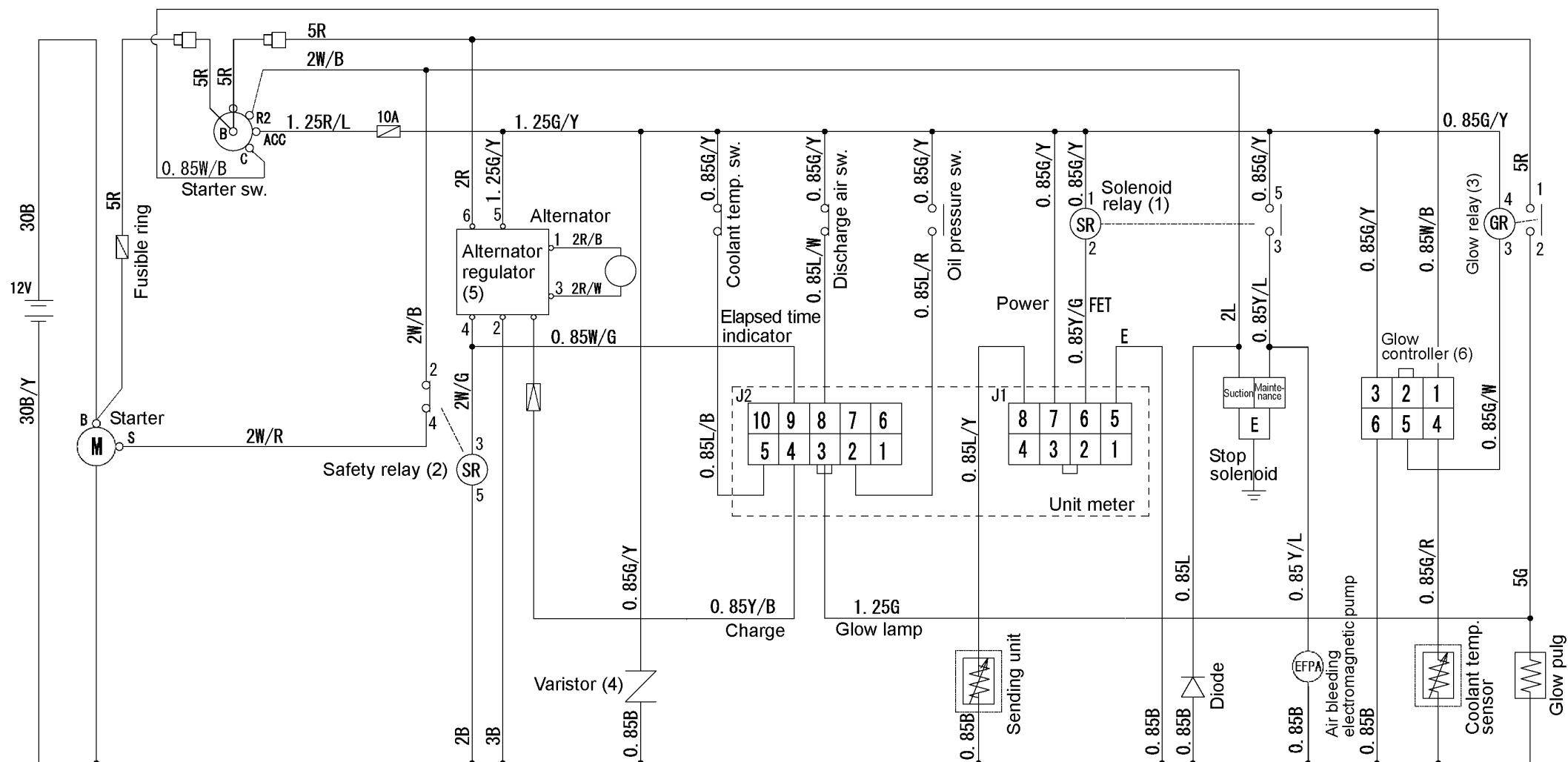
(4)PDS55S-5C1, PDS75,100S[SC]-5C1 [Sequence]



