Product Installation Manual

產品安裝手冊

For Audi B8 S5 3.0TFSI

適用車種 Audi B8 S5 3.0TFSI

July 11th, 2013

The information furnished herein is proprietary and confidential to **Innotech Performance Exhaust (iPE)**, and is not to be duplicated, published, or disclosed to any third party in whole or in part without prior authorization from **Innotech Performance Exhaust (iPE).**

Copyright© 2013 Innotech Performance Exhaust (iPE).
ALL RIGHTS RESERVED. Unpublished rights reserved under the copyright laws of Republic of China (Taiwan)

The information contained herein is provided pursuant to the terms of a License, Non-disclosure and/or Confidentiality Agreement and constitutes and contains valuable proprietary information and trade secrets of Innotech Performance Exhaust (iPE), embodying substantial creative efforts and confidential information, ideas, and expressions. Accordingly, strict compliance with the terms and conditions of the governing Agreement, including, without limitation, all restrictions on use and disclosure, is required as a condition to the use of the information contained herein. Except as may be permitted in the applicable Agreement, the information herein may not be reproduced or disclosed in whole or in part.

TABLE OF CONTENTS-目錄索引

1. INTRODUCTION-引言 1-1
1.1. Important Messages-重要訊息 1-2
1.2. Tools Required-操作過程當中所需的工具 1-4
2. REVISIONS AND CONVENTIONS-修正與慣用說明 2-5
3. CHASSIS BEAMS & UNDERTRAY REMOVAL-移除底盤拉桿與護罩 3-6
3.1. Rear Chassis Beams Removal -放鬆後拉桿 3-7
3.2. Center Chassis Beams Removal -移除中間拉桿 3-7
3.3. Undertray Removal--移除前檔板 3-8
3.4. Lower Subframe Brace Removal -移除前拉桿 3-9
4. REMOVE STOCK EXHAUST SYSTEM-移除原廠排氣管 4-10
4.1. Muffler/Mid-Section Removal-移除尾段 4-10
4.2. Downpipe Removal-移除中段 4-12
4.3. Cat-pipe Removal-移除頭段(觸媒段) 4-13
5. iPE SYSTEM INSTALLATION -安裝 iPE 排氣管 5-15
5.1. Cat-pipe Install-安裝頭段(觸媒段) 5-15
5.2. Downpipe Install -安裝中段 5-17
5.3. Muffler/Mid-Section Install-安裝尾段 5-17
6. WIRING & CONFIGURATION-配線與設定 6-20
6.1. Vacuum Accessories Installation-安裝真空配件 6-21
6.2. Wiring-安裝配線 6-24
6.3. ECU Setup-控制盒調整 .....
7. RE-INSTALL CHASSIS BEAMS & UNDERTRAY -復原底盤拉桿與護蓋 7-33

1. INTRODUCTION-引言

The following procedures will explain the installation of iPE exhaust system, and associated settings & operation. Installation can be divided into 5 steps, and the content & estimated install time for each step is listed below in table 1.1. The estimated time is based on the operation of one experienced technician and one assistant.

本份文件用以說明 iPE 所銷售的排氣管之安裝流程，與相關的設定、操作方式。總共可分成五個流程，各個流程的內容於對應所需要的操作時間如下表 1.1 所示。時間的計算係以一位有經驗的技師搭配一位助手為基礎。

工作內容 Content	預估時間 Estimated Time
拆卸底盤拉桿與護蓋 Chassis beams and undertray removal	0.5Hr.
拆卸原廠排氣管 Stock exhaust system removal	6.0Hrs.
安裝 iPE 排氣管 iPE exhaust system installation	3.0Hrs.
配線與設定 Wiring & configuration	1.0Hr.
復原底盤拉桿與護蓋 Re-install chassis beams and undertray	0.5Hr.
合計 Total	11Hrs.

Table 1.1 表格 1.1

Should you find any mistakes or un-identified sections in this document, please feel free to contact us.

如您發現文件當中有任何標示錯誤或不清楚的地方，請與我們連繫。

1.1. Important Messages-重要訊息

Figure 1-2 shows the front section of the stock exhaust system, and the passenger side was found to be offset to the right from the factory. iPE developed this exhaust system based on stock exhaust; therefore, iPE S5 exhaust system will be offset to the right after installation, like the stock configuration.

圖 1-1 為原廠排氣管前段的底盤照片，可以發現原廠排氣管有明顯向右偏移；iPE 開發此套排氣係依據原廠排氣進行改良，因此安裝後也將與原廠相同，有向右偏移的狀況。

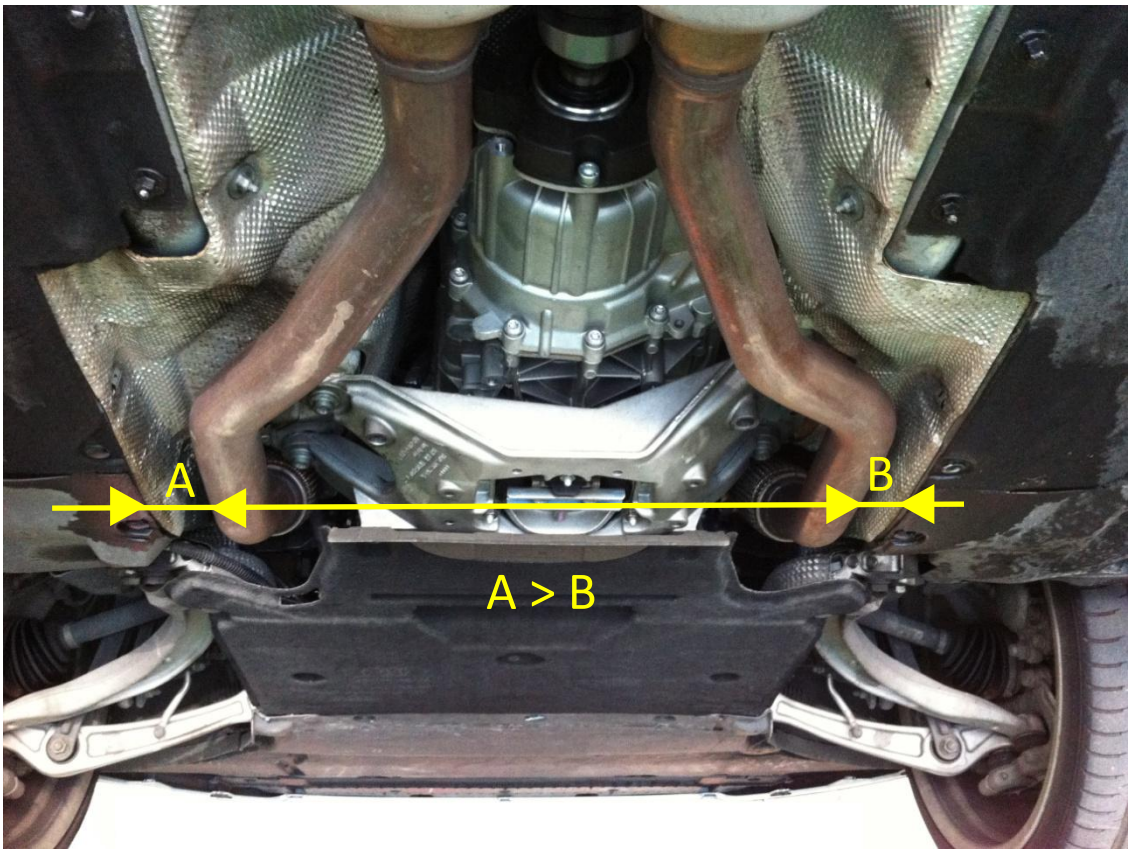


Fig. 1-2 圖 1-2

Cars equipped with keyless entry must keep car keys at least 5 meter, or 16 feet away from the car to ensure personnel safety when working on the car.

許多車款的汽車鑰匙與汽車本身有感應送電功能，因此須將汽車鑰匙遠離汽車本身至少 5 公尺以上的距離，以確保安全。

Exhaust system temperature stays hot after driving. You must wear proper heat-proof safety gears to start working on the car, and allow the car to cool down.

剛行駛完的汽車排氣管仍舊有很高的溫度，因此請配帶隔熱手套進行排氣管的換裝，或者待溫度降低後再行換裝，以避免燙傷。

When configuring auto mode, please set up the valves to open beyond 70% gas pedal input, or when the engine speed is above 4000 rpm to avoid drone and resonance.

