CIT-MR-0

Instruction Manual for
MT-800-V Engine Telegraph System
(Maneuvering Handle type)

The contents

Nabtesco Corporation

MARINE CONTROL SYSTEMS COMPANY

e	誤記を訂正する。		2016 09/21	春名		田中	川谷
d	内容を充実させ本図に書き改める。	-	2016/ 06/07	田高田		田中	田中
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Instruction Manual for Engine Telegraph System

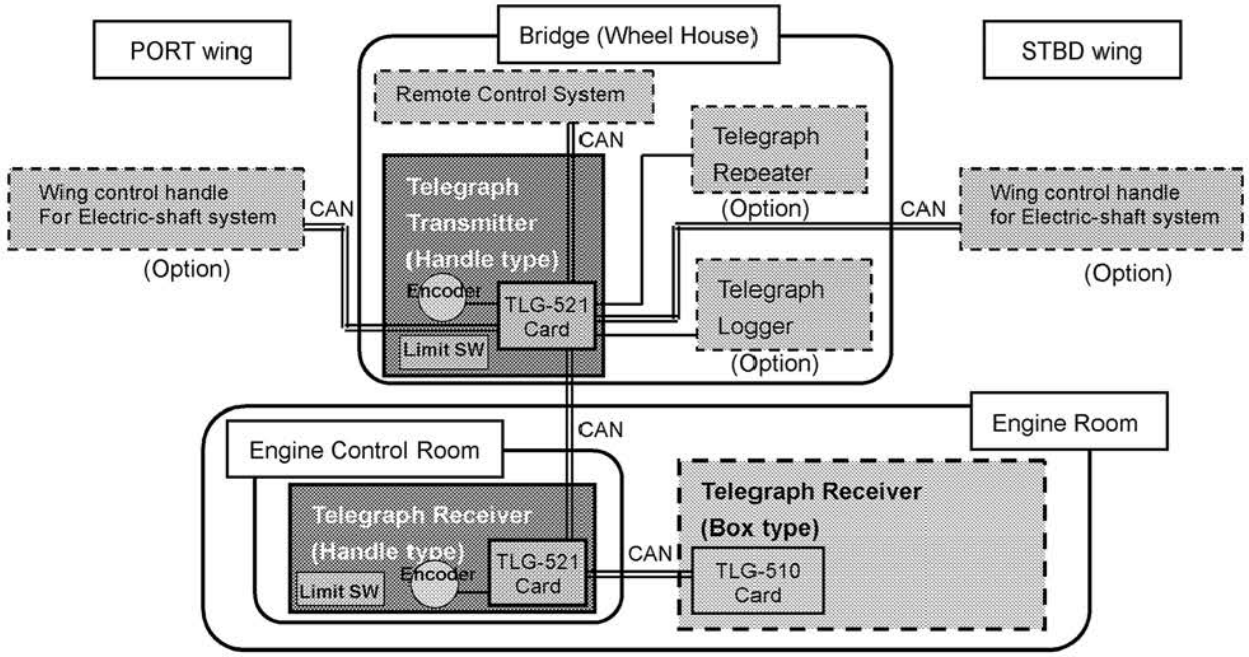


Fig.1. System Construction

1. Outline

MT-800-V telegraph system is used for ordering and replying between the bridge and the engine room (mainly engine control room). A transmitter is positioned on the bridge and receivers are positioned on the engine control room and local side of main engine. The transmitter and receivers have PCB card and they are connected by CAN communication line. A telegraph repeater and a telegraph logger can be connected to the transmitter as optional equipment.

The handle type transmitter and receiver can also use as maneuvering handle of remote control system. If maneuvering from STBD or PORT wing is required, the electric shaft system makes it possible (See Fig. 1).

This manual describes about handle type transmitter and receiver. About the operation for telegraph function programed for each project, please refer to the instruction for remote control system.

2. Mechanical function of handle type telegraph

The handle is designed as a linear movement type. This handle has a dial for fine adjustment. And the handle grip is not moved due to vibration in any position. As the pointer moves together with the handle grip, operate the handle grip by observing the pointer.

