



VEHICULAR CHARGER

(IMPRES™ Compatible System)

NNTN7616, NNTN7618

User Guide

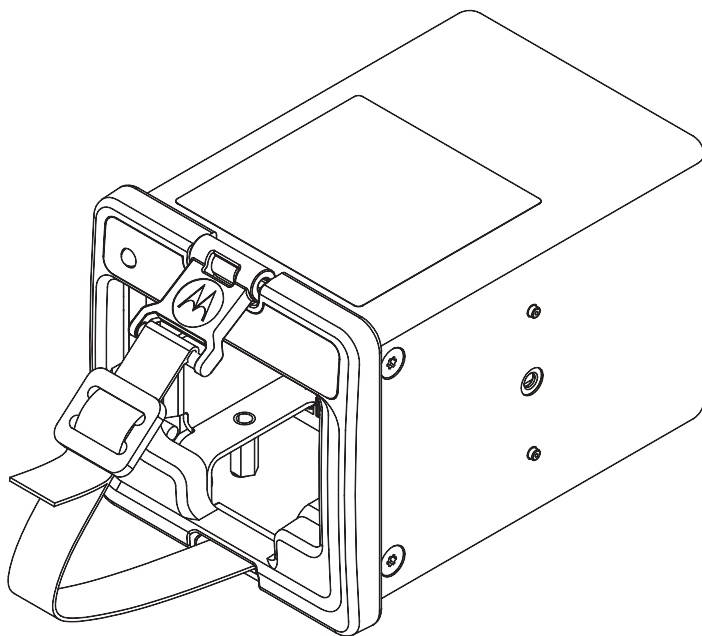
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SAFETY AND GENERAL INFORMATION



WARNING

All batteries can cause property damage and/or bodily injury such as burns if a conductive material such as jewelry, keys or beaded chains touches exposed terminals. The material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse or other container with metal objects.

Do not replace or charge batteries in potentially explosive atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion.

Due to the risk of electrical shock or other physical injury, never insert your hands into the charger pocket.

Product Safety and RF Exposure Compliance



Caution

Before using this product, read the operating instructions for safe usage contained in the "Product Safety and RF Exposure Booklet" enclosed with your radio, (Motorola Solutions publication number 6881095C98 and 6864117B25) to ensure compliance with RF energy exposure limits.



WARNING

Operational Warnings

• Vehicles With an Air Bag

Do not place a portable radio or install radio communications equipment in the area over an air bag or in the air bag deployment area. Air bags inflate with great force. If a portable radio is placed in the air bag deployment area and the air bag inflates, the radio may be propelled with great force and cause serious injury to occupants of the vehicle.

- Installation of vehicle communication equipment should be performed by a professional installer/technician qualified in the requirements for such installations. An airbag's size, shape, and deployment area can vary by vehicle make, model, and front compartment configuration (e.g., bench seat vs. bucket seats).
 - Contact the vehicle manufacturer's corporate headquarters, if necessary, for specific airbag information for the vehicle make, model, and front compartment configuration involved in your communication equipment installation.

• Blasting Caps and Areas

To avoid possible interference with blasting operations, turn your radio off and remove it from the charger when you are near electrical blasting caps, in a blasting area, or in areas posted "Turn off two-way radio." Obey all signs and instructions.



Caution

Operational Cautions

Efficient System Operation

- All equipment must be properly grounded according to Motorola Solutions installation instructions for safe operation.
- All equipment should be serviced only by an authorized technician.

Radio Operation

- Radio operation while driving is not recommended.

About the Vehicular Charger

The NNTN7616 and NNTN7618 Vehicular Charger kit is used for charging a radio (or battery alone) when inside a vehicle. The Vehicular Charger kit includes a mounting bracket (to mount the unit inside the vehicle) and wire harness.

