

# SmartSYNC™ Torches

## Service Parts and Procedures Guide



810460 – REVISION 0

ENGLISH



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Original instructions

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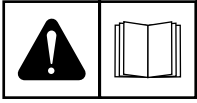
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For training and education resources, go to the Hypertherm Cutting Institute (HCI) online at [www.hypertherm.com/hci](http://www.hypertherm.com/hci).



## ENGLISH

**WARNING!** Before operating any Hypertherm equipment, read the safety instructions in your product's manual, the *Safety and Compliance Manual* (80669C), *Waterjet Safety and Compliance Manual* (80943C), and *Radio Frequency Warning Manual* (80945C). Failure to follow safety instructions can result in personal injury or in damage to equipment.

Copies of the manuals can come with the product in electronic and printed formats. Electronic copies are also on our website. Many manuals are available in multiple languages at [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## BG (БЪЛГАРСКИ/BULGARIAN)

**ПРЕДУПРЕЖДЕНИЕ!** Преди да работите с което и да е оборудване Hypertherm, прочетете инструкциите за безопасност в ръководството на вашия продукт, „Инструкция за безопасност и съответствие“ (80669C), „Инструкция за безопасност и съответствие на Waterjet“ (80943C) и „Инструкция за предупреждение за радиочестота“ (80945C).

Продуктът може да е съпроводен от копия на ръководствата в електронен и в печатен формат. Тези в електронен формат са достъпни също на уебсайта ни. Много ръководства са налице на няколко езика на адрес [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## CS (ČESKY/CZECH)

**VAROVÁNÍ!** Před uvedením jakéhokoli zařízení Hypertherm do provozu si přečtěte bezpečnostní pokyny v příručce k produktu a v *Manuálu pro bezpečnost a dodržování předpisů* (80669C), *Manuálu pro bezpečnost a dodržování předpisů při řezání vodním paprskem* (80943C) a *Manuálu varování ohledně rádiových frekvencí* (80945C).

Kopie příruček mohou být součástí dodávky produktu, a to v elektronické i tištěné formě. Elektronické kopie jsou k dispozici i na našich webových stránkách. Mnoho příruček je k dispozici v různých jazycích na stránce [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## DA (DANSK/DANISH)

**ADVARSEL!** Inden Hypertherm udstyr tages i brug skal sikkerhedsinstruktionerne i produktets manual og i *Manual om sikkerhed og overholdelse af krav* (80669C), *Manual om sikkerhed og overholdelse af krav for vandstråleskæring* (80943C), og *Manual om radiofrekvensadvarsel* (80945C), gennemlæses.

Kopier af manualerne kan leveres med produktet i elektronisk og trykt format. Elektroniske kopier findes også på vores hjemmeside. Mange manualer er tilgængelige på flere sprog på [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## DE (DEUTSCH/GERMAN)

**WARNUNG!** Bevor Sie ein Hypertherm-Gerät in Betrieb nehmen, lesen Sie bitte die Sicherheitsanweisungen in Ihrer Bedienungsanleitung, das *Handbuch für Sicherheit und Übereinstimmung* (80669C), das *Handbuch für Sicherheit und Compliance bei Wasserstrahl-Schneidanlagen* (80943C) und das *Handbuch für Hochfrequenz-Warnung* (80945C).

Bedienungsanleitungen und Handbücher können dem Gerät in elektronischer Form oder als Druckversion beiliegen. In elektronischer Form liegen sie auch auf unserer Website vor. Viele Handbücher stehen in verschiedenen Sprachen auf [www.hypertherm.com/docs](http://www.hypertherm.com/docs) zur Verfügung.

## ES (ESPAÑOL/SPANISH)

**¡ADVERTENCIA!** Antes de operar cualquier equipo Hypertherm, lea las instrucciones de seguridad del manual de su producto, del *Manual de seguridad y cumplimiento* (80669C), del *Manual de seguridad y cumplimiento en corte con chorro de agua* (80943C) y del *Manual de advertencias de radiofrecuencia* (80945C).

