KH-065-00

HITACHI

SERVICEMAN HANDBOOK
For KH Series

KH100D, KH125D, KH125-3
KH150-3, KH180-3, KH230-3
KH300-3, KH500-3

1. FOREWORD

This SERVICEMAN HANDBOOK complies the data of the KH Series as categorized by each model.
It is mainly composed of the specifications of main equipment, its performance and measured performance data, as well as the standards and other items necessary for the field services.
As to the method of performance measurement and other details, refer to the Service Manual.

2. TO UPDATE THE CONTENTS OF THE SERVICEMAN HANDBOOK

The each serviceman handbook is serially numbered and is recorded by us with the name of the person who received this handbook.
And they are referred when the delivered serviceman handbook are required to be revised by up-to-date information as such information must be supplied quickly and correctly.

Please, advice us the name of person who keeps the serviceman handbook and is in responsible to keep it up-to-date by sending back to us the slip of the shipping information sheet enclosed in the handbook.

In case that the personal administration change is made, please inform us of the name of the person who is newly appointed to maintain the handbook.

3. TO KEEP CONFIDENTIAL

Please, keep the technical informations and know-how contained in the serviceman handbook confidential to the outsiders.

4. PERFORMANCE CHECK

4.1 PURPOSE OF PERFORMANCE CHECK

The purpose of **"PERFORMANCE CHECK"** are to measure:

4.1.1 Operational performance of a new machine

In case that a new machine is delivered in sections to a custermer's site, it must be tested to confirm that the operational performance of the machine can meet the "STANDARD" after being reassembled.

4.1.2 Operational performance of an operated machine

With the time progress of operation, the machine operational performance becomes deteriorated so that the machine needs to be serviced periodically to restore its original performance.

Before the machine is serviced, the performance check of it is carried out to check the extent of deterioration.

And the check results are collated with the "**GUIDE TO SERVICE**" or "**SERVICE LIMIT OF USE**" to decide the kinds of services applied.

4.1.3 Operational performance of a repaired machine

After the machine was repaired or serviced, it must be tested to confirm how the operational performance of it is restored by the repair and/or service work applied.

4.2 TERMINOLOGY

4.2.1 STANDARD

Specifications applied to the brand new machine, components and parts. These are sometimes accompanied with tolerances.

4.2.2 GUIDE TO SERVICE

Recommendable level to service the machine. When the performance level of the machine comes lower than this level, the machine needs to be served to renew its original performance.

The parts and components shall be repaired and/or adjusted.

4.2.3 SERVICE LIMIT OF USE

The lowest level of the performance. When the performance level of the machine comes lower than this level, the machine must be stopped to work and repaired. The parts and components must be replaced for renewal.

4.3 PREPARATION FOR PERFORMANCE CHECK

Observe the following rule to carry out the performance test accurately and safely.

4.3.1 TEST MACHINE

Repair the machine with any defects and damages found from outside such as oil and water leak, loose bolts, cracks and so on, before starting the test.

4.3.2 TEST YARD

(1) Select a flat and hard ground.

(2) Secure the space area enough to allow the machine to run straight more than 20 m and to make a swing motion .

(3) If required, rope the test yard and provide a signboards to keep the outsider off.

4.3.3 PRECAUTION

(1) Before starting the test, decide the kinds of signals employed for communication made among the coworkers.
Once the test stars, be sure to communicate each other with the signals and follow them without fail.

(2) Operate the machine deliberately and always give the first priority to the safety operation.

(3) During the test, always be careful to avoid accidents due to a landslide or contact with a high voltage power line.
Always confirm of a sufficient space for seing motion is kept.

(4) Try not to pollute the machine and the earth with leaked oil. Pay attention it specially when removing the hydraulic pipings.

4.3.4 REQUESTS FOR PRECISE MEASUREMENT

(1) Calibrate the test instruments in advance accurately to get the correct data.

(2) Carry out the test under the correct test conditions prescribed for each test item.

(3) Repeat the same test and confirm if the test data measures can be procured repeatedly. Use the mean values of the measurement of necessary.

CONTENTS

SECTION 1. ENGINE

1. MAIN SPECIFICATIONS

		KH100D (1001~)	KH125D (0802~)	KH125.3 (0601~0727)	KH125.3 (0801~)	KH150.3 (0803~0910)
Model		HINO H06C-T	←	HINO EM 100	HINO H06C-T	HINO EM 100
Cyl. nos- bore × stroke	mm	6-108×118	←	6-124×130	6-108×118	6-124×130
Piston displacement	cc	6 485	←	9 419	6 485	9 419
Compression ratio		17.7	←	18.0	17.7	18.0
Dry weight	kg (lb)	580 (1 279)	←	740 (1 631)	580 (1 279)	740 (1 631)
Dimensions (L×W×H)	mm	1 221×791 ×1 006	←	1 364×828 ×1 030	1 221×791 ×1 006	1 364×828 ×1 030
Firing order		1-4-2-6-3-5	←	←	←	←
Rotating direction (view from fan)		Clockwise	←	←	←	←
Injection timing (before T.D.C)		16°	←	18°	16°	18°
Valve clearance (cold)	mm	IN 0.3 OUT 0.45	←	IN 0.4 OUT 0.5	IN 0.3 OUT 0.45	IN 0.4 OUT 0.5
Rated horsepower	PS/rpm	155 / 2100	←	150 / 2000	155 / 2100	150 / 2000
Max. torque	kgf·m	54 / 1800 rpm	←	60 / 1600 rpm	54 / 1800 rpm	60 / 1600 rpm
Low idle speed	rpm	825 ± 25	←	750 ± 25	825 ± 25	750 ± 25
High idle speed	rpm	2 250 ± 50	←	2 150 ± 50	2 250 ± 50	2 150 ± 50
Compression pressure	kgf/cm² (psi)	33~36 (470~512)	←	28~30 (400~427)	33~36 (470~512)	28~30 (400~427)
Fuel consumption ratio	g/PS·hr	Less than 165	←	Less than 175	Less than 165	Less than 175

		KH150-3 (0911~)	KH180-3 (0703~)	KH230-3 (0106~)	KH300-3 (0216~)	KH500-3 (0201~)
Model		HINO H06C-T	HINO EM 100	←	ISUZU 6RB1 PA-S	ISUZU 6RB1T
Cyl. nos-bore × stroke	mm	6-108×118	6-124×130	←	6-135×160	←
Piston displacement	cc	6 485	9 419	←	13 741	←
Compression ratio		17.7	18.0	←	16.5	←
Dry weight	kg (lb)	580 (1 279)	740 (1 631)	←	990 (2 183)	1 065 (2 348)
Dimensions (L×W×H)	mm	1 221×791 ×1 006	1 364×828 ×1 030	←	1 492×759 ×1 424	1 510×887 ×1 407
Firing order		1-4-2-6-3-5	←	←	←	←
Rotating direction (view from fan)		Clockwise	←	←	←	←
Injection timing (before T.D.C)		16°	18°	←	22°	18°
Valve clearance (cold)	mm	IN 0.3 OUT 0.45	IN 0.4 OUT 0.5	←	IN 0.6 OUT 0.6	IN 0.3 OUT 0.45
Rated horsepower	PS/rpm	155 / 2100	150 / 2000	←	225 / 2000	280 / 2100
Max. torque	kgf·m	54 / 1800 rpm	60 / 1600 rpm	←	94.3 /1300 rpm	119 /1800 rpm
Low idle speed	rpm	825±25	750±25	←	775±25	←
High idle speed	rpm	2 250±50	2 150±50	←	2 200±30	2 150±30
Compression pressure	kgf/cm² (psi)	33~36 (470~512)	28~30 (400~427)	←	29 (412)	←
Fuel consumption ratio	g/PS·hr	Less than 165	Less than 175	←	Less than 183	Less than 170

2. PERFORMANCE CHECK

Note : The engine performance has a total affection the machine performance so that be sure always to check the engine performance prior to other performance checks.

2.1 ENGINE SPEED

1. Preparation
   (1) Make sure if the governor lever can contact to the high idle stopper when the engine speed control lever is set in the high idle position.

   (2) Install a sensor of tachometer onto the injection pump piping.

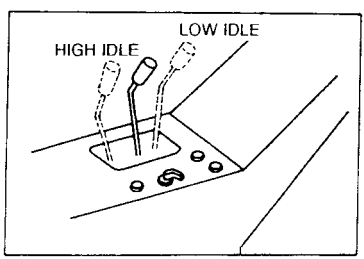
   (3) Start engine and run it at high idle.

   (4) Keep the coolant temperature at more than 50°C (122°F) and hydraulic temperature at 50 ± 5°C (122 ± 41°F).

2. Measurement

   (1) Unloaded Low Idle
   Run the engine at low idle and read the tachometer.

   (2) Unloaded High Idle
   Run the engine at high idle and read the tachometer.



3. Judgement Data

Unit : rpm

Model	Serial No.	Standard	Guide to Service	Service Limit of Use
KH100D	1001~	Low 825 ± 25 High 2250 ± 50		
KH125D	0802~	Low 825 ± 25 High 2250 ± 50		
KH125-3	0601~0727	Low 750 ± 25 High 2150 ± 50		
	0801~	Low 825 ± 25 High 2250 ± 50		
KH150-3	0803~0910	Low 750 ± 25 High 2150 ± 50		
	0911~	Low 825 ± 25 High 2250 ± 50		
KH180-3	0703~	Low 750 ± 25 High 2150 ± 50		
KH230-3	0106~	Low 750 ± 25 High 2150 ± 50		
KH300-3	0216~	Low 775 ± 25 High 2200 ± 30		
KH500-3	0201~	Low 775 ± 25 High 2150 ± 30		

2.2 COMPRESSION PRESSURE

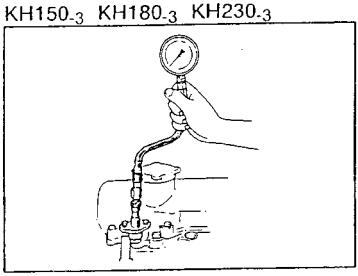
Note : Judge the degree of engine output drop by measuring the cylinder compression pressure.
Before check, Insure that the battery is fully charged, valve clearance is correct and glow plugs are thoroughly cleaned.

1. Preparation
   (1) Warm up the engine.

   (2) Remove all injection nozzles and injection pipes.

   (3) Install a compression gauge and adapter to the injection nozzle fitting hole.

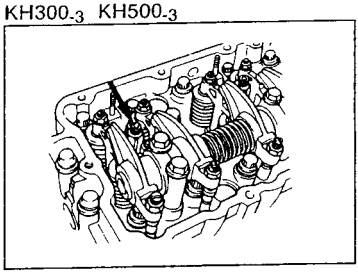
KH100D KH125D KH125-3
KH150-3 KH180-3 KH230-3

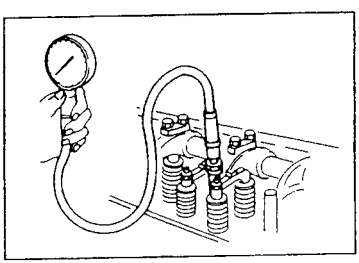


2. Measurement
   (1) Turn crankshaft for a few seconds with starter motor.

   (2) Measure compression pressure three times for each cylinder, and read the pressure higher in stability.

KH300-3 KH500-3





3. Judgement Data

Unit : bar (kgf/cm², psi)

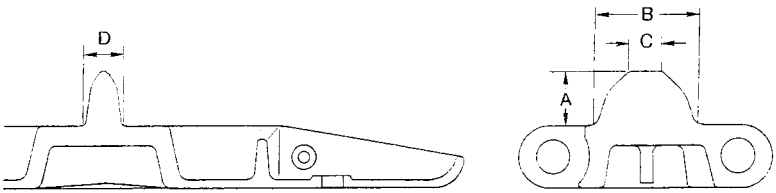
Model	Serial No.	Standard	Guide to Service	Service Limit of Use
KH100D	1001~	32.4~35.3 (33~36, 470~512)		
KH125D	0802~	32.4~35.3 (33~36, 470~512)		
KH125-3	0601~0727	27.5~29.4 (28~30, 398~427)		
	0801~	32.4~35.3 (33~36, 470~512)		
KH150-3	0803~0910	27.5~29.4 (28~30, 398~427)		
	0911~	32.4~35.3 (33~36, 470~512)		
KH180-3	0703~	27.5~29.4 (28~30, 398~427)		
KH230-3	0106~	27.5~29.4 (28~30, 398~427)		
KH300-3	0216~	28.4 (29, 412)		
KH500-3	0201~	28.4 (29, 412)		

Note: The difference in pressure between each cylinder should not exceed 1.9 bar (2.0 kgf/cm², 28.4 psi).

SECTION 2. UNDERCARRIAGE

1. WEAR CHECK

1.1 TRACK LINK



(1) KH100D (S/No.1001~) KH125D (S/No.0802~)
KH125-3 (SNo.0801~)

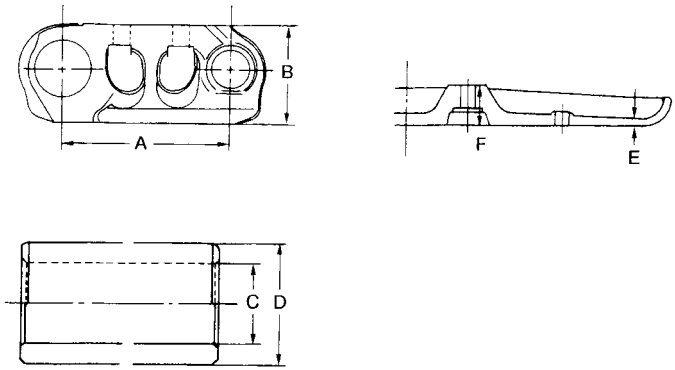
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	53 (2.09)	56 (2.20)	58 (2.28)
B	95 (3.74)	-	-
C	33 (1.30)	-	-
D	35 (1.38)	29 (1.14)	25 (0.98)

(2) KH180-3 (SNo.0703~) KH230-3 (SNo.0106~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	53 (2.09)	56 (2.20)	58 (2.28)
B	105 (4.13)	-	-
C	50 (1.97)	-	-
D	40 (1.57)	33 (1.30)	28 (1.10)



(3) KH125-3 (SNo.0601~0727)

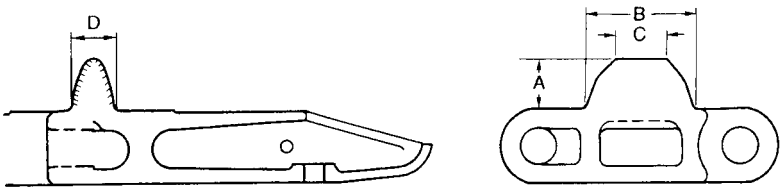
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	175.41 (6.91)	178 (7.01)	180 (7.087)
B	103.2 (4.06)	100 (3.94)	97 (3.82)
C	36.95 (1.45)	38.5 (1.52)	38.0 (1.50)
D	58.8 (2.31)	57.0 (2.24)	56.0 (2.20)
E	12 (0.47)	-	-
F	57 (2.24)	54 (2.13)	52 (2.05)

(4) KH150-3 (SNo.0803~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	203.2 (8.00)	205 (8.07)	206 (8.11)
B	117.6 (4.63)	114 (4.49)	113 (4.45)
C	44.7 (1.76)	45.5 (1.79)	46.0 (1.81)
D	66.65 (2.62)	65 (2.56)	64.5 (2.54)
E	13 (0.52)	-	-
F	57 (2.24)	54 (2.13)	52 (2.05)



(5) KH300-3 (SNo.0216～)

Unit : mm (in)

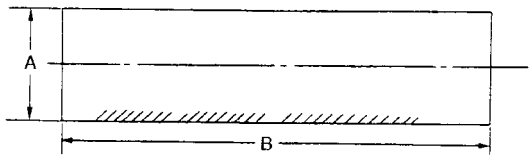
Mark	Standard	Guide to Service	Service Limit of Use
A	62 (2.44)	65 (2.56)	67 (2.64)
B	132 (5.20)	-	-
C	60 (2.36)	-	-
D	52 (2.05)	43 (1.69)	37 (1.46)

(6) KH500-3 (SNo.0201～)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	65 (2.56)	68 (2.68)	70 (2.76)
B	146 (5.75)	-	-
C	80 (3.15)	-	-
D	65 (2.56)	56 (2.20)	50 (1.97)

1.2 JOINT PIN and MASTER PIN



(1) KH100D (S/No. 1001~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	32 (1.26)	30.5 (1.20)	28 (1.10)
B	184 (7.24)	-	-

(2) KH125D (S/No. 0802~) KH125-3 (S/No. 0801~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	36 (1.42)	34.5 (1.36)	32 (1.26)
B	215 (8.47)	-	-

(3) KH180-3 (S/No. 0703~) KH230-3 (S/No. 0106~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	36 (1.42)	34.5 (1.36)	32 (1.26)
B	271 (10.67)	-	-

(4) KH300-3 (S/No. 0216~)

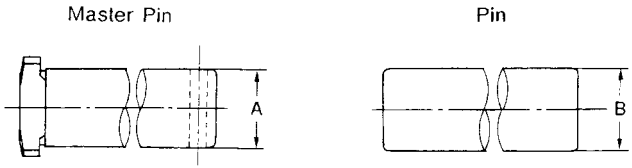
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	44 (1.73)	42 (1.65)	40 (1.57)
B	271 (10.67)	-	-

(5) KH500-3 (S/No. 0206~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	50 (1.97)	47.5 (1.87)	45 (1.77)
B	260 (10.24)	-	-



(6) KH125-3 (S/No. 0601~0727)

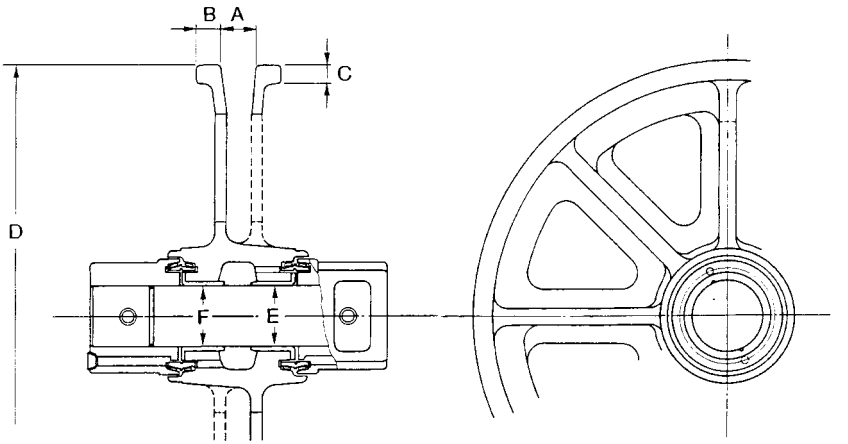
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	36.35 (1.43)	34 (1.34)	33 (1.30)
B	36.6 (1.44)	34 (1.34)	33 (1.30)

(7) KH150-3 (S/No. 0803~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	44.19 (1.77)	43 (1.69)	42 (1.65)
B	44.5 (1.75)	43 (1.69)	42 (1.65)



(1) KH100D (S/No.1001~) KH125D (S/No.0802~)
KH125-3 (S/No.0801~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	43 (1.69)	-	-
B	30 (1.18)	27 (1.06)	25 (0.98)
C	25 (0.98)	22 (0.87)	19 (0.75)
D	612 (24.09)	602 (23.70)	598 (23.54)
E (Bushing Inside Dia.)	75 (2.95)	75.5 (2.97)	76 (2.99)
F (Bushing outside Dia.)	85 (3.35)	-	-

(2) KH180-3 (S/No. 0703~) KH230-3 (S/No. 0106~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	50 (1.97)	-	-
B	35 (1.38)	32 (1.26)	30 (1.18)
C	35 (1.38)	-	-
D	686 (27.0)	666 (26.22)	656 (25.83)
E (Bushing Inside Dia.)	95 (3.74)	95.5 (3.76)	96 (3.78)
F (Bushing outside Dia.)	107 (4.21)	-	-

(3) KH300-3 (S/No. 0216~)

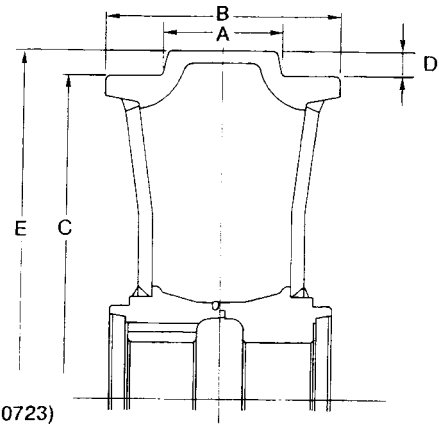
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	66 (2.60)	-	-
B	40 (1.57)	-	-
C	35 (1.38)	-	-
D	854 (33.62)	834 (32.83)	824 (32.44)
E (Bushing Inside Dia.)	140 (5.51)	140.5 (5.53)	141 (5.55)
F (Bushing outside Dia.)	160 (6.30)	-	-

(4) KH500-3 (S/No. 0201~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	75 (2.95)	-	-
B	55 (2.17)	-	-
C	40 (1.57)	-	-
D	940 (37.0)	-	
E (Bushing Inside Dia.)	140 (5.51)	140.5 (5.53)	141 (5.55)
F (Bushing outside Dia.)	160 (6.30)	-	-



(4) KH125-3 (S/No. 0601~0723)

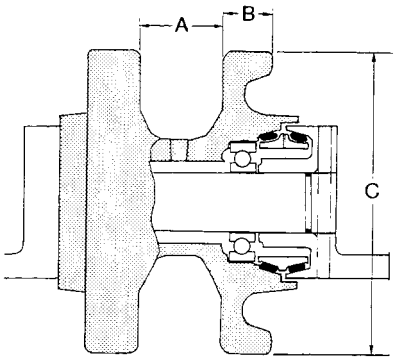
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	84 (3.31)	78 (3.07)	72 (2.83)
B	159 (6.26)	-	-
C	507 (19.96)	501 (19.72)	495 (19.49)
D	19.5 (0.77)	-	-
E	545 (21.46)	-	-
Axle Outside Dia.	75 (2.95)	74.5 (2.93)	74.2 (2.92)
Bushing Inside Dia.	75 (2.95)	75.5 (2.97)	76 (2.99)
Bushing outside Dia.	85 (3.35)	-	-

(5) KH150-3 (S/No. 0803~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	102 (4.02)	96 (3.78)	89 (3.50)
B	204 (8.03)	-	-
C	570 (22.44)	564 (22.20)	557 (21.93)
D	22.5 (0.89)	-	-
E	615 (24.21)	-	-
Axle Outside Dia.	90 (3.54)	89.5 (3.52)	89.2 (3.51)
Bushing Inside Dia.	90 (3.54)	90.5 (3.56)	91 (3.58)
Bushing outside Dia.	101 (3.98)	-	-



(1) KH100D (S/No. 1001~) KH125D (S/No. 0802~)
KH125-3 (S/No. 0801~) KH180-3 (S/No. 0703~)
KH230-3 (S/No. 0106~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	55 (2.17)	-	-
B	35 (1.38)	-	-
C	200 (7.87)	190 (7.48)	186 (7.32)

(2) KH300-3 (S/No. 0216~)

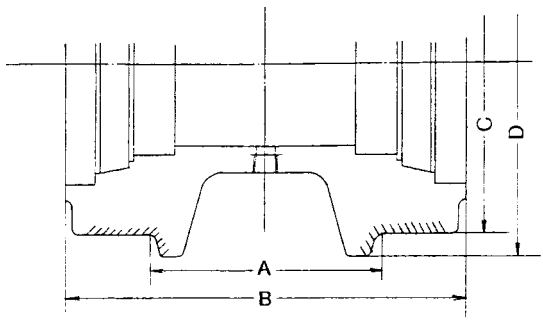
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	65 (2.56)	-	-
B	36 (1.42)	-	-
C	250 (9.84)	240 (9.45)	236 (9.29)

(3) KH500-3 (S/No. 0201~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	75 (2.95)	-	-
B	40 (1.57)	-	-
C	250 (9.84)	240 (9.45)	236 (9.29)



(4) KH125-3 (S/No. 0601~0727)

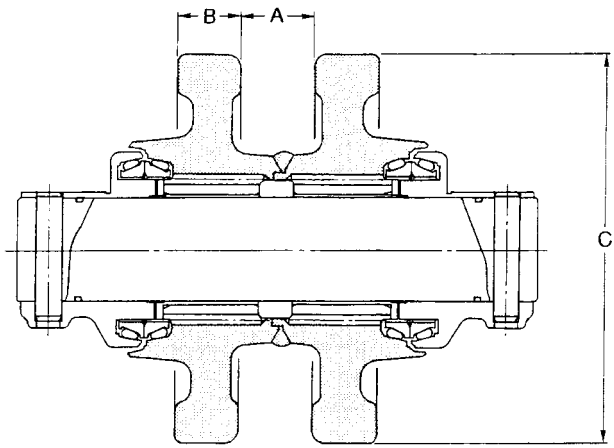
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	84 (3.31)	-	-
B	166 (6.54)	-	-
C	150 (5.91)	144 (5.67)	140 (5.51)
D	180 (7.09)	-	-

(5) KH150-3 (S/No. 0803~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	98 (3.86)	-	-
B	176 (6.93)	-	-
C	150 (5.91)	144 (5.67)	140 (5.51)
D	170 (6.69)	-	-



(1) KH100D (S/No. 1001~) KH125D (S/No. 0802~)
KH125-3 (S/No. 0801~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	45 (1.77)	-	-
B	40 (1.58)	37 (1.46)	35 (1.38)
C	240 (9.45)	230 (9.06)	224 (8.82)
Axle outside dia.	65 (2.56)	64.5 (2.54)	64.2 (2.53)
Bushing inside dia.	65 (2.56)	65.5 (2.58)	66 (2.60)

(2) KH180-3 (S/No. 0703~) KH230-3 (S/No. 0106~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	50 (1.97)	-	-
B	45 (1.77)	-	-
C	25 (0.98)	18 (0.71)	15 (0.59)
Axle outside dia.	75 (2.95)	74.5 (2.93)	74.2 (2.92)
Bushing inside dia.	75 (2.95)	75.5 (2.97)	76 (2.99)

(6) KH300-3 (S/No.0216~)

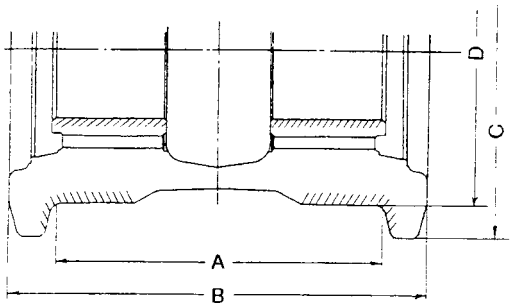
Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	66 (2.60)	-	-
B	50 (1.97)	47 (1.85)	45 (1.77)
C	310 (12.2)	280 (11.02)	270 (10.63)
Axle outside dia.	85 (3.35)	84.5 (3.33)	84.2 (3.31)
Bushing inside dia.	85 (3.35)	85.5 (3.37)	86.0 (3.39)

(5) KH500-3 (S/No. 0201~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	80 (3.15)	-	-
B	85 (3.35)	82 (3.23)	80 (3.15)
C	350 (13.78)		
Axle outside dia.	120 (4.72)	115 (4.53)	112 (4.41)
Bushing inside dia.	120 (4.72)	120.5 (4.74)	121 (4.76)



(4) KH125-3 (S/No. 0601 ~ 0727)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	172 (6.77)	177 (6.97)	180 (7.09)
B	218 (8.58)	-	-
C	195 (7.68)	189 (7.44)	185 (7.28)
D	160 (6.30)	154 (6.06)	148 (5.83)
Axle outside dia.	65 (2.56)	64.5 (2.54)	64.2 (2.53)
Bushing inside dia.	65 (2.56)	65.5 (2.58)	66 (2.60)

(5) KH150-3 (S/No. 0803 ~)

Unit : mm (in)

Mark	Standard	Guide to Service	Service Limit of Use
A	203 (7.99)	208 (8.19)	211 (8.31)
B	256 (10.08)	-	-
C	210 (8.28)	204 (8.03)	200 (7.87)
D	180 (7.09)	174 (6.85)	170 (6.69)
Axle outside dia.	75 (2.95)	74.5 (2.93)	74.2 (2.92)
Bushing inside dia.	75 (2.95)	75.5 (2.97)	76 (2.99)

2. PERFORMANCE CHECK

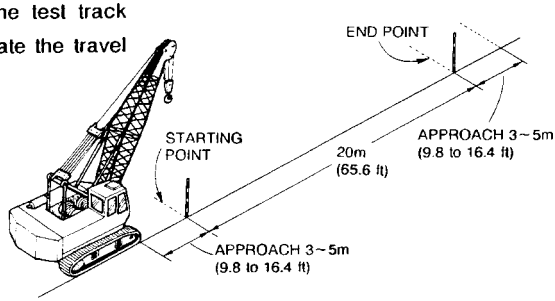
2.1 TRAVEL SPEED

Note : Total performance of the overall travelling system is measured.
Adjust the tension of the both side track links and make them equally before the test.

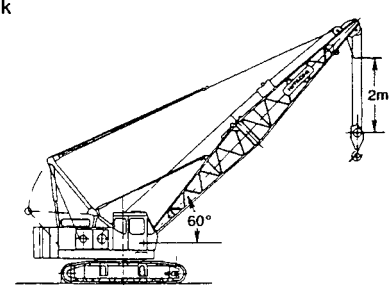
1. Preparation

(1) Set a flat, solid ground test yard with enough space for the 20 m (65.6 ft.) test track length.

(2) Provide 3 to 5 m (9.8 to 16.4 ft.) long extra spaces on the both sides of the test track length for a runaway to accelerate the travel speed.



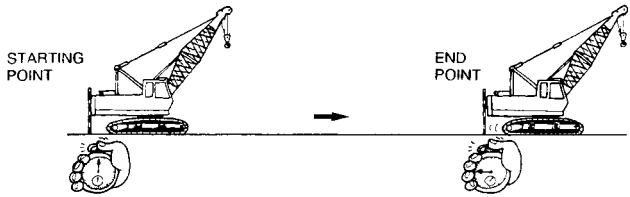
(3) Set the boom at 60° and hoist the hook to approximately 2 m (6.6 ft.) point before the hook overhoist prevention device operates.



2. Measurement

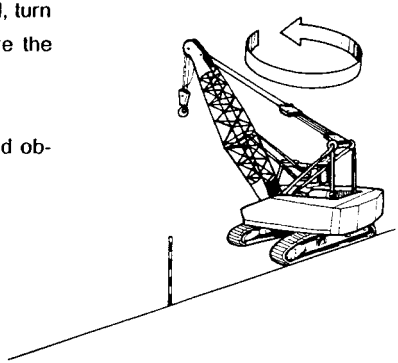
(1) Set the engine speed control lever in high idle position and start travelling the machine from runaway zone with the both sides of travel lever operated fully.

(2) Measure the time required to travel 20 m (65.6 ft).



(3) After measuring the forward travel speed, turn the superstructure by 180° and measure the reverse travel speed.

(4) Repeat the measurement three times and obtain the average values.



3. Judgment Data

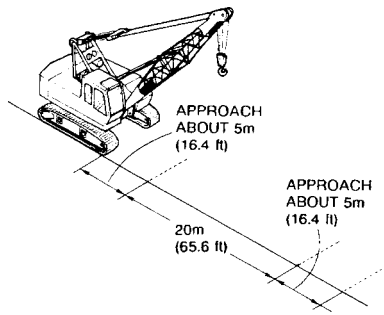
Unit : sec / 20 m (65.6 ft.)

Model	S/No.	Standard	Guide to Service	Service Limit of Use
KH100D	0101~	37.9~43.4	48.0	50.0
KH125D	0802~	37.0~43.4	48.0	50.0
KH125-3	0601~0727 0801~	41.5~45.0 37.0~43.4	50.0 48.0	52.0 50.0
KH150-3	0803~	40.6~45.7	50.0	53.0
KH180-3	0703~	45.2~49.5	54.0	57.0
KH230-3	0106~	45.2~51.4	57.0	59.0
KH300-3	0216~	Low 27.7~31.7 High 18.5~20.4	Low 35.0 High 22.0	Low 37.0 High 24.0
KH500-3	0201~	Low 76.6~86.7 High 52.2~58.5	Low 95.0 High 64.0	Low 100 High 68.0

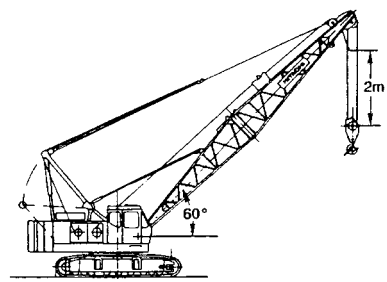
Note: The extent of unbalance performance between the both sides of travel driving system is measured.
Adjust the tension of the both side track links and make them equally before the test.
Perform the tests on a flat ground.

1. Preparation

(1) Provide 20 m (65.6 ft.) long track test course with 5 m (16.4 ft.) long runaways on both end sides of it.

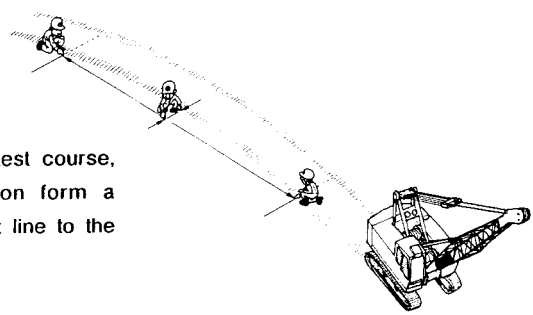


(2) Set the boom at 60° and hoist the hook to approximately 2 m (6.6 ft.)point before the hook overhoist prevention device operates.



2. Measurement

(1) Set the engine speed control lever in high idle position and start travelling the machine from the runaways zone with the both sides of travel lever operated fully.



(2) After running through the track test course, measure the maximum deviation form a straight line drawn from the start line to the end line.

(3) Perform the measurement in both forward and reverse runs.

(4) Perform the measurement three times to get the average value as the measurement value.

3. Judgment Data

Unit : mm / 20 m (in. / 65.6 ft.)

Model	Standard	Guide to Service	Service Limit of Use
All Model	Under 250 (9.8)	275 (10.8)	290 (11.4)

3. OTHERS

3.1 SERVICE REFILL CAPACITIES

Unit : L (US gal, Imp gal)

	KH100D (S/No. 0101~)	KH125D (S/No. 0802~)	KH125-3 (S/No. 0601~0727)	KH125-3 (S/No. 0801~)
Travel Final Device (each side)	7.0 (1.85, 1.54)	7.0 (1.85, 1.54)	9.0 (2.38, 1.98)	7.0 (1.85, 1.54)
Front Idler	220~240 cm³ (13.4~14.6 cu in)	220~240 cm³ (13.4~14.6 cu in)	260 cm³ (15.9 cu in)	220~240 cm³ (13.4~14.6 cu in)
Upper Roller	120 cm³ (7.3 cu in)	120 cm³ (7.3 cu in)	160 cm³ (9.8 cu in)	120 cm³ (7.3 cu in)
Lower Roller	90 cm³ (5.5 cu in)	90 cm³ (5.5 cu in)	350 cm³ (21.4 cu in)	90 cm³ (5.5 cu in)

Unit : L (US gal, Imp gal)

	KH150-3 (S/No. 0803~)	KH180-3 (S/No. 0703~)	KH230-3 (S/No. 0106~)	KH300-3 (S/No. 0216~)
Travel Final Device (each side)	31.5 (8.32, 6.93)	16.0 (4.23, 3.52)	16.0 (4.23, 3.52)	22.0 (5.81, 4.84)
Front Idler	320 cm³ (19.5 cu in)	400~420 cm³ (24.4~25.6 cu in)	400~420 cm³ (24.4~25.6 cu in)	900 cm³ (54.9 cu in)
Upper Roller	160 cm³ (9.8 cu in)	120 cm³ (7.3 cu in)	120 cm³ (7.3 cu in)	88 cm³ (5.4 cu in)
Lower Roller	450 cm³ (27.4 cu in)	170 cm³ (10.4 cu in)	170 cm³ (10.4 cu in)	220 cm³ (13.4 cu in)

Unit : L (US gal, Imp gal)

	KH500-3 (S/No. 0201~)			
Travel Final Device (each side)	35.0 (9.25, 7.70)			
Front Idler	1200 cm³ (73.2 cu in)			
Upper Roller	79 cm³ (4.8 cu in)			
Lower Roller	290 cm³ (17.7 cu in)			

Unit : N·m (kgf·m, lbf·ft)

	KH100D (S/No. 0101~)	KH125D (S/No. 0802~)	KH125-3 (S/No. 0601~0701)	KH125-3 (S/No. 0801~)
Travel Device Attaching Bolt	736 (75, 543)	←	←	736 (75, 543)
Travel Motor Attaching Bolt	265 (27, 195)	←	206 (21, 152)	265 (27, 195)
Upper Roller Attaching Bolt	88 (9, 65)	←	←	88 (9, 65)
Lower Roller Attaching Bolt	206 (21, 152)	←	←	206 (21, 152)

Unit : N·m (kgf·m, lbf·ft)

	KH150-3 (S/No. 0803~)	KH180-3 (S/No. 0703~)	KH230-3 (S/No. 0106~)	KH300-3 (S/No. 0216~)
Travel Device Attaching Bolt	206 (21, 152)	932 (95, 687)	←	2354 (240, 1736)
Travel Motor Attaching Bolt	206 (21, 152)	206 (21, 152)	←	206 (21, 152)
Upper Roller Attaching Bolt	88 (9, 65)	88 (9, 65)	←	206 (21, 152)
Lower Roller Attaching Bolt	392 (40, 289)	392 (40, 289)	←	539 (55, 398)

Unit : N·m (kgf·m, lbf·ft)

	KH500-3 (S/No. 0201~)			
Travel Device Attaching Bolt	2354 (240, 1736)			
Travel Motor Attaching Bolt	294 (30, 217)			
Upper Roller Attaching Bolt	196 (20, 147)			
Lower Roller Attaching Bolt	686 (70, 506)			

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SECTION 3. SUPERSTRUCTURE

1. WEAR CHECK

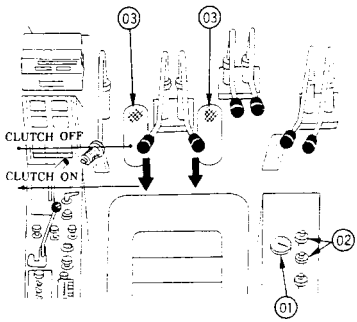
1.1 CLUTCH SYSTEM

1.1.1 KH100D (S/No. 1001~)
KH125D (S/No. 0802~)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar
(40~50 kgf/cm², 569~711psi)



(2) Lower the hook to the ground for safety.

