

ELECTRICAL SYSTEM

- 20 - 01 GENERAL
- 20 - 02 SERVICE
- CIRCUIT DIAGRAM
- 21 - 01 AIR CONDITION

SAFETY PRECAUTIONS

! WARNING

- Good ventilation is required in welding area.
- Turn off start switch before welding.
- Disconnect battery terminals and remove batteries.
- Detach electronic control unit's cables before welding otherwise serious damage will occur on electronic parts.
- When welding, first remove paint from the welding area. Heated paint gives off harmful gases.
- Do not weld near flammable materials such as polymers, elastomers, flammable fluids. Before you weld components which contains flammable materials, remove them from the welding area.
- Keep handy a fire extinguisher.

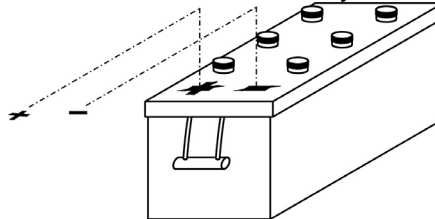
START ENGINE WITH BOOSTER CABLES (JUMP START)

When starting the engine with booster cables, observe the following.

■ **CAUTIONS WHEN CONNECTING/DISCONNECTING THE BOOSTER CABLES**

! WARNING

- When you start the engine with booster cables, wear safety goggles.
- Ensure the positive (+) terminal does not contact the negative (-) terminal when connecting the cables.
- When starting the engine with an other machine, be careful that the normal machine does not touch the disabled machine.
- Prevent sparks around the battery; they could cause battery gases to explode.
- Make sure that the booster cable connections are correct. The last cable is connected to the upper structure, but connect it as far as possible from the battery. (However, do not connect to the attachments).
- When disconnecting the booster cables from the battery, disconnect in the reverse order.



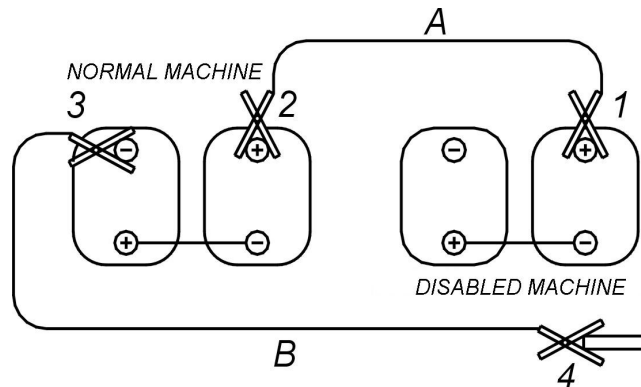
IMPORTANT

- Booster cables and clips should be sized according to the battery capacity
- Use the same capacity battery and system voltage as the disabled machine
- Do not use corroded or damaged cables and clips
- Connect the clips firmly

■ CONNECTING BOOSTER CABLE

Turn the start switch to STOP position, and connect the booster cables in numbering order shown in the figure.

- 1) Turn the start key of disabled machine and normal machine to STOP position.
- 2) Connect clip (1) of booster cable (A) to the battery positive (+) terminal of the machine to be boost started.
- 3) Connect clip (2) to the battery positive (+) terminal of the engine which is running.
- 4) Connect clip (3) of booster cable (B) to the battery negative (-) terminal of the engine, which is running.
- 5) Connect clip (4) to the upper structure of the machine to be boost started



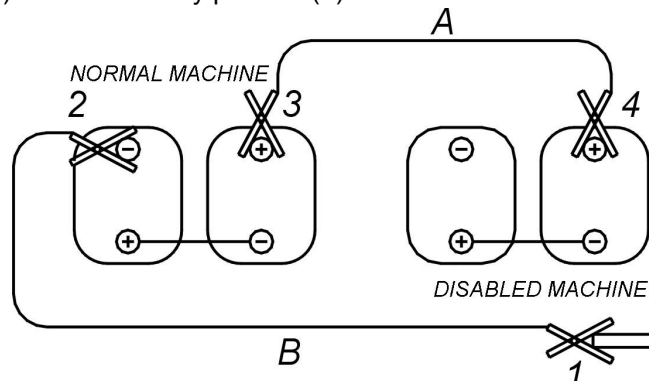
■ STARTING THE ENGINE

- 1) Make sure the clips are firmly connected to battery terminals.
- 2) Turn the key switch of normal machine to START position, and start the engine.
- 3) Turn the key switch of disabled machine to START position, and start the engine. If the engine does not start within 30 seconds, wait for 2 minutes between cranking attempts.

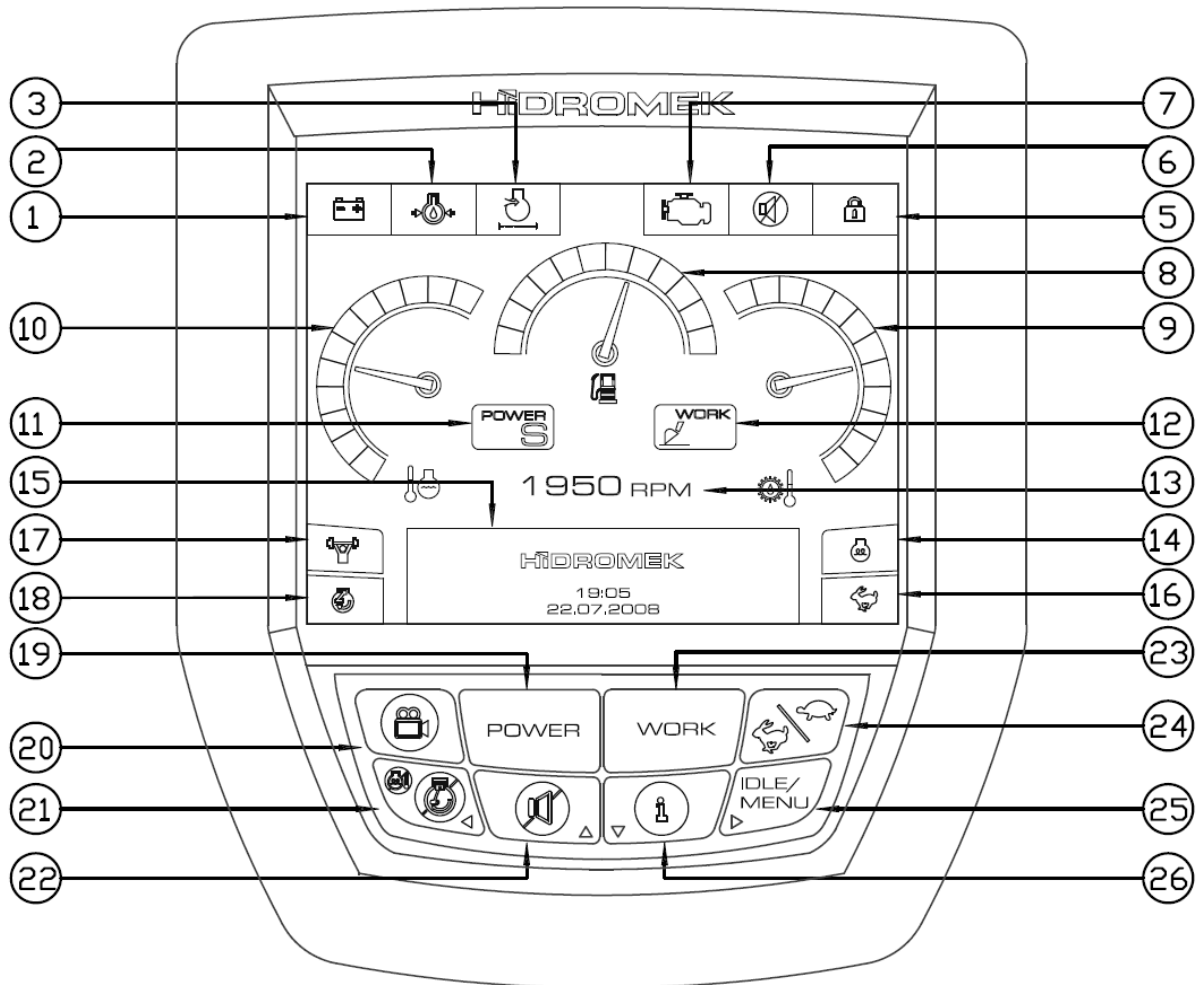
■ DISCONNECTING THE BOOSTER CABLES

After the engine has started, the booster cables must be disconnected in the reverse order.

- 1) Disconnect clip (1) of booster cable (B) from the upper structure.
- 2) Disconnect clip (2) from the battery negative (-) terminal of the running engine.
- 3) Disconnect clip (3) of booster cable (A) from the battery positive (+) terminal of the running engine.
- 4) Disconnect clip (4) from the battery positive (+) terminal of the machine which was boost started.



INSTRUMENT PANEL



- | | |
|--|---|
| 1. "Battery charge" indicator | 16. "Low/high speed travel" indicator |
| 2. "Engine oil pressure low" indicator | 17. "Power boost" indicator |
| 3. "Air filter clogged" indicator | 18. "Auto idle" indicator |
| 5. "Locked safety lever" indicator | 19. "Power mode selection" switch |
| 6. "Buzzer" indicator | 20. "Camera ON/OFF" switch (optional) |
| 7. "Engine error" indicator | 21. "Auto idle stop / auto warm up stop / exit / NO" switch |
| 8. "Fuel level" gauge | 22. "Buzzer stop / scroll up" switch |
| 9. "Hydraulic oil temperature" gauge | 23. "Work mode selection" switch |
| 10. "Engine temperature" gauge | 24. "Low / high speed selection" switch |
| 11. "Power mode" gauge | 25. "One touch idle / menu / enter / YES" switch |
| 12. "Work mode" gauge | 26. "Information screen selection / scroll down" switch |
| 13. RPM display | |
| 14. "Glow plugs active" indicator | |
| 15. Message and Error Display Area (MED) | |

Functions of Instrument Panel

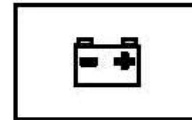
Switchboard consists of three parts

- Indicator part
- The part that displays operating functions
- Switch part

Indicators

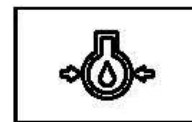
"Battery charge" indicator

Comes on when the voltage from the battery falls and simultaneously displays "CHARGING ERROR" on MED.



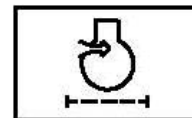
"Engine oil pressure low" indicator.

Comes on when the engine oil pressure is below the correct level or when the engine oil filter clogged. Simultaneously "LOW OIL PRESSURE" displays on MED.



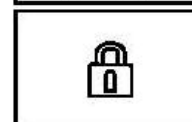
"Air filter clogged" indicator

Comes on when the air filter element clogged.



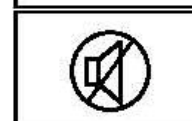
"Locked safety lever" indicator

Displays when safety-locking lever is pulled and locked.



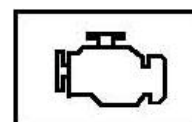
"Buzzer" indicator

Buzzer alarm comes on in case of breakdown.



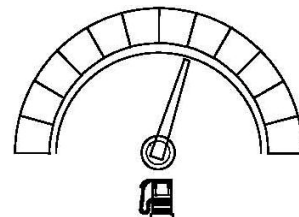
"Engine error" indicator

If engine failure occurs this symbol appears on instrument panel and simultaneously error code is displayed on MED.



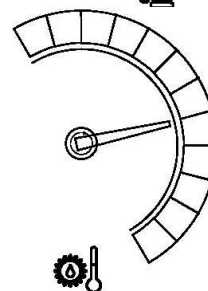
"Fuel level" gauge

Shows fuel level.



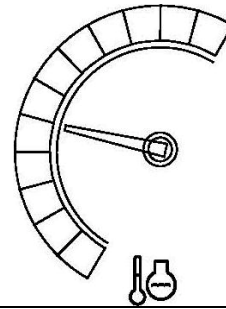
"Hydraulic oil temperature" gauge

- Shows hydraulic oil temperature level.
- Error message appears with buzzer sound on MED when hydraulic oil temperature is higher than desired temperature.



“Engine temperature” gauge

1. Shows engine coolant temperature level.
2. “HIGH TEMPERATURE” message appears with buzzer sound on MED when coolant temperature is higher than desired level.
3. “LOW WATER LEVEL” message appears with buzzer sound on MED water level in reservoir tank is lower than desired level.

**⚠ WARNING**

Cooling water becomes extremely hot after the engine is run for some time. Do not open the cap until the radiator cools down. Turn the cap slowly to release the inner pressure and then open the cap.

“Power mode” gauge

Shows which power mode is selected. The machine has four different power modes.

F (Fine Mode): For fine control operations. Operator uses this mode when the load is to be positioned accurately and with controlled movements.

E (Economy Mode): For light digging and loading operations where fuel economy is the priority.

P (Power Mode) : For general digging and loading operations where performance is as important as fuel economy.

HP (High Power Mode) : For heavy load operations and operations which need high speed and power. Productivity is the priority and fuel consumption is secondary.

**⚠ WARNING**

Use F mode for safety while loading/unloading machine or lifting objects.

“Work mode” indicator

Shows working mode selected. Four different work modes can be set on control panel: Digging, Trenching, Breaker, and Optional Attachment.

**RPM Display**

Displays engine RPM.

“Glow plugs active” indicator

The indicator light comes ON when the glow plugs on the cylinder heads are running. If any breakdown occurs, indicator displays with buzzer sound.

(For detail see 12.2.2)

1 900 RPM

**Message and error display area (MED)**

It shows messages and errors when breakdown occurs.
(For details call authorized HIDROMEK service)

**“High speed travel” indicator**

Comes ON when the operator selects high speed traveling mode on the control panel.

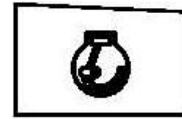
**“Power boost” indicator**

Comes ON when high power function is ON.



“Auto Idle” indicator

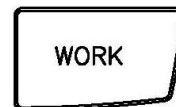
Comes ON when machine operates at auto idle mode.

**Switches*****“Power mode selection” switch***

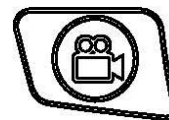
Press to browse and select between available power modes.

***“Work mode selection” switch***

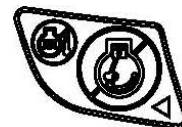
Press to browse and select between available work modes.

***“Camera ON / OFF” switch (optional)***

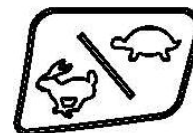
When pressed “rear view camera” is displayed, if pressed again “arm camera” is displayed. On third press it returns to main screen.

***“Auto idle stop / Auto warm-up stop / Exit / NO” switch***

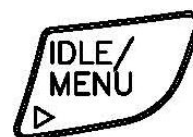
1. Cancels auto idle function
2. Cancels auto warm-up by pressing 3 seconds
3. Exits actual menu and goes to upper menu when working in control system menu mode
4. Function as “NO” button when using menu

***“Low / high speed selection” switch***

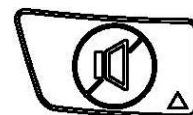
Switch for controlling low / high travel speed of vehicle. If high speed is selected rabbit symbol, if low speed selected tortoise symbol is displaced on the screen.

***“One touch idle / menu / enter / YES” switch***

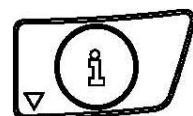
1. Switch to return immediately to the first idle by one touch
2. Switch to enter menu when pressed for 3 seconds
3. Function as “ENTER” button on menus
4. Function as “YES” button on menus

***“Buzzer stop / scroll up” switch***

1. Switch to cancel buzzer.
2. Switch to browse a menu item by scrolling up in the control menu page.

***“Information screen selection / scroll down” switch***

1. Switch to select information screen.
2. Switch to browse a menu item by scrolling down in the control menu page.



MENU ITEMS

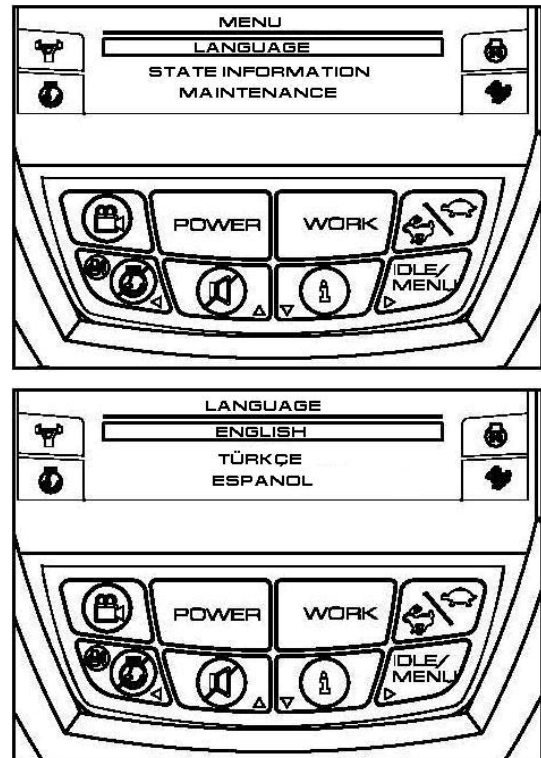
Enter the control menu by pressing menu switch for 3 seconds; menu is displayed on MED. The main menu includes 7 sub-menus.

1. Language
Use this menu to choose your preferred language among the available options.
2. State Information
Press to see current operational parameters such as temperatures, pressures, fuel consumption, current etc.
3. Periodic Maintenance
Hours left for the next maintenance, last maintenance hours and maintenance period can be viewed. Additionally, maintenance hours can be updated and maintenance periods can be changed.
4. Operating Hours
26 different types of operating hours can be registered and viewed.
5. Settings
Breaker and optional attachment flow values can be adjusted and active attachment can be selected. Date-time, camera function, auto idle and backlight level of the screen can be adjusted. User can assign a password and change the request period. Seven types of setting can be done.
6. Failures
Up to 258 current and previous failures registered in the memory can be viewed.
7. Machine Information
Instrument panel and machine control unit version can be viewed.

Language

To set your preferred language, perform the followings.

1. Select "Language" item by using item selection switches (▲/▼).
2. Move the cursor by item selection switches (▲/▼) to highlight the desired language.
3. When the cursor is on desired language, press "enter" switch (►).
4. To exit from the menu, press "menu page exit" switch (◄).

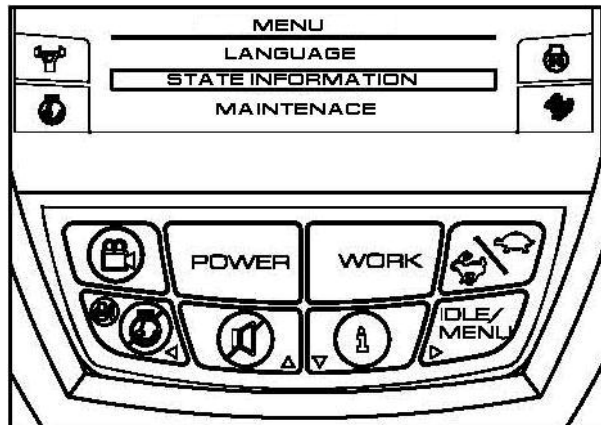


State Information

To view the state information contents follow these steps.

1. Move the cursor (▲/▼) to find "state information".
2. When the cursor is on "state information", press "enter switch" (►).

State information menu has six pages and every page has six different information items. To enter each page, select the item by SCROLL switches (▲/▼) and press IDLE/MENU.



On page 1/6

PV-I : Instant proportional valve current

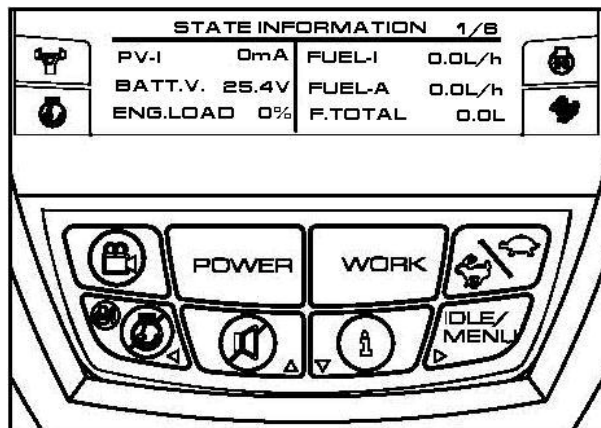
BATT.V. : Instant battery voltage

ENG.LOAD: Instant engine load by %.

FUEL-I: Instant fuel consumption.

FUEL-A: Average fuel consumption after trip.

F.TOTAL: Total fuel consumption after trip is reset.



On page 2/6

P1: First pump pressure.

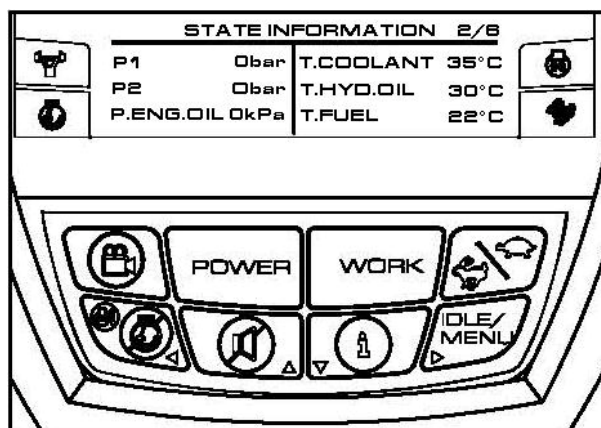
P2: Second pump pressure.

P.Eng.Oil: Engine oil pressure

T.Coolant: Coolant temperature

T.Hyd.Oil: Hydraulic oil temperature.

T.Fuel: Fuel temperature on feed pump



On page 3/6

P.Baro: Atmosphere pressure

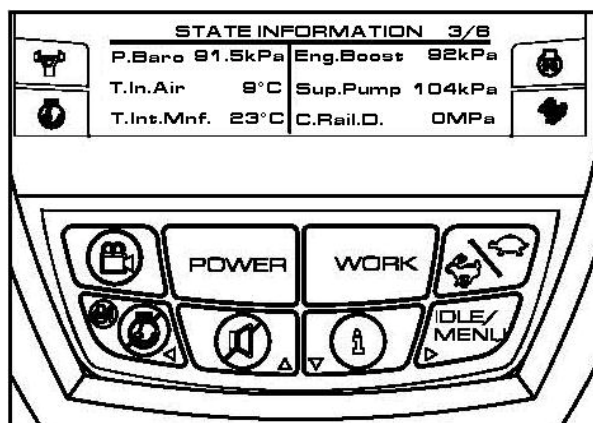
T.In.Air: Turbocharger inlet air temperature.

T.Int.Manifold: Engine intake manifold air temperature.

Eng.Boost: Air pressure from turbocharger to engine

Sup.Pump.: Electromagnetic fuel supply pump pressure

C.Rail.D.: Pressure difference on common rail.



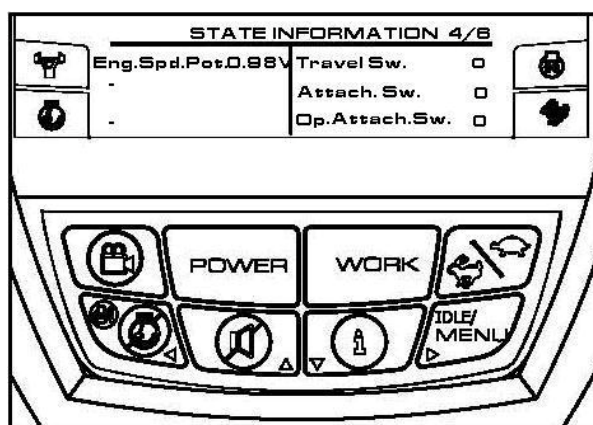
On page 4/6

Eng.Spd.Pot.: Voltage from throttle control dial.

Travel Sw.: Shows if machine travels or not. If travels, it indicates 1. If not, it indicates 0.

Attach.Sw.: Shows if attachments are operated or not. If operated, it indicates 1. If not, it indicates 0.

Op.Attach.Sw.: Shows if optional attachment pedal (or button-located on joystick) is activated or not. If activated, it indicates 1. If not, it indicates 0.



On page 5/6

Preheat Relay: Shows if glow plugs relay operates or not. If operates, it indicates 1. If not, it indicates 0.

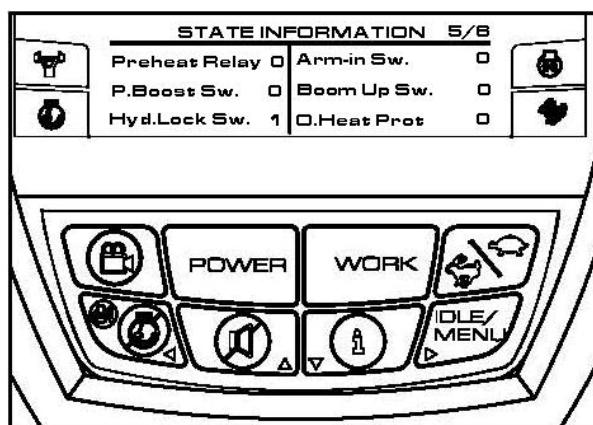
P.Boost Sw.: Shows if power boost switch operates or not. If operates, it indicates 1. If not, it indicates 0.

Hyd.Lock Sw.: Shows if safety lock lever locked or not. If locked, it indicates 1. If not, it indicates 0.

Arm-in Sw.: Shows if left lever is pulled at least 2/3 of its stroke and arm moves inwards. If operated, it indicates 1. If not, it indicates 0.

Boom-up Sw.: Shows if right lever is pulled at least 2/3 of its stroke and boom moves up. If operated, it indicates 1. If not, it indicates 0.

O.Heat Prot.: Shows over heat protection state. If there is no over heat, it indicates 0. If over heat function operates, it indicates 1.



On page 6/6

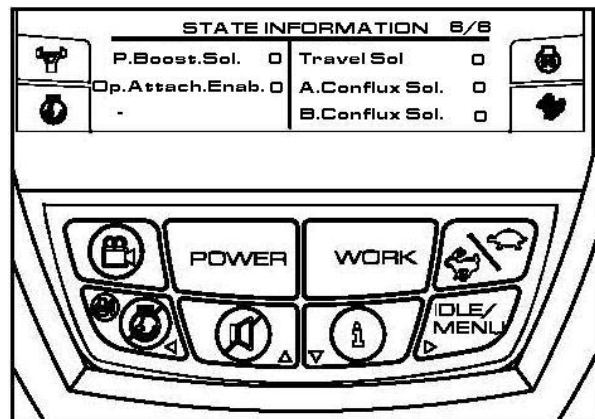
P.Boost Sol.: Shows power boost solenoid operating state. If operates, it indicates 1. If not, it indicates 0.

Op.Attach.Enab.: Shows if optional attachment is activated from the instrument panel or not. If activated, it indicates 1. If not, it indicates 0.

Travel Sol.: Shows if travel solenoid operates or not. If operates, it indicates 1. If not, it indicates 0.

A.Conflux Sol.: Shows if arm conflux solenoid operates or not. If operates, it indicates 1. If not, it indicates 0.

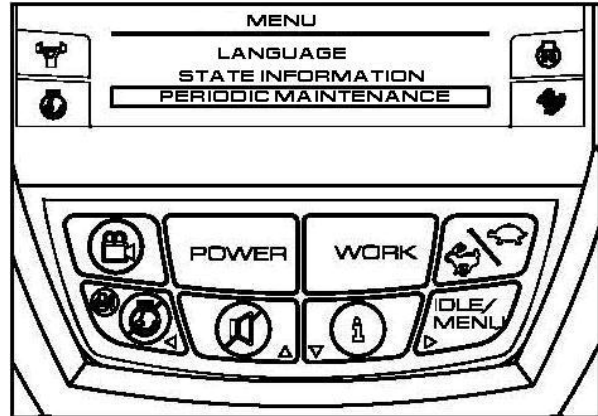
B.Conflux Sol.: Shows if boom conflux solenoid operates or not. If operates, it indicates 1. If not, it indicates 0.



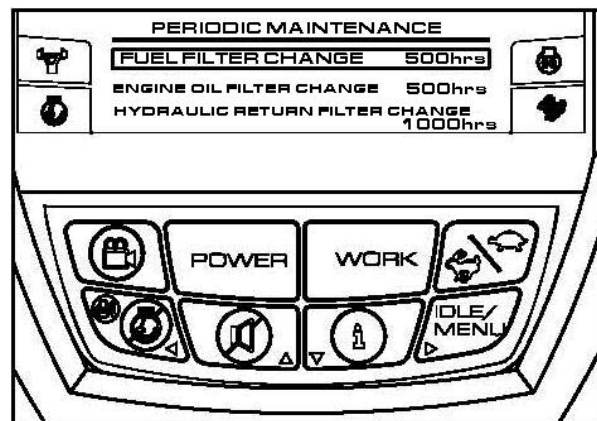
Periodic Maintenance

Periodic maintenance menu covers various maintenance issues that differ according to the type of the machine. Operator can register any maintenance activity that he performed and update the control menu. If it is not updated, machine will buzz and update message will display on MED. To view and update periodic maintenance, follow steps.

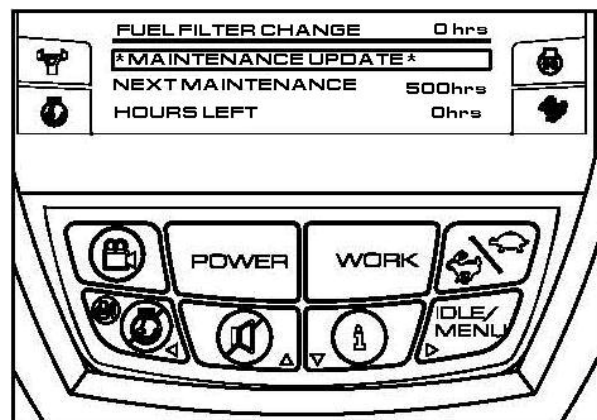
1. Select "Periodic Maintenance" item by using up or down scroll switches (▲/▼).
2. Press "enter" switch (►) to enter.



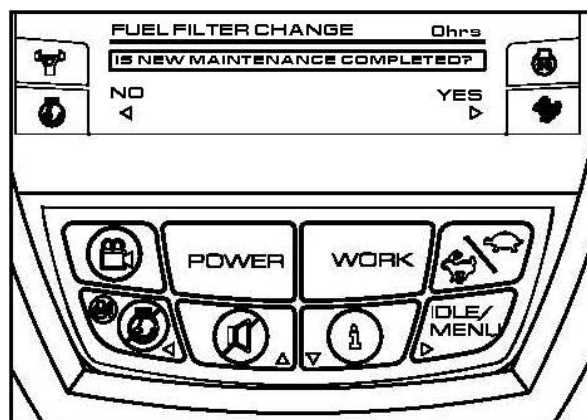
3. When you enter periodic maintenance menu, periodic maintenance list will be displayed on MED.
4. Move cursor (▲/▼) to find the desired periodic maintenance item according to the maintenance type on your machine.
5. Press "enter" switch (►) to enter maintenance type.



6. When *PERIODIC MAINTENANCE TIME UPDATE* is highlighted and IDLE/MENU (►) switch is pressed, the operator will be asked on MED to approve if "new maintenance is completed".



7. Press "YES" (▶), to update the maintenance time. If it is not wanted to update, press "NO" (◀).



Before 20 hours to the periodic maintenance, a notification message is displayed on the screen. And a wrench symbol comes on the top of the screen. After maintenance period ends, the system continues displaying the message for another 50 hours. After only the wrench symbol is displayed. In the periodic maintenance list, oncoming, current and elapsed maintenances are displayed with different colors.

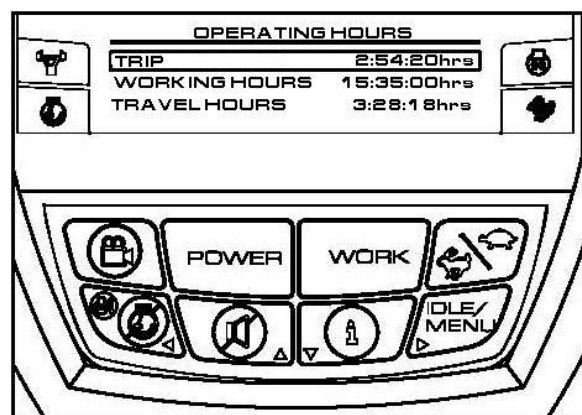
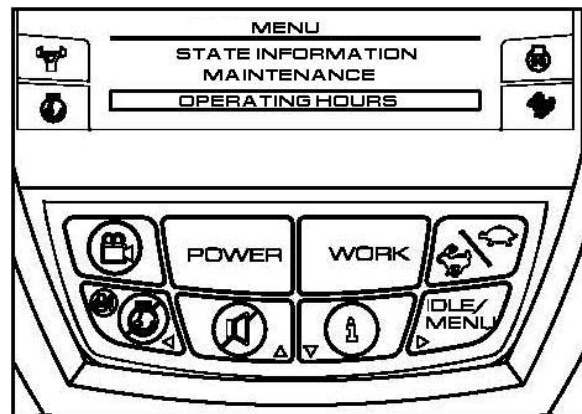
Operating Hours

The following Operating Hours can be selected on the control panel. Only trip hours can be changed, others are not adjustable.

TRIP	00:00:00	STARTER ON HOURS	00:00:00
WORKING HOURS	00:00:00	LOW IDLE HOURS	00:00:00
TRAVEL HOURS	00:00:00	1000-1099 RPM HRS	00:00:00
ATTACHMENT HOURS	00:00:00	1100-1199 RPM HRS	00:00:00
BREAKER HOURS	00:00:00	1200-1299 RPM HRS	00:00:00
OP. ATTACH.-2 HRS	00:00:00	1300-1399 RPM HRS	00:00:00
DIGGING HOURS	00:00:00	1400-1499 RPM HRS	00:00:00
TRENCHING HOURS.	00:00:00	1500-1599 RPM HRS	00:00:00
MODE-E HOURS	00:00:00	1600-1699 RPM HRS	00:00:00
MODE-P HOURS	00:00:00	1700-1799 RPM HRS	00:00:00
MODE-HP HOURS	00:00:00	1800-1899 RPM HRS	00:00:00
MODE-F HOURS	00:00:00	1900-1999 RPM HRS	00:00:00
MANUAL MODE HOURS	00:00:00	2000-... RPM HRS	00:00:00

To view operating hours items, follow the steps.

1. Enter the menu by pressing the menu switch (►) for three seconds.
2. Move cursor (▲/▼) to select the "operating hours" menu and press IDLE/MENU (►) to enter.
3. Move cursor (▲/▼) to select the desired operating hour item.
4. To exit the menu, press "menu page exit" switch (◄).

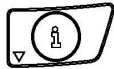


Resetting the Trip Hour

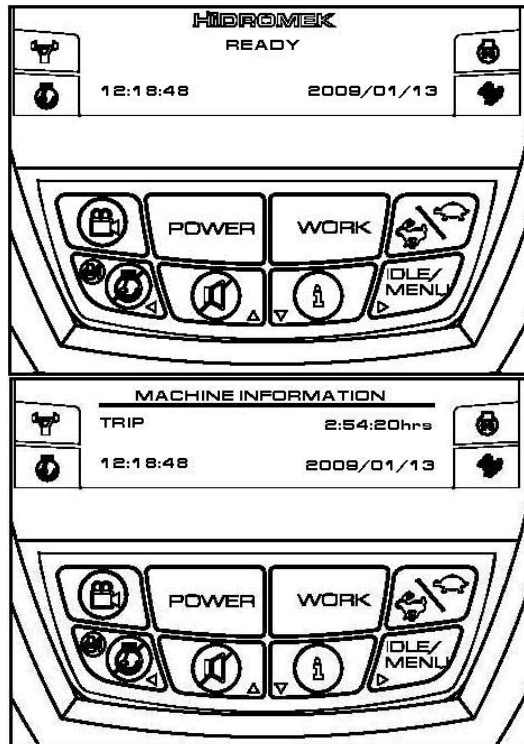
The trip hour function counts the operating hours starting from a pre-set point of time. The trip hour can be reset by the operator. To reset the trip hour do the following steps.

1. Turn the starter key to "ON" position.
2. Wait until "READY" message is displayed in the screen.

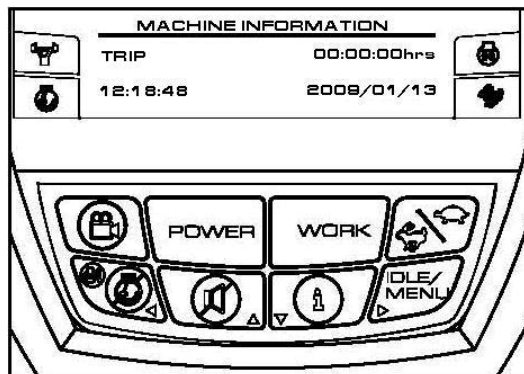
3. Press "information screen selection switch"



to view the trip hour.



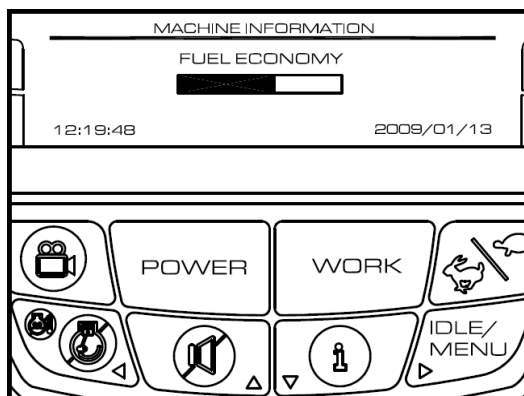
4. To reset "users hour" press "information screen selection switch" continuously.
5. Press the "information screen selection switch" twice to exit the page.



Fuel Economy

While main screen is displayed, press information

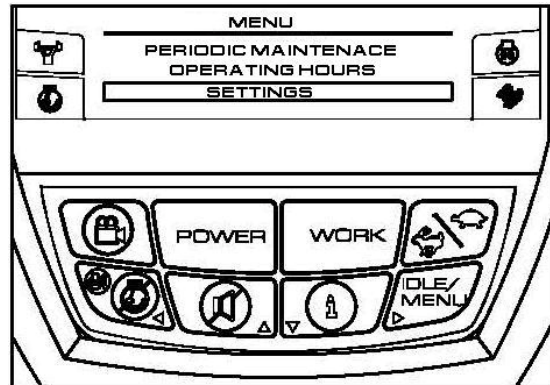
button  twice to see fuel economy screen. Fuel consumption can be followed and optimal operation can be experienced.



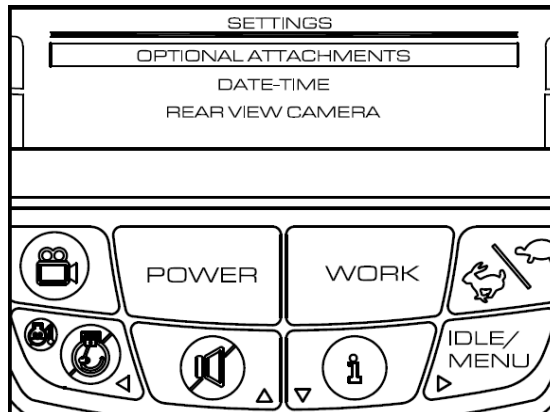
Settings

The “SETTINGS” menu under the main menu allows the operator to set seven different functions.

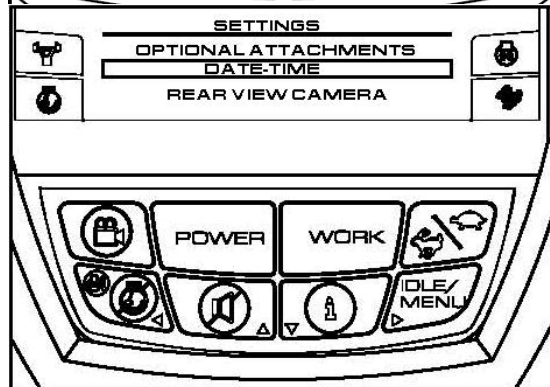
- Optional Attachments
- Date-time
- Rear View Camera
- Arm View Camera
- Auto Idle Times
- Display backlight level
- Password

*Optional Attachments*

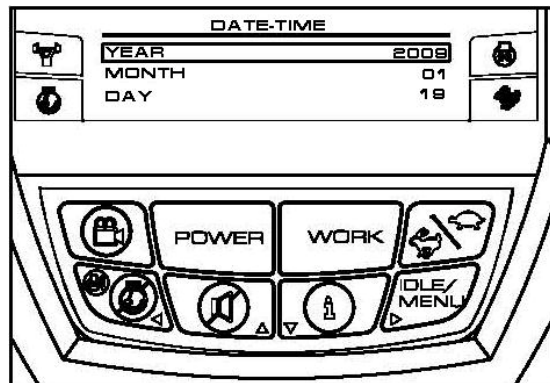
See “Hydraulic Breaker” and “Optional Attachment 2” section in chapter “Working Equipment and Optional Attachments”.

*Date-Time Setting*

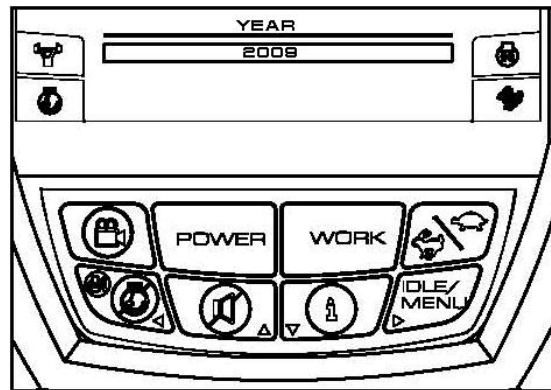
1. Select “Settings” item and enter (▶) key to set date-time. Move cursor (▲/▼) to find “date-time” and enter (▶) to set the correct date and time.



2. When the cursor is on desired item, enter (▶) to set.



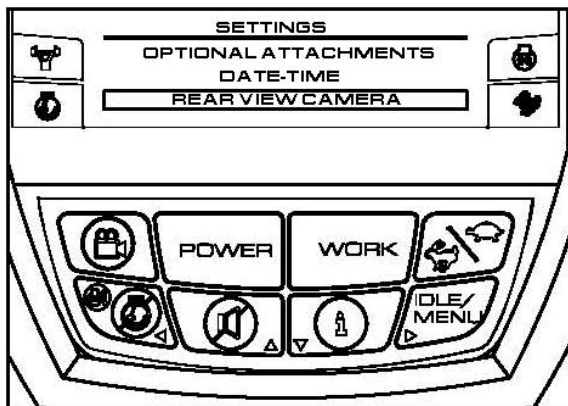
3. To change the number use item selection switch (▲/▼).
4. When the item is updated, press exit switch (◀) to approve the updated number.



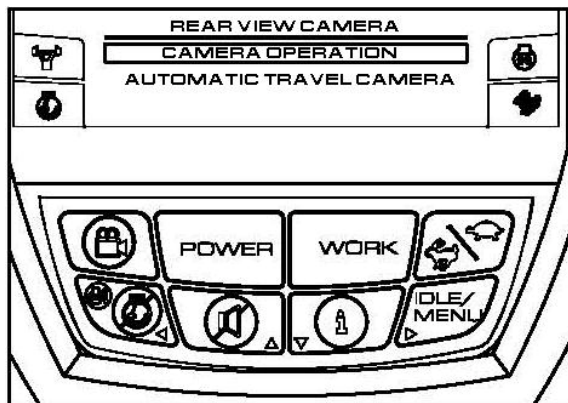
Turning the Camera ON (Optional)

Camera is optional for this machine. Perform the following steps to start the camera if equipped.

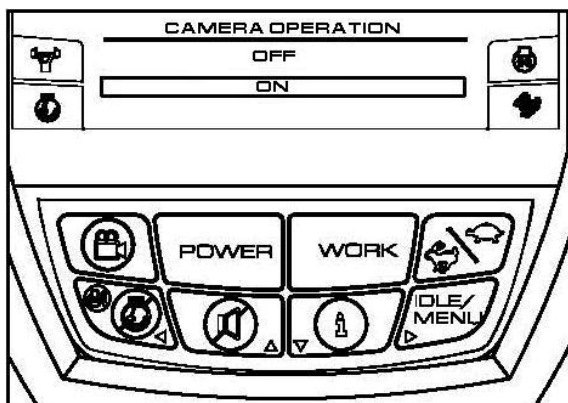
1. Enter settings (▶) from control menu and move (▲/▼) cursor to select "rear view camera" or "arm view camera" as appropriate. When the cursor is on desired item, enter (▶) item for settings.



2. To start the "Rear View Camera" or "Arm View Camera" select "CAMERA OPERATION" and enter (▶).

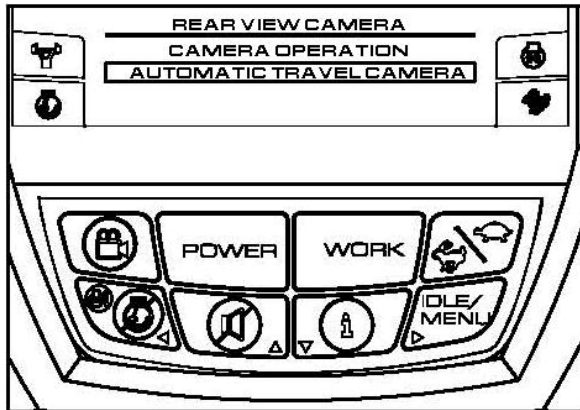


3. Select "ON" and enter (▶) to operate the camera.
4. Press EXIT key (◀) to approve your choice.

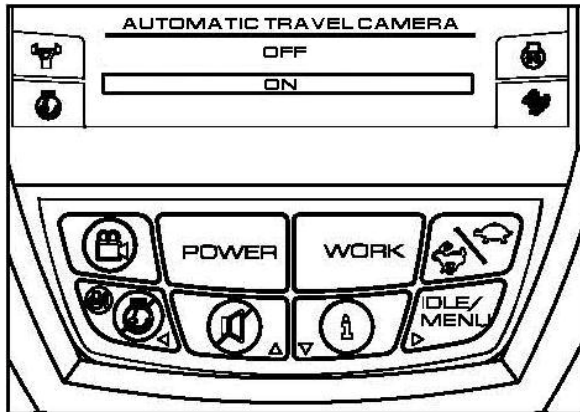


When AUTOMATIC TRAVEL CAMERA is activated, the camera view of camera is displayed on the screen only when the machine is in travel mode. Camera view is not displayed on the screen during digging operation.