El producto puede incluir copias de los manuales en formato digital e impreso. Las copias digitales también están en nuestra página web. Hay diversos manuales disponibles en varios idiomas en [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## ET (EESTI/ESTONIAN)

**HOIATUS!** Enne Hyperthermi mis tahes seadme kasutamist lugege läbi toote kasutusjuhendis olevad ohutusjuhised ning *Ohutus- ja vastavusjuhend* (80669C), *Veejõa ohutuse ja vastavuse juhend* (80943C) ja *Raadiosageduse hoiatusjuhend* (80945C). Ohutusjuhiste eiramine võib põhjustada vigastusi ja kahjustada seadmeid.

Juhiste koopiad võivad tootega kaasas olla elektrooniliselt või trükituna. Elektroonilised koopiad on saadaval ka meie veebilehel. Paljud kasutusjuhendid on erinevates keeltes saadaval veebilehel [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## FI (SUOMI/FINNISH)

**VAROITUS!** Ennen minkään Hypertherm-laitteen käyttöä lue tuotteen käyttöoppaassa olevat turvallisuusohjeet, *turvallisuuden ja vaatimustenmukaisuuden käsikirja* (80669C), *vesileikkauksen turvallisuuden ja vaatimustenmukaisuuden käsikirja* (80943C) ja *radiotaajuusvaroitusten käsikirja* (80945C).

Käyttöoppaiden kopiot voivat olla tuotteen mukana sähköisessä ja tulostetussa muodossa. Sähköiset kopiot ovat myös verkkosivustollamme. Monet käyttöoppaat ovat myös saatavissa useilla kielillä [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## FR (FRANÇAIS/FRENCH)

**AVERTISSEMENT!** Avant d'utiliser tout équipement Hypertherm, lire les consignes de sécurité du manuel de votre produit, du *Manuel de sécurité et de conformité* (80669C), du *Manuel de sécurité et de conformité du jet d'eau* (80943C) et du *Manuel d'avertissement relatif aux radiofréquences* (80945C).

Les exemplaires des manuels qui accompagnent le produit peuvent être sous forme électronique ou papier. Les manuels sous forme électronique se trouvent également sur notre site Internet. Plusieurs manuels sont offerts en plusieurs langues à [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## GR (ΕΛΛΗΝΙΚΑ/GREEK)

**ΠΡΟΕΙΔΟΠΟΙΗΣΗ!** Πριν θέσετε σε λειτουργία οποιονδήποτε εξοπλισμό της Hypertherm, διαβάστε τις οδηγίες ασφαλείας στο εγχειρίδιο του προϊόντος και στο *εγχειρίδιο ασφαλείας και συμμόρφωσης* (80669C), στο *εγχειρίδιο ασφαλείας και συμμόρφωσης του waterjet* (80943C) και στο *εγχειρίδιο προειδοποιήσεων για τις ραδιοσυχνότητες* (80945C).

Το προϊόν μπορεί να συνοδεύεται από αντίγραφα των εγχειριδίων σε ηλεκτρονική και έντυπη μορφή. Τα ηλεκτρονικά αντίγραφα υπάρχουν επίσης στον ιστότοπό μας. Πολλά εγχειρίδια είναι διαθέσιμα σε διάφορες γλώσσες στο [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## HU (MAGYAR/HUNGARIAN)

**VIGYÁZAT!** Mielőtt bármilyen Hypertherm berendezést üzemeltetne, olvassa el a biztonsági információkat a termék kézikönyvében, a *Biztonsági és szabálykövetési kézikönyvben* (80669C), a *Vízugaras biztonsági és szabálykövetési kézikönyvben* (80943C) és a *Rádiófrekvenciás figyelmeztetéseket tartalmazó kézikönyvben* (80945C).

A termékhez a kézikönyv példányai elektronikus és nyomtatott formában is mellékelve lehetnek. Az elektronikus példányok webhelyünkön is megtalálhatók. Számos kézikönyv áll rendelkezésre több nyelven a [www.hypertherm.com/docs](http://www.hypertherm.com/docs) weboldalon.

## ID (BAHASA INDONESIA/INDONESIAN)

**PERINGATAN!** Sebelum mengoperasikan peralatan Hypertherm, bacalah petunjuk keselamatan dalam manual produk Anda, *Manual Keselamatan dan Kepatuhan* (80669C), *Manual Keselamatan dan Kepatuhan Jet Air* (80943C), dan *Manual Peringatan Frekuensi Radio* (80945C). Kegagalan mengikuti petunjuk keselamatan dapat menyebabkan cedera pribadi atau kerusakan pada peralatan.