當設定閥門自動開啟時，請勿讓閥門過早開啟，以避免有共振的問題產生；建議將閥門的開

啟設定在踩踏至油門七成，或者引擎轉速達 4000RPM。

iPE exhaust system is designed based on the stock system. Any engine upgrades such as, ECU tuning/chip/flash/piggyback systems may result in undesirable exhaust drone and resonance. However, iPE offers alternative systems for enthusiasts with engine upgrades. Please contact us for more information

iPE 排氣管係依據原廠引擎數據進行設計，倘若引擎進行電腦升級以加大馬力，搭配此排氣管可能會有明顯的共振產生。iPE 亦可針對此類車輛提供修正版的排氣管，詳情請連繫我們。

1.2. Required Tools - 操作過程當中所需的工具

編號	Tool Name 工具名稱	Photo 照片
1	**Clip Remover** 卡扣板手	
2	**Philips Screwdriver** 十字螺絲起子	
3	**Flathead Screwdriver** 一字螺絲起子	
4	**Torx Driver Bit** 梅花槽板手 **T25, T50**	
5	**12-point Driver Bit** **12 角板手** **10mm, 14mm**	
6	**Ratchet Wrench** 外六角板手 **12mm, 13mm, 16mm**	
7	**Transmission Jack** 變速箱千斤頂	
8	**Torque Wrench** 扭力板手	

2. REVISIONS AND CONVENTIONS-修正與慣用說明

Revision History 修正說明

Revision/版本	Date/日期	Description/說明
00	July 09, 2013	Initial Draft/初稿

Conventions Used in this Document 本文件慣用敘述說明

Convention/慣用詞	Use/使用時機	Examples/範例
All caps 大寫字母	Any section of a file that is typically in caps. 段落標題	INTRODUCTION 引言
Bold+Underlined text 粗體+底線文字	Vehicle parts, including original & iPE exhaust pipes 汽車上的零件，包含原廠與 iPE 的排氣管	**Tail tips** **尾飾管**
Bold 粗體	Tools during operation 操作過程當中所需要的工具	**Philips screwdriver** **十字螺絲起子**

3. CHASSIS BEAMS & UNDERTRAY REMOVAL-移除底盤拉桿與護罩

Fig. 3-1 shows the chassis and marked in red are chassis beams and undertray that needs to be removed before gaining access to stock exhaust system. Following procedures will illustrate how to remove these parts.

圖 3-1 是底盤的照片，紅色部分是會影響**排氣管**換裝的障礙，包括**護板**與**拉桿**，以下流程將解說如何移除這些障礙。

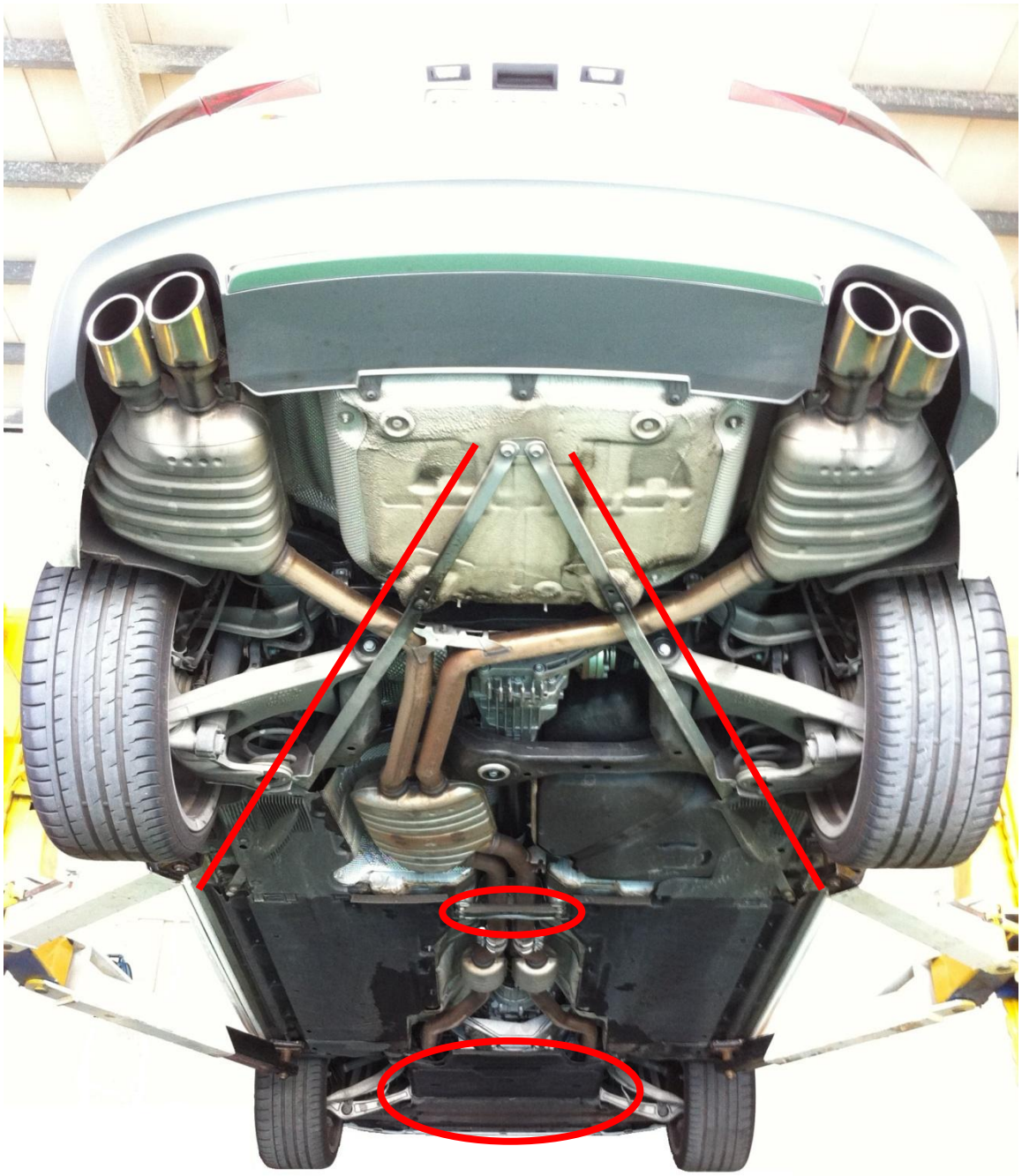


Fig. 3-1 圖 3-1

3.1. Rear Chassis Beams Removal-放鬆後拉桿

A **T50 Torx driver** is required to remove the 4 bolts indicated by red arrows in Fig 3-2.

以 **T50 梅花板手**卸下圖 3-2 內紅色箭頭所指的 4 個螺絲，以便讓中尾段排氣管可以自車尾抽出卸下。

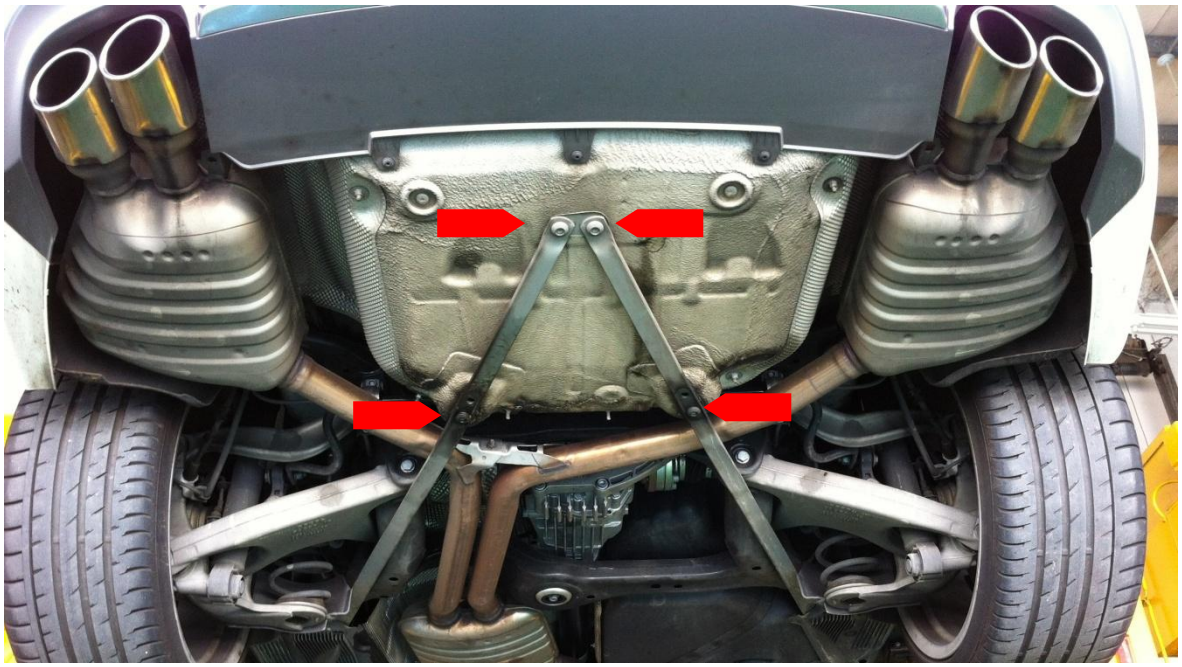


Fig. 3-2 圖 3-2

3.2. Center Chassis Beams Removal-移除中間拉桿

Use a **16mm ratchet wrench** to remove the 4 bolts indicated by red arrows in Fig 3-3, then remove the center chassis beam.