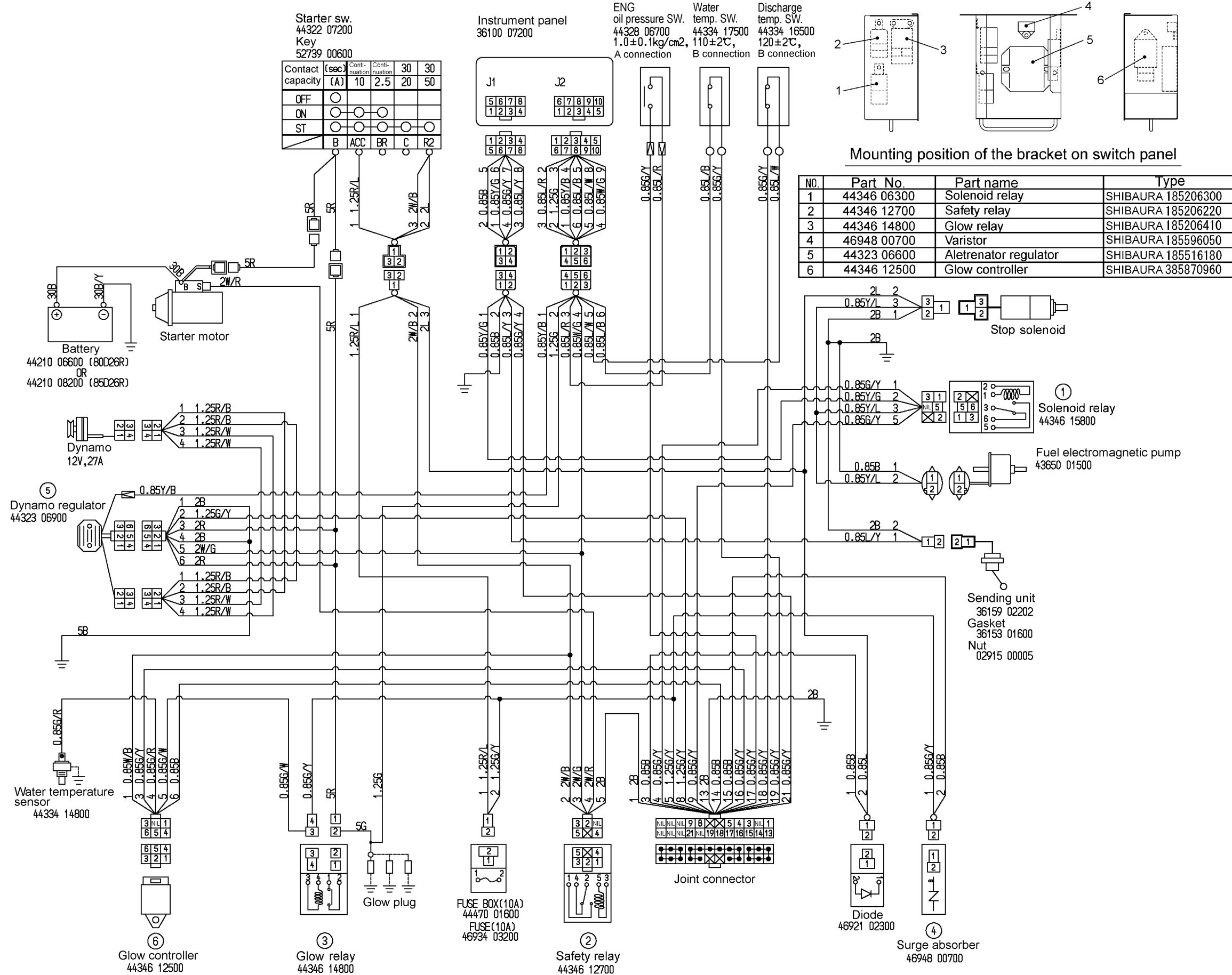
Mounting positino of the bracket on switch panel

Contact capacity	(sec)	Conti-nuation 10	Conti-nuation 2.5	30	30
	(A)			20	50
OFF	○				
ON	○	○	○		
ST	○	○	○	○	○
	B	ACC	BR	C	R2

