TRACTION BATTERY INSTRUCTION MANUAL

SAFETY MEASURES

» The battery emits hydrogen gas during recharging. Never approach the battery with flames or sources of ignition!

» Always use the required protective equipment (eye protector, mask, glove) during battery recharging or maintenance operations!

» The battery must not be tilted more than 45°!

» Waste batteries must be handed over to the authorized technical service in accordance with the regulations!

» In case of cell replacement in batteries with total surface voltage exceeding 60 V, disconnect at least from 3 points!

» Definitely read the warranty and instruction manual.

» Switch off the battery when the battery is connected to and disconnected from the rectifier!

OPERATING FEATURES

» After recharging, use the battery up to 80% max. and do not leave the battery at discharged status but recharged it. Stop using after receiving a signal from the vehicle.

» The electrolyte temperature must not exceed 40°C during recharging.

» Electrolyte density is around 1280±0.01 gr/cm³ at 25°C when the cell is fully charged.

» In terminal cable connection, do not allow excessive bending or deformation of cable and fix the cable to the battery tray.

» (TOP-UP) In the automatic filling system, pure water should be filled after recharging. The distance between the water tank used for filling pure water and the top point of the battery should be 2mt. The water pressure should be 0,2-0,25 Bar.

» The temperature of the environment where the batteries are kept must not exceed 25°C. Measure the total surface voltage and cells voltage once a month, perform “equalization charge” in case of sulfation (discharge).

» The terminal connection screw should be tightened value of 32 Nm. For 2 PzS - PzB and 3 PzS - PzB products, the torque value should be 27 Nm.

» If SKP terminal shoe connection is used for connection of Battery terminals, the tightening crimping should be performed as required by the SKP shoe terminal manufacturer.

MAINTENANCE

Definitely keep maintenance records for each battery!

VISUAL CONTROL

» Checks for any cracks, breaks on cells and terminals; and if any, call İnci GS Yuasa.

STATUS OF POLES

» If the connections are loose and/or non-isolated, deficiencies should be completed. If it is not proper, the melting of the cable and pole may occur.

STATUS OF CONNECTIONS AND SOCKETS

» Replace in case of cracks and/or deformation.

STATUS OF PLUGS

» Replace in case of cracks and/or deformation.

ELECTROLYTE LEVEL CONTROL

» The electrolyte level should never fall below the separator level or the minimum level specified in the filter plug (the bottom of plug). Electrolyte level is adjusted automatically in batteries that use automatic filling plug.

AIR-MIX HOSE CANAL

» If there is any blockage or breakage in the hoses, they should be cleaned or replaced.

STATUS OF TRAY

» If there is the accumulation of water or electrolyte, the discharge of accumulation must be with the pump from the tray. Otherwise, a breakdown could be seen.

VOLTAGE - DENSITY CONTROL (After charging)

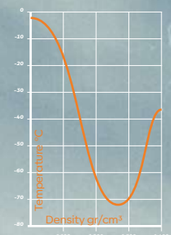
» If the cell density is more than 1.300 gr/cm³, İnci GS Yuasa should be called.
» If the cell density is less than 1.260 gr/cm³, the balance charge should be done.

RECHARGING OPERATIONS

STATE OF CHARGE TABLE

Starte of charge	Cell voltage	Cell density
Fully charged	2,10/2,15 V	1,280±0,01 gr/cm³
Discharged	1,70 V	1,100±0,01 gr/cm³

Values of a fully charged battery are 2,10V-2,15V and 1,280±0,01 gr/cm³.



CELL FREEZING

» If the cell is at a discharged state (1,100 gr/cm³), then the freezing starts at -7°C.
» If the cell is at a fully charged state (1,280 gr/cm³), no cell freezing will be observed up to -71°C.
» The frozen cell should be kept at room temperature and the rectifier charge should be performed after the electrolyte liquefies.

RECTIFIER CHARGE

» Step 1: Rectifier Current = Battery Capacity x 15% (Cell voltage up to 2,40 V)
» Step 2: Rectifier Current = Battery Capacity x 5% (Cell voltage up to 2,70 V)

RECTIFIER CHARGE TIME

» Where the rectifier is compatible and battery has discharged up to 80%, rectifier charge time is 8-10 hours. Never open the plug lids during charging.
» Batteries should be kept waiting for 2 hours after being charged.

WHEN TO PERFORM EQUALIZING CHARGE?

» When more than 80% of Battery capacity is consumed,
» When the battery is not used for 30-60 days,
» After rectifier charge, if the density is <1.260 gr/cm³ at 27°C and the voltage difference between cells is more than 0,05V.

EQUALIZING CHARGE

» Current = Battery Capacity x 5% (Cell voltage up to 2,70V-2,75V) When the rectifier is compatible with the battery, the average charging time is 20-24 hours.

ADDITION OF PURE WATER INTO CELL

» The addition of pure water into the cell must be made after recharging. The level should be below the plug’s lower point and visible.