以 **16mm 外六角板手**卸下圖 3-3 內紅色箭頭所指的 4 個螺絲，以便讓中間拉桿可以卸下，卸下後如圖 3-4 所示。

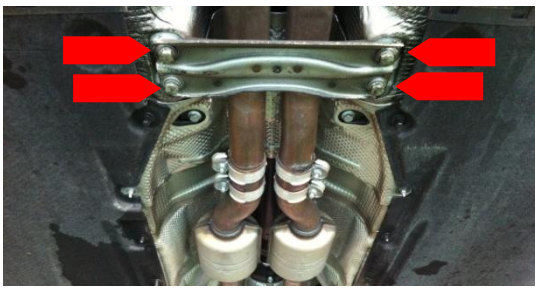


Fig. 3-3 圖 3-3

Fig. 3-4 圖 3-4

3.3. Undertray Removal-移除前檔板

Use **Clip remover** and **Philips screwdriver** to remove the undertrays consisting of 3 separate pieces, as marked in red in Fig 3-5.

使用**卡扣板手**與**十字螺絲起子**移除三片**前檔板**，如圖 3-5 紅色圈選處所示。

Fig. 3-5 圖 3-5

The corresponding locations of fasteners are shown in Fig 3-6/3-7/3-8, indicated by red arrows

對應的扣件位置，如圖 3-6/3-7/3-8 紅色箭頭所示。

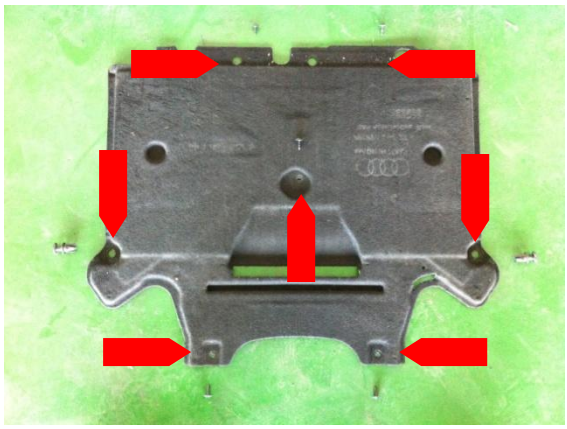


Fig. 3-6 圖 3-6

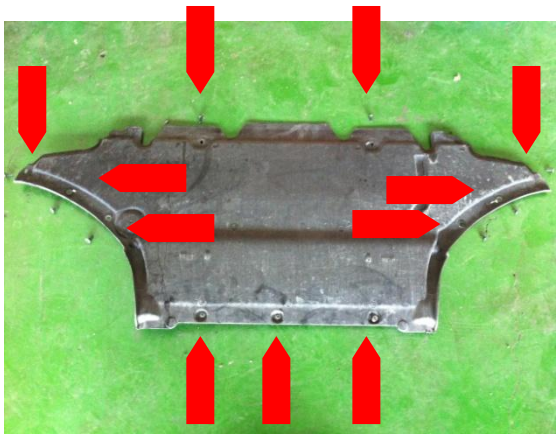


Fig. 3-7 圖 3-7

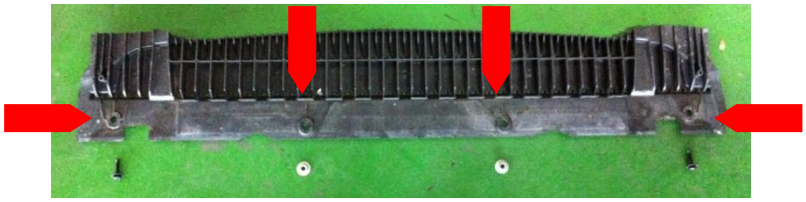


Fig. 3-8 圖 3-8

3.4. Lower Subframe Brace Removal - 移除前拉桿

Use **14mm 12-point Driver Bit** and **16mm Ratchet Wrench** to remove **lower subframe brace**, marked in red in Fig 3-9.

使用 **14mm 十二角板手**與 **16mm 外六角板手**移除**前拉桿**，如圖 3-9 紅色圈選處所示。

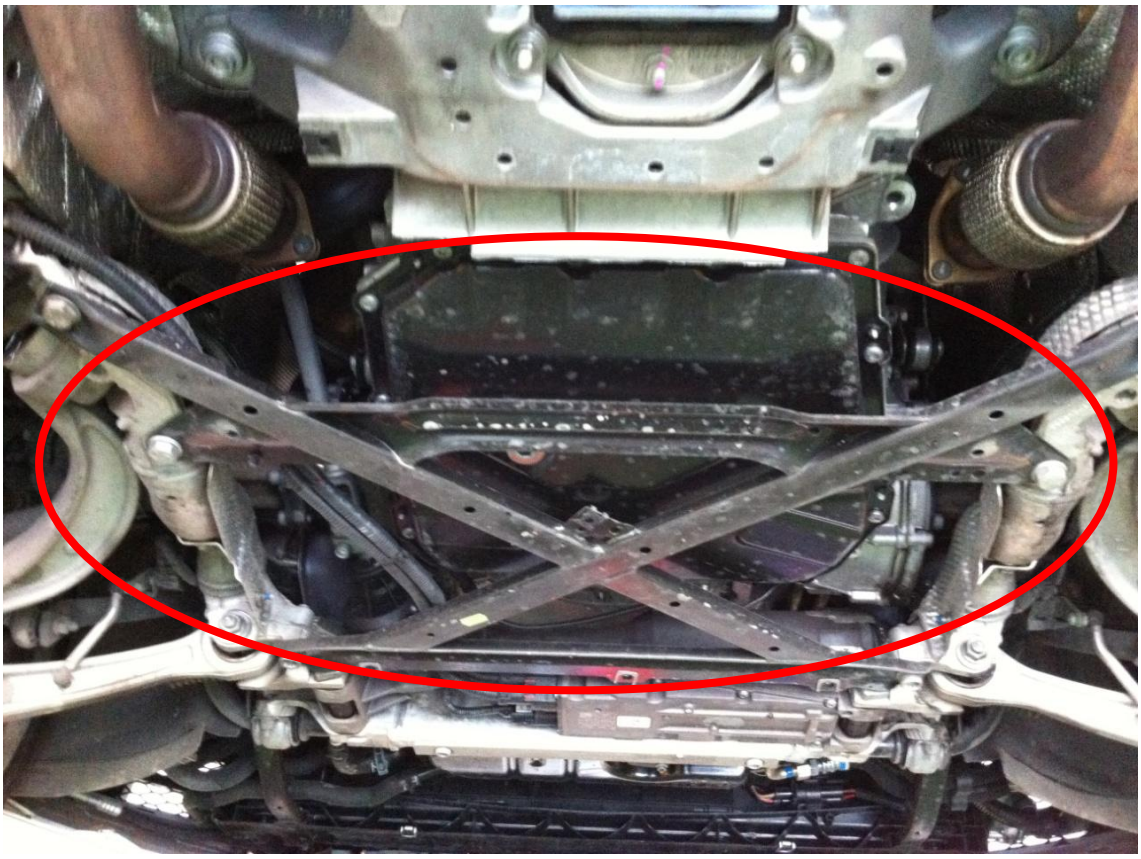


Fig. 3-9 圖 3-9

The corresponding locations of fasteners are shown in Fig 3-10, as indicated in red arrows.