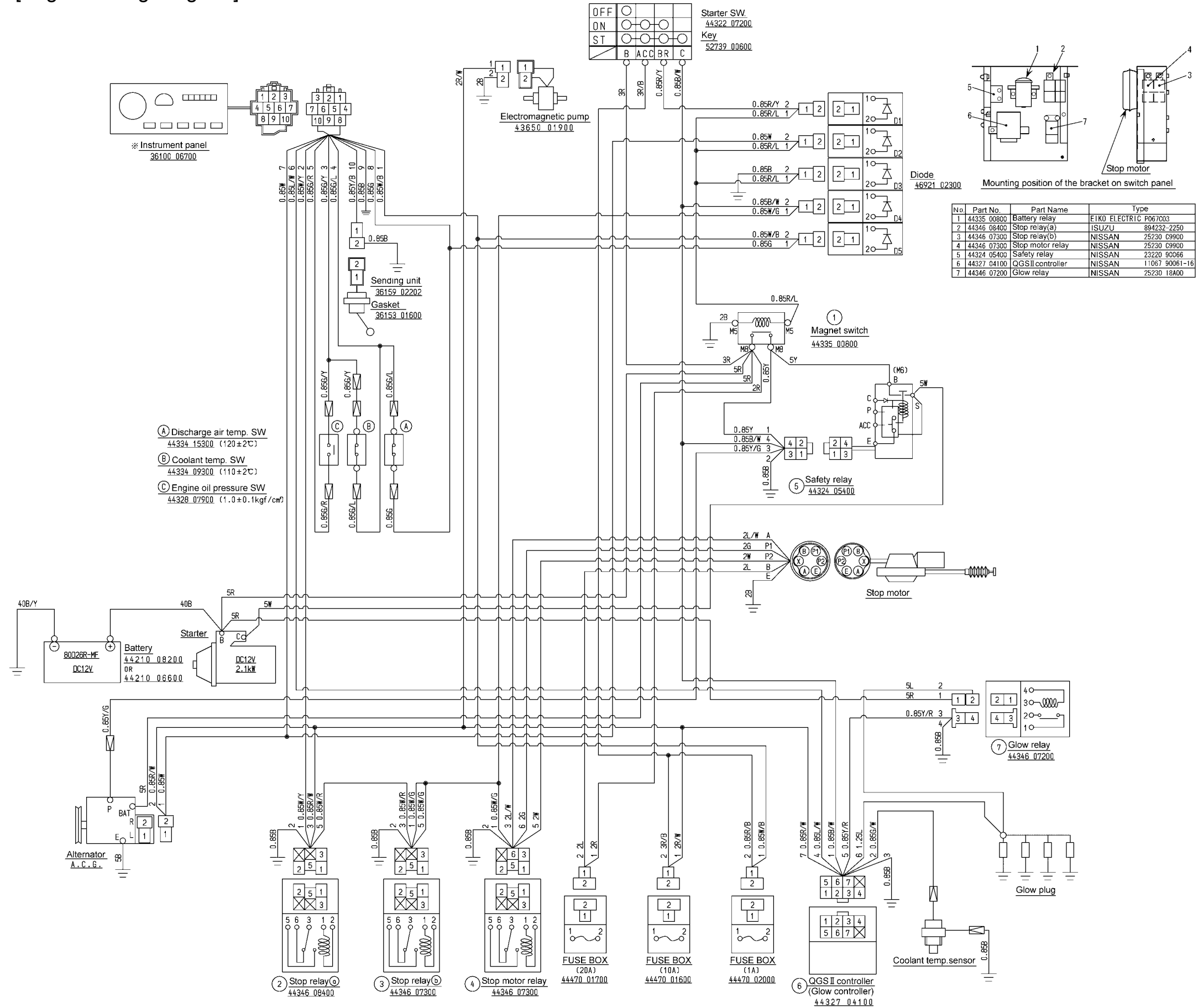
No.	Part No.	Part name	Type
1	44346 15800	Solenoid relay	SHIBAURA 185206480
2	44346 12700	Safety relay	SHIBAURA 185206220
3	44346 14800	Glow relay	SHIBAURA 185206410
4	46948 00700	Varistor	SHIBAURA 185596050
5	44323 06600	Alternator regulator	SHIBAURA 185516170
6	44346 12500	Glow controller	SHIBAURA 385870960