The NNTN7616 Tri-Chemistry Vehicular Charger are designed and approved to charge the following batteries for **MOTOTRBO** series portable radios:

Battery No.	Description
PMNN4065	NiMH 1300 mAh Submersible IP57 Battery*
PMNN4066	Li-Ion 1500 mAh IMPRES™ Submersible IP57 Battery
PMNN4069	Li-Ion 1400 mAh IMPRES FM Submersible IP57 Battery
PMNN4077	Li-Ion 2150 mAh IMPRES Submersible IP57 Battery
PMNN4406	Li-Ion 1600 mAh IP68 Battery*
PMNN4407	Li-Ion 1600 mAh IMPRES IP68 Battery
PMNN4409	Li-Ion 2150 mAh IMPRES IP68 Battery
PMNN4412	NiMH 1300 mAh IP68 Battery*
PMNN4415	NiMH 1300 mAh IP56 Battery*
PMNN4416	Li-Ion 1600 mAh IP56 Battery*
PMNN4417	Li-Ion 1600 mAh IMPRES IP56 Battery
PMNN4418	Li-Ion 2150 mAh IMPRES IP56 Battery
PMNN4435	Li-Ion 1300 mAh IP68 Battery**
PMNN4488	Li-Ion 3000 mAh IMPRES IP68 Battery for Vibrating Belt Clip
PMNN4489	Li-Ion 2900 mAh IMPRES TIA4950 HazLoc IP68 Battery
PMNN4490	Li-Ion 2900 mAh IMPRES TIA4950 HazLoc IP68 Battery
PMNN4491	Li-Ion 2100 mAh IMPRES IP68 Battery
PMNN4493	Li-Ion 3000 mAh IMPRES IP68 Battery
NNTN8386	Li-Ion 1800 mAh IMPRES Submersible ATEX Battery
NNTN8359	Li-Ion 1800 mAh IMPRES Submersible IP67 Battery
NNTN8560	Li-Ion 2500 mAh IMPRES TIA4950 HazLoc IP67 Battery

* All non IMPRES batteries must use NNTN7616C and onward.

Long Life Battery (Typically 1000 Full Charge/Discharge Cycles).

The NNTN7618 Tri-Chemistry Vehicular Charger is designed and approved to charge the following batteries for the HT and GP Professional series portable radios:

Battery No.	Description
HNN4001	NiMH 1800 mAh IMPRES Battery
HNN4002	NiMH 1700 mAh IMPRES FM
HNN4003	Li-Ion 2350 mAh IMPRES IP54 Battery
HNN9008	NiMH 1500 mAh Battery
HNN9009	NiMH 1900 mAh Battery
HNN9010	NiMH 1800 mAh FM Battery
HNN9011	NiCd 1200 mAh FM Battery
HNN9012	NiCd 1300 mAh Battery
HNN9013	Li-Ion 1500 mAh Battery
NNTN4503	NiMH 1500 mAh FPP Battery (HT1550XLS)
NNTN5510	Li-Ion 1480 mAh ATEX Battery
NNTN7380	NiMH 1150 mAh MSHA Battery
PMNN4455	Li-Ion 2800 mAh IP54, CE
PMNN4457	Mag One Li-Ion 2075 mAh, CE

The NNTN7616 Tri-Chemistry Vehicular Charger is designed and approved to charge the following batteries for APX2000/4000 series portable radios:

Battery No.	Description
NNTN8128	Li-Ion 1900 mAh IMPRES IP67 Battery
NNTN8129	Li-Ion 2300 mAh IMPRES FM IP67 Battery
PMNN4424	Li-Ion 2300 mAh IMPRES IP67 Battery
PMNN4448	Li-Ion 2700 mAh IMPRES IP67 Battery

The charger uses a microprocessor to sense the type of battery inserted and control the rate of charge accordingly. A battery will be charged at a rapid rate until it is >90% charged and then it will trickle charge until the battery is >95% charged. The charger will then switch to a maintenance charge mode to keep the battery fully charged.

The charger has IMPRES charger to battery communication capability which means it will log charging events and data in the IMPRES battery. This charger does not have automated reconditioning as IMPRES Desktop Chargers do. Therefore, for an initial calibration (this Vehicular Charger DOES NOT initialize a new IMPRES battery) and subsequent recommended recalibration, this unit will indicate when the IMPRES battery needs to be taken to an IMPRES Desktop Charger for reconditioning/calibration in order to maintain fuel gauge capability on the appropriate radio.