Produk mungkin disertai salinan manual atau petunjuk dalam format elektronik maupun cetak. Salinan elektronik juga tersedia di situs web kami. Berbagai manual tersedia dalam beberapa bahasa di [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## IT (ITALIANO/ITALIAN)

**AVVERTENZA!** Prima di usare un'attrezzatura Hypertherm, leggere le istruzioni sulla sicurezza nel manuale del prodotto, nel *Manuale sulla sicurezza e la conformità* (80669C), nel *Manuale sulla sicurezza e la conformità Waterjet* (80943C) e nel *Manuale di avvertenze sulla radiofrequenza* (80945C).

Copie del manuale possono accompagnare il prodotto in formato cartaceo o elettronico. Le copie elettroniche sono disponibili anche sul nostro sito web. Molti manuali sono disponibili in diverse lingue all'indirizzo [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## JA (日本語/JAPANESE)

**警告!** Hypertherm 機器を操作する前に、この製品説明書にある安全情報、「安全とコンプライアンスマニュアル」(80669C)、「ウォータージェット的安全とコンプライアンス」(80943C)、「高周波警告」(80945C)をお読みください。

説明書のコピーは、電子フォーマット、または印刷物として製品に同梱されています。電子コピーは当社ウェブサイトにも掲載されています。説明書の多くは [www.hypertherm.com/docs](http://www.hypertherm.com/docs) にて複数の言語でご用意しています。

## KO (한국어/KOREAN)

**경고!** Hypertherm 장비를 사용하기 전에 제품 설명서와 안전 및 규정 준수 설명서(80669C), 워터젯 안전 및 규정 준수 설명서(80943C) 그리고 무선 주파수 경고 설명서(80945C)에 나와 있는 안전 지침을 읽으십시오.

전자 형식과 인쇄된 형식으로 설명서 사본이 제품과 함께 제공될 수 있습니다. 전자 사본도 Hypertherm 웹사이트에서 보실 수 있으며 설명서 사본은 [www.hypertherm.com/docs](http://www.hypertherm.com/docs) 에서 여러 언어로 제공됩니다.

## NE (NEDERLANDS/DUTCH)

**WAARSCHUWING!** Lees voordat u Hypertherm-apparaat gebruikt de veiligheidsinstructies in de producthandleiding, in de *Veiligheids- en nalevingshandleiding* (80669C) in de *Veiligheids- en nalevingshandleiding voor waterstralen* (80943C) en in de *Waarschuwingshandleiding radiofrequentie* (80945C).

De handleidingen kunnen in elektronische en gedrukte vorm met het product worden meegeleverd. Elektronische versies zijn ook beschikbaar op onze website. Veel handleidingen zijn in meerdere talen beschikbaar via [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## NO (NORSK/NORWEGIAN)

ADVARSEL! Før du bruker noe Hypertherm-utstyr, må du lese sikkerhetsinstruksjonene i produktets håndbok, *håndboken om sikkerhet og samsvar* (80669C), *håndboken om vannjet sikkerhet og samsvar* (80943C), og *håndboken om radiofrekvensadvarslar* (80945C).

Eksemplarer av håndbøkene kan følge med produktet i elektronisk og trykt form. Elektroniske eksemplarer finnes også på nettstedet vårt. Mange håndbøker er tilgjengelig i flere språk på [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## PL (POLSKI/POLISH)

OSTRZEŻENIE! Przed rozpoczęciem obsługi jakiegokolwiek systemu firmy Hypertherm należy się zapoznać z instrukcjami bezpieczeństwa zamieszczonymi w podręczniku produktu, w *podręczniku bezpieczeństwa i zgodności* (80669C), *podręczniku bezpieczeństwa i zgodności systemów strumienia wody* (80943C) oraz *podręczniku z ostrzeżeniem o częstotliwości radiowej* (80945C).