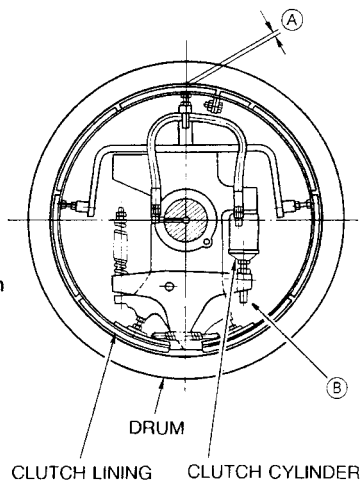
(3) Put the drum locks (02) and brake pedals (03) in the ON position.

2. Inspection

(1) Measure clearance (A) between the clutch lining and drum with clutch OFF (disengaged) position .

(A) : 0.3~0.5 mm (0.01~0.02 in)

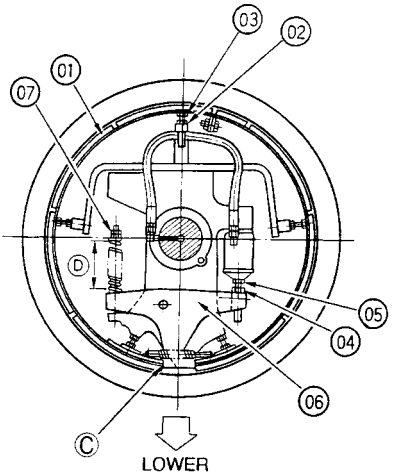
(2) With the clearance (A) in the normal range, the clutch cylinder stroke (B) is 3.0~5.0mm (0.12~0.20 in).



SUPERSTRUCTURE

3. Adjustment

When the lining is worn off, or when adjusting the clearance of clutch lining after replacement with new one, make the adjustment according to the procedures mentioned below.



(1) With the clutch lever put to OFF (disengaged) position and hoist lever in ON (operation) position, the clutch should be set to the position in which the end of clutch band (01) is located downward as shown in Fig. .

(2) Loosen five lock nuts (02).
Loosen five bolts (03) until the top of it gets apart from clutch band (01).

(3) Loosen lock nut (04) and turn cylinder push rod (05) to make the part (C) of lever (06) apart from the clutch band.

(4) Adjust the clearance between the clutch lining and drum to 0.5 mm (0.02 in) uniformly all around the drum by turning five lock nuts (03) .

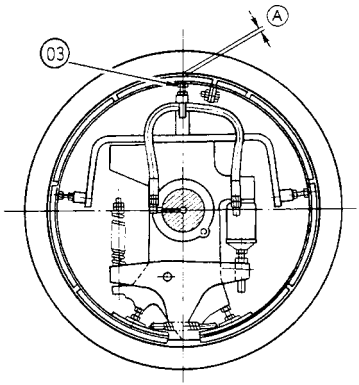
(5) Set the (C) of the lever (06) in such a way to push the clutch band slightly by turning cylinder push rod (05).

(6) Adjust the dimension (D) by turning adjusting nut (07).
(D) : 129 mm (5.08 in)

(7) Tighten lock nuts (02) and (04).

(8) Operate the clutch lever to apply it two or three times and then set the clutch lever to OFF position.
Check the clearance (A) between the clutch lining and the drum.

Note : If the clearance (A) is not normal range, readjust lock nut (03).



4. Judgement Data

Unit : mm (in)

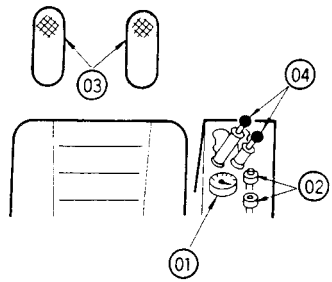
	Standard	Service Limit of Use
Wear of clutch lining	12 (0.472)	7.0 (0.276)

1.1.2 KH125-3 (S/No.0601~0632), KH150-3 (S/No.0803~0838)
KH180-3 (S/No.0703~0750)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar
(40~50 kgf/cm², 569~711psi)

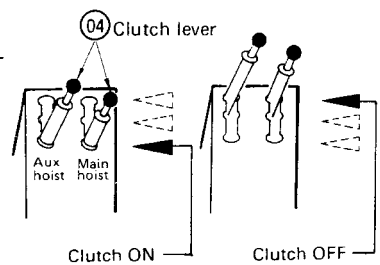


(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

2. Inspection

(1) Measure each dimensions with the clutch lever (04) ON position.



Standard specifications are as follows.

(A) : 56~58 mm (2.20~2.28 in)

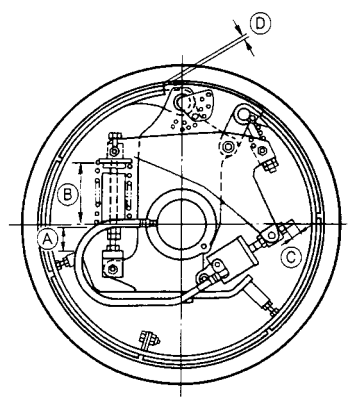
(B) : 158~160 mm (6.22~6.30 in)

Note: Service limit of (B) is 168 mm (6.61 in) caused by the wear of the lining.

(C) : 11~13 mm (0.43~0.51 in)

(2) Measure the clearance (D) between the clutch lining and drum with the clutch lever OFF position.

(D) : 0.3~0.5 mm (0.01~0.02 in)

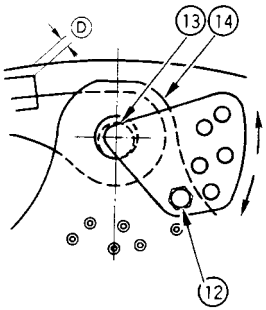


Note : If the each dimensions are within the above standards, adjustment is not necessary.

3. Adjustment

(1) Set the clutch lever OFF position.

(2) Remove bolt (12).
Adjust the clearance (D) between the clutch lining and drum uniformly all around the drum by turning pin (13).
(D) : 0.3~0.5 mm (0.01~0.02 in)



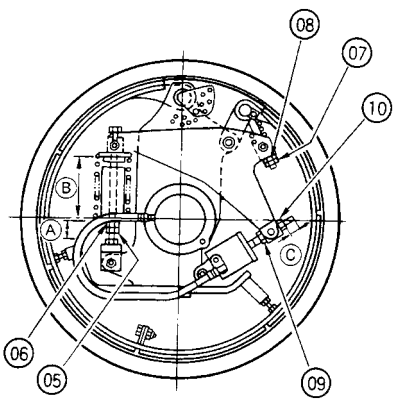
(3) After adjustment, fix the pin (13) at the point of aligning the screw center of driver (14) with the drill center of pin (13) by bolt (12).

(4) Set the clutch lever ON position.

(5) Adjust the dimension (A) by loosening lock nut (05) and turning nut (06).
(A) : 56~58 mm (2.20~2.28 in)

(6) Adjust the dimension (B) by loosening lock nut (07) and turning nut (08).
(B) : 158~160 mm (6.22~6.30 in)

(7) Adjust the dimension (C) by loosening lock nut (09) and turning nut (10).
(C) : 11~13 mm (0.43~0.51 in)

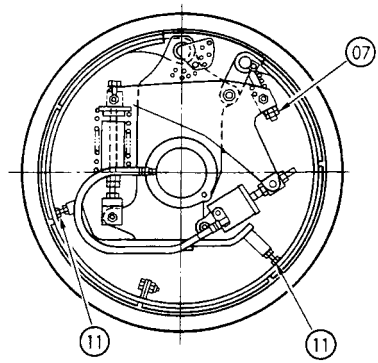


(8) Set the clutch lever OFF position.

(9) Adjust the clearance between the clutch lining and drum uniformly all around the drum by turning two guide bolts (11).

(10) Tighten each lock nuts with clutch lever ON position.
Tighten lock nut (07) with clutch OFF position.

Note : Usually, adjustment is required only when the clutch linings have worn and the dimension (B) becomes 168 mm (6.61 in).



4. Judgment

Unit : mm (in)

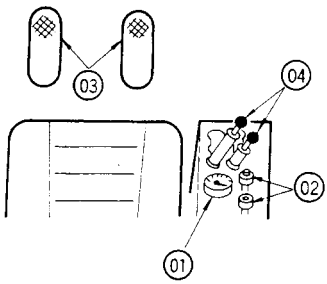
	Standard	Service Limit of Use
Wear of clutch lining	12 (0.472)	7.0 (0.276)

1.1.3 KH125-3 (S/No.0633~0840), KH150-3 (S/No.0839~0926)
KH180-3 (S/No.0751~1045), KH230-3 (S/No.0106~0121)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar
(40~50 kgf/cm^2,569~711 psi)



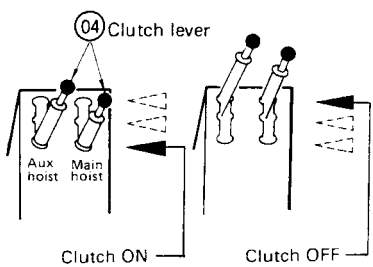
(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

2. Inspection

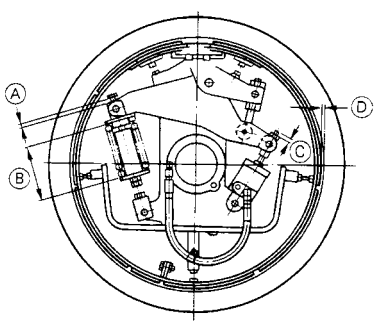
(1) Measure each dimensions with the clutch lever (04) ON position.

(A) : 16~17 mm (0.63~0.67 in)
(B) : 158~160 mm (6.22~6.30 in)
(C) : 6~7 mm (0.24~0.28 in)



(2) Measure the clearance (D) between the clutch lining and the drum with clutch lever OFF position.

(D) :0.5 mm (0.02 in)



Note : If the dimension (A) is less than 8 mm (0.31 in), adjustment is necessary.

3. Adjustment

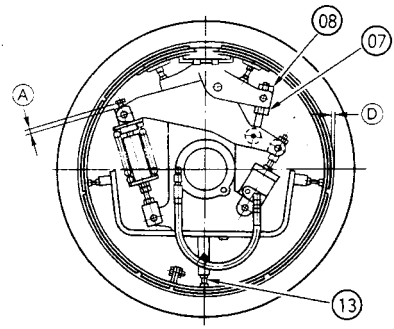
3.1 Adjustment for wear of the lining

(1) Set the clutch lever OFF position.

(2) Loosen lock nut (07), and retighten nut (08) corresponding the wear extent of the lining to thereby tension the lining.

(3) Adjust the clearance (D) between the clutch lining and drum uniformly all around the drum by turning five guide bolts (13).
(D) : 0.5 mm (0.02 in)

(4) Confirm that the dimension (A) is 16~17 mm (0.63~0.67 in) with clutch lever ON position.



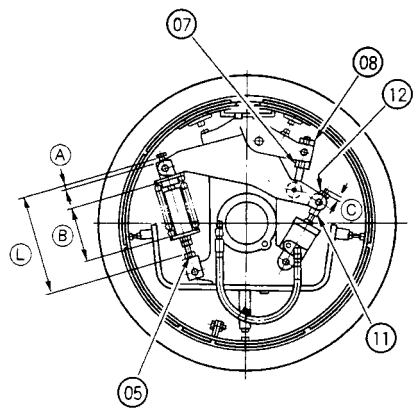
3.2 Adjustment in reassembly
(at overhauling and reassembly)

(1) Adjust the dimension (L) by loosening lock nut (05) and turning nut (06).
(L) : 299~300 mm (11.77~11.81 in)
After adjustment, tighten lock nut (05).

(2) Set the clutch lever ON position.

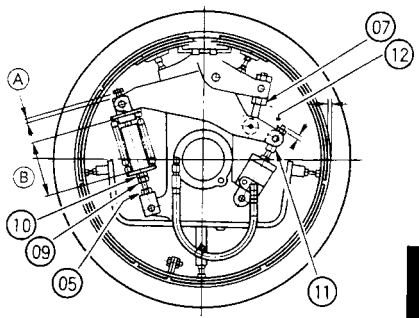
(3) Adjust the dimension (C) by loosening lock nut (11) and turning nut (12).
(C) : 6~7 mm (0.23~0.28 in)
After adjustment, tighten lock nut (11).

(4) Adjust the dimension (A) by loosening lock nut (07) and turning nut (08).
(A) : 16~17 mm (0.63~0.67 in)



(5) Adjust the dimension (B) by loosening lock nut (09) and turning nut (10).
(B) : 158~160 mm (5.90~6.30 in)

Note : The dimension (A) adjusted in step (4) changes a little after the adjustment in step (5), therefore if may be necessary to repeat step (4) and (5) to set adjustments (A) and (B) to the correct dimensions.



(6) Set the clutch lever OFF position.

(7) Adjust the clearance (D) between the clutch lining and drum uniformly all around the drum by turning the five guide bolts (13).
(D) : 0.5 mm (0.02 in)

(8) Tighten all lock nuts (05), (07), (09), (11) and (12).

Note : Check whether split pins are inserted through each lock pin.

(9) In clutch ON condition, finally check dimension (A) and (B).

4. Judgment

Unit : mm (in)

	Standard	Service Limit of Use
Wear of clutch lining	12 (0.472)	7.0 (0.276)

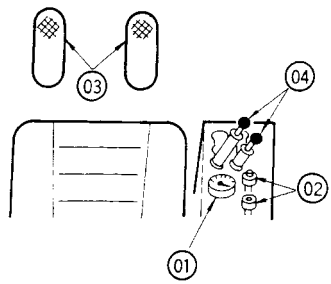
Note : The lining does not always wear equally along its full periphery.
Accordingly decide wear extent at maximum wear depth. Pay special care to the lining wear at dead point side.

1.1.4 KH125-3 (S/No.0841~), KH150-3 (S/No.0927~)
KH180-3 (S/No.1046~), KH230-3 (S/No.0122~)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar
(40~50 kgf/cm^2,569~711 psi)



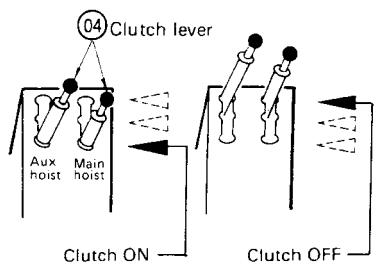
(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

2. Inspection

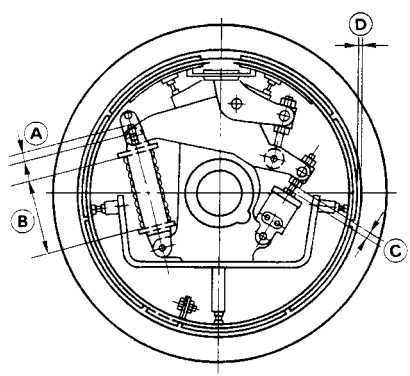
(1) Measure each dimensions with the clutch lever (04) ON position.

(A) : 18~22 mm (0.71~0.87 in)
(B) : 199~201 mm (7.83~7.91 in)
(C) : 18.5~19.5 mm (0.73~0.77 in)



(2) Measure the clearance (D) between the clutch lining and the drum with clutch lever OFF position.

(D) :0.5 mm (0.02 in)



3. Adjustment

3.1 Adjustment for wear of the lining

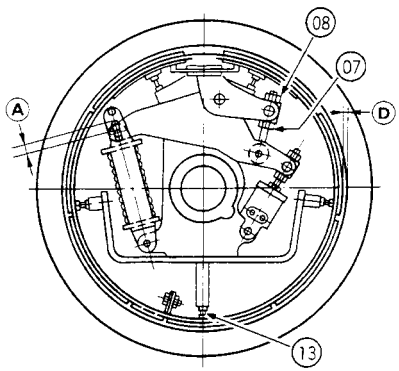
(1) Set the clutch lever OFF position.

(2) Loosen lock nut (07), and retighten nut (08) corresponding the wear extent of the lining to thereby tension the lining.

(3) Adjust the clearance (D) between the clutch lining and drum uniformly all around the drum by turning five guide bolts (13).

(D) : 0.5 mm (0.02 in)

(4) Confirm that the dimension (A) is 18~22 mm (0.71~0.87 in).



3.2 Adjustment in reassembly
(at overhauling and reassembly)

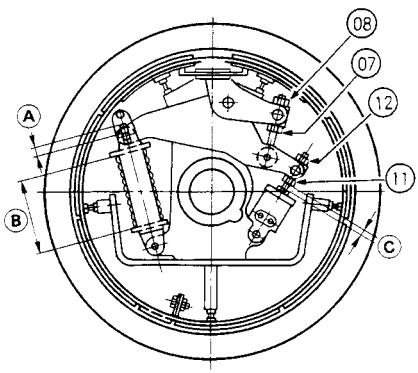
(1) Set the clutch lever ON position.

(2) Adjust the dimension (C) by loosening lock nut (11) and turning nut (12). After adjustment, tighten lock nut (11).

(C) : 18.5~19.5 mm (0.73~0.77 in)

(3) Adjust the dimensions (A) and (B) by loosening lock nut (07) and turning nut (08).

(A) : 18~22 mm (0.71~0.87 in)
(B) : 199~201 mm (7.83~7.91 in)

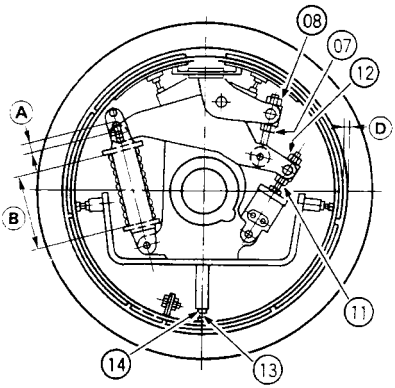


(4) Set the clutch lever OFF position.

(5) Adjust the clearance (D) between the clutch lining and drum uniformly all around the drum by turning the five guide bolts (13).

(D) : 0.5 mm (0.02 in)

Note : The dimension (A) adjusted in step (3) changes a little after the adjustment in step (5), therefore if may be necessary to repeat step (3) and (5) to set adjustments (A) and (B) to the correct dimensions.



(6) Tighten all lock nuts (07), (08), (11), (12) and (14).

Note : Check whether split pins are inserted through each lock pin.

(7) In clutch ON condition, finally check dimension (A) and (B).

4. Judgment

Unit : mm (in)

	Standard	Service Limit of Use
Wear of clutch lining	12 (0.472)	7.0 (0.276)

Note : The lining does not always wear equally along its full periphery.
Accordingly decide wear extent at maximum wear depth. Pay special care to the lining wear at dead point side.

1.1.5 KH300-3 (S/No.0216~0248)

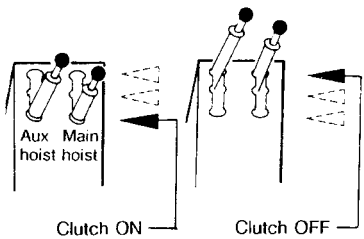
1. Inspection

1.1 Inspection every 8 hours

(1) Before start engine, measure dimension (A) with clutch lever ON position.

(A) : 15~21 mm (0.59~0.83 in)

Note : If the clutch lining is worn out, dimension (A) is reduced. When it reaches 14 mm (0.55 in), adjust the clutch.

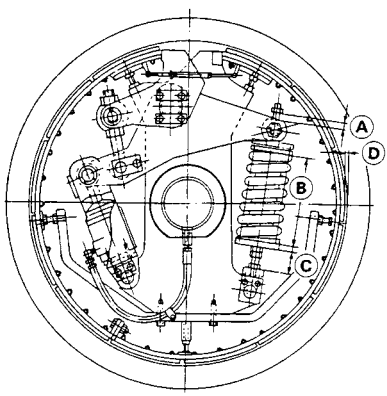


(2) Make sure that bolts and nuts are secured.

1.2 Inspection every 250 hours

(1) Before start engine, measure dimensions (A), (B) and (C) with clutch lever ON position.

(A) : 15~21 mm (0.59~0.63 in)
(B) : 255~261 mm (10.04~10.28 in)
(C) : 70~72 mm (2.76~2.83 in)



(2) Measure clearance (D) between the clutch lining and drum with clutch lever OFF position.

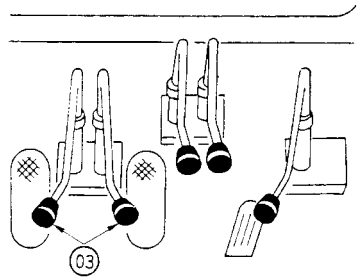
(D) : 0.5 mm (0.02 in)

(3) Make sure that bolts and nuts are secured.

SUPERSTRUCTURE

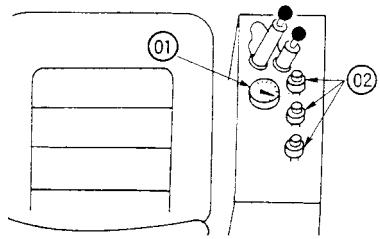
2. Adjustment

Note : The dimension (A) must be adjusted if it is found 14 mm (0.55 in) upon daily inspection.



(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

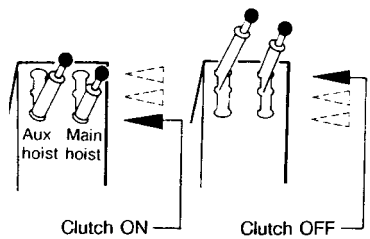
Pilot pressure : 39~49 bar
(40~50 kgf/cm², 569~711 psi)



(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in ON position.

(4) Set the clutch lever OFF potion.

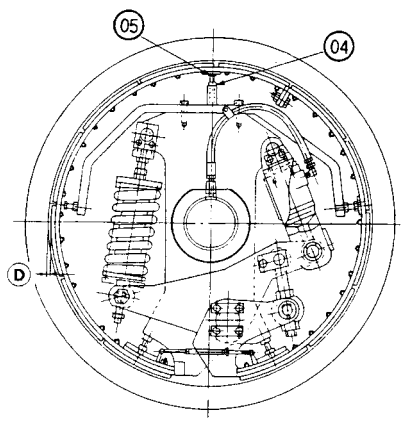


(5) Set the clutch as shown by operating the hoist lever .

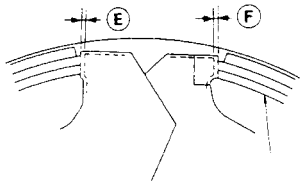
(6) Adjust clearance (D) between the clutch lining and drum uniformly all around the drum by loosening nut (04) and turning guide bolts (05).

(D) : 0.5 mm (0.02 in)

Note : If the guide bolt (05) is at the lower, turn the clutch till it comes to the upper.



(7) Adjust clearances (E) and (F) to zero respectively by loosening nut (06) and screwing nut (07).

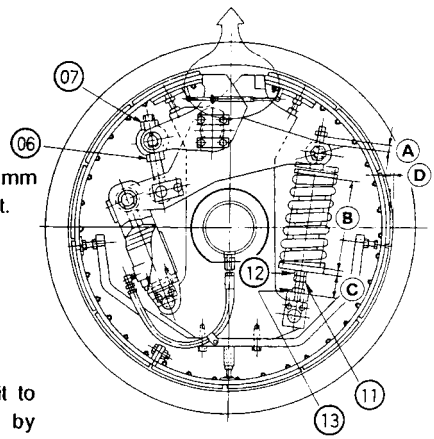


(8) Set the clutch lever ON position.

(9) Measure dimension (A) .

(A) : 19~21 mm (0.75~0.83 in)

Note : If dimension (A) is beyond 19~21 mm (0.75~0.83 in), make readjustment.



(10) Measure dimension (B) .

(B) : 259~261 mm (10.20~10.28 in)

Note : If it is beyond that range, adjust it to 259~261 mm (10.20~10.28 in) by loosening nut (11) and turning nut (12).

(11) Measure dimension (C) .

(C) : 70~72 mm (2.76~2.83 in)

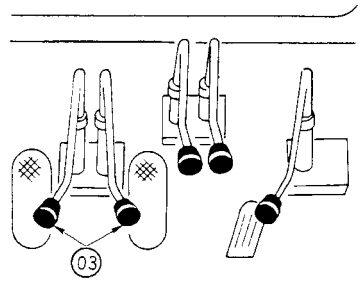
Note : If it is beyond that range, adjust it to 70~72 mm (2.76~2.83 in) by loosening nut (13) and turning bolt (14).

(12) With clutch OFF, make sure that clearance (D) is kept along the entire periphery between the clutch lining and drum.

(13) Retighten all loosened bolts and nuts.

3. Replacement of lining

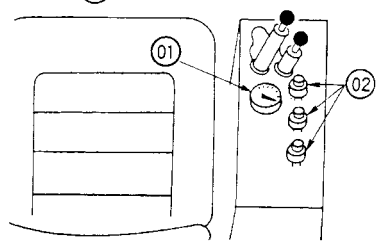
Note : The intial thickness of the lining is 12 mm (0.47 in). When it has worn to 7 mm (0.28 in), replace them with new ones. Replace 12 linings altogether.



3.1 Disassembly of lining

(1) Run the engine at medium speed and check pilot pressure at the pressure gauge (01).

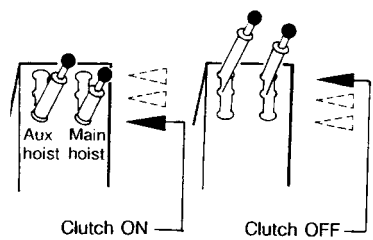
Pilot pressure : 39~49 bar (40~50 kgf/cm², 569~711 psi)



(2) Lower the hook to the ground for safety.

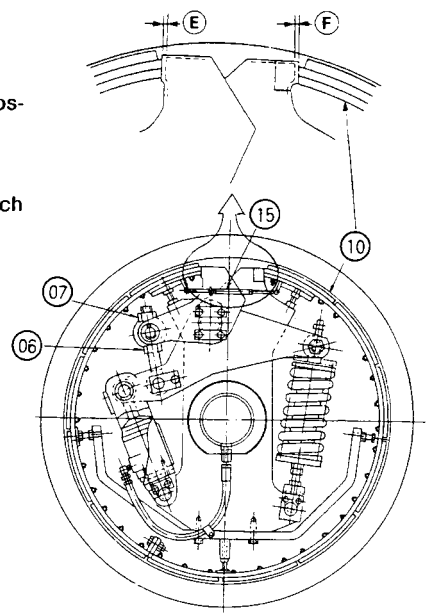
(3) Put the drum locks (02) and brake pedals (03) in the ON position.

(4) Set the clutch lever to OFF position.



(5) Adjust clearances (E) and (F) to zero by loosening nut (07) and tightening nut (06).

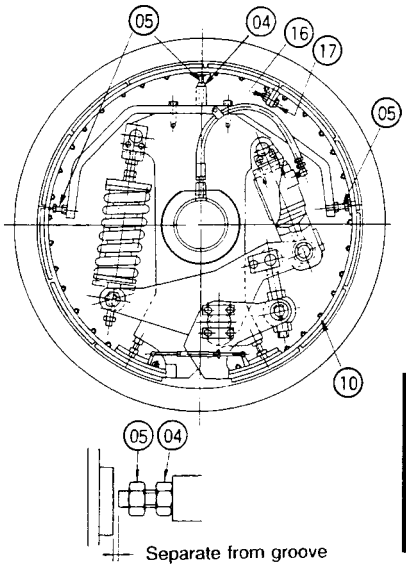
(6) Disassemble two springs (15) for the clutch band (10).



(7) Operate the hoist lever toward "HOIST" to hold the clutch as shown.

(8) Separate guide bolts (05) from the groove in clutch band (10) by loosening nuts (04) and turning guide bolts (05) .

(9) Remove nuts (16) and bolts (17) with a split pin for connecting the clutch band (10). Disassemble clutch band (01) into two and take out them from the drum.

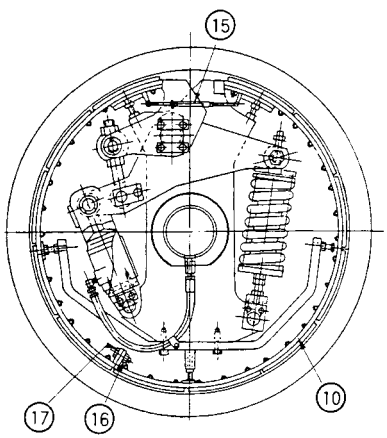


3.2 Assembly of lining

Note : Before assembling, check each part for abrasion and flaw, and the clutch band (with lining) for roundness, twist, abrasion and flaw.

(1) Insert clutch band (10) with a new lining into the drum to unite them with nuts (16) and bolts (17), and fix nuts (16) with a split pin.

(2) Operate the hoist lever and set the clutch as shown and install spring (15).

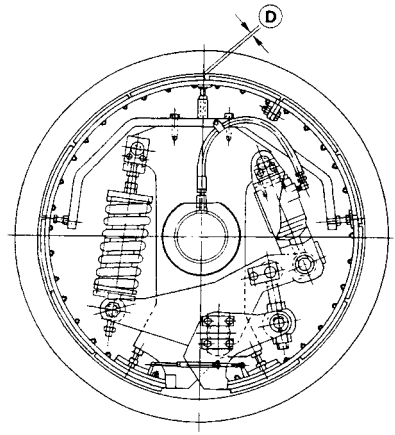


(3) Operate the hoist lever again and set the clutch as shown.

(4) Adjust clearance (D) between the lining and drum uniformly all around the drum by turning five guide bolts (05).

(D) : 0.5 mm (0.02 in)

Note : If the guide bolt is at the lower, turn the clutch to locate the bolt at the upper for adjustment.



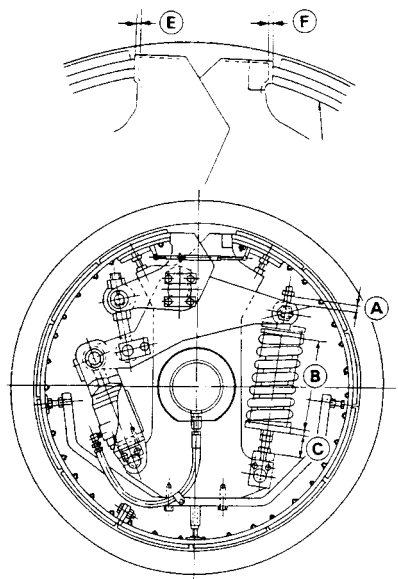
(5) Operate the hoist lever and set the clutch as shown.

(6) Adjust clearances (E) and (F) to zero by turning nuts (06) and (07).

(7) Measure dimensions (A), (B) and (C) with clutch lever ON position.

(A) : 19~21 mm (0.75~0.83 in)
(B) : 259~261 mm (10.20~10.28 in)
(C) : 70~72 mm (2.76~2.83 in)

(8) Retighten all nuts and bolts.



1.1.6 KH300-3 (S/No.0249~)

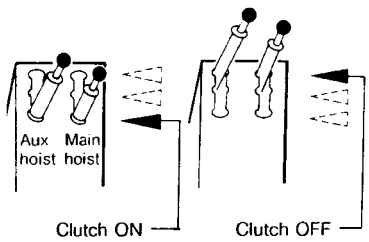
1. Inspection

1.1 Inspection every 8 hours

(1) Before start engine, measure dimension (A) with clutch lever ON position.

(A) : 27~33 mm (1.06~1.30 in)

Note : If the clutch lining is worn out, dimension (A) is reduced. When it reaches 26 mm(1.02 in), adjust the clutch.

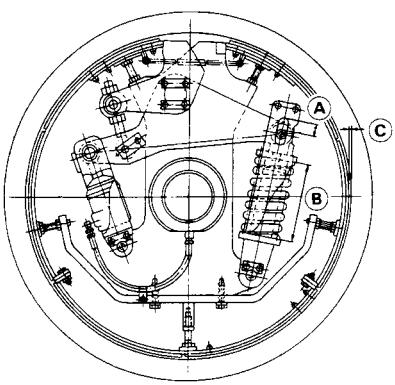


(2) Make sure that bolts and nuts are secured.

1.2 Inspection every 250 hours

(1) Before start engine, measure dimensions (A) and (B) with clutch lever ON position.

(A) : 27~33 mm (1.06~1.30 in)
(B) : 259~265 mm (10.20~10.43 in)



(2) Measure clearance (C) between the clutch lining and drum with clutch lever OFF position.

(C) : 0.5 mm (0.02 in)

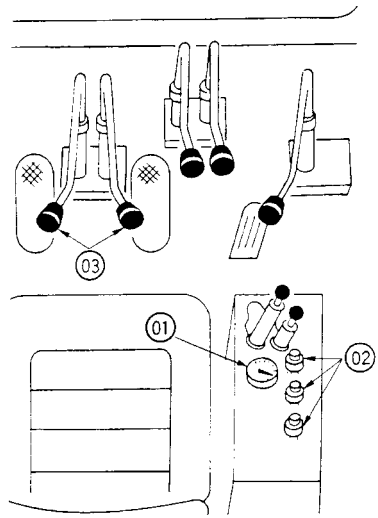
(3) Make sure that bolts and nuts are secured.

2. Adjustment

Note : The dimension (A) must be adjusted if it is found 26 mm (1.02 in) upon daily inspection.

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

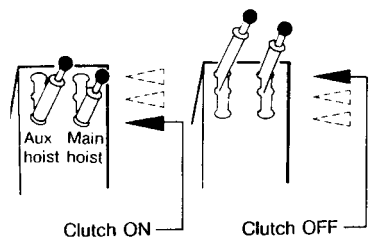
Pilot pressure : 39~49 bar
(40~50 kgf/cm², 569~711 psi)



(2) Lower the hook to the ground for safely.

(3) Put the drum locks (02) and brake pedals (03) in ON position.

(4) Set the clutch lever OFF potion.

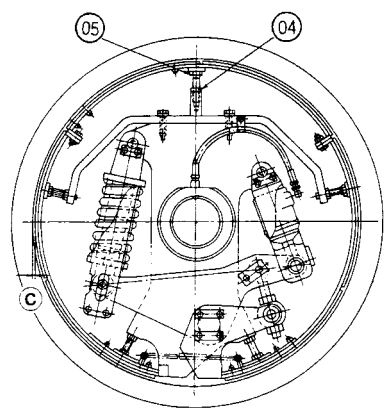


(5) Set the clutch as shown by operating the hoist lever .

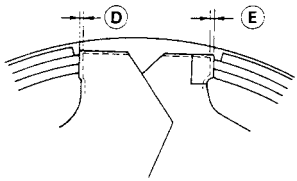
(6) Adjust clearance (C) between the clutch lining and drum uniformly all around the drum by loosening nut (04) and turning guide bolts (05).

(C) : 0.5 mm (0.02 in)

Note : If the guide bolt (05) is at the lower, turn the clutch till it comes to the upper.



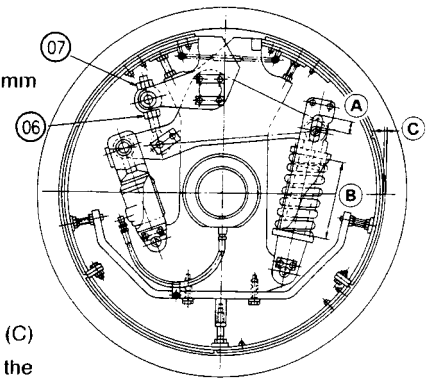
(7) Adjust clearances (D) and (E) to zero respectively by loosening nut (06) and screwing nut (07).



(8) Set the clutch lever ON position.

(9) Measure dimension (A) .
(A) : 31~33 mm (1.22~1.30 in)

Note : If dimension (A) is beyond 31~33 mm (1.22~1.30 in), make readjustment.



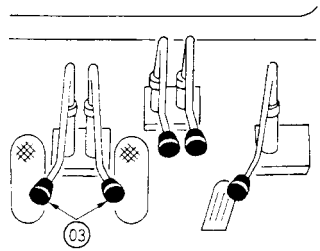
(10) Measure dimension (B) .
(B) : 259~261 mm (10.20~10.28 in)

(11) With clutch OFF, make sure that clearance (C) is kept along the entire periphery between the lining and drum.

(12) Retighten all loosened bolts and nuts.