The handle grip's linear movement is converted into a rotational movement by a mechanism to operate a rotary encoder for the telegraph system and the encoder and limit switches for the remote control system. The handle position detecting limit switches are independent from the telegraph and wired to the connectors for remote control. The encoders for remote control and telegraph are wired to the main card. A digital speed meter can also be built in. Still more, for electric shaft driving motor, a solenoid clutch can also be included.

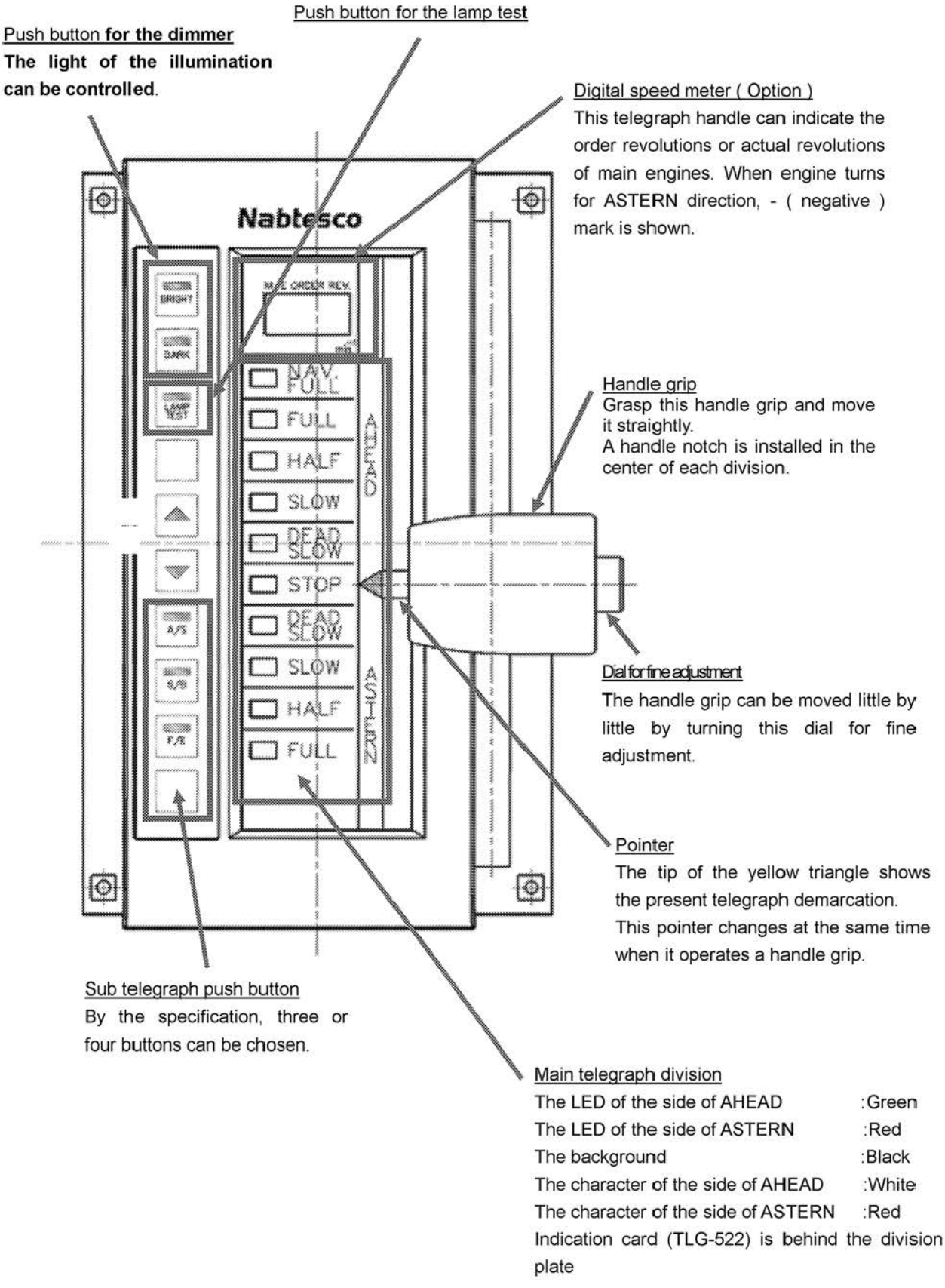


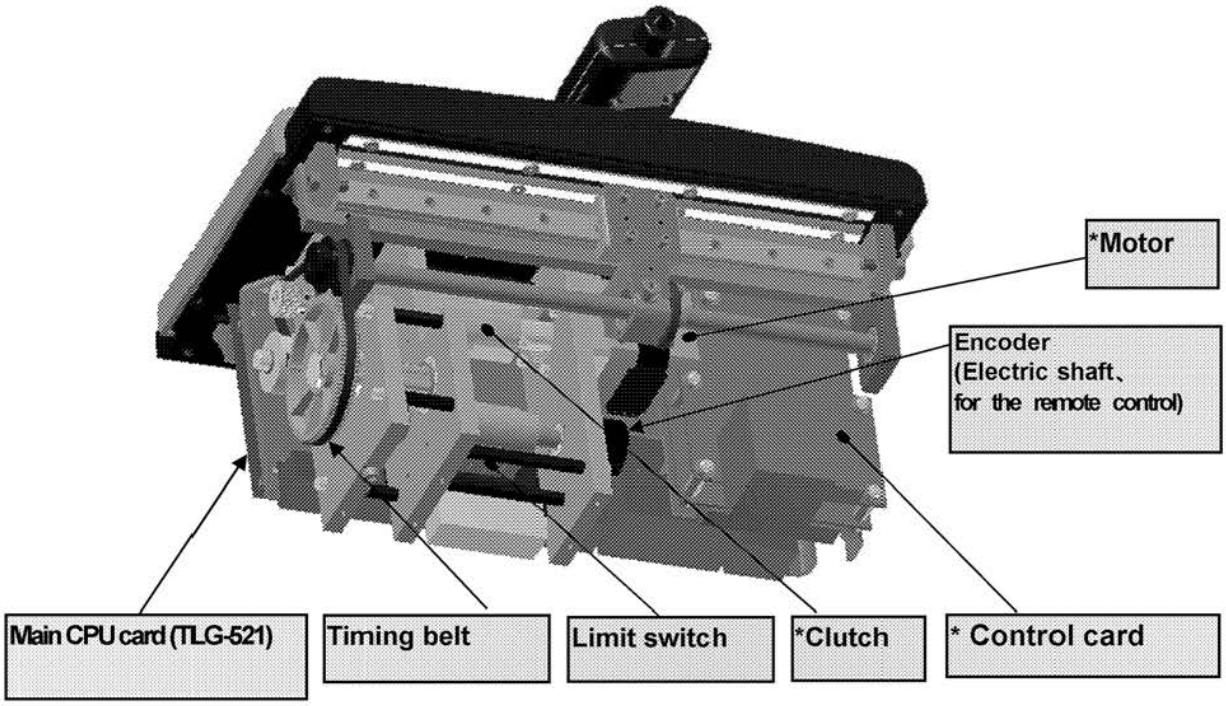
Fig. 2.Top view of MT-800-V type handle

3. Maintenance

Please maintain this handle according to the following period.

- Main CPU Card (TLG-521): every 10 years
- Control Card(Option): every 10 years
- Motor(Option): every 10 years

The timing belt is maintenance free. Please contact **Nabtesco**, if it is broken.



* These parts are included only in the telegraph handle with the electric shaft(Option).