5. To operate "AUTOMATIC TRAVEL CAMERA", move (▲/▼) cursor and enter (►) the item.



6. Move (▲/▼) cursor to "ON" and enter (►) to activate "AUTOMATIC TRAVEL CAMERA".

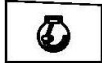


Auto-Idle Times Settings

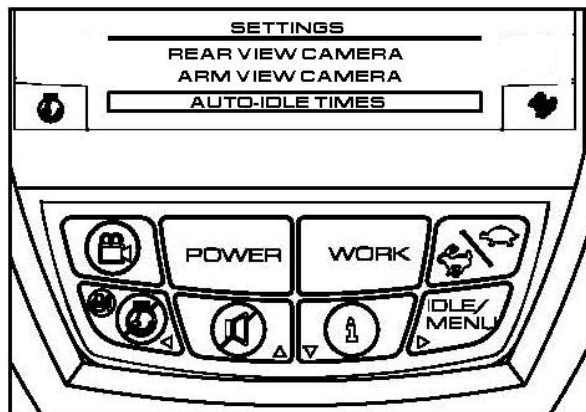
For the AUTO IDLE TIMES function to take effect, AUTO IDLE must be activated. To activate or deactivate auto idle "press AUTO

IDLE STOP" switch



. When auto idle is activated, auto idle  symbol will be indicated on the left-bottom part of the instrument panel. Do the following steps to set auto idle times.

1. Enter "SETTINGS" sub-menu from the main menu. Move (▲/▼) cursor to select "AUTO-IDLE TIMES" and enter (►) to view preset time levels.



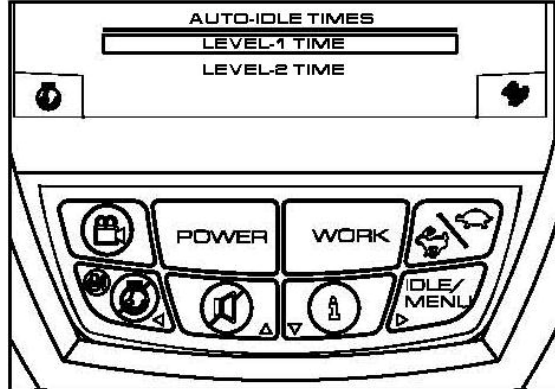
2. There are two preset time levels.

Auto-Idle time is set to allow operator a time before the engine speed is decreased to IDLE speed during when the attachments are not controlled.

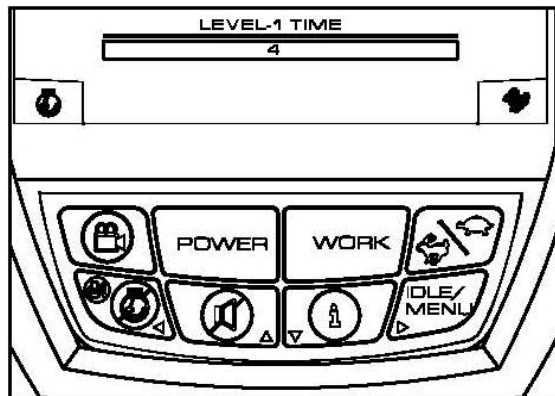
LEVEL-1 TIME: AUTO-IDLE time can be set at any value between 3 seconds to 30 seconds.

LEVEL-2 TIME: AUTO-IDLE time can be set at any value between 20 seconds to 250 seconds.

3. Select "LEVEL-1 TIME" or "LEVEL-2 TIME" by pressing "enter switch" (►).



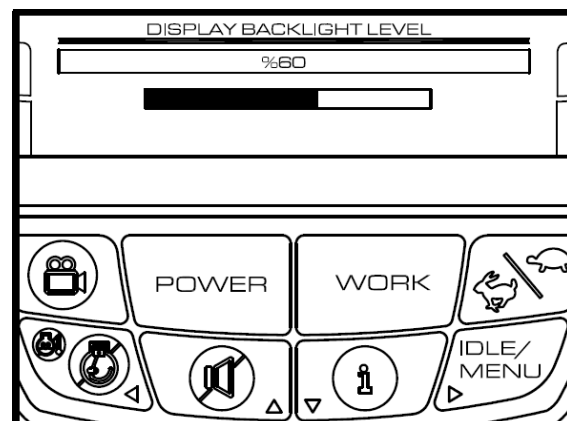
4. Press "UP" switch (▲) to increase (▲) and press "DOWN" switch (▼) to decrease auto idle time.



5. To approve the desired time value press "exit switch" (◀).

Display Backlight Level

1. To increase the backlight level of the screen press (▲) button and to decrease the backlight level press (▼) button.



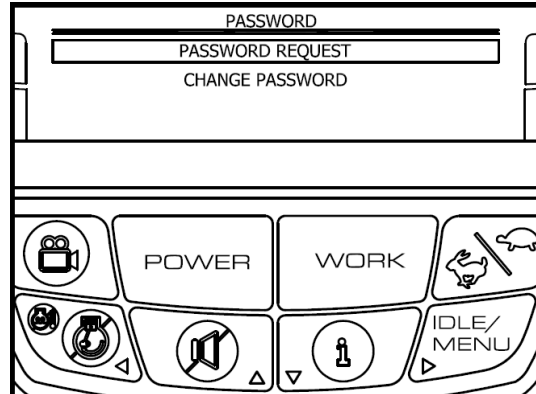
Password

There is a password security system in your machine against unauthorized start of engine.

1. Password request

If you want to turn the password protection on you must set a value on this menu. You will be prompted to enter your password in order to start the engine. Prompting will be according to the period you have selected from this menu. Select one of the periods below.

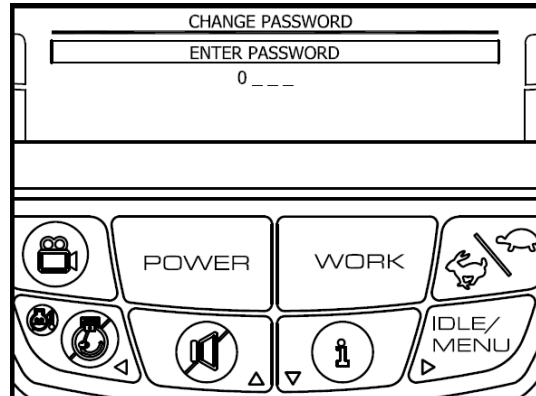
- NEVER
- ALWAYS
- EVERY 1 HOUR
- EVERY 12 HOURS
- EVERY 24 HOURS

**2. Change Password**

After entering the change password menu you will be asked for the current password of your machine. Factory default of the password is "0 0 0 0". Enter your password by selecting the digits by pressing up (▲) and down (▼) buttons.

Press "Enter"  button after entering every digit. After entering current password you will be asked for a new password.

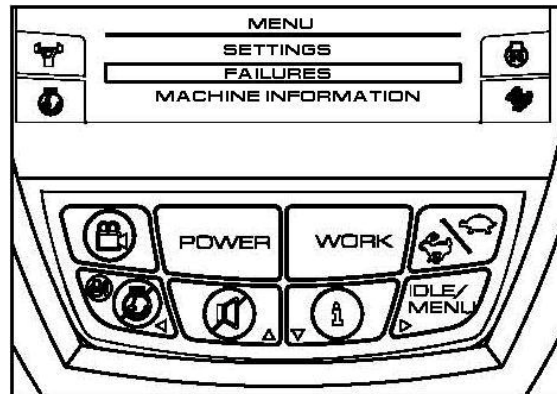
Enter a new password in the same way and you will be prompted to enter the password again for verification. Enter the password again correctly and your new password is set.



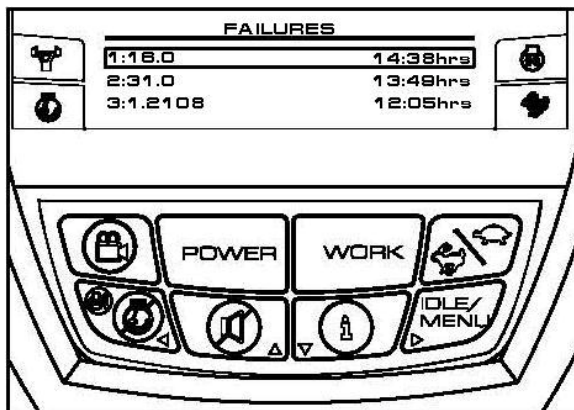
Failures

Previously registered failures can be viewed by entering "FAILURES" sub-menu. Instrument panel can save 258 failures in its memory. To view previous failures enter menu and follow the below steps.

1. Move (▲/▼)cursor to select "FAILURES" and enter (►) to view.

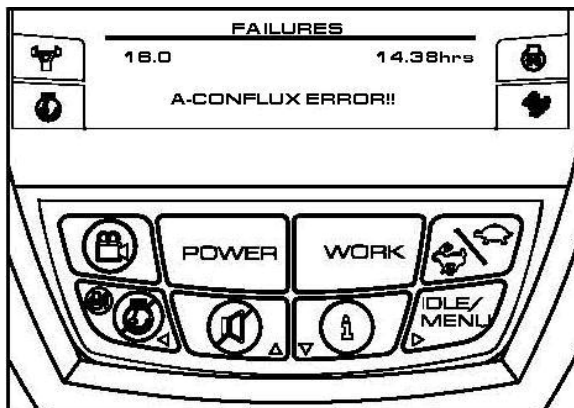


2. Failure codes are displayed the left hand side of the screen and error times are displayed on the right hand side of the screen.



3. Highlight the error code you are interested in and enter (►)to view description of the error.

4. To exit the page, press "EXIT" switch (◀).

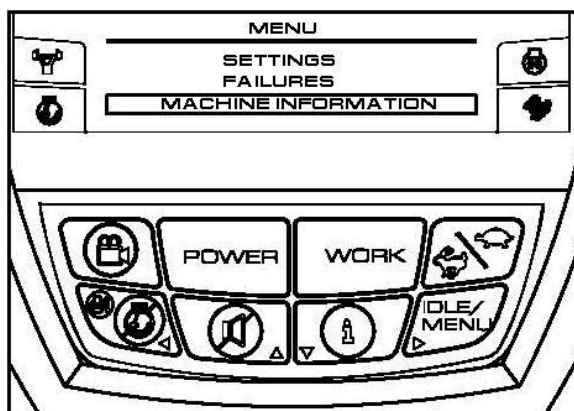


Machine Information

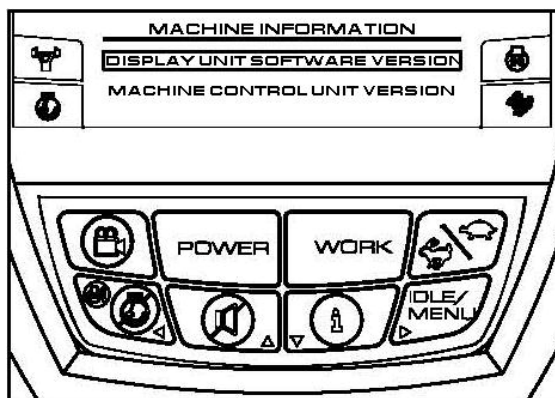
“MACHINE INFORMATION” menu includes;

- Display Unit Software Version
Information about instrument panel software version, machine type, engine type, and instrument panel type
- Machine Control Unit (MCU) Version
Information about MCU version, machine type, engine type, and MCU type

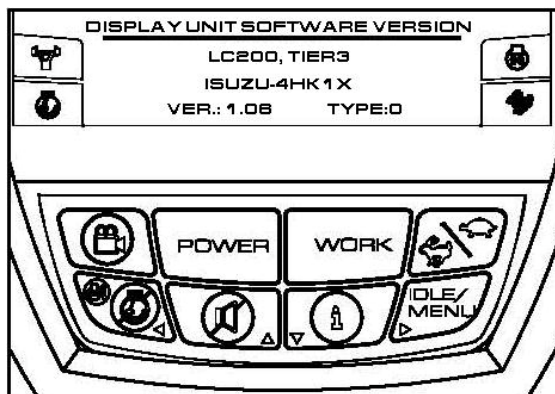
To view machine information, enter (►) menu and follow steps.



1. Move (▲/▼) cursor to the desired information item and enter (►) to view.



2. To exit the page press “exit switch” (◀).



START SWITCH

This switch is used to start, run or stop the engine.

- "OFF" position

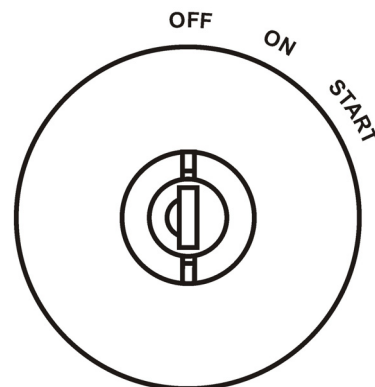
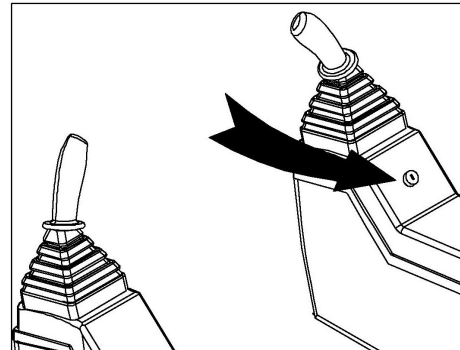
The start switch key can only be inserted or pulled out in the OFF position. The electric circuit to the system is cut-off.

- "ON" position

The electric circuit to the engine is ON. Leave the key in this position after starting. The electrical system is ON and accessories such as interior lamp, fuel filler pump, cigar lighter, car stereo are functional but engine stops.

- "START" position

Used to start the engine. Release the key immediately after starting. The key returns to "ON" position.



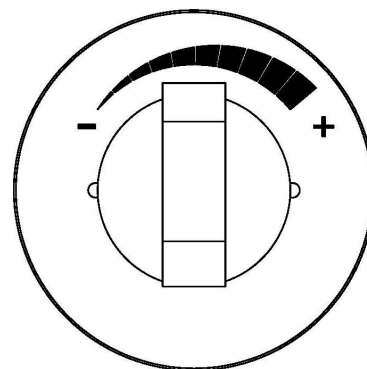
THROTTLE CONTROL DIAL

Throttle control dial is placed on right console.

Dial controls the engine speed manually. Turn in plus (+) direction to increase the engine speed; turn in opposite direction to reduce the speed.

(+) High idle

(-) Low idle

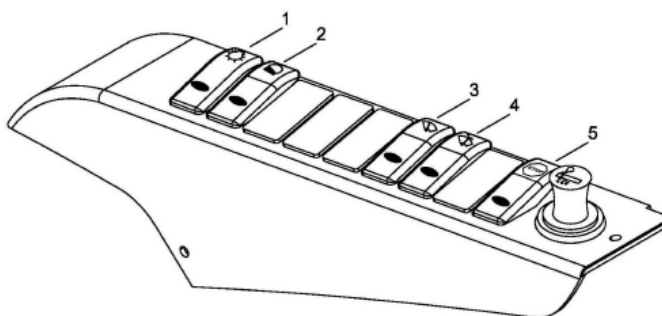


WARNING

Do not suddenly shut off the engine when operating at high speed. First, rotate dial to low speed to allow the engine and turbocharger speeds to stabilize, and then shut it off.

SWITCHES

1. Low beam switch
2. Working lamp switch
3. Wiper motor switch
4. Washer pump switch
5. Engine emergency stop switch



Low beam switch

Switch for low beam.

Working lamp switch

Switch for lighting working lamp.

Wiper motor switch

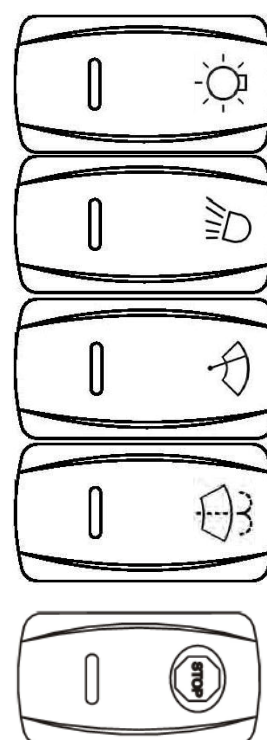
Switch for operating wiper motor.

Washer pump switch

Switch for ejecting the window washer liquid.

Engine emergency stop switch

Use this switch if the engine can not be shut and only in case of an emergency situation to stop the engine immediately.



LIGHTER

Press it down, and in a few seconds it will return to the original position. At this moment, it is ready to use.

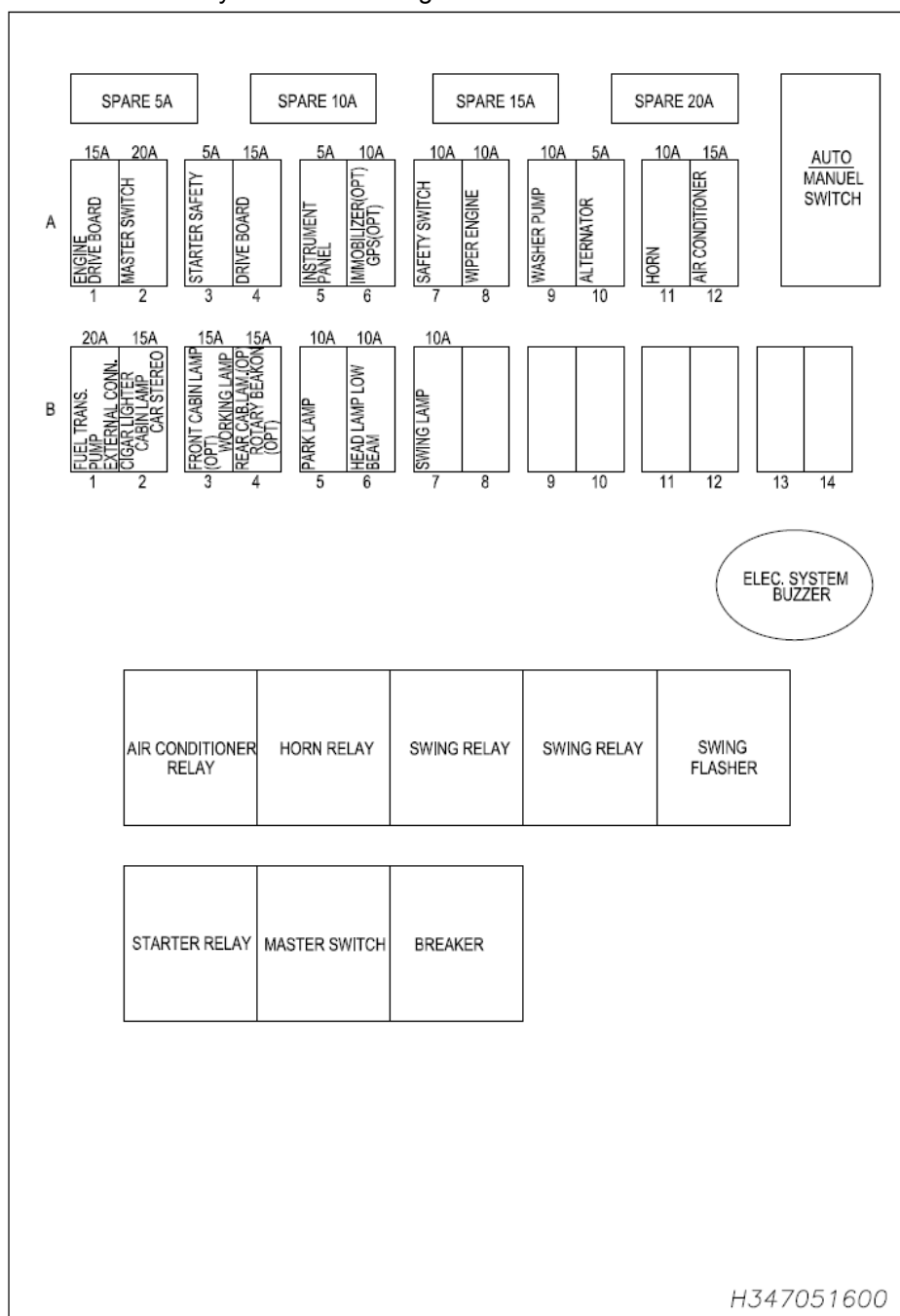


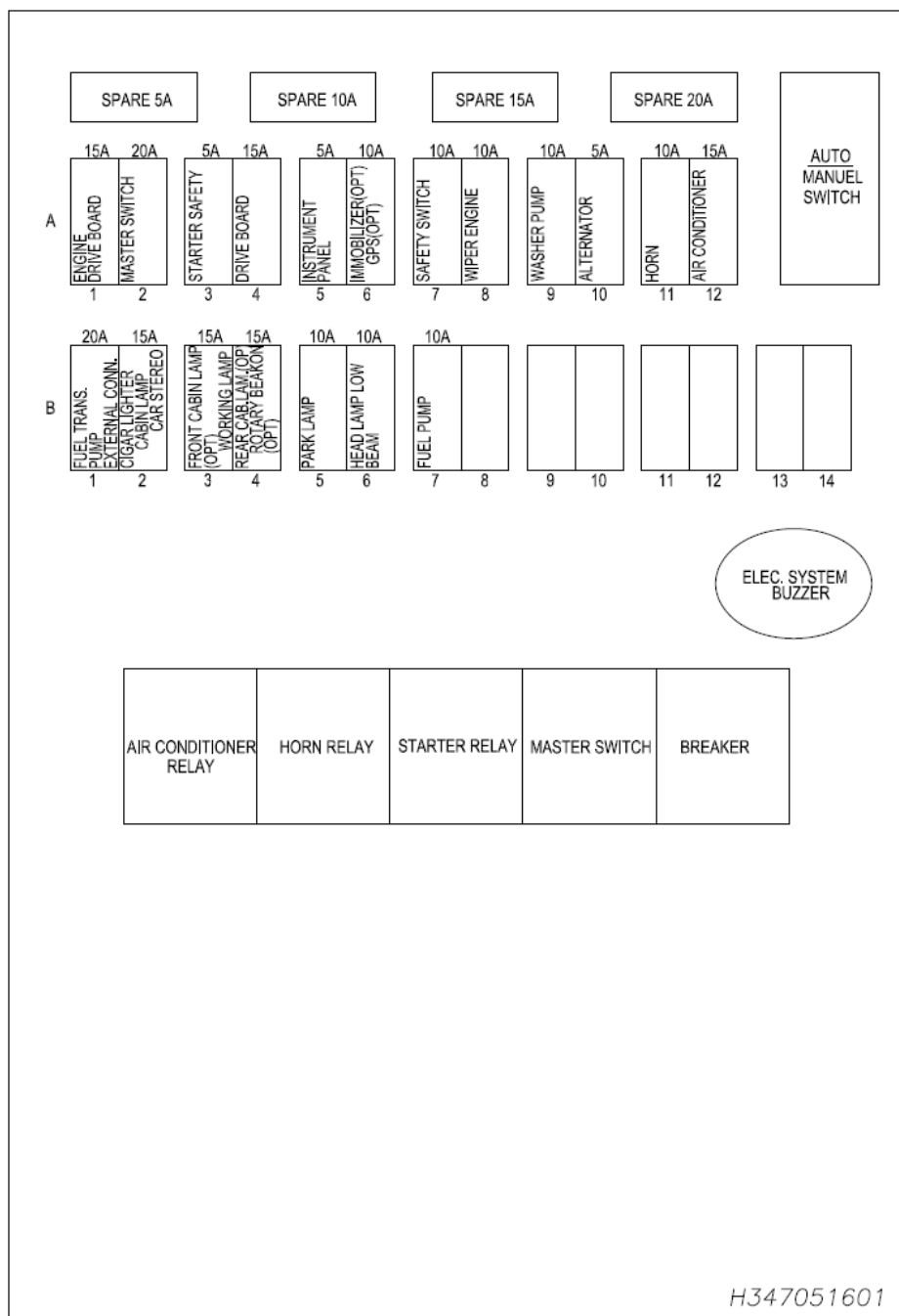
FUSE BOX

Fuses are equipped to protect the electric system from an electrical overload.

IMPORTANT

- When replacing the fuses, make sure to turn the start key to “stop” (OFF) position.
- When replacing fuses, ensure that they are at the same capacity.
- Replacement method
 - Open the cover of the fuse box.
 - Remove the burnt fuse using a fuse holder tool.
 - Install a new fuse with same capacity as the burnt one.
- Placement of fuses and relays are shown in figures below.



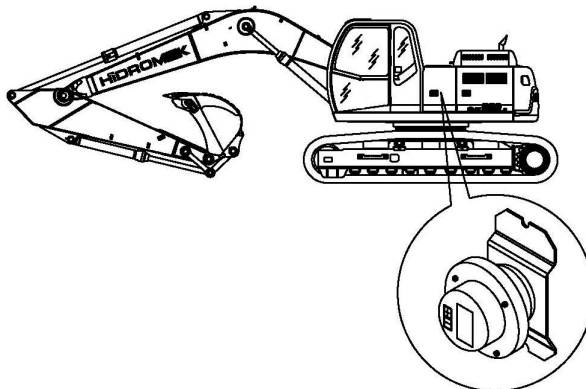


Fuse box placement rev 01 : counter weight changed, swing lamp relay and fuse removed. Starter relay's, battery relay's and breaker relay's places are changed.

BATTERY RELAY

Battery relay is located under the air filter. When the operator stops the engine it will automatically cut off the circuit after 7-8 seconds and an audio warning will be heard.

It will automatically cut the power off in case of an electrical short circuit or overload. This will prevent the electric wiring and components from burning or damage.



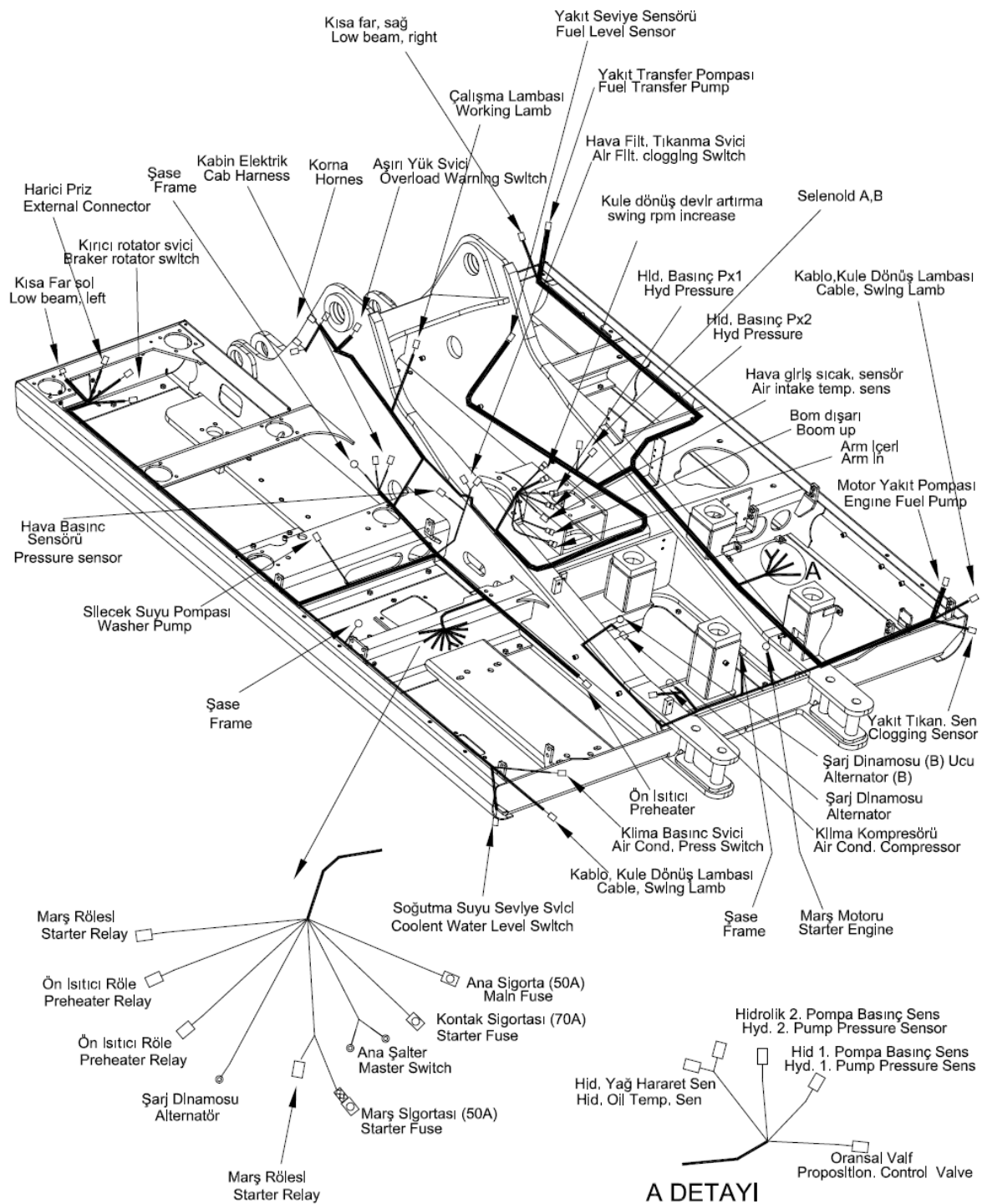
CONTROL PANEL FAULT & TROUBLE MESSAGES

ERROR CODE	DESCRIPTION TEXT
50	ALTERNATOR CHARGE FAILURE
51	LOW ENGINE OIL PRESSURE
52	ENGINE OVER-TEMPERATURE
53	AIR FILTER CLOGGED!
60	LOW COOLANT WATER LEVEL!
72	FUEL FILTERS CLOGGED (1) !!
73	FUEL FILTERS CLOGGED (2) !!
12	PV FAILURE !!
14	TS VALVE FAILURE!!
15	PB VALVE FAILURE!!
16	A-CONFLUX FAILURE!!
17	B-CONFLUX FAILURE!!
26	CRUISE VALVE FAILURE!!
27	TRANSMISSION PRESSURE LOW !!
74	HIGH ENGINE BOOST TEMPR. !!
75	HIGH FUEL TEMPERATURE !!
29	LOW BRAKE PRESSURE !!
30	CAN-BUS FAILURE!!
31	FOOT ACCELERATOR PEDAL FAILURE
32	P1 PUMP PRES. SENSOR FAILURE(1)
33	P2 PUMP PRES. SENSOR FAILURE (1)
34	SPEED POTENTIOMETER FAILURE!
35	STEP MOTOR FAILURE
36	ENGINE OIL FILTER CLOGGED!
18	TRENCHING VALVE FAILURE
54	HYDRAULIC OVER-TEMPERATURE
61	ALTERNATOR HIGH CHARGE LEVEL !
37	ATTACHMENT PRESSURE SW. FAIL.
38	TRAVEL PRESSURE SW. FAILURE
39	BOM-UP PRESSURE SW. FAILURE
40	ARM-IN PRESSURE SW. FAILURE
41	T. SWING PRESSURE SW. FAILURE
42	P1 PUMP PRES. SENSOR FAILURE(2)
43	P2 PUMP PRES. SENSOR FAILURE(2)
44	HYD.OIL TEMPERATURE SEN. FAIL.(1)
46	ENGINE TEMPERATURE SENS.FAIL.(1)
45	HYD.OIL TEMPERATURE SEN. FAIL.(2)
46	ENGINE TEMPERATURE SENS.FAIL.(2)

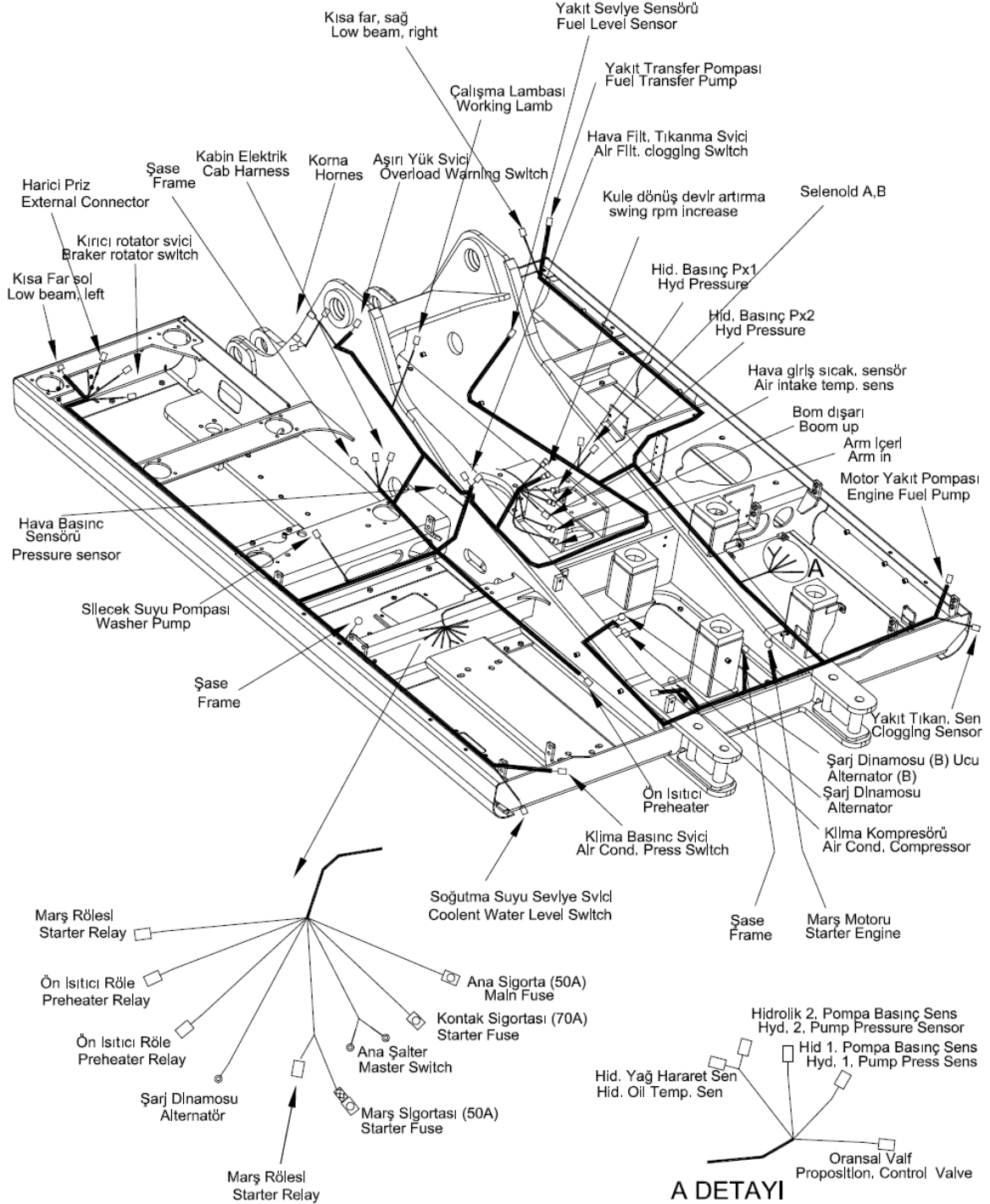
TROUBLESHOOTING

FAULT	PROBABLE CAUSE	REMEDY
The lamp fades out or blinks even though the engine is operated	- Terminal segregation or wire disconnection - Loose belt tension	- Inspection, replace - Adjust
The battery recharge warning lamp doesn't work	- Alternator trouble - Wire disconnection	- Inspection, replace - Inspection, replace
The alternator generates an abnormal sound	Alternator trouble	Replace
Starting motor doesn't work while the key ON	- Wire disconnection - Battery discharge - Starting motor trouble	- Replace - Recharge - Replace
The pinion of starting motor is projected or not	Battery discharge	Recharge
The starting motor can't start the engine	- Battery discharge - Starting motor trouble	- Recharge - Replace
The starting motor is stopped before the engine is started	- Wire problem - Battery discharge	- Inspection, replace - Recharge
Engine oil pressure warning lamp doesn't light up when engine is stopped	- Monitor trouble - Wire disconnection - Pressure switch trouble	- Replace - Inspection, replace - Replace
Battery recharge warning lamp does not light up when engine is stopped. (Key is ON)	- Monitor trouble - Wire problem	- Replace - Inspection, replace

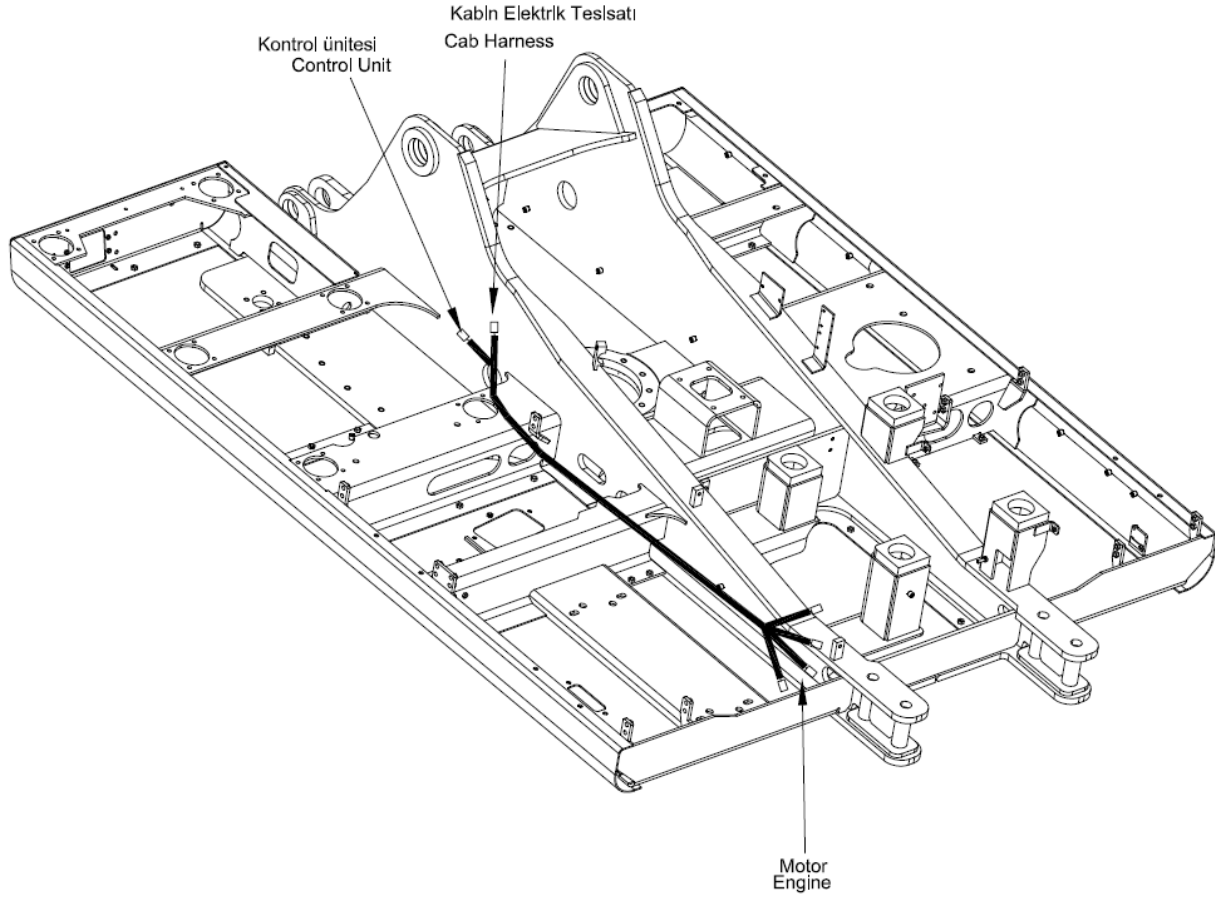
MAIN HARNESS Rev 00



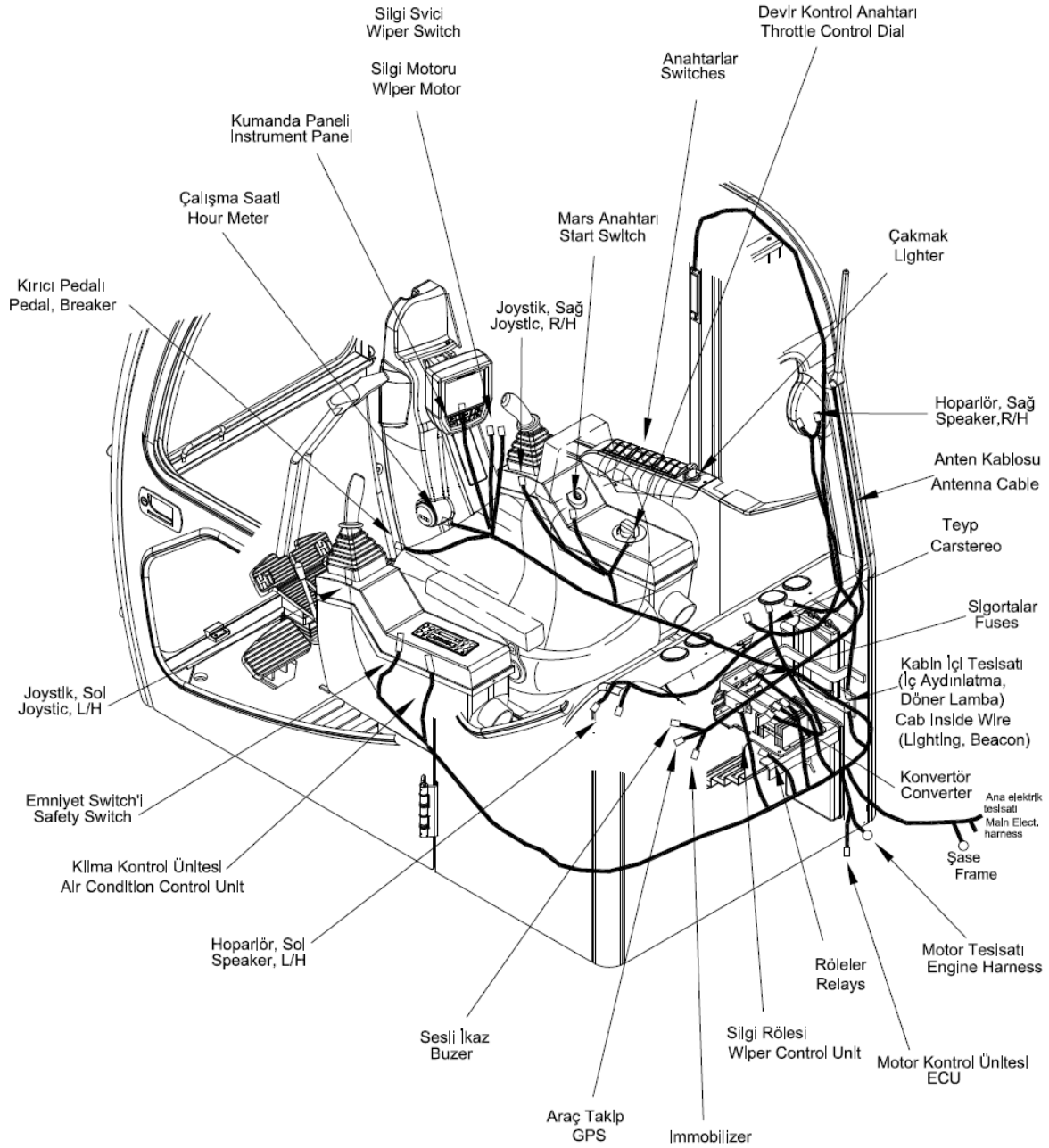
MAIN HARNESS Rev 01

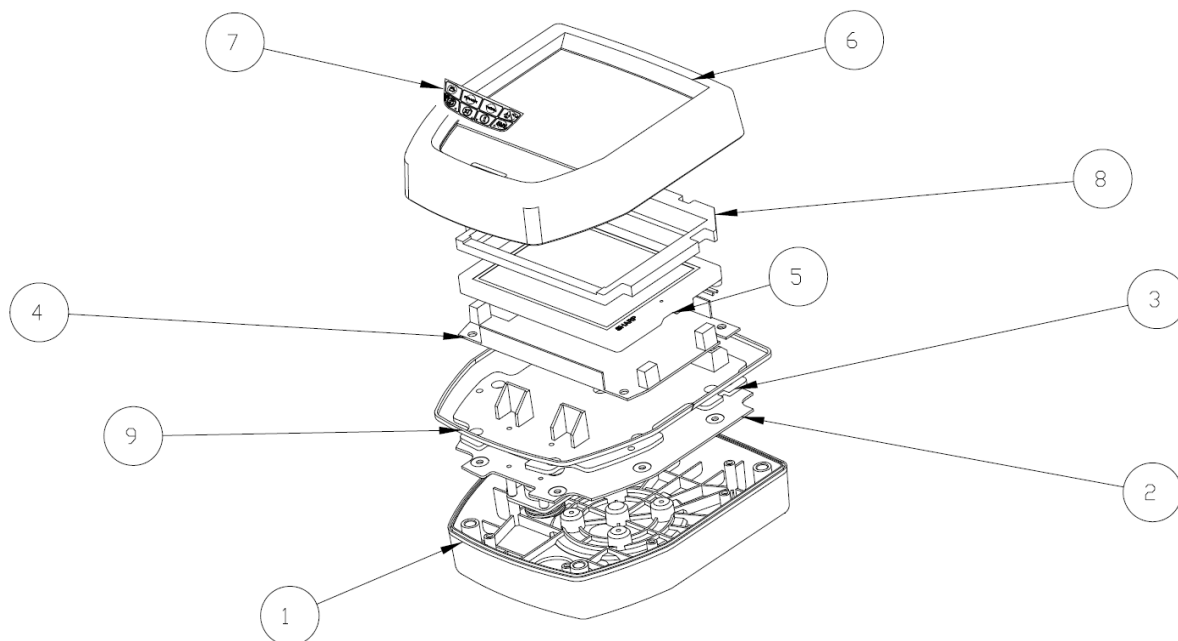


ENGINE HARNESS

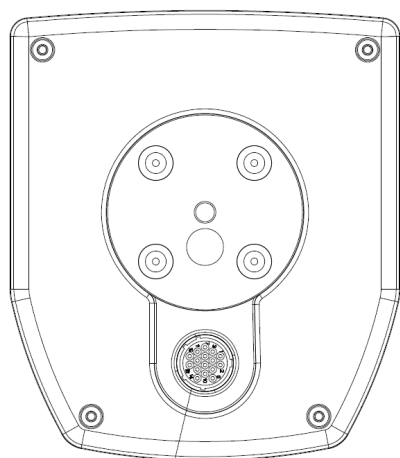


CABIN HARNESS

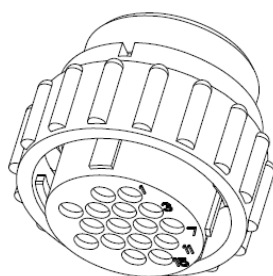
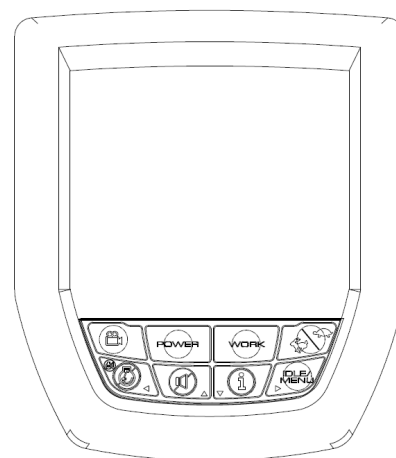
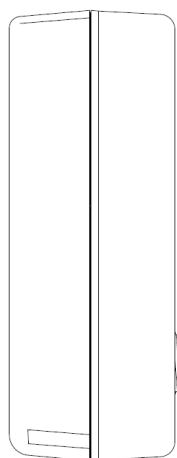


PARTS OF CONTROL PANEL

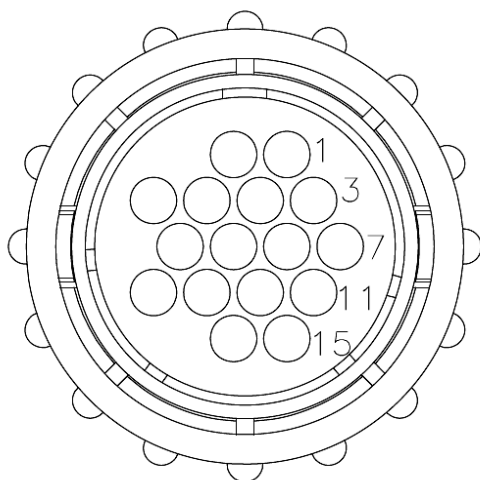
1	Back Lid
2	Control panel circuit board
3	Screen holder
4	Screen holder (back)
5	Screen
6	Front Lid
7	Keypad
8	Screen holder (front)
9	Seal



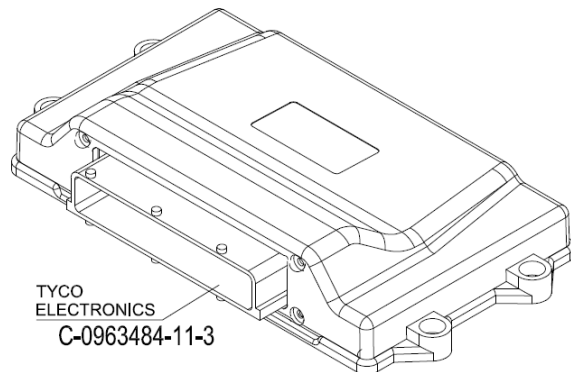
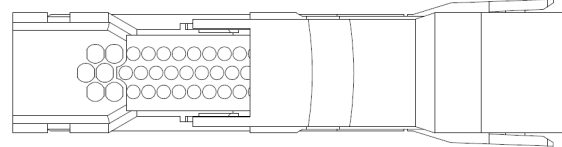
TYCO
ELECTRONICS
C-0207303-11-3



Harness side
Tyco Electronics
C-0206037-01-3



1	Fuel level sensor
2	Engine temperature sensor (Tier 2)
3	Alternator charging equipment
4	-----
5	Can-L
6	Can-H
7	Manual mode signal (+)
8	Alternator rpm signal (+) (Tier 2)
9	Chassis (-)
10	Overload warning sensor (-) (Optional)
11	Engine diagnostics lamp (-) (Tier 3)
12	----
13	Engine oil pressure switch (-) (Tier 2)
14	Engine diagnostics lamp-2 (Tier 3–Tier 2)
15	Hydraulic temperature sensor
16	(+) 24 V (5 Amper Fuse)

**HARNESS SIDE****TYCO ELECTRONICS
C-0968879-11-3**

NO	EXPLANATION	NO	EXPLANATION	NO	EXPLANATION
1	---	24	---	48	---
2	'P/V valve' OUT	25	---	49	Transmission pressure switch (-) IN (W excavator)
3	---	26	Cruise switch (-) IN (W exc)	50	---
4	Forward direction selection(+) (W exc)	27	Brake 1.5 bar (-) IN (W exc)	51	---
5	'P/V valve' return	28	Reverse direction selection (+) (W exc)	52	---
6	Manual sw manual part	29	Breaker pedal (-) IN	53	Attachment pressure switch (-) IN
7	Travel speed valve OUT	30	Travel pressure switch (-) IN (LC exc)	54	---
8	Cruise valve out (W exc)	31	Brake2 40 bar (-) IN (W exc)	55	---
9	Manual sw auto part (+) 24 V feed	32	---	56	---
10	B Conflux, trenching valve OUT	33	---	57	Speed sensor1-B
11	A Conflux OUT	34	Speed sensor1-A	58	Pump pressure sensor, GND
12	---	35	Pump2 pressure sensor	59	Pump pressure sensor, (+) 5V feed
13	Power boost valve OUT	36	---	60	---
14	Breaker valve OUT	37	Air filter clogged switch (-) IN	61	Coolant level switch (-) IN
15	(+) 24V feed (15 Amper fuse)	38	Hydraulic safety lock lever (+) IN	62	Preheat (+) IN
16	---	39	Brake pressure low switch (-) IN (W exc)	63	Mode switch travel position (+) (W exc)
17	---	40	Mode switch work and travel position (+) IN (W exc)	64	2 nd gear selection (W exc)
18	---	41	---	65	Arm-in pressure switc (-) IN
19	14 ton selection valve	42	Fuel filter clogged sensor	66	Swing speed increase (-) IN
20	Buzzer OUT	43	Engine oil filter clogged sensor	67	Boom-up pressure switch (-) IN
21	Engine speed control dial warning	44	Pump1 pressure sensor	68	Throttle pedal warning (W exc)
22	(+) 24 V feed	45	---	69	CanH optional line resistance
23	Chassis (-) feed	46	CanL optional line resistance	70	---

1. The Definition of Air Conditioning

In general, air conditioner is an apparatus, used for controlling the temperature and humidity of an enclosed area in order to get the most comfortable air for humans and to maintain the temperature to required needs for objects. To that end, the following requirements should be properly accomplished.