3. Replacement of lining

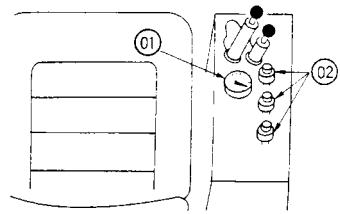
Note : The intial thickness of the lining is 12 mm (0.47 in). When it has worn to 7 mm (0.28 in), replace them with new ones. Replace 12 linings altogether.



3.1 Disassembly of lining

(1) Run the engine at medium speed and check pilot pressure at the pressure gauge (01).

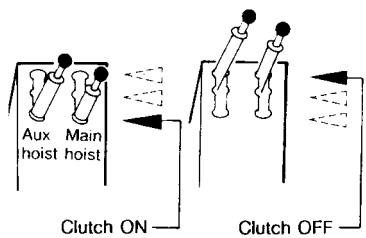
Pilot pressure : 39~49 bar
(40~50 kgf/cm^2,569~711 psi)



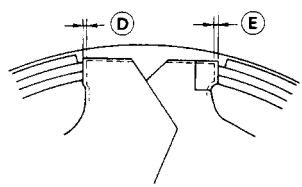
(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

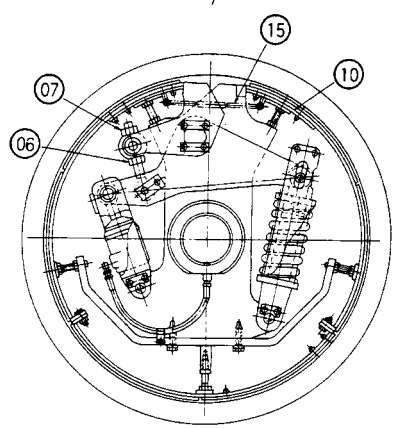
(4) Set the clutch lever to OFF position.



(5) Adjust clearances (D) and (E) to zero by loosening nut (07) and securing nut (06).



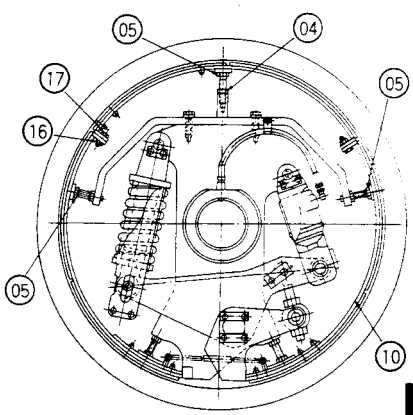
(6) Disassemble two springs (15) for the clutch band (10).

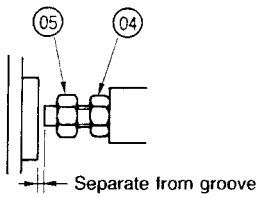


(7) Operate the hoist lever toward "HOIST" to hold the clutch shown.

(8) Separate guide bolts (05) from the groove in clutch band (10) by loosening nuts (04) and turning guide bolts (05).

(9) Remove nuts (16) and bolts (17) with a split pin for connecting the clutch band (10). Disassemble clutch band (01) into two and take out them from the drum.



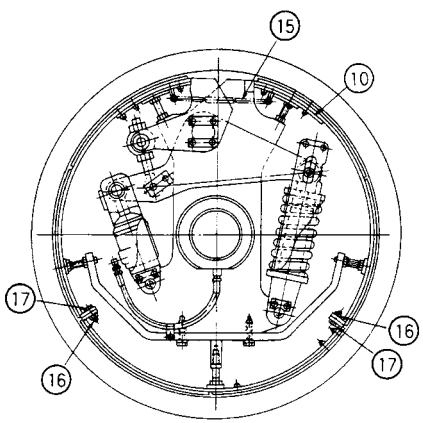


3.2 Assembly of lining

Note: Before assembling, check each part for abrasion and flaw, and the clutch band (with lining) for roundness, twist, abrasion and flaw.

(1) Insert clutch band (10) with a new lining into the drum to unite them with nuts (16) and bolts (17), and fix nuts (16) with a split pin.

(2) Operate the hoist lever and set the clutch as shown and install spring (15).

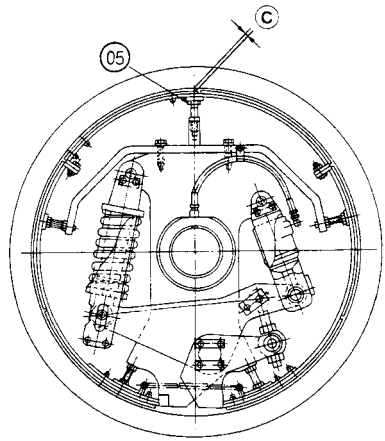


(3) Operate the hoist lever again and set the clutch as shown.

(4) Adjust clearance (C) between the lining and drum uniformly all around the drum by turning five guide bolts (05).

(D) : 0.5 mm (0.02 in)

Note : If the guide bolt is at the lower, turn the clutch to locate the bolt at the upper for adjustment.



(5) Operate the hoist lever and set the clutch as shown.

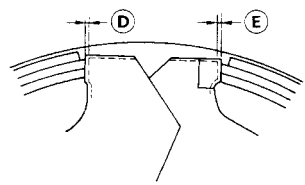
(6) Adjust clearances (D) and (E) to zero by turning nuts (06) and (07).

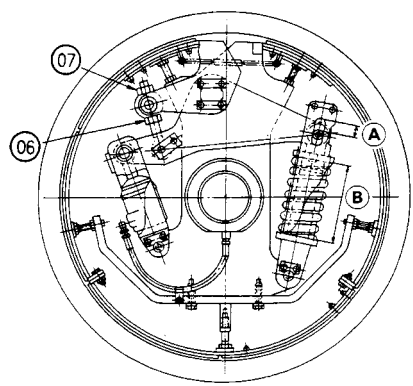
(7) Measure dimensions (A) and (B) with clutch lever ON position.

(A) : 31~33 mm (1.22~1.30 in)

(B) : 259~261 mm (10.20~10.28 in)

(8) Retighten all nuts and bolts.





1.1.7 KH500-3 (S/No.0201~)

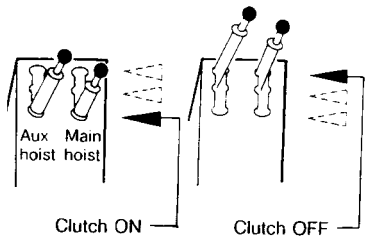
1. Inspection

1.1 Inspection every 8 hours

(1) Before start engine, measure dimension (A) with clutch lever ON position.

(A) : 26~41 mm (1.02~1.61 in)

Note : If the clutch lining is worn out, dimension (A) is reduced. When it reaches 14 mm (0.55 in), adjust the clutch.

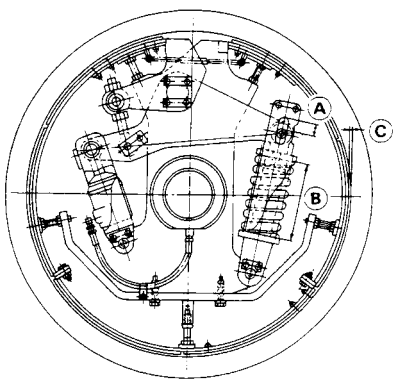


(2) Make sure that bolts and nuts are secured.

1.2 Inspection every 250 hours

(1) Before start engine, measure dimensions (A) and (B) with clutch lever ON position.

(A) : 26~41 mm (1.02~1.61 in)
(B) : 259~274 mm (10.20~10.79 in)



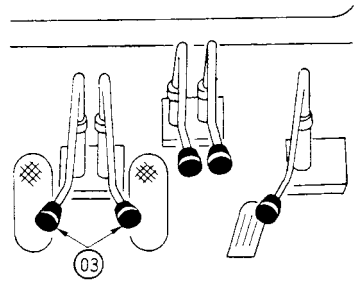
(2) Measure clearance (C) between the clutch lining and drum with clutch lever OFF position.

(C) : 0.5 mm (0.02 in)

(3) Make sure that bolts and nuts are secured.

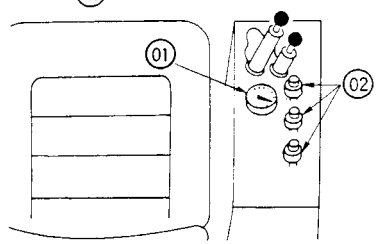
2. Adjustment

Note : The dimension (A) must be adjusted if it is found 25 mm (0.98 in) upon daily inspection.



(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

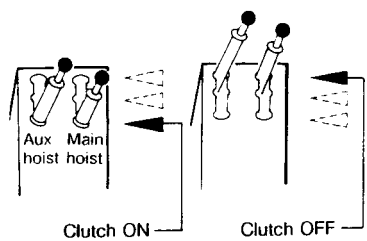
Pilot pressure : 39~49 bar
(40~50 kgf/cm², 569~711 psi)



(2) Lower the hook to the ground for safety.

(3) Put the drum locks and brake pedals in ON position.

(4) Set the clutch lever OFF potion.

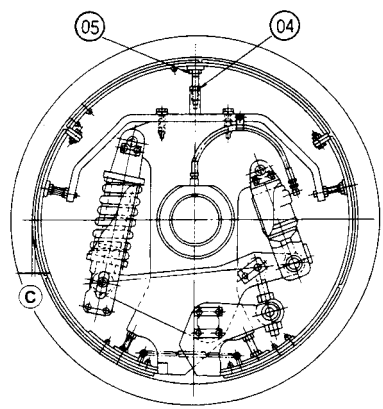


(5) Set the clutch as shown by operating the hoist lever .

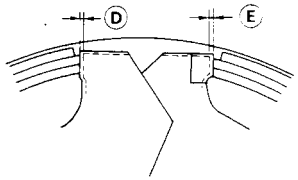
(6) Adjust clearance (C) between the clutch lining and drum uniformly all around the drum by loosening nut (04) and turning guide bolts (05).

(D) : 0.5 mm (0.02 in)

Note : If the guide bolt (05) is at the lower, turn the clutch till it comes to the upper.



(7) Adjust clearances (E) and (F) to zero respectively by loosening nut (06) and screwing nut (07).

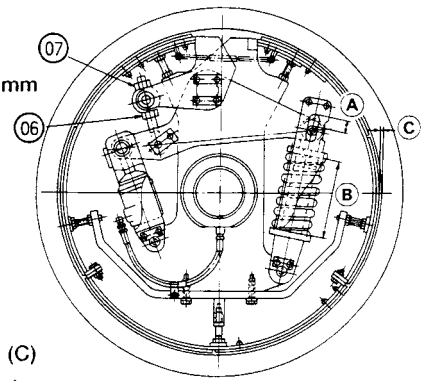


(8) Set the clutch lever ON position.

(9) Measure dimension (A) .

(A) : 39~41 mm (1.54~1.61 in)

Note : If dimension (A) is beyond 39~41 mm (1.54~1.61 in), make readjustment.



(10) Measure dimension (B) .

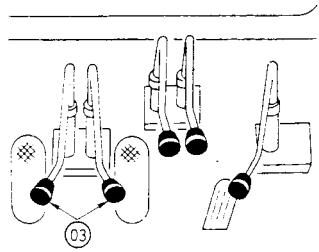
(B) : 259~261 mm (10.20~10.28 in)

(11) With clutch OFF, make sure that clearance (C) is kept along the entire periphery between the clutch lining and drum.

(12) Retighten all loosened bolts and nuts.

3. Replacement of lining

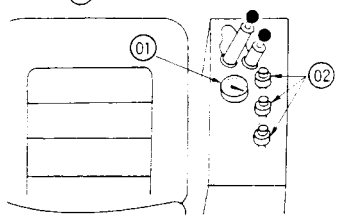
Note : The intial thickness of the lining is 12 mm (0.47 in). When it has worn to 7 mm (0.28 in), replace them with new ones. Replace 12 linings altogether.



3.1 Disassembly of lining

(1) Run the engine at medium speed and check pilot pressure at the pressure gauge.

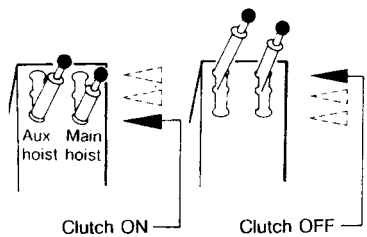
Pilot pressure : 39~49 bar (40~50 kgf/cm², 569~711 psi)



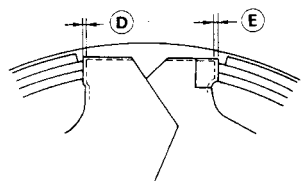
(2) Lower the hook to the ground for safety.

(3) Put the drum locks and brake pedals in the ON position.

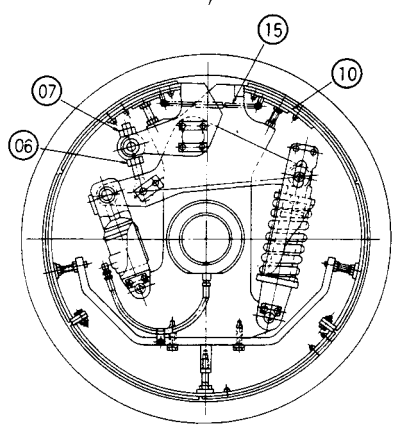
(4) Set the clutch lever to OFF position.



(5) Adjust clearances (E) and (F) to zero by loosening nut (07) and tightening nut (06).



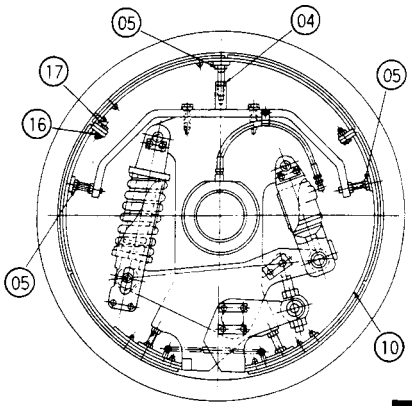
(6) Remove two springs (15) for the clutch band (10).

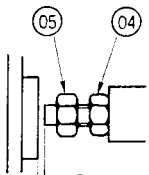


(7) Operate the hoist lever and set the clutch as shown.

(8) Separate guide bolt (05) from the groove in clutch disk (10) by loosening nut (04) and turning guide bolt (05) .

(9) Remove nut (16) and bolt (17) with a split pin for connecting the clutch band (10).
Disassemble clutch band into three and take out them from the drum.





Separate from groove

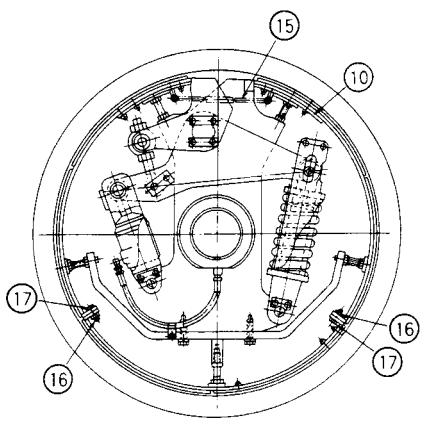
3.2 Assembly

Note : Before assembling, check each part for abrasion and flaw, and the clutch band (with lining) for roundness, twist, abrasion and flaw.

(1) Insert clutch band (10) with a new lining into the drum to unite them with nut (16) and bolt (17), and fix nut (16) with a split pin.

(2) Operate the hoist lever and set the clutch as shown

(3) Install springs (15).

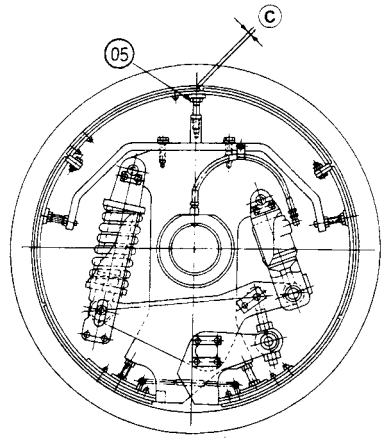


(4) Operate the hoist lever and set the clutch as shown.

(5) Adjust clearance (C) between the lining and drum uniformly all around the drum by turning five guide bolts (05).

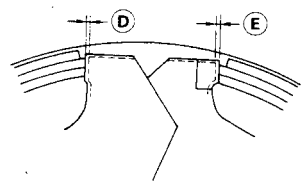
(D) : 0.5 mm (0.02 in)

Note : If the guide bolt is at the lower, turn the clutch to locate the bolt at the upper for adjustment.



(6) Operate the hoist lever and set the clutch as shown.

(7) Adjust clearances (D) and (E) to zero by turning nuts (06) and (07).

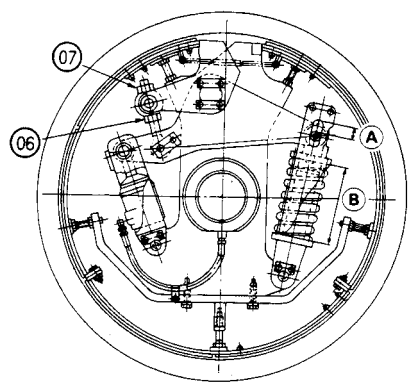


(8) Measure dimensions (A), (B) and (C) with clutch lever ON position.

(A) : 39~41 mm (1.54~1.61 in)

(B) : 259~261 mm (10.20~10.28 in)

(9) Retighten all nuts and bolts.



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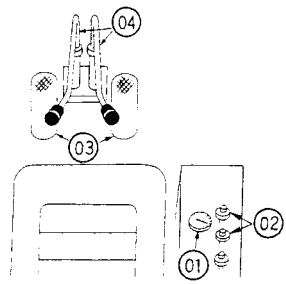
1.2.1 KH100D (S/No. 1001~), KH125D (S/No. 0802~)
KH125-3 (S/No. 0801~), KH150-3 (S/No. 0803~)
KH180-3 (S/No. 0703~), KH230-3 (S/No. 0106~)

1. Preparation

KH100D
KH125D

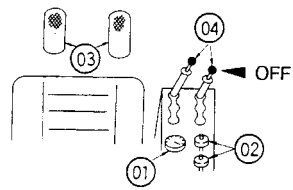


(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar (40~50 Kgf/cm², 569~711 psi)

(2) Lower the hook to the ground for safety.

KH125-3
KH150-3
KH180-3
KH230-3



(3) Put the drum locks (02) and brake pedals (03) in the ON position.

(4) Set the clutch lever (04) to OFF position.

2. Inspection

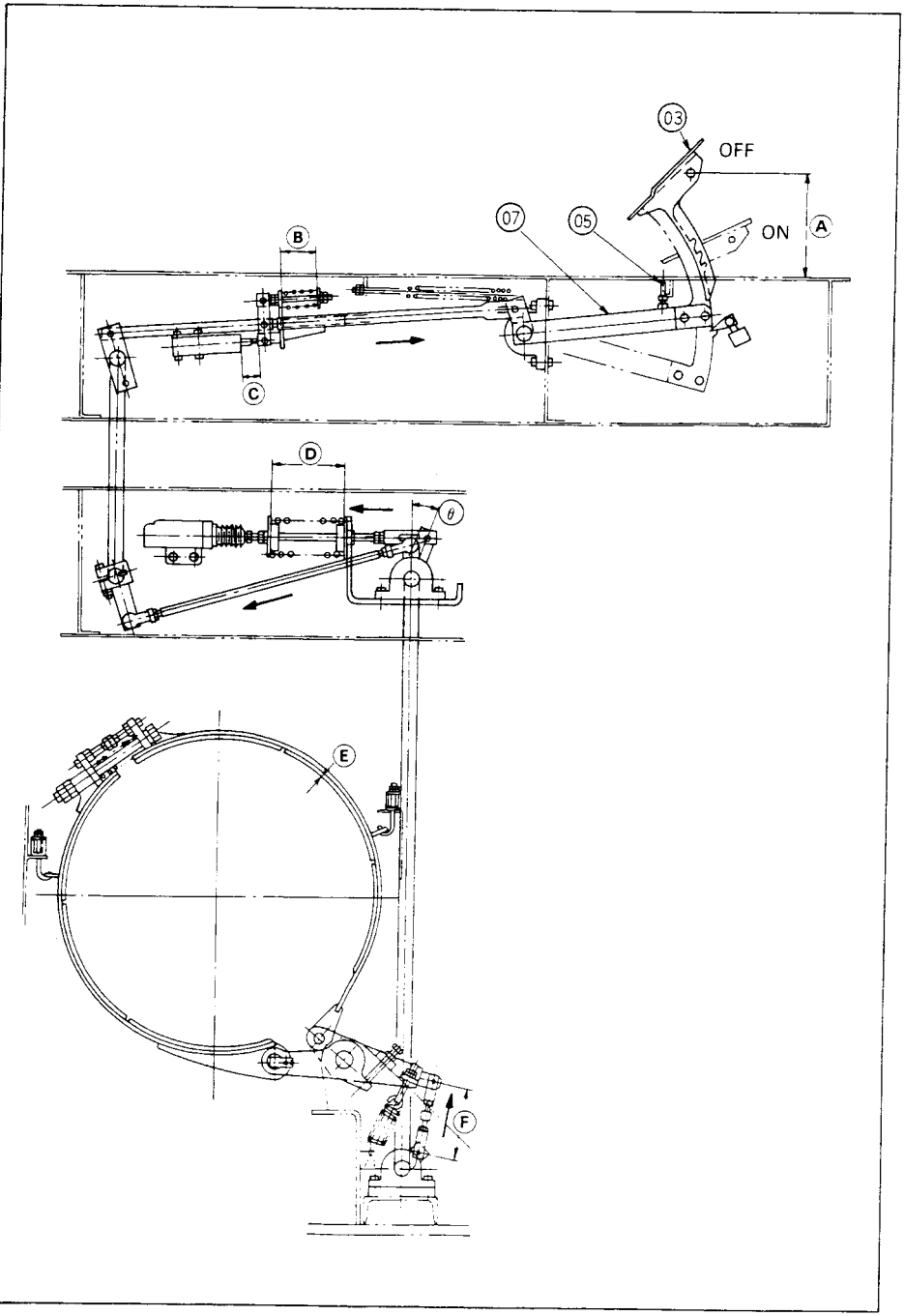
(1) Measure dimensions (A), (B), (C), (D), (E) and (F) with brake pedal OFF position (where the brake pedal lever (07) comes into contact with stopper bolt (05)).

(A) : 230 mm (9.06 in)
(B) : 79 mm (3.11 in)
(C) : 40~41 mm (1.57~1.61 in)
(D) : 174~176 mm (6.85~6.93 in)
(E) : 0.8~1.0 mm (0.031~0.039 in)
(F) : 190 mm (7.48 in)

(2) Measure dimension (D) with engine stops.

(D) : 203~210 mm (7.99~8.27 in)

Note : If each dimensions are within normal range, adjustment is not necessary.


03
OFF
ON
A
07
05
B
C
D
θ
E
F

3. Adjustment

3.1 Adjustment of Brake System

(1) Put the brake pedal (03) in the OFF position.

(2) Adjust dimension (A) by loosening lock nut (06) and turning stopper bolt (05).

(A) : 230 mm (9.06 in)

(3) Adjust dimensions (B) and (C) by turning nuts (08) and (09).

(B) : 79 mm (3.11 in)
(C) : 40~41 mm (1.57~1.61 in)

(4) Adjust dimension (D) by turning nut (10).

(D) : 174~176 mm (6.85~6.93 in)

(5) Loosen nuts (11) and bolts (12).
Adjust dimension (E) by turning nut (13), lifting bolts (14), (15) and stopper bolt (16).

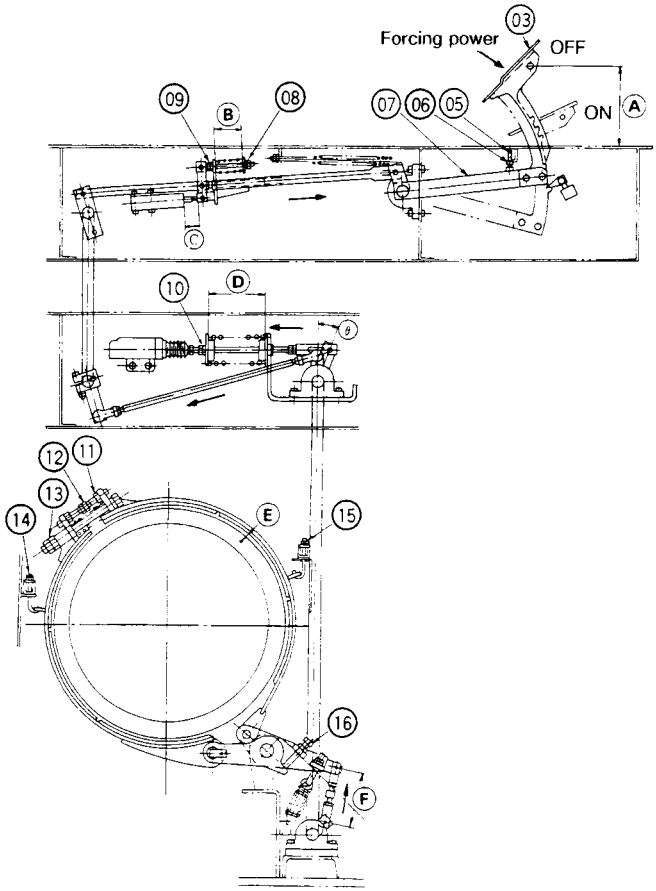
(E) : 0.8~1.0 mm (0.03~0.04 in)

(6) After adjustment, make the bolts (12) contact with each other, then set the brake pedal (03) in the ON position.
Tighten each bolts (12) about 1/4 turn, and lock with lock nuts (11).

(7) Depress brake pedal (03) to check the effectiveness of braking.
Lock the nut (13).

(8) Stop the engine and check that the dimension (D) is 203~210 mm (7.99~8.27 in).

Note : If it is less than 203 mm (8.27 in), readjust the dimension (E) slightly larger, and in the event of more than 210 mm (8.27 in), slightly smaller by turning the nut (13).



3.2 General Adjustment

The brake system is properly adjusted before leaving factory and each dimension is correctly set.
Therefore, in general, it should be adjusted only when the linings are excessively worn. The adjustment should be performed in the order from (5), (6), (7) and (8).

4. Replacement of linings

New lining is 12 mm (0.47 in) thick.
Replace the brake lining with new one when it is worn down to 7 mm (0.28 in).

1.2.2 KH125-3 (S/No. 0601~0727)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar (40~50 Kgf/cm², 569~711 psi)

(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

(4) Set the clutch lever (04) to OFF position.

2. Inspection

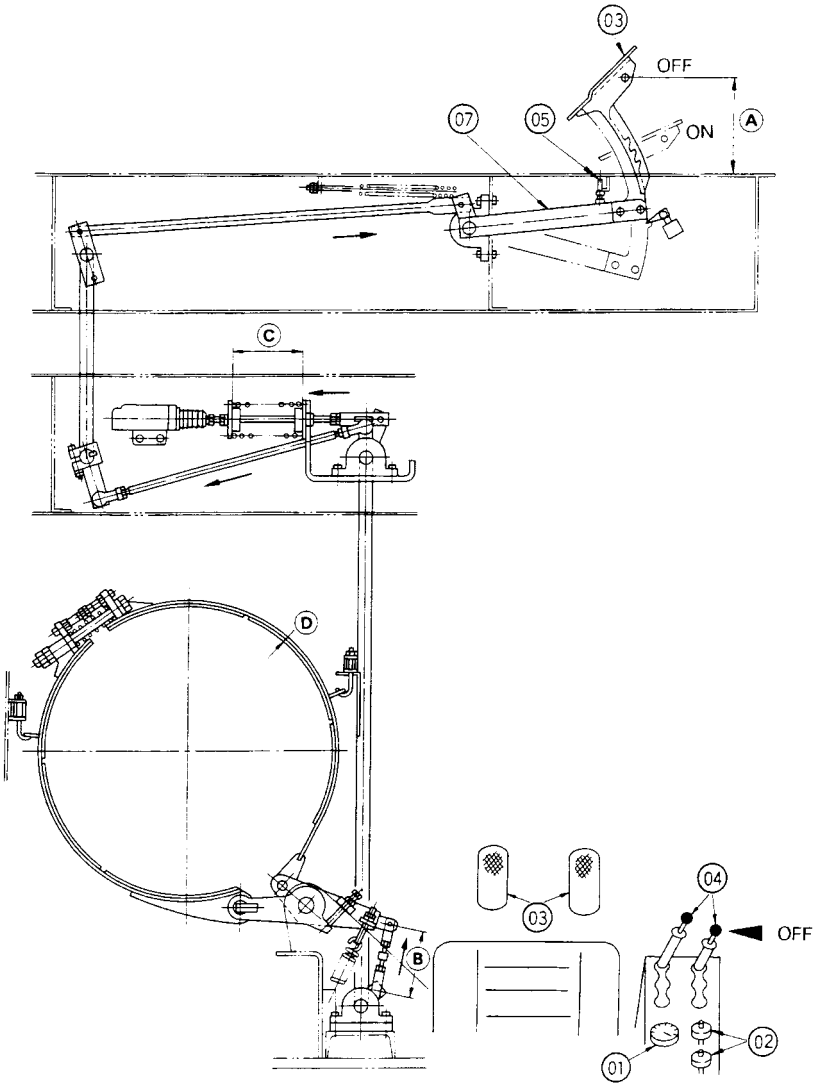
(1) Measure dimensions (A), (B), (C) and (D) with brake pedal OFF position (where the brake pedal lever (07) comes into contact with stopper bolt (05)).

(A) : 230 mm (9.06 in)
(B) : 190 mm (7.48 in)
(C) : 174~176 mm (6.85~6.93 in)
(D) : 0.8~1.0 mm (0.031~0.039 in)

(2) Measure dimension (C) with engine stops.

(D) : 203~215 mm (7.99~8.46 in)

Note : If each dimensions are within normal range, adjustment is not necessary.


03
OFF
07
05
ON
A
C
D
B
03
04
OFF
02
01

3. Adjustment

3.1 Adjustment of Brake System

(1) Put the brake pedal (03) in the OFF position.

(2) Adjust dimension (A) by loosening lock nut (06) and turning stopper bolt (05).

(A) : 230 mm (9.06 in)

(3) Adjust dimension (C) by turning nut (10).

(C) : 174~176 mm (6.85~6.93 in)

(5) Loosen nuts (11) and bolts (12).
Adjust dimension (D) by turning nut (13), lifting bolts (14), (15) and stopper bolt (16).

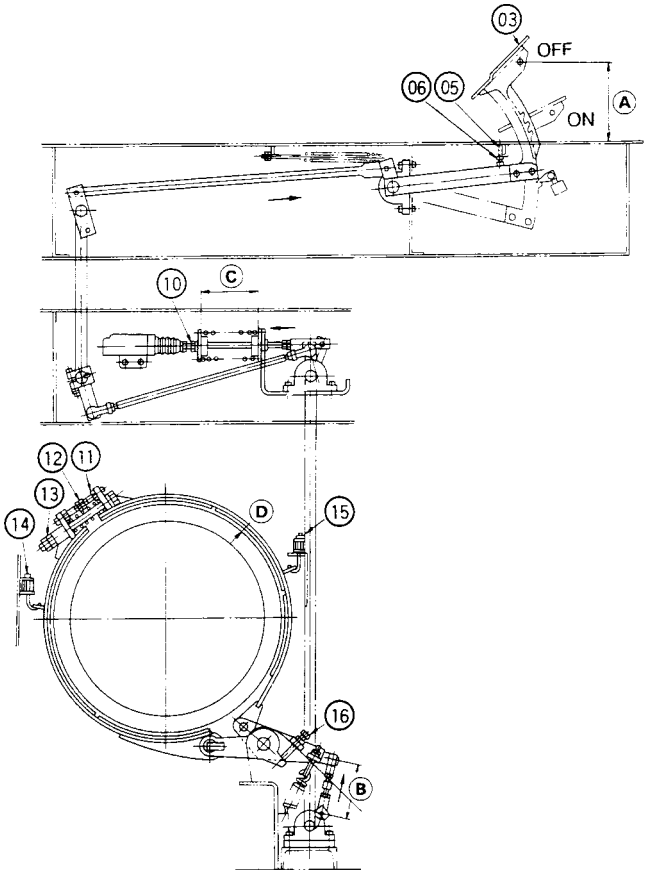
(D) : 0.8~1.0 mm (0.03~0.04 in)

(6) After adjustment, make the bolts (12) contact with each other, then set the brake pedal (03) in the ON position.
Tighten each bolts (12) about 1/4 turn, and lock with lock nuts (11).

(7) Depress brake pedal (03) to check the effectiveness of braking.
Lock the nut (13).

(8) Stop the engine and check that the dimension (C) is 205~215 mm (8.07~8.46 in).

Note : If it is less than 205 mm (8.07 in), readjust the dimension (E) slightly larger, and in the event of more than 215 mm (8.46 in), slightly smaller by turning the nut (13).



3.2 General Adjustment

The brake system is properly adjusted before leaving factory and each dimension is correctly set.
Therefore, in general, it should be adjusted only when the linings are excessively worn. The adjustment should be performed in the order from (5), (6), (7) and (8).

4. Replacement of linings

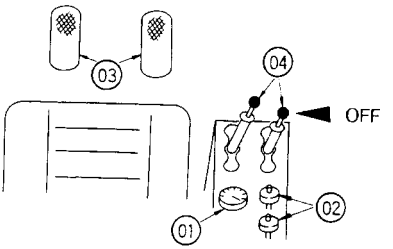
New lining is 12 mm (0.47 in) thick.
Replace the brake lining with new one when it is worn down to 7 mm (0.28 in).

1.2.3 KH300.3 (S/No. 0216~)

1. Preparation

(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

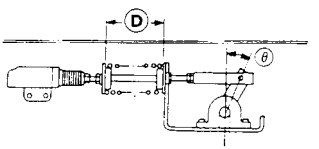
Pilot pressure : 39~49 bar (40~50 Kgf/cm², 569~711 psi)



(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.

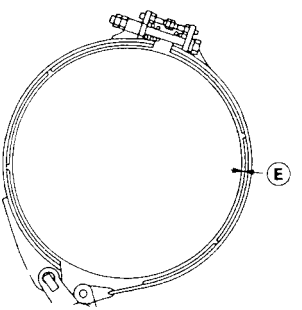
(4) Set the clutch lever (04) to OFF position.

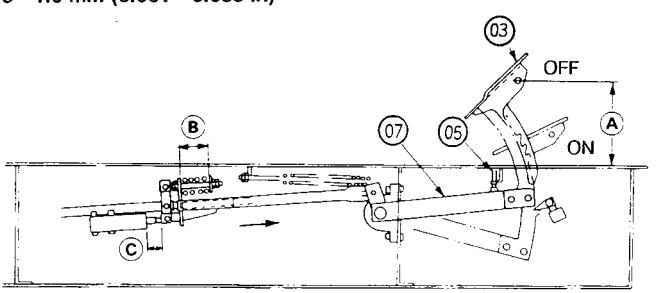


2. Inspection

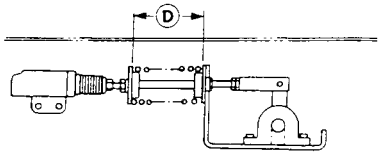
(1) Measure dimensions (A), (B), (C), (D) and (E) with brake pedal OFF position (where the brake pedal lever (07) comes into contact with stopper bolt (05)).

(A) : 230 mm (9.06 in)
(B) : 79 mm (3.11 in)
(C) : 40~41 mm (1.57~1.61 in)
(D) : 174~176 mm (6.85~6.93 in)
(E) : 0.8~1.0 mm (0.031~0.039 in)





(2) Measure dimension (D) with clutch lever ON position.

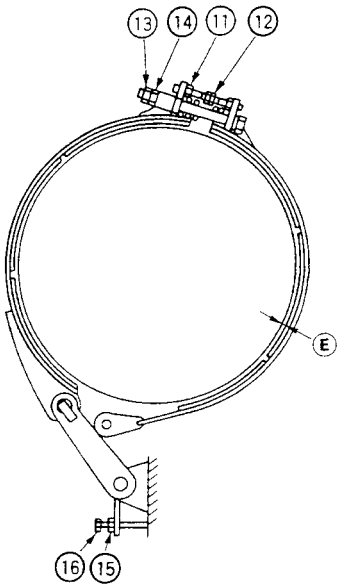


(D) : 205~220 mm (8.07~8.66 in)

Note : Usually, adjustment is required only when the brake linings have worn and the dimension (D) becomes 220 mm (8.66 in).

3. Adjustment

Note : If the dimension (D) becomes 220 mm (8.66 in) with brake ON upon inspection, adjust the clearance between the lining and drum to lower.



(1) Set the clutch lever to OFF position.

(2) Loosen nuts (11) and bolts (12).

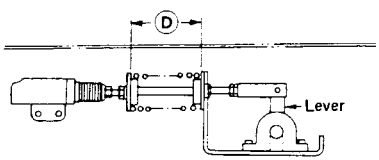
(3) Adjust clearance (E) between the lining and drum uniformly all around the drum by loosening nut (13) and tightening nut (14).

(E) : 0.8~1.0 mm (0.031~0.039 in)

(4) Set the clutch lever to ON position.

(5) Measure dimension (D)

(D) : 205~212 mm (8.07~8.35 in)
(With lever kept almost vertically)



(6) After adjustment, make the bolts (12) contact with each other and further tighten them about 1/4 turn and lock them by lock nuts (11) with the brake pedal ON position.

(7) Fix nut (14) with nut (13) and bolt (16) with nut (15) respectively.