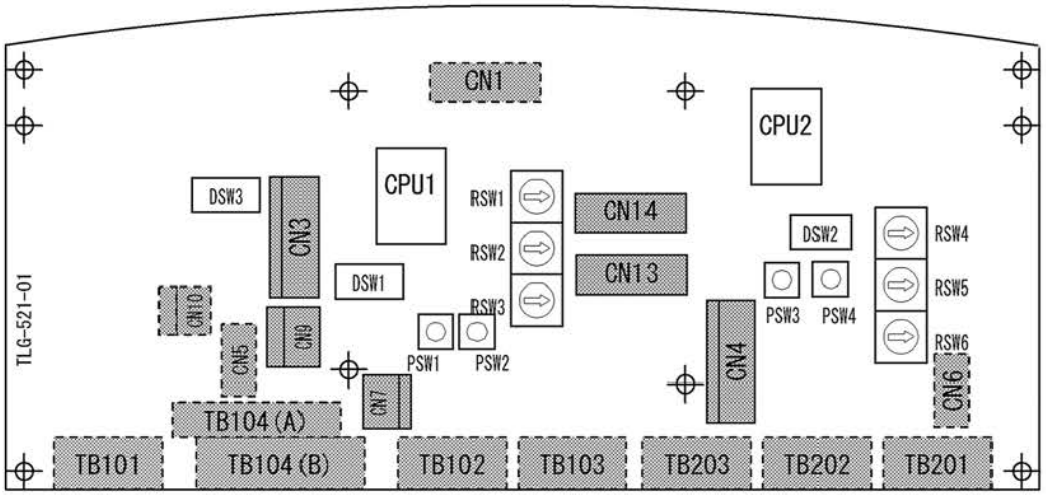
Fig.3 MT-800-V mechanical parts

4. Explanation of each card

4-1. TLG-521 CARD (Main CPU Card)

- TLG-521 Card can be divided broadly into two part; TLG-part and RCP-part.
  TLG-part : Telegraph control part
  RCP-part : Potentiometer for remote control system (REMOCON) control part
- TLG-part is supplied with telegraph power source and RCP-part with REMOCON power source.
- TLG and RCP parts have 2-ch (Main and Sub) CAN communications respectively.
- TLG and RCP parts are written with a different software respectively.
- TLG-521 Card has Sub Telegraph division LEDs and pushbuttons.

The outline figure of TLG-521 Card is shown in Fig.4 (terminal boards and connectors, and switches (without sub telegraph)) and Fig.5 (check pins and LEDs).



【Terminal board / Connector】

TB101	: Power source for telegraph
TB102	: CAN1 for telegraph
TB103	: CAN2 for telegraph
TB104	: Various I/O
TB201	: Power source for REMOCON
TB202	: CAN1 for REMOCON
TB203	: CAN2 for REMOCON

CN1	: TLG-502 connecting
CN3	: Software writing (CPU1)
CN4	: Software writing (CPU2)
CN5	: TLG-part potentiometer
CN6	: RCP-part potentiometer
CN7	: VDR receiving
CN9	: Logger receiving
CN10	: Buzzer output

TB104-A1	: VDR sending (H)
TB104-A2	: VDR sending (L)
TB104-A3	: VDR sending (S)
TB104-A4	: Repeater sending (H)
TB104-A5	: Repeater sending (L)
TB104-A6	: Repeater sending (S)
TB104-A7	: Abnormal output (+)
TB104-A8	: Abnormal output (-)
TB104-B1	: Logger output (H)
TB104-B2	: Logger output (L)
TB104-B3	: Logger output (S)
TB104-B4	: Buzzer source (+)
TB104-B5	: Buzzer output
TB104-B6	: Buzzer source (-)
TB104-B7	: Limit switch STOP input (+)
TB104-B8	: Limit switch STOP input (-)