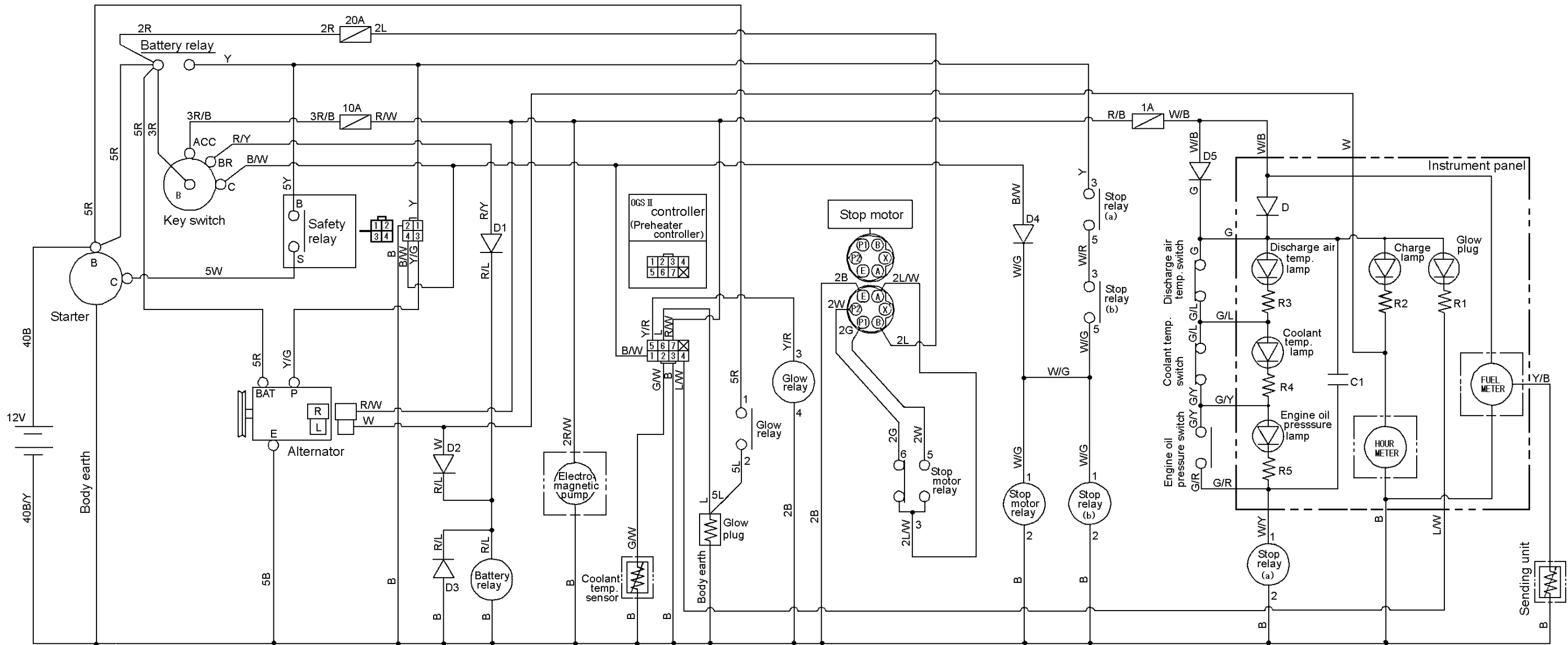
(5)PDS130S[SC]-5B2 [Engine Wiring Diagram]



(7)PDS175S[SC]-5B2 [Engine Wiring Diagram]

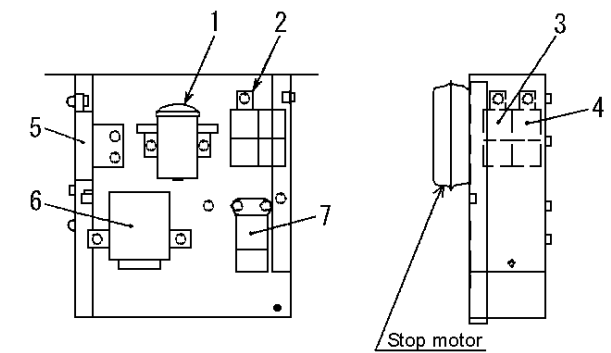


(8)PDS175S[SC]-5B2 [Sequence]