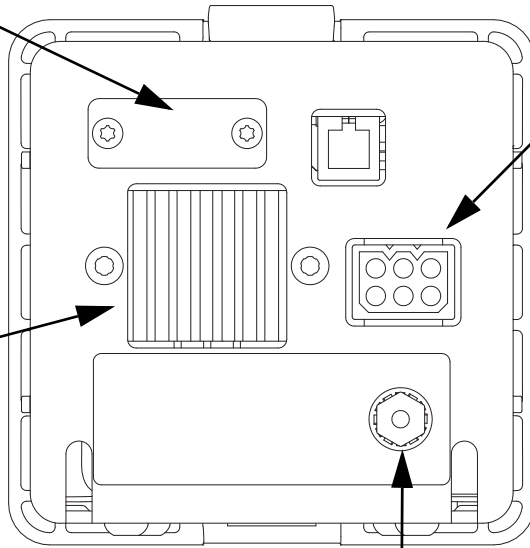
The charger can charge either a battery that is attached to a radio or just the battery alone. This allows a spare battery to be maintained in a fully charged condition. A radio can be operated while in the charger, but this will prolong the amount of time needed to fully charge the battery.

Note: Excessive use of a radio while it is in the charger will cause its battery to become discharged.

Getting to Know Your Vehicular Charger

Programming Port
- Programming
via RLN5671
Field
Programmer
only by service
personnel.

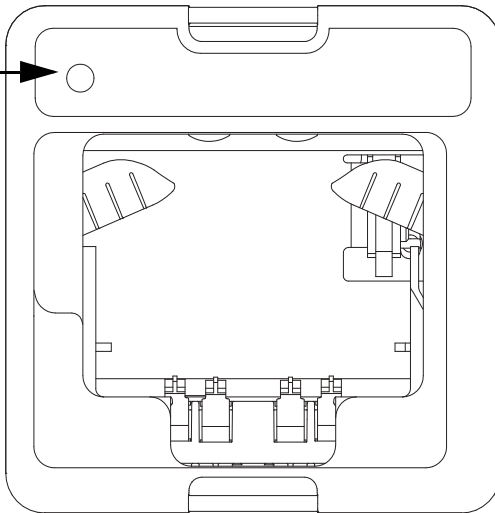
Heatsink

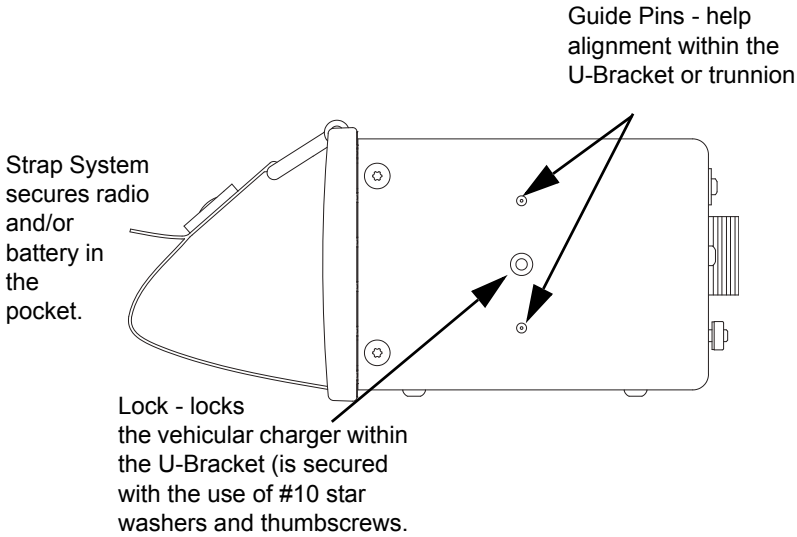


Power Connector
- Attaches to
Power Harness
supplied with unit.

Ground Stud - This
can be used to tie the
Vehicular Charger to
the chassis ground.

Charger
Status
LED





Installation

Mounting hardware supplied includes a trunion bracket for mounting the unit below the vehicle dashboard, on the floor, or on the wall, and a cable for connection to the vehicle's electrical system. The bracket enables the charger to be pivoted to a position that offers the best security to the portable radio during rough driving conditions.

Operation Caution

- Ensure the rear of the Vehicular Charger, especially around the heatsink is clear of any obstruction that would otherwise restrict air movement.
- The vehicular charger is designed for 12-volt, negative ground system.

Install the vehicular charger as follows:

1. Plan the location for mounting the charger. Identify the routing paths for the cable and verify that the cable length is adequate. Also check the mounting penetrations required. On most vehicles, it is necessary to penetrate the firewall to reach the battery. Check the opposite side of the firewall for cable clearance before drilling holes. Protect the cable where it passes through the firewall by use of appropriate rubber grommets (not supplied) or other protective measures.

Survey the firewall for existing holes occupied by vehicle wire harnesses. Often there is an opportunity to route other cables using the same path. Because of the wide variation in vehicle design, these instructions may be modified to suit each particular installation.