Do produktu mogą być dołączone podręczniki użytkownika w formie elektronicznej i drukowanej. Kopie elektroniczne znajdują się również w naszej witrynie internetowej. Wiele podręczników jest dostępnych w różnych językach pod adresem [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## PT (PORTUGUÊS/PORTUGUESE)

ADVERTÊNCIA! Antes de operar qualquer equipamento Hypertherm, leia as instruções de segurança no manual do seu produto, no *Manual de Segurança e de Conformidade* (80669C), no *Manual de Segurança e de Conformidade do Waterjet* (80943C) e no *Manual de Advertência de radiofrequência* (80945C).

Cópias dos manuais podem vir com o produto nos formatos eletrônico e impresso. Cópias eletrônicas também são encontradas em nosso website. Muitos manuais estão disponíveis em vários idiomas em [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## RO (ROMÂNĂ/ROMANIAN)

AVERTIZARE! Înainte de utilizarea oricărei echipament Hypertherm, citiți instrucțiunile de siguranță din manualul produsului, *manualul de siguranță și conformitate* (80669C), *manualul de siguranță și conformitate Waterjet* (80943C) și din *manualul de avertizare privind radiofrecvența* (80945C).

Produsul poate fi însoțit de copii ale manualelor în format tipărit și electronic. Exemplarele electronice sunt disponibile și pe site-ul nostru web. Numeroase manuale sunt disponibile în mai mult limbi la adresa: [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## RU (РУССКИЙ/RUSSIAN)

БЕРЕГИСЬ! Перед работой с любым оборудованием Hypertherm ознакомьтесь с инструкциями по безопасности, представленными в руководстве, которое поставляется вместе с продуктом, в *Руководстве по безопасности и соответствию* (80669C), в *Руководстве по безопасности и соответствию для водоструйной резки* (80943C) и *Руководстве по предупреждению о радиочастотном излучении* (80945C).

Копии руководств, которые поставляются вместе с продуктом, могут быть представлены в электронном и бумажном виде. Электронные копии также доступны на нашем веб-сайте. Целый ряд руководств доступны на нескольких языках по ссылке [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## SK (SLOVENČINA/SLOVAK)

VÝSTRAHA! Pred použitím akéhokoľvek zariadenia od spoločnosti Hypertherm si prečítajte bezpečnostné pokyny v návode na obsluhu vášho zariadenia a v *Manuáli o bezpečnosti a súlade s normami* (80669C), *Manuáli o bezpečnosti a súlade s normami pre systém rezania vodou* (80943C) a v *Manuáli s informáciami o rádiových frekvenciách* (80945C).

Návod na obsluhu sa dodáva spolu s produktom v elektronickej a tlačenej podobe. Jeho elektronickej formát je dostupný aj na našej webovej stránke. Mnohé z návodov na obsluhu sú dostupné vo viaczjazyčnej mutácii na stránke [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## SL (SLOVENŠČINA/SLOVENIAN)

OPOZORILO! Pred uporabo katerekoli Hyperthermove opreme preberite varnostna navodila v priročniku vašega izdelka, v *Priročniku za varnost in skladnost* (80669C), v *Priročniku za varnost in skladnost sistemov rezanja z vodnim curkom* (80943C) in v *Priročniku Opozorilo o radijskih frekvencah* (80945C).

Izvodi priročnikov so lahko izdelku priloženi v elektronski in tiskani obliki. Elektronski izvodi so na voljo tudi na našem spletnem mestu. Številni priročniki so na voljo v različnih jezikih na naslovu [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## SR (SRPSKI/SERBIAN)

UPOZORENJE! Pre rukovanja bilo kojom Hyperthermovom opremom pročitajte uputstva o bezbednosti u svom priručniku za proizvod, *Priručniku o bezbednosti i usaglašenosti* (80669C), *Priručniku o bezbednosti i usaglašenosti Waterjet tehnologije* (80943C) i *Priručniku sa upozorenjem o radio-frekvenciji* (80945C).