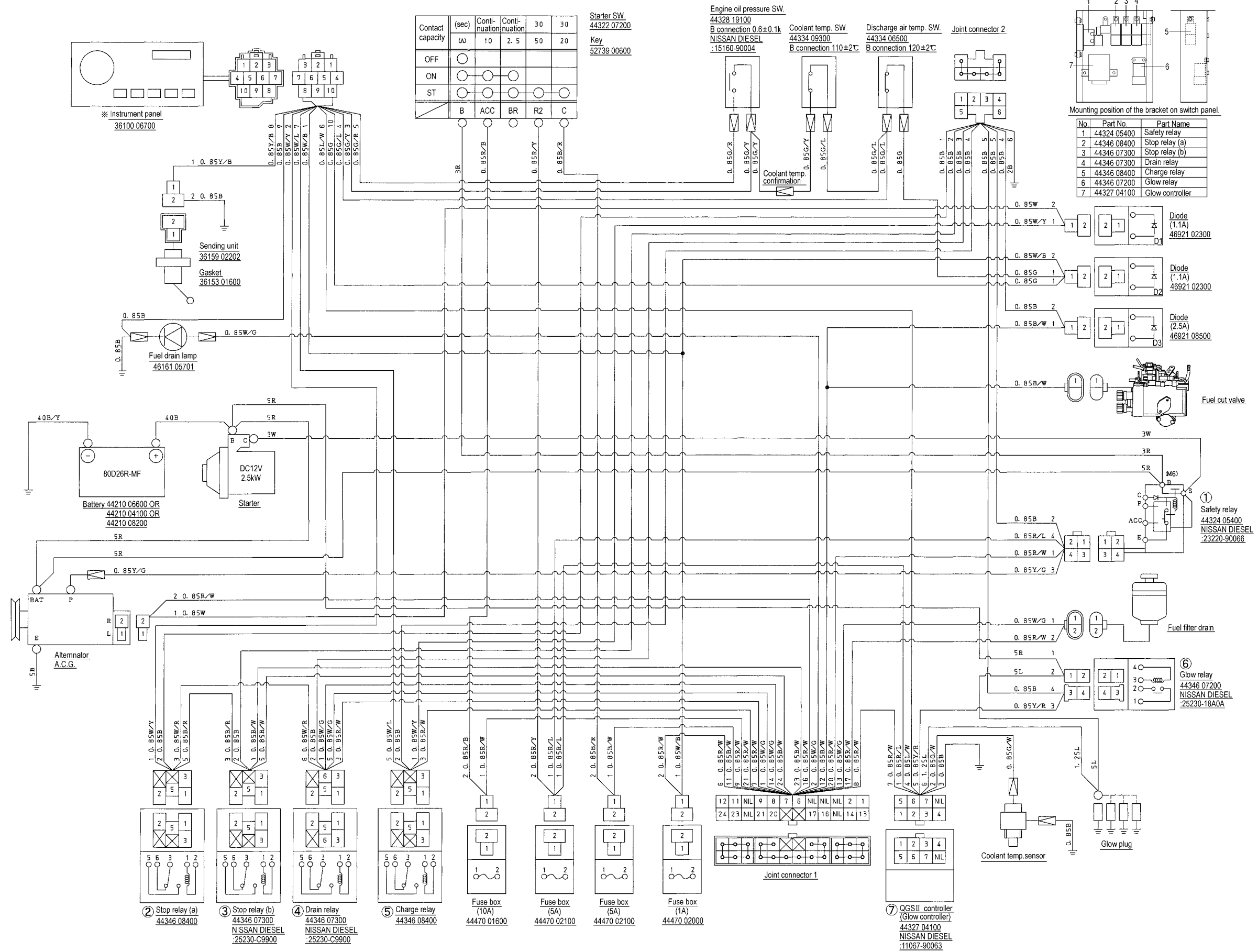
The wire size without directions is 0.85mm².

No.	Part No.	Part Name	Type
1	44335 00800	Battery relay	EIKO ELECTRIC P067C03
2	44346 08400	Stop relay(a)	ISUZU 894232-2250
3	44346 07300	Stop relay(b)	NISSAN 25230 C9900
4	44346 07300	Stop motor relay	NISSAN 25230 C9900
5	44324 05400	Safety relay	NISSAN 23220 90066
6	44327 04100	QGSII controller	NISSAN 11067 90061-16
7	44346 07200	Glow relay	NISSAN 25230 18A00



Mounting position of the bracket on switch panel

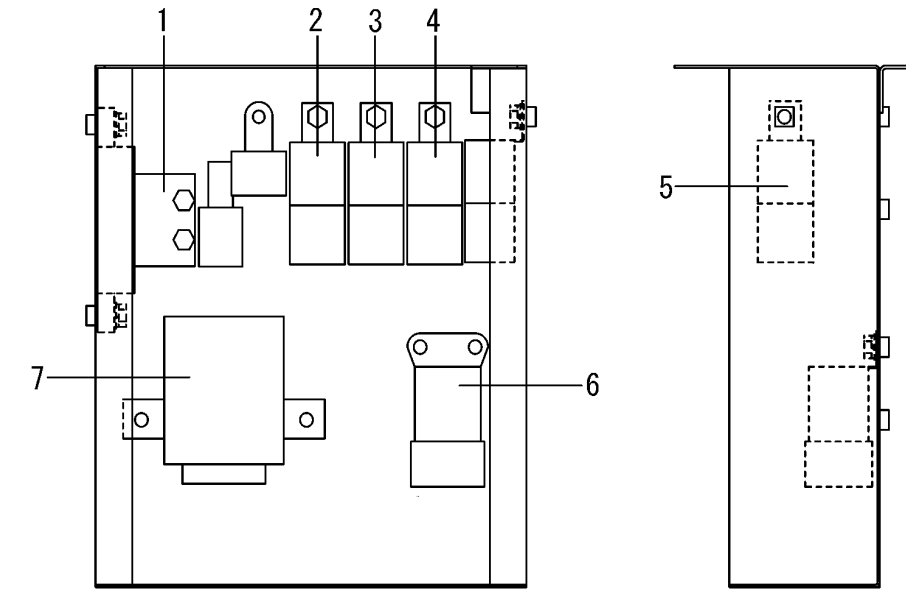
(9)PDS175S[SC]-5C1 [Engine Wiring Diagram]