A properly installed unit will minimize service calls and equipment downtime. Consider the following guidelines when planning the installation:

- DO consider a mounting location which will allow the unit to be mounted at a 45-degree up angle. This angle provides operational convenience and physical security for the portable radio under rough traveling conditions.
 - DO use heat shrink tubing on all splices.
 - DO ensure that the cable is not placed under stress, is not exposed to weather, and is not subjected to damage due to engine heat.
 - DO retain the in-line cable fuse when trimming the cable to fit. Locate the in-line fuse as close as practical to the supply voltage connection.
 - DO check the opposite sides of all mounting surfaces before drilling, to insure that there are no obstructions, such as vehicle wiring and fluid lines.
 - DO check to make sure the charger heat sink on the back of the unit has adequate ventilation space when mounted in vehicle.
 - DON'T attach the unit to any part of the vehicle that is not rigid or is subject to excessive vibration.
 - DON'T install the unit in an area where rain or snow can easily get into it, such as next to a vehicle window which may be left open.
 - DON'T install the unit in a location where it could interfere with the vehicle's operator or operating controls.
 - DON'T dress the cable over sharp edges that could cause wear or tearing of cable insulation.
 - DON'T install the unit in a location where it may be difficult for the operator to reach.
 - DON'T install the unit where it may interfere with the vehicle safety air bag deployment.
 - DON'T install the unit where the LED indicators and switch may become physically damaged.
2. Using the trunnion bracket as a template, mark the mounting surface drilling locations. It is recommended that at least four screws be used, with 1/4 inch being the preferred fastener diameter.
 3. Re-verify that there are no wires, fluid lines, or other obstructions on the other side of the mounting location, and drill appropriate sized holes for the mounting screws to be used.
 4. Referring to Figure 1, mount the bracket using appropriate screws, washers, lock washers, and nuts.
 5. Insert the unit into the bracket, and install the washer and threaded knob into the housing, as shown in Figure 1.
 6. Rotate the unit to the preplanned mounting angle and tighten the two threaded knobs holding the charger to the bracket.

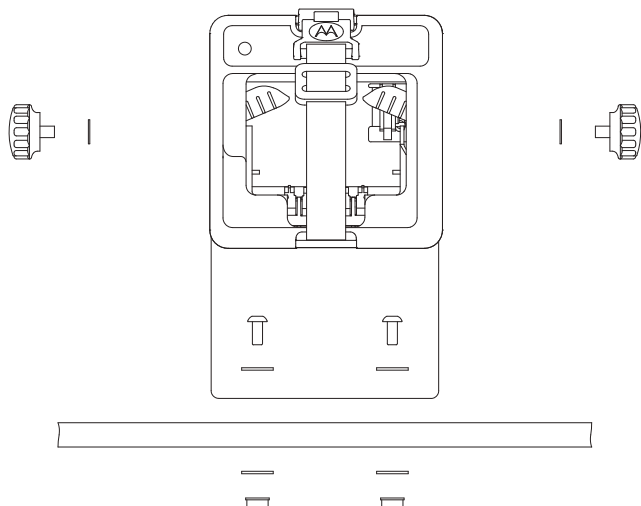


Figure 1 Installing the Vehicular Charger

7. Referring to Table 1 and Figure 2, connect the red (A+) wire (with the inline fuse) of the supplied cable to either an unswitched terminal on the vehicle's fuse box or directly to the positive (+) terminal of the vehicle's battery. Always position the fuse as close to the voltage source as possible.
8.
 - a. **Standard wiring to vehicle Switched A+ : Charging OFF with vehicle OFF**
 For installations where the radio may be left in the charger with the vehicle's ignition switched OFF and minimal vehicle battery current drain is important, the standard wiring connection of the yellow wire to vehicle switched A+ will disable charging. Connect the yellow (ignition sense) wire (with the inline fuse) to a switched terminal on the vehicle's fuse box. It is important not to connect the yellow wire to the red lead. The charger will remain ON for approximately 30-minutes after ignition is turned OFF.
 - b. **Optional wiring to vehicle A+ : Charging ON with vehicle OFF**
 When the radio is left in the charger for charging with the vehicle's ignition switched off, the optional wiring connection of the yellow wire to always live vehicle A+ will keep the charger ON. The charger, in this condition will not power down and will continue to drain the vehicle battery.
9. Connect the black (Gnd) wire to any convenient vehicle ground. DO NOT connect the black wire directly to the vehicle battery negative terminal.
10. The white wire is no connect (NC). This can be either be unterminated, removed, or connected to any convenient vehicle ground. DO NOT connect the white wire directly to the vehicle battery negative terminal.
11. Recheck all wiring connections, cable routing, and all physical aspects of the installation. Carefully insert the connector on the end of the cable into the mating connector on the back of the charger and test the charger for proper operation.