Уз производ се испоручују копије приручника у електронском или штампаном формату. Електронске копије су такође доступне на нашем веб-сајту. Многи приручници су доступни на више језика на адреси [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## SV (SVENSKA/SWEDISH)

VARNING! Läs häftet säkerhetsinformationen i din produkts *säkerhets- och efterlevnadsmanual* (80669C), *säkerhets- och efterlevnadsmanualen för Waterjet* (80943C) och *varningsmanualen för radiofrekvenser* (80945C) för viktig säkerhetsinformation innan du använder eller underhåller Hypertherm-utrustning. Kopior av manualerna kan medfölja produkten i elektroniskt och tryckt format. Elektroniska kopior finns också på vår webbplats. Många manualer finns på flera språk på [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## TH (ภาษาไทย/THAI)

คำเตือน! ก่อนการใช้งานอุปกรณ์ของ Hypertherm ทั้งหมด โปรดอ่านคำแนะนำด้านความปลอดภัยในคู่มือการใช้สินค้า คู่มือด้านความปลอดภัยและการปฏิบัติตาม (80669C), คู่มือด้านความปลอดภัยและการปฏิบัติตามสำหรับการใช้หัวตัดระบบวอเตอร์เจ็ต (80943C) และ คู่มือคำเตือนเกี่ยวกับความถี่วิทยุ (80945C) การไม่ปฏิบัติตามคำแนะนำด้านความปลอดภัยอาจส่งผลให้เกิดการบาดเจ็บหรือเกิดความเสียหายต่ออุปกรณ์  
สำเนาคู่มือทั้งในรูปแบบอิเล็กทรอนิกส์และแบบสิ่งพิมพ์จะถูกแนบมาพร้อมกับผลิตภัณฑ์ สำหรับสำเนาคู่มือในรูปแบบอิเล็กทรอนิกส์ของผลิตภัณฑ์และสำเนาคู่มือต่างๆ ในหลากหลายภาษาอื่นยังมีให้บริการบนเว็บไซต์ [www.hypertherm.com/docs](http://www.hypertherm.com/docs) ของเรอีกด้วย

## TR (TÜRKÇE/TURKISH)

UYARI! Bir Hypertherm ekipmanını çalıştırmadan önce, ürününüzün kullanım kılavuzunda, *Güvenlik ve Uyumluluk Kılavuzu'nda* (80669C), *Su Jeti Güvenlik ve Uyumluluk Kılavuzu'nda* (80943C) ve *Radyo Frekansı Uyarısı Kılavuzu'nda* (80945C) yer alan güvenlik talimatlarını okuyun.

Kılavuzların kopyaları, elektronik ve basılı formatta ürünü birlikte verilebilir. Elektronik kopyalar web sitemizde de yer alır. Kılavuzların birçokğu [www.hypertherm.com/docs](http://www.hypertherm.com/docs) adresinde birçok dilde mevcuttur.

## VI (TIẾNG VIỆT/VIETNAMESE)

CẢNH BÁO! Trước khi vận hành bất kỳ thiết bị Hypertherm nào, hãy đọc các hướng dẫn an toàn trong hướng dẫn sử dụng sản phẩm của bạn, *Sổ tay An toàn và Tuân thủ* (80669C), *Sổ tay An toàn và Tuân thủ Tia nước* (80943C), và *Hướng dẫn Cảnh báo Tần số Vô tuyến* (80945C). Không tuân thủ các hướng dẫn an toàn có thể dẫn đến thương tích cá nhân hoặc hư hỏng thiết bị.

Bản sao của sổ tay có thể đi kèm với sản phẩm ở định dạng điện tử và in. Bản điện tử cũng có trên trang web của chúng tôi. Nhiều sổ tay có sẵn bằng nhiều ngôn ngữ tại [www.hypertherm.com/docs](http://www.hypertherm.com/docs).

## ZH-CN (简体中文/CHINESE SIMPLIFIED)

警告! 在操作任何海宝设备之前, 请阅读产品手册、《安全和法规遵守手册》(80669C)、《水射流安全和法规遵守手册》(80943C) 以及《射频警告手册》(80945C) 中的安全操作说明。

随产品提供的手册可提供电子版和印刷版两种格式。电子版本同时也在我们的网站上提供。很多手册有多种语言版本, 详见 [www.hypertherm.com/docs](http://www.hypertherm.com/docs)。

## ZH-TW (繁體中文/CHINESE TRADITIONAL)

警告! 在操作任何 Hypertherm 設備前, 請先閱讀您產品手冊內的安全指示, 包括《安全和法規遵從手冊》(80669C)、《水刀安全和法規遵從手冊》(80943C), 以及《無線電頻率警示訊號手冊》(80945C)。