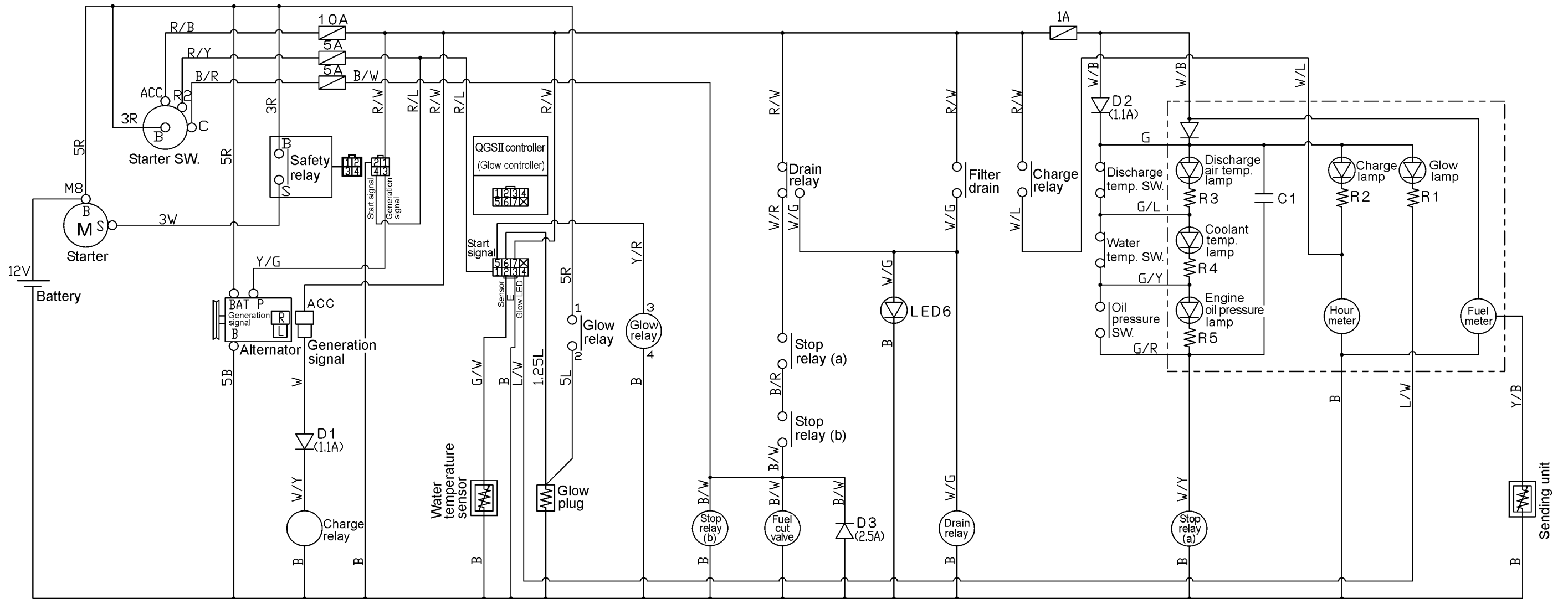
(10)PDS175S[SC]-5C1 [Sequence]

Contact capacity	(sec)	Continuation	Continuation	30	30
	(A)	10	2.5	50	20
OFF	○				
ON	○—○—○				
ST	○—○—○—○—○				
	B	ACC	BR	R2	C

No.	Part No.	Part Name
1	44324 05400	Safety relay
2	44346 08400	Stop relay (a)
3	44346 07300	Stop relay (b)
4	44346 07300	Drain relay
5	44346 08400	Charge relay
6	44346 07200	Glow relay
7	44327 04100	Glow controller



Mounting position of the bracket on switch panel



Note)The wire size without directions is 0.85mm².

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