對應的扣件位置，如圖 3-10 紅色箭頭所示。

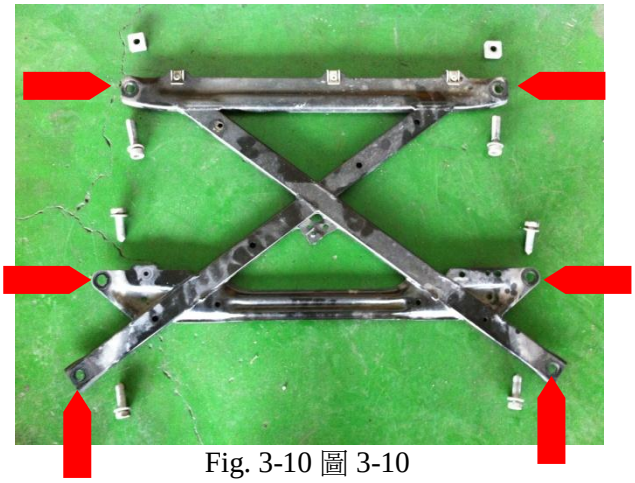


Fig. 3-10 圖 3-10

4. Stock Exhaust System Removal - 移除原廠排氣管

Stock exhaust system can be broken down into 3 parts, mufflers/mid-section, downpipes, and cat-pipes. The stock system will be removed from the rear towards the front.

原廠排氣管由後到前可分為三段，**尾段**、**中段**、與**頭段(觸媒段)**，我們也將依此順序拆卸原廠排氣管。

4.1. Muffler/Mid-Section Removal - 移除尾段

Mufflers/mid-sections and downpies are held together by 4 sets of clamps (as marked in red in Fig. 4-1). Use a 13mm ratchet wrench to loosen the clamps

尾段與**中段**是藉由圖 4-1 紅色圈選處的**束環**加以連結，因此須先以 **13mm 外六角板手**放鬆束環，以便加以脫離，如圖 4-2 所示。

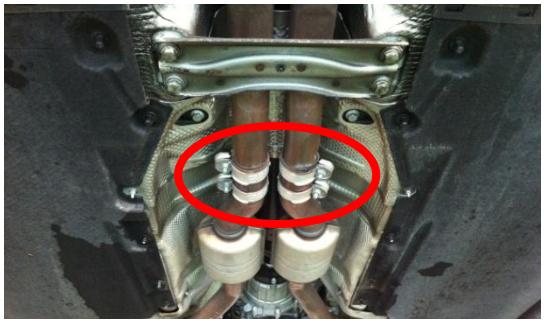


圖 4-1 Fig 4-1

圖 4-2 Fig 4-2

Use **transmission jack** to support the **resonator**, as shown in Fig. 4-3.

使用**變速箱千斤頂**支撐住**中段消音桶**，如圖 4-3 所示。

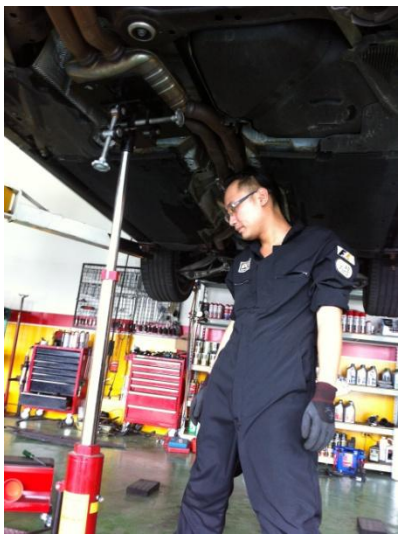


圖 4-3 Fig 4-3

After the mufflers are freed from the mid-section, the mufflers are held in place by 4 exhaust hangers as shown in Fig. 4-4

與中段脫離的尾段排氣管，尾段只剩下四個支撐點進行固定，如圖 4-4 紅色箭頭所示。

圖 4-4 Fig 4-4

The exhaust hangers that holds **resonator** in place can be removed by hand, and the mufflers can be removed by 13mm ratchet wrench. Then slide the mufflers out and away from the car.

中段消音桶的左右橡膠吊環以徒手方式即可撥開，尾段消音桶須以 **13mm 外六角板手**卸下螺絲，即可讓尾段脫離汽車底盤。

圖 4-5 Fig 4-5

After removal from chassis, mufflers/mid-section are supported by **transmission jack** only. Ensure the mufflers/mid-section are placed steadily on the jack and slowly remove from the car, shown in Fig. 4-5.

脫離汽車底盤的尾段僅以**變速箱千斤頂**單點加以支撐，請扶穩尾段並自車尾抽出，如圖 4-5 所示。

4.2. Downpipe Removal - 移除中段

With the **mufflers** removed, the **downpipes** are hanging by the fasteners connected to **cat-pipes** only. Causing downpipes to drop down, as shown in Fig. 4-6. To prevent damage to cat-pipes, fasteners, and downpipes, place **transmission jack** for support.

與尾段脫離的中段只剩下與頭段的支撐，因此會有傾斜的現象，如圖 4-6 所示；為避免傷及固定螺絲，請先以支撐住中段的後半部。

圖 4-6 Fig 4-6

圖 4-7 Fig 4-7

Downpipes are connected to the cat-pipes by 3 bolts (Fig. 4-7). 12mm ratchet wrench is required to remove the nut, then remove downpipes from car.

單邊的中段與僅以三顆螺絲與其頭段連結，如圖 4-7 所示，以 **12mm 外六角板手**卸下螺帽，便可自底盤取下中段。

4.3. Cat-pipe Removal-移除頭段(觸媒段)

Remove **O_2 sensor** from cat-pipes to prevent damage to sensors and wiring as shown in Fig.4-8

移除頭段之前，須先將**含氧感知器**卸下，如圖 4-8 所示，以避免扯斷線路。

圖 4-8 Fig 4-8

圖 4-9 Fig 4-9

Since **steering linkage** prevents access to removal of drive's side cat-pipes, we need to use a **10mm 12-point driver** to remove the **steering linkage**, as shown in red in Fig 4-9.

因**方向機連桿**會阻擋左側頭段的拆卸，因此須以 **10mm 十二角板手**先將**方向機連桿**卸除連接，如圖 4-9 紅色圈選處所示。

Cat-pipes are bolted to the chassis through a set of cushioning device (Fig. 4-10) on both sides of the engine. A 12mm ratchet wrench is required to remove the device as shown in Fig. 4-11.

頭段與汽車底盤之間藉由一組緩衝組件加以固定，如圖 4-10 紅色圈選處所示；請先以 **12mm 外六角板手**卸下，卸下後如圖 4-11 所示。

圖 4-10 Fig 4-10

圖 4-11 Fig 4-11

Cat-pipes are bolted onto exhaust manifolds by 3 bolts. Please use a 12mm ratchet wrench to remove the bolts as shown in Fig.4-10.

頭段與**芭蕉段**同樣也是由三個螺絲加以固定，所以使用 **12mm 外六角板手**卸下螺帽，便可自底盤取下**頭段**，如圖 4-10 所示。

圖 4-12 Fig 4-12

5. iPE SYSTEM INSTALLATION-安裝 iPE 排氣管

iPE system will be installed in the reverse order of the stock exhaust system removal.

安裝 iPE 排氣管的順序與拆卸原廠的順序相反，由頭段至尾段依序安裝。

5.1. Cat-pipe Installation -安裝頭段(觸媒段)

iPE cat-pipes are shown in Fig. 5-1. Re-use the stock nuts for install. Due to limited space, torque wrench cannot be used. Please ensure the 3 nuts on both sides are securely tightened.

iPE 頭段如圖 5-1 所示，使用原本的左右各三個螺帽加以固定即可；此處因安裝空間十分狹小，無法使用扭力板手加以鎖緊，因此請記得再次確認六個螺帽皆已鎖緊。

圖 5-1 Fig 5-1

Before installing iPE **cat-pipes**, remember to install **O_2 sensor** first.

安裝 iPE 頭段前請記得先將含氧感知器裝回。

Fig 5-2/5-3 shows iPE car-pipes after installation.

安裝 iPE **頭段**後的照片如圖 5-2/5-3 所示。

圖 5-2 Fig 5-2

圖 5-3 Fig 5-3

After iPE cat-pipe installation, remember to re-insatll **steering linkage**, as shown in red in Fig. 5-4.