電子版和印刷版手冊複本可能隨產品附上。您也可以前往我們的網站下載電子版手冊。我們的網站上還以多種語言形式提供多種手冊, 請造訪 [www.hypertherm.com/docs](http://www.hypertherm.com/docs)。

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# 1

## ***Before You Begin***

This manual helps you do the following:

- **Install replacement parts that you already have**
  - Refer to [Prepare to Do the Part Replacement](#) on page 37.
- **Find the part number that you need to order**
  - Refer to [Service Parts](#) on page 13.
  - Refer to [Find torch replacement parts by part number](#) on page 35.

For assistance with repairing or replacing internal components, do the following:

1. Get the serial number for your torch from the data plate that is on the torch.
2. Contact your Hypertherm distributor or authorized repair facility.
3. Contact the nearest Hypertherm office shown in the front of this manual.

For related information, refer to the following documents:

- *Powermax65/85/105 SYNC Troubleshooting Guide (810430)*
- *Powermax65/85 SYNC Service Parts and Procedures Guide (810440)*
- *Powermax105 SYNC Service Parts and Procedures Guide (810450)*

Technical documentation is available at [www.hypertherm.com/docs](http://www.hypertherm.com/docs).



Technical documentation is current as of the date of its release.  
Subsequent revisions are possible.



# 2

## **Service Parts**

### **NOTICE**

Genuine Hypertherm parts are factory-recommended parts for your Hypertherm system. Any damage caused by the use of parts that are not from Hypertherm may not be covered by the Hypertherm warranty.

Hypertherm recommends that service centers keep all of these parts available for repairs because these parts are parts necessary for safety or are usually exposed to continuous wear.



Cartridges are not included in this manual. For a list of the cutting and gouging cartridges available, refer to the *Powermax65/85/105 SYNC Parts Guide* (810490).

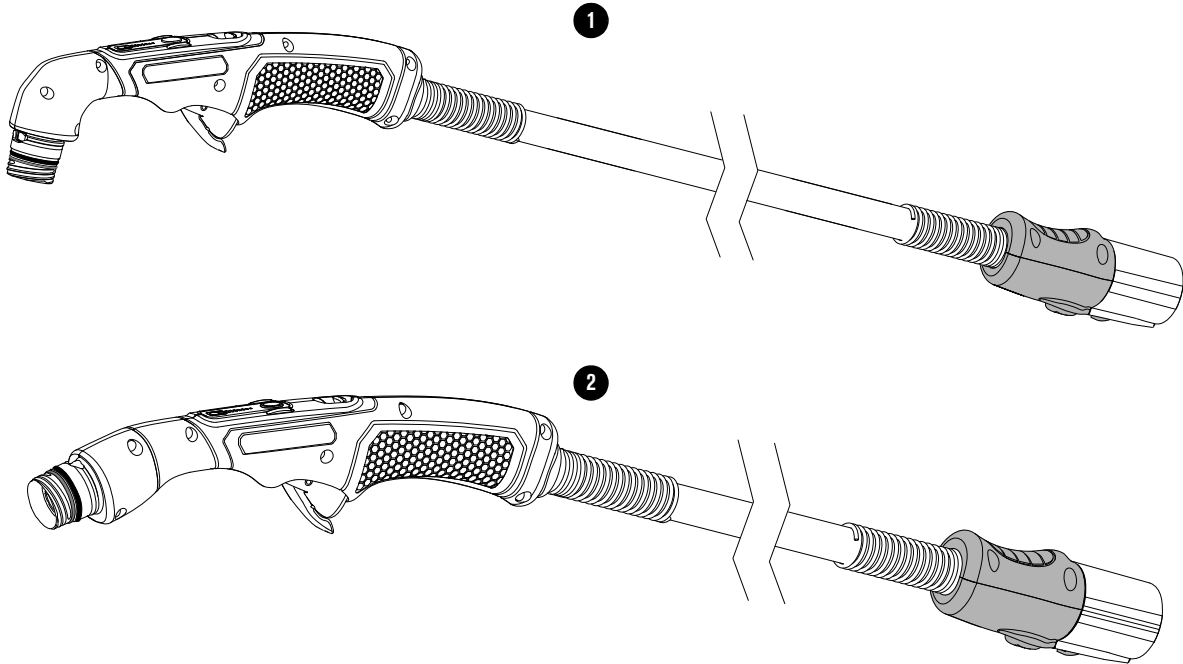
**To find part numbers with kit contents**, refer to the following:

- [Hand torch parts](#) on page 14
- [Full-length machine torch parts](#) on page 20
- [Mini machine and 180° robotic torch parts](#) on page 25
- [90° and 45° robotic torch parts](#) on page 30

**To see a list of parts in order by part number**, refer to [Find torch replacement parts by part number](#) on page 35.