4. Replacement of the brake lining

Note : New lining is 12 mm (0.47 in) thick.
Replace the brake lining with new one when it is worn down to 7 mm (0.28 in).

(1) Run the engine and check the pilot pressure at pressure gauge.

(2) Set the clutch lever to OFF position.

(3) Put the brake pedal in OFF position.

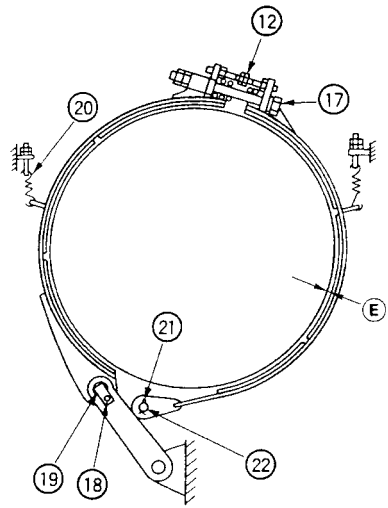
(4) Remove bolts (12) and (17) respectively .
Loosen bolt (18) and pull out pin (19).
Remove split pin (21) and pull out pin (22).

(5) Remove spring (20) from the band hook and then remove the brake band.

(5) Replace linings with new ones and reinstall the band assembly.

(6) Adjust clearance (E) between the lining and drum uniformly around all around the drum.

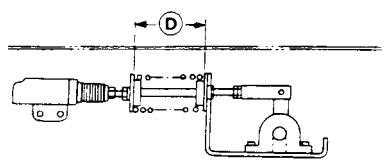
(E) : 0.8~1.0 mm (0.031~0.039 in)



(7) Set the clutch lever to ON position.

(8) Measure dimension (D).

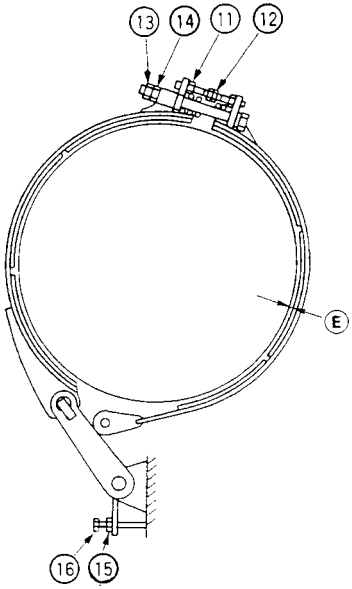
(D) : 205~212 mm (8.07~8.35 in)



(9) After adjustment, make the bolts (12) contact with each other and further tighten them about 1/4 turn, and lock them by lock buts (11).

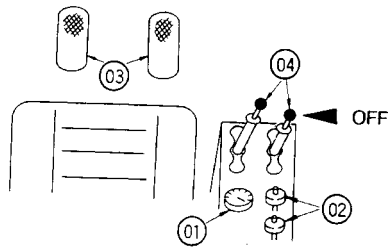
(10) Fix the nut (14) with nut (13) and the bolt (16) with nut (15) respectively.

(11) Tighten all bolts and nuts which are loosened for adjustment.



1.2.4 KH500-3 (S/No. 0201~)

1. Preparation

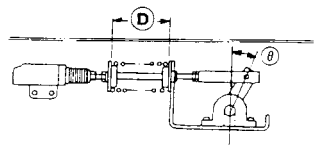


(1) Run the engine at medium speed and check the pilot pressure at pressure gauge (01).

Pilot pressure : 39~49 bar (40~50 Kgf/cm², 569~711 psi)

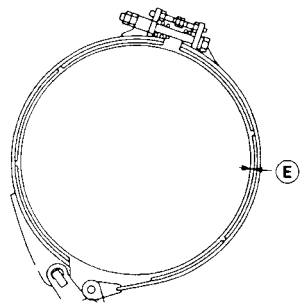
(2) Lower the hook to the ground for safety.

(3) Put the drum locks (02) and brake pedals (03) in the ON position.



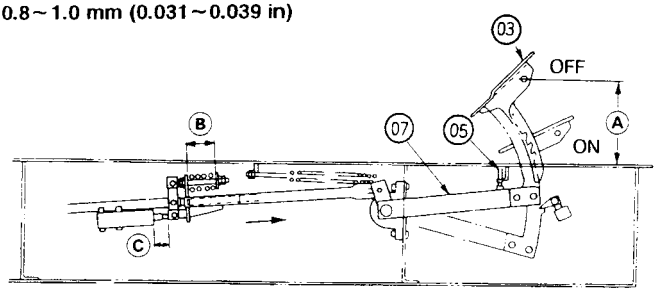
(4) Set the clutch lever (04) to OFF position.

2. Inspection

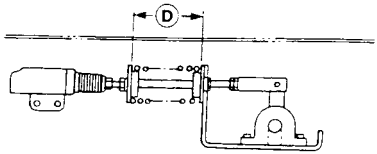


(1) Measure dimensions (A), (B), (C), (D) and (E) with brake pedal OFF position (where the brake pedal lever (07) comes into contact with stopper bolt (05)).

(A) : 230 mm (9.06 in)
(B) : 79 mm (3.11 in)
(C) : 40~41 mm (1.57~1.61 in)
(D) : 193~195 mm (7.60~7.68 in)
(E) : 0.8~1.0 mm (0.031~0.039 in)



(2) Measure dimension (D) with clutch lever ON position.

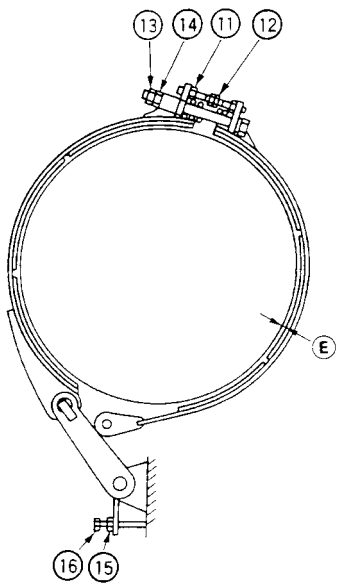


(D) : 228~235 mm (8.98~9.25 in)

Note : Usually, adjustment is required only when the brake linings have worn and the dimension (D) becomes 235 mm (9.25 in).

3. Adjustment

Note : If the dimension (D) becomes 235 mm (9.25 in) with brake ON upon inspection, adjust the clearance between the lining and drum to lower.



(1) Set the clutch lever to OFF position.

(2) Loosen nuts (11) and bolts (12).

(3) Adjust clearance (E) between the lining and drum uniformly all around the drum by loosening nut (13) and tightening nut (14).

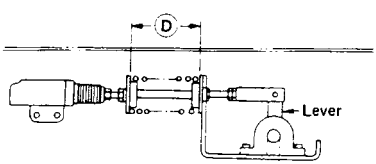
(E) : 0.8~1.0 mm (0.031~0.039 in)

(4) Set the clutch lever to ON position.

(5) Measure dimension (D)

(D) : 228~235 mm (8.98~9.25 in)
(With lever kept almost vertically)

(6) After adjustment, make the bolts (12) contact with each other and further tighten them about 1/4 turn and lock them by lock nuts (11) with the brake pedal ON position.



(7) Fix nut (14) with nut (13) and bolt (16) with nut (15) respectively.

4. Replacement of the brake lining

Note : New lining is 12 mm (0.47 in) thick.
Replace the brake lining with new one when it is worn down to 7 mm (0.28 in).

(1) Run the engine and check the pilot pressure at pressure gauge.

(2) Set the clutch lever to OFF position.

(3) Put the brake pedal in OFF position.

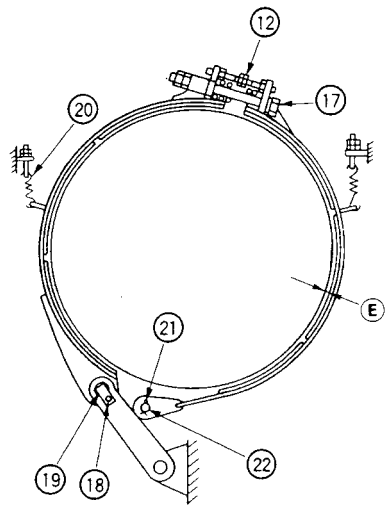
(4) Remove bolts (12) and (17) respectively .
Loosen bolt (18) and pull out pin (19).
Remove split pin (21) and pull out pin (22).

(5) Remove spring (20) from the band hook and then remove the brake band.

(5) Replace linings with new ones and reinstall the band assembly.

(6) Adjust clearance (E) between the lining and drum uniformly around all around the drum.

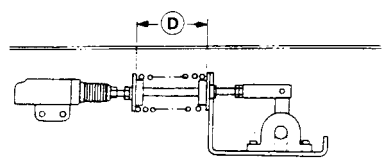
(E) : 0.8~1.0 mm (0.031~0.039 in)



(7) Set the clutch lever to ON position.

(8) Measure dimension (D).

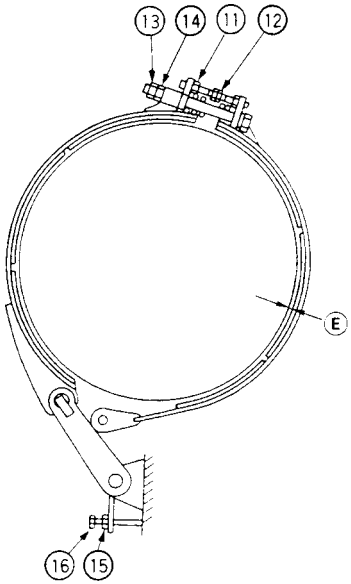
(D) : 228~235 mm (8.98~9.25 in)



(9) After adjustment, make the bolts (12) contact with each other and further tighten them about 1/4 turn, and lock them by lock buts (11).

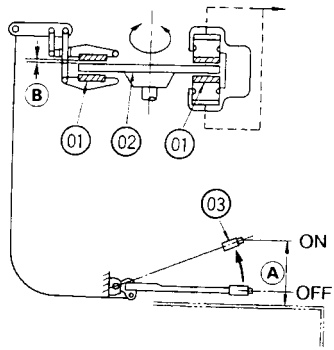
(10) Fix the nut (14) with nut (13) and the bolt (16) with nut (15) respectively.

(11) Tighten all bolts and nuts which are loosened for adjustment.



KH150-3 (S/No. 0803~0852)
KH180-3 (S/No. 0703~0807)

1. Inspection



(1) Measure the lever stroke (A) .

(A) : 185~220 mm (7.28~8.56 in)

Note : If the lever stroke (A) is not above specifications, the clearance (B) is incorrect and adjustment is required.

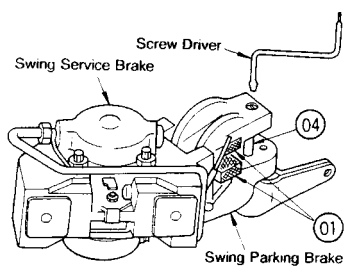
2. Adjustment

(1) Set the parking brake lever (03) to OFF position.

(2) Turn adjusting bolt (04) clockwise with a screw driver until the clearance (B) becomes zero.

(3) Adjust clearance (B) by loosening adjusting bolt (04) about half a turn.

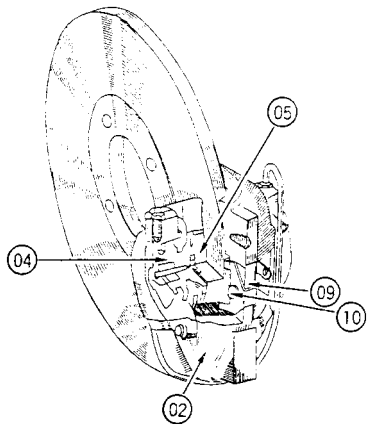
(B) : 0.25 mm (0.001 in)



(4) Make sure the lever stroke is within 185~220 mm (7.28~8.66 in) as specified in the above inspection procedure.

3. Replacement of Pad

Note : New pad is 11.7 mm (0.46 in) thick.
Replace the pad with new ones if thickness has come to 7 mm (0.28 in) through wear.

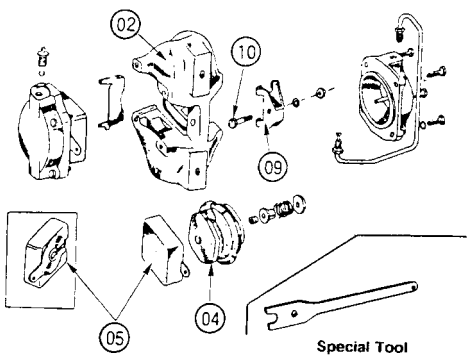


(1) Remove bolt (10) and the keep plate (09) from cariper (02).

(2) Pull out the pad (05) with a special tool.

(3) Push piston (04) and install new pads to the groove of the cariper (02).

(4) Install the keep plate (09) and bolt (10).



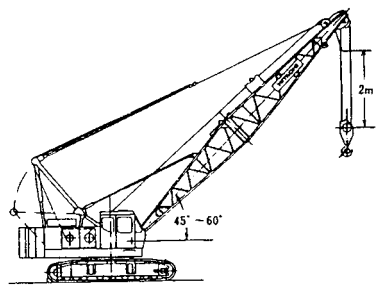
2. PERFORMANCE CHECK

2.1 SWING SPEED

Note : The total performance of the swing driving system including the hydraulic pump and motor is checked by measuring the required time to revolve the superstructure three times.
Be sure to check the grease for the swing gear and bearing before the test.
Perform the test on a flat ground.

1. Preparation
   (1) Set the boom at 60° and hoist the hook to approximately 2 m (6.6 ft.) point before the hook overhoist prevention device operates.

   (2) Warm up the engine and keep the hydraulic oil temperature at 50 ± 5°C (122 ± 41°F).



2. Measurement
   (1) Set the engine speed control lever in high idle position and operate the swing lever fully.

   (2) After swing speed reached constant speed, measure the time necessary to make the superstructure three turns.

   (3) Measure the speed in both clockwise and counterclockwise directions.

   (4) Perform the measurement three times to get the average value as the measurement value.

3. Judgement Data

Unit : sec / 3 turn

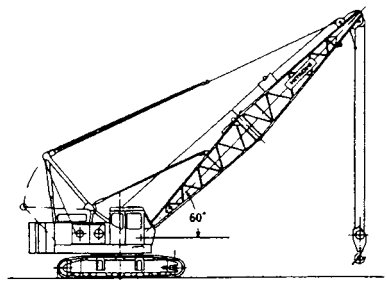
Model	Serial No.	Standard	Guide to Service	Service Limit of Use
KH100D	0101~	37.0~42.1	46.5	48.5
KH125D	0802~	37.0~42.1	46.5	48.5
KH125-3	0601~0727 0801~	42.1~48.6 37.0~42.1	53.5 46.5	56.0 48.5
KH150-3	0803~0852 0853~	46.6~54.5 44.4~51.9	60.0 57.0	62.5 59.5
KH180-3	0703~0807 0808~	48.2~58.1 45.0~58.1	64.0	67.0
KH230-3	0106~	43.7~48.0	53.0	55.0
KH300-3	0216~	Low 84.0~100.0 High 60.6~66.6	Low 110.0 High 73.5	Low 115.0 High 77.0
KH500-3	0201~	Low 116.1~131.4 High 70.0~78.9	Low 144.5 High 87.0	Low 151.0 High 91.0

2.2 HOIST SPEED

Note : The total performance of the hoist driving system including the hydraulic pump and motor is checked by measuring the required time to turn the hoist drum six times. Perform the test on a flat ground.

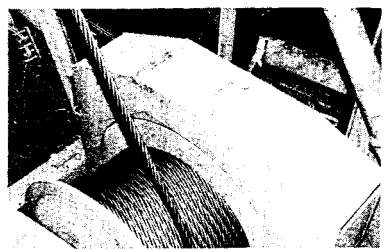
1. Preparation

   (1) Set the boom at 60° and lower the hook as shown in figure.

   (2) Put a mark on the hoist drum.

   (3) Warm up the engine and keep the hydraulic oil temperature at 50 ±5°C (122±41°F).

2. Measurement

   Note : The measurement should be made for each high and low speed of the system.

   (1) Set the engine speed control lever in high idle position and operate the hoist lever fully.

   (2) After hoist speed reached constant speed, measure the time necessary to make the hoist drum six turns.

   (3) Measure the speed in both hoisting and lowering directions.

   (4) Perform the measurement three times to get the average value as the measurement value.

3. Judgement Data

Unit : sec / 6 turn

Model	Serial No.	Standard	Guide to Service	Service Limit of Use
KH100D	0101~	Low 13.1~14.9 High 6.5~7.5	Low 16.5 High 8.0	Low 17.0 High 8.5
KH125D	0802~	Low 13.1~14.9 High 6.5~7.5	Low 16.5 High 8.0	Low 17.0 High 8.5
KH125-3	0601~0701	Low 12.6~13.5 High 6.5~7.5	Low 15.0 High 8.0	Low 15.5 High 8.5
	0801~ (STD Winch)	Low 11.9~13.5 High 5.9~6.8	Low 15.0 High 7.5	Low 15.5 High 8.0
	(HD Wich)	Low 13.1~14.9 High 6.5~7.5	Low 16.5 High 8.0	Low 17.0 High 8.5
KH150-3	0803~0830	Low 12.6~13.5 High 6.5~7.5	Low 15.0 High 8.0	Low 15.5 High 8.5
	0831~ (STD Winch)	Low 11.9~13.5 High 5.9~6.8	Low 15.0 High 7.5	Low 15.5 High 8.0
	(HD Winch)	Low 13.1~14.9 High 6.5~7.5	Low 16.5 High 8.0	Low 17.0 High 8.5
KH180-3	0703~	Low 12.6~13.5 High 6.3~6.7	Low 15.0 High 7.5	Low 15.5 High 8.0
KH230-3	0106~	Low 13.7~15.0 High 6.8~7.5	Low 16.5 High 8.0	Low 17.0 High 8.5
KH300-3	0216~	Low 18.1~20.7 High 9.4~10.3	Low 23.0 High 11.5	Low 24.0 High 12.0
KH500-3	0201~	Low 19.2~21.4 High 9.6~10.7	Low 23.5 High 12.0	Low 24.5 High 12.5

2.3 BOOM HOIST SPEED

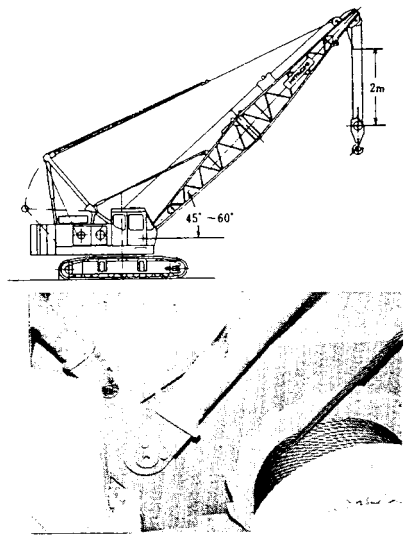
Note : The total performance of the boom hoist driving system including the hydraulic pump and motor is checked by measuring the required time to turn the boom hoist drum six times.
Perform the test on a flat ground.

1. Preparation

(1) Hoist the hook to approximately 2 m (6.6 ft.) point before the hook overhoist prevention device operates.

(2) Put a mark on the boom hoist drum.

(3) Warm up the engine and keep the hydraulic oil temperature at 50 ± 5°C (122 ± 41°F).



2. Measurement

(1) Set the engine speed control lever in high idle position and operate the boom hoist lever fully.

(2) After boom hoist speed reached constant speed begining at a boom angle of 45° in boom hoisting and at a boom angle of 60° in boom lowering, measure the time necessary to make the boom hoist drum six turns.

(3) Measure the speed in both hoisting and lowering directions.

(4) Perform the measurement three times to get the average value as the measurement value.

3. Judgement Data

Unit : sec / 6 turn

Model	Serial No.	Standard	Guide to Service	Service Limit of Use
KH100D	0101~	6.5~7.4	8.0	8.5
KH125D	0802~	6.5~7.4	8.0	8.5
KH125-3	0601~	6.5~7.4	8.0	8.5
KH150-3	0803~	6.5~7.4	8.0	8.5
KH180-3	0703~	6.7~7.4	8.0	8.5
KH230-3	0106~	6.7~7.4	8.0	8.5
KH300-3	0216~	10.6~11.8	13.0	13.5
KH500-3	0201~	9.3~10.1	11.0	11.5

Unit : L (US gal, Imp gal)

	KH100D (1001~)	KH125D (0802~)	KH125-3 (0601~0727)	KH125-3 (0801~)	KH150-3 (0803~0910)	KH150-3 (0911~)
Fuel Tank	250 (66.1, 55.0)	←	←	250 (66.1, 55.0)	←	←
Engine Coolant (engine only)	11.0 (2.91, 2.42)	←	15.0 (3.96, 3.30)	11.0 (2.91, 2.42)	15.0 (3.96, 3.30)	11.0 (2.91, 2.42)
Engine Coolant (radiator)	9.5 (2.51, 2.09)	←	24.0 (3.64, 5.28)	9.5 (2.51, 2.09)	24.0 (3.64, 5.28)	24.0 (3.64, 5.28)
Engine Oil	27.0 (7.13, 5.94)	←	24.0 (6.34, 5.28)	27.0 (7.13, 5.94)	24.0 (6.34, 5.28)	27.0 (7.13, 5.94)
Oil Pan Capacities	20.0 (5.28, 4.40)	←	←	20.0 (5.28, 4.40)	←	←
Pump Transmission	2.7 (0.71, 0.59)	←	←	2.7 (0.71, 0.59)	←	←
Boom Hoist Reduction Device	5.6 (1.48, 1.23)	←	←	5.6 (1.48, 1.23)	←	←
Main / Aux. Hoist Reduction Device	11.5 (3.04, 2.53)	←	←	11.5 (3.04, 2.53)	←	←
Swing Reduction Device	8.7 (2.30, 1.91)	←	4.0 (1.06, 0.88)	8.7 (2.30, 1.91)	*1	*1
Hydraulic Tank	200 (52.8, 44.0)	←	←	200 (52.8, 44.0)	←	←

Note : *1 S/No. 0803~0852 . 8.7 L (2.30 US gal, 1.91 Imp gal)
S/No. 0853~ . . . . 4.0 L (1.06 US gal, 0.88 Imp gal)

Unit : L (US gal, Imp gal)

	KH180-3 (0703~)	KH230-3 (0106~)	KH300-3 (0216~)	KH500-3 (0201~)	Reference
Fuel Tank	250 (66.1, 55.0)	←	440 (116.2, 96.8)	←	Diesel Fuel
Engine Coolant (engine only)	15.0 (3.96, 3.30)	←	30.0 (7.93, 6.60)	32.0 (8.45, 7.04)	Soft Water
Engine Coolant (radiator)	24.0 (3.64, 5.28)	←	27.0 (7.13, 5.94)	18.0 (4.76, 3.96)	
Engine Oil	24.0 (3.64, 5.28)	←	45.0 (11.89, 9.90)	←	Engine Oil (CD Class) Ordinary SAE 30 Hot Region SAE 40 Cold Region SAE 10W
Oil Pan Capacities	20.0 (5.28, 4.40)	←	42.0 (11.10, 9.24)	←	
Pump Transmission	2.7 (0.71, 0.59)	←	←	1.3 (0.34, 0.29)	
Boom Hoist Reduction Device	5.6 (1.48, 1.23)	←	11.5 (3.04, 2.53)	←	
Main / Aux. Hoist Reduction Device	13.0 (3.43, 2.86)	←	14.5 (3.83, 3.19)	15.0 (3.96, 3.30)	
Swing Reduction Device	*2	4.0 (1.06, 0.88)	←	←	
Hydraulic Tank	200 (52.8, 44.0)	←	250 (66.05, 55.0)	←	

Note : *2 S/No. 0703~0807 . 8.7 L (2.30 US gal, 1.91 Imp gal)
S/No. 0808~ .... 4.0 L (1.06 US gal, 0.88 Imp gal)

Unit : Hours

	KH100D (1001~)	KH125D (0802~)	KH125-3 (0601~0727)	KH125-3 (0801~)	KH150-3 (0803~0910)	KH150-3 (0911~)
Hydraulic Oil	1500	←	←	←	←	←
Line Filter	50 (intial only) 500	←	←	←	←	←
Pilot Line Filter	50 (intial only) 500	←	←	←	←	←
Suction Filter	1500 (Cleaning)	←	←	←	←	←
Air Breather Element	1500	←	←	←	←	←
Engine Oil	500	←	50 (intial only) 250	500	50 (intial only) 250	500
Eng. Oil Filter	500	←	50 (intial only) 250	500	50 (intial only) 250	500
Bypass Filter	500	←	-	500	-	500
Pump Transmission	1000	←	←	←	←	←
Boom Hoist Reduction Device	1000	←	←	←	←	←
Main / Aux. Hoist Reduction Device	1000	←	←	←	←	←
Swing Reduction Device	1000	←	←	←	←	←
Travel Reduction Device	1000	←	←	←	←	←
Fuel Filter	500	←	←	←	←	←
Aircleaner Element	250 (Cleaning) *1	←	250 (Cleaning) 1500	250 (Cleaning) *1	250 (Cleaning) 1500	250 (Cleaning) *1

Note : *1 After cleaning 6 times or 1 year.

Unit : Hours

	KH180-3 (0703~)	KH230-3 (0106~)	KH300-3 (0216~)	KH300-3 (0249~)	KH500-3 (0201~)
Hydraulic Oil	1500	←	←	2000	1500
Line Filter	50 (intial only) 500	←	←	←	←
Pilot Line Filter	50 (intial only) 500	←	←	←	←
Drain Filter	-	-	50 (intial only) 500	←	←
Suction Filter	1500 (Cleaning)	←	←	2000 (Cleaning)	1500 (Cleaning)
Air Breather Element	1500	←	←	2000	1500
Engine Oil	50 (intial only) 250	←	50 (intial only) 500	←	←
Eng. Oil Filter	50 (intial only) 250	←	←	←	←
Bypass Filter	-	-	-	-	-
Centrifugal Oil Filter (Cleaning)	-	-	50 (intial only) 500	50 (intial only) 500	-
Pump Transmission	1000	←	1000 (Clamshell) 1500	1000 (Clamshell) 2000	1000
Boom Hoist Reduction Device	1000	←	1000 (Clamshell) 1500	1000 (Clamshell) 2000	1000
Main / Aux. Hoist Reduction Device	1000	←	1000 (Clamshell) 1500	1000 (Clamshell) 2000	1000
Swing Reduction Device	1000	←	1000 (Clamshell) 1500	1000 (Clamshell) 2000	1000
Travel Reduction Device	1000	←	←	2000	1000
Fuel Filter	500	←	←	←	←
Aircleaner Element	250 (Cleaning) 1500	←	←	←	←

Unit : N·m (kgf·m, lbf·ft)

	KH100D (1001~)	KH125D (0802~)	KH125-3 (0601~)	KH150-3 (0803~)	KH180-3 (0703~)	KH230-3 (0106~)	KH300-3 (0216~)	KH500-3 (0201~)
Swing Bearing Mounting Bolt	1177 (120, 868)	←	←	←	←	1618 (165, 1193)	2403 (245, 1772)	2746 (280, 2025)
Bed Mounting Bolt	206 (21, 152)	←	←	←	←	←	←	←
Engine Mounting Bolt	392 (40, 290)	←	*1	*3	206 (21, 152)	←	(F) 206 (21, 152) (R) 540 (55, 398)	(F) 206 (21, 152) (R) 736 (75, 542)
Counter Weight Mounting Bolt	588 (60, 434)	←	←	←	←	←	1128 (115, 832)	←
Hoist Device Mounting Bolt	1177 (120, 868)	←	←	←	←	←	1570 (160, 1157)	←
Hoist Motor Mounting Bolt	265 (27, 195)	←	←	392 (40, 289)	←	←	432 (44, 318)	←
Swing Device Mounting Bolt	206 (21, 152)	←	←	←	←	←	←	265 (27, 195)
Swing Motor Mounting Bolt	294 (30, 217)	←	*2	206 (21, 152)	←	←	←	←
Boom Hoist Drum Mounting Bolt	1177 (120, 868)	←	←	←	←	←	1226 (125, 904)	←
Boom Hoist Motor Mounting Bolt	206 (21, 152)	←	←	←	←	←	432 (44, 318)	←
Cab Mounting Bolt	78.5 (8.0, 57.9)	←	←	←	←	←	206 (21, 152)	←
Pump Transmission Mounting Bolt	49.0 (5.0, 36.2)	←	←	←	←	←	←	98 (10, 72)
Gear Pump, Piping Mounting Bolt	88.3 (9.0, 65.1)	←	←	←	←	←	98.0 (10, 72)	←

Note : *1. S/No. 0601~0727 206N·m (21 kgf·m, 152 lbf·ft)
S/No. 0801~ 392N·m (40 kgf·m, 289 lbf·ft)
*2. S/No. 0601~0727 206N·m (21 kgf·m, 152 lbf·ft)
S/No. 0801~ 294N·m (30 kgf·m, 217 lbf·ft)
*3. S/No. 0803~0910 206N·m (21 kgf·m, 152 lbf·ft)
S/No. 0911~ 392N·m (40 kgf·m, 289 lbf·ft)
(F) : Front (R) : Rear

SECTION 4. PRESSURE MESUREMENT

1. PILOT RELIEF VALVE

Note : Judge the performance of the pilot relief valve in the pilot circuit with the pressure gauge installed in the operator's cab.
When the relief pressure mesured is out of specification, adjust it to the specified value.

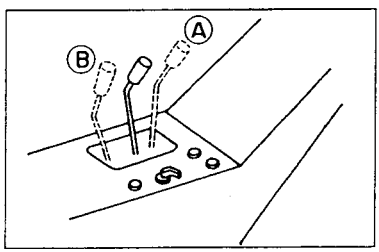
1.1 PREPARATION

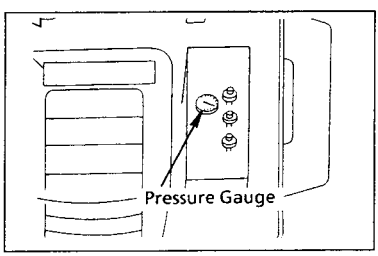
(1) Hydraulic oil temperature should be 50 ± 5°C (122 ± 41°F).

1.2 MEASUREMENT

(1) Run the engine at LOW IDLE (A).
Read the pilot system pressure with the pressure gauge installed in the operator's cab.

(2) Run the engine at HIGH IDLE (B).
Read the pilot system pressure with the pressure gauge installed in the operator's cab.





1.3 JUDGMENT DATA

Unit : bar (kgf/cm², psi)

Engine Speed	Stndard	Guide to Service	Service Limit of Use
Low Idle	41 ~ 47 (42 ~ 48, 597 ~ 683)	Max : 47 (48, 683) Min : 37 (38, 538)	Max : 47 (48, 683) Min : 35 (36, 512)
High Idle	46 ~ 52 (47 ~ 53, 668 ~ 754)	Max : 52 (53, 754) Min : 41 (42, 597)	Max : 52 (53, 754) Min : 39 (40, 569)

1.4 ADJUSTMENT

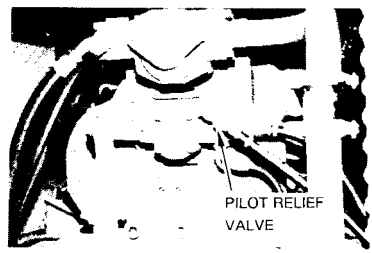
If necessary, adjust the pilot relief valve.

1.4.1 KH100D, KH125D, KH125-3, KH150-3 KH180-3, KH230-3, KH300-3

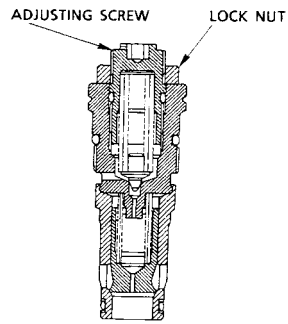
(1) Remove the cap and loosen the lock nut.

(2) Turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.
When the adjusting screw is turned counterclockwise, the set pressure decreases.



(3) After adjusting, tighten the locknut, and install the cap.



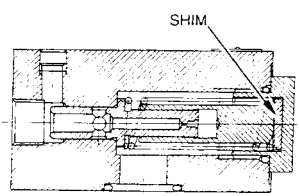
Note : The relation between the number of screw turns and change in set pressure is as shown below.

Unit : bar (kgf/cm^2, psi)

Numbers of turns	Pressure variation
1	Approx. 133 (136, 1934)
3/4	Approx. 100 (102, 1450)
1/2	Approx. 67 (68, 967)
1/4	Approx. 33 (34, 483)

1.4.2 KH500-3

(1) Add adjustment shim to increase the pressure setting or remove shim to decrease the pressure setting.



2. MAIN RELIEF VALVE

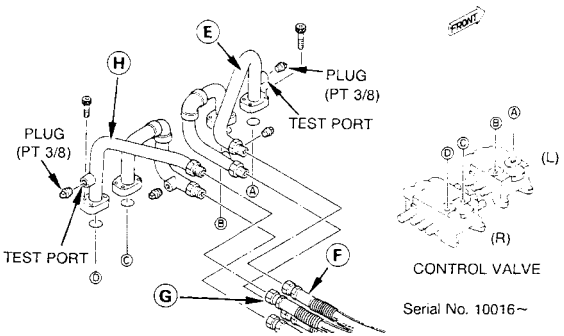
Note : Measure the relief pressure of the main relief valves in the control valves to judge the performance of each relief valve.
When the pressure is out of specification, adjust it to the specified value.

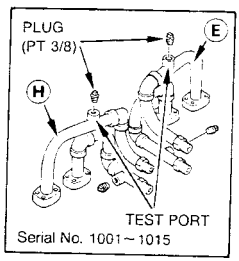
2.1 KH100D (S/No. 1001~)

2.1.1 PREPARATION

Left Control Valve (3-Spools)

(1) Disconnect the horse (F) from Pipe (E), and install plugs to each horse and pipe disconnected.





(2) Remove the plug (PT3/8) from the pipe (E) for left travelling.

(3) Install pressure gauge assembly to the test port of the pipe (E).

(4) Run the engine until it is at normal operating temperature.

Right Control Valve (4-Spools)

(1) Disconnect the horse (G) from Pipe (H), and install plugs to each horse and pipe disconnected.

(2) Remove the plug (PT3/8) from the pipe (H) for right travelling.

(3) Install pressure gauge assembly to the test port of the pipe (H).

(4) Run the engine until it is at normal operating temperature.

2.1.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate the left or right travel lever to full sroke slowly.

(3) Read the relief pressure.

2.1.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

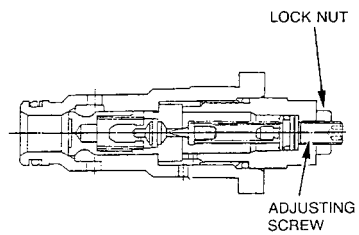
	Standard	Guide to Service	Service Limit of Use
KH100D	275 ± 5 (280 ± 5, 3980 ± 71)	Max : 280 (285, 4053) Min : 245 (250, 3555)	Max : 280 (285, 4053) Min : 230 (235, 3342)

2.1.4 ADJUSTMENT

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.



(3) After adjusting, tighten the locknut, and install the cap.

Note : The relation between the number of screw turns and pressure variation is as shown right.

Unit : bar (kgf/cm^2, psi)

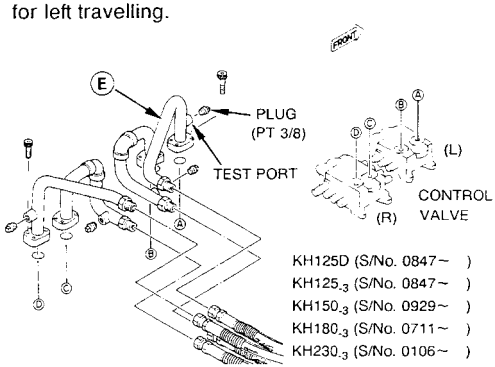
Numbers of turns	Pressure variation
1	Approx. 102 (104, 1480)
3/4	Approx. 77 (78, 1110)
1/2	Approx. 51 (52, 740)
1/4	Approx. 25 (26, 370)

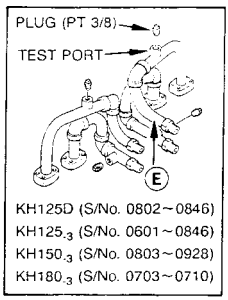
2.2 KH125D (S/No. 0802~) KH125-3 (S/No. 0601~)
KH150-3 (S/No. 0803~) KH180-3 (S/No. 0703~)
KH230-3 (S/No. 0106~)

2.2.1 LEFT CONTROL VALVE (3-Spools)

1. Preparation

(1) Remove the plug (PT3/8) from the pipe (E) for left travelling.





(2) Install pressure gauge assembly to the test port of the pipe (E).

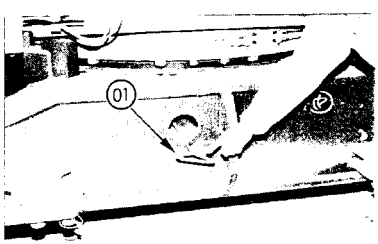
(3) Start the engine and make sure that no oil leaks from the pressure gauge attaching part.

(4) Run the engine until it is at normal operating temperature.

2. Measurement

(1) Run the engine at high idle.

(2) Pull the lever (01) of the track gauge control valve for side frame extending/retracting cylinder.