- (1) Dry-bulb temperature and its distribution(temperature)
- (2) Air humidity and its distribution(humidity)
- (3) Air flow(air current)
- (4) Air freshness(cleanness)

If any of the following requirements is not properly accomplished, the original purpose can not be achieved.

Air conditioning falls into two categories depending on its serving subject: comfort air conditioning and industrial air conditioning. Comfort air conditioning means air conditioning in houses, offices, department stores, theaters and a variety of buses and cars and industrial air conditioning means air conditioning aimed at maintaining the temperature suitable for production and preservation of products in textile mills, confectionary plants and each refrigerator car.

2. The Structure of Air Conditioning System

The air conditioning system basically consists of 4 main parts in accordance with the refrigerant operation.

(1) Compressor :

The compressor is a belt driven pump that is fastened to the engine. It is responsible for compressing refrigerant gas of low pressure and low temperature as high pressure and high temperature gas and transferring the gas to the condenser.

- Magnetic clutch is mounted to control the compressor.

(2) Condenser :

The condenser is located in front of the vehicle. As hot compressed gasses are introduced into the condenser, they are cooled off. As the gas cools, it condenses as a high pressure and high temperature liquid.

- Hot compressed gasses transferred from the compressor are cooled off and condensed in this condenser.

(3) Expansion valve :

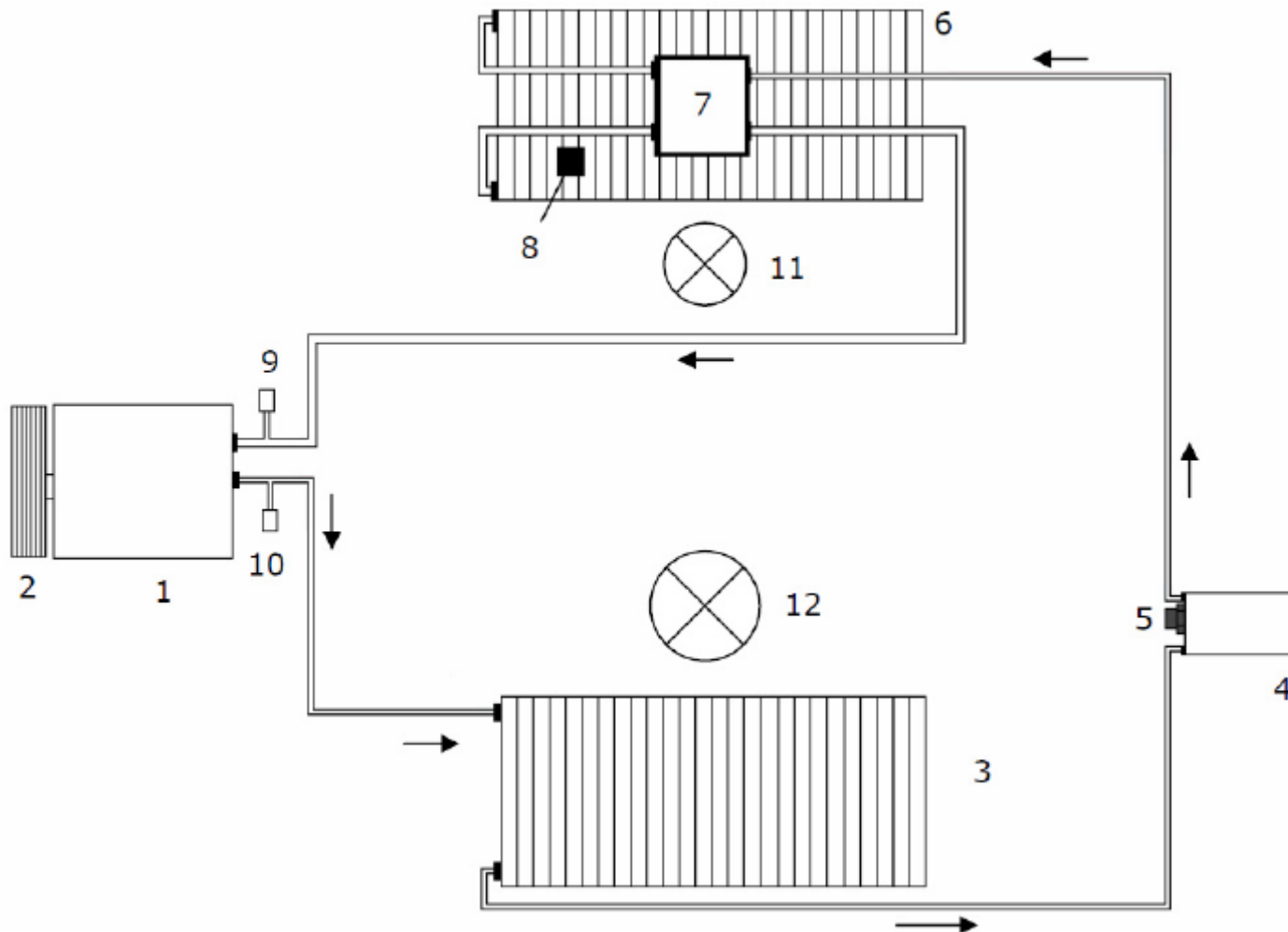
The expansion valve is very efficient at regulating refrigerant flow to the evaporator. As high pressure refrigerant is passing through this valve, it rapidly becomes low temperature and low pressure wet vapor.

(4) Evaporator :

Misty refrigerant enters the evaporator as a low pressure liquid. The warm air passing through the evaporator fins caused the refrigerant to boil. As the refrigerant begins to boil, it can absorb large amount of heat.

(The surrounding environment is cooled off.)

3. Cooling Cycle



- | | |
|---|------------------------|
| 1. Compressor | 7. Expansion valve |
| 2. Compressor pulley and electromagnetic clutch | 8. Duct sensor |
| 3. Condenser | 9. Low pressure line |
| 4. Dryer | 10. High pressure line |
| 5. Pressure switch | 11. Electro motor fan |
| 6. Evaporator | 12. Motor fan |

Refrigerant circulates through the closed-circuit system and its components. Refrigerant repeats this kind of circulation and it is referred to as "Cooling Cycle." What happens in the refrigerant circulation in the cycle is related to changing pressure and temperature as the refrigerant becomes a gas and is condensed as a liquid back.

The cooling system is based on a few unchanged physical principles.

These principles are discussed in the section concerning what is happening to refrigerant when the cooling system is in operation.

Refrigerant gas is drawn into the intake side of the compressor and compressed and discharged as high temperature and high pressure gas. The compressed gas is sent to the condenser and then cooled off by the cooling fan. As the gas cools, it condenses because its latent heat is absorbed by the air traveling through the condenser. The condensed refrigerant is sent to the receiver-drier and the receiver-drier removes moisture and filters out dirt. Then the refrigerant is introduced into the expansion valve.

The high pressure liquid refrigerant rapidly expands in the valve and becomes low temperature and low pressure misty refrigerant. Then it goes to the evaporator.

The misty refrigerant enters the evaporator and absorbs latent heat of vaporization from the air introduced through the blower, providing cooling. At the same time, it becomes from misty state to gaseous state and drawn into the compressor again.

As mentioned above, the refrigerant repeatedly circulates in the cooling cycle providing cooling. In general, the gas needs to be compressed to become liquid. But it becomes easier by cooling off at the same time while compressing. Therefore, both the compressor and the condenser are needed for the car air conditioner.

4. Refrigerant

A refrigerant is a substance used to provide cooling. It absorbs and radiates heat while circling in the closed-circuit cooling cycle.

4-1) Characteristics of Refrigerant

There are various types of refrigerant. In the cooling system, mainly R-12(CFC:Chloro Fluoro Carbon) was used. But its use has been regulated since it was proved that Freon gas results in damage of ozone layer. Consequently, new refrigerant R-134a(HFC) has been used.

4-2) Characteristics of R-134a(Hydro Fluoro Carbon)

(1) Merits

- ① Alternative refrigerant to R-12, containing no chlorine causing damage of Ozone layer.
- ② Chemically safe
- ③ Thermal properties most similar to R-12
- ④ Incombustibility and no toxicity

(2) Demerits

- ① low refrigeration capacity at the same condensation temperature as R-12
(To get the same refrigerating capacity of R-12, the condensation temperature should be lowered.)
- ② Change of refrigeration oil due to the insolubility of R-12 refrigeration oil
- ③ Problems concerning absorptiveness of R-134a refrigeration oil and change of Rubber quality
- ④ Problems concerning moisture permeability of R-12 Freon hose(Nitrile)

4-3) Flammable HC(Hydrocarbon) refrigerants

(1) Use depending on its type

- ① R-290(Propane), R-1270(Propylene)
 - Applied to most heat pumps for heating and residential home in some countries in Europe
- ② R-600(Butane), R-600a(isobutane)
 - Mainly used for household refrigerators
 - The Auto-Ignition Temperature of 460°C and very small refrigerant charge

(2) Characteristics

- ① GWP, Global Warming Potential(3) and ODP, Ozone Depletion Potential(0)
- ② It is inexpensive and only a small quantity can work.
- ③ Easy to use (well mixed with mineral lubricant)
- ④ Flammable and non-toxic

(3) The regulation of hydrocarbon refrigerants

- ① Europe
 - CEN Standard EN 378 (specifies safety and surrounding conditions for refrigerators and heat pump systems)
 - Among the systems providing comfort, it is banned from applying to the direct systems (household air conditioners and car air conditioners).
 - Specified in German standard DIN 7003 and NPR 7600 of the Netherlands.
 - Hydrocarbon refrigerant is applied on a limited basis depending on the room size and the number of residents.
- ② The United States
 - ANSI/ASHRAE Standard 15
 - Flammable refrigerants (refrigerants classified as A3) are banned from using for high-risk systems (namely direct system).

③ IEC(International Electrotechnical Commission) Publication

- Specifies the quantity of flammable refrigerants which is able to make 335-2-40 - 130m³ room flammable

(4) Possibility of being used as substitutes for R-134a

- ① Hydrocarbon refrigerants work similarly to R-134a, but if they are used for a long period, a leak from hoses or the Fitting part is expected due to different components of refrigeration oil.
- ② The use of two kinds of hydrocarbon blends can raise the possibility of explosion (Hydrocarbon blends for car air conditioning systems in the market all use more than two kinds of refrigerants.)
- ③ If air is drawn into imperfect vacuum conditions by a system leak, the possibility of explosion will be raised.
- ④ A systematic review is needed for the potential flame sources due to metal spark in the rotating part of the compressor and other safety devices.
- ⑤ When mixed with R-134a, hydrocarbon refrigerants aren't recyclable.
- ⑥ For hydrocarbon refrigerants, concentration is more important than the absolute quantity of refrigerant. Even with a very small quantity, if hydrocarbon blends reach the combustion concentration, there can be an explosion.

(5) Substitutes for R-134a

- ① The Kyoto Protocol
 - Industrialized nations who sign up to the treaty are legally bound to reduce worldwide emissions by an average of 5.2% below their 1990 levels by the period 2008-2012.
 - HFC refrigerant(R-134a) should be also reduced in accordance with the treaty.
- ② Decision by the European parliament
 - The use of HC refrigerants will be prohibited for new car air conditioning systems beginning in 2011 and for all kinds of automobiles in 2017.
 - Pursuing a system change to CO₂(BMW is expected to mass-produce in 2008.)
- ③ R-152a: under consideration for North America OEM

5. Components of the Air Conditioning System

5-1) COMPRESSOR

The compressor is responsible for raising pressure of refrigerant gas, namely for compressing it. Refrigerant is circulated in the cycle due to this compressor. When compared to the human body, refrigerant can be referred to as the blood and the compressor can be referred to as the heart.

(1) The Functions of COMPRESSOR

Specifically speaking, the intake side of the compressor draws in low pressure refrigerant gas from the outlet of the evaporator. Once the refrigerant is drawn into the intake side, it is compressed and sent to the condenser. Therefore, the refrigerant can be circulated in the cycle and the heat drawn from the inside of the vehicle in the evaporator is sent to the condenser by the compressor and radiates heat to the air passing through the condenser.

① Sucking:

The compressor lowers the refrigerant pressure in the evaporator so that liquid refrigerant can evaporate at low temperature.

② Compressing:

The compressor compresses the evaporated refrigerant and sends it to the condenser where it can condense at normal temperature.

③ Pumping:

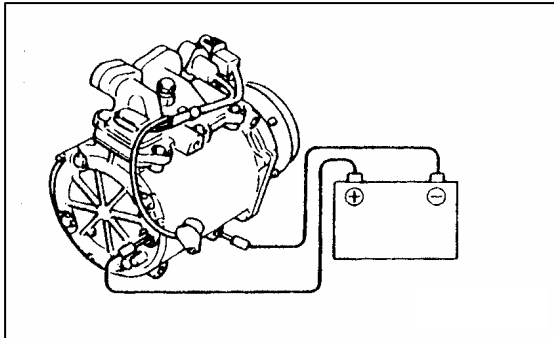
The refrigerant can be circulated due to the above-mentioned sucking and compressing functions and a consecutive work cycle is formed.

(2) Compressor Inspection

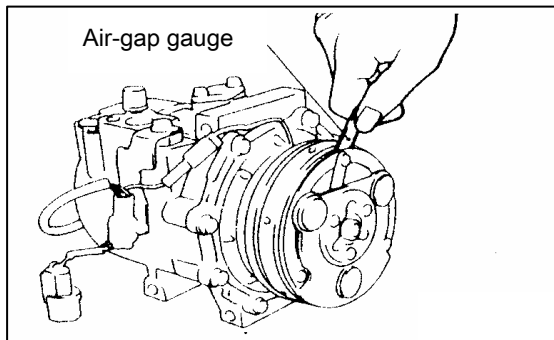
① Inspection for clutch operation

- ※ Connect the battery(+) terminal to the compressor side terminal and earth the battery(-) terminal to the compressor Body.

If it is in normal condition, you can hear the “click” sound from the magnetic clutch.



② Inspection for the clutch AIR-GAP



- ※ Inspect whether the clutch air-gap is a required value.

(3) Causes for faulty compressor**① Insufficient lubrication due to a lack of refrigerant(low refrigerant charge, refrigerant leak)**

The oil in the A/C System provides the lubrication by being sprayed on compressor's working part (Swash plate & Piston) in misty condition while circulating with the refrigerant. If there is a lack of refrigerant, the oil amount drawn into the compressor also decreases, diminishing the lubrication and lowering air conditioning performance at the same time. Then, the intake temperature goes up to create abnormal superheat. Consequently, early damage to the operating friction part can result in, thus causing stick occurring.

- If the air conditioning capacity is lowered, you need to instantly inspect the refrigerant amount and recharge it.
- In the winter time when the air conditioner is not in use, operate it periodically(one time in two weeks) at an idle condition to enhance the circulation of the refrigerant and the oil.

② Liquid compression due to the inflow of liquid refrigerant

Liquid compression by overcharge of refrigerant and the unevaporated liquid refrigerant introduced into the compressor causes overload to the compressor's working part, resulting in compressor damage and stick of disk slip occurrence.

When the A/C system is turned on at high-speed after it is mounted to the vehicle, the simultaneous outflow of the oil in the compressor occurs and low-pressure liquid refrigerant is drawn into the compressor, wiping out the oil on the friction surface of the working part. Thus, the compressor is operated under unlubricated condition before the compressor oil circulates, resulting in a stick.

□ A lack of lubrication due to the clogged refrigerant circuit

Moisture can exist in the remaining air of the system due to poor vacuum level before refrigerant charging. It can result in expansion valve icing, causing instant circuit clogging. Thus, the compressor is operated under unlubricated condition, resulting in a stick and a lack of lubrication.

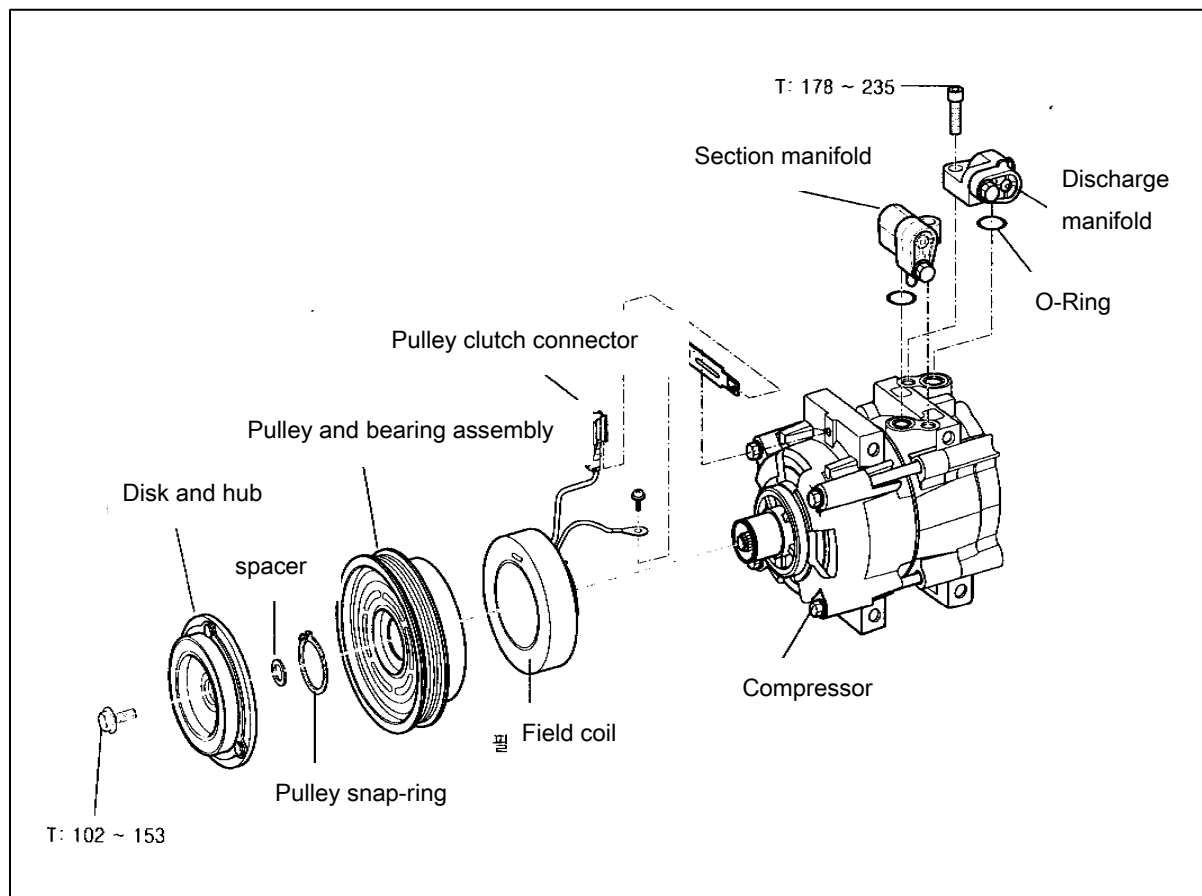
- For moisture inflow vehicle, sufficient vacuum work(for more than 30 minutes) should be done after a recovery of refrigerant in order to remove the moisture in the system.

Phase separation and migration of the compressor oil

The refrigerant and the oil are separated and oil is migrated by the outdoor temperature deviation because of the nature of the new refrigerant(R-134a) if the system is transported or neglected for a long time. Therefore, at the initial stage of the A/C operation, only the refrigerant is drawn into the compressor, diminishing the lubrication.

- Pre-running is required with the A/C system on at an idle condition in initial days of the A/C season after winter or for export car port.

(4) Compressor Structure



(5) Refrigeration Oil

Refrigeration oil is charged to provide the lubrication of the compressor which pressurizes the refrigerant.

But only specified amount should be charged since the characteristics of the old and the new refrigerants differ as follows and air conditioning performance also varies depending on the refrigerant charge amount.

Classification	Mineral Oil	PAG Oil
Applied refrigerant	R-12(CFC)	R-134a(HFC)
Molecular Polarity	Non-polar	Polar
Lubrication	Excellent	Good

5-2) CONDENSER**(1) Function**

The condenser cools off and condenses high temperature and high pressure gas refrigerant from the compressor.

The condenser transfers the heat inside the vehicle drawn from the evaporator to the outside of the vehicle by taking advantage of the cooling fan and the wind by driving. Therefore, high temperature and high pressure gas refrigerant cools off while traveling through the condenser and becomes mid-temperature and high pressure liquid at the exit.

The condenser is usually located in front of the radiator and its location causes the amount of air passing through the radiator decrease and the air temperature increase, thus deteriorating the efficiency of radiator.

Therefore, the engine cooling fan should be bigger and radiator shroud should be attached in order to support the system cooling operation and enhance the heat radiation from the condenser.

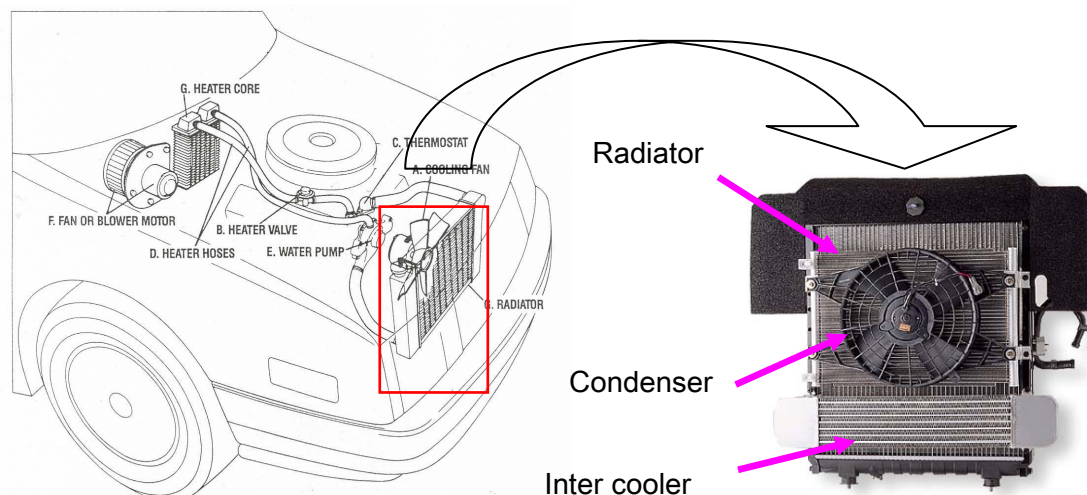
(2) Quality Characteristics

Dirt and dust accumulated on the cooling fins of the condenser reduce the efficiency of not only the radiator but also the condenser and result in insufficient heat radiation. As a result, the condenser fails to fully condense the refrigerant.

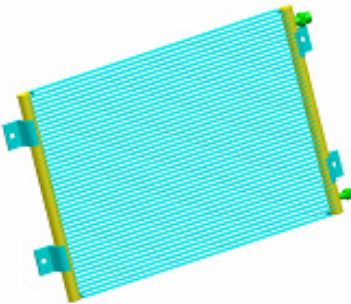
In some extreme cases, dirt and dust not only can be directly attributed to engine overheating but also abnormally increase cycle pressure only to reduce the system's cooling ability.

In addition, crushed or damaged cooling fins can result in the above-mentioned situation as they can bring about a lack of air.

Mixed air due to insufficient air bleeding before charging refrigerant fails to fully condense in the condenser, causing the pressure in the cycle to greatly increase. Thus, perfect air bleeding and proper refrigerant charge are required.

(3) Mounting Location

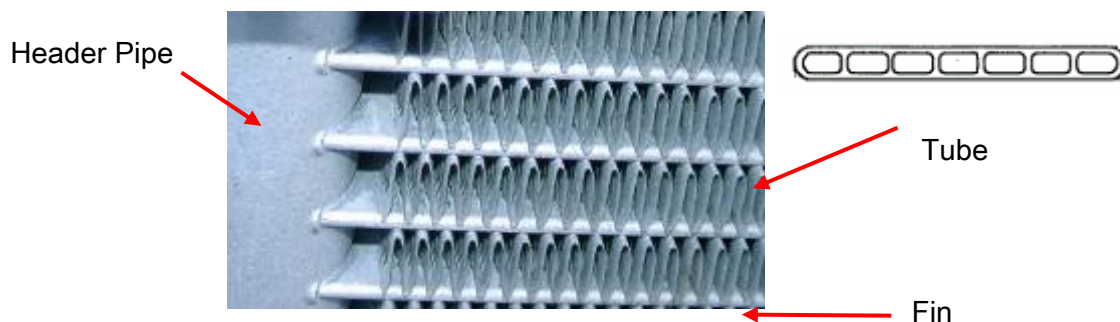
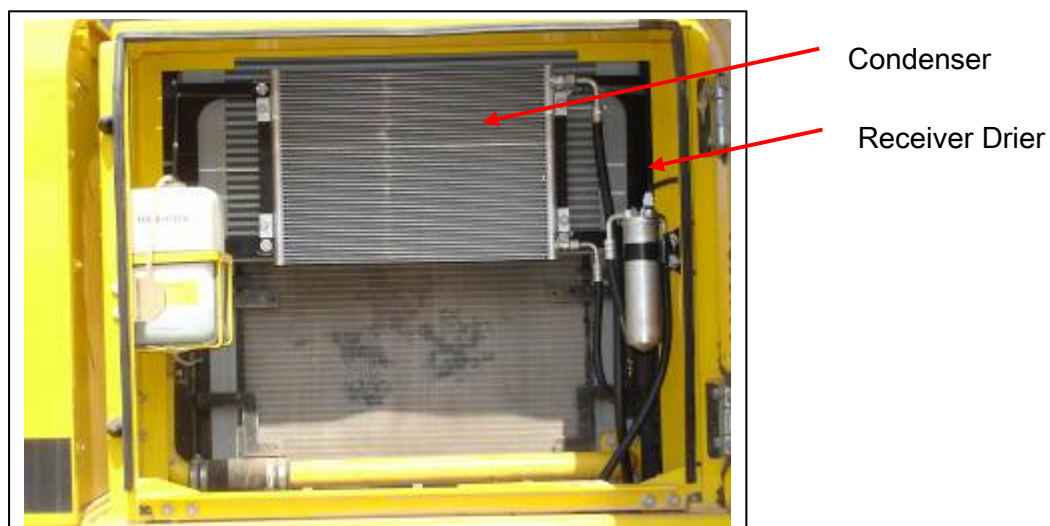
(4) Condenser Model

	Model	Spec
	size(mm)	490(L)×365.7(H)×22(D)
	Frontal area(m²)	0.179193
	type	LOUVER

(5) Condenser Components

The condenser, just as other heat exchangers, comprises fins for air and tubes for refrigerant and the fins and tubes are mainly aluminum.

Refrigerant gas radiates heat into the air while traveling through the tubes and discharges heat into the air passing through the fins.

**(6) Mounting Location of Condenser**

5-3) RECEIVER-DRIER**(1) Function**

Liquid refrigerant containing bubbles can lower the cooling ability. The primary function of the receiver-drier is to separate gas and liquid and transfer liquid refrigerant only to the expansion valve. The secondary purpose is to remove moisture from the refrigerant and filter out dirt.

(2) Structure

The receiver-drier contains a steel or aluminum body, baffle, desiccant, a sight glass and a safety valve and provides the following functions.

- Storing function

As shown in the below figure, it stores liquid refrigerant to send to the evaporator depending on heat load.

- Bubble-separating function

While refrigerant is condensing in the condenser, it can contain some bubbles. The receiver-drier completely separates gas and liquid and transfers liquid refrigerant only to the expansion valve.

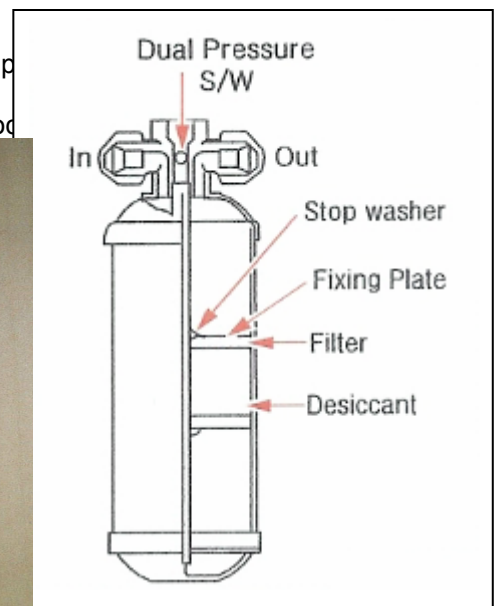
- Moisture-removing function

It removes moisture and small amounts of debris from the refrigerant.

- Recently, a sight glass is disappearing as R-134A is increasingly being used as refrigerant.

(3) Receiver Drier Check-up

- The receiver drier can break down due to internal blockage.
- The blocked entrance side of the receiver drier can cause the gauge pressure to decrease, reducing the cooling ability.
- The excessively cold discharge pipe of the receiver drier means a blockage.

**5-4) Dual Pressure Switch****(1) Function**

- It is mounted to the upper part of the receiver drier.
- It is connected to the A/C relay and turns it off to shut off the compressor if abnormal pressure occurs.
- Dual pressure s/w serves as a safety device and it is operated by the refrigerant pressure in the system.
- If the air conditioning system is turned on with no refrigerant in it, the compressor continues to run with the evaporator not cooled. Therefore, overheating can result in damage to the compressor. In this case, the dual pressure s/w is turned off to cut off the power to the A/C relay.
- Conversely, overcharged refrigerant or blocked system rapidly increases the pressure of refrigerant, resulting in damage to the compressor and the system. In order to prevent this, the dual pressure switch is turned off.

5-5) EXPANSION VALVE

Mid-temperature and high-pressure liquid state refrigerant is introduced into the expansion valve under normal operating conditions and becomes low-temperature and low pressure state while passing through the orifice valve.

This liquid refrigerant absorbs heat from the air and exits the evaporator as a gaseous state. At this time, the temperature of gaseous refrigerant goes up a little higher than that of the liquid state. The amount of liquid-state refrigerant passing through the expansion valve is controlled by the thermostatic valve and the pressure of the liquid-state refrigerant in the evaporator. In short, the expansion valve controls the amount of refrigerant coming into the evaporator.

(1) ANGLE TYPE

□ Structure

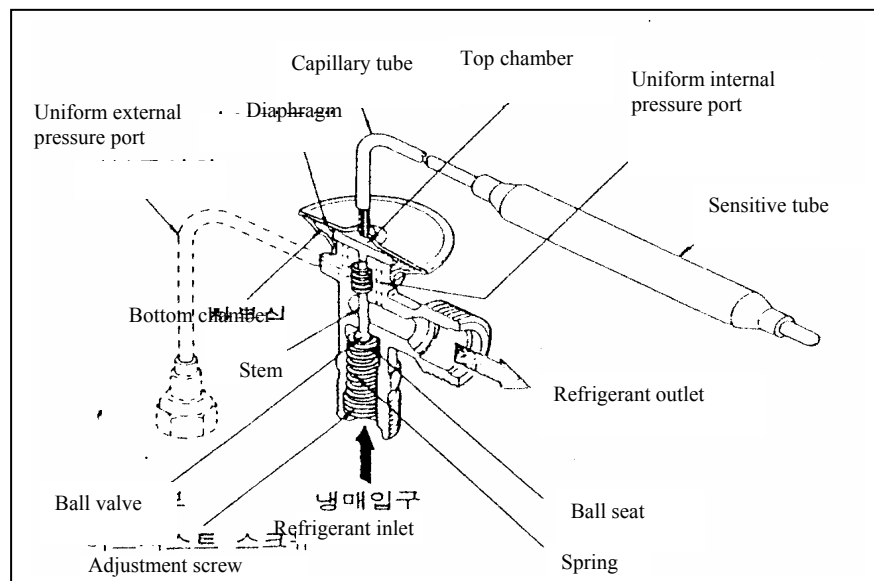
The expansion valve is opened and closed by the size of gas pressure in the sensitive tube. High-pressure and high-temperature liquid refrigerant drawn from the receiver drier is turned into low-pressure and Low-temperature misty vapor by throttling and transferred to the evaporator.

- SENSITIVE TUBE
- DIAPHRAM
- BALL
- P/SPRING
- FILTER

□ Operating Principle

The opening and closing of the expansion valve is automatically controlled by three forces, the pressure in the sensitive tube containing liquid or gas (P1), the pressure of evaporator outlet (P2) and the spring tension (F).

- Pressure in the sensitive tube (P1) Press the diaphragm downward (Valve opened)
- Pressure of Evaporator outlet (P2) Move the diaphragm upward. (Valve closed)
- Spring Tension(F) Move the ball upward (Valve closed)

**(2) BLOCK TYPE (High sensitivity Expansion valve)**

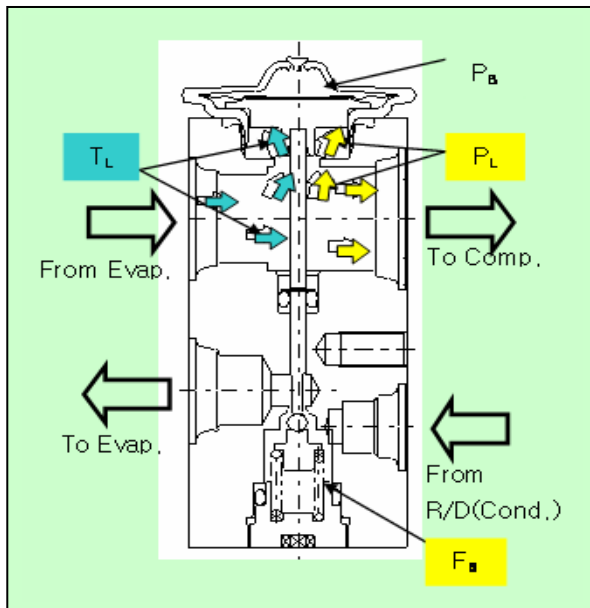
□ Structure

The expansion valve is usually attached to the evaporator entrance and senses the temperature of the evaporator outlet by using the sensitive tube. But the high-sensitivity expansion valve exhibits excellent sensitivity since it is assembled in the middle of the evaporator entrance and the outlet.

Operating Principle

If room temperature is high, the pressure of the evaporator outlet is transferred to the diaphragm, causing the pressure to rise and opening the valve.

- P_B : Gas pressure in the diaphragm
(pressure change by gas pressure & T_L temperature)
- P_L : Evaporator outlet pressure
- T_L : Evaporator outlet temperature
- F_s : Spring Tension



☞ The refrigerant gas at the evaporator outlet comes into the expansion valve to sense P_L and T_L .
- Operated like the ANGLE Type

□ Features

- The heat sensors are quick to respond to fluctuations in heat load because they have direct contact with the refrigerant. (approximately 17 times quicker than usual)
- Even with fluctuations in heat load, it can enhance the performance of evaporator because it is good at controlling a flow rate of the refrigerant so as to consistently maintaining a proper degree of superheat.
- When the system is initially operated, the cool-down in the vehicles is okay.

5-6) EVAPORATOR**(1) Function**

As the low-temperature and low-pressure misty refrigerant is traveling through the evaporator core, warm air passing through fins and plate evaporates the refrigerant into low-temperature and low-pressure gas, providing cool air inside the vehicle.

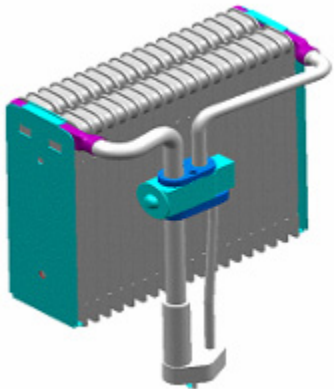
(2) Quality Characteristics

The amount of heat which is cooled in the evaporator is determined by heat sources both inside and outside of the vehicle and solar radiation. During the cooling process, moisture contained in the air condenses on its surface. So, the structure should be designed to discharge this condensed water. Moreover, if the system is operated in high-temperature and humid conditions, micro-organisms can propagate on the evaporator surface, causing a bad smell. Thus, an anti-bacterial system is required to prevent the propagation of the micro-organism on the surface.

(3) Structure

There are three types of evaporators. First, a dry evaporator consists of aluminum alloy cooling tube, cooling fins and the distributor (fin under tube type). For a laminated evaporator, fins are attached between thin rectangular aluminum plates. Lastly, a serpentine evaporator consists of colgate fins which exist within 5mm-thick flat porous serpentine tube.

4) EVAPORATOR Model

	Model	Spec
	Overall size(mm)	240(L)×211(H)×78(D)
	Effective Size(mm)	0.05064
	Core type	Laminated Type
	Performance	4200(kcal)

(5) EVAPORATOR Components

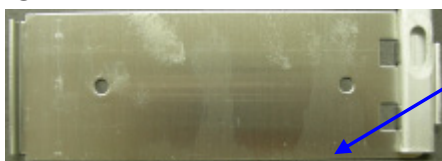
① Tube Plate : 38EA



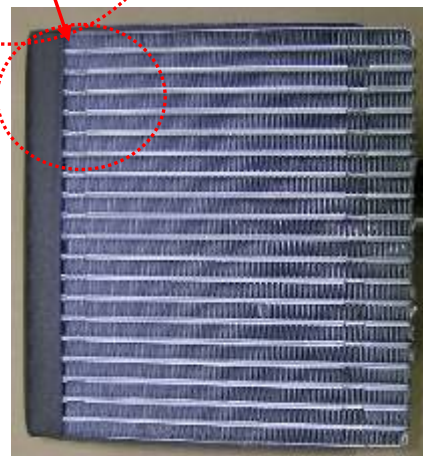
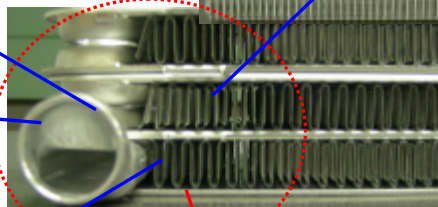
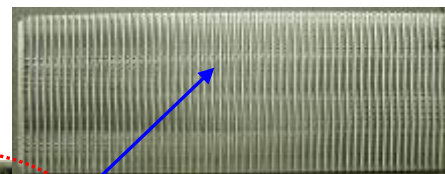
③ In/Out Pipe: Each 1EA



④ Side Plate : 2EA



② Fin : 20EA



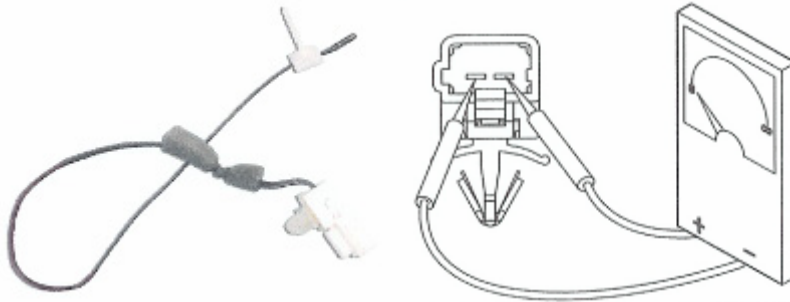
5-7) Duct Sensor**(1) Function**

The duct sensor detects the temperature of the evaporator core to keep the evaporator from freezing and turns the compressor on or off to provide a continuous pleasant atmosphere.

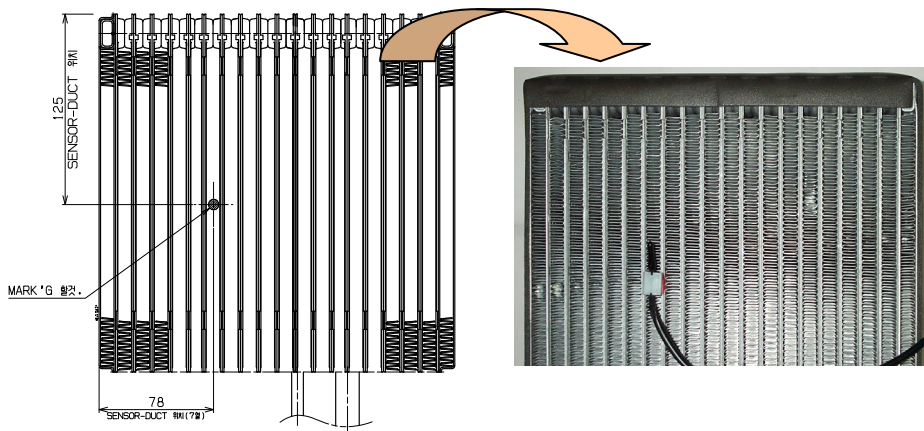
In addition, the resistance inside the duct sensor chip increases with temperature decreasing and decreases with temperature rising thank to NTC (Negative Temperature Coefficient) duct sensor.

(2) Test for the Duct Sensor Working

- ☐ Connect the multi-tester to the duct sensor and measure output voltage.
- ☐ If the measured output voltage is beyond the defined range, find out what is wrong through item inspection.
- ☐ If the measured voltage is normal, check out resistance properties depending on duct sensor temperature so as to on/off working is in normal condition.

**(3) Characteristic Table (temp -resistance-output voltage)**

Temp (°C)	Resistance (kΩ)	Voltage (V)	Temp (°C)	Resistance (kΩ)	Voltage (V)
30.00	1.98	0.99	2.00	7.23	2.37
25.00	2.45	1.17	1.00	7.60	2.44
20.00	3.06	1.38	0.00	8.00	2.50
15.00	3.85	1.62	-1.00	8.42	2.56
10.00	4.88	1.89	-2.00	8.87	2.63
5.00	6.22	2.19	-3.00	9.34	2.69
4.00	6.54	2.25	-4.00	9.48	2.71
3.00	6.87	2.31	-5.00	10.37	2.82

(4) Duct Sensor position**5-8) BLOWER****(1) Function**

The blower forcefully blows air into the evaporator, turning hot and humid air into low-temperature and moist air so that it can be carried off to the inside of the vehicle.