## Hand torch parts

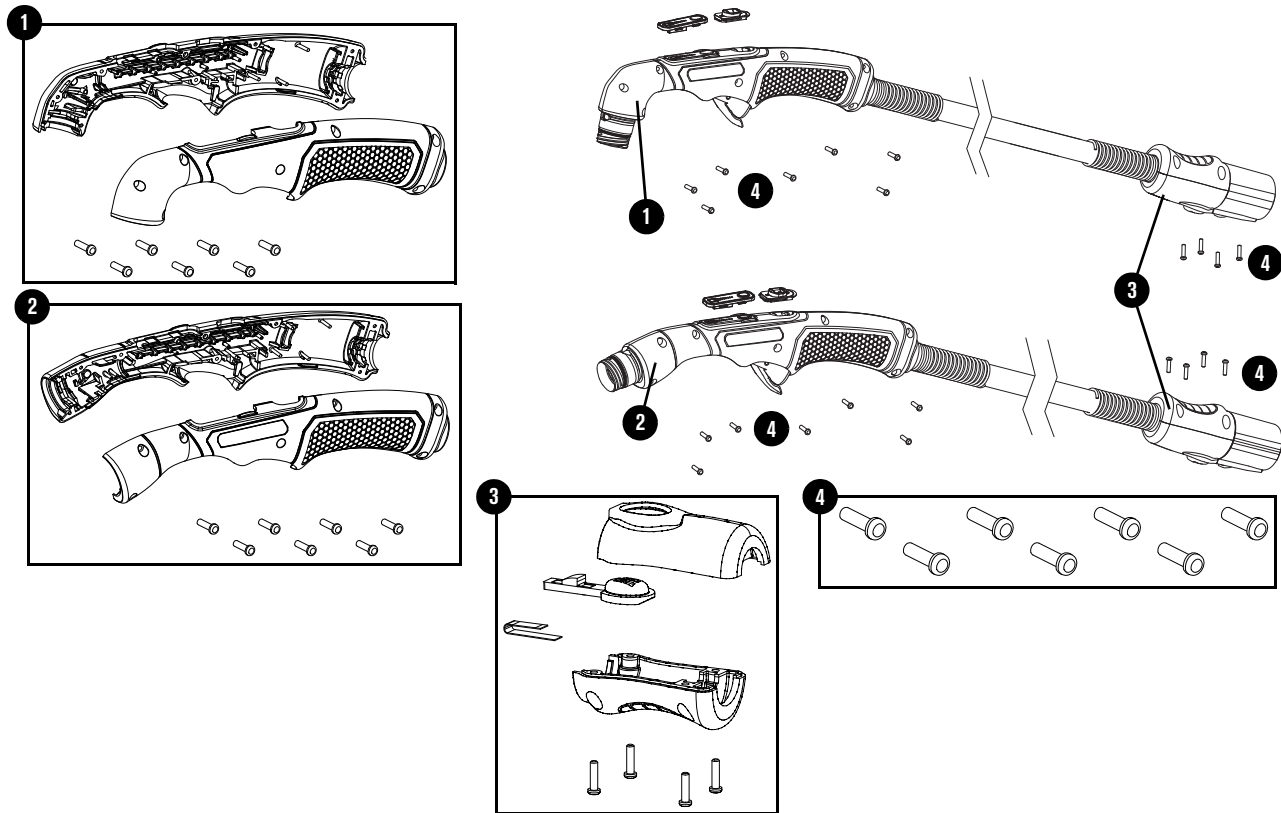
### 75° and 15° hand torch assemblies



Item	Part number	Description
1	059726	75° hand torch assembly with 7.6 m (25 foot) lead*
1	059727	75° hand torch assembly with 15 m (50 foot) lead*
1	059728	75° hand torch assembly with 23 m (75 foot) lead*
2	059723	15° hand torch assembly with 7.6 m (25 foot) lead*
2	059724	15° hand torch assembly with 15 m (50 foot) lead*
2	059725	15° hand torch assembly with 23 m (75 foot) lead*

\* The torch assembly does not include a cartridge. For a full list of the cutting and gouging cartridges available, refer to the *Powermax65/85/105 SYNC Parts Guide* (810490).