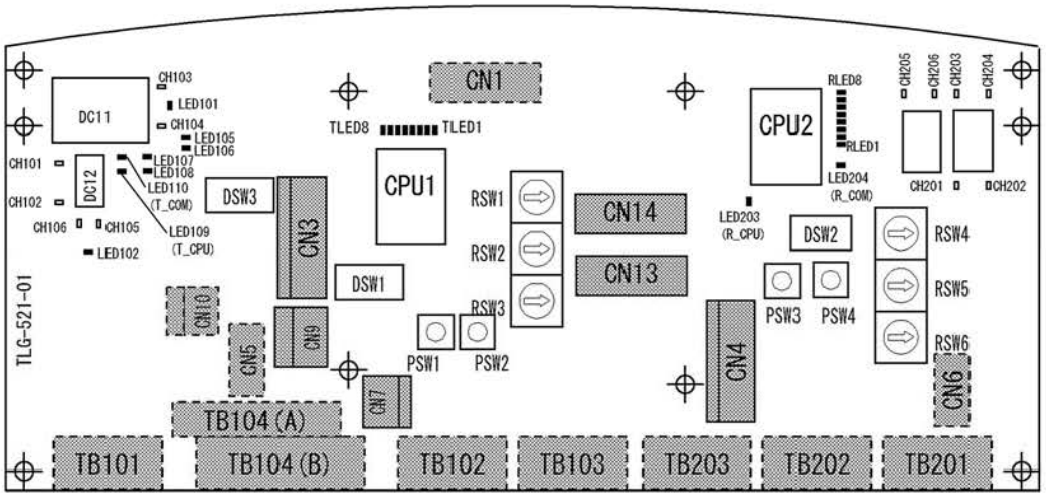
【Jumper】

JP1	: Software writing
JP2	: CAN1 terminator for telegraph
JP3	: CAN2 terminator for telegraph
JP4	: VDR receiving terminator
JP6	: Logger receiving terminator
JP7	: Logger output (H) } 1-2: EIA-422
JP8	: Logger output (L) } 2-3: Current loop
JP9	: CAN1 terminator for REMOCON
JP10	: CAN2 terminator for REMOCON

【Switch】

RSW1	: CAN node ID setting 1 for REMOCON (same as RSW4)
RSW2	: CAN node ID setting 2 for REMOCON (same as RSW5)
RSW3	: Mode switch for TLG-part
RSW4	: CAN node ID setting 1 for REMOCON
RSW5	: CAN node ID setting 2 for REMOCON
RSW6	: Mode switch for RCP-part
DSW1	: Setting for TLG-part
DSW2	: Setting for RCP-part
PSW1	: Abnormal reset for TLG-part
PSW2	: (Not used)
PSW3	: Abnormal reset for RCP-part
PSW4	: (Not used)

Fig.4: Outline Figure of TLG-521 Card (terminal boards and connectors, and switches)



【Check pin】
■TLG-part
CH101/CH102 : Telegraph source DC24V
CH103/CH104 : for CPU1
CH105/CH106 : for CAN communication

■RCP-part
CH201/CH202 : REMOCON source DC24V
CH203/CH204 : for CPU2
CH205/CH206 : for CAN communication

【LED】
■TLG-part
LED101 : CPU1 source..... (light at norm.)
LED102 : CAN source..... (light at norm.)
LED105 : VDR sending..... (light at send.)
LED106 : VDR receiving..... (light at receiv.)
LED107 : Repeater/Logger sending..... (light at send.)
LED108 : Repeater/Logger receiving... (light at receiv.)
LED109 : CPU abnormality ..... (light at abnorm.)
LED110 : Comm. abnormality ..... (light at abnorm.)

TLED1～8 : General LED

■RCP-part
LED201 : CPU2 source..... (light at norm.)
LED202 : CAN source..... (light at norm.)
LED203 : CPU abnormality ..... (light at abnorm.)
LED204 : Comm. abnormality ..... (light at abnorm.)

RLED1～8 : General LED

Fig.5: Outline Figure of TLG-521 Card (check pins and LEDs)

*CAUTION

The terminal board numbers on TLG-521 card are different from the actual seal numbers on the terminal boards.

A comparative table is shown below for converting them as necessary.

on Card		Seal	
TB101	1	TB11	PT
	2		NT
	3		FG
TB102	1	TB12	T1
	2		T2
	3		T3
TB103	1	TB13	T4
	2		T5
	3		T6

on Card		Seal	
TB104	A1	TB14	A1
	⋮		⋮
	A8		A8
	B1		B1
	⋮		⋮
	B8		B8

on Card		Seal	
TB201	1	TB21	PR
	2		NR
	3		FG
TB202	1	TB22	R1
	2		R2
	3		R3
TB203	1	TB23	R4
	2		R5
	3		R6

(1) Indication of TLG-part

The indication of TLED1～8 can be changed by setting RSW3 on TLG-521 Card.
Table 1 shows details of the indication.