Air flow has a great impact on the cooling ability. In general, for the cooling capacity of 3600□4000kcal/h, a blower motor of 180□210W is used and mostly a centrifugal fan is used.

(2) Structure

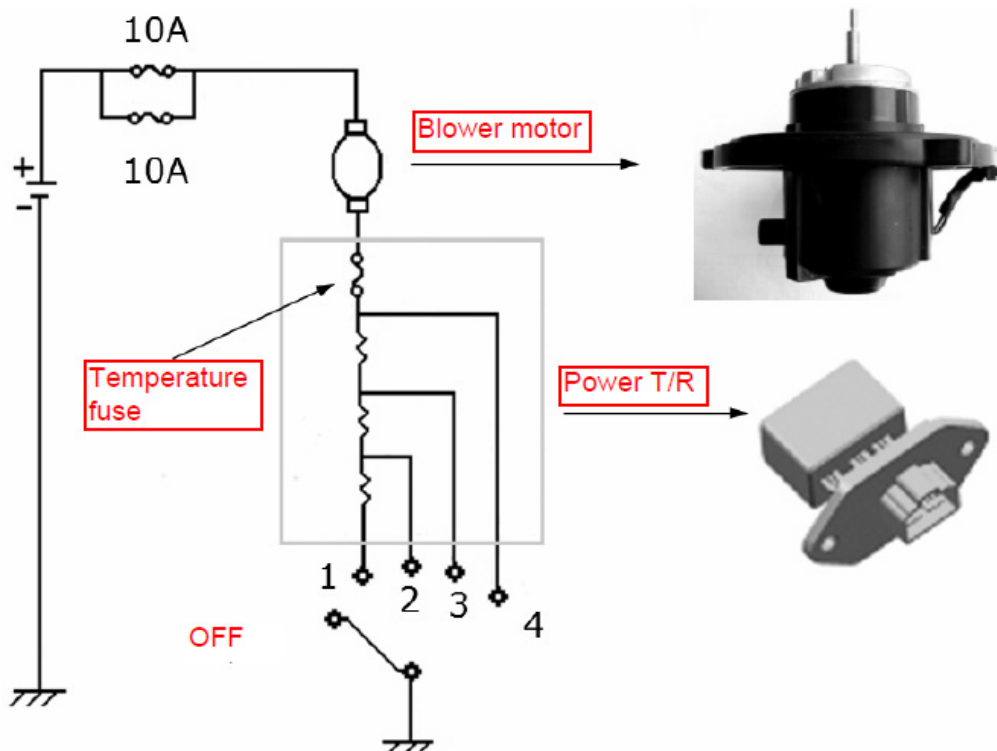
A centrifugal fan is mounted on the motor and the edge of the fan is the synthetic resin case. Air is introduced into the center from the centrifugal fan and its case shape makes a contribution to good-efficient air flow.

(3) Features of Centrifugal Fan

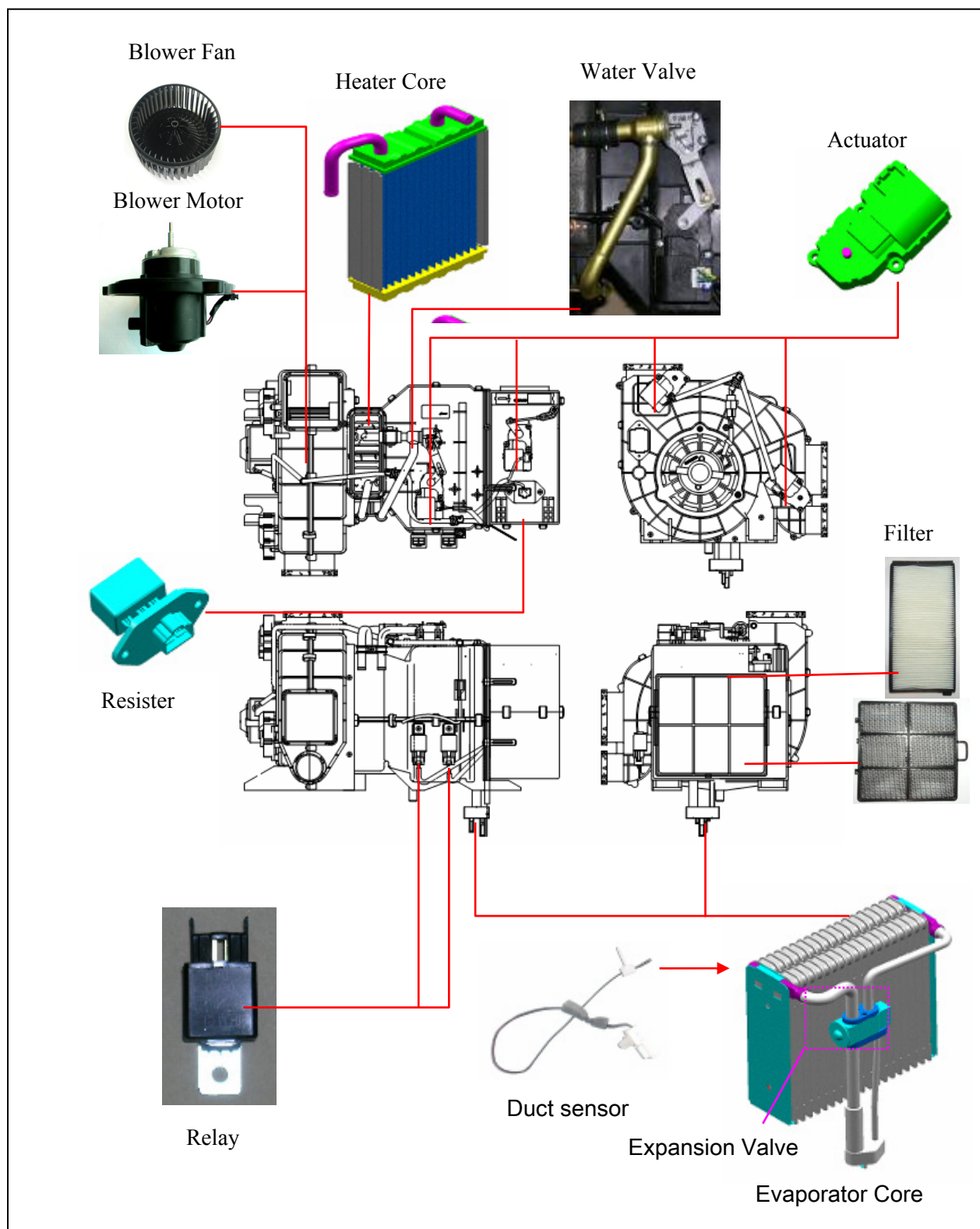
- Simple structure and capable of being used at low wind pressure and low horsepower
- Small shape and less noise

(4) Control parts and control circuit

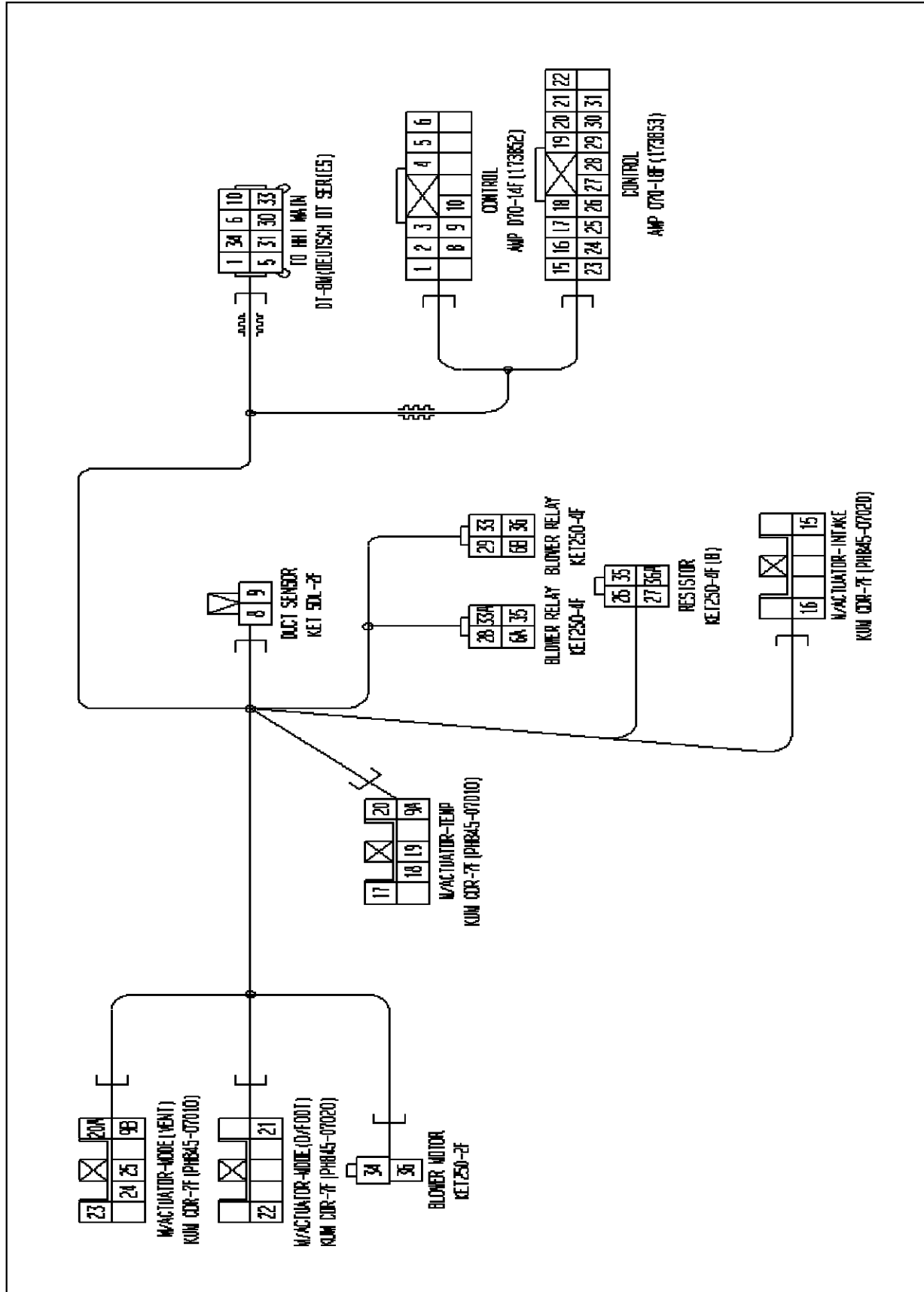
The rotating of the blower motor is controlled by using a resistor to control motor current. The following is an example of circuit.



1. HVAC Composition



2. HVAC Harness Composition



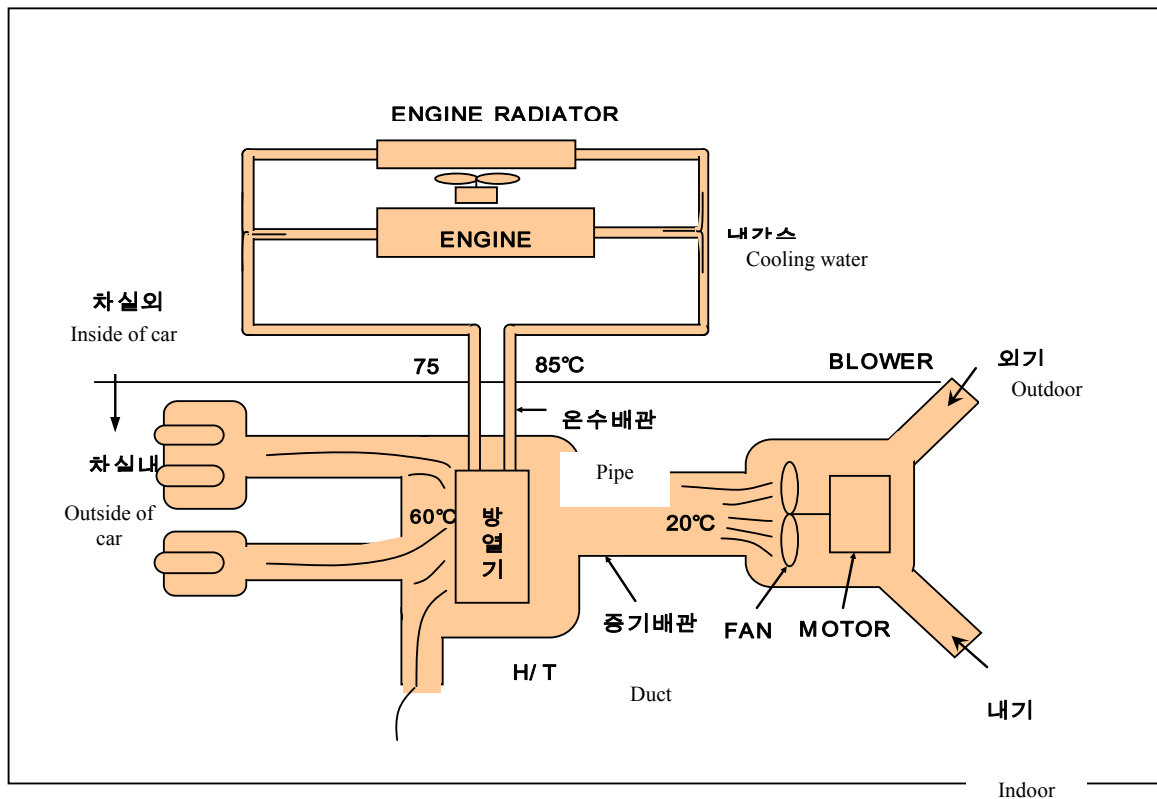
3. Heater

3-1) Overview of Heater

- (1) This heater is for automobile using engine cooling water as heat source.
- (2) It heats the inside of the car for driver and rider to have pleasant and comfortable feeling in the car.
- (3) It prevents the car front window and other windows from being frozen or dimmed for safe driving.
- (4) Generally for passenger car, it is installed at the center in front of the driver's seat.
- (5) For BUS type cars, it consists of DEFROSTER UNIT (1 each) installed at the side of the driver's seat and indoor units (2~4 each) installed under the passenger seats

3-2) Operation Principle of Heater

- 1) The heat source, Engine cooling water, is heated up to about 85°C by the combustion heat of engine using fuel.
- 2) This cooling water is passed to the radiator through hot water piping.
- 3) When the cooling water passing through radiator, heat is exchanged between the air forced to be flown in by Blower Unit fan and radiator, so that the air is heated up to about 65°C.
- 4) This heated air heats the car going around inside the car.



4. Heater Parts

4-1) Heater core

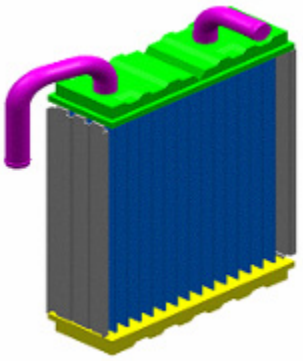
(1) Function

This is a heat exchanger that receives the cooling water heated by engine and circulates such heated cooling water into Heater core to heat the cool air inside the car.

(2) Features

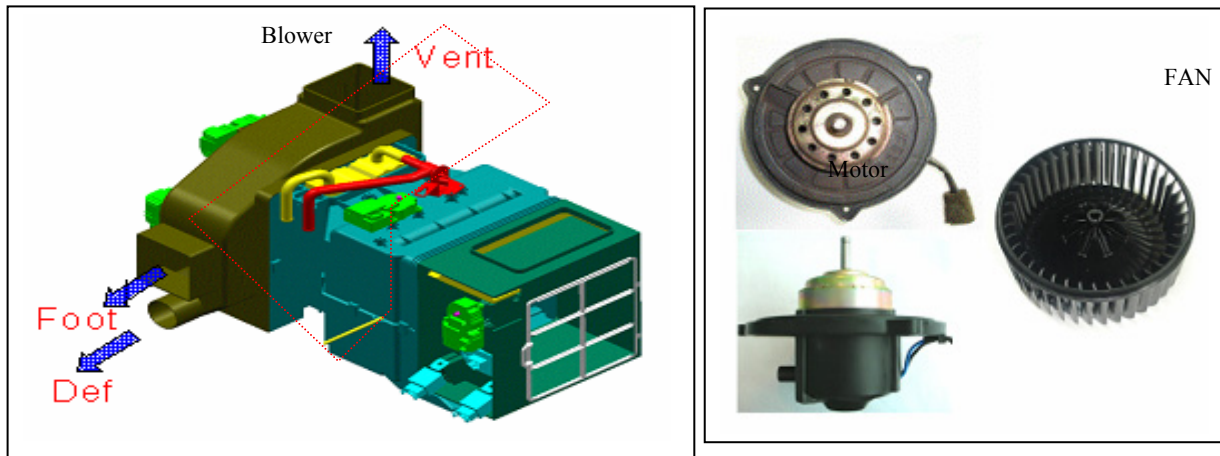
The calorie of Heater core for heating is depending on the heating load in/outside the car. Especially in winter, this device is absolutely needed to defrost the window in front of the driver. This is identified as a security part to which driver safety relevant law is applied to be managed.

(3) Heater Model (Fin & Tube Type)

	Model	Spec
	Effective size(mm)	142.4(L)×189(H)×41(D)
	Frontal area(m²)	0.026914
	Core type	Copper
	Performance	4945(kcal)min

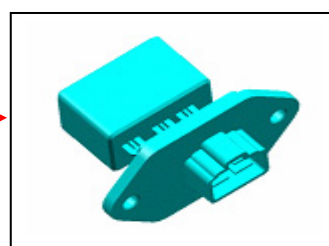
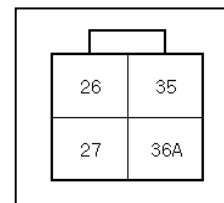
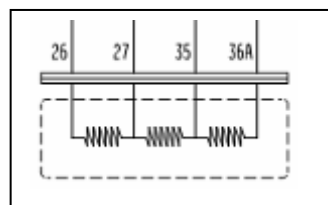
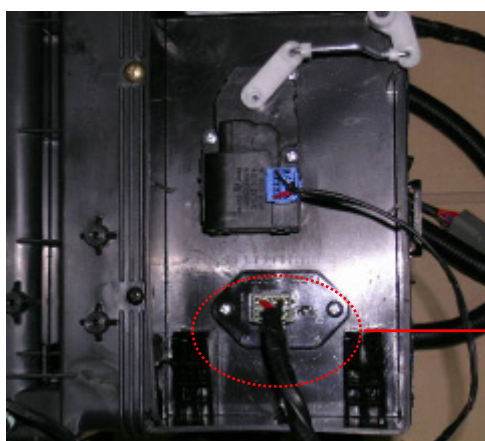
4-2) Blower & Fan motor

This device sends the air generated by fan to the Heater for needed work to be done.



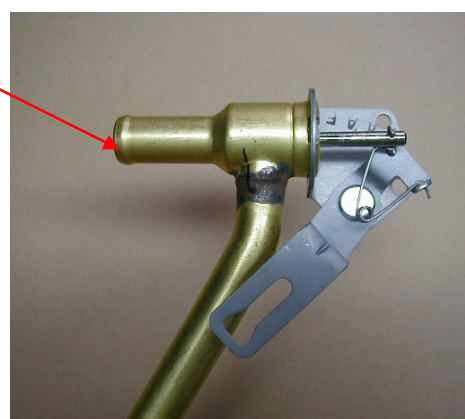
4-3) Resistors

This electric safety device uses resistor to change the current flowing into Motor and adjust the Motor circulation speed; and blocks power when the motor circulation is forced to be stopped by external factor or motor's own defect.



4-4) Water valve

This controls the flow into heater core and air temperature (Hot Air and Cool Air) when A/CON is used or constantly warm temperature (17°C~32°C) is set.



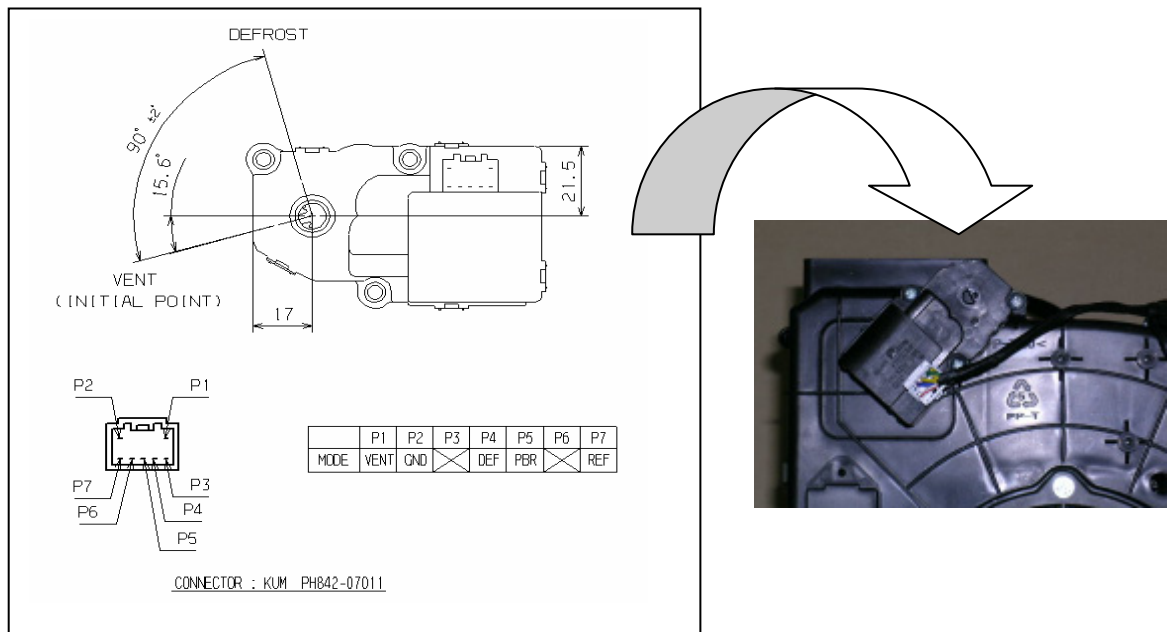
4-5) Damper

This device changes the air flow direction to the position desired by the user and is required for mode setting.

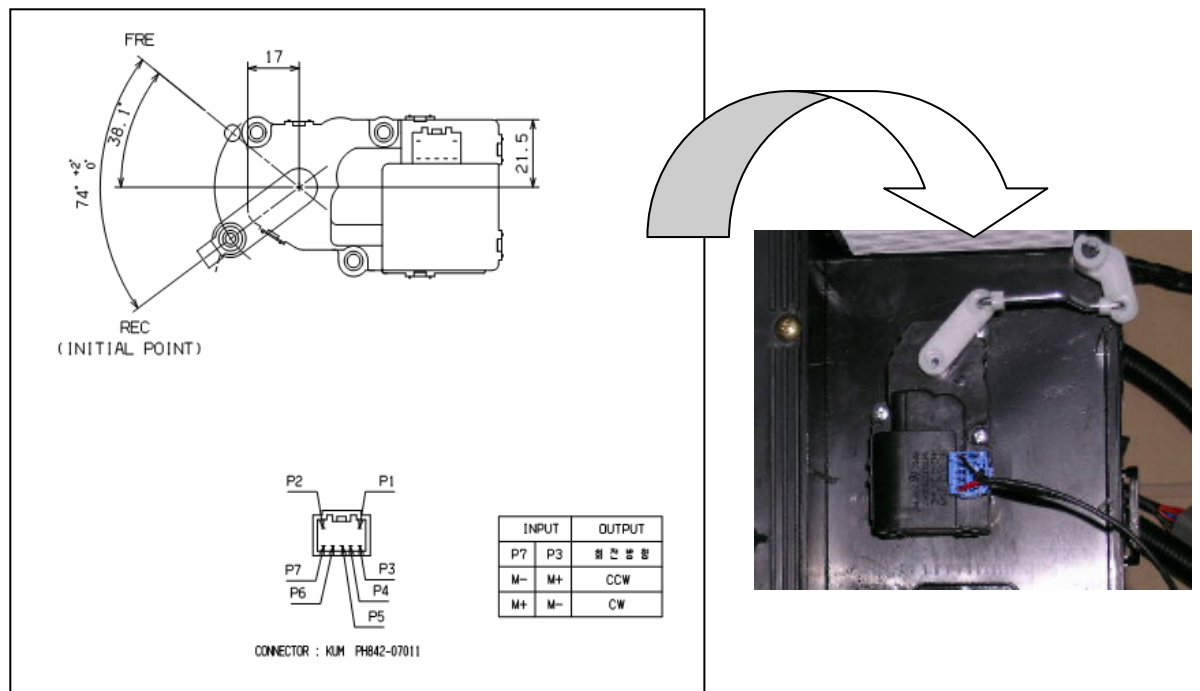
4-6) Link Part

This moves the damper to change the air flow direction to the position desired by the user and is the most essential part in the heater design.

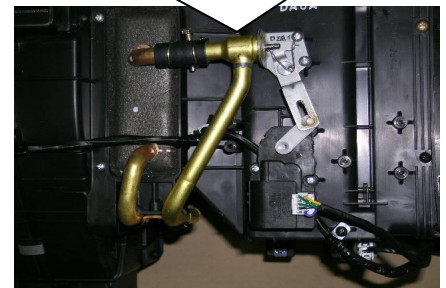
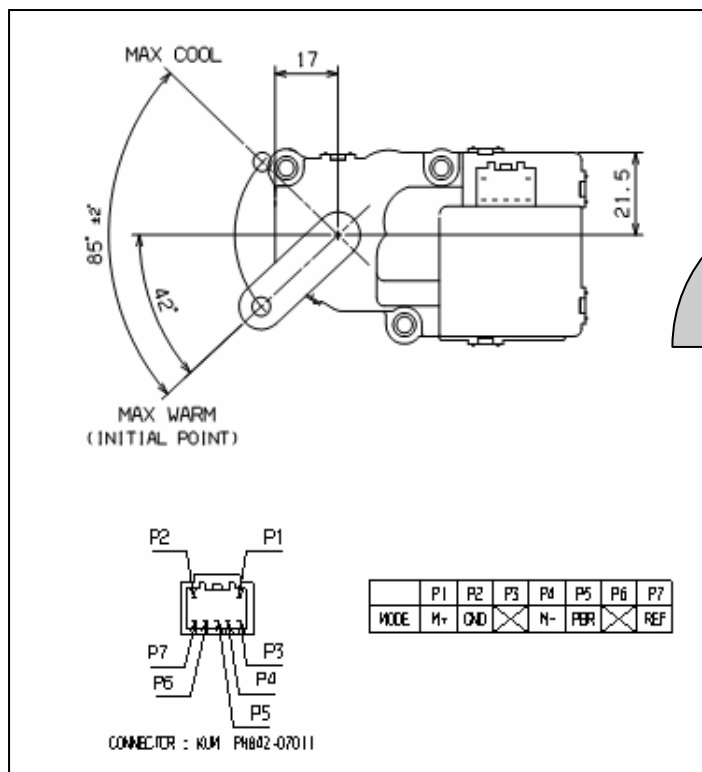
(1) Vent actuator



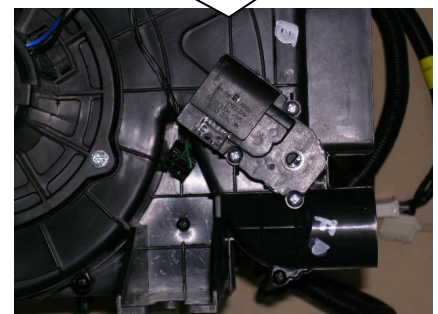
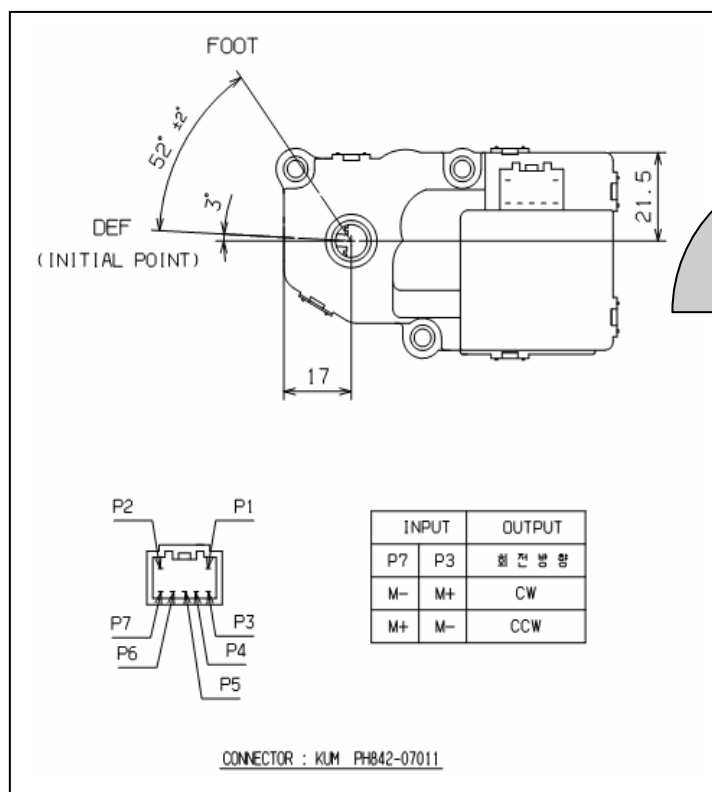
(2) Intake actuator



(3) Temp actuator



(4) Def/Foot actuator



4-8) FILTER

(1) Function

Filter is used to eliminate alien substance and smell inside the vehicle to keep the indoor environment pleasant constantly.

(2) Exchange Cycle

- If not replaced for a long period, Filter can be blocked by alien substance and air flow extremely decreases; Blower Motor may make noise; and bad odor may be generated out of Air discharge port.
- Filter should be frequently checked and replaced depending on the area, device and work site environment where air pollution is serious and/or dust or smoke is largely generated due to bad road condition.

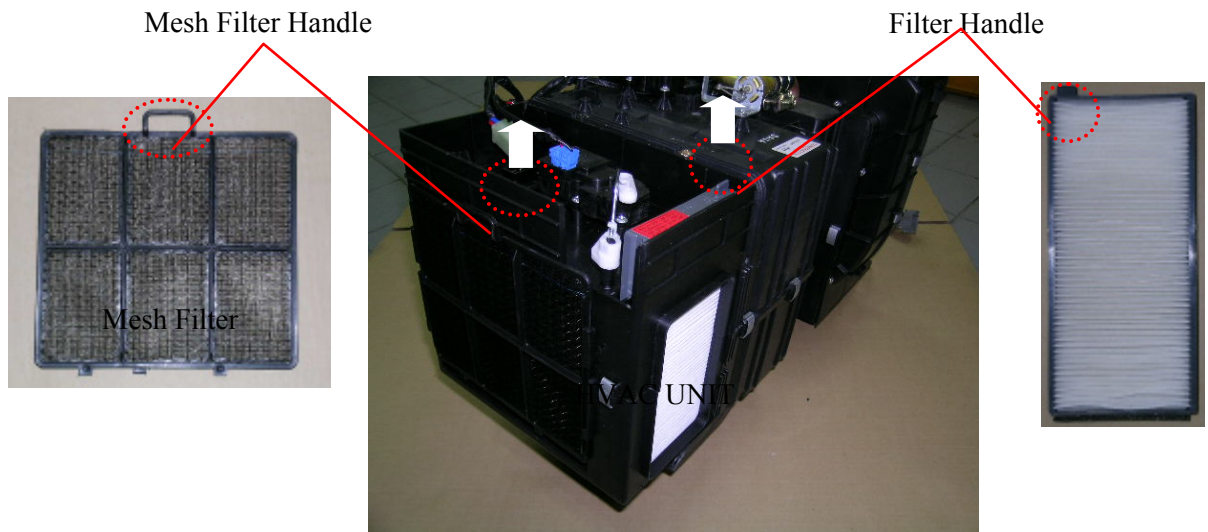
(3) How to replace

□ External Filter

- As shown below, turn the Filter top handle toward the arrow direction to detach.
- Based on the contamination level of the detached Filter, brush it first. If not well cleaned, replace it.

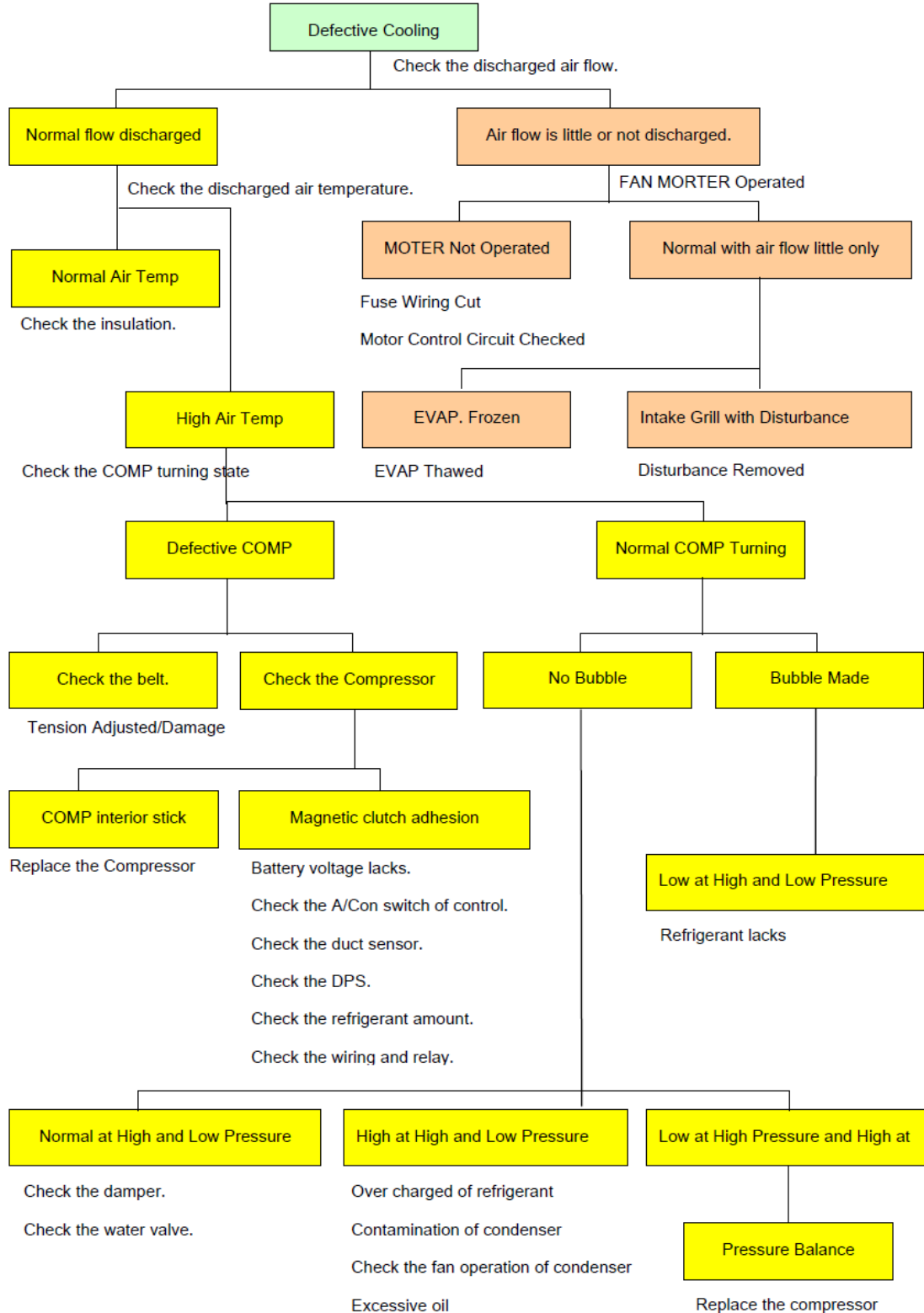
□ Internal Mesh Filter

- As shown below, turn the Mesh Filter top handle toward the arrow direction to detach.
- Check the contamination level of the detached Mesh Filter and then remove the dust on the contaminated part by Air or Water.



1. Defective Cooling and Heating

1-1) Defective Cooling



1-2) Defective Cooling**(1) Fan Motor Not Turning**

Cause	How to check	Action to take
Fuse Cut	Check the air-con fuse.	Replace it with a new one.
Wiring Cut and Defective Connection	Check if the wiring is cut and connector is properly connected.	Repair the cut wire with a new one or connect it correctly.
Fan Motor Broken	Check 2 lead wires from Motor by circuit tester. If current not flown, it is broken.	Replace it with a new one.
Resistor Cut	Check if the resistor electrically works by circuit tester. If not electrically works, it is cut on wire.	Replace it with a new one.
Fan Switch Broken	Run the Fan Switch in order and check the fan turning.	Replace it with a new one.

(2) Fan Motor is normal with little air flow.

Cause	How to check	Action to take
Evaporator Intake is disturbed.	Evaporator Contaminated	Remove the disturbance and clean it.
Air Leakage	Check the assembly state of the cooling unit.	Modify and Adjust
Duct Sensor Defect	Check if the Evaporator is frozen.	Replace it with a new one.

(3) Compressor does not turn or hardly turns.

Cause	How to check	Action to take
Belt Loosen	Belt largely shakes.	Tension Adjust
Compressor Inner Breakage	Belt slips.	Repair or replace it with a new one.
Battery Voltage Short	Slips when turning	Battery Charge
Coil Layer Short	Slips when turning	Replace it with a new one.
Clutch Face Oiled	Clutch ambient part is contaminated and slippery.	Replace it with a new one or clean it,
Big Interval between Clutch Plate and Clutch Wheel.	Push the clutch plate by hands and it is adsorbed.	Modify the interval or replace the part with a new one.
Coil Cut	Not adsorbed or resistance is $\square$	Replace the compressor with a new one.

Cause	How to check	Action to take
Wiring Cut or Earth and Connection Defective	Not adsorbed regardless operation control; and check the earth and connection part.	Repair
Wiring Parts	Check if input switch, thermo switch and relay work electrically.	Replace it with a new one.

(4) Air flow is normally and Compressor turns normally with defective cooling.

Cause	How to check	Action to take
Refrigerant lacks.	Temp little changes when touching the high-low pressure pipe 5~10min after air-con works. Bubble flow is seen through the check-glass and fog-type flow is little seen.	Repair the leaking part and charge refrigerant up to proper volume.
Refrigerant is over charged.	The high-compressed pressure is high. Bubble is not seen through the check-window even when the condenser is cooled by water.	Draw the refrigerant little by little until bubble is seen..
Compression Pressed by Inlet/Outlet	High-Compressed Pressure: 14~15kg/cm ² G Low-Compressed Pressure: 1.5~2.0kg/cm ² G External Temp: 30~35℃; Engine: Approx. 2000 rpm	Normal Pressure
Low Pressure is high.	• <u>Duct Sensor Defect</u> Magnetic Clutch is cut before the discharged air is cooled enough.	Adjust or replace it with a new one.
	• <u>Compressor Gasket or Valve Defect</u> Right after the magnetic clutch is OFF, the high-low pressure gauge pressure is balanced.	Replace the compressor with a new one or repair it.
	• <u>Expansion Valve Over-Opened</u> Same as above; and pressure little changes when the temp reduction tank is attached to or detached from the pipe.	Replace it with a new one.
	• <u>Compressor Suction Filter Clogged</u> The low-pressure hose is not cool enough and only the Compressor connection part is cool.	Clean the filter.
Low Pressure is low.	• <u>Refrigerant lacks.</u> Refer to the section, 'Refrigerant lacks'.	Add refrigerant.
	• <u>Receiver Drier Clogged</u> Temp largely varies at the tank outlet. Also, the tank is frosted.	Replace the Receiver Drier with a new one.

Cause	How to check	Action to take
Low Pressure is low.	• <u>Expansion Valve Clogged</u> Expansion valve inlet is cool and frosted.	Replace the expansion valve with a new one.
	• <u>Tank reduction tank of expansion valve leaks gas.</u> Expansion valve outlet is not cool and the low-pressure gauge is vacuumed.	Replace the expansion valve with a new one.
	• <u>Piping is clogged and distorted.</u> Clogged piping indicates that the low-pressure may be low or lower than atmospheric pressure.	Replace the piping with a new one or clean it.
	• <u>Duct Sensor Defect</u> Evaporator is frozen.	Add refrigerant.
High Pressure is high.	• <u>Condenser Cooling Defect</u> Condenser is contaminated or clogged. Fan turns defectively.	Clean, repair or replace the fan with a new one.
	• <u>Refrigerant Over-Charged</u> Check the volume of refrigerant	Adjust the refrigerant volume.
	• <u>Air Mixed inside Cycle</u> Refer to the section, 'Refrigerant Over-Charged'.	Vacuum Work; and recharge the refrigerant.
High Pressure is low.	• <u>Refrigerant lacks.</u> Refer to the section, 'Refrigerant lacks'.	Add refrigerant.

1-3) Defective Heating**(1) Fan Motor works normal with little air flow.**

Cause	How to check	Action to take
Aeration is too much resistant.	Check if Duct is clogged or distorted.	Modify
Air Leaking from Duct Connection Part	Check Duct connection part. Check Duct assembly state.	Modify

(2) Air flow is discharged normally but hot air does not come out.

Cause	How to check	Action to take
Cooling Water Temp is low.	Check the water temp after heating operation.	Replace the thermostat with a new one.
Cooling Water is little.	Check the water volume of Radiator.	Add cooling water.

Cause	How to check	Action to take
Cooling Water circulation volume is little.	Check if the cooling water piping and heater blocking valve are clogged.	Get rid of air or Modify
Air does not pass through Heater Core.	Check the operation and seal state of the air-mix door.	Modify or replace the control cable with a new one. Check the seal.

(3) Water drop leaks.

Cause	How to check	Action to take
Seal Defect	Check any leakage from Heater core, Core Connection Part, Hose and Pipe.	Replace it with a new one or modify it.
Core is punctured.	Heater core	Replace it with a new one.

2. Visual and Auditory Troubleshooting**2-1) Noise is made as V-belt is getting loosen.**

If V-belt is loosen or too much worn, frictional sound (halt) is made. Adjust the V-belt tension. If torn away, replace it.

2-2) Abnormal noise is made around Compressor.

Check the compressor and installed bracket bolts are loosen. If loosen, tighten them.

2-3) Abnormal noise is made from Compressor.

Abnormal noise inside the compressor may indicate damage of Suction Valve. Detach it for repair or replace it with a new one.

2-4) Condenser is stained with clay and dust.

Clay and dust remarkably degrade the heating effect influencing cooling capability. Wash out such clay and dust with water. At the moment, make sure that the pin is not damaged or distorted.

2-5) Piping Connection Part and Compressor Part are contaminated with oil.

The part contaminated with oil indicates that refrigerant leaks with compressor oil from the cycle due to some reason. If any contamination is found, check the relevant part by gas leakage sensor and tighten it or replace it with a new one.

Compressor O-ring, connected parts O-Ring and shaft seal part should be checked fully.

2-6) Abnormal noise is made from Fan Motor.

If Fan Motor makes abnormal noise or defective turning, replace the Fan Motor with a new one.

Such abnormal noise may be made by alien substance inside the fan or defective joint of the fan.

Work on this matter with full care.

3. Checking Methods per Case

3-1) Gauge based Checking Method

- (1) Open the bonnet.
- (2) Close the Manifold Gage low-pressure side and high-pressure side valve and then install the gauge onto the service valve.
- (3) Release the low-pressure side valve little by little to discharge the air inside the hose and then close it. Same procedure is used also for the high-pressure side.
- (4) Start the device and raise the engine rpm to about 1,500rpm.
- (5) Turn the air-con switch ON and position the air flow switch at the biggest and the temp adjusting switch at the coolest.

Note

- Put the device on even place and support the parking brake and wheel with wooden support.

Caution

- Manifold Gage measuring value is subject to little change by external temp and depends on the specific conditions as follow:

•

Door

: All Opened

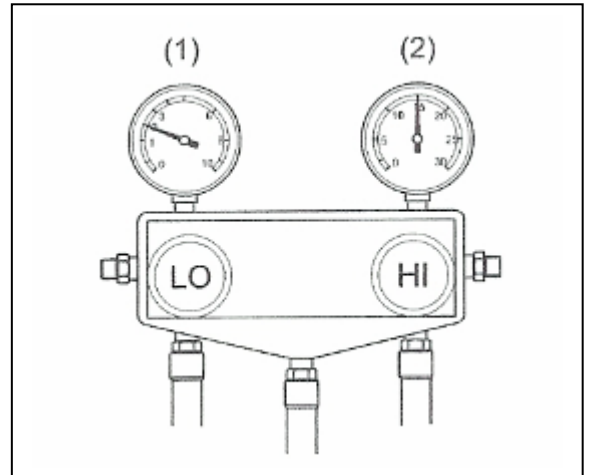
- External-Internal Circulation: Internal
- Engine RPM: Approx. 1,500rpm
- Air Flow Adjusting Switch: Biggest
- Air-Con Switch: ON
- Temp Adjusting Switch: Coolest Position
- External Temp: 30°C ~ 35°C

- The following 3-2) ~ 3-9) show the ideal input state. Actually, however, the high-pressure low-pressure may be displayed differently depending on temp, humidity, operation condition and etc.

3-2) Normal:

If air-con works normally, the gauge pressure at the low pressure side and high pressure side is seen as follows:
i.e.) High/Low pressure may be displayed differently depending on temp, humidity, operation condition and etc.

- Low Pressure Side (Blue) (1): 1.5 ~ 2.0kg/cm²
- High Pressure Side (Red) (2): 14.5 ~ 15kg/cm²

**3-3) Refrigerant is little.**

(1) Case: Not Cool

(2) Symptom:

- Low Pressure at Both Low Pressure and High Pressure Sides

- Low Pressure Side (Blue) (1): 0.8kg/cm² 이하

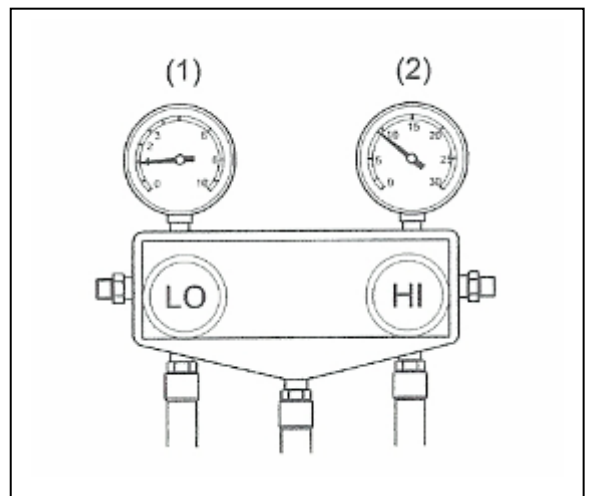
- High Pressure Side (Red) (2): 8~9kg/cm²

- Bubble Seen through Check-Window

- Discharging Temp Not Down

(3) Cause: Refrigerant leaks.