(3) After change the circuit, operate the left travel lever to forward.

(4) Read the relief pressure.

PRESSURE MEASUREMENT

3. Judgment data

Unit : bar (kgf/cm^2, psi)

Model	Standard	Guide to Service	Service Limit of Use
KH125D KH125-3 KH150-3	275 ± 5 (280 ± 5, 3980 ± 71)	Max : 280 (285, 4053) Min : 245 (250, 3555)	Max : 280 (285, 4053) Min : 235 (240, 3413)

Unit : bar (kgf/cm^2, psi)

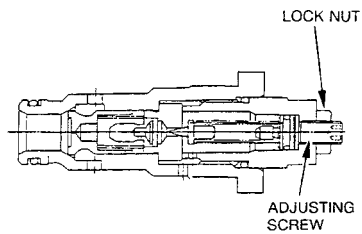
Model	Standard	Guide to Service	Service Limit of Use
KH180-3 KH230-3	295 ± 5 (300 ± 5, 4266 ± 71)	Max : 300 (305, 4337) Min : 260 (265, 3768)	Max : 300 (305, 4337) Min : 245 (250, 3555)

4. Adjustment

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.



(3) After adjusting, tighten the locknut, and install the cap.

Note : The relation between the number of screw turns and pressure variation is as shown right.

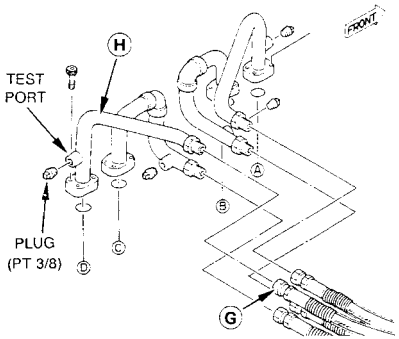
Unit : bar (kgf/cm^2, psi)

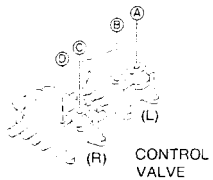
Numbers of turns	Pressure variation
1	Approx. 102 (104, 1480)
3/4	Approx. 77 (78, 1110)
1/2	Approx. 51 (52, 740)
1/4	Approx. 25 (26, 370)

2.2.2 RIGHT CONTROL VALVE (4-Spools)

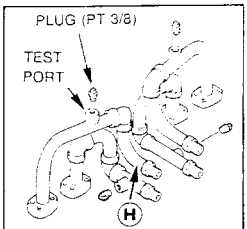
1. Preparation

(1) Disconnect the horse (G) from pipe (H), and install plugs to each horse and pipe disconnected.





KH125D (S/No. 0847~)
KH125-3 (S/No. 0847~)
KH150-3 (S/No. 0929~)
KH180-3 (S/No. 0711~)
KH230-3 (S/No. 0106~)



KH125D (S/No. 0802~0846)
KH125-3 (S/No. 0601~0846)
KH150-3 (S/No. 0803~0928)
KH180-3 (S/No. 0703~0710)

(2) Remove the plug (PT 3/8) from the pipe (H) for right travelling.

(3) Install the pressure gauge assembly to the test port of pipe (H).

(4) Start the engine and make sure that no oil leaks from the pressure gauge attaching part.

(5) Run the engine until it is at normal operating temperature.

2. Measurement

(1) Run the engine at high idle.

(2) Operate the right travel lever to full stroke slowly.

(3) Read the relief pressure.

3. Judgment data

Unit : bar (kgf/cm^2, psi)

Model	Standard	Guide to Service	Service Limit of Use
KH125D KH125-3 KH150-3	275 ± 5 (280 ± 5, 3980 ± 71)	Max : 280 (285, 4053) Min : 245 (250, 3555)	Max : 280 (285, 4053) Min : 235 (240, 3413)

Unit : bar (kgf/cm^2, psi)

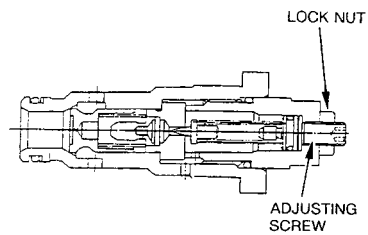
Model	Standard	Guide to Service	Service Limit of Use
KH180-3 KH230-3	295 ± 5 (300 ± 5, 4266 ± 71)	Max : 300 (305, 4337) Min : 260 (265, 3768)	Max : 300 (305, 4337) Min : 245 (250, 3555)

4. Adjustment

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.



(3) After adjusting, tighten the lock nut, and install the cap.

Note : The relation between the number of screw turns and pressure variation is as shown right.

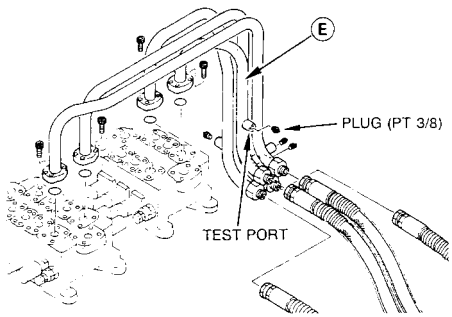
Unit : bar (kgf/cm^2, psi)

Numbers of turns	Pressure variation
1	Approx. 102 (104, 1480)
3/4	Approx. 77 (78, 1110)
1/2	Approx. 51 (52, 740)
1/4	Approx. 25 (26, 370)

2.3.1 LEFT CONTROL VALVE (3-Spools)

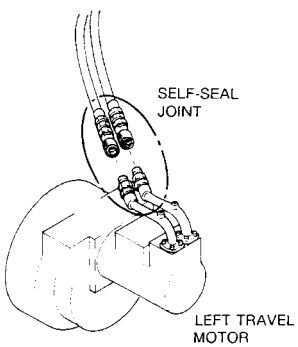
1. Preparation

(1) Remove plug (PT 3/8) from pipe (E) for left travelling.

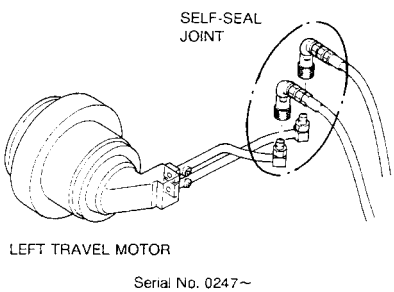


(2) Install the pressure gauge assembly to the test port of pipe (E).

(3) Remove self-seal joints for left travel circuit.



Serial No. 0216~0246



Serial No. 0247~

(4) Run the engine until it is at normal operating temperature.

2. Measurement

(1) Run the engine at high idle.

(2) Operate the left travel lever to "FORWARD" and full stroke slowly.

(3) Read the relief pressure.

3. Judgment data

Unit : bar (kgf/cm^2, psi)

	Standard	Guide to Service	Service Limit of Use
KH300-3	275 ± 5 (280 ± 5, 3980 ± 71)	Max : 280 (285, 4053) Min : 245 (250, 3555)	Max : 280 (285, 4053) Min : 230 (235, 3342)

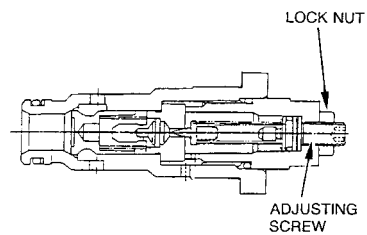
4. Adjustment

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.

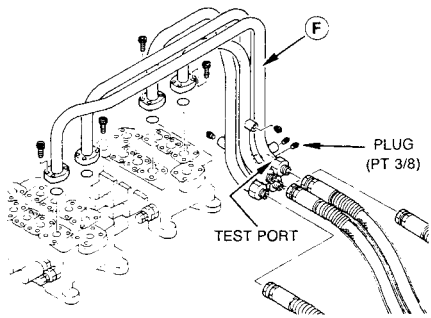
(3) After adjusting, tighten the lock nut, and install the cap.



2.3.2 RIGHT CONTROL VALVE (4-Spools)

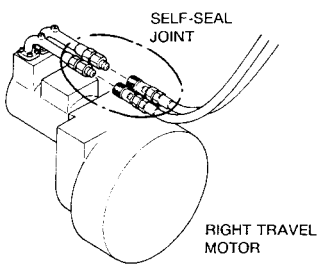
1. Preparation

(1) Remove plug (PT 3/8) from pipe (F) for right travelling.

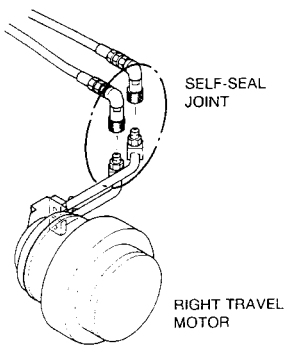


(2) Install the pressure gauge assembly to the test port of pipe (F).

(3) Remove self-seal joints for right travel circuit.



Serial No. 0216~0246



Srial No. 0247~

(4) Run the engine until it is at normal operating temperature.

2. Measurement

(1) Run the engine at high idle.

(2) Operate the left travel lever to "FORWARD" and full stroke slowly.

(3) Read the relief pressure.

3. Judgment data

Unit : bar (kgf/cm^2, psi)

	Standard	Guide to Service	Service Limit of Use
KH300-3	275 ± 5 (280 ± 5, 3980 ± 71)	Max : 280 (285, 4053) Min : 245 (250, 3555)	Max : 280 (285, 4053) Min : 230 (235, 3342)

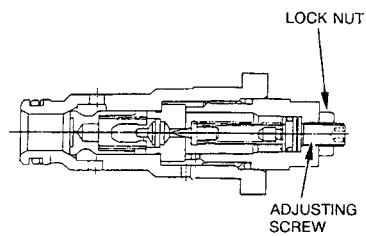
4. Adjustment

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.

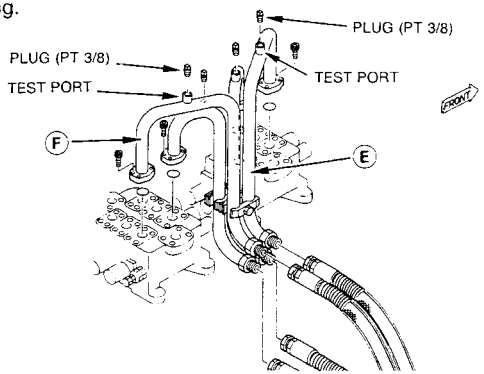
(3) After adjusting, tighten the lock nut, and install the cap.



2.4.1 PREPARATION

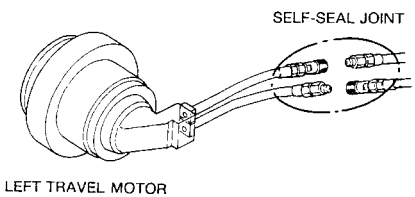
1. Left Control Valve [Main hoist, Travel (R)]

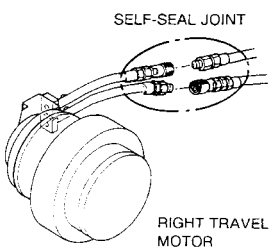
(1) Remove plug (PT 3/8) from pipe (E) for right travelling.



(2) Install the pressure gauge assembly to the test port of pipe (E).

(3) Remove self-seal joints for right travel circuit.





(4) Run the engine until it is at normal operating temperature.

2. Right Control Valve (Aux. hoist, Travel (L), Boom hoist)

(1) Remove plug (PT 3/8) from pipe (F) for left travelling.

(2) Install the pressure gauge assembly to the test port of pipe (F).

(3) Remove self-seal joints for left travel circuit.

(4) Run the engine until it is at normal operating temperature.

2.4.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate the left or right travel lever to full stroke slowly.

(3) Read the relief pressure.

2.4.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

	Standard	Guide to Service	Service Limit of Use
KH500-3	305 ± 5 (310 ± 5, 4410 ± 71)	Max : 310 (315,4480) Min : 270 (275, 3910)	Max : 310 (315, 4480) Min : 255 (260, 3700)

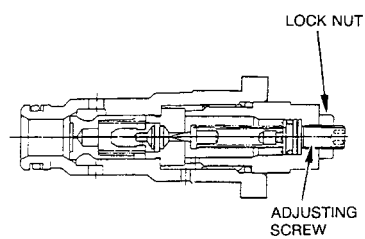
2.4.4 ADJUSTMENT

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.

(3) After adjusting, tighten the lock nut, and install the cap.



3. SWING CIRCUIT RELIEF VALVE

Note : Measure the pressure of the relief valve built in the swing control valve to judge the performance of the relief valve.
When the pressure is out of specification, adjust it to the specified value.

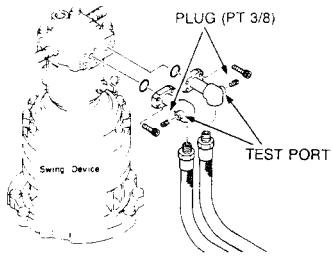
3.1 KH100D (S/No. 1001~) KH125D (S/No. 0802~)
KH125-3 (S/No. 0601~) KH150-3 (S/No. 0803~)
KH180-3 (S/No. 0703~) KH230-3 (S/No. 0106~)

3.1.1 PREPARATION

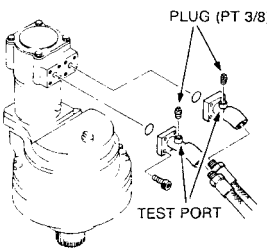
(1) Remove plug (PT 3/8) from the pipe.

(2) Install the pressure gauge assembly to the test port.

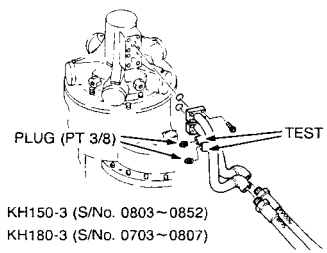
(3) Run the engine and make sure that no oil leaks from the gauge attaching part.



KH100D (S/No. 1001~)
KH125D (S/No. 0802~)
KH125-3 (S/No. 0801~)



KH125-3 (SNo. 0601~0727)
KH150-3 (S/No. 0853~)
KH180-3 (S/No. 0808~)
KH230-3 (S/No. 0106~)



KH150-3 (S/No. 0803~0852)
KH180-3 (S/No. 0703~0807)

3.1.2 MEASUREMENT

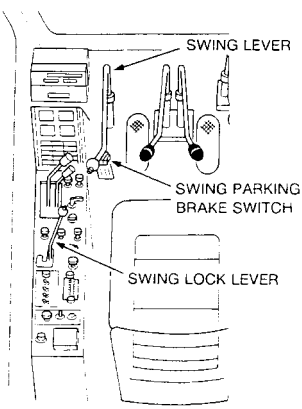
(1) Run the engine at high idle.

(2) Apply swing lock by the swing lock lever.

(3) Set the swing parking brake switch "ON" position.

(4) Operate the swing lever to the left or right slowly.

(5) Read the relief pressure.



3.1.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH100D (1001~) KH125D (0802~) KH125-3 (0801~) KH180-3 (0808~) KH230-3 (0106~)	206 ± 5 (210 ± 5, 2990 ± 71)	Max : 210 (215, 3060) Min : 181 (185, 2630)	Max : 210 (215, 3060) Min : 172 (175, 2490)
KH125-3 (0601~0727) KH150-3 (0803~)	181 ± 5 (185 ± 5, 2630 ± 71)	Max : 186 (190, 2660) Min : 168 (170, 2432)	Max : 186 (190, 2660) Min : 150 (154, 2190)
KH180-3 (0703~0807)	196 ± 5 (200 ± 5, 2844 ± 71)	Max : 201 (205, 2915) Min : 172 (175, 2489)	Max : 201 (205, 2915) Min : 155 (158, 2247)

3.1.4 ADJUSTMENT

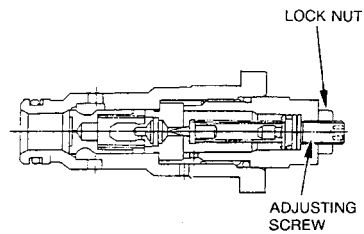
If necessary, adjust the relief valve of swing control valve.

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.

(3) After adjusting, tighten the lock nut, and install the cap.



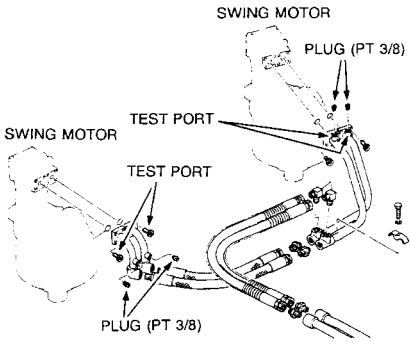
3.2 KH300-3 (S/No. 0216~)
KH500-3 (S/No. 0201~)

3.2.1 PREPARATION

(1) Remove plug (PT 3/8) from the pipe.

(2) Install the pressure gauge assembly to the test port.

(3) Run the engine and make sure that no oil leaks from the gauge attaching part.



3.2.2 MEASUREMENT

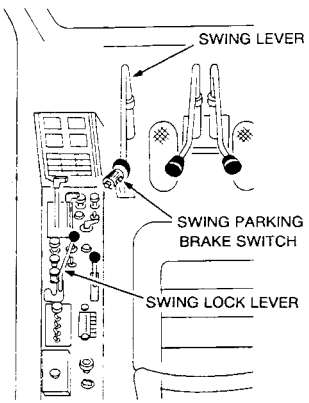
(1) Run the engine at high idle.

(2) Apply swing lock by the swing lock lever.

(3) Set the swing parking brake switch "ON" position.

(4) Operate the swing lever to the left or right slowly.

(5) Read the relief pressure.



3.2.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH300-3 (0216~) KH500-3 (0201~)	181 ± 5 (185 ± 5, 2630 ± 71)	Max : 186 (190, 2660) Min : 168 (170, 2432)	Max : 186 (190, 2660) Min : 150 (154, 2190)

3.2.4 ADJUSTMENT

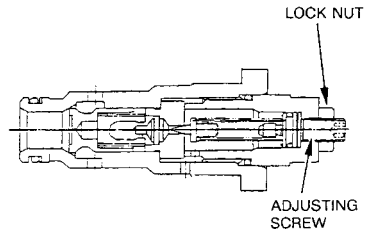
If necessary, adjust the relief valve of swing control valve.

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

Note : When the adjusting screw is turned clockwise, the set pressure increases.

(3) After adjusting, tighten the lock nut, and install the cap.



4. BOOM HOIST CIRCUIT RELIEF VALVE

Note : · Measure the relief pressure in the boom lowering circuit between the control valve and boom hoist motor to judge the performance of the relief valve in the counterbalance valve.
· When that the pressure is out of specification, adjust it to the specified value.
· The relief pressure of the relief valve in the boom hoist circuit, built in the counterbalance valve, cannot be measured with the counterbalance valve installed in the machine. If necessary, remove the counterbalance valve and measure the relief valve.

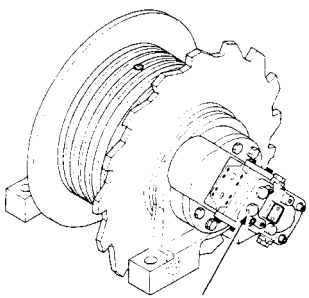
4.1 KH100D (S/No. 1001~) KH125D (S/No. 0802~)
KH125-3 (S/No. 0601~) KH150-3 (S/No. 0803~)
KH180-3 (S/No. 0703~) KH230-3 (S/No. 0106~)

4.1.1 PREPARATION

(1) Remove plug (PT 1/8) from the counterbalance valve.

(2) Install the pressure gauge assembly to the test port.

(3) Run the engine and make sure that no oil leaks from the gauge attaching part.



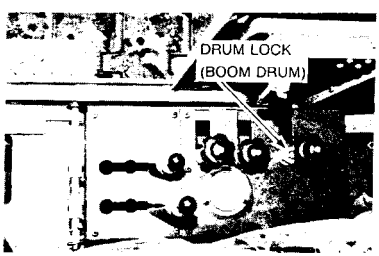
4.1.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Apply the drum lock for boom lowering by the drum lock lever.

(2) Operate the boom hoist lever to "LOWERING" position slowly

(3) Read the relief pressure.



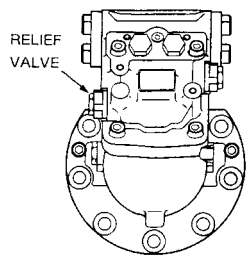
4.1.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH100D (1001~) KH125D (0802~) KH125-3 (0601~) KH150-3 (0803~) KH180-3 (0703~) KH230-3 (0106~)	157 ± 5 (160 ± 5, 2275 ± 71)	Max : 162 (165, 2346) Min : 144 (147, 2090)	Max : 162 (165, 2346) Min : 130 (132, 1877)

4.1.4 ADJUSTMENT

If necessary, adjust the relief valve in the counterbalance valve.



(1) Loosen the lock nut and turn the adjusting screw.

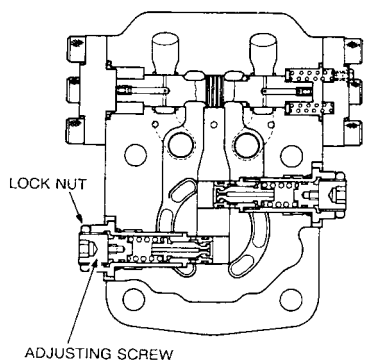
Note : When the adjusting screw is turned clockwise, the set pressure increases.

(2) After adjusting, tighten the lock nut.

Note : The relation between the number of screw turns and change in set pressure is as shown below.

Unit : bar (kgf/cm^2, psi)

Numbers of turns	Pressure variation
1/2	Approx. 49~59 (50~60, 711~853)
1/4	Approx. 24.5~29 (25~30, 356~427)



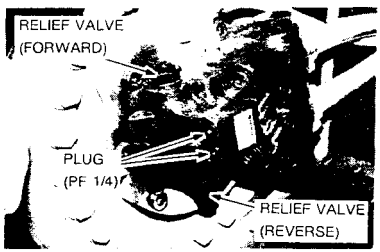
5. TRAVEL CIRCUIT RELIEF VALVE

Note : · Measure the relief pressure of the relief valve built in the travel brake valve to judge the performance of the relief valve.
· Measure on the left and right sides and in the forward and reverse direction.

5.1 KH100D (S/No. 1001~) KH125D (S/No. 0802~) KH125-3 (S/No. 0801~)

5.1.1 PREPARATION

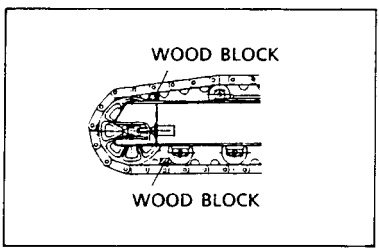
(1) Remove plug (PF 1/4) and install the pressure from the travel motor.
Gauge assembly to the test port.



(Left Travel Motor)

(2) Turn adjusting screw of the main relief valve approximately 1/2 turn clockwise to increase the pressure setting of the main relief valve.

(3) Insert the wood blocks between front idler and lower roller.



5.1.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate and hold either left or right travel lever full stroke slowly.

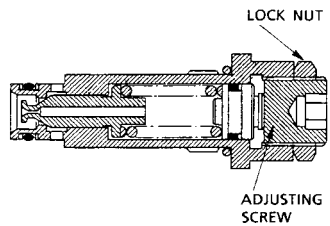
(3) Read the relief pressure.

5.1.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH100D (1001~) KH125D (0802~) KH125-3 (0801~)	127^{+10}_{-0} (330^{+10}_{-0}, 4693^{+142}_{-0})	Max : 333 (340, 4835) Min : 308 (314, 4465)	Max : 333 (340, 4835) Min : 278 (283, 4024)

5.1.4 ADJUSTMENT



(1) Loosen the lock nut and turn the adjusting screw.

Note : The top relief valve is for forward operation. The bottom relief valve is for reverse operation. Make sure its relief set pressure again after adjusting.

(2) After adjusting, tighten the lock nut to 49 N·m (5.0 kgf·m, 36 lbf·ft)

Note : The relation between the number of screw turns and change in set pressure is as shown below.

Unit : bar (kgf/cm^2, psi)

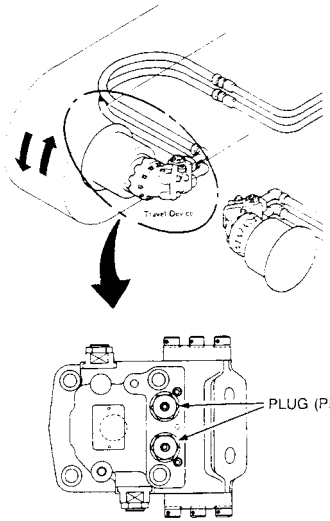
Numbers of turns	Pressure variation
1/2	Approx. 49~59 (50~60, 711~853)
1/4	Approx. 24.5~29 (25~30, 356~427)

Important : After repair or adjustment of the travel relief valve, the main relief valve must be adjusted to its normal setting. If not, hydraulic components can be damaged.

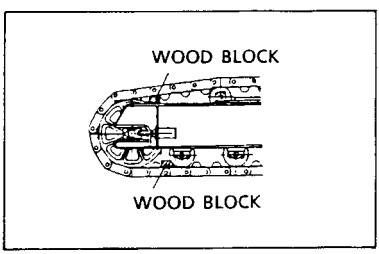
5.2 KH125-3 (S/No. 0601~0727)
KH150-3 (S/No. 0803~)

5.2.1 PREPARATION

(1) Remove plug (PF 1/8) and install the pressure gauge assembly to the test port of the travel motor.



(2) Insert the wood blocks between front idler and lower roller.



5.2.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate and hold either left or right travel lever full stroke slowly.

(3) Read the relief pressure.

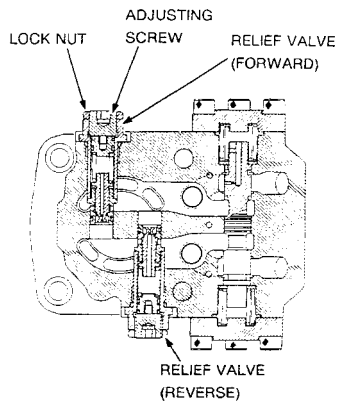
5.2.3 JUDGMENT DATA

Unit : bar (kgf/cm², psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH125-3 (0601~0727) KH150-3 (0803~)	265 ± 5 (270 ± 5, 3840 ± 71)	Max : 270 (275, 3910) Min : 247 (252, 3583)	Max : 270 (275, 3910) Min : 223 (227, 3228)

5.2.4 ADJUSTMENT

If necessary, adjust the relief valve in the counterbalance valve.



(1) Loosen the lock nut and turn the adjusting screw.

Note : The top relief valve is for forward operation. The bottom relief valve is for reverse operation. Make sure its relief set pressure again after adjusting.

(2) After adjusting, tighten the lock nut.

Note : The relation between the number of screw turns and change in set pressure is as shown below.

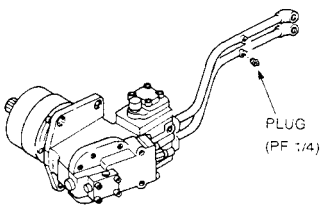
Unit : bar (kgf/cm², psi)

Numbers of turns	Pressure variation
1/2	Approx. 49~59 (50~60, 711~853)
1/4	Approx. 24.5~29 (25~30, 356~427)

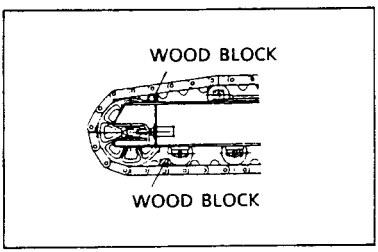
5.3 KH180-3 (S/No. 0703~)
KH230-3 (S/No. 0106~)

5.3.1 PREPARATION

(1) Remove plug (PF 1/4) and install the pressure gauge assembly to the pipes for travelling.



(2) Insert the wood blocks between the front idler and lower roller.



5.3.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate and hold either left or right travel lever full stroke slowly.

(3) Read the relief pressure.

5.3.3 JUDGMENT DATA

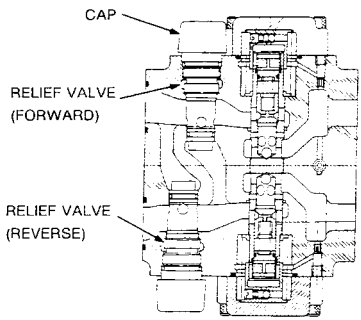
Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH180-3 (0703~) KH230-3 (0106~)	280 ± 5 (285 ± 5, 4053 ± 71)	Max : 284 (290, 4124) Min : 261 (266, 3783)	Max : 284 (290, 4124) Min : 235 (240, 3413)

5.3.4 ADJUSTMENT

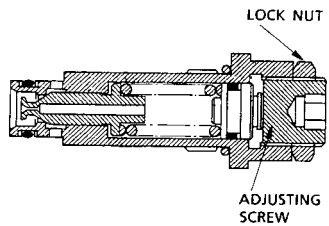
If necessary, adjust the relief valve in the brake valve.

(1) Remove the cap.



(2) Loosen the lock nut and turn the adjusting screw.

Note : The top relief valve is for forward operation. The bottom relief valve is for reverse operation. Make sure its relief set pressure again after adjusting.

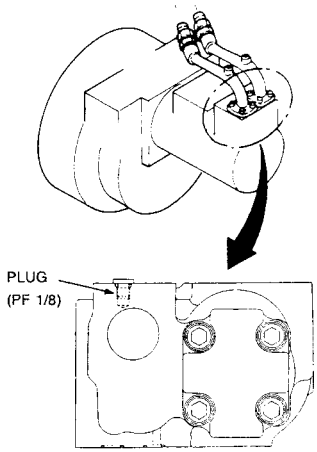


(2) After adjusting, tighten the lock nut and install the cap.

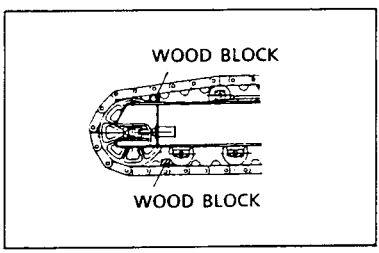
5.4.1 PREPARATION

4.1.1 KH300-3 (S/No.0216~0246)

(1) Remove plug (PF 1/8) and install the pressure gauge assembly to the brake valve.

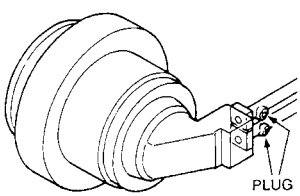


(2) Insert the wood blocks between the front idler and lower roller.



4.1.2 KH300-3 (S/No.0247~)

(1) Remove the plug and install the pressure gauge assembly to the pipes for travelling.



(2) Turn the adjusting screw of the main relief valve approximately 1/8 turn clockwise to increase the pressure setting of the main relief valve.

(3) Insert the wood blocks between the front idler and lower roller.

5.4.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate and hold either left or right travel lever full stroke slowly.

(3) Read the relief pressure.

5.4.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH300-$_3$ (0216~0246)	245 ± 5 (250 ± 5, 3555 ± 71)	Max : 250 (255, 3626) Min : 229 (233, 3313)	Max : 250 (255, 3626) Min : 206 (210, 2986)
KH300-$_3$ (0247~)	294 ± 10 (300 ± 10, 4266 ± 142)	Max : 304 (310, 4408) Min : 270 (276, 3925)	Max : 304 (310, 4408) Min : 243 (248, 3527)

5.4.4 ADJUSTMENT

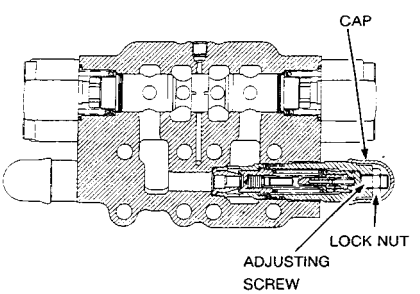
If necessary, adjust the relief valve in the brake valve.

1. KH300-$_3$ (S/No. 0216~0246)

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

(2) After adjusting, tighten the lock nut and install the cap.

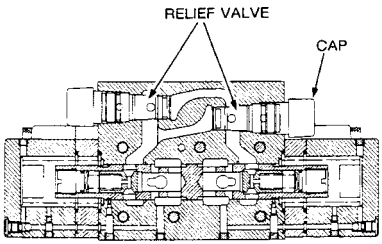


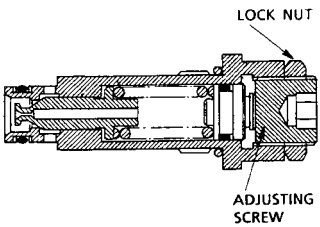
2. KH300-3 (S/No. 0247~)

(1) Remove the cap.

(2) Loosen the lock nut and turn the adjusting screw.

(2) After adjusting, tighten the lock nut and install the cap.

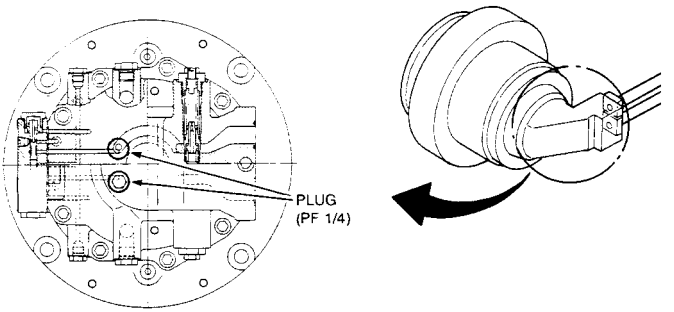




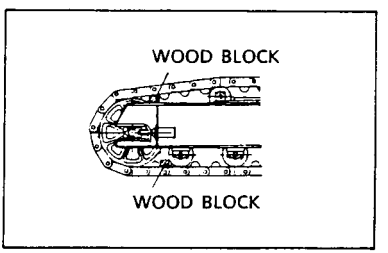
Important : **After repair or adjustment of the travel relief valve, the main relief valve must be adjusted to its normal setting. If not, hydraulic components can be damaged.**

5.5.1 PREPARATION

(1) Remove plug (PF 1/4) and install the pressure gauge assembly to the brake valve.



(2) Insert the wood blocks between the front idler and lower roller.



5.5.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate and hold either left or right travel lever full stroke slowly.

(3) Read the relief pressure.

5.5.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH500-3 (0201 ~)	294 ± 5 (300 ± 5, 4266 ± 71)	Max : 299 (305, 4337) Min : 275 (280, 3982)	Max : 299 (305, 4337) Min : 247 (252, 3583)

5.5.4 ADJUSTMENT

If necessary, adjust the relief valve in the brake valve.

(1) Loosen the lock nut and turn the adjusting screw.

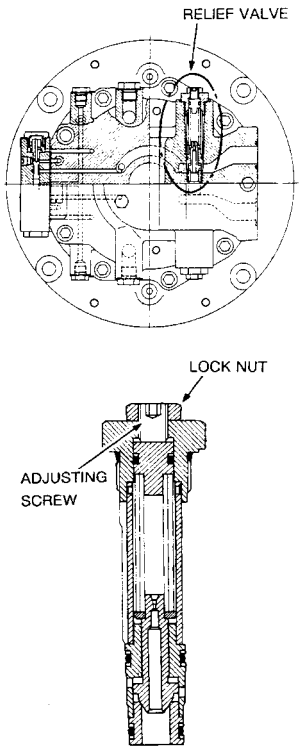
Note : When the adjusting screw is turned clockwise, the set pressure increases.

(2) After adjusting, tighten the lock nut .

Note : The relation between the number of screw turns and pressure variation is as shown below.

Unit : bar (kgf/cm^2, psi)

Numbers of turns	Pressure variation
1	Approx. 78.5 (80, 1138)
3/4	Approx. 59 (60, 853)
1/2	Approx. 39 (40, 569)
1/4	Approx. 19 (20, 285)

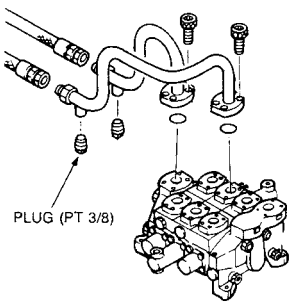


6. JACK CIRCUIT RELIEF VALVE

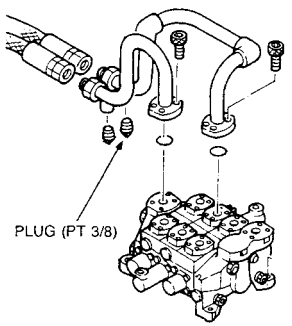
6.1 KH300-3 (S/No. 0216~) KH500-3 (S/No. 0201~)

6.1.1 PREPARATION

(1) Remove plug (PT 3/8) and install the pressure gauge assembly to the test port.

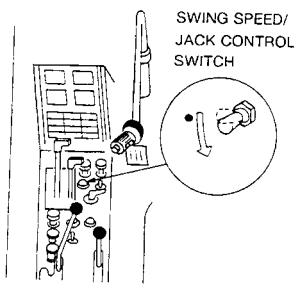


KH300-3 (S/No.0216~)



KH500-3 (S/No.0201~)

(2) Turn the swing speed and jack control switch to JACK CONTROL position.



6.1.2 MEASUREMENT

(1) Run the engine at high idle.

(2) Operate the jack up lever to full stroke slowly.

(3) Read the relief pressure.