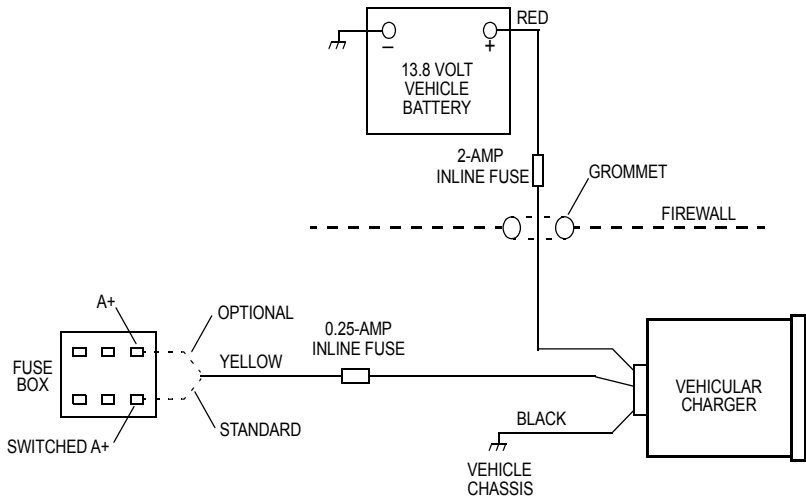


Figure 2 Cable Console

Pin	Connected To
1	Positive (+) vehicle battery terminal or unswitched fuse terminal
2	N/C
3	N/C
4	Switched fuse terminal (ignition sense)
5	N/C
6	Vehicle ground

Table 1 Cable Connector Pins

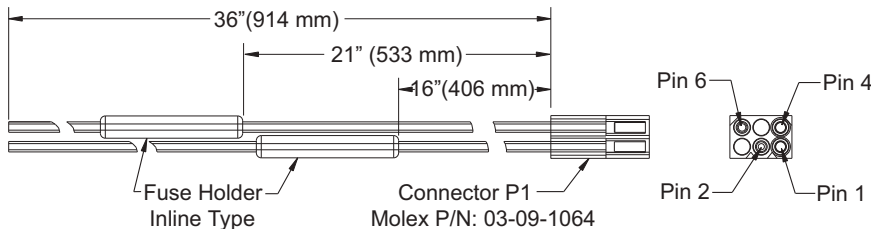
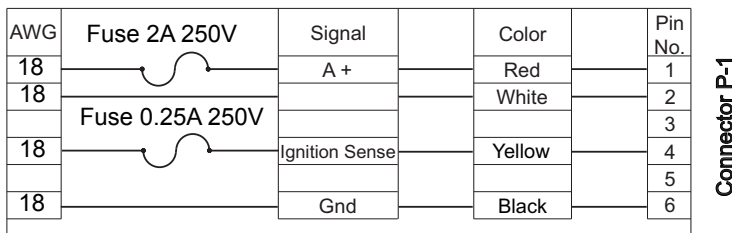


Figure 3 Cable Wiring Diagram

Securing the Radio in the Vehicular Charger

The NNTN7616 and NNTN7618 Vehicular Charger is equipped with a feature that reduces the risk of a portable radio (or battery alone) in the pocket from becoming dislodged and potentially hazardous in the event of a vehicular collision. Operators are instructed to follow the vehicular charger installation instructions and to use this feature as follows:

1. Anyone intending to operate the vehicular charger is advised to locate and become familiar with:
 - The Ballistic Nylon Strap. (Tri-Glide adjustment between battery alone or radio with battery attached)
 - The Retention Housing (Latch)
 - The Engagement Bar (Faceplate).
2. When the vehicular charger is not in use, the latch may be engaged to the Top Engagement Bar on the Faceplate.
3. To use the vehicular charger, disengage the latch from the Top Engagement Bar on the Faceplate.
4. Insert the portable radio or battery alone into the charger pocket.
5. For radios with an antenna installed, loop the strap between the base of the antenna and base of the channel selector, and then engage the latch onto the Top Engagement Bar on the Faceplate. Adjust the strap through the Tri-Glide to secure radio with battery attached within the Vehicular Charger (refer to Figure 4).