This setting can be changed without turning off the power.
However, if turning off and on the power with RSW3 remained at except "0", the operation goes into special mode.
After changing the setting and then checking the indication, **restore RSW3 to "0"**.

Table 1: Details of Indication on TLG-521 Card's TLG-part in Normal Operation Mode

RSW3	Outline of Indication	Indication LED	Details of Indication
0	CAN Communication Abnormality (the Whole)	TLED1	CAN1: Telegraph (OR of RSW3 = 1)
		TLED2	CAN1: CONTROL CPU
		TLED3	CAN1: SAFETY CPU
		TLED4	CAN2: Telegraph (OR of RSW3 = 2)
		TLED5	CAN2: CONTROL CPU
		TLED6	CAN2: SAFETY CPU
		TLED7, 8	(No set)
1	CAN Communication Abnormality (Telegraph CAN1)	TLED1	W/H
		TLED2	C/R
		TLED3	E/S
		TLED4	WING
		TLED5-8	Other
2	CAN Communication Abnormality (Telegraph CAN2)	TLED1-8	*Each bit is the same as RSW3 = 1
3	Other Abnormalities	TLED1	Potentiometer error bit abnormality
		TLED2	Potentiometer range abnormality
		TLED3	EEPROM abnormality
		TLED4-8	(No set)
4	Potentiometer Data (after adjustment)	TLED1-8	Lower 8 bits (LSB: TLED1)
5	Potentiometer Data (after adjustment)	TLED1-4	Upper 4 bits (MSB: TLED4)
		TLED5-8	(No set)
6	Software Version	TLED1-8	8 bits (MSB: TLED8, LSB: TLED1)
7	Software Type	TLED1-8	Lower 8 bits (LSB: TLED1)
8	Software Type	TLED1-8	Upper 8 bits (MSB: TLED8)
9-B	(No set)	—	—
C	Potentiometer Data (Non-adjusted)	TLED1-8	Lower 8 bits (LSB: TLED1)
D	Potentiometer Data (Non-adjusted)	TLED1-4	Upper 4 bits (MSB: TLED4)
		TLED5-8	(No set)
E-F	(No set)	—	—

Note) RSW3-C,D Potentiometer Data (Non-adjusted) are only indicated after soft version M of telegraph side.

(2) Indication of RCP-part

The indication of RLED1～8 can be changed by setting RSW6 on TLG-521 Card.
Table 2 shows details of the indication.

This setting can be changed without turning off the power.
However, if turning off and on the power with RSW6 remained at except "0", the operation goes into special mode.
After changing the setting and then checking the indication, **restore RSW6 to "0"**.

Table 2: Details of Indication on TLG-521 Card's RCP-part in Normal Operation Mode