6.1.3 JUDGMENT DATA

Unit : bar (kgf/cm^2, psi)

Model (Serial No.)	Standard	Guide to Service	Service Limit of Use
KH300-3 (0216~) KH500-3 (0201~)	196 ± 5 (200 ± 5, 2844 ± 71)	Max : 201 (205, 2915) Min : 181 (185, 2630)	Max : 201 (205, 2915) Min : 164 (167, 2375)

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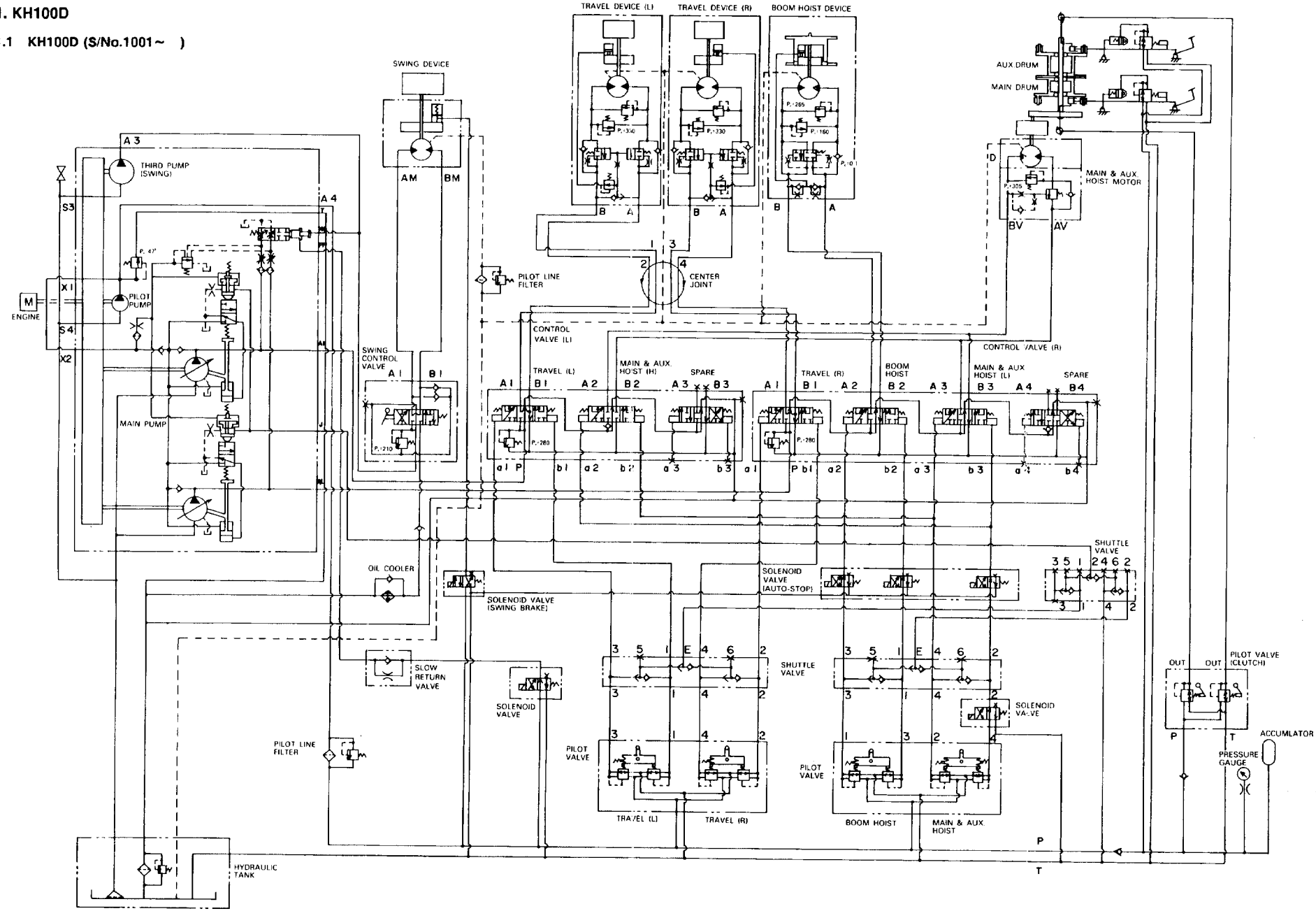
SECTION 5. HYDRAULIC CIRCUIT

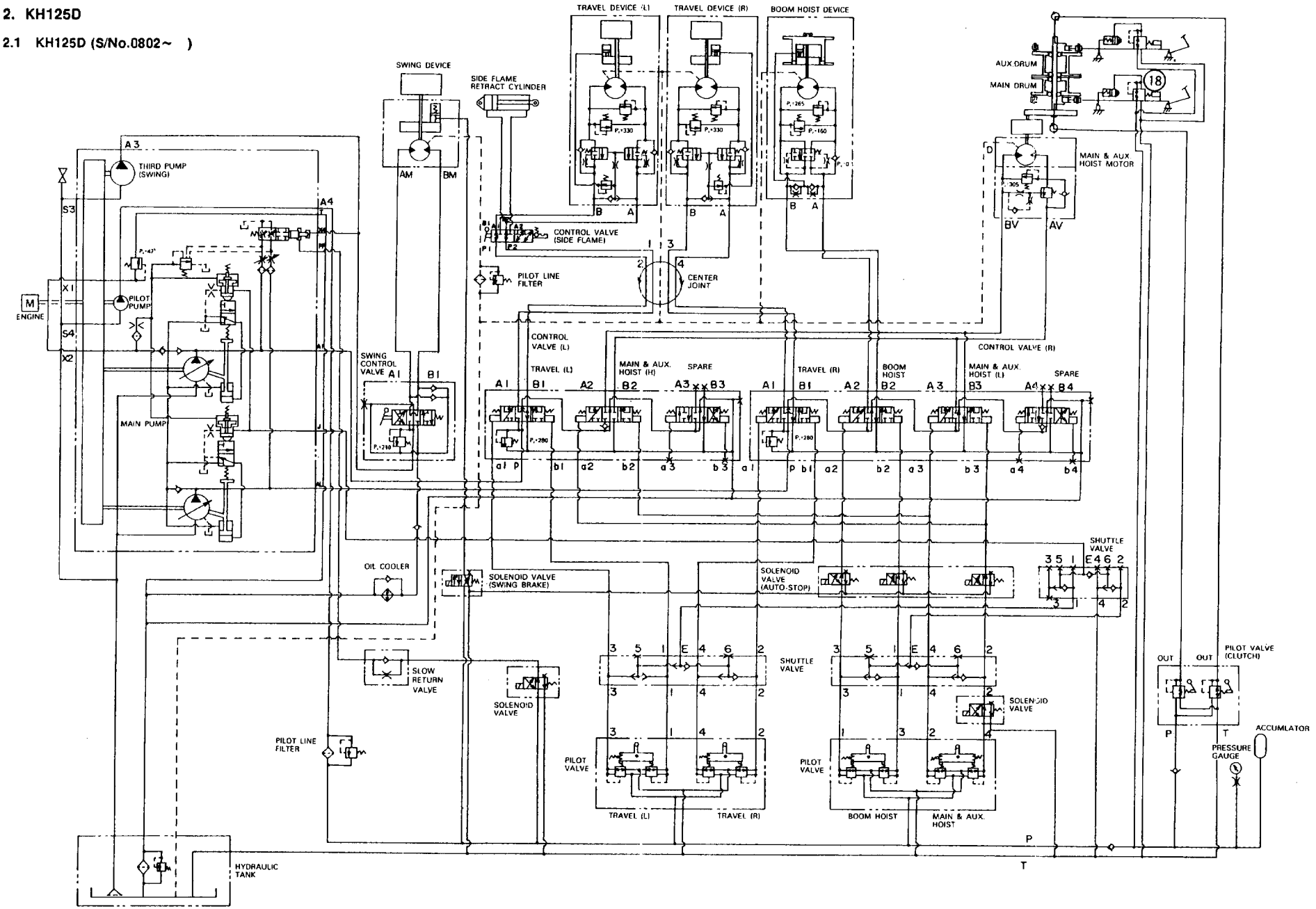
1. KH100D

1.1 KH100D (S/No.1001~)



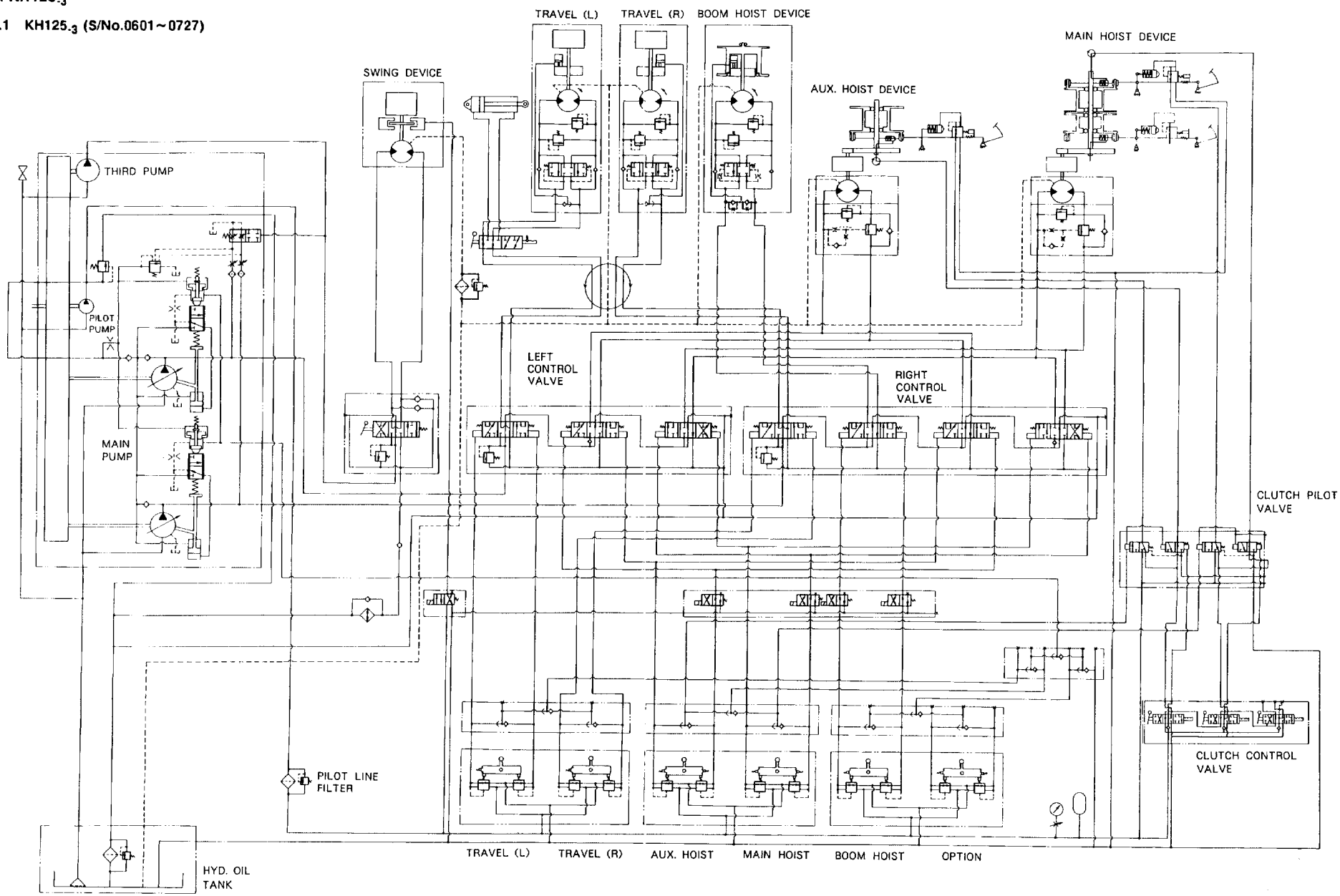
2. KH125D

2.1 KH125D (S/No.0802~)

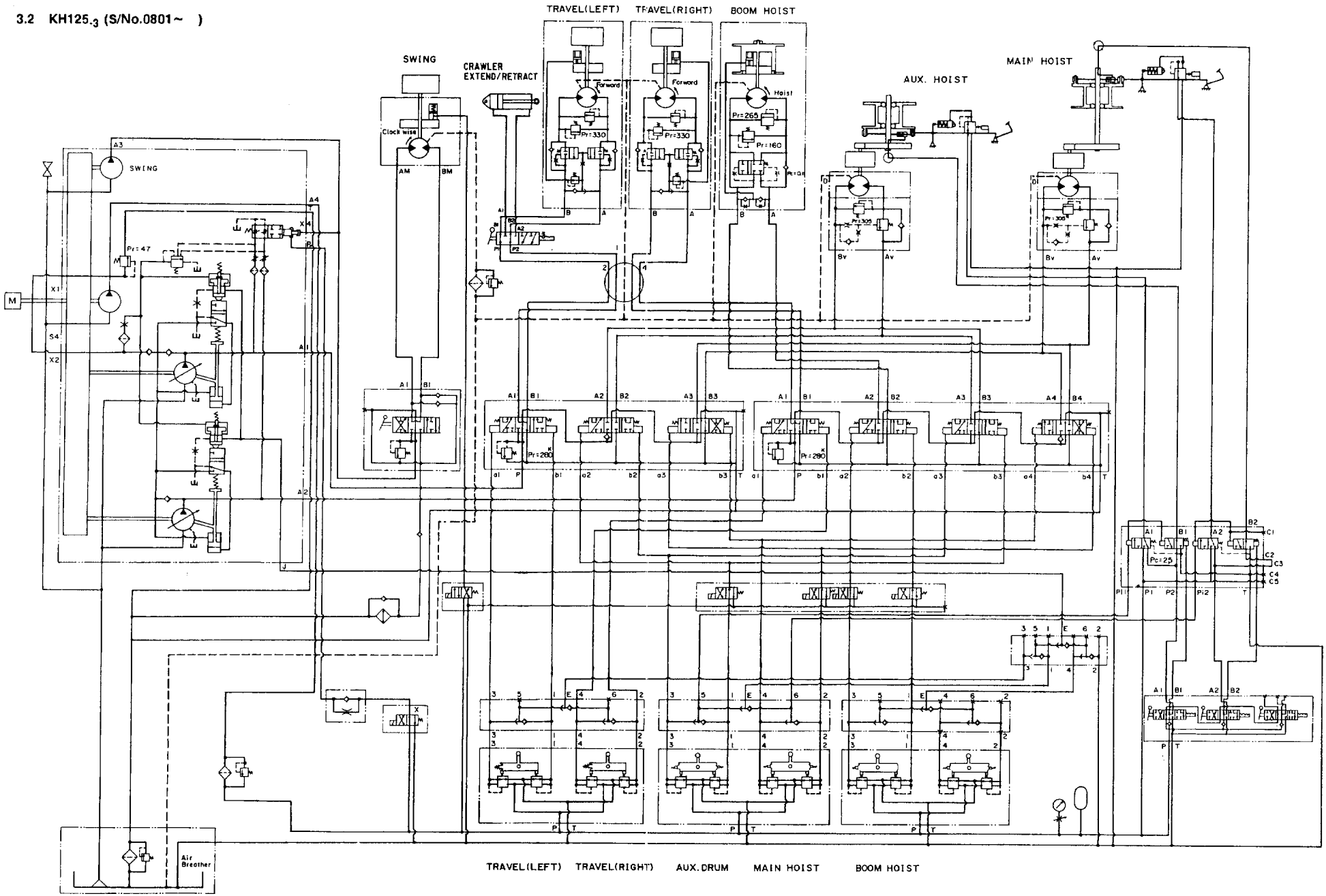


3. KH125$_3$

3.1 KH125$_3$ (S/No.0601~0727)

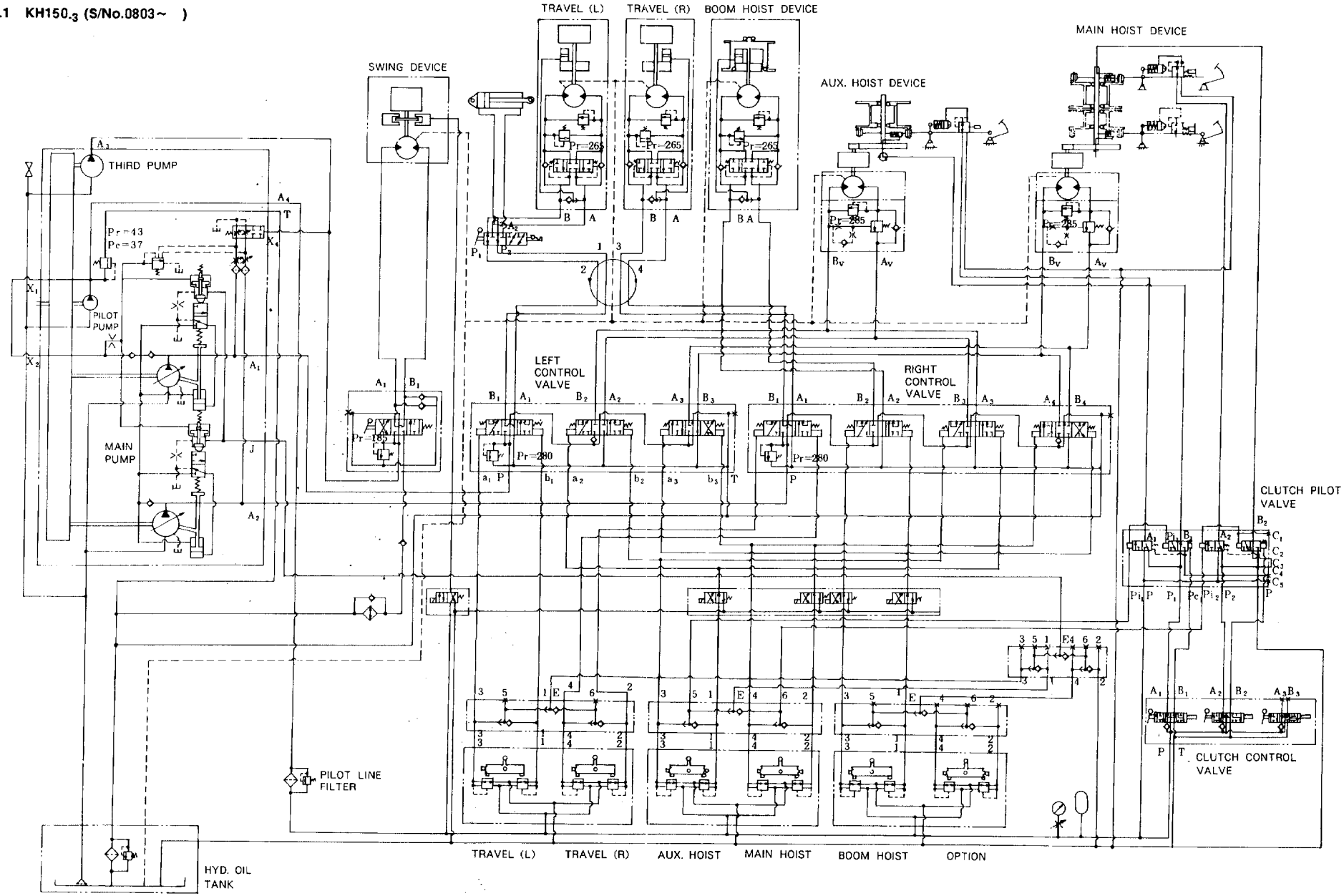


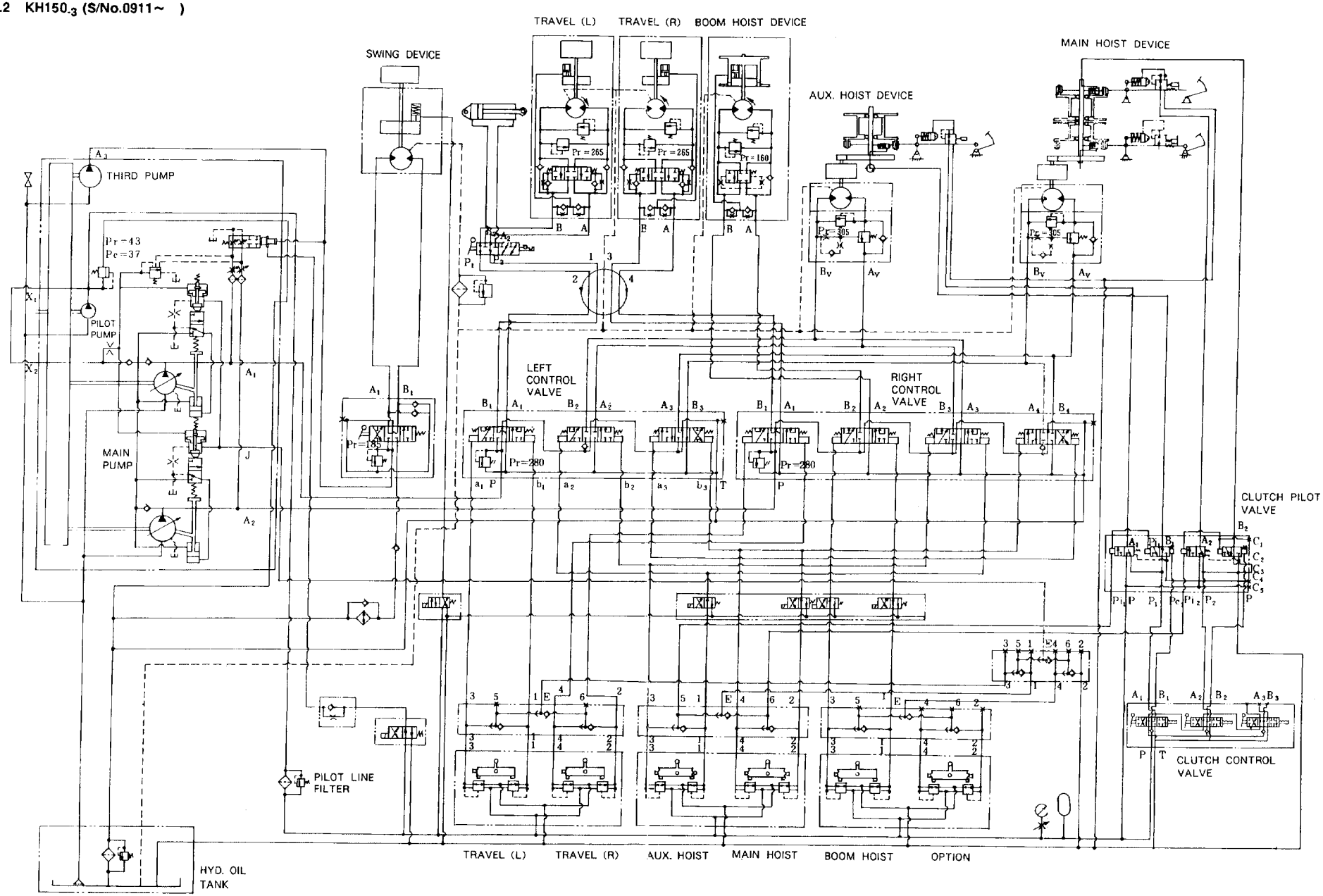
3.2 KH125.3 (S/No.0801~)



4. KH150$_3$

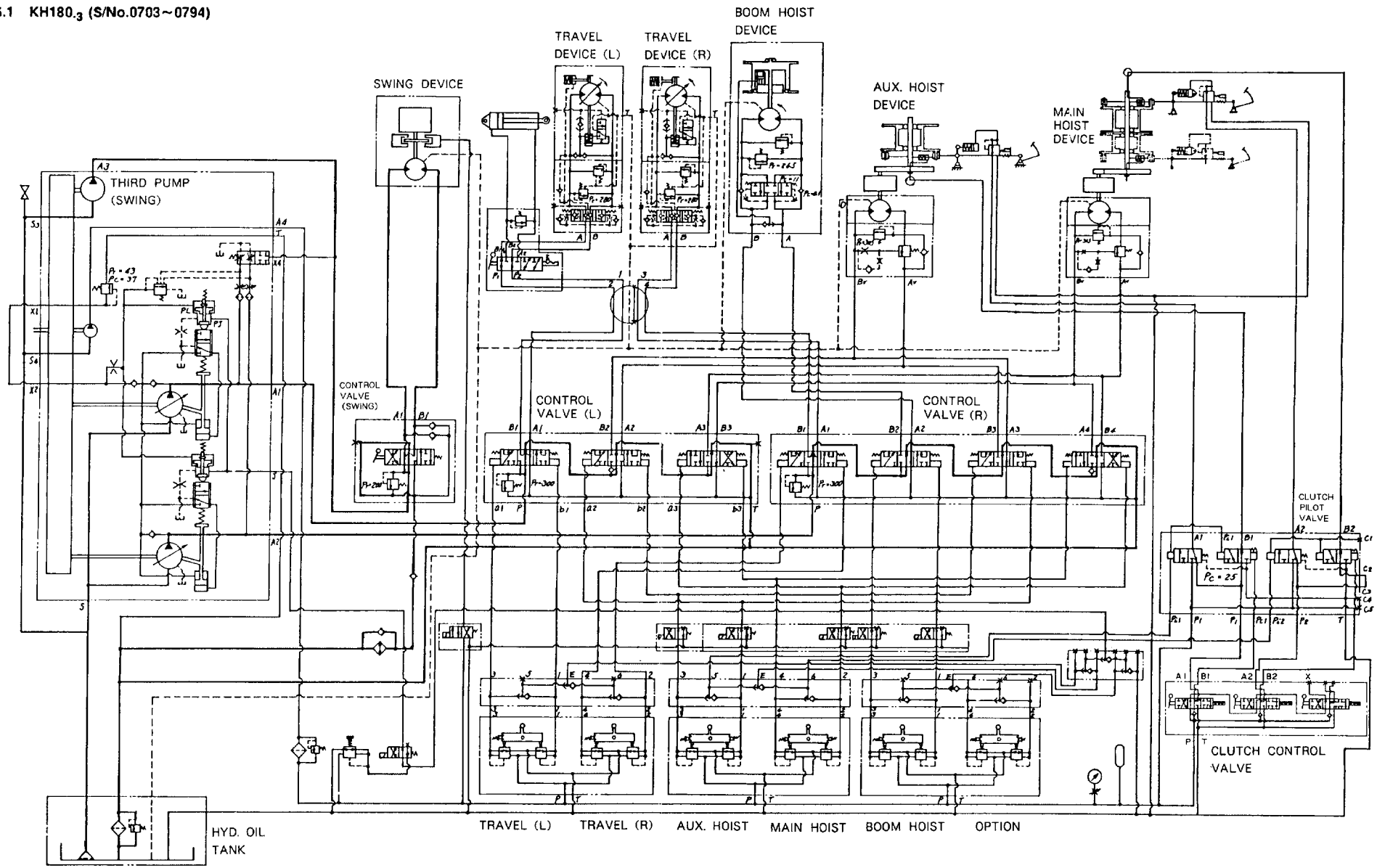
4.1 KH150$_3$ (S/No.0803~)



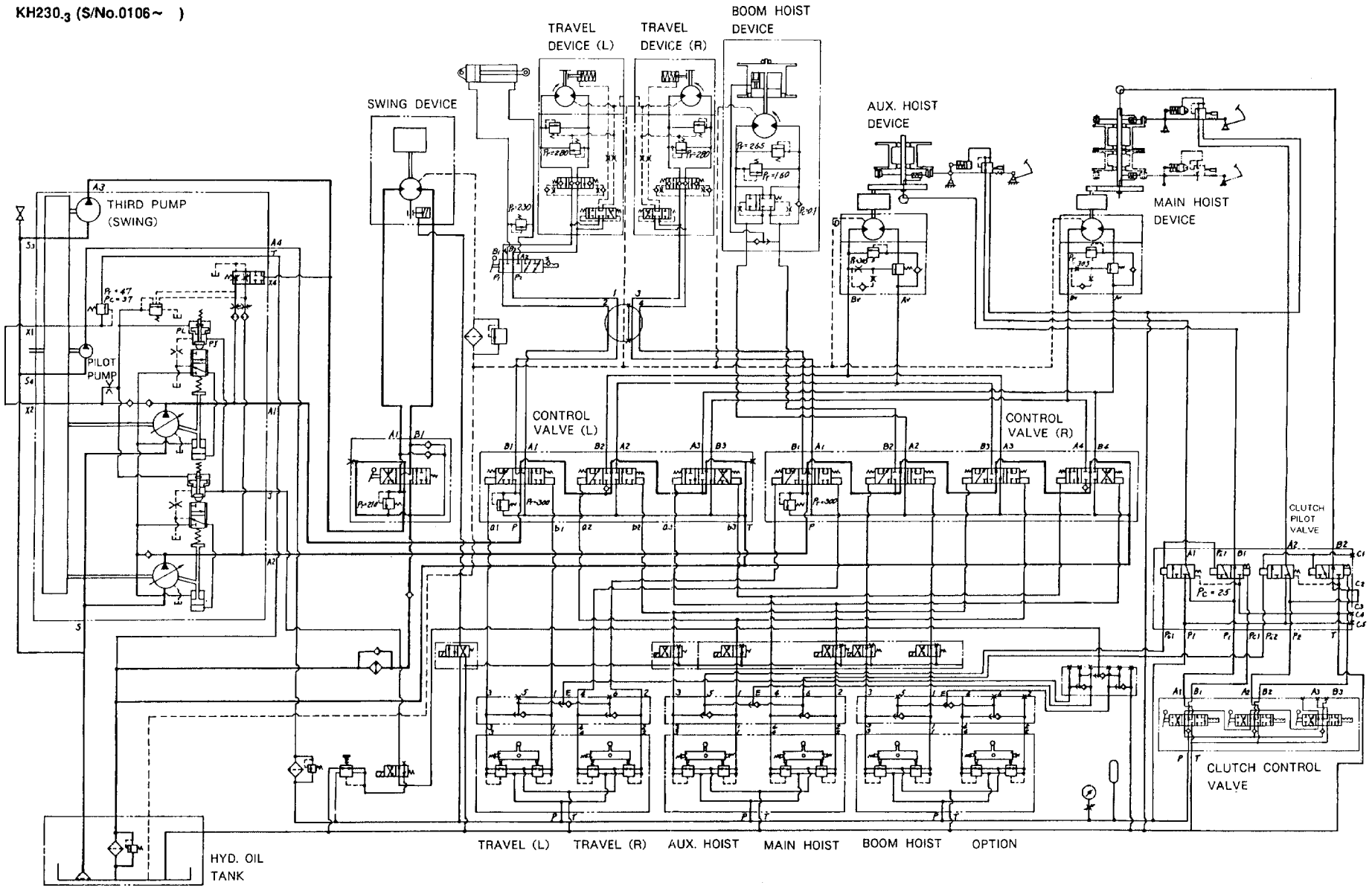

TRAVEL (L)
TRAVEL (R)
BOOM HOIST DEVICE
SWING DEVICE
MAIN HOIST DEVICE
AUX. HOIST DEVICE
THIRD PUMP
PILOT PUMP
MAIN PUMP
LEFT CONTROL VALVE
RIGHT CONTROL VALVE
CLUTCH PILOT VALVE
CLUTCH CONTROL VALVE
PILOT LINE FILTER
HYD. OIL TANK
TRAVEL (L)
TRAVEL (R)
AUX. HOIST
MAIN HOIST
BOOM HOIST
OPTION