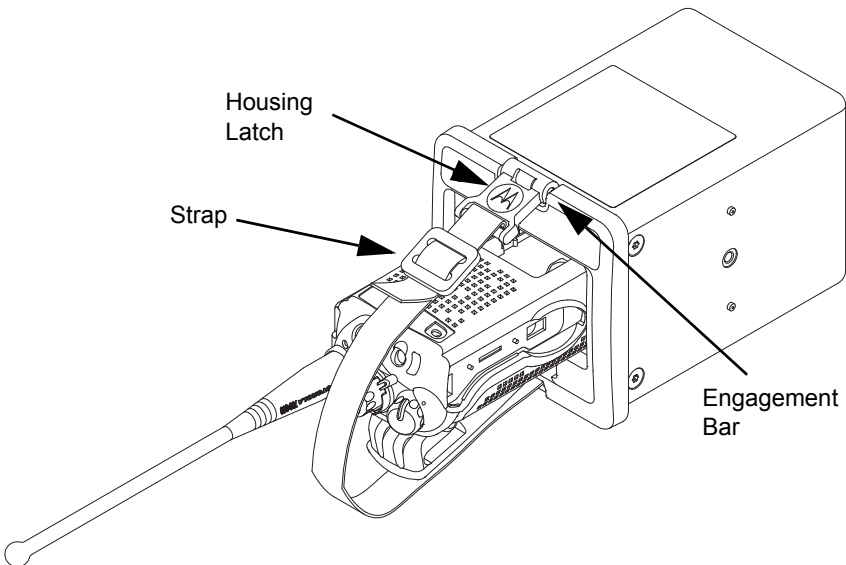


Figure 4 Radio with Battery, Antenna, PSM or RFA Attached

— or —

For radios with a Public Safety Microphone (PSM) and RF Adapter installed, adjust the strap through the Tri-Glide to secure radio with battery attached within the Vehicular Charger (refer to Figure 4).

— or —

For charging a battery that is not attached to a radio, loop the strap over the top of the battery, then engage the latch onto the Top Engagement Bar on the Faceplate. Adjust the strap through the Tri-Glide to secure battery within Vehicular Charger (refer to Figure 5).

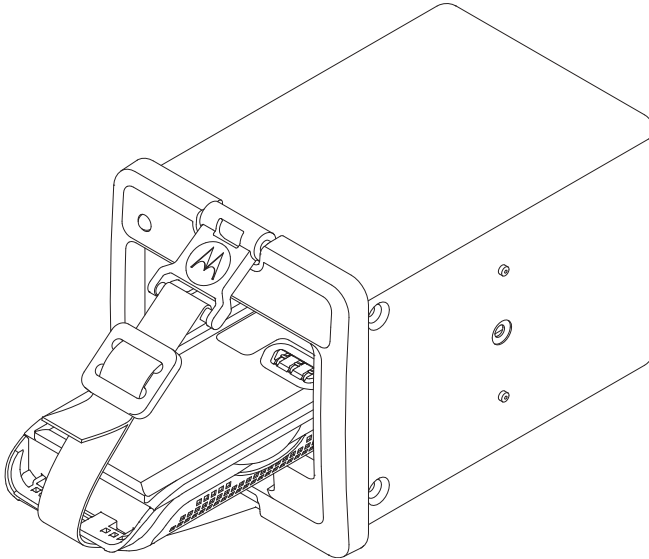


Figure 5 Battery without Radio

6. Before you remove a portable radio or battery from the vehicular charger, first disengage the latch.

Operating the Vehicular Charger



Caution

Never place any objects other than a radio and/or battery into the charger pocket — this could damage the charger!



WARNING

Please avoid contact (direct or incidental) with the heatsink.

Operation of the charger is automatic. When a portable radio or a battery is not in the charger's pocket, the charger is in standby mode.

Note: Please ensure initial charge of an IMPRES battery is performed in an IMPRES Desktop Charger (Single or Multi-unit Pocket) to calibrate the battery for optimal performance. IMPRES batteries, which are not first calibrated in an IMPRES Desktop Charger will not allow the display of fuel gauge on an IMPRES radio.