(4) Action to Take: Check the part by gas leakage sensor to repair the leaking part and charge proper volume of refrigerant.



3-4) Refrigerant is over-charged. Condenser is not fully cooled

(1) Case: Not Cool

(2) Symptom: High at Both High and Low Pressure Sides

(3) Cause:

- Pressure rises up because refrigerant is over-charged.

- Low Pressure Side (Blue) (1): 2.5 kg/cm²

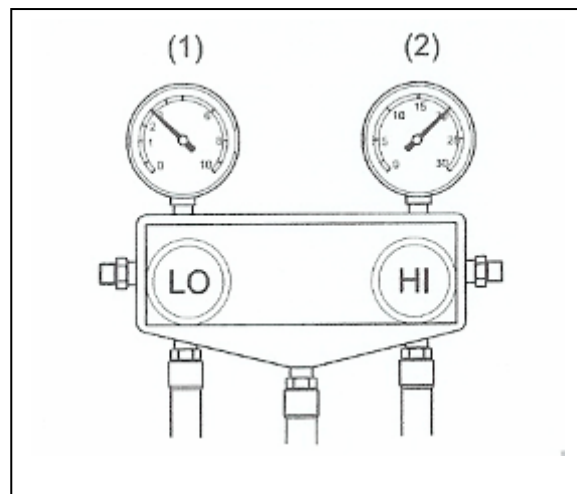
- High Pressure Side (Red) (2): 20kg/cm²

- Condenser is not fully cooled.

- Air-Con belt is loosen.

(4) Action to Take:

- Clean the condenser.
- Check the fan or condenser motor and adjust it.
- Check the refrigerant volume.



3-5) Air Contained in Cycle

(1) Case: Not Cool

(2) Symptom:

- High at Both High and Low Pressure Sides

- Low Pressure Side (Blue) (1): 2.5 kg/cm²

- High Pressure Side (Red) (2): 23kg/cm²

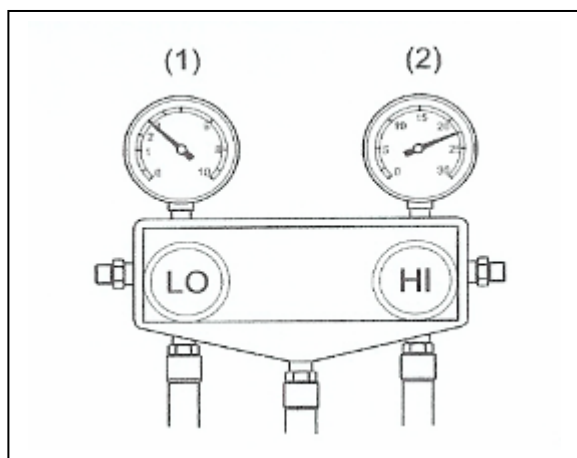
- Piping at Low Pressure Side is not cool

(3) Cause: Air is contained in the cooling cycle.

If not vacuuming, indication is displayed as shown right in the figure.

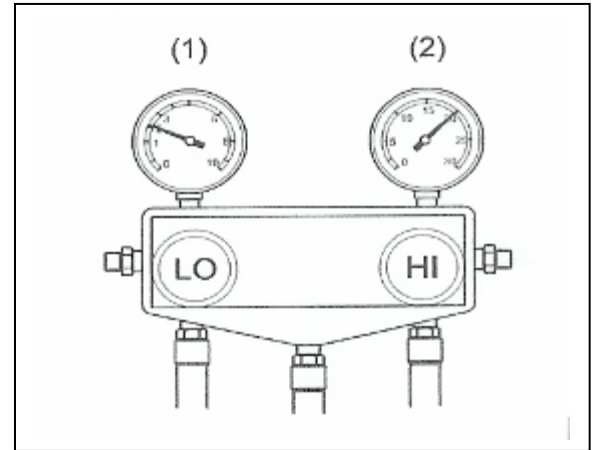
(4) Action to Take:

- Check the indication while charging refrigerant after vacuuming.
- To operate the device for a long period with air contained, replace the receiver drier.
- Check the refrigerant and oil contamination.



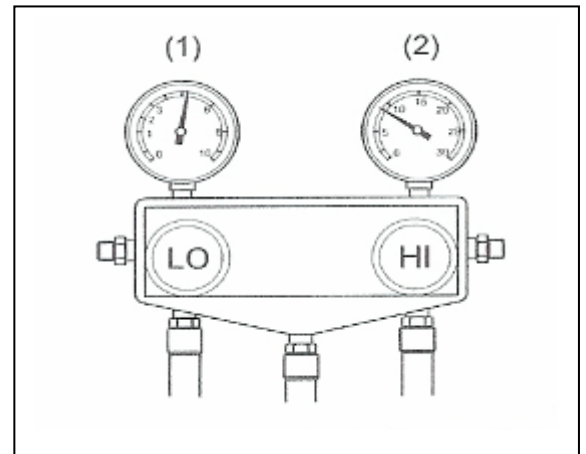
3-6) Expansion Valve Broken

- (1) Case: Not Cool
 (2) Symptom: High at Both High and Low Pressure Sides
 - Low Pressure Side (Blue) (1): 2.5 kg/cm²
 - High Pressure Side (Red) (2): 19 ~ 20 kg/cm²
 (3) Cause: Expansion valve is defective and temp reduction tank is defectively assembled, so that refrigerant flow is defectively adjusted.
 (4) Action to Take: Check the assembly state, position and insulation state of the temp reduction tank. If normal, replace the expansion valve.



3-7) Compressor Compression Defect

- (1) Case: Not Cool
 (2) Symptom:
 • High at Low Pressure Side while Extremely Low at High Pressure Side
 - Low Pressure Side (Blue) (1): 4 ~ 6 kg/cm²
 - High Pressure Side (Red) (2): 7 ~ 10 kg/cm²
 • As soon as operation stops, low and high pressures become same.
 (3) Cause: Compressor gasket is defective and suction valve is damaged making defective compression.
 (4) Action to Take:
 • Detach the compressor and repair it.
 • Replace the compressor assembly.

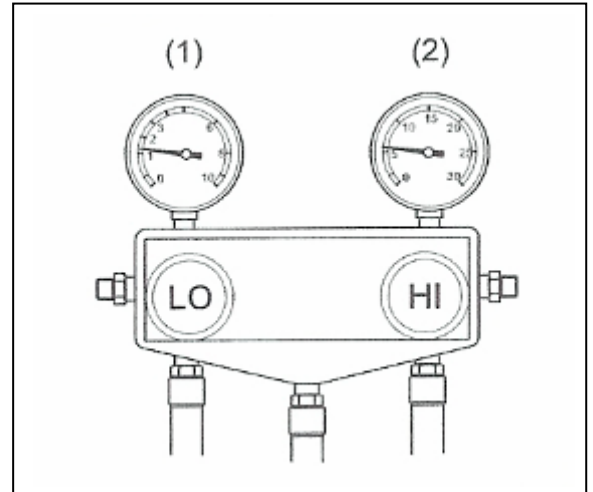


3-8) Moisture Contained in Cooling Cycle

(1) Case: Cool Sometimes and Not Cool Other-Times

(2) Symptom: Low Pressure Side is lower than the atmospheric pressure and gets normal sometimes.

- Low Pressure Side (Blue) (1): vacuum $\sim 1.3 \text{ kg/cm}^2$
- High Pressure Side (Red) (2): $6 \sim 18 \text{ kg/cm}^2$
- (3) Cause: The moisture is frozen inside the cooling cycle and then closes the cycle in the expansion valve, or it is melted and then makes normal operation.
- (4) Action to Take: Replace the Receiver Drier with a new one.
- Vacuum it 2-3 times.
- Charge the proper volume of refrigerant.



3-9) Refrigerant Circulation Defect

(1) Case: Not Cool (Sometimes Cool)

(2) Symptom:

- Low Pressure Side is lower than atmospheric pressure and High Pressure Side is $5 \sim 6 \text{ kg/cm}^2$.

- Low Pressure Side (Blue) (1): 0.76 kg/cm^2
- High Pressure Side (Red) (2): 6 kg/cm^2

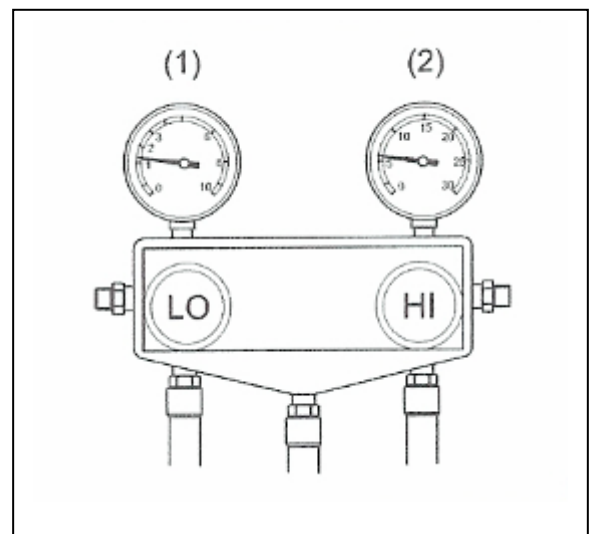
- The front/rear piping connection parts of the Receiver Drier or Expansion Valve are frosted or dewed.

(3) Cause:

- Moisture frozen or dust inside the freezing cycle closes the cycle.
- Expansion valve temp reduction tank is defective and blocks the cycle.

(4) Action to Take:

- Stop the operation and to check if it is blocked by moisture and dust.
- If moisturized, vacuum it.
- Detach the expansion valve and wipe out the dust by air.
- Replace the Receiver Drier with a new one.

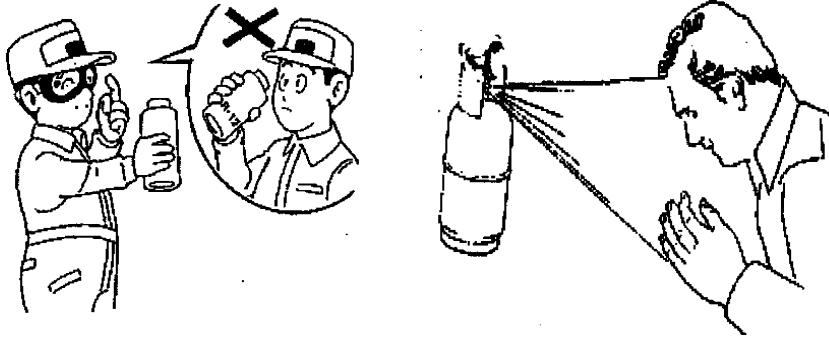


4. Air-Con System Checking and Adjustment

4-1) Note for Working with Refrigerant:

(1) Refrigerant is frozen at low temp.

Touching it by skin may make you frostbitten and touching it by eye may makes you blind.



Note

If the refrigerant gets in your eyes or contacts your skin:

Wash it with fresh water and then get treatment by optical or skin doctor.

Do not scrub eyes with hands or handkerchief.

(2) For refrigerant wok, the work site should be well ventilated and clean. Refrigerant is harmless.

If, however, it is largely discharged in closed place,

Oxygen gets reduced.

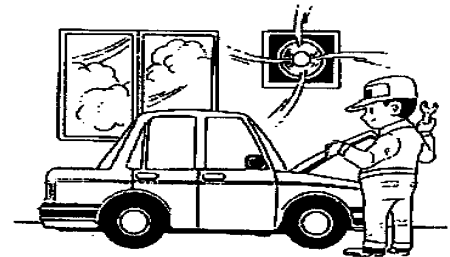
□ Exposure Allowance Limit: 1,000ppm(4,184mg/m²)

- If risk increases by exposure,

You may get abnormality in/on the parts as follow:

heart, cardiovascular system, immune system,

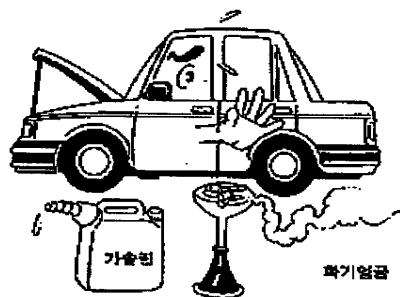
allergy, respiratory organs and skin.



(3) While working on refrigerant, get any flammable and firing object away from the car.

Make sure that the refrigerant container is not exposed to heat.

Otherwise, it may burst or explode.

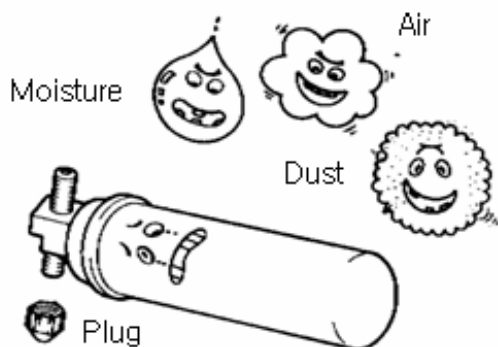


(4) A/CON parts are sealed to prevent dust inflow.

Remove the cap before work. Seal it after work.

- PAG cooling oil for R-134a absorbs moisture more easily than the oil for R-12. Its absorption rate is about 10 times MINERAL cooling oil.

Too much moisture may make trouble on the compressor circulation and then affect durability.

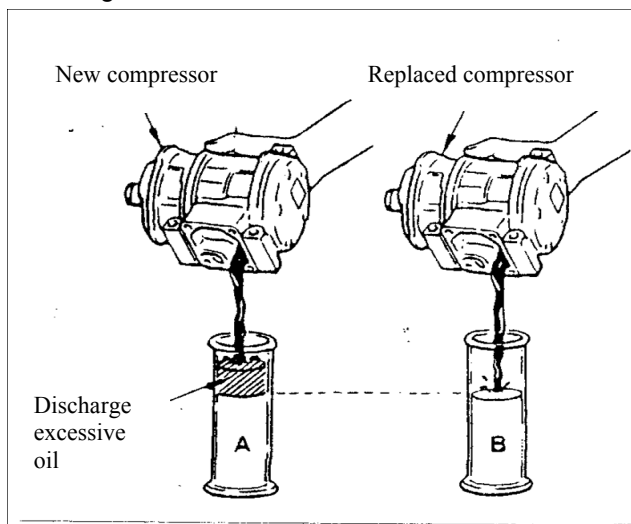


(4) Add the refrigerant oil after replace any of A/CON parts or check the refrigerant.

Item	OIL Volume	Item	OIL Volume
Recharge the refrigerant.	30cc	Replace Hose and Pipe with new ones.	10cc
Replace EVAP. with a new one.	50cc	Replace R/Drier with a new one.	30cc
Replace COND. with a new one.	30cc		

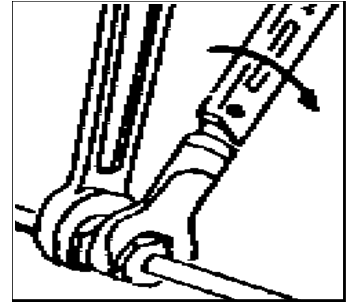
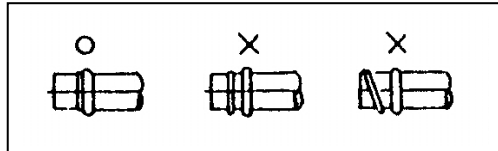
(6) Replace a new compressor with another new one after checking the oil volume of the compressor to be replaced and then discharging excessive oil as shown right in the figure.

- Discharge about 70cc.



- Compressor oil absorbs moisture in the air fast. Protect it from moisture.

(7) When detaching A/CON System and installing it again, spread cooling oil onto O-Ring. Briefly assemble the bolt type connection part by hands and then tighten it using 2 spanners so that the tube cannot be twisted. Then, tighten it to meet its specified torque. Make sure that O-Ring is not bitten due to careless work and the refrigerant shall not leak.



(8) When connecting the pipes, make sure that O-Ring part shall not be contaminated by alien substance or deformed. Coat them with cooling oil (PAG) and then assemble them.

(9) Promptly detach and attach them so that dust or moisture cannot penetrate into the air-con system.

(10) After working on refrigerant, operate the air-con for about 5min in Idle state and then use it. (After working on refrigerant, if the air-con is operated by turning the engine at high speed, the compressor may be broken.)

(11) Before collecting the refrigerant completely, do not detach the A/CON System.

☐ Otherwise, the refrigerant and oil are discharged into the air by the system inner pressure and then pollute the ambient environment.

(12) Inject specified volume of refrigerant.

☐ If the compressor inner part is broken or it is broken by penetration of alien substance and moisture, Receiver Drier is also recommended to be replaced with a new one.

4-2) Note for Maintenance

(1) If the air-con performance gets loose, check the volume of refrigerant and recharge it immediately. (Using it for a long period with little volume of refrigerant may make the compressor broken.)

(2) Condenser needs to be cleaned periodically.

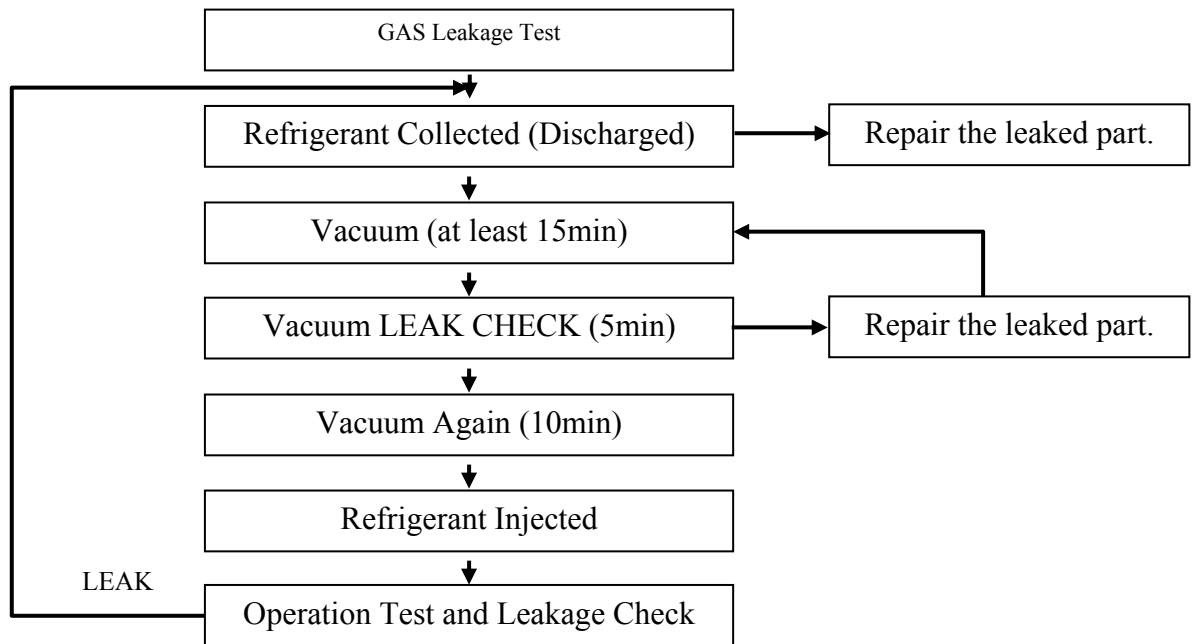
If the condenser is stained by alien substance (soil, weed and etc) on its outer surface, abnormally high pressure is made degrading the cooling performance and generating high pressure cycle that cause the compressor to be broken. Periodic check is needed.

3) Internal filter built in HVAC Unit and external filter should be cleaned and replaced with new ones periodically.

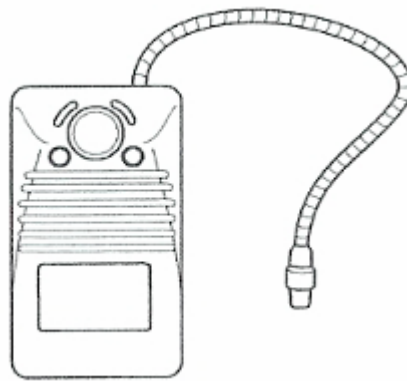
4-3) Working Method on A/CON Refrigerant

To secure A/CON performance and Compressor durability, it is basically needed to keep proper volume of refrigerant inside the SYSTEM. The system vacuum state and injection method largely influence the compressor. Therefore, before injecting refrigerant, clearly understand the refrigerant injection method and correctly work on it.

A/CON refrigerant work should be done in the order as follows. If possible, use automatic collecting/charging device to prevent working error.

**(1) GAS Leakage Test**

- Check any leakage of each part by gas leakage sensor.

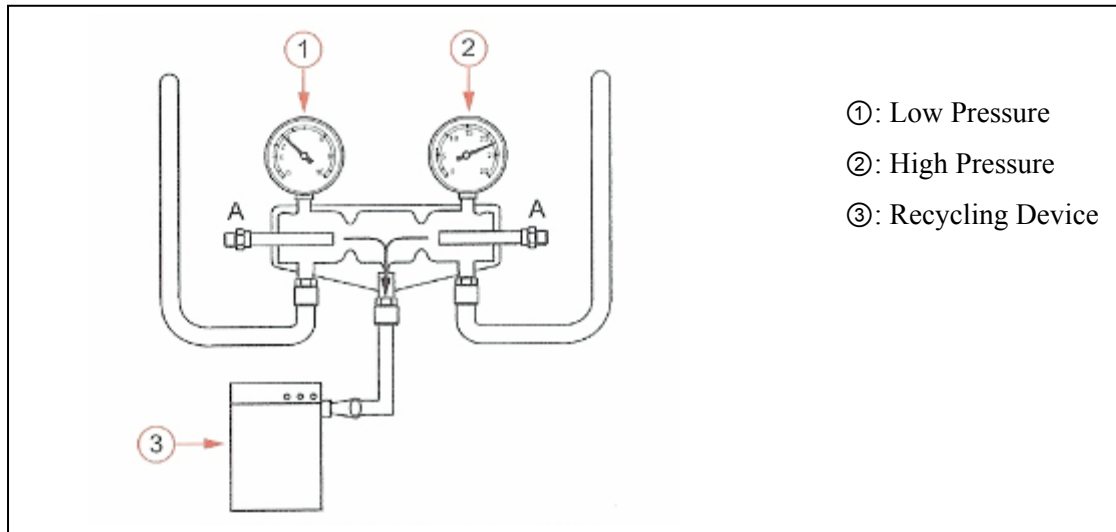


- Visual Identification Method of Leaking Part

- The connection part of each Hose & Pipe is stained by oil trace and dust.
- Condenser has changed on the surface of its leaking part that is contaminated by dust and oil.
- When Evaporator leaks, oil is mixed in the condensate water of Drain Hose.

4-4) A/CON Refrigerant Collecting and Charging Method**(1) When using MANIFOLD GAUGE****1) Refrigerant Discharging (Manifold Gauge Used)**

- ☐ When Manifold Gauge is used, "CLOSE" the high/low pressure valves and then the high/low pressure hose coupling to the service valve of A/CON SYSTEM.

**Important**

- Do not take out refrigerant to the outdoor.
- Use HRC-134a device only.
- Check if the maintenance hose is correctly connected.

Caution

- Wear protective glasses and gloves.

- ☐ As shown in the figure, attach the manifold gauge and recycling device to the refrigerant line.

Note

- Make sure that the low/high pressure valves' connection parts are not switched each other.

- ☐ Open the high pressure valve slowly to discharge refrigerant through the recycling device.

Note

- Make sure that refrigerant does not leak and open the valve slowly.

- ☐ When Manifold Gauge dial gets down to 3.5 kg/cm² (50 psi) or lower, open the low pressure valve slowly.

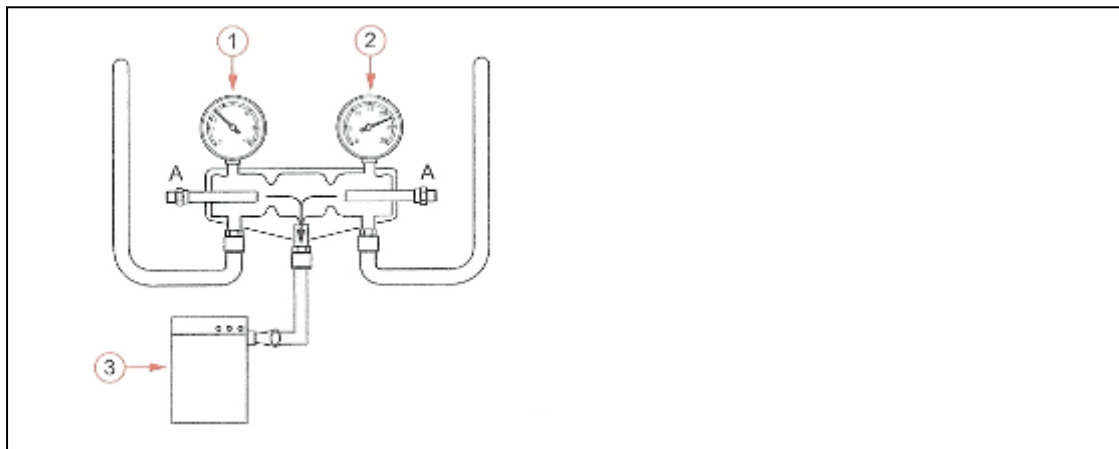
- ☐ Until Manifold Gage dial displays 0 kg/cm² (0 psi), open both high/low pressure valves slowly.

2) Vacuum

After refrigerant is completely discharged, connect the discharging hose to the vacuum pump and then open the high/low pressure valves. Operate the vacuum pump to vacuum the system inner part for approximately 15min so that it can be fully vacuumed.

Note

If vacuum is not enough, it cannot be charged and the moisture contained in the system is not eliminated causing the expansion valve to be frozen and clogged on its circuit decreasing its performance; and Compressor Oil reacts to the moisture and is blazed causing the compressor to be damaged earlier.



- ☐ Connect the manifold low pressure maintenance hose (blue) and high pressure maintenance hose (red) to the service valve.
- ☐ Connect the manifold central hose (yellow) to the vacuum pump.
- ☐ Open the low/high pressure side valves and operate the vacuum pump as directed to vacuum.
- ☐ Vacuum it for about 15min. When the low pressure gauge gets to the lowest safety vacuum level (711.2~736.2 mmHg), stop the vacuum pump and close the manifold low/high pressure side valves. Approximately 5min later, check if the gauge does not get to "0".
- The said vacuum level can be gotten at 0m above sea level. The vacuum level decreases by 25.4mmHg as the altitude gets higher by 340m (1000 feet).
- Ex) At 1524m (5000 feet) high, work with the device until the vacuum level gets to 584.2 ~ 609.7 mmHg.
- ☐ When the gauge gets to 0, it indicates leakage. Check and repair the pipe connection part and then vacuum it. Then, check if gas leaks.

Note

- After vacuum is formed, close the gauge valve at high/low pressure sides. Detach the hose after the vacuum pump completely stops. Otherwise, alien substance is sucked into.

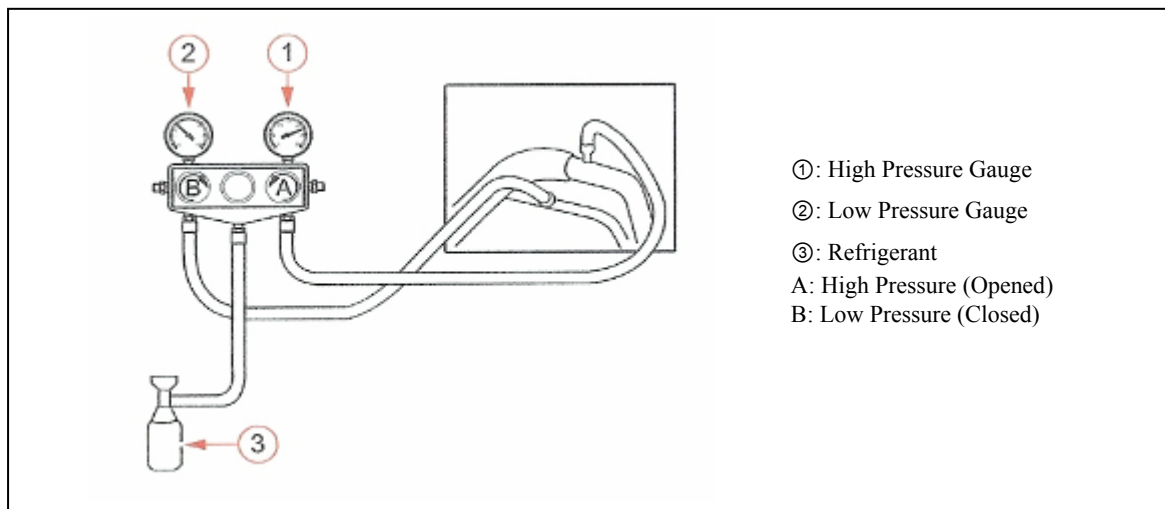
3) Charging

After vacuuming, close the manifold high pressure valve and connect the discharging hose to the charge cylinder. Then, open the connection part between the manifold and hose. Close the connection part when it is full with refrigerant. Before injection, mark the correct charging volume on the charge cylinder and open the high pressure valve to charge refrigerant through the high pressure side.

Note

- Refrigerant must be charged through the high pressure side. If charged through the low pressure side, liquid refrigerant flows into the compressor and causes the compressor to be stuck when A/CON is turned "ON".

If not fully vacuumed, refrigerant cannot be charged. Full vacuum is needed.

**Important**

- Discharge the gas and vacuum before charge the gas.
- When charging the gas, do not start the engine. Charge it from the edge of the High Pressure Side and then start the engine to charge the specified volume of gas.

Caution

- When charging gas at the edge of High Pressure Side, do not start the engine. Otherwise, refrigerant flows backward and the device may be broken; and the compressor may be damaged due to shortage of refrigerant.

- Open the high pressure valve and inject refrigerant of about 700g.
- Close the high pressure valve and check if gas leaks.
- After checking with the high pressure valve closed, start the engine and operate it at about 2000rpm.
- Set the temp control lever at Cooling and position the blower switch at High Speed.
- Open the low pressure valve and charge refrigerant until bubble disappears from Receiver Window.
- When refrigerant fully charged, close the low pressure valve and stop the engine.
- Test if refrigerant leaks.
- Refrigerant Volume to be Charged: 1,300g (2.866 lbs)
- Manifold Gauge Pressure (External temp is 30°C (86°F).)
 - High Pressure: 14.5 ~ 15 kgf/cm² (1.42~1.47 Mpa. 206.2~213.3 psi)
 - Low Pressure: 1.5 ~ 2.0 kgf/cm² (0.15~0.19 Mpa. 21.3~28.4 psi)

Caution

- Replace the service can after discharging the air from the charging hose (red).
- When the service can is used, connect it to the discharging hose for charging. If the ambient temp is low, warm the service can by 40°C or colder hot water and then charge the refrigerant.



Note

- Do not turn over the service can to charge refrigerant. Put the service can on a scale so that specified volume can be charged.

4-5) Checking of Refrigerant Volume

Refrigerant volume can be checked by seeing the pressure gauge and the flowing state of the refrigerant shown through Check-glass of Receiver Drier. The bubble state and discharging pressure seen through Check-glass largely depend on external temp, condenser front temp, air flow speed of the fan, weather and etc. Therefore, check the air-con system under the conditions as follow:

(1) Operate the air-con under the conditions as follow:

- External Temp: 20°C or higher
- Engine Speed: Approximately, 1500rpm
- Temp Control Lever: Positioned at the Coldest Temp
- Fan Control Switch: High
- Air-Con Switch: ON

(2) Open the hood and check the temp difference between the high pressure pipe and low pressure pipe.

□ Normal:

Temp largely differs between the high pressure pipe and low pressure pipe.
(High pressure pipe is hot while low pressure pipe is cold.)

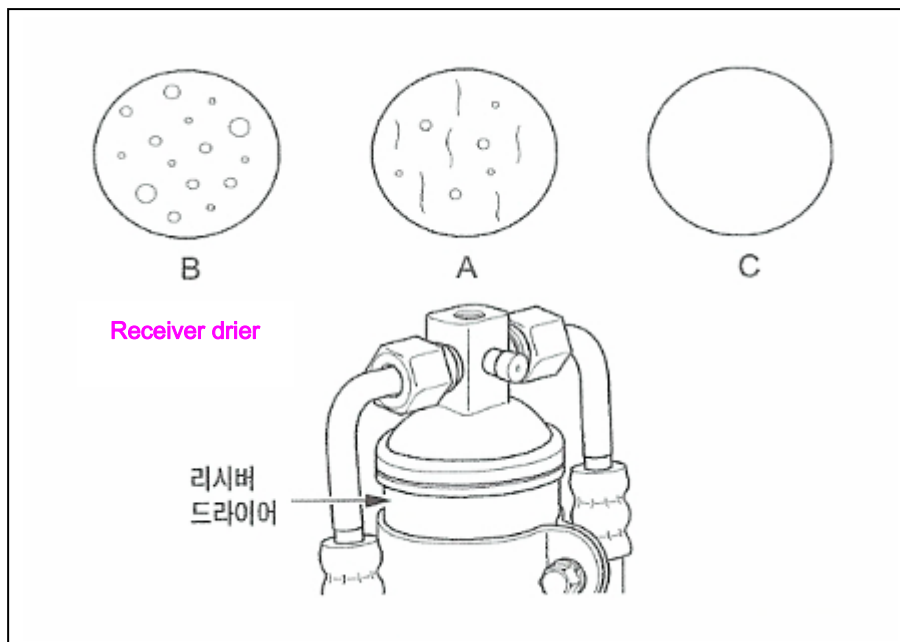
□ Abnormal:

- Temp little differs between the high pressure pipe and low pressure pipe.
(Refrigerant almost or completely lacks.)
- High pressure pipe is hot while low pressure pipe is cold, so that temp largely differs between them.
(Too Much Refrigerant)

□ Action to Take:

If refrigerant almost lacks, discharge the air and then recharge the refrigerant. Then, check if it leaks.
If refrigerant is too much, discharge it down to the specified volume.

(3) Check the Receiver Drier Check-glass.

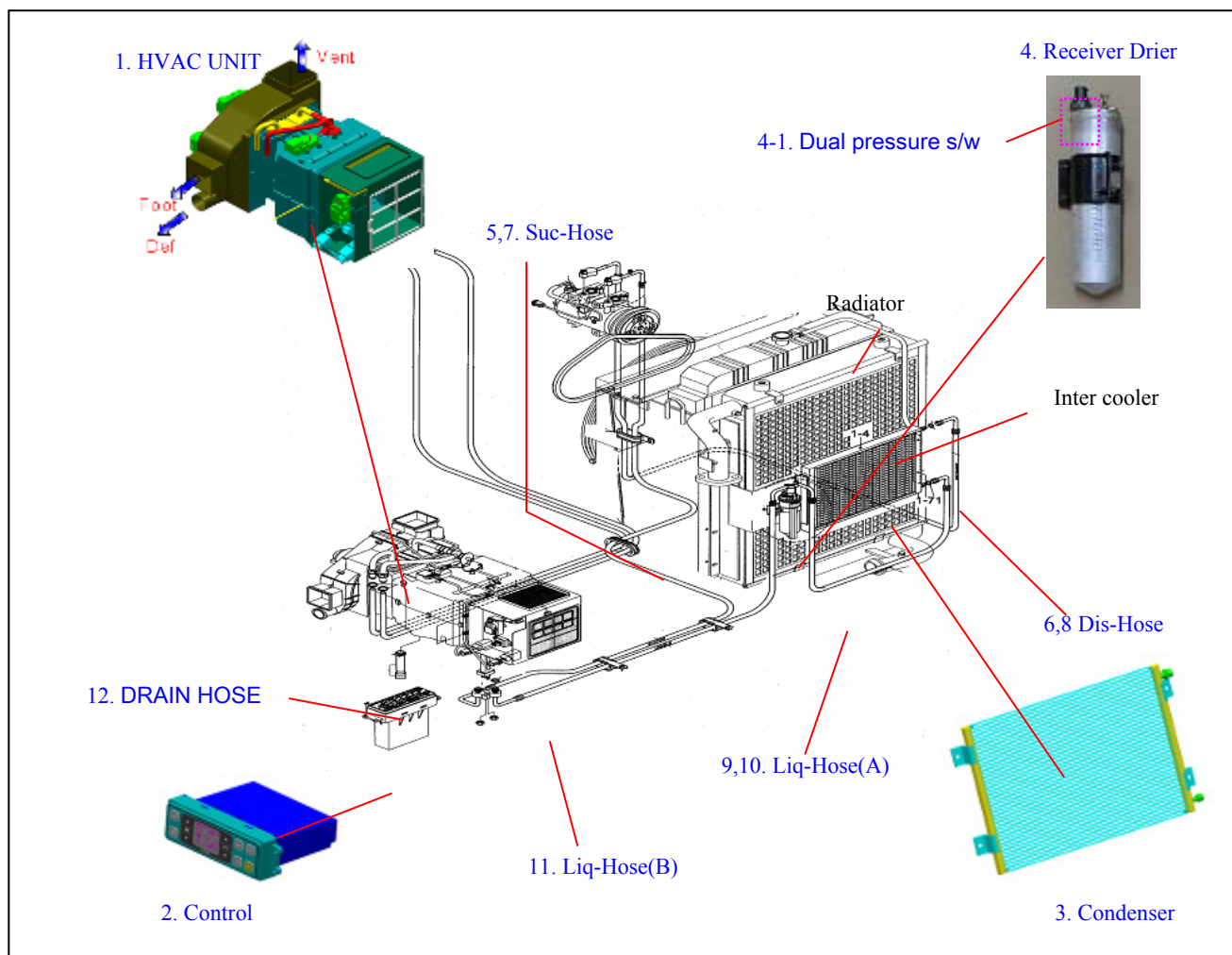


A, Normal: Air drop sometimes passes through.

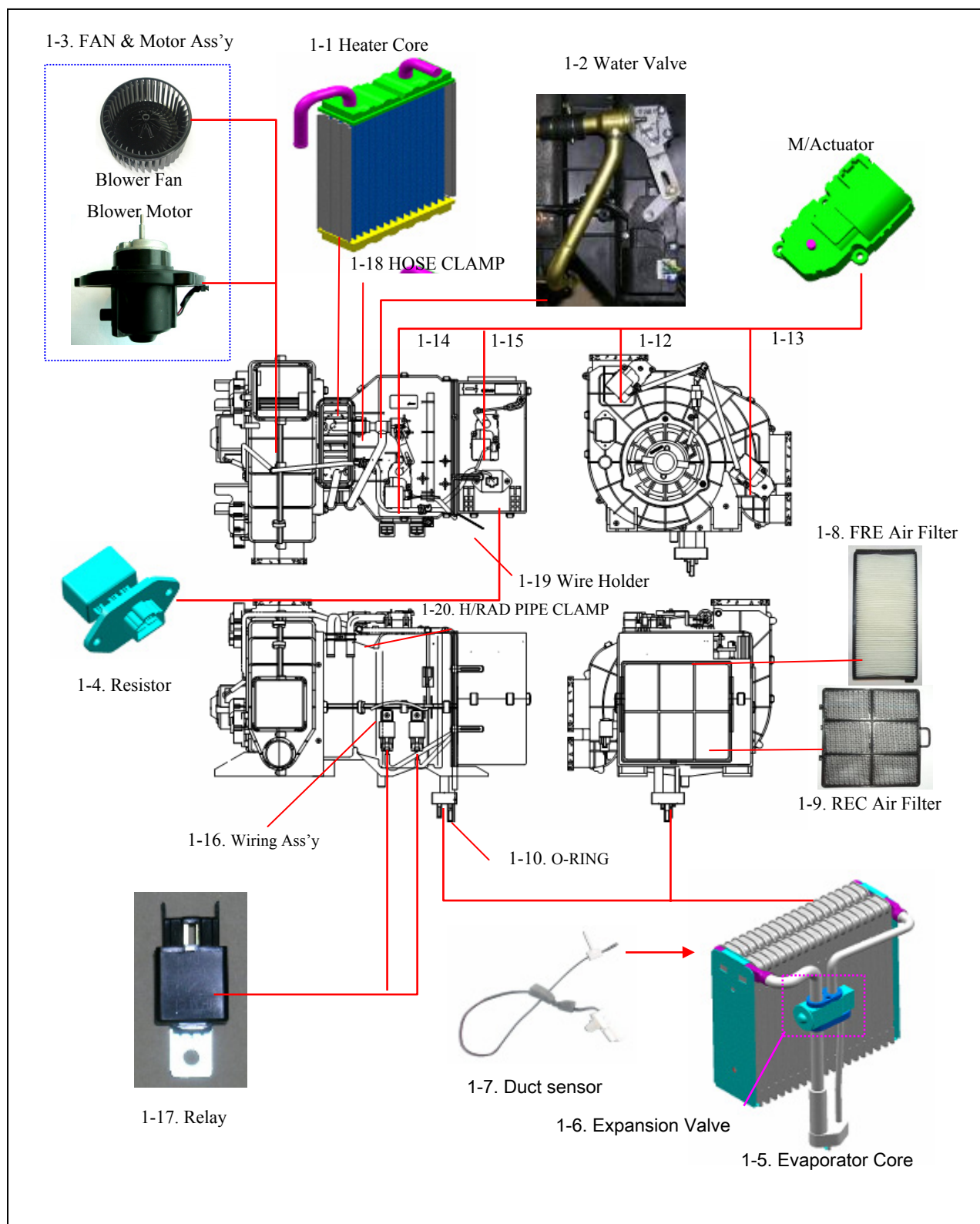
B, Short: Air drop keeps passing through.

C, Too Much: Air drop does not keep passing through.