安裝完**頭段**後，請務必記得將**方向機連桿**恢復原狀，如圖 5-4 紅色圈選處。

圖 5-4 Fig 5-4

5.2. Downpipe Installation - 安裝中段

iPE **downpipes** are shown in Fig 5-5. Use stock nuts for driver and passenger side for install. Use a **torque wrench** to tighten the nuts to 34N-m/25ft-lb. Fig 5-6 shows downpipes after install..

iPE 中段如圖 5-5 所示，使用原本的左右各三個螺帽與前段固定，請搭配使用**扭力板手**並設定為 34N-m/25ft-lb 加以鎖緊；鎖緊後如圖 5-6 所示。

圖 5-5 Fig 5-5

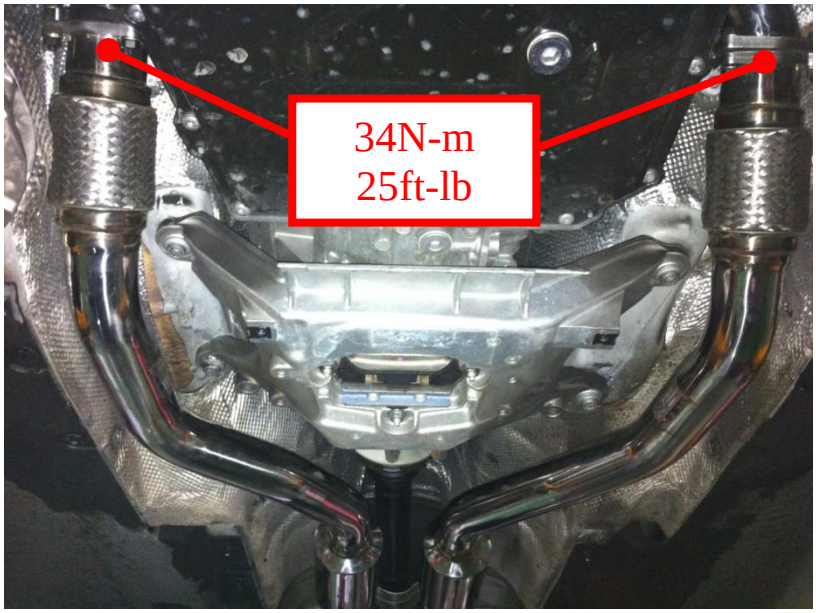


圖 5-6 Fig 5-6

5.3. Mid-Section/Muffler Installation -安裝尾段

iPE_replaces the stock mid-section with X-pipe. Shown in Fig. 5-7/ 5-8/5-9 are iPE X-pipe, Valvetronic mufflers, and exhaust tips.

iPE 的尾段設計分成三個組件，**X 管**、閥門消音筒與尾飾管，如圖 5-7/5-8/5-9 所示。

圖 5-7 Fig 5-7

圖 5-8 Fig 5-8

圖 5-9 Fig 5-9

First, place the exhaust clamps onto downpipes as shown in Fig. 5-10. Then, install another set of exhaust clamps onto mufflers. Lastly, install the x-pipe and mufflers as a whole on to the car. Transmission jack will need to be placed under X-pipe/mufflers to provide support during the install of exhaust hangers, After hangers are installed, tighten the clamps to 34N-m/25ft-lb with a torque wrench.

先將中段與 **X 管**相接的束環，如圖 5-10 紅色圈選所示，塞入中段當中；然後再以另一束環，如圖 5-11 紅色圈選所示，將 **X 管**與**閥門消音筒**進行結合，最後由車尾將**尾段**塞入；**尾段**仍舊需要以**變速箱千斤頂**進行支撐，才能與原本的車底盤橡膠吊環進行連結。請以**扭力板手** 34N-m/25ft-lb 的力量鎖緊這四個束環。

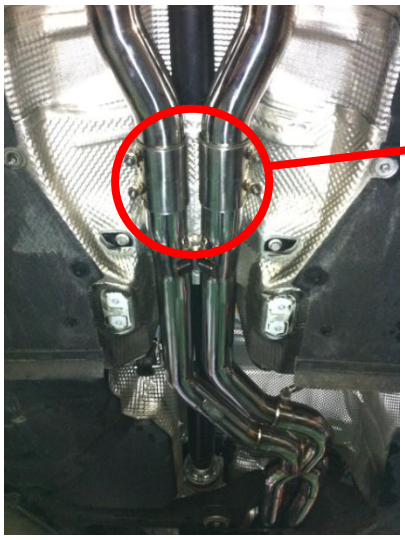


圖 5-10 Fig 5-10

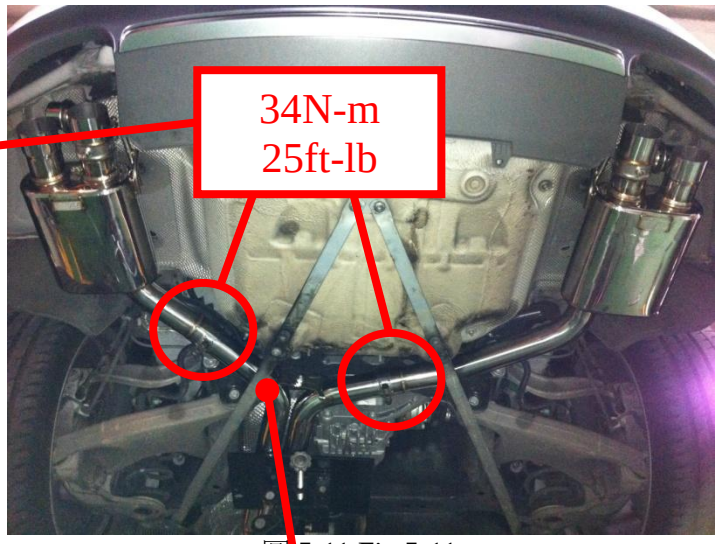


圖 5-11 Fig 5-11

After the whole exhaust system in installed on the car, the next step is height adjustment. First, loosen the 4 **clamps** in Fig. 5-10/5-11. The bend shown in Fig. 5-12 is closest to the underbody. Manually lift the section to allow 2cm, or 0.8" of free space, then tighten all clamps to 34N-m/25ft-lb to finish height adjustment.

當完成 iPE 頭段/中段/尾段與底盤的安裝後，**下一步驟是進行排氣管高度的調整。首先，放鬆圖 5-10/5-11 的四個束環；因整個排氣管與下方最近位置為圖 5-12 圈選處，因此請先徒手托高尾段，以便讓該圈選處有 2cm 左右的緩衝空間，然後再次鎖緊四個束環，便完成高度的調整。**

圖 5-12 Fig 5-12

The last step of iPE system installation is to install the **quad tips**. Please make sure to tighten the bolts to 34N-m/25ft-lb.