5. KH180$_3$, KH230$_3$

5.1 KH180$_3$ (S/No.0703~0794)

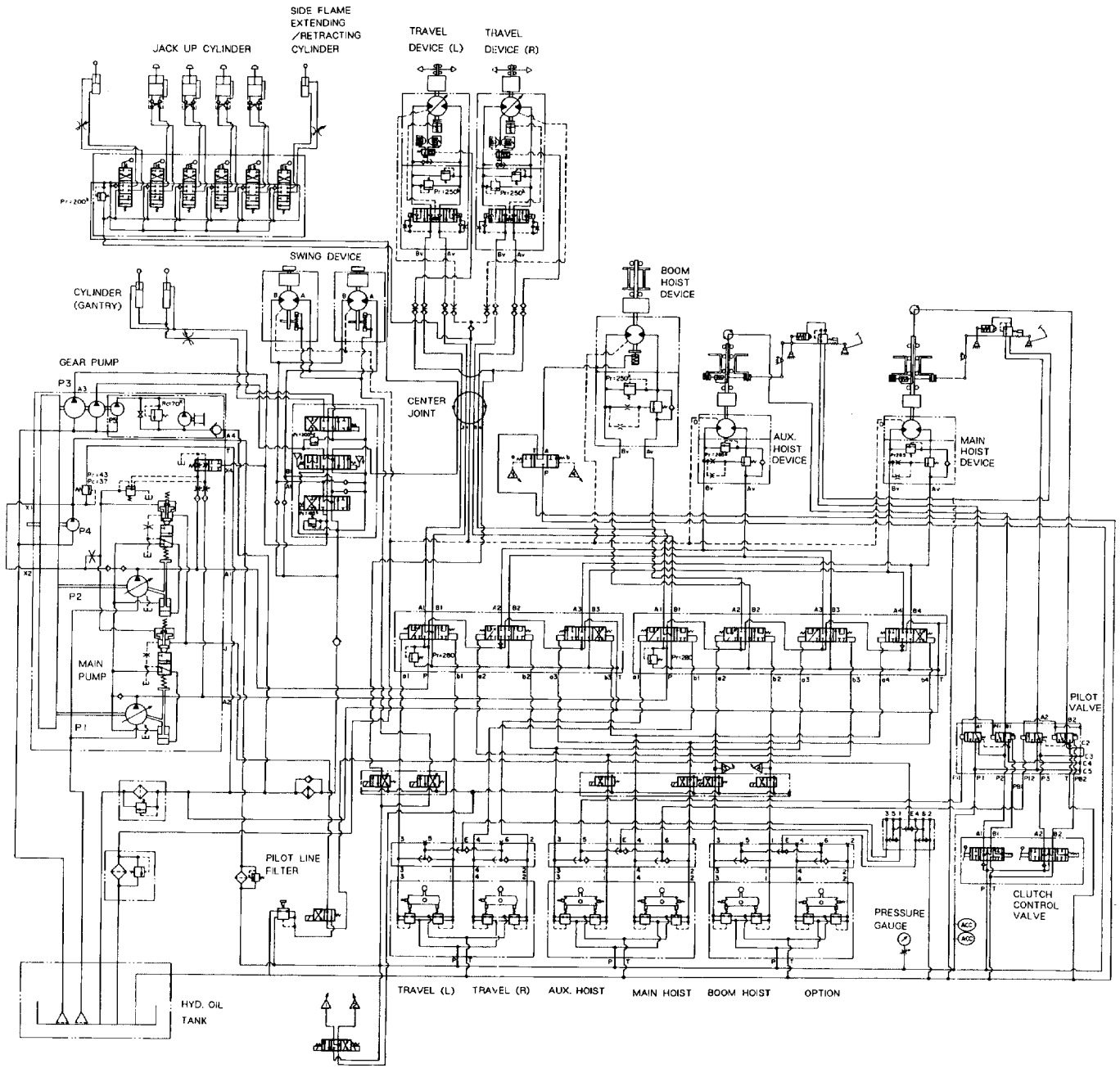


5.2 KH180$_3$ (S/No.0795~)
KH230$_3$ (S/No.0106~)



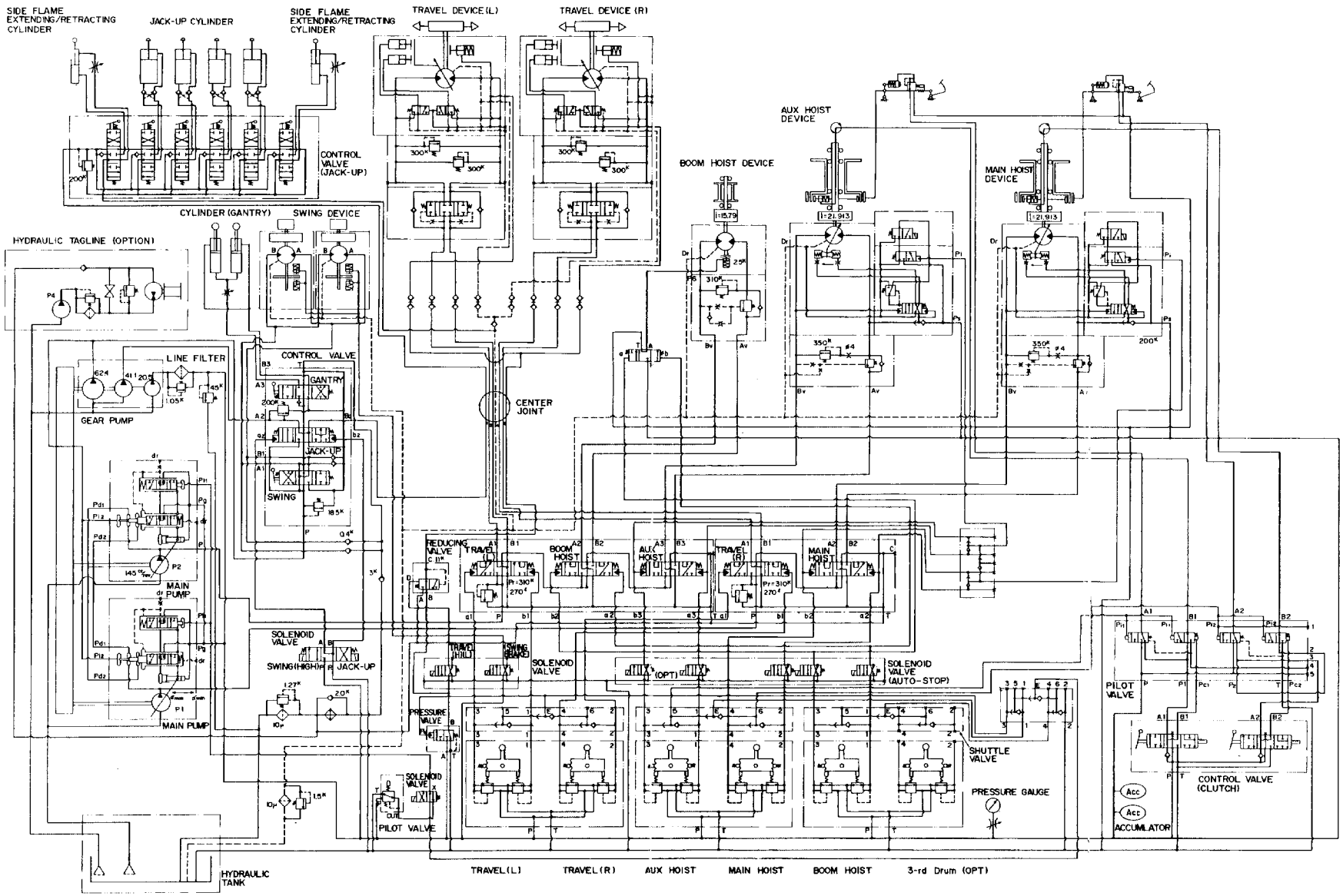
6. KH300$_3$

6.1 KH300$_3$ (S/No.0216~)



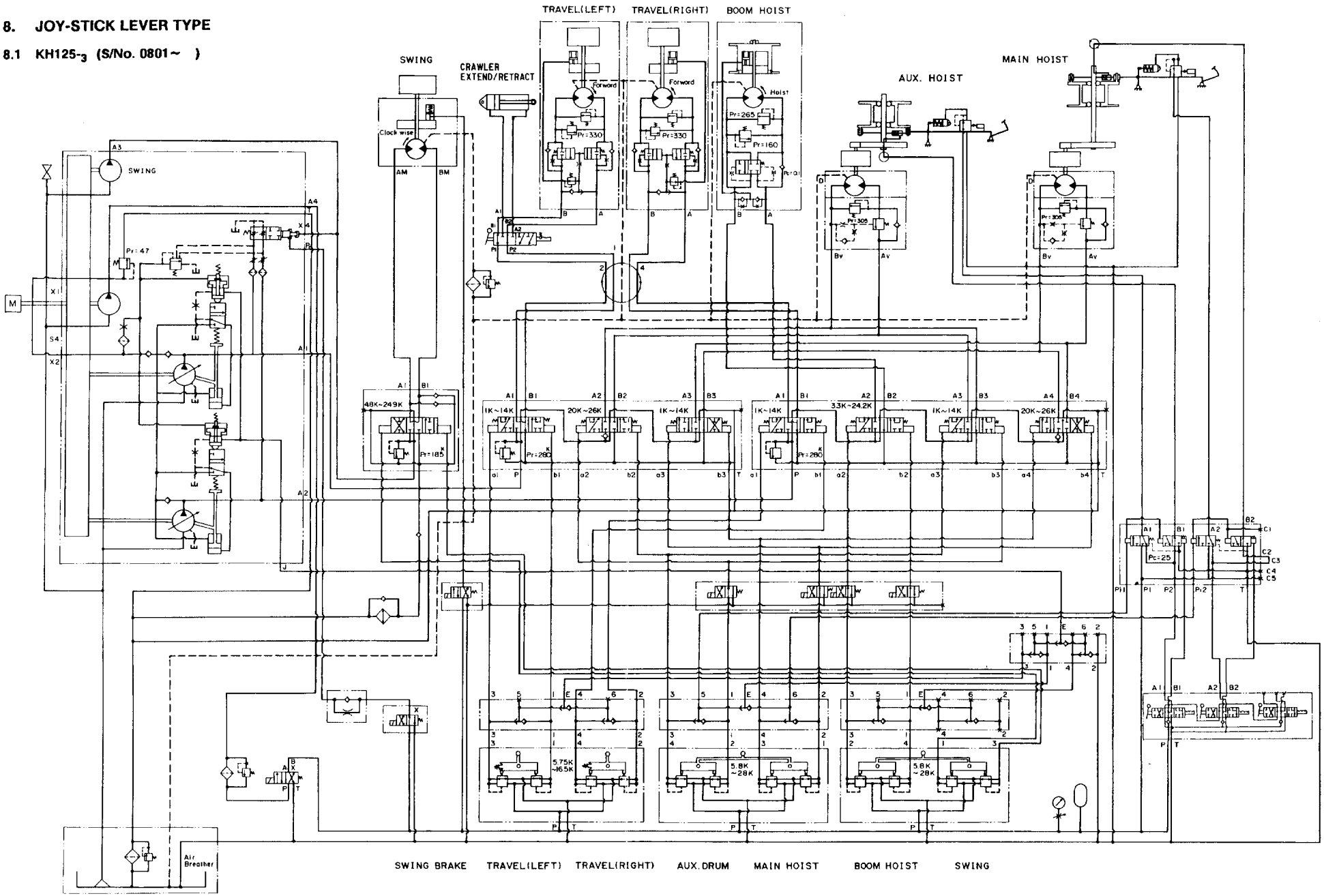
7. KH500$_{-3}$

7.1 KH500$_{-3}$ (S/No.201~)

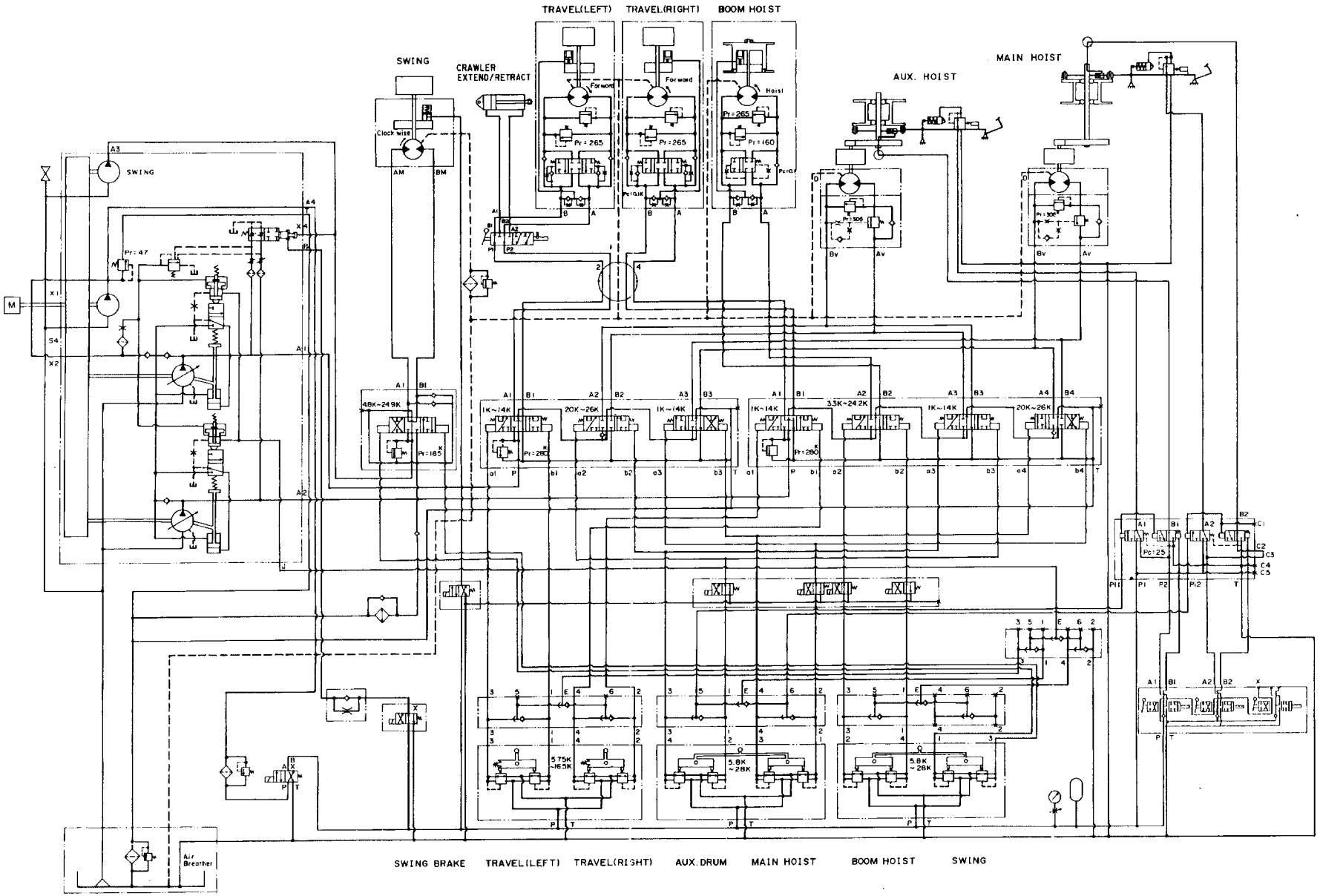


8. JOY-STICK LEVER TYPE

8.1 KH125-$_3$ (S/No. 0801~)

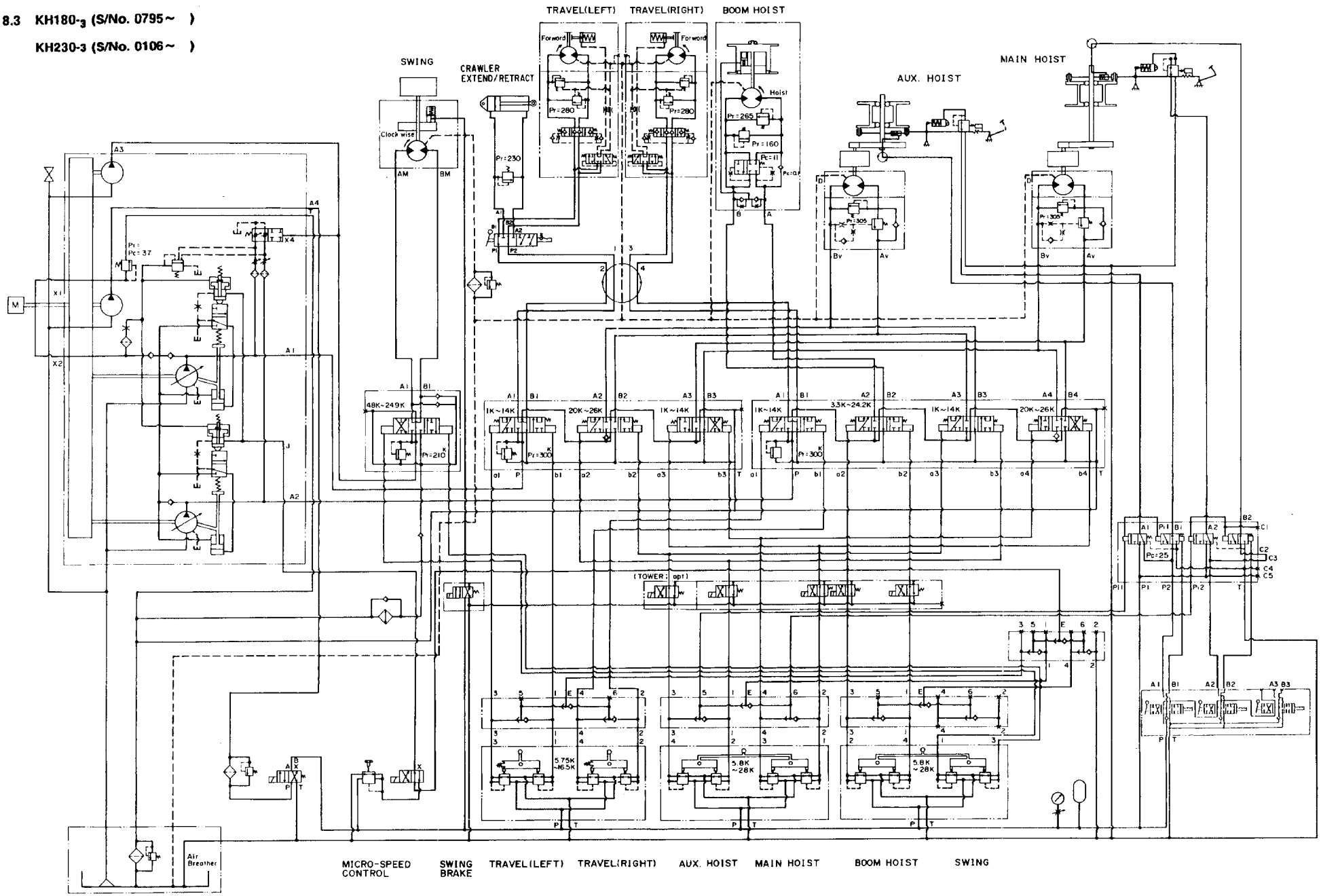


8.2 KH150-3 (S/No. 0911~)



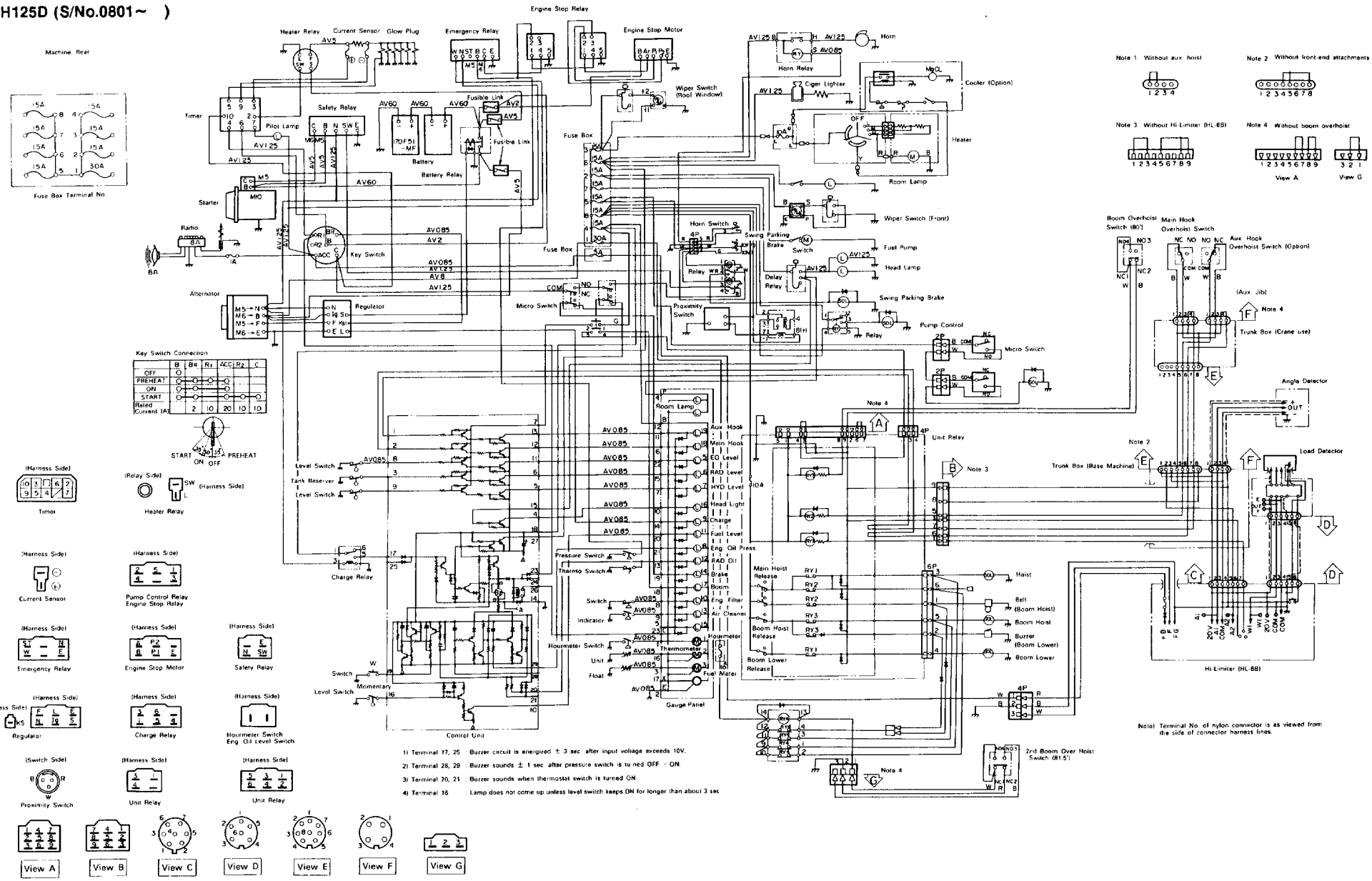
8.3 KH180-3 (S/No. 0795~)

KH230-3 (S/No. 0106~)



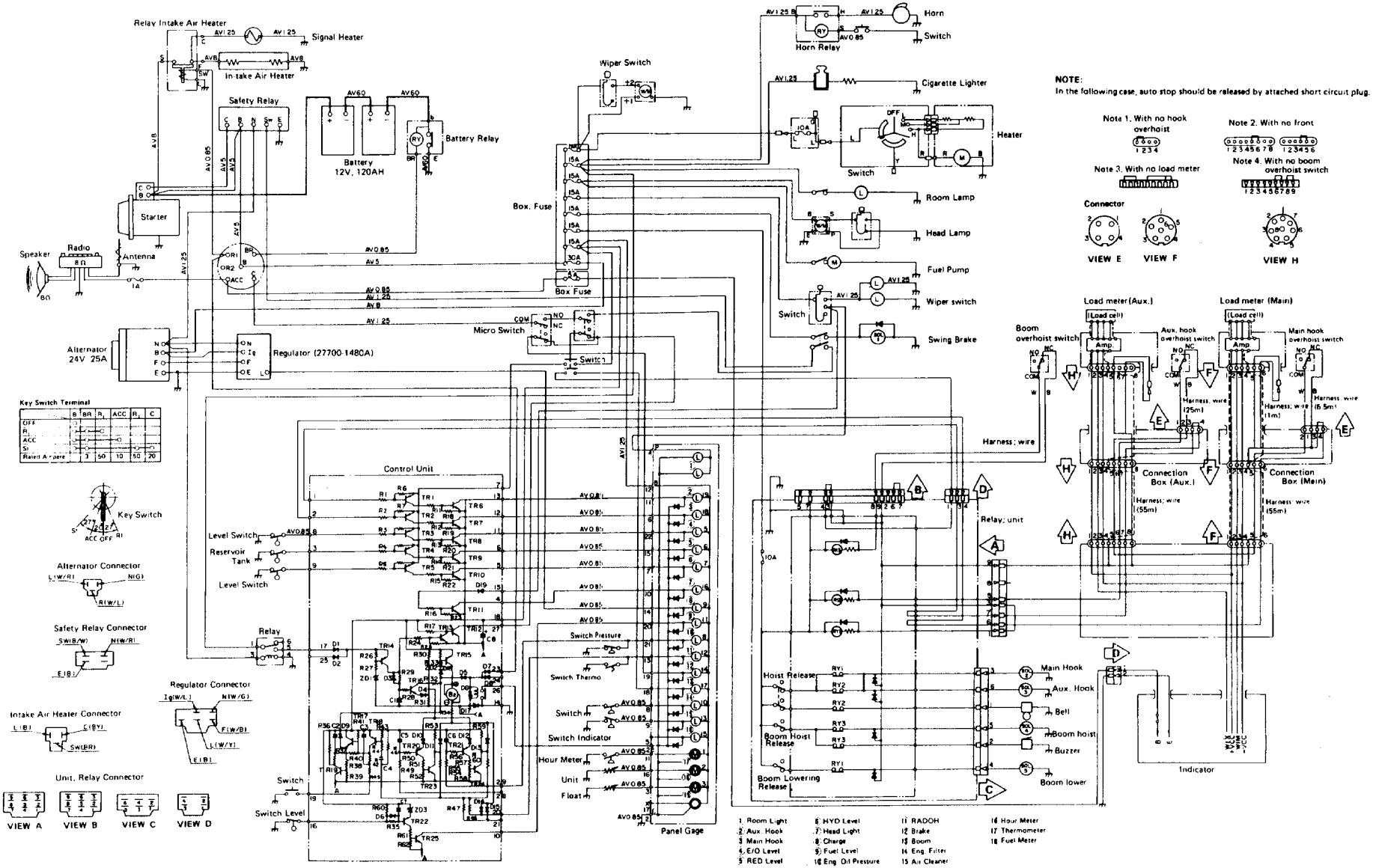
SECTION 6. ELECTRICAL CIRCUIT

1. KH100D (S/No.1001~)
KH125D (S/No.0801~)

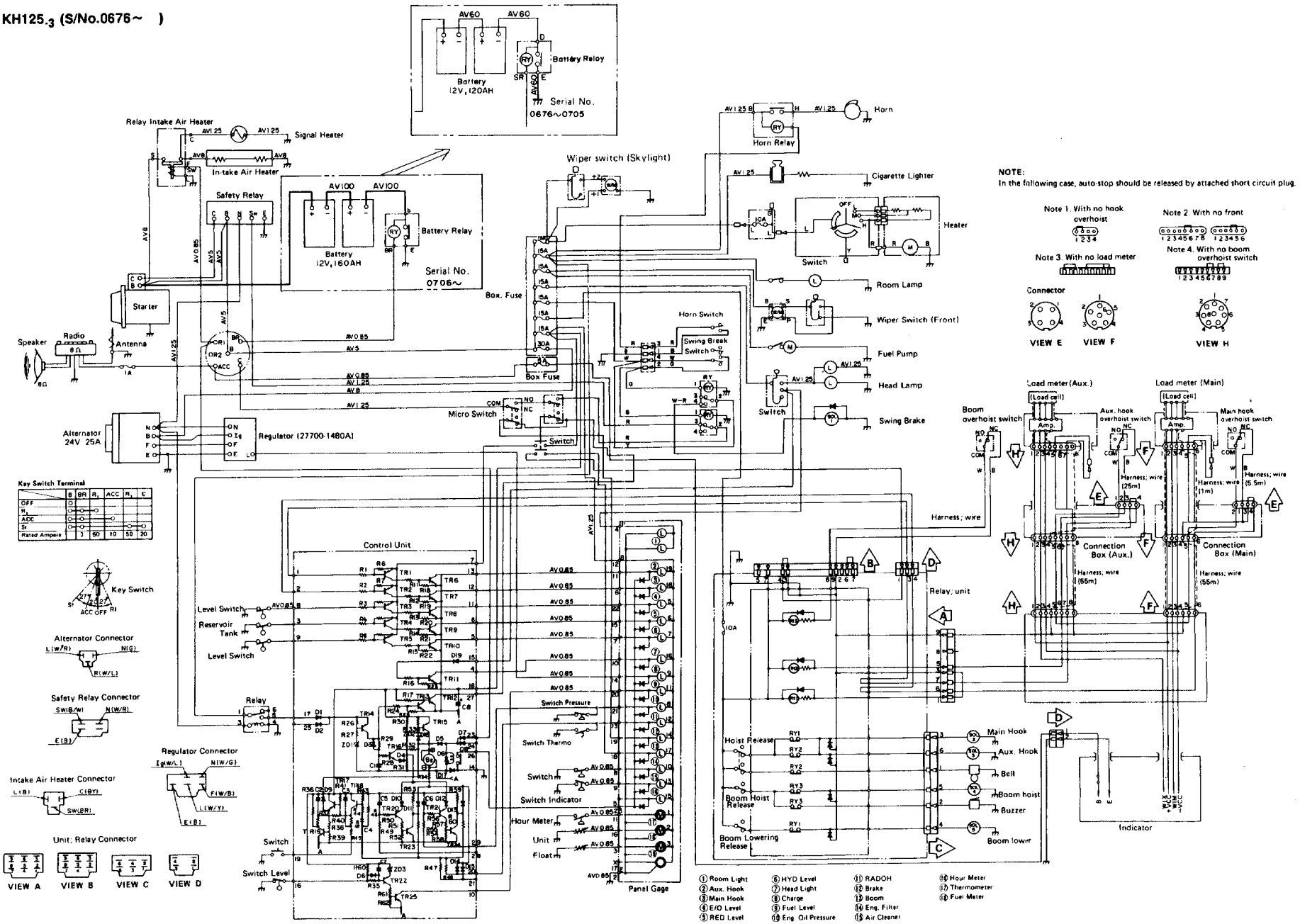


2. KH125.3

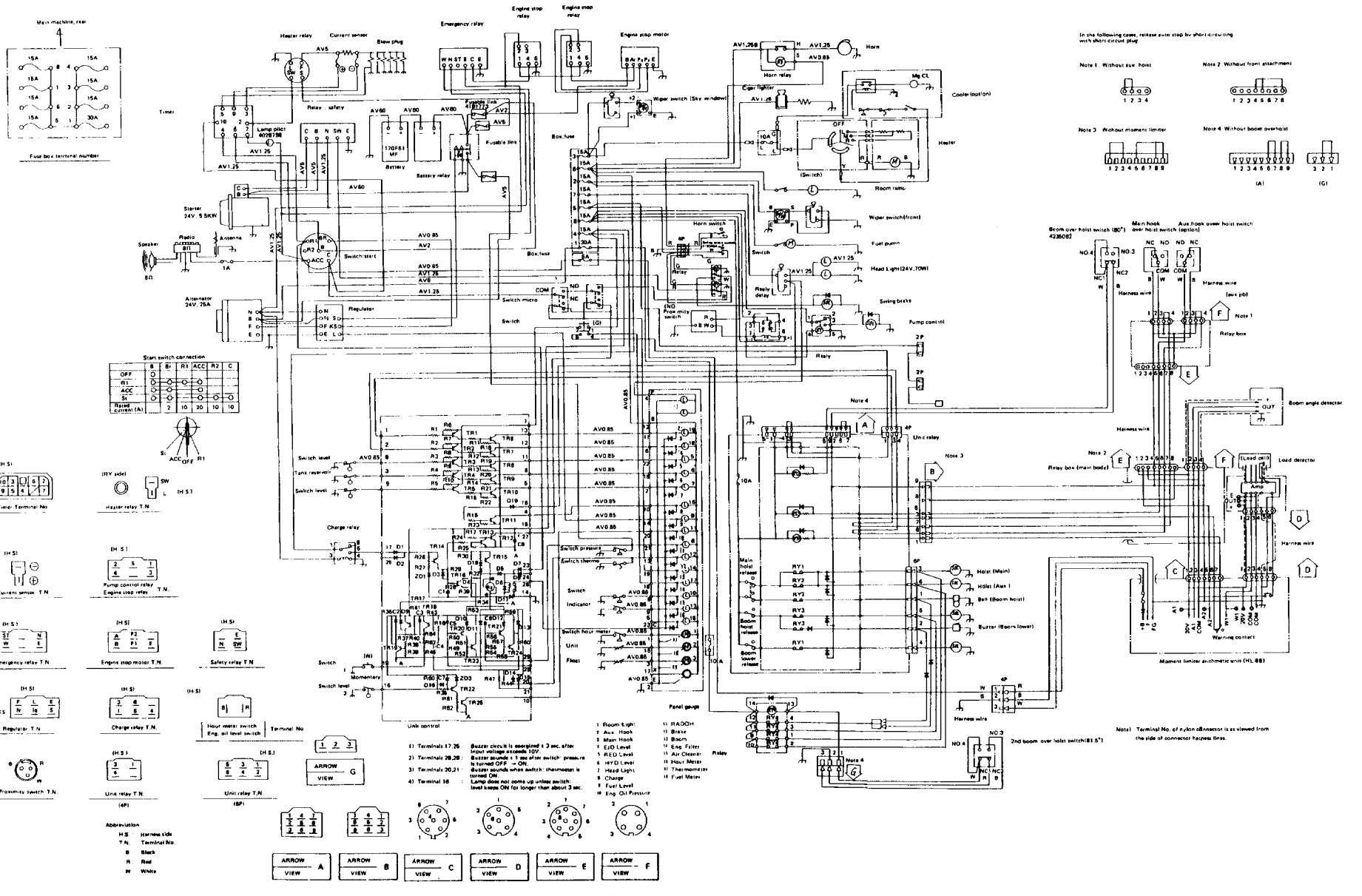
2.1 KH125.3 (S/No.0601~)



2.2 KH125.3 (S/No.0676~)

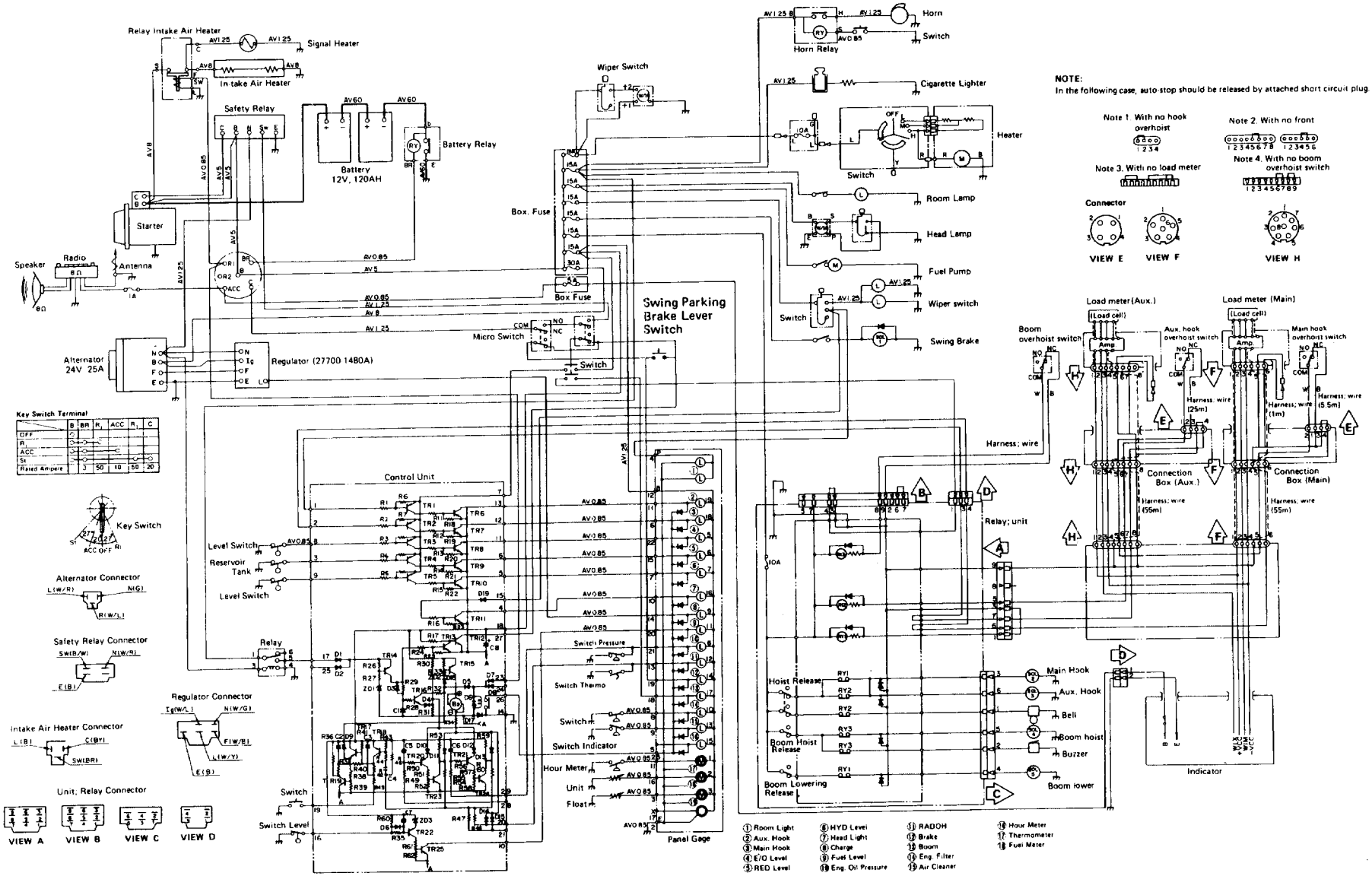


2.3 KH125$_3$ (S/No.0801~)

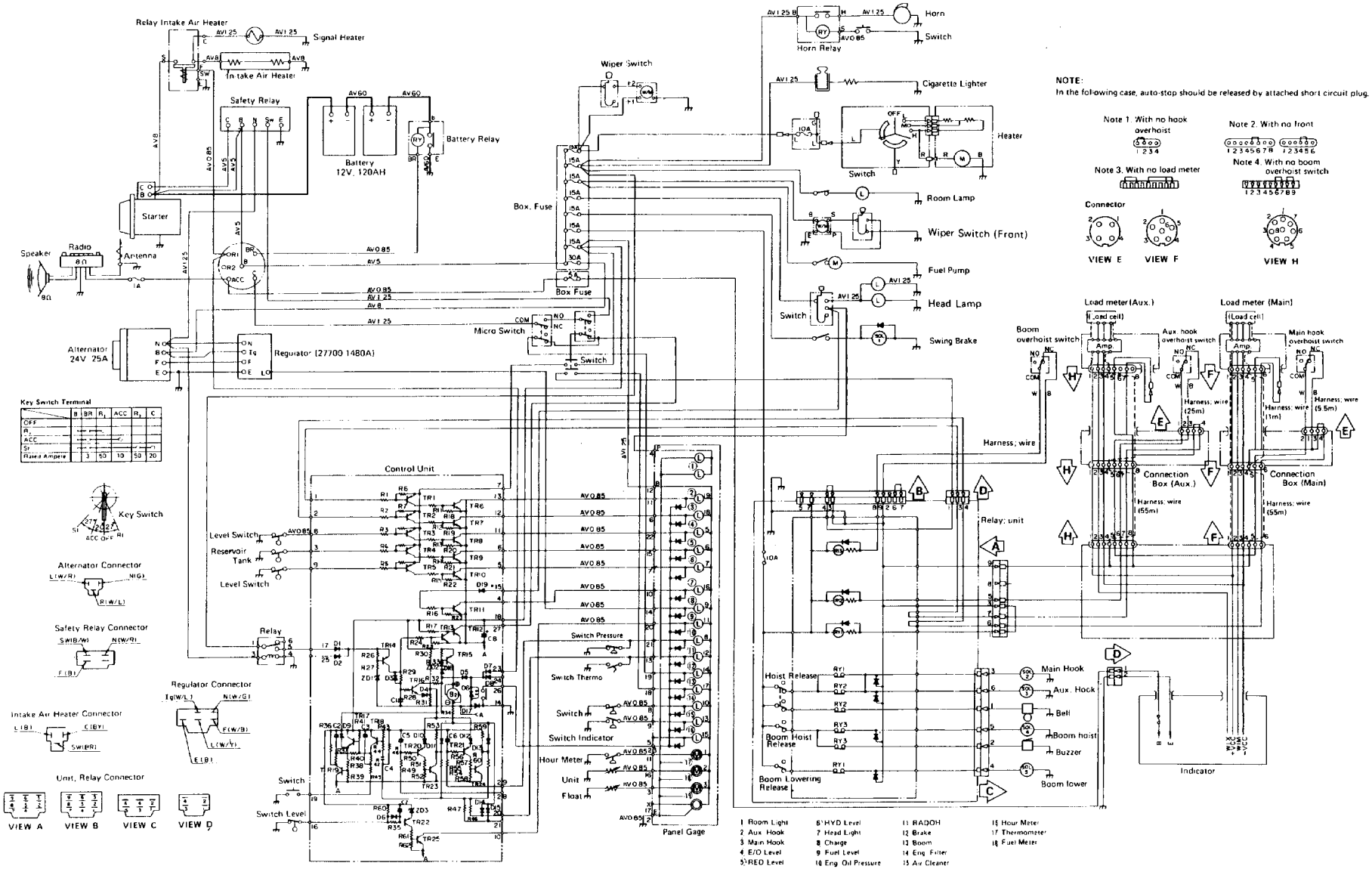


3. KH150$_3$

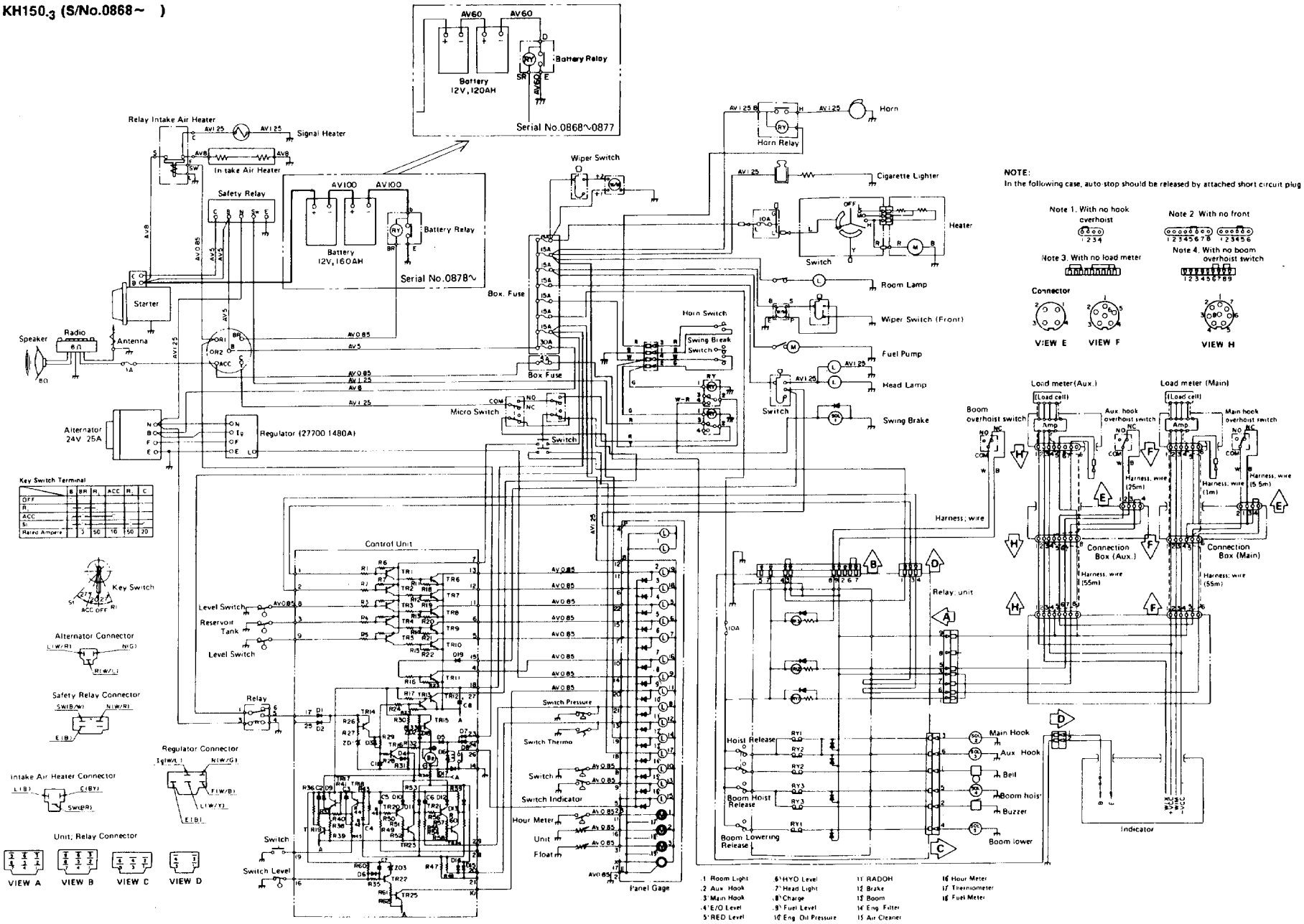
3.1 KH150$_3$ (S/No.0803~)