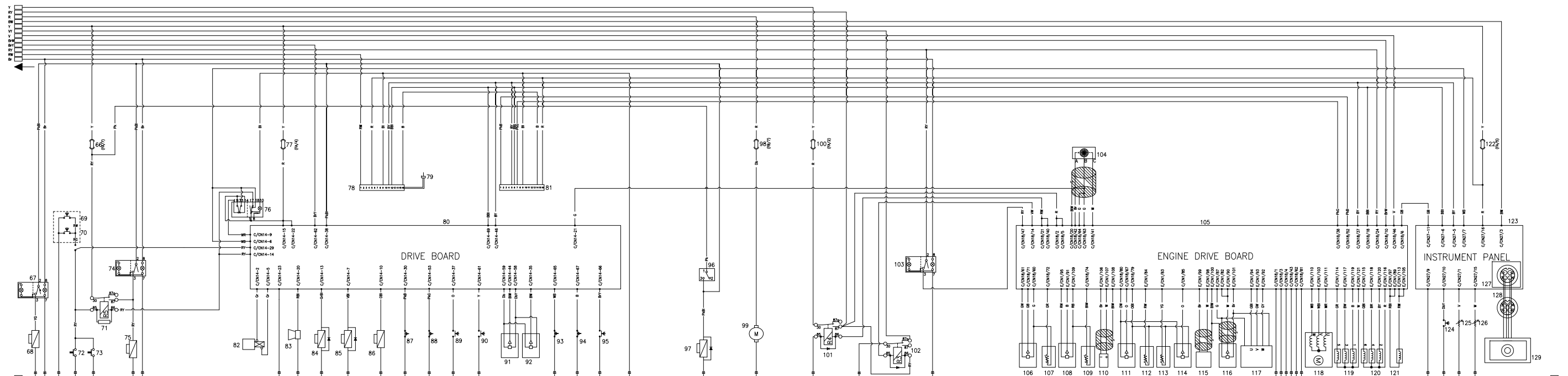
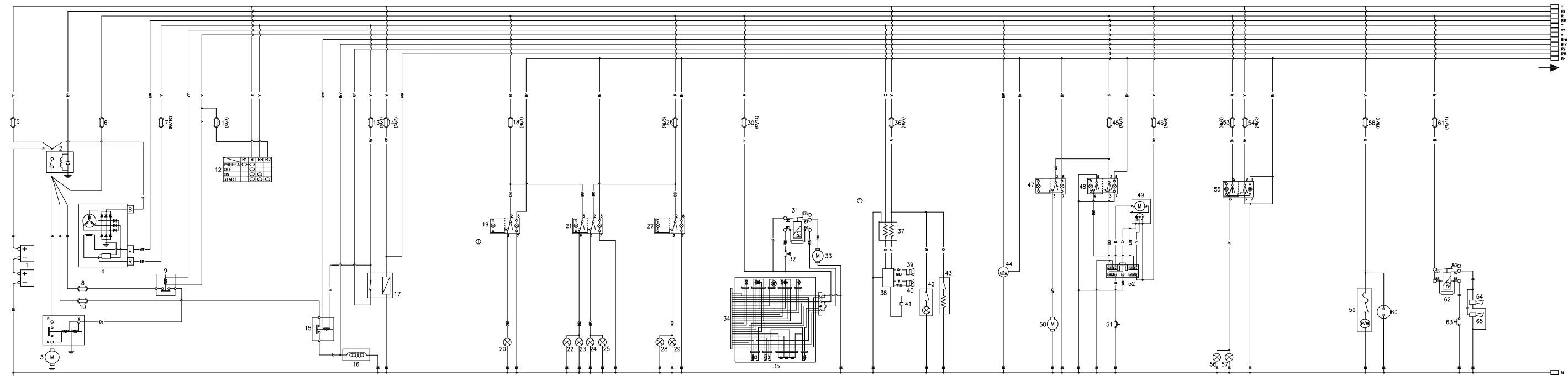
1. Air-con system Components



2. HVAC UNIT Components



PAGE NO	DRAWING NAME	EXPLANATION	SERIAL NO
1.1	Electric Circuit Diagram		9125501 -
1.2	Electric Circuit Diagram	Counter weight changed. Swing lamp cables are removed. Car stereo connected to the starter key.	9125511 -
2.1	Cabin Harness		9125501 -
2.2	Cabin Harness	Counter weight changed. Swing lamp cables are removed. Car stereo connected to the starter key.	9125511 -
3.1	Main Harness		9125501 -
3.2	Main Harness	Solenoid valve of quick coupling changed. Counter weight changed. Swing lamp cables are removed.	9125511 -
4.1	Engine Harness		9125501 -
4A.1	Engine Harness – 4HK1X		9125501 -
5.1	Working Lamp Harness		9125501 -
6.1	Cable (Master Cutter-Fuse)		9125501 -
7.1	Cable (Relay_Preheater-Fuse)		9125501 -
8.1	Cable (Master Cutter-Fuse)		9125501 -
9.1	Cable (Safety Switch)		9125501 -
10.1	Cable (Battery (-) _ Battery(+))		9125501 -
11.1	Cable (Battery(+)_Master Cutter)		9125501 -
11.2	Cable (Battery(+)_Master Cutter)	Battery is placed under the air filter.	9125511 -
12.1	Cable (Battery (-)_Frame)		9125501 -
13.1	Cable (Master Cutter_Starter Engine)		9125501 -
14.1	Cable (Working Lamp)		9125501 -
15.1	Cable (Swing Lamp)		9125501 -



1. AKÜ [BATTERY], 24V
2. ELEKTRİK AKÜ SALTERİ [SWITCH BATTERY]
3. MARS MOTORU [STARTER MOTOR]
4. SARJ DİNAMOSU [ALTERNATOR]
5. SİGORTA [FUSE], 50A
6. SİGORTA [FUSE], 70A
7. SİGORTA [FUSE], 5A
8. SİGORTA [FUSE], 50A
9. MARS RÖLESİ [STARTER RELAY]
10. SİGORTA [FUSE], 70A
11. SİGORTA [FUSE], 5A
12. KONTAK ANAHTARI [STARTER SWITCH]
13. SİGORTA [FUSE], 15A
14. SİGORTA [FUSE], 10A
15. ÖN İSİTİCİ RÖLESİ [PREHEATER RELAY]
16. ÖN İSİTİCİ [PREHEATER]
17. İMMOBİLİZER (OPS)
18. SİGORTA [FUSE], 15A
19. TEPE LAMBASI ANAHTARI (OPS) [ROTARY LAMP SWITCH (OPT)]
20. TEPE LAMBASI (OPS) [ROTARY BEAKON (OPT)]
21. ÖN/ARKA CALISMA LAMBASI ANAHTARI (OPS) [FRONT/REAR WORKING LAMP SWITCH (OPT)]
22. ARKA CALISMA LAMBASI (OPS) [WORKING LAMP, REAR (OPT)]
23. ARKA CALISMA LAMBASI (OPS) [WORKING LAMP, REAR (OPT)]
24. ÖN CALISMA LAMBASI (OPS) [WORKING LAMP, FRONT (OPT)]
25. ÖN CALISMA LAMBASI (OPS) [WORKING LAMP, FRONT (OPT)]
26. SİGORTA [FUSE], 15A
27. CALISMA LAMBASI ANAHTARI [WORKING LAMP SWITCH]
28. CALISMA LAMBASI (SOL) [WORKING LAMP (LEFT)]
29. CALISMA LAMBASI (SAG) [WORKING LAMP (RIGHT)]
30. SİGORTA [FUSE], 15A
31. KLİMA RÖLESİ [AIR CONDITIONER RELAY]
32. KLİMA BASINÇ ANAHTARI [AIR CONCONDITIONER PRESSURE SWITCH]
33. KLİMA KOMPRESÖRÜ [AIR CONDITIONER COMPRESSOR]
34. KLİMA KUMANDA PANELİ [AIR CONDITIONER INSTRUMENT PANEL]
35. KLİMA [AIR CONDITIONER]

36. SİGORTA [FUSE], 15A
37. KONVERTÖR [CONVERTER], (24V-12V)
38. TEYF [CAR STEREO]
39. SOL HOPARLÖR [LEFT SPEAKER]
40. SAG HOPARLÖR [RIGHT SPEAKER]
41. ANTEN [ANTENNA]
42. KABİN LAMBASI [CABIN LAMP]
43. ÇAKMAK [CIGAR LIGHTER]
44. ÇALIŞMA SAATİ [OPERATING HOUR COUNTER]
45. SİGORTA [FUSE], 10A
46. SİGORTA [FUSE], 10A
47. SİLECEK SUYU POMPA ANAHTARI [WASTER PUMP SWITCH]
48. SİLECEK MOTORU ANAHTARI [WIPER MOTOR SWITCH]
49. SİLECEK MOTORU [WIPER MOTOR]
50. SİLECEK SUYU POMPASI [WASTER PUMP]
51. SİLECEK MOTORU EMNİYET ANAHTARI [WIPER MOTOR SAFETY SWITCH]
52. SİLECEK MOTORU KONTROL UNİTESİ [WIPER MOTOR DRIVE BOARD]
53. SİGORTA [FUSE], 10A
54. SİGORTA [FUSE], 10A
55. PARK/FAR ANAHTARI [PARK/HEAD LAMP SWITCH]
56. KISA FAR (SOL) [HEAD LAMP, LOW BEAM (LEFT)]
57. KISA FAR (SAG) [HEAD LAMP, LOW BEAM (RIGHT)]
58. SİGORTA [FUSE], 20A
59. YAKIT TRANSFER POMPASI [FUEL TRANSFER PUMP]
60. HARİCİ PRİZ [EXTERNAL CONNECTOR]
61. SİGORTA [FUSE], 10A
62. KORNA RÖLESİ [HORN RELAY]
63. KORNA ANAHTARI [JOYSTİK KÖLÜ] [HORN SWITCH (JOYSTİK LEVER)]
64. KORNA (YÜKSEK) [HORN (HIGH)]
65. KORNA (DÜŞÜK) [HORN (LOW)]
66. SİGORTA [FUSE], 10A
67. ÇABUK SOK TAK ANAHTARI (OPS) [QUICK COUPLER SWITCH (OPT)]
68. ÇABUK SOK TAK SELENOİDİ (OPS) [QUICK COUPLER SELENOİD (OPT)]
69. KIRICI&ROTATÖR SWITCH (OPS) [BREAKER&ROTATOR SWITCH (OPT)]
70. KIRICI&ROTATÖR SWITCH (OPS) [BREAKER&ROTATOR SWITCH (OPT)]
71. KIRICI RÖLE (OPS) [BREAKER RELAY (OPT)]

72. KIRICI ANAHTARI (PEDAL) (OPS) [BREAKER SWITCH (FOOD) (OPT)]
73. KIRICI ANAHTARI (JOYSTİK KÖLÜ) (OPS) [BREAKER SWITCH (JOYSTİK LEVER) (OPT)]
74. ROTATÖR ANAHTARI (OPS) [ROTATOR SWITCH (OPT)]
75. KIRICI SELENOİDİ (OPS) [BREAKER SELENOİD (OPT)]
76. OTOMATİK/MANUEL ANAHTARI [AUTO/MANUEL SWITCH]
77. SİGORTA [FUSE], 15A
78. HI-MOBİL KONTROL UNİTESİ (OPS) [HI-MOBİL DRIVE BOARD (OPT)]
79. HI-MOBİL ANTEN (OPS) [HI-MOBİL ANTENNA (OPT)]
80. KONTROL UNİTESİ [DRIVE BOARD]
81. VERİ TRANSFER KONEKTÖRÜ [DATA TRANSFER CONNECTOR]
82. ORANSAL VALF [PROPORTIONAL CONTROL VALVE]
83. SESLİ İKAZ [BUZZER]
84. YÜKSEK GÜÇ SELENOİDİ [POWER BOOST SELENOİD]
85. YÜRÜYÜS SELENOİDİ [TRAVEL SELENOİD]
86. SELENOİD-B CONFLUX
87. HİDROLİK BASINÇ (Px1) [HYD. PRESSURE SWITCH (Px1)]
88. HİDROLİK BASINÇ (Px2) [HYD. PRESSURE SWITCH (Px2)]
89. HAVA FİLTRESİ TIKANMA SWITCH [AIR CLEANER CLOGGING SWITCH]
90. SOĞUTMA SUYU SEVİYE SENSÖRÜ [COOLANT WATER LEVEL SENSÖR]
91. HİDROLİK 1.POMPA BASINÇ SENSÖRÜ [HYD.1.PUMP PRESSURE SENSÖR]
92. HİDROLİK 2.POMPA BASINÇ SENSÖRÜ [HYD.2.PUMP PRESSURE SENSÖR]
93. ARM İÇERİ SWITCH [ARM IN SWITCH]
94. BOOM YÜKARI SWITCH [BOOM UP INCREASE SWITCH]
95. KULE DÖNÜŞ DEVİR ARTIRIMA [SWING RPM INCREASE SWITCH]
96. EMNİYET ANAHTARI [SAFETY SWITCH]
97. EMNİYET SELENOİDİ [SAFETY SELENOİD]
98. SİGORTA [FUSE], 10A
99. MOTOR YAKIT POMPASI [ENGİN FUEL PUMP]
100. SİGORTA [FUSE], 20A
101. ANA RÖLESİ [MAIN RELAY]
102. MARS EMNİYET RÖLESİ [STARTER SAFETY RELAY]
103. ACİL STOP ANAHTARI [EXİGENT STOP SWITCH]
104. GAZ POTANSİYOMETRESİ [ACCEL POTANTIAL]
105. MOTOR KONTROL UNİTESİ [ECM]
106. DİS ORTAM BASINÇ SENSÖRÜ [BAROMETRIC SENSÖR]
107. EMLEN HAVA SICAKLIK SENSÖRÜ [INTAKE AIR TEMP. SENSÖR]

108. TURBO SARJ BASINÇ SENSÖRÜ [BOOST PRESSURE SENSÖR]
109. TURBO SARJ SICAKLIK SENSÖRÜ [BOOST TEMP. SENSÖR]
110. KIRANK MİLİ KONUM SENSÖRÜ [CRANK ANGLE(MPU) SENSÖR]
111. MOTOR YAG BASINÇ SENSÖRÜ [OIL PRESSURE SENSÖR]
112. MOTOR SOĞUTMA SUYU SICAKLIK SENSÖRÜ [ENGINE COOLANT TEMP. SENSÖR]
113. YAKIT SICAKLIK SENSÖRÜ [FUEL LEAKAGE TEMP. SENSÖR]
114. YAKIT TIKANIKLIK SENSÖRÜ [CLOGGING SENSÖR]
115. KAM MİLİ KONUM SENSÖRÜ [CAM ANGLE(HALL) SENSÖR]
116. COMMON RAIL BASINÇ SENSÖRÜ [COMMON RAIL PRESSURE SENSÖR]
117. EGR VALFİ KONUM SENSÖRÜ [EGR BRUSH-LESS DC MOTOR POSITION SENSÖR]
118. EGR MOTORU [EGR BRUSH-LESS DC MOTOR]
119. ENJEKTÖR 1,3,5 [INJECTION ORDER 1,3,5]
120. ENJEKTÖR 2,4,6 [INJECTION ORDER 2,4,6]
121. EMİS KONTROL VALFİ [SUCTION CONTROL VALVE]
122. SİGORTA [FUSE], 5A
123. KUMANDA PANELİ [INSTRUMENT PANEL]
124. ASIRI YÜK SWITCH (OPS) [OVER LOAD WARNING SWITCH (OPT)]
125. YAKIT SEVİYE SENSÖRÜ [FUEL LEVEL SENSÖR]
126. HİDROLİK YAG HARARET SENSÖRÜ [HYD OIL HEAT SENSÖR]
127. KAMERA KARTI (OPS) [CAMERA DRIVE (OPT)]
128. KAMERA KABLOSU (OPS) [CAMERA CABLE (OPT)]
129. KAMERA (OPS) [CAMERA (OPT)]

- R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bİ--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]
S--GÜMÜS [SILVER]

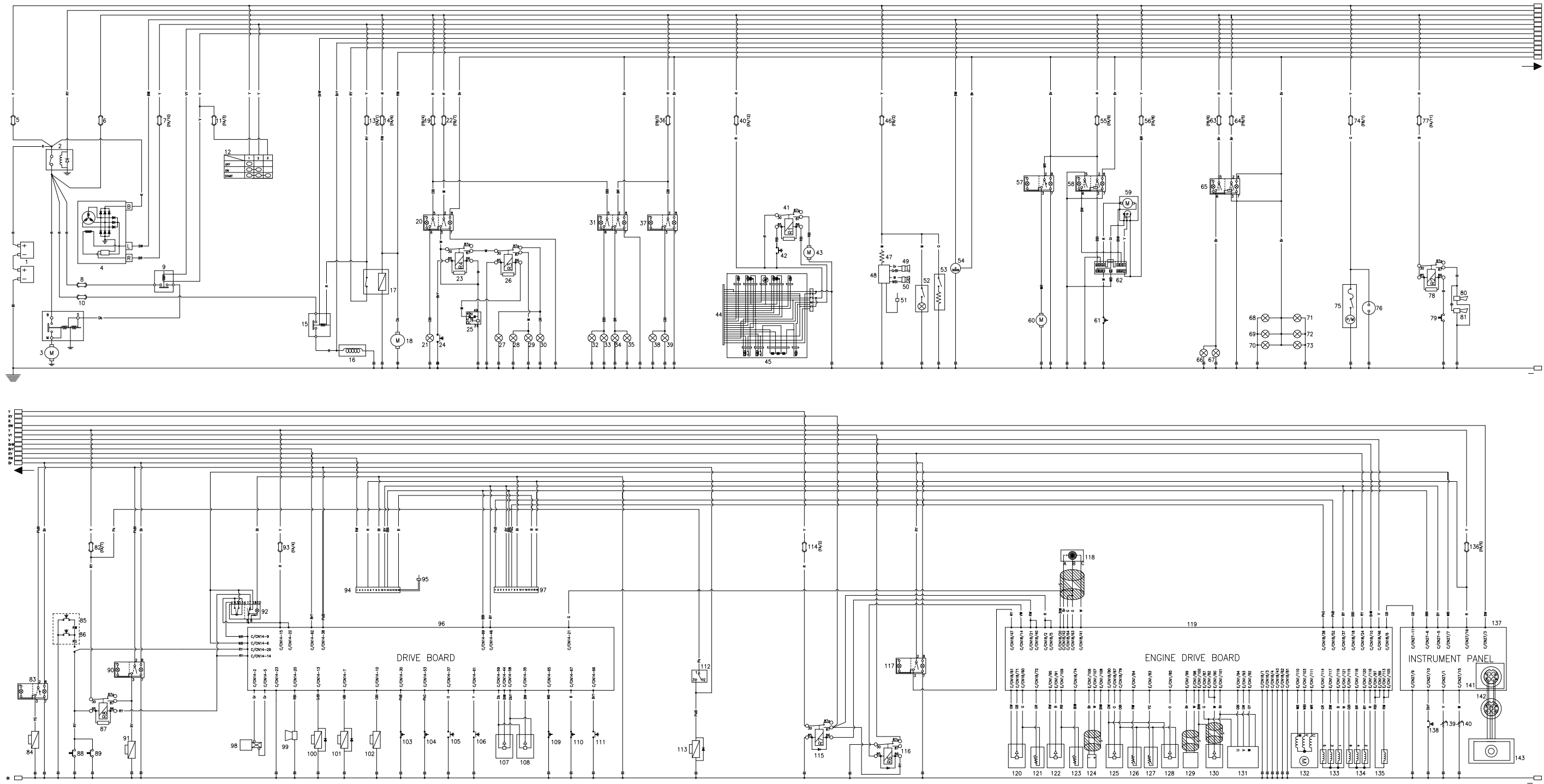
HİDROMEK

ELEKTRİK SEMASI, ISUZU
ELECTRIC CIRCUIT DIAGRAM, ISUZU

HMK 300 LC3

29.05.2009

1.1



1. AKÜ [BATTERY], 24V
2. ELEKTRİKLİ AKÜ SALTERİ [SWITCH BATTERY]
3. MARS MOTORU [STARTER MOTOR]
4. SARI DİNAMOŞU [ALTERNATOR]
5. SİGORTA [FUSE], 50A
6. SİGORTA [FUSE], 70A
7. SİGORTA [FUSE], 5A
8. SİGORTA [FUSE], 50A
9. MARS RÖLESİ [STARTER RELAY]
10. SİGORTA [FUSE], 70A
11. SİGORTA [FUSE], 5A
12. KONTAK ANAHTARI [STARTER SWITCH]
13. SİGORTA [FUSE], 15A
14. SİGORTA [FUSE], 10A
15. ÖN İSTİCİ RÖLESİ [PREHEATER RELAY]
16. ÖN İSTİCİ [PREHEATER]
17. İMMOBİLİZER [OPS]
18. MOTOR YAKIT POMPASI [ENGİN FUEL PUMP]
19. SİGORTA [FUSE], 15A
20. KULE DÖNÜŞ/TEPE LAMBASI ANAHTARI [SWING/ROTARY LAMP SWITCH]
21. TEPE LAMBASI [OPS] [ROTARY BEAKON (OPT)]
22. SİGORTA [FUSE], 10A
23. KULE DÖNÜŞ ANAHTARI RÖLESİ [SWING SWITCH RELAY]
24. KULE DÖNÜŞ ANAHTARI [SWING SWITCH]
25. KULE DÖNÜŞ FLAŞÖRÜ [SWING FLASHER]
26. KULE DÖNÜŞ LAMBA RÖLESİ [SWING LAMP RELAY]
27. KULE DÖNÜŞ LAMBASI [DIS] [SWING LAMP (EXTERIOR)]
28. KULE DÖNÜŞ LAMBASI [IC] [SWING LAMP (INTERIOR)]
29. KULE DÖNÜŞ LAMBASI [IC] [SWING LAMP (INTERIOR)]
30. KULE DÖNÜŞ LAMBASI [DIS] [SWING LAMP (EXTERIOR)]
31. ÖN/ARKA CALISMA LAMBASI ANAHTARI [OPS] [FRONT/REAR WORKING LAMP SWITCH (OPT)]
32. ARKA CALISMA LAMBASI[OPS] [WORKING LAMP, REAR (OPT)]
33. ARKA CALISMA LAMBASI[OPS] [WORKING LAMP, REAR (OPT)]
34. ÖN CALISMA LAMBASI [OPS] [WORKING LAMP, FRONT (OPT)]
35. ÖN CALISMA LAMBASI [OPS] [WORKING LAMP, FRONT (OPT)]
36. SİGORTA [FUSE], 15A
37. CALISMA LAMBASI ANAHTARI [WORKING LAMP SWITCH]
38. CALISMA LAMBASI [SOL] [WORKING LAMP (LEFT)]
39. CALISMA LAMBASI [SAG] [WORKING LAMP (RIGHT)]
40. SİGORTA [FUSE], 15A
41. KLİMA RÖLESİ [AIR CONDITIONER RELAY]
42. KLİMA BASINÇ ANAHTARI [AIR CONCONDITIONER PRESSURE SWITCH]
43. KLİMA KOMPRESÖRÜ [AIR CONDITIONER COMPRESSOR]
44. KLİMA KUMANDA PANELİ [AIR CONDITIONER INSTRUMENT PANEL]
45. KLİMA [AIR CONDITIONER]
46. SİGORTA [FUSE], 15A
47. KONVERTÖR [CONVERTER], (24V-12V)
48. TEYP [CAR STEREO]
49. SOL HOPARLÖR [LEFT SPEAKER]
50. SAG HOPARLÖR [RIGHT SPEAKER]
51. ANTEN [ANTENNA]
52. KABİN LAMBASI [CABIN LAMP]
53. ÇAKMAK [CIGAR LIGHTER]
54. ÇALISMA SAATİ [OPERATING HOUR COUNTER]
55. SİGORTA [FUSE], 10A
56. SİGORTA [FUSE], 10A
57. SİLECEK SUYU POMPA ANAHTARI [WASTER PUMP SWITCH]
58. SİLECEK MOTORU ANAHTARI [WIPER MOTOR SWITCH]
59. SİLECEK MOTORU [WIPER MOTOR]
60. SİLECEK SUYU POMPASI [WASTER PUMP]
61. SİLECEK MOTORU EMNİYET ANAHTARI [WIPER MOTOR SAFETY SWITCH]
62. SİLECEK MOTORU KONTROL UNİTESİ [WIPER MOTOR DRIVE BOARD]
63. SİGORTA [FUSE], 10A
64. SİGORTA [FUSE], 10A
65. PARK/FAR ANAHTARI [PARK/HEAD LAMP SWITCH]
66. KISA FAR [SOL] [HEAD LAMP, LOW BEAM (LEFT)]
67. KISA FAR [SAG] [HEAD LAMP, LOW BEAM (RIGHT)]
68. PARK LAMBASI [SOL-ARKA] [PARKING LAMP (LEFT-REAR)]
69. PARK LAMBASI [SOL-ARKA] [PARKING LAMP (LEFT-REAR)]
70. PARK LAMBASI [SOL-ARKA] [PARKING LAMP (LEFT-REAR)]
71. PARK LAMBASI [SAG-ARKA] [PARKING LAMP (RIGHT-REAR)]
72. PARK LAMBASI [SAG-ARKA] [PARKING LAMP (RIGHT-REAR)]
73. PARK LAMBASI [SAG-ARKA] [PARKING LAMP (RIGHT-REAR)]
74. SİGORTA [FUSE], 20A
75. YAKIT TRANSFER POMPASI [FUEL TRANSFER PUMP]
76. HARİCİ PİRİZ [EXTERNAL CONNECTOR]
77. SİGORTA [FUSE], 10A
78. KORNİ RÖLESİ [HORN RELAY]
79. KORNİ ANAHTARI [JOYSTİK KÖLÜ] [HORN SWITCH (JOYSTICK LEVER)]
80. KORNİ (YÜKSEK) [HORN (HIGH)]
81. KORNİ (DÜŞÜK) [HORN (LOW)]
82. SİGORTA [FUSE], 10A
83. ÇABUK SÖK TAK ANAHTARI [OPS] [QUICK COUPLER SWITCH (OPT)]
84. ÇABUK SÖK TAK SELENOİDİ [OPS] [QUICK COUPLER SELENOİD (OPT)]
85. KIRICI&ROTATÖR SWITCH [OPS] [BREAKER&ROTATOR SWITCH (OPT)]
86. KIRICI&ROTATÖR SWITCH [OPS] [BREAKER&ROTATOR SWITCH (OPT)]
87. KIRICI RÖLE [OPS] [BREAKER RELAY (OPT)]
88. KIRICI ANAHTARI [PEDAL] [OPS] [BREAKER SWITCH (FOOD) (OPT)]
89. KIRICI ANAHTARI[JOYSTİK KÖLÜ] [OPS] [BREAKER SWITCH(JOYSTICK LEVER) (OPT)]
90. ROTATÖR ANAHTARI [OPS] [ROTATOR SWITCH (OPT)]
91. KIRICI SELENOİDİ [OPS] [BREAKER SELENOİD (OPT)]
92. OTOMATİK/MANUEL ANAHTARI [AUTO/MANUEL SWITCH]
93. SİGORTA [FUSE], 15A
94. Hİ-MOBİL KONTROL UNİTESİ [OPS] [Hİ-MOBİL DRIVE BOARD (OPT)]
95. Hİ-MOBİL ANTEN [OPS] [Hİ-MOBİL ANTENNA (OPT)]
96. KONTROL UNİTESİ [DRIVE BOARD]
97. VERİ TRANSFER KONNEKTÖRÜ [DATA TRANSFER CONNECTOR]
98. ORANSAL VALF [PROPORTIONAL CONTROL VALVE]
99. SESLİ KAZ [BUZZER]
100. YÜKSEK GÜÇ SELENOİDİ [POWER BOOST SOLENOİD]
101. YÜRÜYÜS SELENOİDİ [TRAVEL SOLENOİD]
102. SOLENOİD-B CONFLUX
103. HİDROLİK BASINÇ (Px1) [HYD. PRESSURE SWITCH (Px1)]
104. HİDROLİK BASINÇ (Px2) [HYD. PRESSURE SWITCH (Px2)]
105. HAVA FLİTRESİ TIKANMA SWITCH [AIR CLEANER CLOGGING SWITCH]
106. SOĞUTMA SUYU SEVİYE SENSÖRÜ [COOLANT WATER LEVEL SENSOR]
107. HİDROLİK 1.POMPA BASINÇ SENSÖRÜ [HYD.1.PUMP PRESSURE SENSOR]

108. HİDROLİK 2.POMPA BASINÇ SENSÖRÜ [HYD.2.PUMP PRESSURE SENSOR]
109. ARM İÇERİ SWITCH [ARM IN SWITCH]
110. BOOM YUKARI SWITCH [BOOM UP SWITCH]
111. KULE DÖNÜŞ DEVİR ARTIRMA [SWING RPM INCREASE SWITCH]
112. EMNİYET ANAHTARI [SAFETY SWITCH]
113. EMNİYET SELENOİDİ [SAFETY SOLENOİD]
114. SİGORTA [FUSE], 20A
115. ANA RÖLESİ [MAIN RELAY]
116. MARS EMNİYET RÖLESİ [STARTER SAFETY RELAY]
117. ACİL STOP ANAHTARI [EXİGENT STOP SWITCH]
118. GAZ POTANSİYOMETRESİ [ACCEL POTANTIAL]
119. MOTOR KONTROL UNİTESİ [ECM]
120. DİS ORTAM BASINÇ SENSÖRÜ [BAROMETRIC SENSOR]
121. EMİLEN HAVA SICAKLIK SENSÖRÜ [INTAKE AIR TEMP. SENSOR]
122. TURBO SARIJ BASINÇ SENSÖRÜ [BOOST PRESSURE SENSOR]
123. TURBO SARIJ SICAKLIK SENSÖRÜ [BOOST TEMP. SENSOR]
124. KIRANK MİLİ KONUM SENSÖRÜ [CRANK ANGLE(MPU) SENSOR]
125. MOTOR YAG BASINÇ SENSÖRÜ [OIL PRESSURE SENSOR]
126. MOTOR SOĞUTMA SUYU SICAKLIK SENSÖRÜ [ENGINE COOLANT TEMP. SENSOR]
127. YAKIT SICAKLIK SENSÖRÜ [FUEL LEAKAGE TEMP. SENSOR]
128. YAKIT TIKANIKLIK SENSÖRÜ [CLOGGING SENSOR]
129. KAM MİLİ KONUM SENSÖRÜ [CAM ANGLE(HALL) SENSOR]
130. COMMON RAIL BASINÇ SENSÖRÜ [COMMON RAIL PRESSURE SENSOR]
131. EGR VALFİ KONUM SENSÖRÜ [EGR BRUSH-LESS DC MOTOR POSITION SENSOR]
132. EGR MOTORU [EGR BRUSH-LESS DC MOTOR]
133. ENJEKTÖR 1,3,5 [INJECTION ORDER 1,3,5]
134. ENJEKTÖR 2,4,6 [INJECTION ORDER 2,4,6]
135. EMİS KONTROL VALFİ [SUCTION CONTROL VALVE]
136. SİGORTA [FUSE], 5A
137. KUMANDA PANELİ [INSTRUMENT PANEL]
138. ASIRI YÜK SWITCH [OPS] [OVER LOAD WARNING SWITCH (OPT)]
139. YAKIT SEVİYE SENSÖRÜ [FUEL LEVEL SENSOR]
140. HİDROLİK YAG HARARET SENSÖRÜ [HYD OIL HEAT SENSOR]
141. KAMERA KARTI [OPS] [CAMERA DRIVE (OPT)]
142. KAMERA KABLOSU [OPS] [CAMERA CABLE (OPT)]
143. KAMERA [OPS] [CAMERA (OPT)]

- R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bİ--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]
S--GÜMÜS [SILVER]

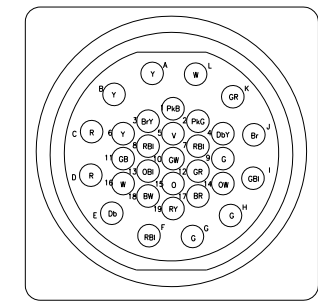
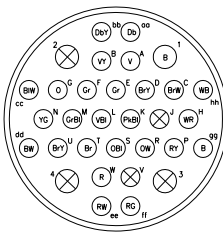
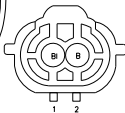
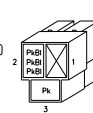
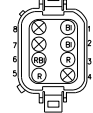
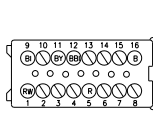
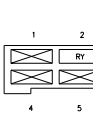
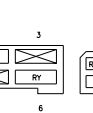
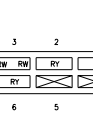
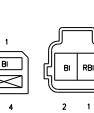
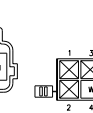
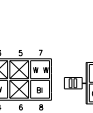
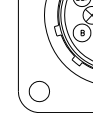
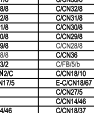
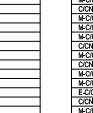
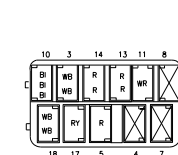
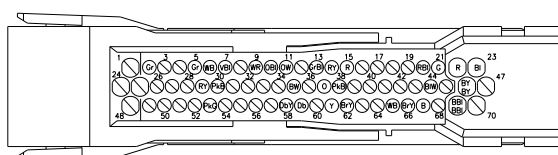
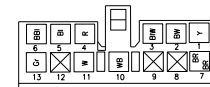
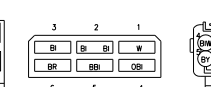
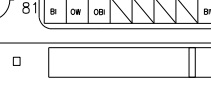
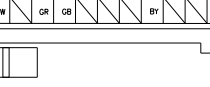
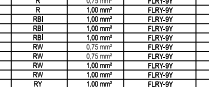
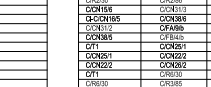
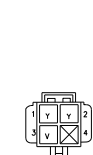
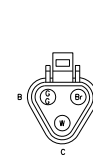
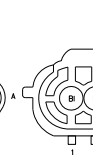
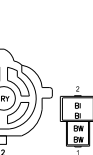
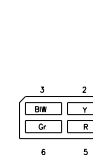
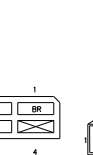
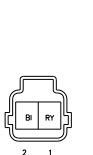
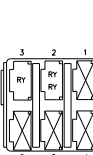
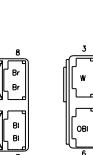
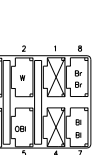
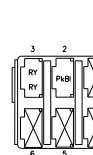
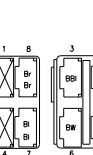
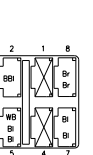
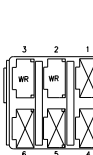
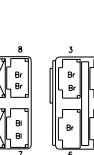
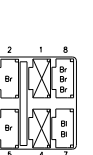
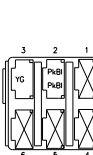
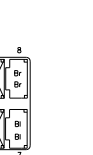
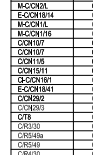
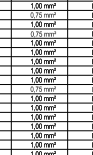
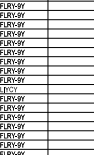
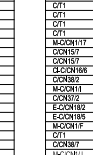
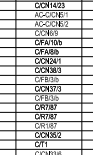
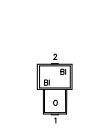
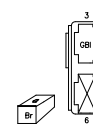
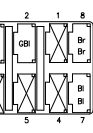
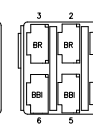
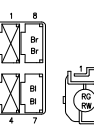
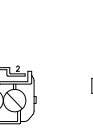
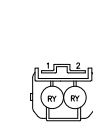
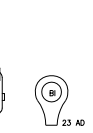
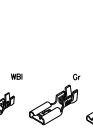
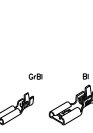
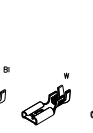
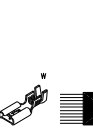
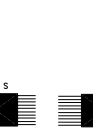
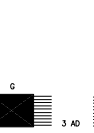
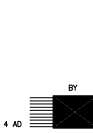
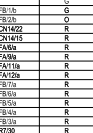
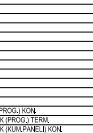
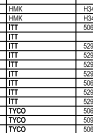
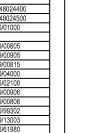
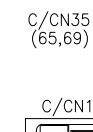
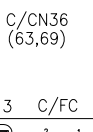
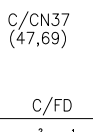
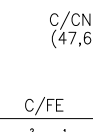
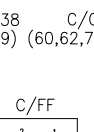
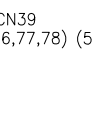
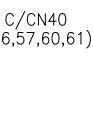
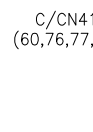
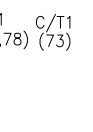
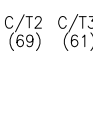
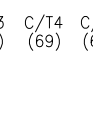
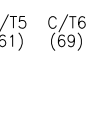
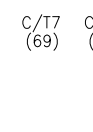
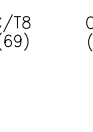
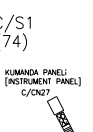
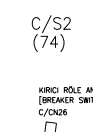
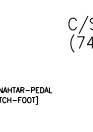
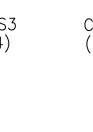
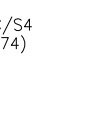
HİDROMEK

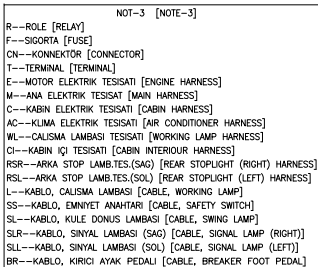
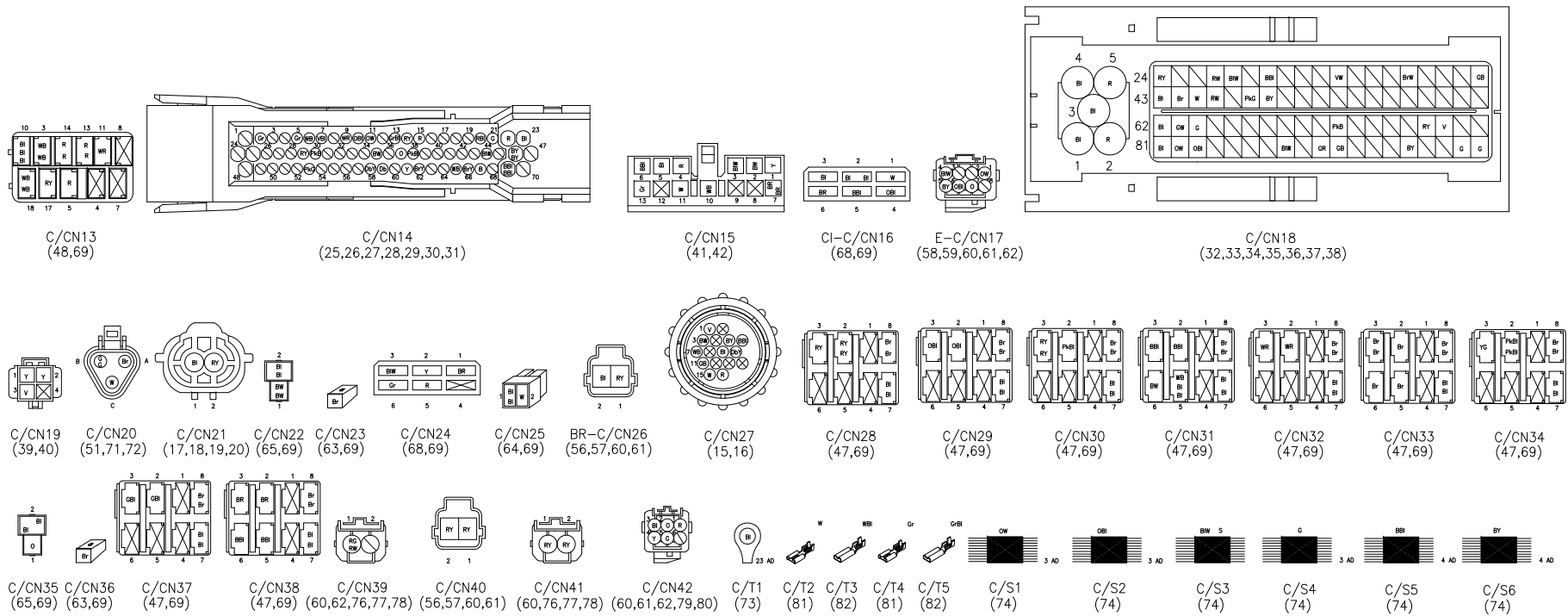
ELEKTRİK SEMASI, ISUZU
ELECTRIC CIRCUIT DIAGRAM, ISUZU

HMK 300 LC3

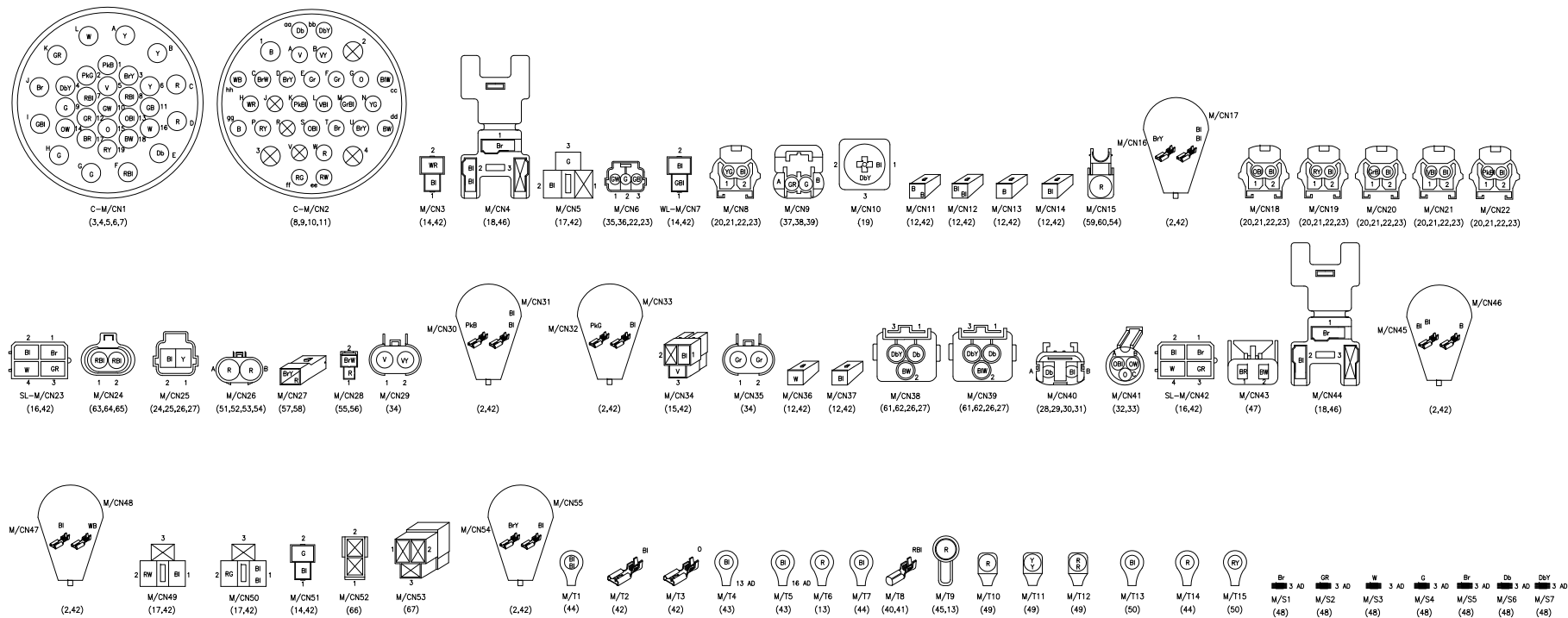
29.05.2009

1.2

M-C/CN1
(4,5,6,7,8,9)M-C/CN2
(10,11,12)C/CN3
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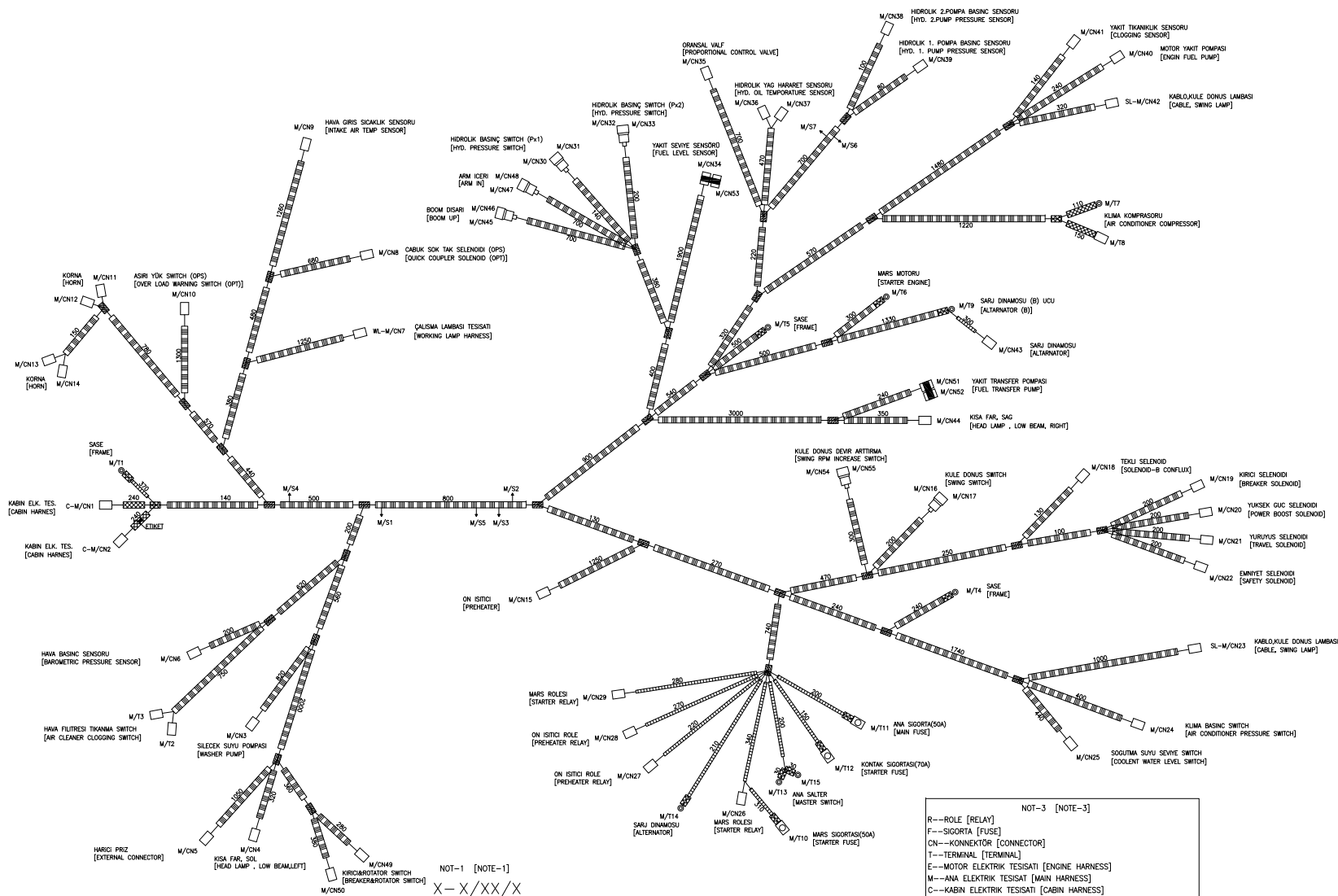
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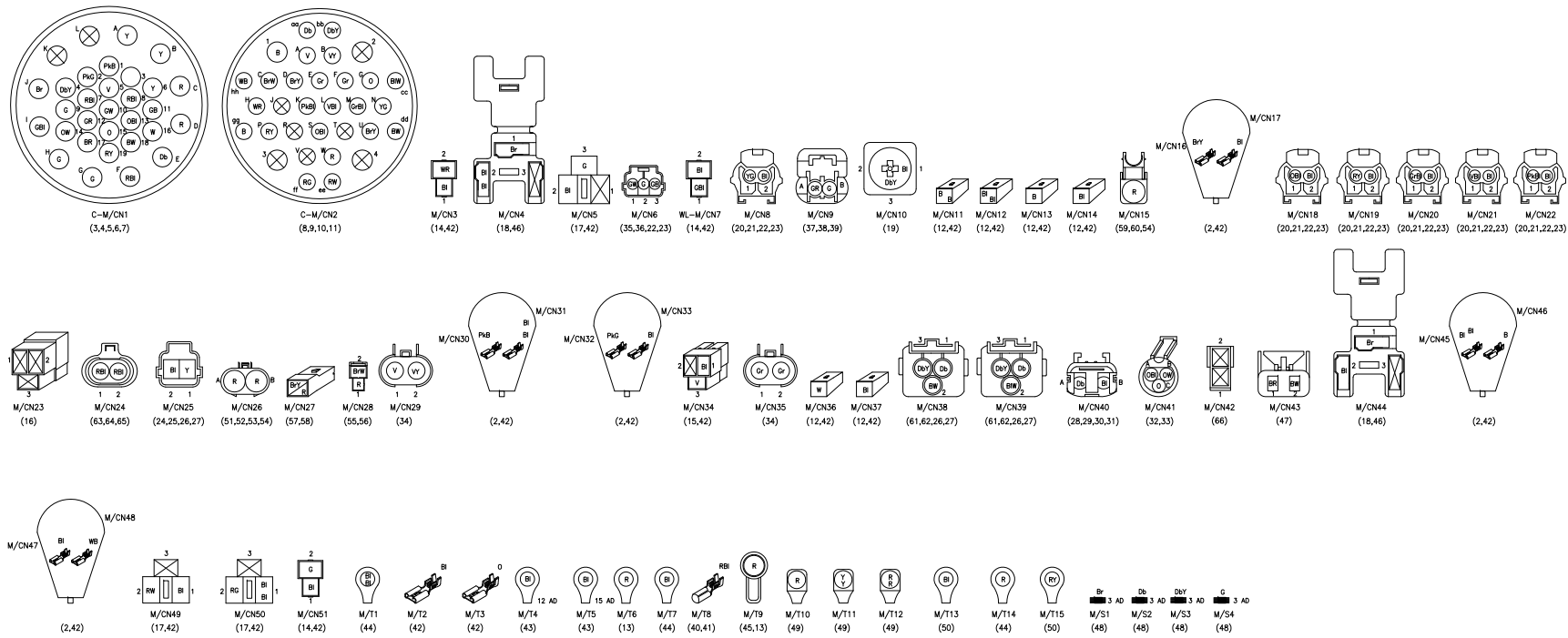
1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPİ (WIRE SIZE)	KABLO TİPİ (WIRE TYPE)	HMK KODU (HMK CODE)
M/T4	M/CN25/2	BI	0.75 mm²	FLRY-9Y	
M/T4	M/CN10/1	BI	0.75 mm²	FLRY-9Y	
M/CN17	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN31	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN31	M/CN33	BI	0.75 mm²	FLRY-9Y	
M/CN17	M/CN45	BI	0.75 mm²	FLRY-9Y	
M/CN34/1	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN37	M/T5	BI	0.75 mm²	FLRY-9Y	
C-M/CN1/16	M/CN36	W	0.75 mm²	FLRY-9Y	
C-M/CN1/6	M/CN25/1	Y	0.75 mm²	FLRY-9Y	
C-M/CN1/9	M/S4	G	0.75 mm²	FLRY-9Y	
M/S4	M/CN9/B	G	0.75 mm²	FLRY-9Y	
C-M/CN1/11	M/CN36/3	GB	0.75 mm²	FLRY-9Y	
C-M/CN1/12	M/CN9/A	GR	0.75 mm²	FLRY-9Y	
C-M/CN2/E	M/CN5/1	Gr	0.75 mm²	FLRY-9Y	
C-M/CN2/F	M/CN35/2	G	0.75 mm²	FLRY-9Y	
C-M/CN1/10	M/CN6/1	GW	0.75 mm²	FLRY-9Y	
C-M/CN1/15	M/CN41/C	O	0.75 mm²	FLRY-9Y	
C-M/CN2/G	M/T3	O	0.75 mm²	FLRY-9Y	
C-M/CN1/13	M/CN41/A	OBI	0.75 mm²	FLRY-9Y	
C-M/CN1/14	M/CN41/B	OW	0.75 mm²	FLRY-9Y	
C-M/CN1/1	M/CN30	PkB	0.75 mm²	FLRY-9Y	
C-M/CN1/2	M/CN32	PKG	0.75 mm²	FLRY-9Y	
C-M/CN1/7	M/CN24/1	RBI	0.75 mm²	FLRY-9Y	
C-M/CN1/8	M/CN42	RBI	0.75 mm²	FLRY-9Y	
C-M/CN1/5	M/CN34/3	V	0.75 mm²	FLRY-9Y	
C-M/CN2/A	M/CN29/1	V	0.75 mm²	FLRY-9Y	
C-M/CN2/B	M/CN29/2	VY	1.00 mm²	FLRY-9Y	
M/T4	M/CN3/1	BI	1.00 mm²	FLRY-9Y	
C-M/CN2/1	M/CN11	B	1.00 mm²	FLRY-9Y	
M/T4	M/T13	BI	1.00 mm²	FLRY-9Y	
M/T4	M/T2	BI	1.00 mm²	FLRY-9Y	
M/T4	M/CN3/1	BI	1.00 mm²	FLRY-9Y	
M/T4	SL-M/CN23/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN44/2	BI	1.50 mm²	FLRY-9Y	
M/T5	M/CN8/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN19/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN20/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN21/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN22/2	BI	1.00 mm²	FLRY-9Y	
M/S5	SL-M/CN22/1	Br	1.00 mm²	FLRY-9Y	
M/S5	SL-M/CN24/1	Br	1.00 mm²	FLRY-9Y	
M/S5	C-M/CN2/T	Br	1.00 mm²	FLRY-9Y	
C-M/CN2/C	M/CN28/2	BrW	1.00 mm²	FLRY-9Y	
C-M/CN1/3	M/CN16	BrY	1.00 mm²	FLRY-9Y	