iPE 排氣管的硬體安裝最後步驟為四件**尾飾管**的安裝，請一樣使用**扭力板手** 34N-m/25ft-lb 的力量鎖緊螺絲。

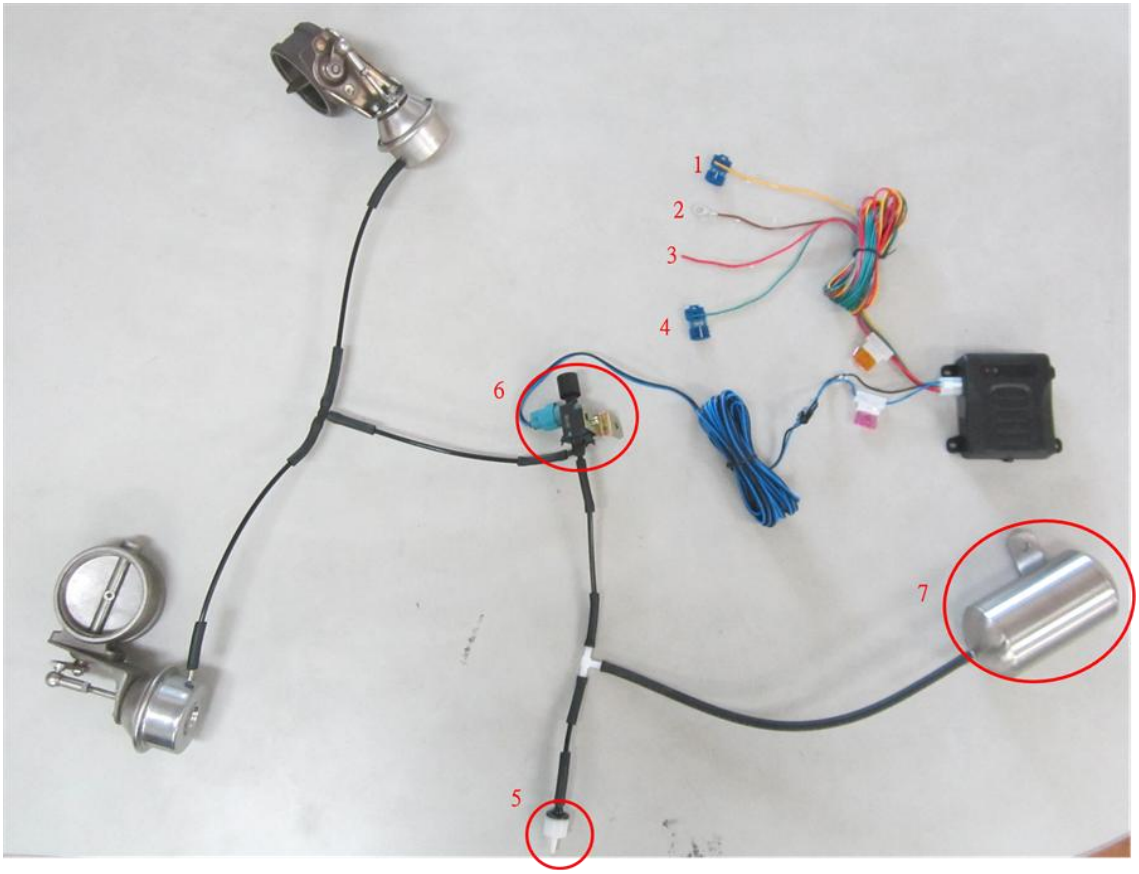
圖 5-13 Fig 5-13

Tip position may shift away from center after break-in period and heat cycles. It is recommended for owners to return back to the dealers 3 days after installation for visual check-ups and perform any adjustments if necessary.

雖然安裝後的**尾飾管**位置已經調整置中，但是使用過的 iPE 排氣管將因熱脹冷縮的緣故而會產生部分的偏移，因此建議車主於安裝後三天再回原安裝地點進行**尾飾管**的再次調整。

6. WIRING & CONFIGURATION-配線與設定

圖 6-1 是所有控制元件的零件圖與對應的連接方式，相關的名稱說明如表 6-2 所示。



編號 NO.	名稱 Part Name	編號 NO.	名稱 Part Name
1	黃線: 油門 TPS 0-5V Yellow Wire: TPS 0-5V	5	單向閥 One Way Valve
2	棕線: 負極 ⊖ Brown Wire: Ground ⊖	6	電磁閥 Electric Vacuum Valve
3	紅線: 電源線 ⊕ Red Wire: Power ⊕	7	儲壓桶 Vacuum Canister
4	綠線: 轉速 RPM Green Wire: RPM		

表 6-2 Table 6-2

6.1. Vacuum Accessories Installation - 安裝真空配件

The plastic panel shown in Fig. 6-3 needs to be removed. After removal, the Electric Vacuum Valve and Vacuum Canister will be installed on the chassis of rear passenger side as indicated in Fig. 6-4.

電磁閥與**儲壓桶**將安裝於左後方乘客座位下方的底盤處，因此須移除該處的蓋板，如圖 6-3 紅色圈選處所示；圖 6-4 為移除蓋板後的照片，紅色箭頭所指的地方為的**電磁閥**與**儲壓桶**安裝位置。

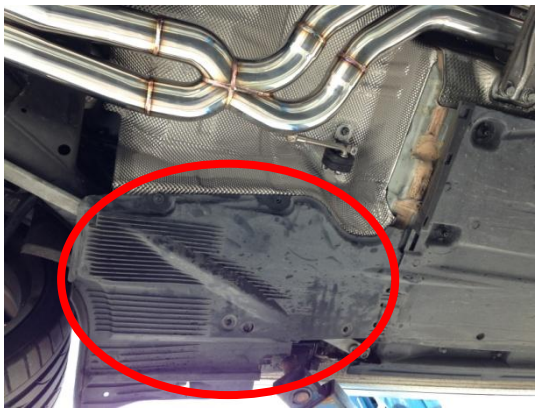


圖 6-3 Fig 6-3

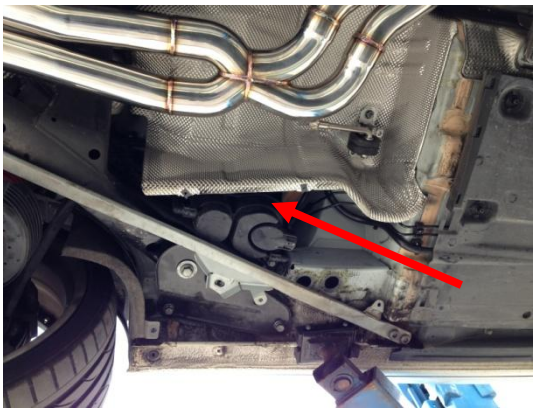


圖 6-4 Fig 6-4

Fig.6-5 and Fig.6-6 are close-up view of the install locations and fastener

圖 6-5/6-6 為**電磁閥**與**儲壓桶**的安裝位置放大圖，圈選的螺栓為其固定螺絲。

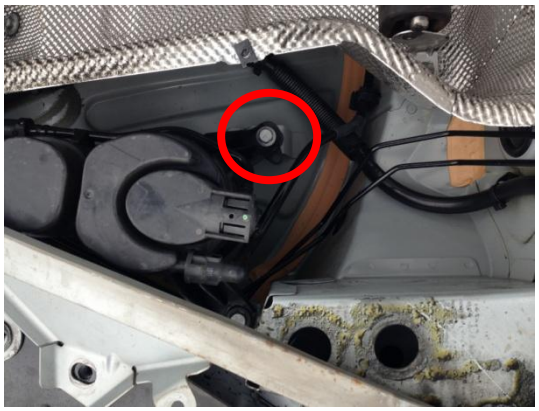


圖 6-5 Fig 6-5

圖 6-6 Fig 6-6

Fig. 6-7 shows Electric Vacuum Valve and Vacuum Canister after installation. Ensure fasteners are properly tightened.

圖 6-7 為**電磁閥**與**儲壓桶**安裝後的照片，務必確認該螺栓完全鎖緊，以避免零件鬆脫。

Connect the 3-way valve on Electric Vacuum Valve to another 3-way valve which connects both exhaust valves via vacuum hoses.

下一步驟是將**電磁閥**旁邊的**三通接頭**未接端，經真空管連接至後方的另一個**三通接頭**，再與二側**閥門**進行連接，如圖 6-8 所示。

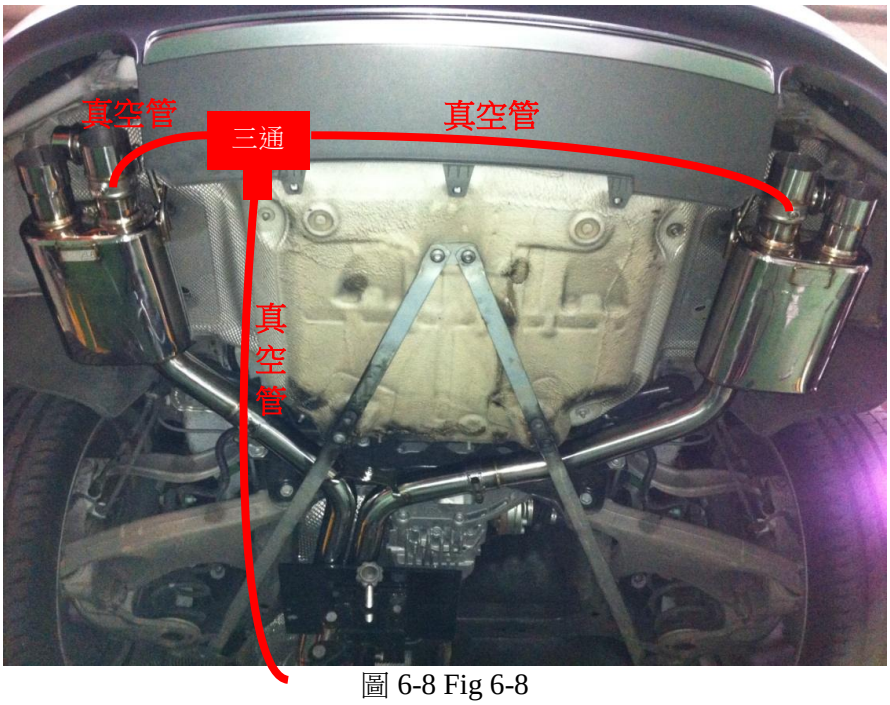


圖 6-8 Fig 6-8

The existing hole behind rear bumper on passenger side shown in Fig.6-9 can be used to support the vacuum hose for passenger side valve. The hose can be fixed to the clip panel inside the bumper to prevent vacuum hose from falling off (Fig.6-10).