RSW6	Outline of Indication	Indication LED	Details of Indication
0	CAN Communication Abnormality (the Whole)	RLED1	(No set)
		RLED2	CAN1: CONTROL CPU
		RLED3	CAN1: SAFETY CPU
		RLED4	(No set)
		RLED5	CAN2: CONTROL CPU
		RLED6	CAN2: SAFETY CPU
		RLED7, 8	(No set)
1, 2	(No set)		
3	Other Abnormalities	RLED1	Potentiometer error bit abnormality
		RLED2	Potentiometer range abnormality
		RLED3	EEPROM abnormality
		RLED4	RCP-FES communication abnormality
		RLED5	Electric shaft abnormality (OR of RSW6 = 9-B)
		RLED6-8	(No set)
4	Potentiometer Data (after adjustment)	TLED1-8	Lower 8 bits (LSB: TLED1)
5	Potentiometer Data (after adjustment)	TLED1-4	Upper 4 bits (MSB: TLED4)
		TLED5-8	(No set)
6	Software Version	RLED1-8	8 bits (MSB: RLED8, LSB: RLED1)
7	Software Type	RLED1-8	Lower 8 bits (LSB: RLED1)
4	Potentiometer Data (after adjustment)	TLED1-8	Lower 8 bits (LSB: TLED1)
9	Electric Shaft Abnormality (Communication Abnormality)	RLED1	PORT - W/H
		RLED2	PORT - PORT
		RLED3	PORT - STBD
		RLED4	PORT - C/R
		RLED5	STBD - W/H
		RLED6	STBD - PORT
		RLED7	STBD - STBD
		RLED8	STBD - C/R
A	Electric Shaft Abnormality (Potentiometer Abnormality)	RLED1-8	*Each bit is the same as RSW6 = 9
B	Electric Shaft Abnormality (Follow-Up Abnormality)	RLED1-8	*Each bit is the same as RSW6 = 9
C	Potentiometer Data (Non-adjusted)	TLED1-8	Lower 8 bits (LSB: TLED1)
D	Potentiometer Data (Non-adjusted)	TLED1-4	Upper 4 bits (MSB: TLED4)
E～F	(No set)	—	—

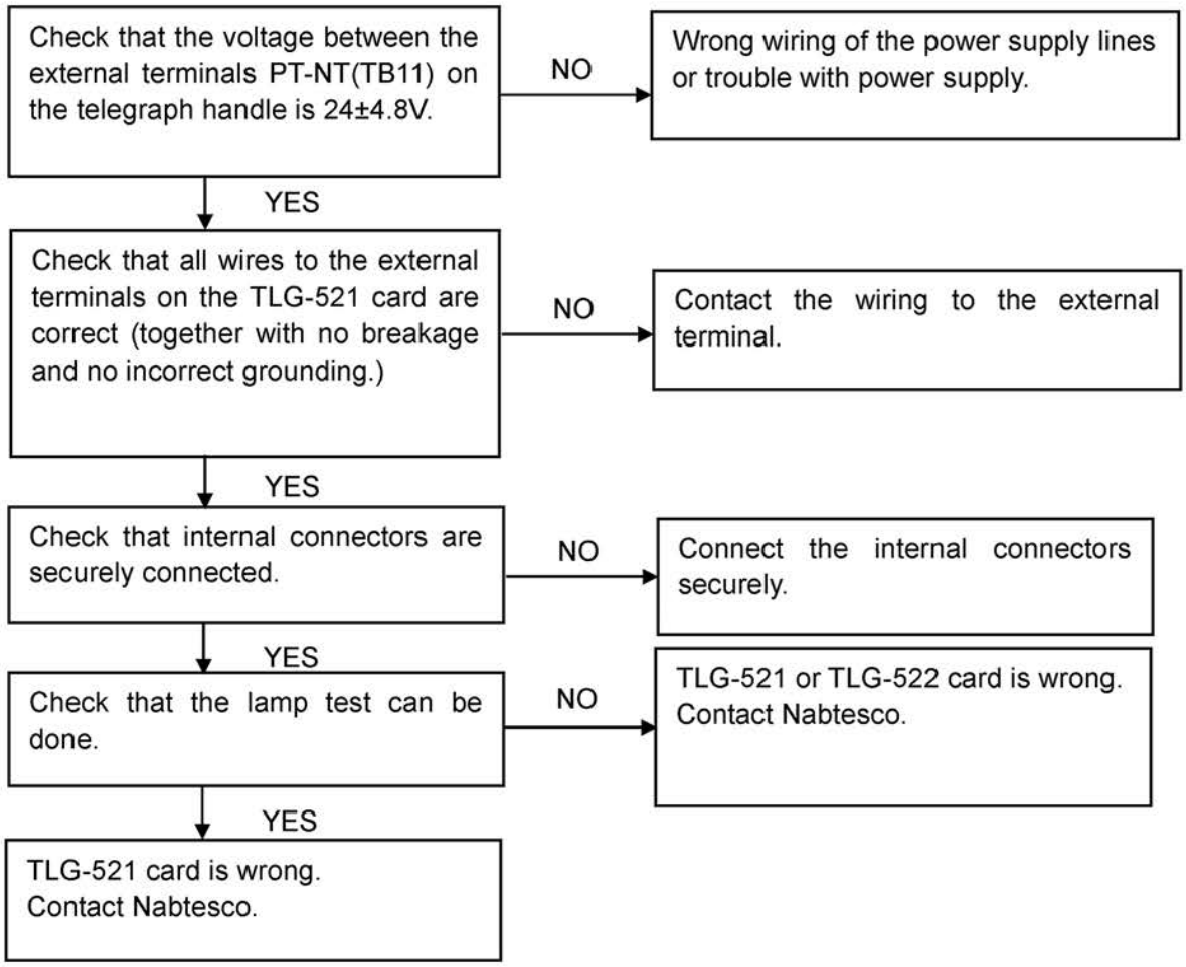
Note) RSW6-C,D Potentiometer Data (Non-adjusted) are only indicated after soft version E of RCP side.