1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPİ (WIRE SIZE)	KABLO TİPİ (WIRE TYPE)	HMK KODU (HMK CODE)
M/T4	M/CN25/2	BI	0.75 mm²	FLRY-9Y	
M/T4	M/CN10/1	BI	0.75 mm²	FLRY-9Y	
M/CN17	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN31	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN31	M/CN33	BI	0.75 mm²	FLRY-9Y	
M/CN17	M/CN45	BI	0.75 mm²	FLRY-9Y	
M/CN34/1	M/T5	BI	0.75 mm²	FLRY-9Y	
M/CN37	M/T5	BI	0.75 mm²	FLRY-9Y	
C-M/CN1/16	M/CN36	W	0.75 mm²	FLRY-9Y	
C-M/CN1/6	M/CN25/1	Y	0.75 mm²	FLRY-9Y	
C-M/CN1/9	M/S4	G	0.75 mm²	FLRY-9Y	
M/S4	M/CN9/B	G	0.75 mm²	FLRY-9Y	
C-M/CN1/11	M/CN36/3	GB	0.75 mm²	FLRY-9Y	
C-M/CN1/12	M/CN9/A	GR	0.75 mm²	FLRY-9Y	
C-M/CN2/E	M/CN5/1	Gr	0.75 mm²	FLRY-9Y	
C-M/CN2/F	M/CN35/2	G	0.75 mm²	FLRY-9Y	
C-M/CN1/10	M/CN6/1	GW	0.75 mm²	FLRY-9Y	
C-M/CN1/15	M/CN41/C	O	0.75 mm²	FLRY-9Y	
C-M/CN2/G	M/T3	O	0.75 mm²	FLRY-9Y	
C-M/CN1/13	M/CN41/A	OBI	0.75 mm²	FLRY-9Y	
C-M/CN1/14	M/CN41/B	OW	0.75 mm²	FLRY-9Y	
C-M/CN1/1	M/CN30	PkB	0.75 mm²	FLRY-9Y	
C-M/CN1/2	M/CN32	PKG	0.75 mm²	FLRY-9Y	
C-M/CN1/7	M/CN24/1	RBI	0.75 mm²	FLRY-9Y	
C-M/CN1/8	M/CN42	RBI	0.75 mm²	FLRY-9Y	
C-M/CN1/5	M/CN34/3	V	0.75 mm²	FLRY-9Y	
C-M/CN2/A	M/CN29/1	V	0.75 mm²	FLRY-9Y	
C-M/CN2/B	M/CN29/2	VY	1.00 mm²	FLRY-9Y	
M/T4	M/CN3/1	BI	1.00 mm²	FLRY-9Y	
C-M/CN2/1	M/CN11	B	1.00 mm²	FLRY-9Y	
M/T4	M/T13	BI	1.00 mm²	FLRY-9Y	
M/T4	M/T2	BI	1.00 mm²	FLRY-9Y	
M/T4	M/CN3/1	BI	1.00 mm²	FLRY-9Y	
M/T4	SL-M/CN23/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN44/2	BI	1.50 mm²	FLRY-9Y	
M/T5	M/CN8/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN19/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN20/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN21/2	BI	1.00 mm²	FLRY-9Y	
M/T5	M/CN22/2	BI	1.00 mm²	FLRY-9Y	
M/S5	SL-M/CN22/1	Br	1.00 mm²	FLRY-9Y	
M/S5	SL-M/CN24/1	Br	1.00 mm²	FLRY-9Y	
M/S5	C-M/CN2/T	Br	1.00 mm²	FLRY-9Y	
C-M/CN2/C	M/CN28/2	BrW	1.00 mm²	FLRY-9Y	
C-M/CN1/3	M/CN16	BrY	1.00 mm²	FLRY-9Y	



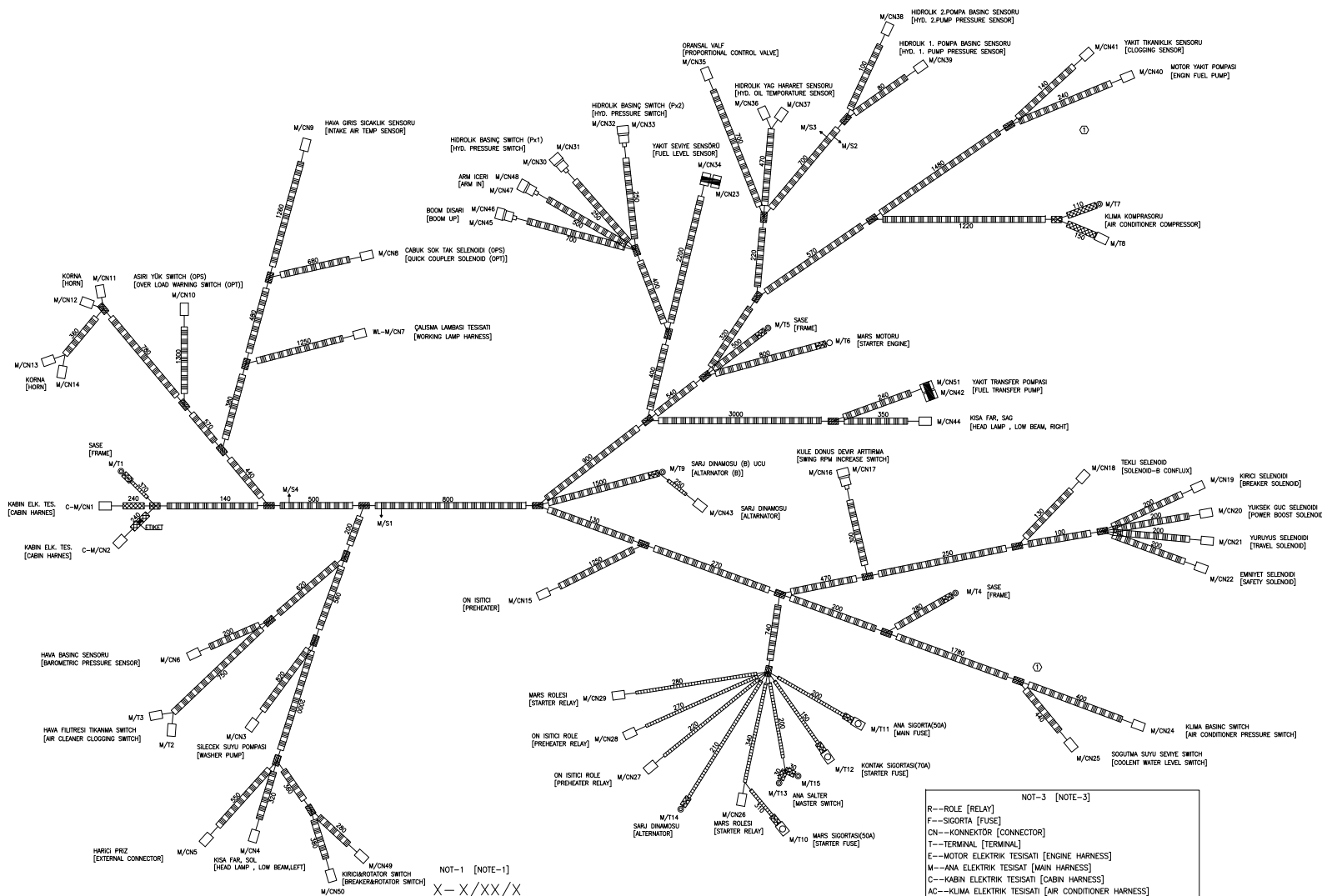
- NOT-1 [NOTE-1]**
- X - PIN NUMARISI (PIN NUMBER)
 - BOLGE KODU [AREA CODE]
 - BOLGE ADI [AREA NAME]
 - KABLO ADACI KODU [HARNES CODE]
 - KABLO GRUBU BAĞLANTI NOKTASI [CONNECTION HARNES]
- NOT-2 [NOTE-2]**
- 1. BELİRTİLEN RENKLERDE KABLO KULLANILACAKTIR. [THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
 - 2. AÇIKTA KALAN TERMINALLER VE ULTRASONİK KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR. [THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINKING TUBES]
 - 3. KONNEKTÖR RESİMLERİ ARKADAN GÖRÜLÜŞ ALINMIŞTIR. [THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]
- NOT-3 [NOTE-3]**
- R--ROL [RELAY]
 - F--SIGORTA [FUSE]
 - CN--KONNEKTÖR [CONNECTOR]
 - T--TERMINAL [TERMINAL]
 - E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNES]
 - M--ANA ELEKTRİK TESİSATI [MAIN HARNES]
 - C--KABİN ELEKTRİK TESİSATI [CABIN HARNES]
 - AC--KALMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNES]
 - WL--CALISMA LAMBASI TESİSATI [WORKING LAMP HARNES]
 - QI--KABİN İÇİ TESİSATI [CABIN INTERIOUR HARNES]
 - RSR--ARKA STOP LAMBELERİ (SAG) [REAR STOPLIGHT (RIGHT) HARNES]
 - RSL--ARKA STOP LAMBELERİ (SOL) [REAR STOPLIGHT (LEFT) HARNES]
 - L--KABLO, CALISMA LAMBASI [CABLE, WORKING LAMP]
 - SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
 - SL--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
 - SLR--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
 - SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]

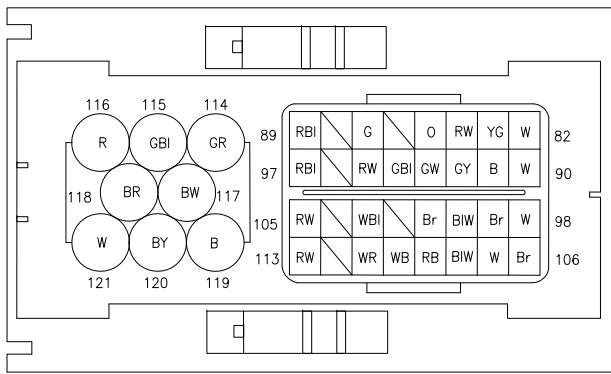
TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]	
KABLO	----- Çok katlı ----- Malzeme : E-CU ETP1,5n plated
LETELİN	----- 200 °C ----- (x1105 °C) 2000
YALITIM	----- TS 1430
ÖZGÜL	-----
ISI İLE DAVRANAN TUP (SİLİ)	-----
MALZEME	----- Alev almayan, polimer
ÖZGÜL	----- (x120 °C - x)125 °C
SPIRAL TUP	-----
MALZEME	----- Polimer PM6
ÖZGÜL	----- (x120 °C - x)125 °C
PVC TUP	-----
MALZEME	----- PVC
ÖZGÜL	----- (x170 °C - x)170 °C



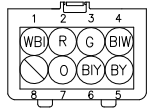
1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TİPİ (WIRE TYPE)	HMK KODU (HMK CODE)
M/T4	M/CN25/2	BI	0,75 mm²	FLRY-9Y	
M/CN45	M/CN10/1	BI	0,75 mm²	FLRY-9Y	
M/CN31	M/T5	BI	0,75 mm²	FLRY-9Y	
M/CN31	M/CN33	BI	0,75 mm²	FLRY-9Y	
M/CN34/1	M/T5	BI	0,75 mm²	FLRY-9Y	
M/CN37	M/CN37	BI	0,75 mm²	FLRY-9Y	
M/CN11/16	M/CN36	W	0,75 mm²	FLRY-9Y	
M/CN11/6	M/CN25/1	Y	0,75 mm²	FLRY-9Y	
M/S4	M/S4	G	0,75 mm²	FLRY-9Y	
M/S4	M/CN9/5	G	0,75 mm²	FLRY-9Y	
M/S4	M/CN6/2	G	0,75 mm²	FLRY-9Y	
M/CN11/11	M/CN3/3	GB	0,75 mm²	FLRY-9Y	
M/CN11/12	M/CN5/1	GR	0,75 mm²	FLRY-9Y	
M/CN2/E	M/CN35/1	Gr	0,75 mm²	FLRY-9Y	
M/CN2/F	M/CN35/2	Gr	0,75 mm²	FLRY-9Y	
M/CN11/10	M/CN8/1	GW	0,75 mm²	FLRY-9Y	
M/CN11/15	M/CN41/C	O	0,75 mm²	FLRY-9Y	
M/CN2/G	M/T3	O	0,75 mm²	FLRY-9Y	
M/CN11/13	M/CN41/A	OBI	0,75 mm²	FLRY-9Y	
M/CN11/14	M/CN41/B	OW	0,75 mm²	FLRY-9Y	
M/CN11/1	M/CN30	Pk8	0,75 mm²	FLRY-9Y	
M/CN11/2	M/CN32	PkG	0,75 mm²	FLRY-9Y	
M/CN11/7	M/CN24/1	RBI	0,75 mm²	FLRY-9Y	
M/CN11/8	M/CN24/2	RBI	0,75 mm²	FLRY-9Y	
M/CN11/5	M/CN34/3	V	0,75 mm²	FLRY-9Y	
M/CN2/A	M/CN29/1	V	0,75 mm²	FLRY-9Y	
M/CN2/B	M/CN29/2	VY	0,75 mm²	FLRY-9Y	
M/CN18/2	M/T5	BI	1,00 mm²	FLRY-9Y	
M/CN2/1	M/CN11	B	1,00 mm²	FLRY-9Y	
M/T4	M/T13	BI	1,00 mm²	FLRY-9Y	
M/T4	M/T2	BI	1,00 mm²	FLRY-9Y	
M/T4	M/CN3/1	BI	1,00 mm²	FLRY-9Y	
M/T5	M/CN44/2	BI	1,50 mm²	FLRY-9Y	
M/T5	M/CN3/2	BI	1,00 mm²	FLRY-9Y	
M/T5	M/CN19/2	BI	1,00 mm²	FLRY-9Y	
M/T5	M/CN20/2	BI	1,00 mm²	FLRY-9Y	
M/T5	M/CN21/2	BI	1,00 mm²	FLRY-9Y	
M/T5	M/CN22/2	BI	1,00 mm²	FLRY-9Y	
M/CN11/17	M/CN43/1	BR	1,00 mm²	FLRY-9Y	
M/CN2/H	M/CN3/2	WR	1,00 mm²	FLRY-9Y	
M/CN2/N	M/CN8/1	YG	1,00 mm²	FLRY-9Y	
M/CN2/C	M/CN28/2	BrW	1,00 mm²	FLRY-9Y	
M/CN2/D	M/CN27	BrY	1,00 mm²	FLRY-9Y	
M/CN11/18	M/CN43/2	BW	1,00 mm²	FLRY-9Y	
M/CN11/4	M/CN10/3	DbY	1,00 mm²	FLRY-9Y	
M/CN2/M	M/CN20/1	GrBI	1,00 mm²	FLRY-9Y	
M/CN2/S	M/CN18/1	OBI	1,00 mm²	FLRY-9Y	
M/CN2/K	M/CN22/1	PkBI	1,00 mm²	FLRY-9Y	
M/CN11/19	M/T15	RY	1,00 mm²	FLRY-9Y	

1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TİPİ (WIRE TYPE)	HMK KODU (HMK CODE)
M/CN2/P	M/CN19/1	RY	1,00 mm²	FLRY-9Y	
M/CN2/W	M/CN28/1	R	1,00 mm²	FLRY-9Y	
M/CN2/L	M/CN21/1	VBI	1,00 mm²	FLRY-9Y	
M/S1	M/CN4/1	Br	1,50 mm²	FLRY-9Y	
M/S1	M/CN44/1	Br	1,50 mm²	FLRY-9Y	
M/CN13	M/CN11	B	1,50 mm²	FLRY-9Y	
M/T4	M/CN7/2	BI	1,50 mm²	FLRY-9Y	
M/T4	M/CN12	BI	1,50 mm²	FLRY-9Y	
M/CN12	M/CN14	BI	1,50 mm²	FLRY-9Y	
M/T5	M/T7	BI	1,50 mm²	FLRY-9Y	
M/CN11/F	M/T8	RBI	1,50 mm²	FLRY-9Y	
M/T4	M/CN4/2	BI	1,50 mm²	FLRY-9Y	
M/CN40/B	M/T5	BI	2,00 mm²	FLRY-9Y	
M/CN11/J	M/S1	Br	2,00 mm²	FLRY-9Y	
M/CN11/E	M/CN40/A	Db	2,00 mm²	FLRY-9Y	
M/CN11/I	M/CN7/1	GBI	1,50 mm²	FLRY-9Y	
M/T4	M/CN5/2	BI	3,00 mm²	FLRY-9Y	
M/CN5/1	M/T5	BI	3,00 mm²	FLRY-9Y	
M/CN11/G	M/CN5/3	G	3,00 mm²	FLRY-9Y	
M/CN11/H	M/CN51/2	G	3,00 mm²	FLRY-9Y	
M/T4	M/T1	BI	4,00 mm²	FLRY-9Y	
M/CN11/C	M/T12	R	4,00 mm²	FLRY-9Y	
M/CN11/D	M/T12	R	4,00 mm²	FLRY-9Y	
M/CN11/A	M/T11	Y	4,00 mm²	FLRY-9Y	
M/CN11/B	M/T11	Y	4,00 mm²	FLRY-9Y	
M/CN27	M/CN15	R	6,00 mm²	FLRY-9Y	
M/T6	M/CN26/A	R	6,00 mm²	FLRY-9Y	
M/T9	M/T14	R	10,00 mm²	FLRY-9Y	
M/CN2/aa	M/S2	Db	0,75 mm²	FLRY-9Y	
M/S2	M/CN39/1	Db	0,75 mm²	FLRY-9Y	
M/S2	M/CN38/1	Db	0,75 mm²	FLRY-9Y	
M/CN2/bb	M/S3	DbY	0,75 mm²	FLRY-9Y	
M/S3	M/CN39/3	DbY	0,75 mm²	FLRY-9Y	
M/S3	M/CN38/3	DbY	0,75 mm²	FLRY-9Y	
M/CN2/cc	M/CN39/2	BW	0,75 mm²	FLRY-9Y	
M/CN2/dd	M/CN38/2	BW	0,75 mm²	FLRY-9Y	
M/CN2/gg	M/CN46	B	0,75 mm²	FLRY-9Y	
M/CN2/hh	M/CN48	VB	0,75 mm²	FLRY-9Y	
M/CN45	M/CN47	BI	0,75 mm²	FLRY-9Y	
M/CN26/B	M/T10	R	6,00 mm²	FLRY-9Y	
M/T1	M/T5	BI	4,00 mm²	FLRY-9Y	
M/CN50/2	M/CN2/f	RG	0,75 mm²	FLRY-9Y	
M/CN49/2	M/CN2/ee	RW	0,75 mm²	FLRY-9Y	
M/CN4/2	M/CN50/1	BI	0,75 mm²	FLRY-9Y	
M/CN50/1	M/CN49/1	BI	0,75 mm²	FLRY-9Y	
M/CN2/U	Br-Y	0,75 mm²	FLRY-9Y		
M/T4	M/CN17	BI	0,75 mm²	FLRY-9Y	

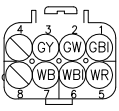




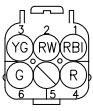
E/CN1
(2,3,4,5,6,7,8)



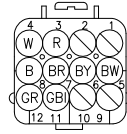
C-E/CN2 E/CN3
(9,10,11,12,13) (18,21,24,25)



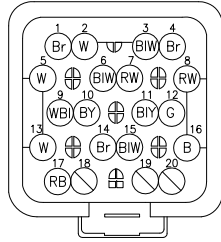
E/CN3
(18,21,24,25)



E/CN.4
(19,21,24,25)



E/CN5
(20,21,22,23,24,25)



E/CN.6
(14,15,16,17)



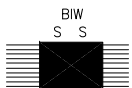
E/S1
(26)



E/S2
(26)



E/S3
(26)



E/S4
(26)



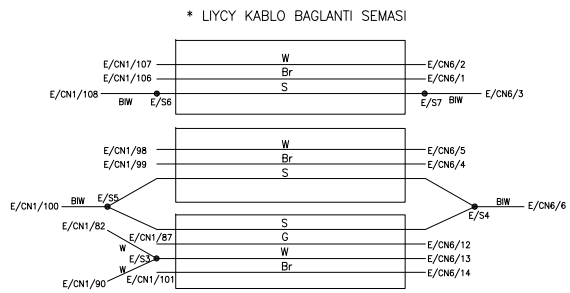
E/S5
(26)



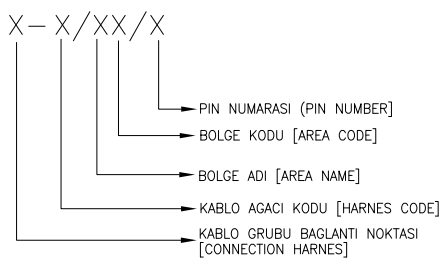
E/S6
(26)



E/S7
(26)

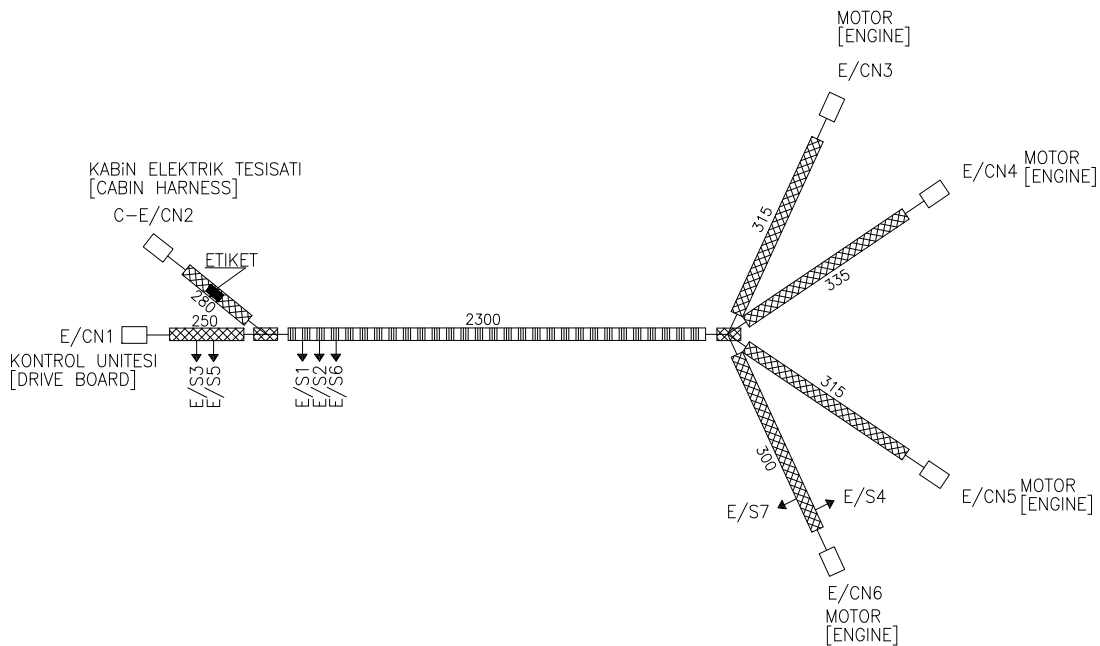


NOT-1 [NOTE-1]



NOT-2 [NOTE-2]

1. BELİRTİLEN RENKLERDE KABLO KULLANILMAKTIR.
[THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
2. AÇIKTA KALAN TERMINALLER VE ULTRASONİK KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR.
[THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINKING TUBES]
3. KONNEKTÖR RESİMLERİ ARKADAN GÖRÜNÜŞ ALINMIŞTIR.
[THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]



NOT-3 [NOTE-3]

R--ROLE [RELAY]
F--SIGORTA [FUSE]
CN--KONNEKTÖR [CONNECTOR]
T--TERMINAL [TERMINAL]
E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNESS]
M--ANA ELEKTRİK TESİSAT [MAIN HARNESS]
C--KABİN ELEKTRİK TESİSATI [CABIN HARNESS]
AC--KLİMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNESS]
WL--CALISMA LAMBASI TESİSATI [WORKING LAMP HARNESS]
CI--KABİN İÇİ TESİSATI [CABIN INTERIOR HARNESS]
RSR--ARKA STOP LAMB.TES.(SAG) [REAR STOPLIGHT (RIGHT) HARNESS]
RSL--ARKA STOP LAMB.TES.(SOL) [REAR STOPLIGHT (LEFT) HARNESS]
K--KABLO, CALISMA LAMBASI [CABLE, WORKING LAMP]
SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
KUL--KABLO, KULE DÖNÜS LAMBASI [CABLE, SWING LAMP]
SLR--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
BR--KABLO, KIRICI AYAK PEDALI [CABLE, BREAKER FOOT PEDAL]

TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]	
KARLO İLKETEN SICAKLIK	Çok telli – Məzərinə : E-CU EPTI-Sn plated TIP – 370 potted Köşəli Köşəli Bəzəli Tel TIP – LNYZ (BENDULU)
KARLO İLKETEN YALITAN SICAKLIK	Çok telli – Məzərinə : E-CU EPTI-Sn plated PVC TIP – (+)105 °C (300oh)
İSİLİE DƏRƏJƏN TUP (SSL)	– – – – – TS 1435 Ayrı ayrıyən, polyaletən C-350 – (+)125 °C
SPIRAL TUP MƏZƏNƏ SICAKLIK	Polyaletən PAF C-350 – (+)120 °C
PVC TUP MƏZƏNƏ SICAKLIK	PVC C-200 – (+)70 °C

RENK KODU [WIRE COLOR]

R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bİ--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACVERT [DARK BLUE]
S--GÜMÜŞ [SILVER]

ISARETLER [SYMBOLES]



1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
E/CN6/1	E/CN1/106	Br	0,75 mm ²	LIYCY	
E/CN6/2	E/CN1/107	W	0,75 mm ²	LIYCY	
E/CN6/3	E/S7	BIW	0,75 mm ²	FLRY-9Y	
E/S7	E/S6	S	—	LIYCY	
E/S6	E/CN1/108	BIW	0,75 mm ²	FLRY-9Y	
E/CN6/4	E/CN1/99	Br	0,75 mm ²	LIYCY	
E/CN6/5	E/CN1/98	W	0,75 mm ²	LIYCY	
E/S5	E/CN1/100	BIW	0,75 mm ²	FLRY-9Y	
E/CN6/7	E/CN1/84	RW	0,75 mm ²	FLRY-9Y	
E/CN6/8	E/CN1/95	RW	0,75 mm ²	FLRY-9Y	
E/CN6/9	C-E/CN2/1	WBI	0,75 mm ²	FLRY-9Y	
E/CN6/10	C-E/CN2/5	BY	0,75 mm ²	FLRY-9Y	
E/CN6/11	C-E/CN2/6	BIY	0,75 mm ²	FLRY-9Y	
E/CN6/12	E/CN1/87	G	0,75 mm ²	LIYCY	
E/S3	E/CN1/82	W	0,75 mm ²	LIYCY	
E/S3	E/CN1/90	W	0,75 mm ²	LIYCY	
E/CN6/14	E/CN1/101	Br	0,75 mm ²	LIYCY	
E/CN6/15	C-E/CN2/4	BIW	0,75 mm ²	FLRY-9Y	
E/CN6/16	E/CN1/91	B	0,75 mm ²	FLRY-9Y	
E/CN6/17	E/CN1/109	RB	0,75 mm ²	FLRY-9Y	
E/CN5/4	E/CN1/121	W	1,50 mm ²	FLRY-9Y	
E/CN5/3	E/CN1/116	R	1,50 mm ²	FLRY-9Y	
E/CN5/8	E/CN1/119	B	0,75 mm ²	FLRY-9Y	
E/CN5/7	E/CN1/118	BR	0,75 mm ²	FLRY-9Y	
E/CN5/6	E/CN1/120	BY	0,75 mm ²	FLRY-9Y	
E/CN5/5	E/CN1/117	BW	0,75 mm ²	FLRY-9Y	
E/CN4/3	E/CN1/83	YG	0,75 mm ²	FLRY-9Y	
E/S1	E/CN1/105	RW	0,75 mm ²	FLRY-9Y	
E/S1	E/CN1/113	RW	0,75 mm ²	FLRY-9Y	
E/S2	E/CN1/89	RBI	0,75 mm ²	FLRY-9Y	
E/S2	E/CN1/97	RBI	0,75 mm ²	FLRY-9Y	
E/CN4/6	C-E/CN2/3	G	0,75 mm ²	FLRY-9Y	
E/CN4/4	C-E/CN2/2	R	0,75 mm ²	FLRY-9Y	
E/CN3/3	E/CN1/92	GY	0,75 mm ²	FLRY-9Y	
E/CN3/2	E/CN1/93	GW	0,75 mm ²	FLRY-9Y	
E/CN3/1	E/CN1/94	GBI	0,75 mm ²	FLRY-9Y	
E/CN3/7	E/CN1/110	WB	0,75 mm ²	FLRY-9Y	
E/CN3/6	E/CN1/103	WBI	0,75 mm ²	FLRY-9Y	
E/CN3/5	E/CN1/111	WR	0,75 mm ²	FLRY-9Y	
E/S3	E/CN6/13	W	0,75 mm ²	LIYCY	
E/S1	E/CN4/2	RW	0,75 mm ²	FLRY-9Y	
E/S2	E/CN4/1	RBI	0,75 mm ²	FLRY-9Y	
E/CN1/85	E/CN2/7	O	0,75 mm ²	FLRY-9Y	
E/CN6/6	E/S4	BIW	0,75 mm ²	FLRY-9Y	
E/S5	E/S4	S	—	LIYCY	
E/S5	E/S4	S	—	LIYCY	
E/CN5/12	E/CN1/114	GR	0,75 mm ²	FLRY-9Y	
E/CN5/11	E/CN1/115	GBI	0,75 mm ²	FLRY-9Y	

NO (NUMBER)	MALZEME ADI/TIPI (MATERIAL/TYPE)	IMALATCI KODU (PRODUCER CODE)	IMALATCI (PRODUCER)	HMK KODU (HMK CODE)
1	TANITIM ETIKETI			
2	AMP PLUG HSG SEALED 40 PIN DISI KON.	1473252-1	TYCO	506/33050
3	AMP PLUG HSG SEALED 40 PIN DISI KAPAK	1473255-1	TYCO	506/33550
4	AMP PLUG HSG SEALED 40 PIN DISI TERM.	968221-1	TYCO	529/14000
5	AMP PLUG HSG SEALED 40 PIN DISI TERM.	964273-2	TYCO	529/14120
6	AMP PLUG HSG SEALED 40 PIN KILIT	368388-1	TYCO	506/33580
7	AMP PLUG HSG SEALED TERM. SEAL	963294-1	TYCO	529/22180
8	AMP PLUG HSG SEALED TAPA	936054-1	TYCO	529/22150
9	SUM. HW SEALED SERIES 8 PIN ERKEK KON.	6181-0075	SUMITOMO	506/10000
10	SUM. HW SEALED SERIES 8 PIN ERKEK KON. KILIT	6918-0333	SUMITOMO	506/10001
11	SUM. HW SEALED SERIES ERKEK TERM.	1500-0105	SUMITOMO	509/03000
12	SUM. HW SEALED SERIES TERM. SEAL	7165-0119	SUMITOMO	529/19000
13	SUM. HW SEALED SERIES TAPA	7161-9787	SUMITOMO	529/22000
14	SUM. DL SEALED SERIES 20 PIN ERKEK KON.	6188-0494	SUMITOMO	506/33040
15	SUM. DL SEALED SERIES ERKEK TERM.	8100-2567	SUMITOMO	529/14110
16	SUM. DL SEALED SERIES TERM. SEAL	7165-0547	SUMITOMO	529/22110
17	SUM. DL SEALED SERIES TAPA	7165-0432	SUMITOMO	529/22130
18	SUM. DL SEALED SERIES 8 PIN DISI KON.	6195-0051	SUMITOMO	506/33020
19	SUM. DL SEALED SERIES 6 PIN DISI KON.	6195-0021	SUMITOMO	506/33010
20	SUM. DL SEALED SERIES 12 PIN DISI KON.	6195-0149	SUMITOMO	506/33030
21	SUM. DL SEALED SERIES DISI TERM. (0,75 mm ²)	8100-1429	SUMITOMO	529/14140
22	SUM. DL SEALED SERIES DISI TERM. (1,50 mm ²)	8100-1428	SUMITOMO	529/14130
23	SUM. DL SEALED SERIES SEAL (1,50 mm ²)	7165-0118	SUMITOMO	529/22140
24	SUM. DL SEALED SERIES SEAL (0,75 mm ²)	7165-0210	SUMITOMO	529/22090
25	SUM. DL SEALED SERIES TAPA	7161-9787	SUMITOMO	529/22000
26	ULTRASONIC KAYNAK			

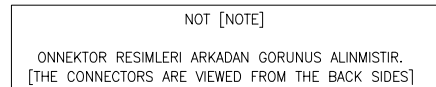
HIDROMEK

MOTOR ELEKTRİK TESİSATI, ISUZU
[ENGINE HARNESS, ISUZU]

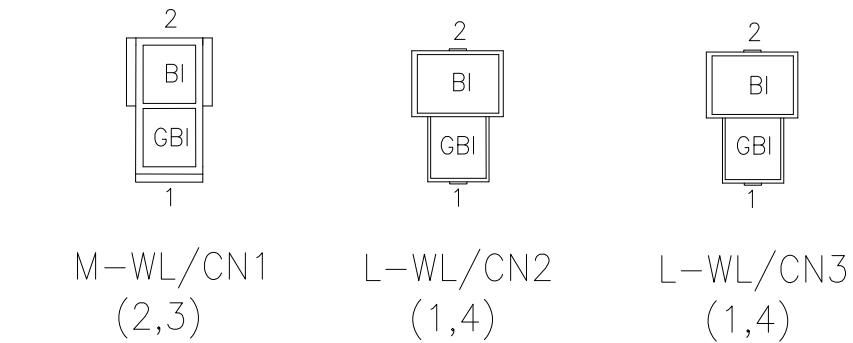
TARIH / DATE
24.07.2008

SAYFA / PAGE
4.1

1. ADRES (FROM)	2. ADRES (TO)	RENK (COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
E/CN8/3	E/CN80/2	GY	0,75 mm ²	FLRY-B	
E/CN6/4	E/CN90/3	R	0,75 mm ²	FLRY-B	
E/CN20/17	E/S7	RB	0,75 mm ²	FLRY-B	
E/S7	E/CN75/1	RB	0,75 mm ²	FLRY-B	
E/S7	E/CN163/B	RB	0,75 mm ²	FLRY-B	
E/CN6/1	E/CN161/2	RB	0,75 mm ²	FLRY-B	
E/CN20/7	E/CN90/2	RBI	0,75 mm ²	FLRY-B	
E/CN20/8	E/CN75/3	RW	0,75 mm ²	FLRY-B	
E/CN6/2	E/CN161/1	RW	0,75 mm ²	FLRY-B	
E/S8	E/CN98	S	0,75 mm ²	LIYCY-1	
E/S3	E/CN112	S	0,75 mm ²	LIYCY-3	
E/S3	E/CN113	S	0,75 mm ²	LIYCY-2	
E/CN8/6	E/CN80/7	WB	0,75 mm ²	FLRY-B	
E/CN8/7	E/CN80/6	WB	0,75 mm ²	FLRY-B	
E/CN20/9	E/CN76/3	WBI	0,75 mm ²	FLRY-B	
E/CN8/5	E/CN80/8	WR	0,75 mm ²	FLRY-B	
E CN6/3	E/CN93/2	YG	0,75 mm ²	FLRY-B	
E/CN12/3	E/S4	R	1,25 mm ²	FLRY-B	
E/S4	E/CN95/3	R	1,25 mm ²	FLRY-B	
E/S4	E/CN95/4	R	1,25 mm ²	FLRY-B	
E/CN12/4	E/S5	W	1,25 mm ²	FLRY-B	
E/S5	E/CN94/3	W	1,25 mm ²	FLRY-B	
E/S5	E/CN94/4	W	1,25 mm ²	FLRY-B	
E/CN22/1	E/CN1/1	BIW	5.00 mm ²	FLRY-B	

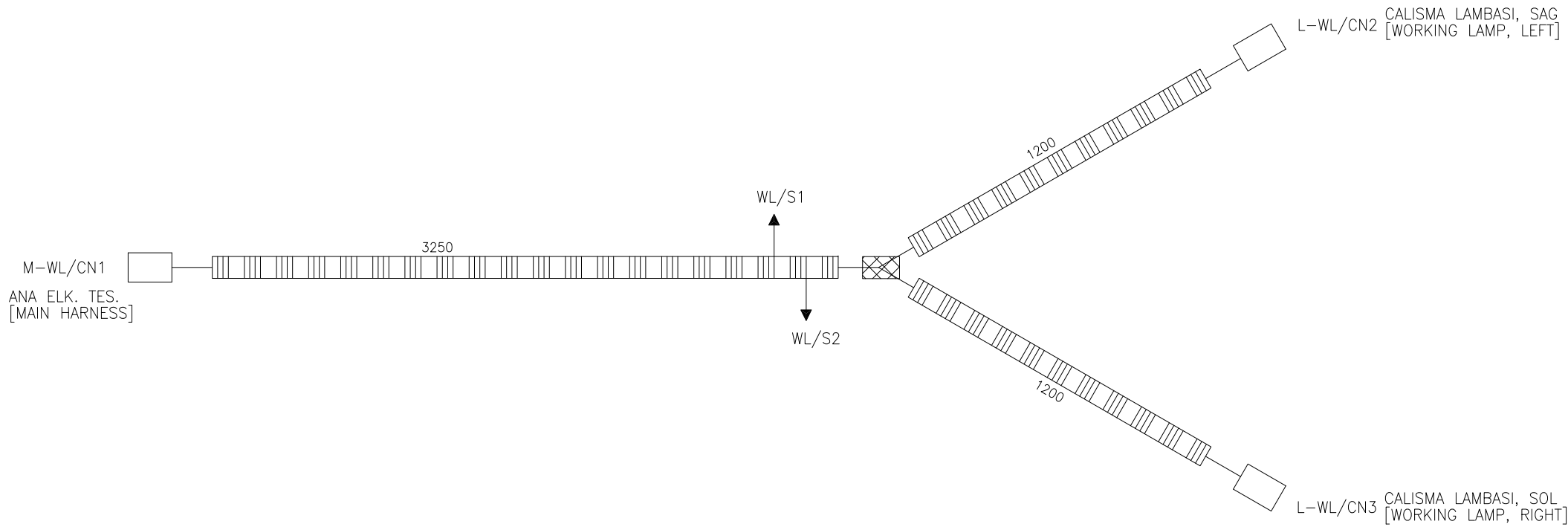


RENK KODU [WIRE COLOR]
R--KIRMIZI [RED]
PK--PEMBE [PINK]
BR--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bl--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACIVERT [DARK BLUE]
S--GÜMÜS [SILVER]

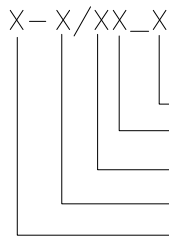


1. ADRES (FROM)	2. ADRES (TO)	KABLO RENK (WIRE COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
L-WL/CN3/2	WL/S2	BI	1,50 mm ²	FLRY-9Y	
L-WL/CN2/2	WL/S2	BI	1,50 mm ²	FLRY-9Y	
M-WL/CN1/2	WL/S2	BI	1,50 mm ²	FLRY-9Y	
L-WL/CN3/1	WL/S1	GBI	1,50 mm ²	FLRY-9Y	
L-WL/CN2/1	WL/S1	GBI	1,50 mm ²	FLRY-9Y	
M-WL/CN1/1	WL/S1	GBI	1,50 mm ²	FLRY-9Y	

NO (NUMBER)	MALZEME ADI/TIPI (MATERIAL/TYPE)	IMALATCI KODU (PRODUCER CODE)	IMALATCI (PRODUCER)	HMK KODU (HMK CODE)
1	MESA KON. 2 PIN T ERKEK BEYAZ	20202240T	MESA	506/19800
2	MESA KON. 2 PIN T DISI BEYAZ	20102240T	MESA	506/19820
3	SF1EU1 RP TERM.	100101003	HATKO	509/13009
4	SF2D (G) RP TERM.	100104223	HATKO	509/09001
5	SK3 RP TERM.	100110001	HATKO	509/13050



NOT-1 [NOTE-1]



NOT-2 [NOTE-2]

- BELIRTELEN RENKLERDE KABLO KULLANILACAKTIR. [THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
- AÇIKTA KALAN TERMINALLER VE ULTRASONIC KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR. [THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINK TUBES]
- KONNEKTÖR RESİMLERİ ARKADAN GÖRÜNÜŞ ALINMIŞTIR. [THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]

NOT-3 [NOTE-3]

- R--ROLE [RELAY]
F--SIGORTA [FUSE]
CN--KONNEKTÖR [CONNECTOR]
T--TERMINAL [TERMINAL]
E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNESS]
M--ANA ELEKTRİK TESİSAT [MAIN HARNESS]
C--KABİN ELEKTRİK TESİSATI [CABIN HARNESS]
AC--KLİMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNESS]
WL--CALISMA LAMBASI TESİSATI [WORKING LAMP HARNESS]
CI--KABİN İÇİ TESİSATI [CABIN INTERIOUR HARNESS]
RSR--ARKA STOP LAMB.TES.(SAG) [REAR STOPLIGHT (RIGHT) HARNESS]
RSL--ARKA STOP LAMB.TES.(SOL) [REAR STOPLIGHT (LEFT) HARNESS]
L--KABLO, CALISMA LAMBASI [CABLE, WORKING LAMP]
SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
SL--KABLO, KULE DÖNÜŞ LAMBASI [CABLE, SWING LAMP]
SLR--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
BR--KABLO, KIRICI AYAK PEDALI [CABLE, BREAKER FOOT PEDAL]

TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]			
KABLO	-----	Çok telli ----	Malzeme : E-Cu ETP1,Sn plated
ULTRASONİK	-----	PVC	-----
SICAKLIK	-----	-140 °C - (+)105 °C (3000h)	---- TS 1435
İSİ İLE DARALAN TUP (SSL)	-----	İsıy almayan, polietilen	-----
MALZEME	-----	-155 °C - (+)125 °C	-----
SICAKLIK	-----	-----	-----
SPIRAL TUP	-----	Polyamid PA6	-----
MALZEME	-----	-140 °C - (+)120 °C	-----
SICAKLIK	-----	-----	-----
PVC TUP	-----	PVC	-----
MALZEME	-----	-120 °C - (+)70 °C	-----
SICAKLIK	-----	-----	-----

RENK KODU [WIRE COLOR]

- R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bİ--SİYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]

İSARETLER [SYMBOLS]

- ✕ BOS YUVA
□ KÖR TAPA TAKILACAKTIR [PLUG]
▨ SPIRAL TUP [SPIRAL TUBE]
▨ BANTLANACAK [STICKY TAPE(PVC)]
▨ MAKARON TAKILACAK [PVC TUBE]
▨ SSL TAKILACAK [HEAT SHRINKABLE TUBE]
▨ BANTLANACAK [STICKY TAPE (TEXTILE)]

HİDROMEKCALISMA LAMBASI TESİSATI
[WORKING LAMP HARNESS]