Important Note: Wait until the previous battery LED goes out prior to re-inserting a battery or inserting a new battery into the Vehicular Charger.

To charge a battery, place the radio and battery (or battery alone) into the pocket and push all the way in. While pushing the radio into the pocket, take care not to inadvertently activate the radio's emergency button.

If a battery alone is placed in the charger, be sure that the slots on either side of the battery engage the two metal tabs at the bottom of the pocket, near the four gold-plated charger terminals. When the battery is properly seated in the charger pocket, the red LED will light steadily. This indicates that the battery is being charged in the rapid-charge mode.

When the radio/battery are in the charger pocket, fasten the safety strap as shown in Figure 1. If a battery alone is in the pocket, fasten securely as shown in Figure 5. This will prevent the battery from being shaken out of the charger during rough traveling conditions, and will also prevent it from becoming a dangerous projectile in the event of a vehicle crash.

LED indicators on the front panel of the charger indicate charger status:

BATTERY CHARGE STATUS INDICATION	
LED INDICATOR	CHARGE STATUS
BLINKING RED	Battery is not chargeable or not making proper contact.
RED	Battery is in rapid charge mode or in charge recovery due to low voltage battery.
BLINKING YELLOW	Battery is recognized by charger but is waiting to rapid charge. The battery temperature is too low or high to allow rapid charging. When this condition is corrected, the battery will automatically begin rapid charging.
BLINKING GREEN	Battery has completed rapid charge (>90% available capacity). Charger is in trickle charge mode.
GREEN	Battery has completed charging and is >95% charged. Charger is in maintenance charge mode.
ALTERNATING RED-GREEN	(This Feature applies to IMPRES Batteries Only) Battery has completed charging and is fully charged. Battery continues to be usable, but may be nearing the end of its rated service life.
ALTERNATING YELLOW-GREEN (during first 4 seconds after insertion and upon charge completion)	(This Feature applies to IMPRES Batteries Only) Battery must be reconditioned/recalibrated in an IMPRES Desktop Charger. Batteries not calibrated will not display fuel gauge on IMPRES radio.

Note: Upon a recalibration recommended indication (Alternating Yellow-Green either in the first 4-seconds after initial insertion into the Vehicular Charger or after charge completion), please ensure within the next few charge-cycles or days, that the IMPRES battery is charged in an IMPRES Desktop Charger (Single or Multi-unit) to calibrate the battery for maintaining optimal performance. Manual reconditioning may be required when removing a battery indicating Alternating Yellow-Green from the Vehicular Charger and inserting that battery into an IMPRES desktop charger within 30 minutes. This is due to an IMPRES feature that prevents battery over-charging and cycle life loss. If the above battery is outside of the vehicular charger for more than 30 minutes prior to inserting it into an IMPRES desktop charger, automatic reconditioning will occur.

Specifications

English

Input Voltage:	11-16 Vdc (13.6V Nominal)
Maximum Charge Rate:	1250 mA +/- 15%
Charge Current Accuracy:	Output > 400 mA +/- 15% of value Output >= 400 mA +/- 20% of value Output <= 50 mA +/- 20mA
Rapid Charge Cycle:	3 hours typical, depending upon battery type, capacity and state of charge.
Size:	3.7" W x 3.7" H x 5.3" D
Weight:	2 Lb (approx.)
Operating Temperature:	+41°F to +113°F (+5°C to +45°C)
Inline Fuses:	AGC 2 Amp and AGC 0.25 Amp

Replacement Part

The replacement part shown below is available for the NNTN7616 and NNTN7618. Please contact your local Motorola Solutions Representative or Dealer for details.

PART NUMBER	DESCRIPTION
0105958U27	Power Harness, U-Bracket + Thumbscrews + Label/Tag

Warranty Replacement

Motorola Solutions, Inc. ("Motorola") warrants the Vehicular Charger against defects in material and workmanship under normal use and service for a period of one (1) year from shipment. Items will be repaired or replaced free of charge for the full warranty period. Freight charges to and from the place where warranty replacement is provided shall be the Customer's responsibility.

This warranty does NOT cover defects or damages to the Vehicular Charger resulting from (a) use in a manner other than normal operation as specified in the instruction manual; (b) misuse, accident, or neglect; (c) improper disassembly, testing, operation, maintenance, installation, adjustment, alteration, repair, or any modification by the Customer or any person without prior written consent of Motorola Solutions.



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