右側閥門附近的底盤支架上有現成的圓孔，可利用於支撐真空管，如圖 6-9 所示；右側閥門的真空管接往三通接頭的沿線，可將真空管固定於後保桿內側的扣板上，以避免讓真空管因吊耳扯斷或脫離，如圖 6-10 所示。

圖 6-9 Fig 6-9

圖 6-10 Fig 6-10

Driver side vacuum hose can be routed through the existing opening (Fig.6-11) like the previous procedure, then zip-tie the vacuum hose traveling from the opening to 3-way valve (Fig. 6-12).

左側閥門的真空管同樣也可以繞進底盤的現成圓孔，以避免垂吊，如圖 6-11 所示；該真空管接往三通接頭的沿線因無任何可固定的地方，因此須以束線帶加以固定，如圖 6-12 所示。

圖 6-11 Fig 6-11

圖 6-12 Fig 6-12

Next, installation for vacuum source of the electric vacuum valve will be

現在，與真空相關的部分只剩電磁閥的真空源尚未完成接線，而該真空源來自於引擎，此部分將與控制線路合併安裝，內容請參考下一章節。

6.2. Wiring Installation -安裝配線

Connect the control module wiring to electric vacuum valve, then connect vacuum hose to 3-way valve (Fig. 6-13). The control module wiring and vacuum hose will be routed along with other wirings on the driver side under the car to the engine bay. Panels on driver side shown in Fig.6-14 will have to be removed in order to secure the wiring to the car body.

將控制線路接上**電磁閥**，連同真空管也一並接上**三通接頭**，如圖 6-13 所示；此真空管與控制線路將沿著汽車底盤左側管線往車頭沿伸，因此須將左側護蓋掀起才能固定線路，如圖 6-14 所示。

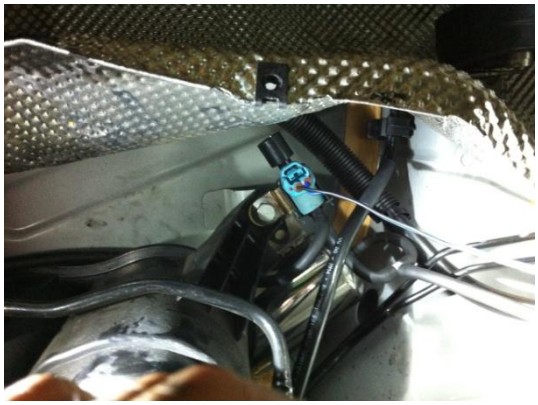


圖 6-13 Fig 6-13

圖 6-14 Fig 6-14

Remove front driver side tire (Fig. 6-15). Guide vacuum hose and control module wiring into the wheel well, and route the wiring into engine bay from below..

卸下左前輪胎，如圖 6-15 所示；將真空管與控制線路沿著護蓋內，由下往上進入引擎室，如圖 6-16 所示。

圖 6-15 Fig 6-15

圖 6-16 Fig 6-16

First, we will assemble the hose for vacuum source (Fig. 6-17). Then remove engine cover, where we will find the vacuum source (Fig. 6-18).

接著，我們先完成真空源的接線；如圖 6-17 所示，移除原廠護蓋；找到引擎真空源，如圖 6-18 所示。

圖 6-17 Fig 6-17

圖 6-18 Fig 6-18

Connect 3-way valve connection to vacuum source as shown in Fig. 6-19 and connect the vacuum hose in Fig. 6-16 to the 3 way valve to complete vacuum accessory installation.

完成原車真空源的三通接頭安裝，如圖 6-19 所示；將圖 6-16 自左前輪護蓋下往上拉的真空管接上此三通接頭，便完成所有真空配件的安裝。

圖 6-19 Fig 6-19

Shown in Fig.6-20 shows the foot-wheel area where electric vacuum valve wiring will enter the cabin through the firewall. Close-up picture in Fig. 6-21

圖 6-20 為駕駛座剎車踏板附近的照片，**電磁閥**接線將自紅色圈選處的橡膠處由引擎室接入駕駛座，細部照片如圖 6-21 所示。

圖 6-20 Fig 6-20

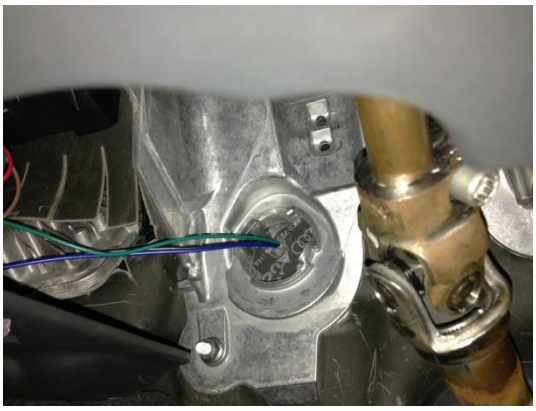


圖 6-21 Fig 6-21

Carefully pry open the side cover for the fuse box with a trim remover, or flathead screwdriver (Fig. 6-22).

以**一字螺絲起子**掀開駕駛座旁邊的保險絲配線區，如圖 6-22 所示。

Depending on the year of production, there are 2 different fuse box layouts, shown below as Type A and Type B. Should you find the fuse box layout different from the ones shown here, connecting the positive (red) Wire to any equipment like sound systems, or cigarette lighter that powers on when the key is present would work as well.

紅色正極⊕的接線主要是選擇與鑰匙控制相關的電源供應點，如點菸器、車內音響；由於不同年代出廠的車款在此保險絲配線區略有不同，圖 6-23A/B 分別是二種不同的保險絲配線區；倘若您所安裝的保險絲配線區與以下照片略有不同，請依照上述原則尋找適當的電源供應點。

Type A

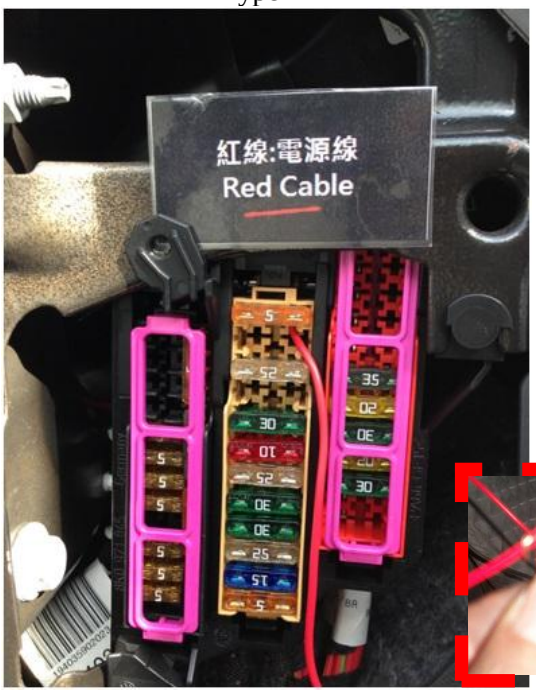


圖 6-23A Fig 6-23A

Type B

圖 6-23B Fig 6-23B

To connect ground (brown) wire, first we will need to remove the panel shown below (Fig. 6-23) and connect ground wire to the location shown in Fig.6-24.

棕線-負極 ⊖的接線鎖附於圖 6-24 紅色圈選處的螺絲處，安裝前應將蓋板卸除。

圖 6-24 Fig 6-24

TPS (yellow) wire will be installed by tapping into the TPS wire on throttle pedal connection. Looking at the throttle pedal connector, the yellow with blue stripe is the wire we tap into with a splice connector.