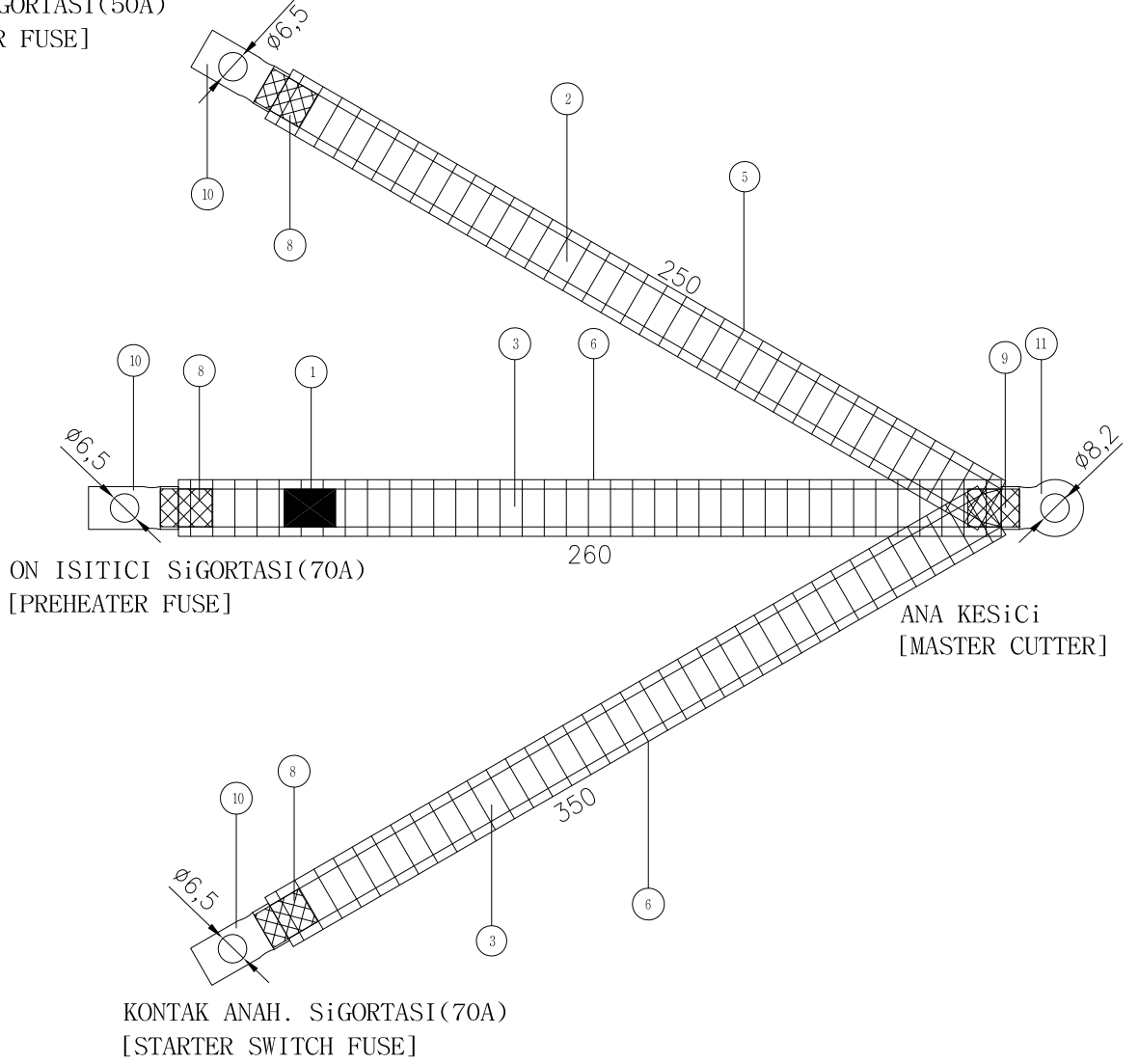
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15.07.2008

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5.1

MARS SiGORTASI(50A)
[STARTER FUSE]



TEKNİK BİLGİ TABLOSU	
KABLO	— Çuk telli — Malzeme : E-CE KIP1
ELEKTİR	— PVC
SEKÜRLÜK	— 40° C - (+100° C (3000h)) — TS 1455
ISI İLE DÖNÜŞÜM TİPİ (SSL)	— 100° C - (+120° C
MALZEME	— 100° C - (+120° C
SEKÜRLÜK	— 100° C - (+120° C
SPIRAL TİPİ	— Poliamid PA6
MALZEME	— 100° C - (+120° C
SEKÜRLÜK	— 100° C - (+120° C
PVC TİPİ	— PVC
MALZEME	— 100° C - (+120° C
SEKÜRLÜK	— 100° C - (+120° C

11	TERMINAL	1	BYT-25 (8,2 mm ²) TERM.	*	AKE	BYT25	*
10	TERMINAL	3	MURAT KOŞELİ DP TERM.	*	MURAT TIC.	92879-0411-00	*
9	DARALAN MAKARON(SSL)	3	CAP : 16,00mm ² * 30 mm	*	YATIZ ELK.	DRM16,40	*
8	DARALAN MAKARON(SSL)	4	CAP : 9,50 mm ² * 30 mm	*	YATIZ ELK.	DRM9,50	*
7	PVC TUP	1	CAP : 6,00 mm ² * 290 mm	*	*	*	*
6	PVC TUP	1	CAP : 6,00 mm ² * 270 mm	*	*	*	*
5	PVC TUP	2	CAP : 6,00 mm ² * 260 mm	*	*	*	*
4	KABLO	1	CAP : 6,00 mm ² * 320 mm FLRY-B KIRMIZI	*	*	*	*
3	KABLO	2	CAP : 6,00 mm ² * 300 mm FLRY-B KIRMIZI	*	*	*	*
2	KABLO	1	CAP : 6,00 mm ² * 290 mm FLRY-B KIRMIZI	*	*	*	*
1	TANITIM ETİKETİ	1	*	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

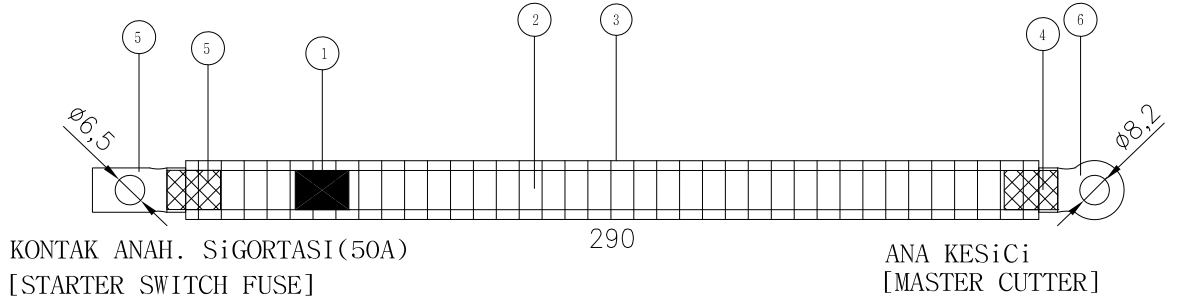
HİDROMEK

KABLO (ANA KESİCİ-SİGORTA)
(CABLE (MASTER CUTTER-FUSE))

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7	TERMINAL	1	YAZAKI 1 PIN DIŞI TERM.	*	YAZAKI	7116-3050	*
6	KONNEKTOR	1	YAZAKI 1 PIN ERKEK KON. BEYAZ	*	YAZAKI	7123-3010	*
5	TERMINAL	1	MURAT KOSELI DP TERM.	*	MURAT TİC.	92879-0411-00	*
4	DARALAN MAKARON(SSL)	1	CAP :9,50 mm² * 30 mm	*	YATIZ ELK.	DRM9,50	*
3	PVC TUP	1	CAP : 6,00 mm² * 180 mm	*	*	*	*
2	KABLO	1	CAP : 6,00 mm² * 210 mm FLRY-B KIRMIZI	*	*	*	*
1	TANITIM ETIKETİ	1	*	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	IMALATCI	PARÇA NO	FORMAT



TEKNİK BİLGİ TABLOSU

KABLO	Çok telli — Malzeme : E-GU ETP1
İLETKEN	— PVC
YALITKAN	— PVC
SICAKLIK	— (+40 °C - (+105 °C (3000h) — TS 1435
İSİ İLE DARALAN TUP (SSL)	—
MALZEME	— Alüminyum, polietilen
SICAKLIK	— (+55 °C - (+125 °C
SPIRAL TUP	—
MALZEME	— Poliamid PA6
SICAKLIK	— (+40 °C - (+120 °C
PVC TUP	—
MALZEME	— PVC
SICAKLIK	— (+20 °C - (+70 °C

6	TERMINAL	1	BYT-25 (8,2 mm ²) TERM.	*	AKE	BYT25	*
5	TERMINAL	1	MURAT KOŞELİ DP TERM.	*	MURAT TIC.	92879-0411-00	*
4	DARALAN MAKARON(SSL)	1	CAP : 9,50 mm ² * 30 mm	*	YATIZ ELK.	DRM9,50	*
3	PVC TUP	1	CAP : 6,00 mm ² * 260 mm	*	*	*	*
2	KABLO	1	CAP : 6,00 mm ² * 290 mm FLRY-B KIRMIZI	*	*	*	*
1	TANITIM ETİKETİ	1	*	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

HİDROMEK

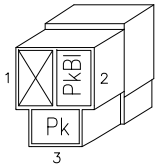
KABLO (ANA KESİCİ-SİGORTA)
CABLE (MASTER CUTTER-FUSE)

TARİH / DATE
15.07.2008

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8.1

1. ADRES (FROM)	2. ADRES (TO)	KABLO RENK (WIRE COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
C-SS/CN1/2	SS/T1	PkBl	0,75 mm²	FLRY-9Y	
C-SS/CN1/3	SS/T2	Pk	0,75 mm²	FLRY-9Y	

NO (NUMBER)	MALZEME ADI/TIPI (MATERIAL/TYPE)	IMALATCI KODU (PRODUCER CODE)	IMALATCI (PRODUCER)	HMK KODU (HMK CODE)
1	MESA KON. 3 PIN DISI BEYAZ	20103040	MESA	506/29000
2	SF1EU1 RPK TERM.	101101003	HATKO	509/13009
3	SKN2,5-04 RP TERM.	100107011	HATKO	508/00960



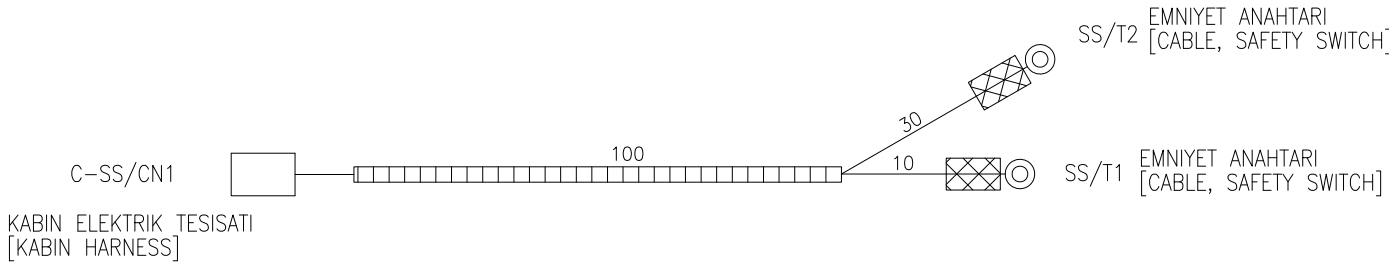
C-SS/CN1
(1,2)



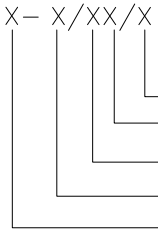
SS/T1
(3)



SS/T2
(3)



NOT-1 [NOTE-1]



NOT-2 [NOTE-2]

- BELİRTİLEN RENKLERDE KABLO KULLANILACAKTIR.
[THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
- AÇIKTA KALAN TERMINALLER VE ULTRASONİK KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR.
[THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINK TUBES]
- KONNEKTÖR RESİMLERİ ARKADAN GÖRÜNÜŞ ALINMIŞTIR.
[THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]

NOT-3 [NOTE-3]

- R--ROLE [RELAY]
F--SIGORTA [FUSE]
CN--KONNEKTÖR [CONNECTOR]
T--TERMINAL [TERMINAL]
E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNESS]
M--ANA ELEKTRİK TESİSAT [MAIN HARNESS]
C--KABİN ELEKTRİK TESİSATI [CABIN HARNESS]
AC--KLİMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNESS]
WL--ÇALIŞMA LAMBASI TESİSATI [WORKING LAMP HARNESS]
CI--KABİN İÇİ TESİSATI [CABIN INTERIOUR HARNESS]
RSR--ARKA STOP LAMB.TES.(SAG) [REAR STOPLIGHT (RIGHT) HARNESS]
RSL--ARKA STOP LAMB.TES.(SOL) [REAR STOPLIGHT (LEFT) HARNESS]
L--KABLO, ÇALIŞMA LAMBASI [CABLE, WORKING LAMP]
SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
SL--KABLO, KULE DONUS LAMBASI [CABLE, SWING LAMP]
SLR--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
BR--KABLO, KIRICI AYAK PEDALI [CABLE, BREAKER FOOT PEDAL]

TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]			
KABLO İLETKEN YALITICI	PVC	Cok telli	Malzeme : E-CU ETP1,Sn plated
SICAKLIK	-40 °C - (+105 °C (3000h))		TS 1435
SSL İLE DARALAN TUP (SSL)	Malzeme : Polyamid PA6		
SICAKLIK	-75 °C - (+125 °C)		
SPIRAL TUP	PVC		
SICAKLIK	-40 °C - (+120 °C)		
PVC TUP	PVC		
SICAKLIK	-20 °C - (+70 °C)		

RENK KODU [WIRE COLOR]
R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bl--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]

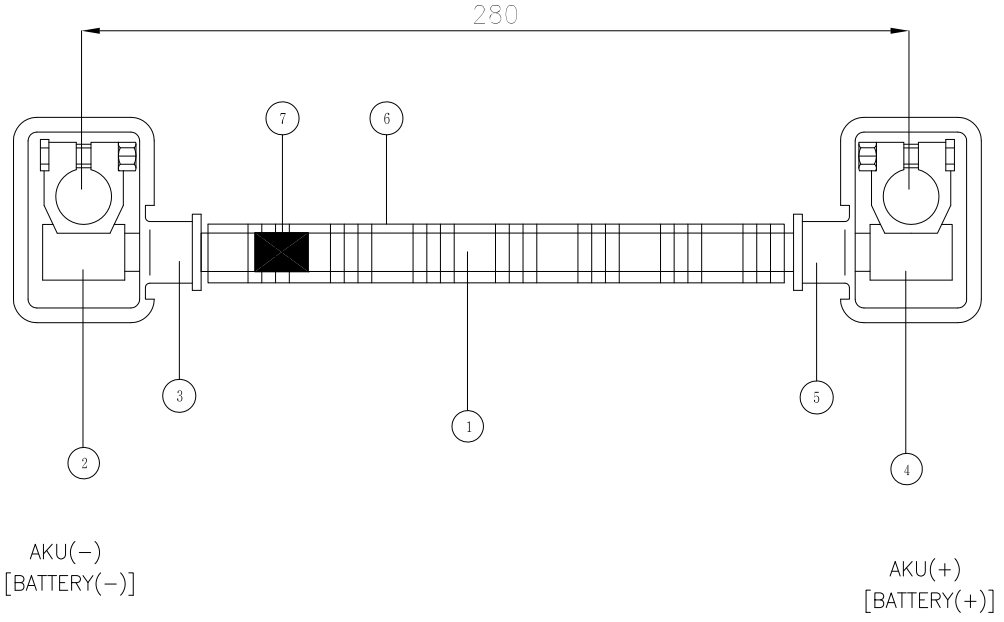
İSARETLER [SYMBOLS]	
	BOS YUVA
	KÖR TAPA TAKILACAKTIR [PLUG]
	SPIRAL TUP [SPIRAL TUBE]
	BANTLANACAK [STICKY TAPE(PVC)]
	MAKARON TAKILACAK [PVC TUBE]
	SSL TAKILACAK [HEAT SHRINKABLE TUBE]
	BANTLANACAK [STICKY TAPE (TEXTILE)]

HİDROMEK

KABLO, EMNİYET ANAHTARI
[CABLE, SAFETY SWITCH]

TARİH / DATE
20.05.2008

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TEKNİK BİLGİ TABLOSU	
KABLO	Çok telli — Malzeme : E-CU ETP1
İLETKEN	PVC
YALITKAN	— TS 1435
SICAKLIK	(-40 °C - (+)105 °C (3000h))
ISI İLE DARALAN TUP (SSL)	—
MALZEME	— Alüminyum, poliolefin
SICAKLIK	(-55 °C - (+)125 °C
SPIRAL TUP	— Poliamid PA6
MALZEME	—
SICAKLIK	(-40 °C - (+)120 °C

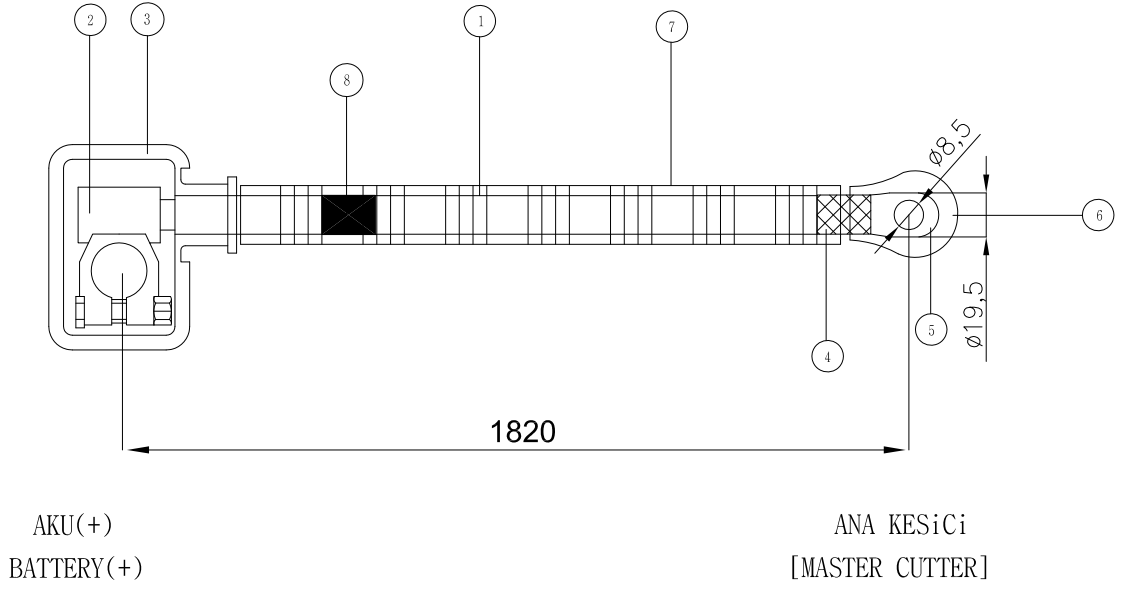
7	TANITIM ETİKETİ	1	*	*	*	*	
6	SPIRAL TUP	1	CAP :16.50 mm² * 250 mm	*	SALFLEX	PA6-17	
5	KUTUP KORUYUCU	1	(+) KUTUP KORUYUCU KIRMIZI (SOL)	*	ECS	K-01-0655	
4	KUTUP BASI	1	(+) KUTUP - BASKILI TIP	*	*	*	
3	KUTUP KORUYUCU	1	(-) KUTUP KORUYUCU SIYAH (SAG)	*	ECS	K-01-0654	
2	KUTUP BASI	1	(-) KUTUP - BASKILI TIP	*	*	*	
1	KABLO	1	CAP :50,00 mm² * 310 mm ANV KIRMIZI	*	*	*	
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

HİDROMEK

KABLO (AKU(-)_AKU(+))
[CABLE (BATTERY(-)_BATTERY(+))]

TARİH / DATE
15.07.2008

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TEKNİK BİLGİ TABLOSU

KABLO	Çok telli — Malzeme : E-OU ETP1	
İLETKEN	PVC	
YALITKAN	c40 °C ~ (+)105 °C (3000h)	— TS 1435
SICAKLIK		
ISI İLE DARALAN TUP (SSL)		
MALZEME	Alüminyum, polietilen	
SICAKLIK	c40 °C ~ (+)125 °C	
SPIRAL TUP	Polyamid PA6	
MALZEME		
SICAKLIK	c40 °C ~ (+)120 °C	

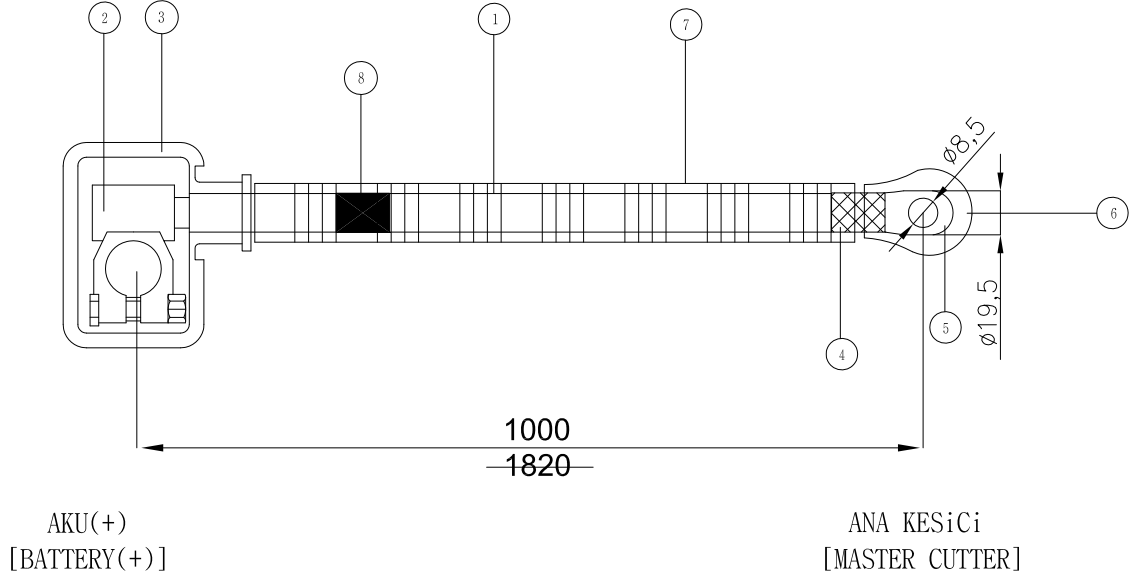
8	TANITIM ETİKETİ	1	*	*	*	*	
7	SPIRAL TUP	1	CAP :16,50 mm² * 1760 mm	*	SALFLEX	PA6-17	*
6	GROMET	1	PIPO GROMET	*	ECS	K-01-0627	*
5	TERMINAL	1	BS 50 DP	*	HATKO	0100207032	*
4	DARALAN MAKARON(SSL)	1	CAP :16,40 mm² * 40 mm	*	YATIZ ELK.	DRM16,40	*
3	KUTUP KORUYUCU	1	(+) KUTUP KORUYUCU KIRMIZI (SOL)	*	ECS	K-01-0655	*
2	KUTUP BASI	1	(+) KUTUP - BASKILI TİP	*	*	*	*
1	KABLO	1	CAP :50,00 mm² * 1800 mm ANV KIRMIZI	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

HİDROMEK

KABLO (AKÜ(+)_ANA KESİCİ)
[CABLE (BATTERY(+)_MASTER CUTTER)]

TARİH / DATE
08.09.2008

SAYFA / PAGE
11.1



TEKNİK BİLGİ TABLOSU	
KABLO	— Çok telli — Malzeme : E-CU ETP1
İLETKEN	— PVC
YALITKANI	— PVC
SICAKLIK	— (-40 °C - (+105 °C (3000h)) — TS 1435
İŞİLE DARALAN TUP (SSL)	
MALZEME	— Alüminyum, polietilen
SICAKLIK	— (-55 °C - (+125 °C
SPIRAL TUP	
MALZEME	— Poliamid PA6
SICAKLIK	— (-40 °C - (+120 °C

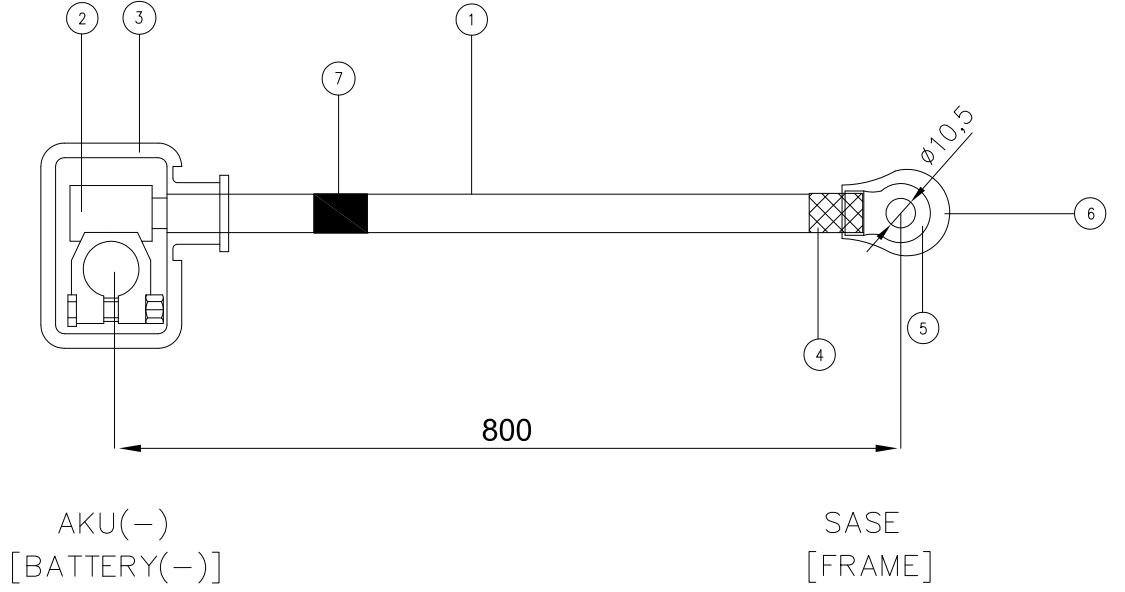
8	TANITIM ETİKETİ	1	*	*	*	*	*
7	SPIRAL TUP	1	CAP :16,50 mm ² * 940 mm	*	SALFLEX	PA6-17	*
6	GROMET	1	PIPO GROMET	*	ECS	K-01-0627	*
5	TERMINAL	1	BS 50 DP	*	HATKO	0100207032	*
4	DARALAN MAKARON(SSL)	1	CAP :16,40 mm ² * 40 mm	*	YATIZ ELK.	DRM16,40	*
3	KUTUP KORUYUCU	1	(+) KUTUP KORUYUCU KIRMIZI (SOL)	*	ECS	K-01-0655	*
2	KUTUP BASI	1	(+) KUTUP - BASKILI TIP	*	*	*	*
1	KABLO	1	CAP :50,00 mm ² * 980 mm ANV KIRMIZI	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

HİDROMEK

KABLO (AKÜ(+)_ANA KESİCİ)
[CABLE (BATTERY(+)_MASTER CUTTER)]

TARİH / DATE
08.09.2008

SAYFA / PAGE
11.2



TEKNİK BİLGİ TABLOSU	
KABLO	Çok telli — Malzeme : E-GU ETP1
İLETKEN	PVC
YALITICI	(+40 °C - (+)105 °C (3000h)) — TS 1435
SICAKLIK	
ISILIE DARALAN TUP (SSL)	
MALZEME	Alüminyum, polietilen
SICAKLIK	(+55 °C - (+)125 °C
SPIRAL TUP	
MALZEME	Poliamid PA6
SICAKLIK	(+40 °C - (+)120 °C

NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT
7	TANITIM ETİKETİ	1	*	*	*	*	*
6	GROMET	1	PIPO GROMET	*	ECS	K-01-0627	*
5	TERMINAL	1	CAP : 10,50 mm ² 50 NO BAKIR BASLIK	*	MESA	10910000	*
4	DARALAN MAKARON(SSL)	1	CAP :16,40 mm ² * 50 mm	*	YATIZ ELK.	DRM16,40	*
3	KUTUP KORUYUCU	1	(-) KUTUP KORUYUCU SIYAH (SOL)	*	ECS	K-01-0656	*
2	KUTUP BASI	1	(-) KUTUP - BASKILI TIP	*	*	*	*
1	KABLO	1	CAP :50,00 mm ² * 780 mm ANV SIYAH	*	*	*	*

R--KIRMIZI [RED]
 Pk--PEMBE [PINK]
 Br--KAHVERENGİ [BROWN]
 O--TURUNCU [ORANGE]
 Y--SARI [YELLOW]
 G--YESİL [GREEN]
 B--MAVİ [BLUE]
 V--MOR [VIOLET]
 Gr--GRI [GREY]
 Bİ--SIYAH [BLACK]
 W--BEYAZ [WHITE]
 Db--LACIVERT [DARK BLUE]
 S--GÜMÜS [SILVER]

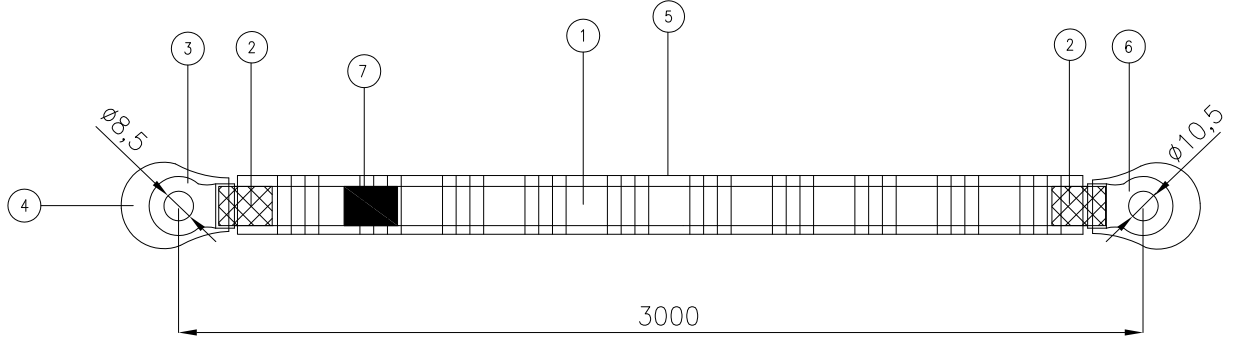
HİDROMEK

KABLO (AKU(-)_SASE)
 [CABLE (BATTERY(-)_FRAME)]

HMK 300 LC3

15.07.2008

12.1



ANA KESİCİ
[MASTER CUTTER]

MARS MOTORU
[STARTER ENGINE]

TEKNİK BİLGİ TABLOSU	
KABLO	— Çok telli — Malzeme : E-CU ETP1
İLETKEN	— PVC
YALITKAN	— PVC
SICAKLIK	— (-40 °C - (+105 °C (3000h)) — TS 1435
ISİ İLE DARALAN TUP (SSL)	— Alev atmayan, poliolefin
MALZEME	— (-55 °C - (+125 °C
SICAKLIK	— (-55 °C - (+125 °C
SPIRAL TUP	— Poliamid PA6
MALZEME	— (-40 °C - (+120 °C
SICAKLIK	— (-40 °C - (+120 °C

7	TANITIM ETİKETİ	1	*	*	*	*	*
6	TERMINAL	1	CAP : 10,50 mm ² 50 NO BAKIR BASLIK	*	MESA	10910000	*
5	SPIRAL TUP	1	CAP : 16,50 mm ² * 2940 mm	*	SALFLEX	PA6-17	*
4	GROMET	2	PIPO LASTİK	*	ECS	K-01-0627	*
3	TERMINAL	1	BS 50 DB	*	HATKO	0100207032	*
2	DARALAN MAKARON (SSL)	2	CAP : 16,40 mm ² * 40 mm	*	YATIZ ELK.	DRM16,40	*
1	KABLO	1	CAP : 50,00 mm ² * 2960 mm ANV KIRMIZI	*	*	*	*
NO	PARÇA ADI	ADET	MALZEME	KOD	İMALATCI	PARÇA NO	FORMAT

R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bl--SIYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]
S--GÜMÜŞ [SILVER]

HİDROMEK

KABLO (ANA KESİCİ_MARS MOTORU)
[CABLE (MASTER CUTTER_STARTER ENG

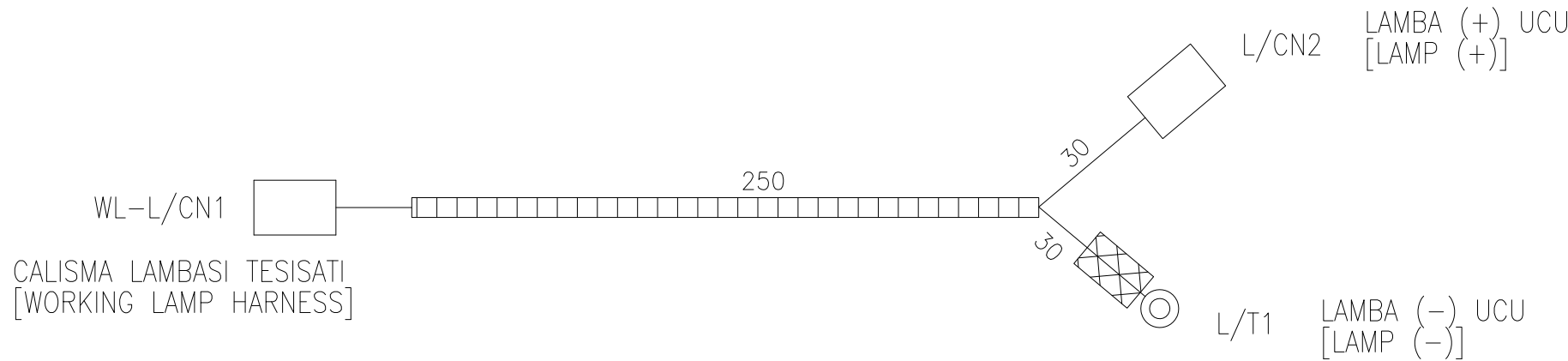
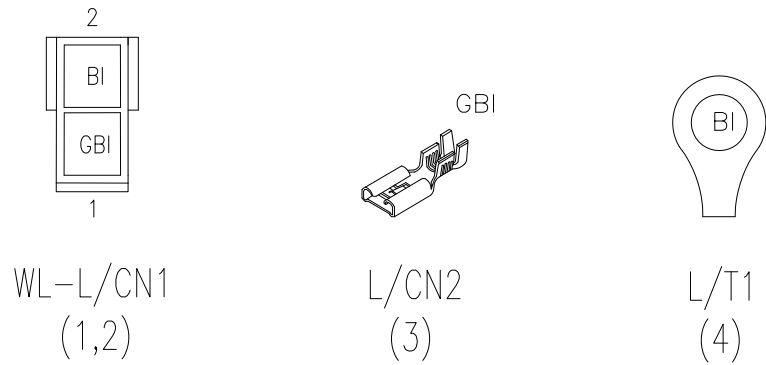
HMK 300 LC3

15.07.2008

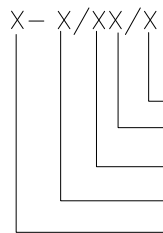
13.1

1. ADRES (FROM)	2. ADRES (TO)	KABLO RENK (WIRE COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
WL-L/CN1/2	L/T1	BI	1,50 mm ²	FLRY-9Y	
WL-L/CN1/1	L/CN2	GBI	1,50 mm ²	FLRY-9Y	

NO (NUMBER)	MALZEME ADI/TIPI (MATERIAL/TYPE)	İMALATCI KODU (PRODUCER CODE)	İMALATCI (PRODUCER)	HMK KODU (HMK CODE)
1	MESA KON. 2 PIN T DİSİ BEYAZ	20102240T	MESA	506/19820
2	SF1EU1 RPK TERM.	101101003	HATKO	509/13009
3	SF2D (G) RPK TERM.	101104223	HATKO	509/09001
4	SKN2.5-04 RP TERM.	100107011	HATKO	508/00960



NOT-1 [NOTE-1]



NOT-2 [NOTE-2]

- BELİRTİLEN RENKLERDE KABLO KULLANILACAKTIR.
[THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
- AÇIKTA KALAN TERMINALLER VE ULTRASONİK KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR.
[THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINK TUBES]
- KONNEKTÖR RESİMLERİ ARKADAN GÖRÜNÜŞ ALINMIŞTIR.
[THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]

NOT-3 [NOTE-3]

- R--ROLE [RELAY]
F--SİGORTA [FUSE]
CN--KONNEKTÖR [CONNECTOR]
T--TERMINAL [TERMINAL]
E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNESS]
M--ANA ELEKTRİK TESİSAT [MAIN HARNESS]
C--KABİN ELEKTRİK TESİSATI [CABIN HARNESS]
AC--KLİMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNESS]
WL--CALISMA LAMBASI TESİSATI [WORKING LAMP HARNESS]
CI--KABİN İÇİ TESİSATI [CABIN INTERIOUR HARNESS]
RSR--ARKA STOP LAMB.TES.(SAG) [REAR STOPLIGHT (RIGHT) HARNESS]
RSL--ARKA STOP LAMB.TES.(SOL) [REAR STOPLIGHT (LEFT) HARNESS]
L--KABLO, CALISMA LAMBASI [CABLE, WORKING LAMP]
SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
SL--KABLO, KULE DÖNÜŞ LAMBASI [CABLE, SWING LAMP]
SLR--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
BR--KABLO, KIRICI AYAK PEDALI [CABLE, BREAKER FOOT PEDAL]

TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]			
KABLO	-----	Cok telli ----	Malzeme : E-Ou ETP1.Sn plated
İLETKEN	-----	PVC	(-40 °C - (+)105 °C (3000h) ---- TS 1435
YALITKAN	-----		
SSL İLE DARALAN TUP (SSL)	-----		
YALITKAN	-----	Yey, gımsız, polyolefin	
YALITKAN	-----	(-55 °C - (+)125 °C	
SPIRAL TUP	-----	Polyamid PA6	
YALITKAN	-----	(-40 °C - (+)120 °C	
PVC TUP	-----		
YALITKAN	-----	PVC	
YALITKAN	-----	(-20 °C - (+)70 °C	

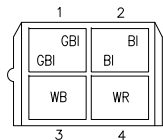
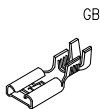
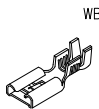
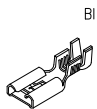
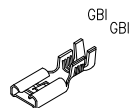
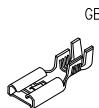
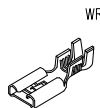
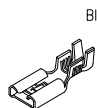
RENK KODU [WIRE COLOR]

- R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
Bİ--SİYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]

İSARETLER [SYMBOLS]

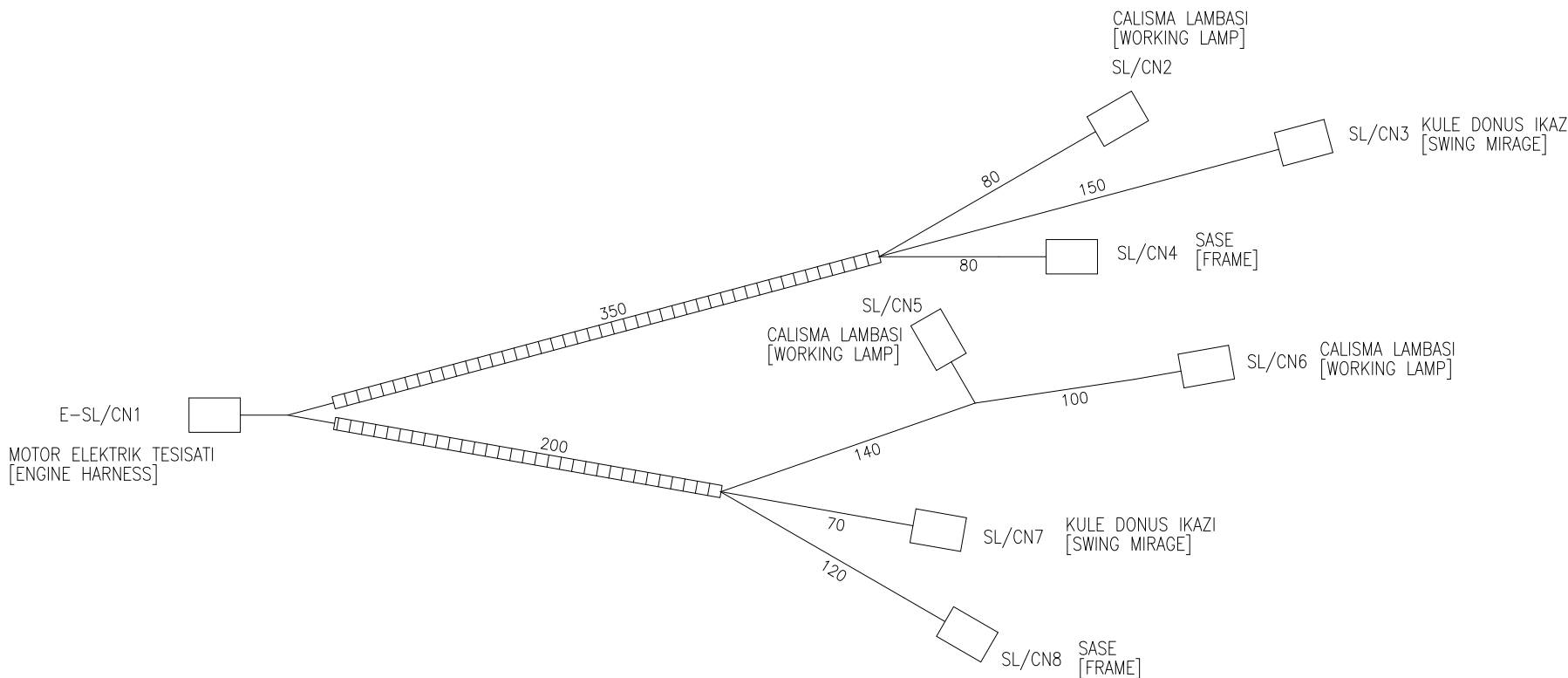
- ☒ BOS YUVA
☐ KÖR TAPA TAKILACAKTIR [PLUG]
▨ SPIRAL TUP [SPIRAL TUBE]
▬ BANTLANACAK [STICKY TAPE(PVC)]
▨ MAKARON TAKILACAK [PVC TUBE]
▨ SSL TAKILACAK [HEAT SHRINKABLE TUBE]
▨ BANTLANACAK [STICKY TAPE (TEXTILE)]

HİDROMEKKABLO, CALISMA LAMBASI
[CABLE, WORKING LAMP]TARİH / DATE
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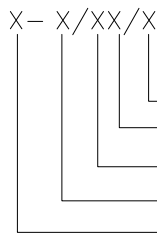
E-SL/CN1
(1,2)SL/CN2
(3)SL/CN3
(3)SL/CN4
(3)SL/CN5
(3)SL/CN6
(3)SL/CN7
(3)SL/CN8
(3)

1. ADRES (FROM)	2. ADRES (TO)	KABLO RENK (WIRE COLOR)	KABLO CAPI (WIRE SIZE)	KABLO TIPI (WIRE TYPE)	HMK KODU (HMK CODE)
C-SL/CN1/4	SL/CN7	WR	0,75 mm ²	FLRY-9Y	
C-SL/CN1/3	SL/CN3	WB	0,75 mm ²	FLRY-9Y	
C-SL/CN1/2	SL/CN4	BI	0,75 mm ²	FLRY-9Y	
C-SL/CN1/2	SL/CN8	BI	0,75 mm ²	FLRY-9Y	
SL/CN5	SL/CN6	GBI	0,75 mm ²	FLRY-9Y	
C-SL/CN1/1	SL/CN5	GBI	0,75 mm ²	FLRY-9Y	
C-SL/CN1/1	SL/CN2	GBI	0,75 mm ²	FLRY-9Y	

NO (NUMBER)	MALZEME ADI/TIPI (MATERIAL/TYPE)	İMALATCI KODU (PRODUCER CODE)	İMALATCI (PRODUCER)	HMK KODU (HMK CODE)
1	MESA KON. 4 PIN DISİ BEYAZ	20104040	MESA	506/23400
2	SF1EU1 RPK TERM.	101101003	HATKO	509/13009
3	SF2D (G) RPK TERM.	101104223	HATKO	509/09001



NOT-1 [NOTE-1]



NOT-2 [NOTE-2]

1. BELİRTİLEN RENKLERDE KABLO KULLANILACAKTIR.
[THE CABLE COLORS MUST BE USED AS SHOWN IN THE FIGURE]
2. AÇIKTA KALAN TERMINALLER VE ULTRASONİK KAYNAKLAR DARALAN MAKARON (SSL) İLE İZOLE EDİLECEKTİR.
[THE TERMINALS AND ULTRASONIC WELDINGS MUST BE INSULATED BY HEAT-SHRINK TUBES]
3. KONNEKTÖR RESİMLERİ ARKADAN GÖRÜNÜŞ ALINMIŞTIR.
[THE CONNECTORS ARE VIEWED FROM THE BACK SIDES]

NOT-3 [NOTE-3]

R--ROLE [RELAY]
F--SİĞORTA [FUSE]
CN--KONNEKTÖR [CONNECTOR]
T--TERMINAL [TERMINAL]
E--MOTOR ELEKTRİK TESİSATI [ENGINE HARNESS]
M--ANA ELEKTRİK TESİSAT [MAIN HARNESS]
C--KABİN ELEKTRİK TESİSATI [CABIN HARNESS]
AC--KLİMA ELEKTRİK TESİSATI [AIR CONDITIONER HARNESS]
WL--ÇALIŞMA LAMBASI TESİSATI [WORKING LAMP HARNESS]
CI--KABİN İÇİ TESİSATI [CABIN INTERIOUR HARNESS]
RSR--ARKA STOP LAMB.TES.(SAG) [REAR STOPLIGHT (RIGHT) HARNESS]
RSL--ARKA STOP LAMB.TES.(SOL) [REAR STOPLIGHT (LEFT) HARNESS]
L--KABLO, ÇALIŞMA LAMBASI [CABLE, WORKING LAMP]
SS--KABLO, EMNİYET ANAHTARI [CABLE, SAFETY SWITCH]
SL--KABLO, KULE DONUS LAMBASI [CABLE, SWING LAMP]
SLR--KABLO, SINYAL LAMBASI (SAG) [CABLE, SIGNAL LAMP (RIGHT)]
SLL--KABLO, SINYAL LAMBASI (SOL) [CABLE, SIGNAL LAMP (LEFT)]
BR--KABLO, KIRICI AYAK PEDALI [CABLE, BREAKER FOOT PEDAL]

TEKNİK BİLGİ TABLOSU [TECHNICAL DATA SHEET]			
KABLO İLETKEN	Cok telli	Malzeme : E-Cu ETP1,5n plated	
YALITKAN	PVC	-40 °C - (+)105 °C (3000h)	TS 1435
İSİ İLE DARALAN TUP (SSL)	poly aliminyan, polyolefin		
MALZEME SICAKLIK	-55 °C - (+)125 °C		
SPIRAL TUP	Polyamid P66		
MALZEME SICAKLIK	-40 °C - (+)120 °C		
PVC TUP			
MALZEME SICAKLIK	PVC	-20 °C - (+)70 °C	

RENK KODU [WIRE COLOR]
R--KIRMIZI [RED]
Pk--PEMBE [PINK]
Br--KAHVERENGİ [BROWN]
O--TURUNCU [ORANGE]
Y--SARI [YELLOW]
G--YESİL [GREEN]
B--MAVİ [BLUE]
V--MOR [VIOLET]
Gr--GRI [GREY]
BI--SİYAH [BLACK]
W--BEYAZ [WHITE]
Db--LACİVERT [DARK BLUE]

İSARETLER [SYMBOLS]
BOS YUVA
KÖR TAPA TAKILACAKTIR [PLUG]
SPIRAL TUP [SPIRAL TUBE]
BANTLANACAK [STICKY TAPE(PVC)]
MAKARON TAKILACAK [PVC TUBE]
SSL TAKILACAK [HEAT SHRINKABLE TUBE]
BANTLANACAK [STICKY TAPE (TEXTILE)]

HİDROMEKKABLO, KULE DONUS LAMBASI
[CABLE (SWING LAMP)]

HMK 300 LC-3

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