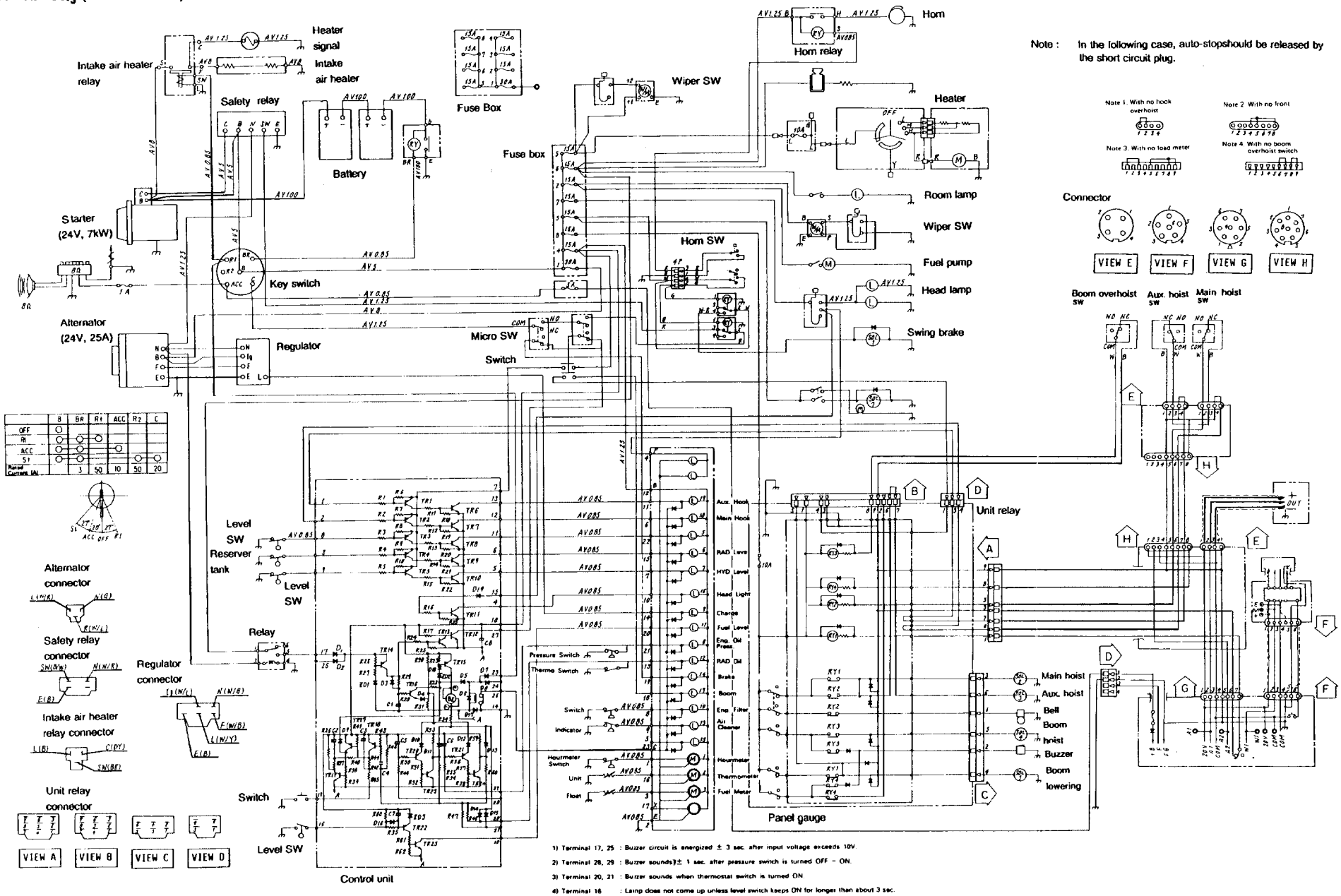
3.2 KH150$_3$ (S/No.0853~0867)



3.3 KH150$_{-3}$ (S/No.0868~)

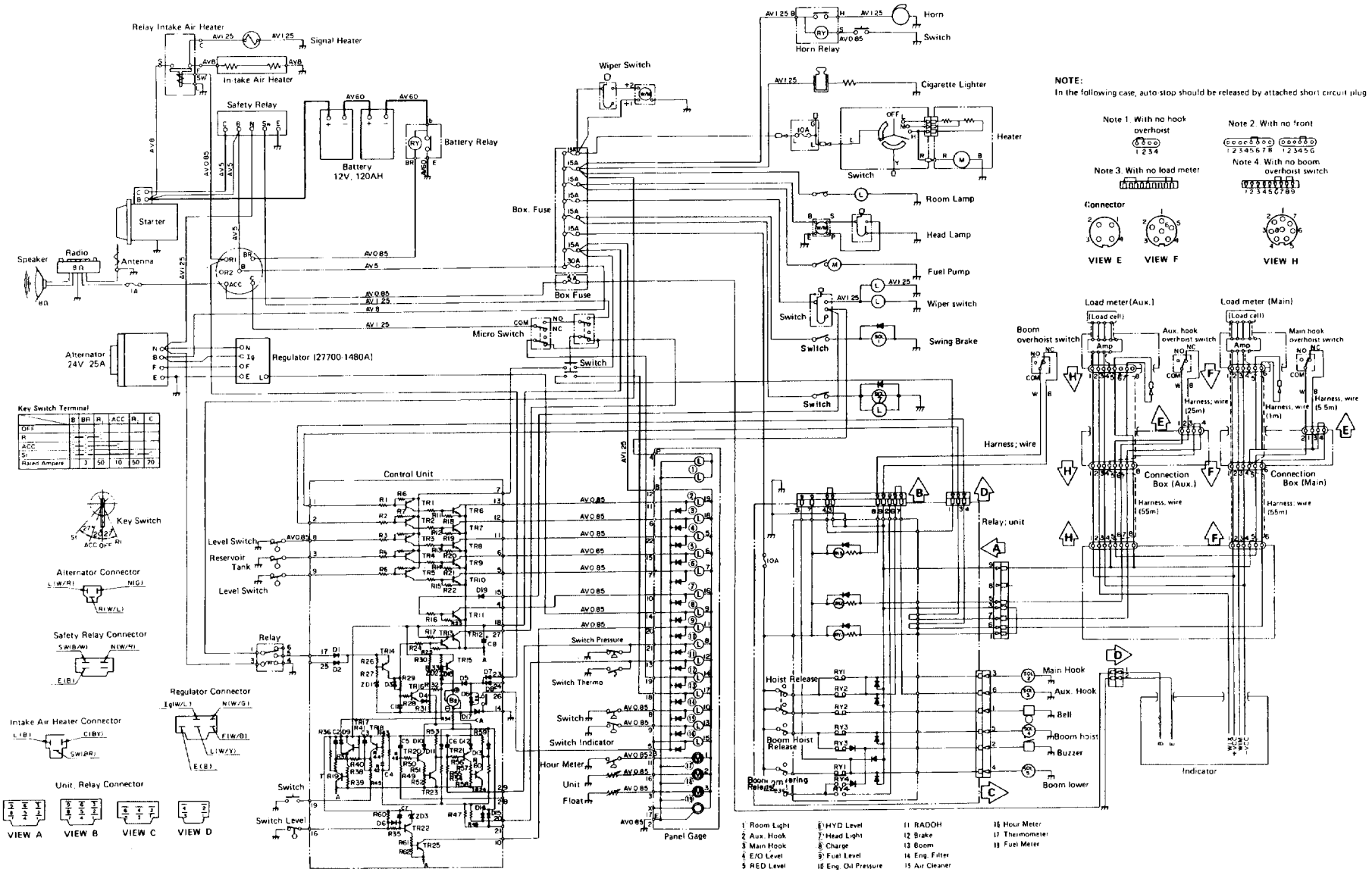


3.4 KH150.$_3$ (S/No.0911~)

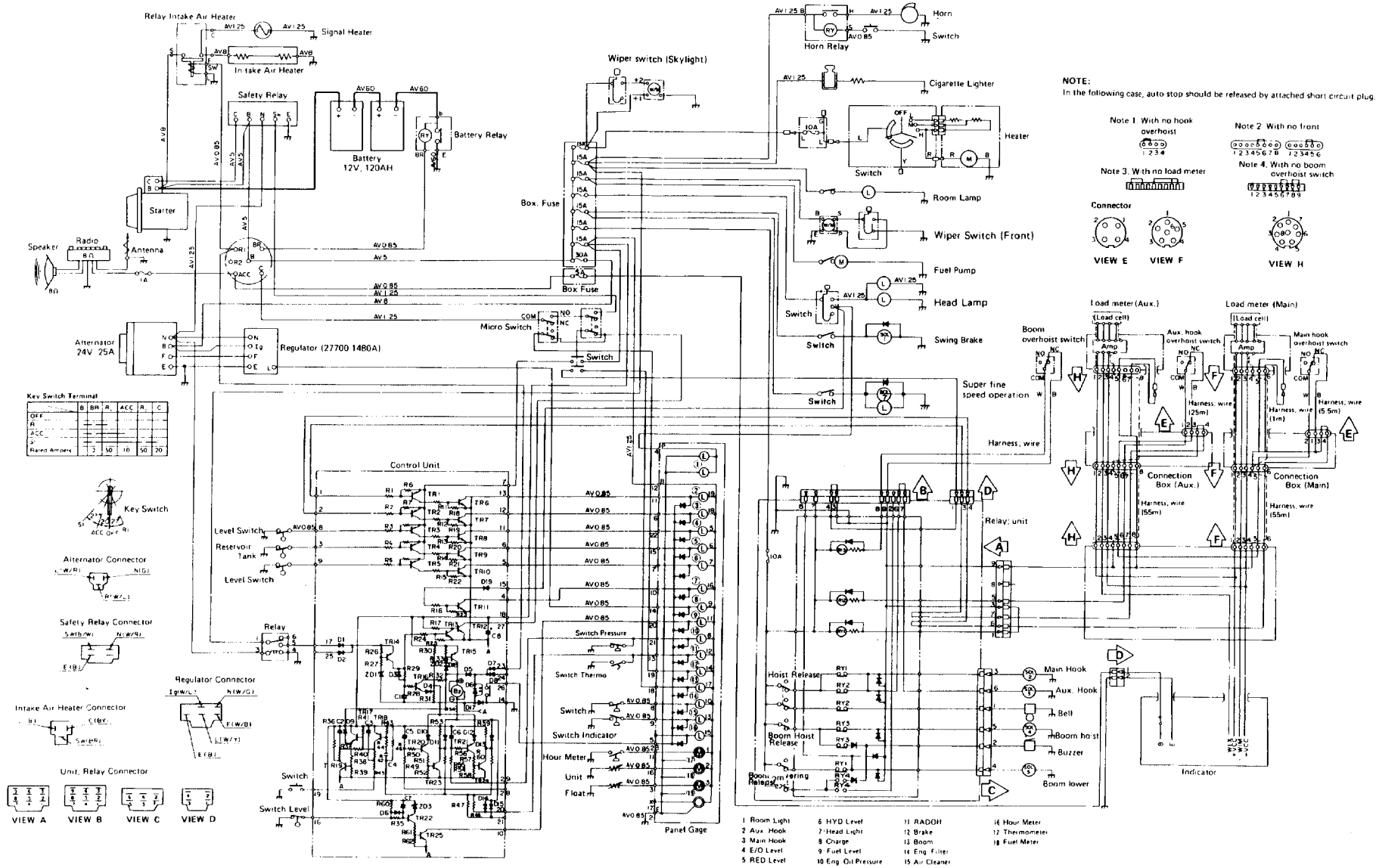


4. KH180$_{-3}$

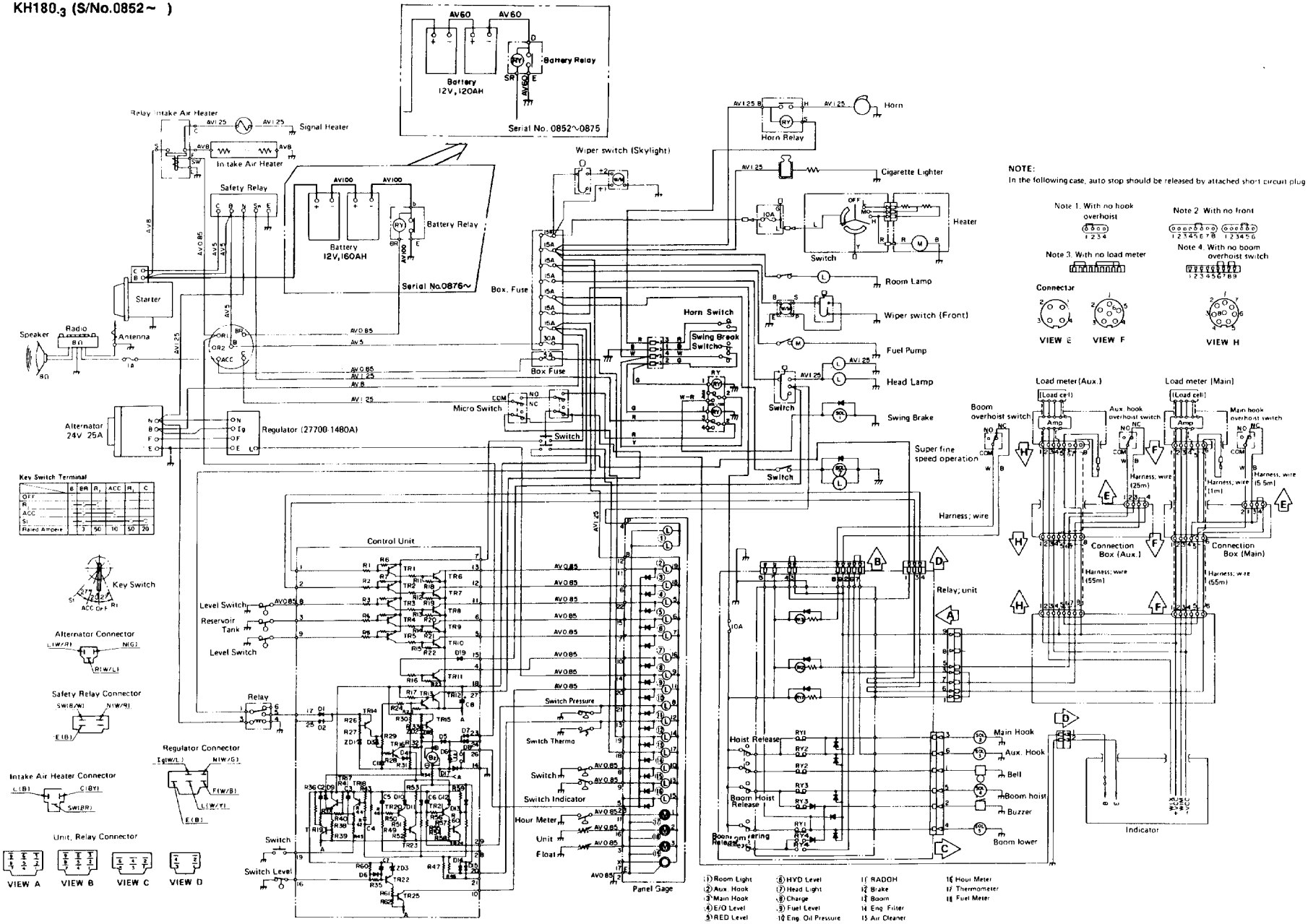
4.1 KH180$_{-3}$ (S/No.0703~)



4.2 KH180$_3$ (S/No.0808~0851)

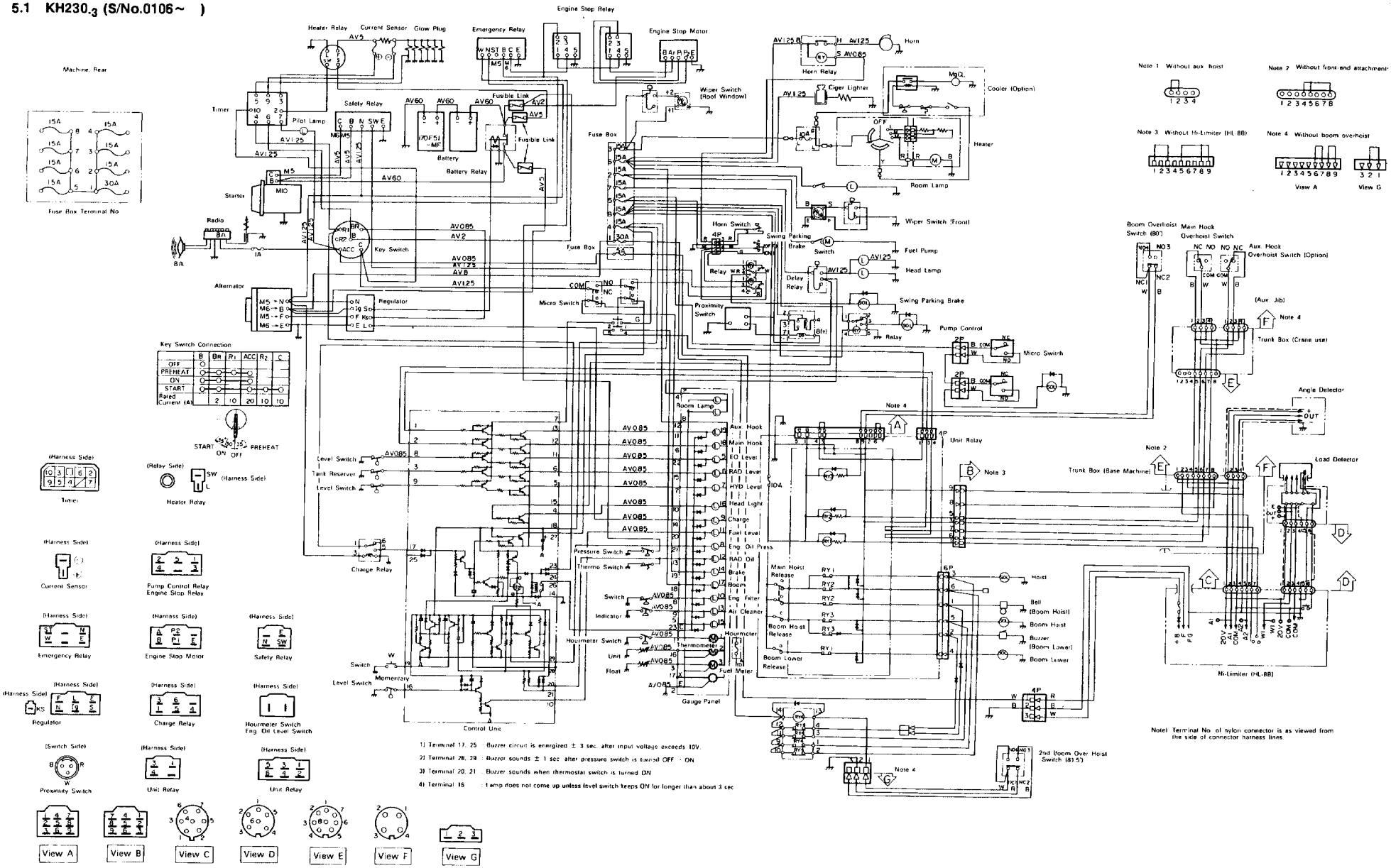


4.3 KH180$_3$ (S/No.0852~)



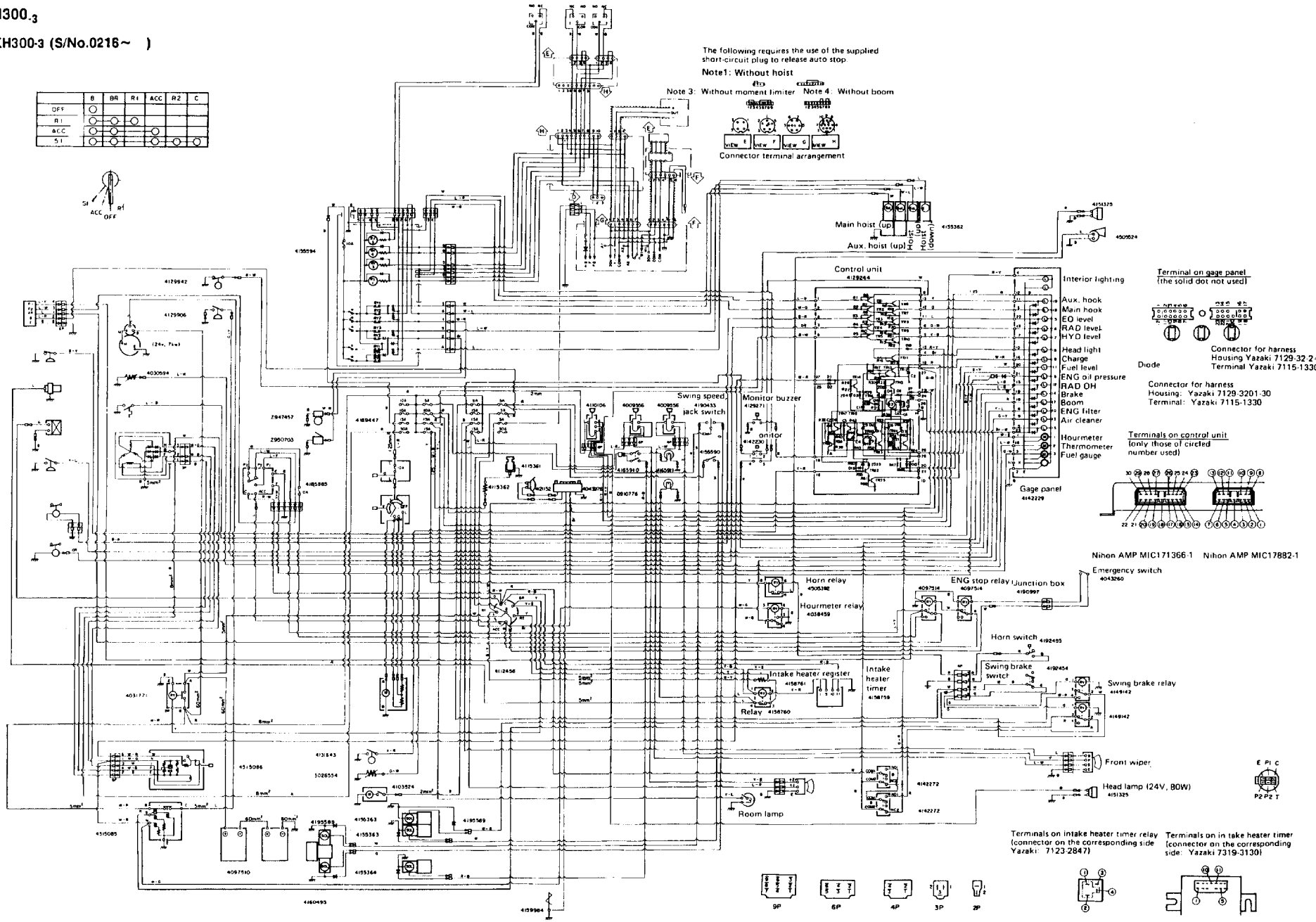
5. KH230$_3$

5.1 KH230$_3$ (S/No.0106~)



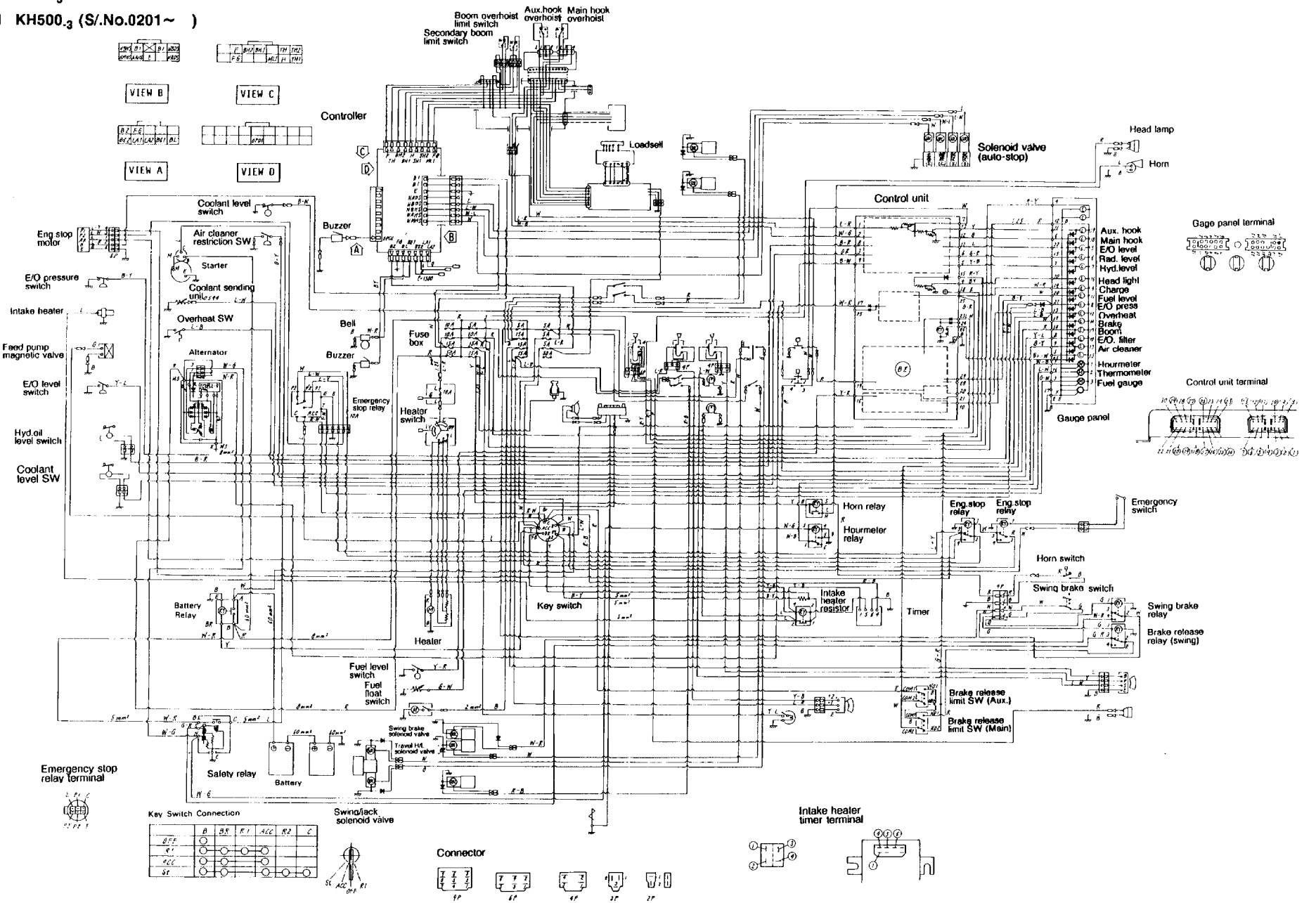
6. KH300$_3$

6.1 KH300-3 (S/No.0216~)



7. KH500$_{.3}$

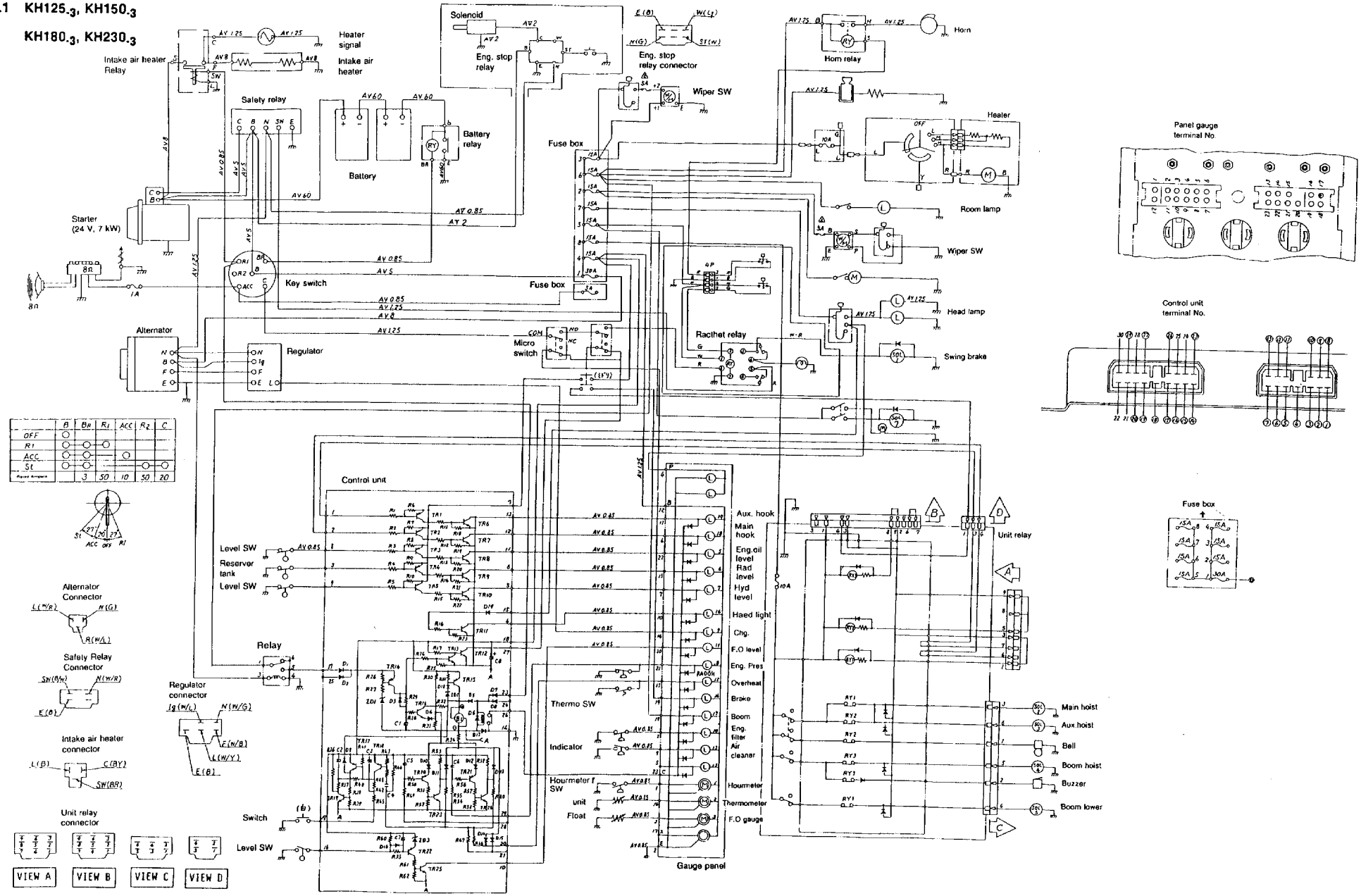
7.1 KH500$_{.3}$ (S/.No.0201~)



8. Joy-Stick Lever Type

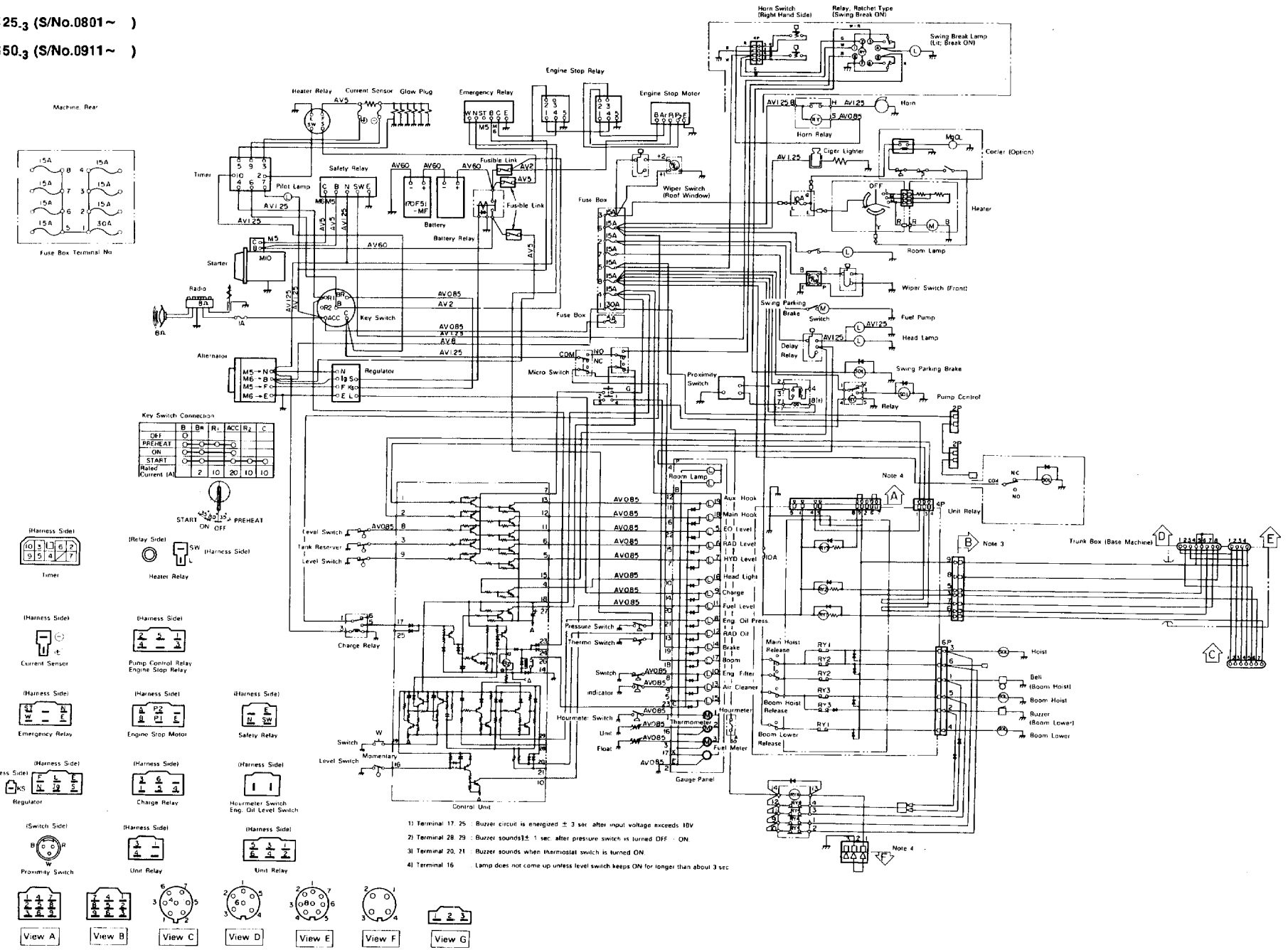
8.1 KH125-3, KH150-3

KH180-3, KH230-3



8.2 KH125$_{-3}$ (S/No.0801~)

KH150$_{-3}$ (S/No.0911~)



1) Terminal 17, 25 : Buzzer circuit is energized ± 3 sec. after input voltage exceeds 10V
2) Terminal 28, 29 : Buzzer sounds1± 1 sec. after pressure switch is turned OFF → ON.
3) Terminal 20, 21 : Buzzer sounds when thermostat switch is turned ON.
4) Terminal 16 : Lamp does not come up unless level switch keeps ON for longer than about 3 sec.

Hitachi Construction Machinery Co., Ltd.

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