黃線-油門 TPS 的線路應與油門踏板的訊號進行串接。圖 6-25 是油門踏板位置，自油門踏板位置往上看，如圖 6-26 紅色圈選處所示，黃/藍線為油門訊號線。

圖 6-25 Fig 6-25

圖 6-26 Fig 6-26

Or, we can utilize a multimeter to find out correct wire for our application.

也可經由**三用電錶**進行踏板訊號測試，如圖 6-27/28 所示。

圖 6-27 Fig 6-27

圖 6-28 Fig 6-28

Place the wires parallel in the grooves the splice connect (Fig. 6-29) and firmly splice the wires with a pair of pliers (Fig. 6-31).

圖 6-29 為訊號串接的操作，圖 6-30 為串接後的情形；串接盒的操作方式如圖 6-31 所示。

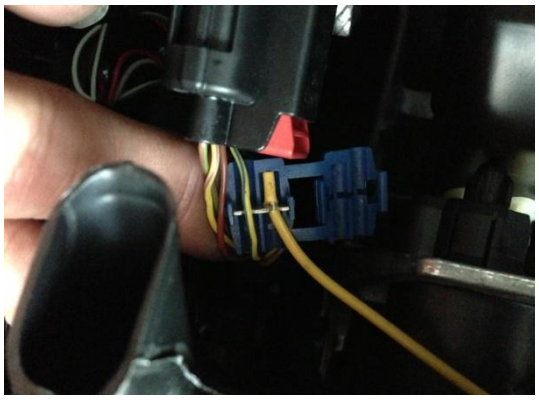


圖 6-29 Fig 6-29

圖 6-30 Fig 6-30

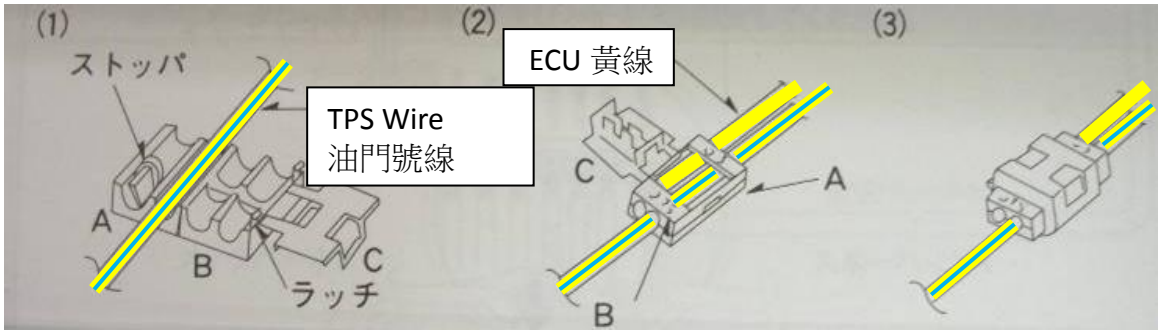


圖 6-31 Fig 6-31

Engine RPM sensor is located between the engine and transmission (Fig. 6-32, Fig.6-33)

找出引擎速度感知器所在位置，位於底盤處，如圖 6-32 所示，介於引擎與變速箱之間，如圖 6-33 所示。

圖 6-32 Fig 6-32

圖 6-33 Fig 6-33

Engine RPM sensor consists of 3 wires, positive wire, negative wire, signal wire. By using a splice connector, we can connect the RPM signal wire to the green wire for valvetronic ECU. Refer to Fig.6-31 for how to connect the wire with a splice connector.

引擎速度感知器有三條接線，正極⊕、負極 ⊖與訊號，將其中的訊號線與 ECU 的綠線 RPM 進行串接，如圖 6-34 所示；串接盒的接線方式請參考圖 6-31。

圖 6-34 Fig 6-34

We have found 2 version of signal wire color. The one shown in Fig.6-34 is black wire with blue stripe. Some cars are equipped with orange wire with green stripe. If you should find a different wiring color than above, please use a multimeter to find the correct wire.

我們目前發現這條訊號現有二種以上的顏色，圖 6-34 內顯示的是黑/藍線，也有橘/綠線的版本；倘若你所安裝車子的此條訊號線顏色不同，請自行確認。

6.3. ECU Setup-控制盒調整

首先，進行車輛靜止之 ECU 設定，請依序完成步驟一、步驟二與步驟三，每項步驟均有六個流程。

流程	步驟一、確認油門訊號	步驟二、轉速設定	步驟三、雜訊排除
1	啟動汽車電源	發動引擎	轉速至 3000RPM→綠燈亮
2	ECU 三旋鈕 ↻ 歸零	↺ 調整 RPM 旋鈕綠燈滅	低轉速時綠燈閃→有雜訊存在，例如：1500~2000 轉
3	TPS 旋鈕 ↺ 90°	轉速維持 3000RPM	將轉速維持在雜訊位置→綠燈亮
4	試踩油門	緩慢 ↺ 調整 RPM 旋鈕直到綠燈亮	緩慢 ↺ 調整敏感旋鈕直到綠燈滅
5	綠燈亮→正常	再次確認 3000 轉速→綠燈亮	檢查 3000 轉綠燈亮 檢查低轉速綠燈不閃
6	完成	完成	完成

接下來，進行道路測試，請依序完成以下二個步驟。

流程	步驟一、設定油門訊號	步驟二、雜訊確認
1	TPS 旋鈕 ↺ 90°	重踩油門，確認低轉速之綠燈是否閃 若有閃，則 ↺ 微調敏感旋鈕 重複測試/調整，直到不閃
2	測試油門踏板與閥門開啟時間點	緩慢加速，確認低轉速之綠燈是否閃 若有閃，則 ↺ 微調敏感旋鈕 重複測試/調整，直到不閃
3	緩慢 ↺↻ 調整 TPS 旋鈕 確認油門踏板踩踏比例	高速時放開油門，確認低轉速之綠燈是否閃 若有閃，則 ↺ 微調敏感旋鈕 重複測試/調整，直到不閃
4	完成	完成

First, we will setup the valvetronic ecu while the car is stationary. There are 3 procedures, consisting of 6 steps each.

Steps	Procedure 1, Test TPS Signal	Procedure 2, RPM setup	Procedure 3 , Noise Elimination
1	Put ignition switch in accessories (ACC)	Start Engine	Bring RPM to 3000RPM → Green light lit
2	Turn all 3 dials on ECU ↻ back to zero.	Turn RPM dial ↺ until green light is off.	Green light flashes below 3000RPM→Noise exists， EX：1500~2000RPM
3	Turn TPS dial ↺ 90°	Keep RPM at 3000RPM	Keep RPM at noise level → Green light lit
4	Apply throttle	Slowly turn RPM dial ↺ until green light is lit.	Slowly turn sensitivity dial ↺ until green light is off.
5	Green light lit → Normal	Double-check when green light is lit at 3000RPM	Check green light is lit at 3000RPM and no flashing below 3000RPM.
6	Done	Done	Done

Road Test。

Step	Procedure 1, Setup TPS Signal	Procedure 2, Noise Elimination
1	Turn TPS dial ↺ 90°	Apply heavy throttle and ensure no green light flashing below the set RPM. If flashing persist, turn sensitivity dial ↺. Repeat this step until flashing stops.
2	Test throttle pedal in relation to valve opening timing.	Accelerate slowly and ensure green light does not flash at lower RPM. If flashing, turn sensitivity dial ↺. Repeat acceleration test and perform adjustment if necessary.
3	Slowly turn TPS dial↺ or ↻, Check for throttle pedal and valve opening timing.	Relieve throttle at highway cruising speed and check for green light flashing at low RPM. If flashing exists, turn sensitivity dial ↺. Repeat this adjustment until flashing stops
4	Done	Done

7. RE-INSTALL CHASSIS BEAMS & UNDERTRAY-復原底盤拉桿與護蓋

The re-installation of chassis beams & undetray is in reversed order of Chapter 3. Below is the item list for re-installation.

復原底盤拉桿與護蓋的步驟為第三章的逆向操作，總計有以下項目需要復原順序。

編號	Part Name 零件名稱	Reference Photo 參考照片
1	**Lower Subframe Brace** 前拉桿	Fig 3-9/3-10 圖 3-9/3-10
2	**Undertray** 前檔板	Fig 3-5~3-8 圖 3-5~3-8
3	**Center Chassis Beam** 中間拉桿	Fig 3-3/3-4 圖 3-3/3-4
4	**Rear Chassis Beam** 後拉桿	Fig 3-2 圖 3-2