4-2. TLG-522 CARD (Indication Card)

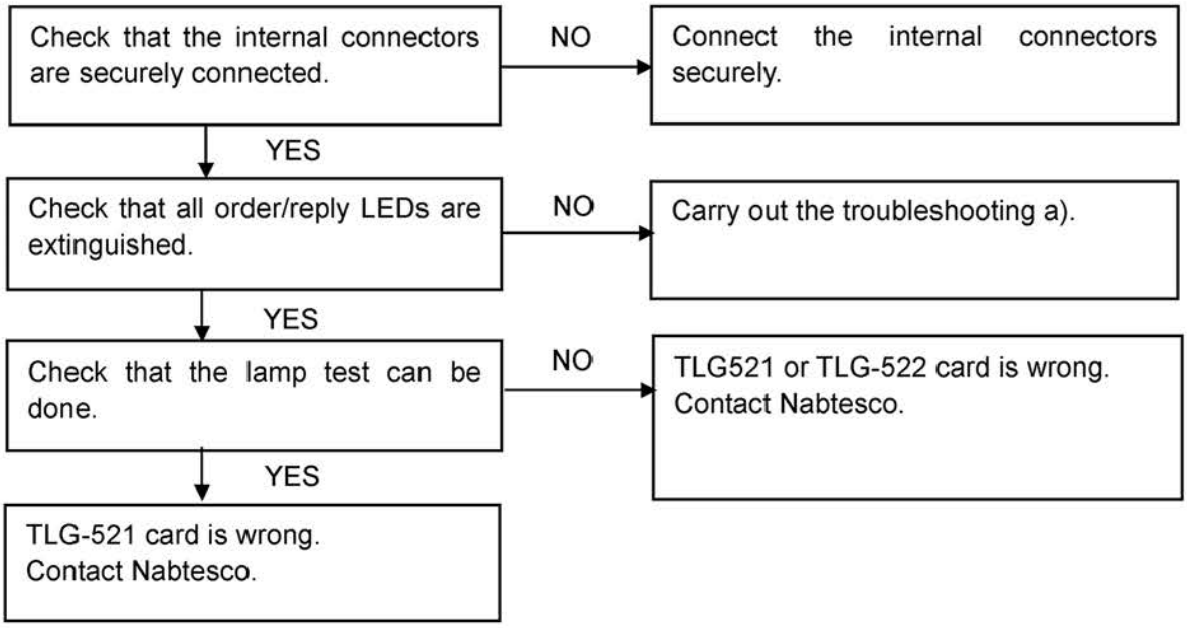
- TLG-522 Card has Main Telegraph division LEDs and 7-segment LEDs for Revolution Indication.
- The power source is supplied from TLG-521 Card via connectors.
  Telegraph power source is supplied for indicating Main Telegraph divisions and REMOCON power source for Revolution Indication.

5. The troubleshooting

a) The transmission order and/or reply divisions is/are not the same as the handle position.



b) The display of the division LED disappears.



c) Gongs and buzzers are continuously sounded although the order and reply indication is good.