27 48V Reference: Charging 48V Battery with 12V Charger DTC P0A7D00

27 23 60 2067906/3 September 11, 2023. Supersedes Technical Service Bulletin Group 27 number 23-50 dated March 27, 2023 for reasons listed below.

Model(s)	Year	VIN Range	Vehicle-Specific Equipment
All Audi Vehicles	2017 – 2024	All	Not Applicable

Condition

REVISION HISTORY						
Revision	Date	Purpose				
3	-	Revised Technical Background (added SoC info)				
		Revised Service (added preconditions and notes)				
		Revised Warranty (added service number/damage code)				
2	03/27/2023	Revised Service (added 100A charger recommendation)				
1	09/13/2022	Initial publication				

Workshop findings:

The 48V battery is in a low voltage protection state and will not accept a charge.

• DTC P0A7D00 Hybrid/EV Battery Pack State of Charge Low.

Technical Background

When the 48V battery falls below a predetermined state of charge (SoC) for any reason, the protection relays inside the battery open, insuring the internal cells remain above the safe minimum voltage limit.

The protection relays will not close until the appropriate adaption channel is set inside the battery.

As long as the 48V battery has a SoC between 5% and 15%, the battery can be charged via the 12V system manually by completing the procedure under "Service".

48V Batteries <u>must not</u> be replaced and instead need to be recharged in such a case. Claims for erroneously replaced 48V batteries may be debited.

Production Solution

Not applicable.

© 2023 Audi of America, Inc.

Page 1 of 4

All rights reserved. Information contained in this document is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, nor may these materials be modified or reposted to other sites, without the prior expressed written permission of the publisher.

Service

Preconditions

- The SoC of the 48V battery must be between 5% and 15%
- The SoC of the 12V battery must be between 40% and 60%
- The SoC of the 12V battery can be checked via GFF in the Data Bus On Board Diagnostic Interface control unit -J533- (address word 0019)

The 48V battery cannot be charged if the SoC of the 12V battery is above 60%! If necessary, drain the 12V battery to a SoC between 40% and 60% by switching on the ignition for approx. 20 minutes (longer if necessary).

Procedure

1. Attach an approved 12V charger, with a minimum output of 100 amps continuous to the 12V system of the vehicle.

The negative cable of the 12V charger must not be directly attached to the negative terminal post of the 12V battery. For the battery management system to read the incoming charge, the negative cable of the battery charger must be attached to the vehicle chassis, or jump-start ground post.

2. Shut off all non-essential electrical consumers in the vehicle.

3. In ODIS GFF run test plan "0021 – Close charging contactor" (Figure 1) to set the adaptation for protection relay closed, **do not exit the test plan** once the adaptation has been set.

© 2023 Audi of America, Inc.

All rights reserved. Information contained in this document is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, nor may these materials be modified or reposted to other sites, without the prior expressed written permission of the publisher.

Control mod	ules Orde	rs DISS	TPI	Test plan	Procedure	Special Fund	ctions						
Control mod	Jule list (12	9 entries)											
Address	Event	Name	Name										
0001	0	Engin	Engine electronics (0001 - Engine Electronics) (4K0907557F 0001 V8.4.0LTFSI)										
0021	a	Batter	Battery management 2 (0021 - Battery Management 2 (Battery 48V)) (4N0915105D 0206 BMS_48V_Lilon										
0081	0	Mea	suring	Equipmen	t for Leve	er) (4K171804	1J 0051 GSM	1-LL)					
0002	0	Iden	tify co	ntrol modul	e 002 - Tr	ansmission B	Guided Function		>	SINAR)			
0032	0	Sele	ct vers	sion	0032 -	- Differential N Battery management 2				CU Gen2)			
0042	0	Chec	* DTO	C memory	42 - Dri	ver's C	0021 - Close charging contactor 0021 - Display state of charge 0021 - Status evaluation						
0052	6	Rea	d all D	TC memori	es loop	- Front Past				SG BFS)			
		Guid	Guided Functions		b b	b	0021 - Check control module conliguration						
0082	0	Cont	rol mo	dule OBD	Nor Up	-Display) (4K	0021 - Identification						
0003	0	Vehi	Vehicle OBD ake Electronics) (4) 0021 - Read measuring values 0021 - Replace control module										
0013	0	Distar	ice rei	gulation (00	13 - Distanc	se Control (A			4				
0044	0	Power	Power Steering (0044 - Power St			eng) (4N090	198	Run	Cancel				
0074	0	Chass	Chassis control (0074 - Chassis Control with Air										

Figure 1: Use the steps below to access the test plan.

- a. Right click on 0021 Battery Management 2.
- b. Select "Guided Functions".
- c. Select "0021 close charging contactor".

4. An automatic ignition cycle should be performed by the test plan. A clicking noise should be audible indicating that the battery contactors are closed.

The protection relay closed adaptation value and 48V SoC value may only be visible when the ignition is turned on.

The following conditions will cause the 48V battery to clear the adaptation for protection relay closed. Once the adaptation is cleared, and the 48V battery has not yet sufficiently charged, the protection relay will open and, charging will not be possible until the adaptation is set again.

• Door Open / Closed Status: Opening or closing a door will clear the adaption.

these materials be modified or reposted to other sites, without the prior expressed written permission of the publisher.

© 2023 Audi of America, Inc. All rights reserved. Information contained in this document is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, nor may

Page 3 of 4



- Hood Open / Closed Status: Opening or closing the hood will clear the adaption.
- Trunk Open / Closed Status: Opening or closing the trunk will clear the adaption.
- Ignition On / Off Status: Pressing the Start/Stop ignition button will clear the adaptation
- Diagnostic Interface: Removing the Diagnostic Interface from the OBD2 port, or running any additional test plans will clear the adaptation.
- Key Location: Removing the key from inside the vehicle will clear the adaptation.

Charging the 48V battery takes significantly longer in comparison to charging the 12V battery. Under optimal conditions, you should plan to have the charger active for a minimum of two hours.

WARNING

The 48V battery must only be replaced if a DTC regarding a defective Battery or deep discharge (P0B2900) is stored. Batteries replaced for merely a low charge (between 5% and 15%) may be debited.

Warranty

Please bill using the existing Audi Warranty guidelines. Use Service number/damage code: 2704/0040

Additional Information

The following Technical Service Bulletin(s) will be necessary to complete this procedure:

• TSB 2067937, 27 48V Reference: Diagnosis and system information.

All part and service references provided in this TSB (**2067906**) are subject to change and/or removal. Always check with your Parts Department and/or ETKA for the latest information and parts bulletins. Please check the Repair Manual for fasteners, bolts, nuts, and screws that require replacement during the repair.

©2023 Audi of America, Inc. All rights reserved. The information contained in this document is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies, and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, nor may these materials be modified or reposted to other sites without the prior expressed written permission of the publisher.

^{© 2023} Audi of America, Inc.

All rights reserved. Information contained in this document is based on the latest information available at the time of printing and is subject to the copyright and other intellectual property rights of Audi of America, Inc., its affiliated companies and its licensors. All rights are reserved to make changes at any time without notice. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, nor may these materials be modified or reposted to other sites, without the prior expressed written permission of the publisher.