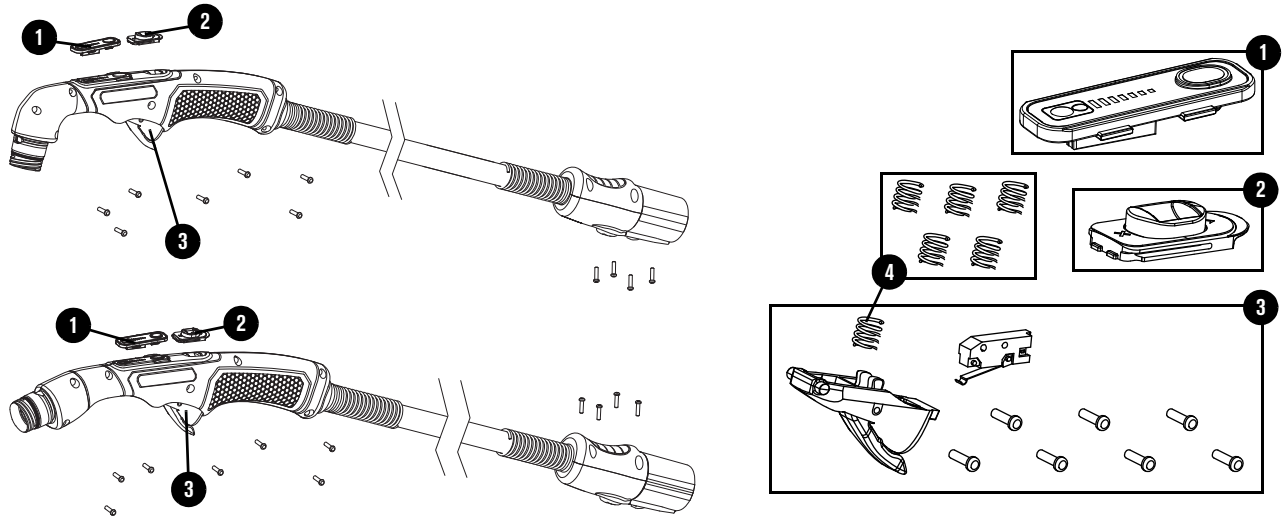
### 75° and 15° hand torch exterior parts



Item	Part number	Description and kit contents
1	428856	Kit: Handle for 75° hand torch
	101453	Handle for 75° hand torch
	075714	Screws for torch handle* (7)
2	428855	Kit: Handle for 15° hand torch
	101452	Handle for 15° hand torch
	075714	Screws for torch handle* (7)
3	428863	Kit: Quick-disconnect shell (shell with button – does not include torch lead or connector)
	420565	Shell for torch quick-disconnect
	220681	Latch with red button
	127197	Lever for latch
	075714	Screws for shell* (4)
4	428148	Kit: Screws for torch handle or quick-disconnect shell
	075714	Screws for torch handle or quick-disconnect shell (7)

\* Can also be ordered separately as kit 428148 (quantity: 7)

### 75° and 15° hand torch controls



Item	Part number	Description and kit contents
1	428873	Kit: Amperage-adjustment control for 75° or 15° hand torch
	229847	Amperage-adjustment control for 75° or 15° hand torch
2	428871	Kit: Torch-lock slider for 75° or 15° hand torch
	229846	Torch-lock slider for 75° or 15° hand torch (with yellow and green label)
3	428156	Kit: Trigger
	002554	Trigger
	027254	Spring for trigger*
	005684	Start switch**
	075714	Screws for torch handle*** (7)
4	428182	Kit: Spring for trigger
	027254	Spring for trigger (5)

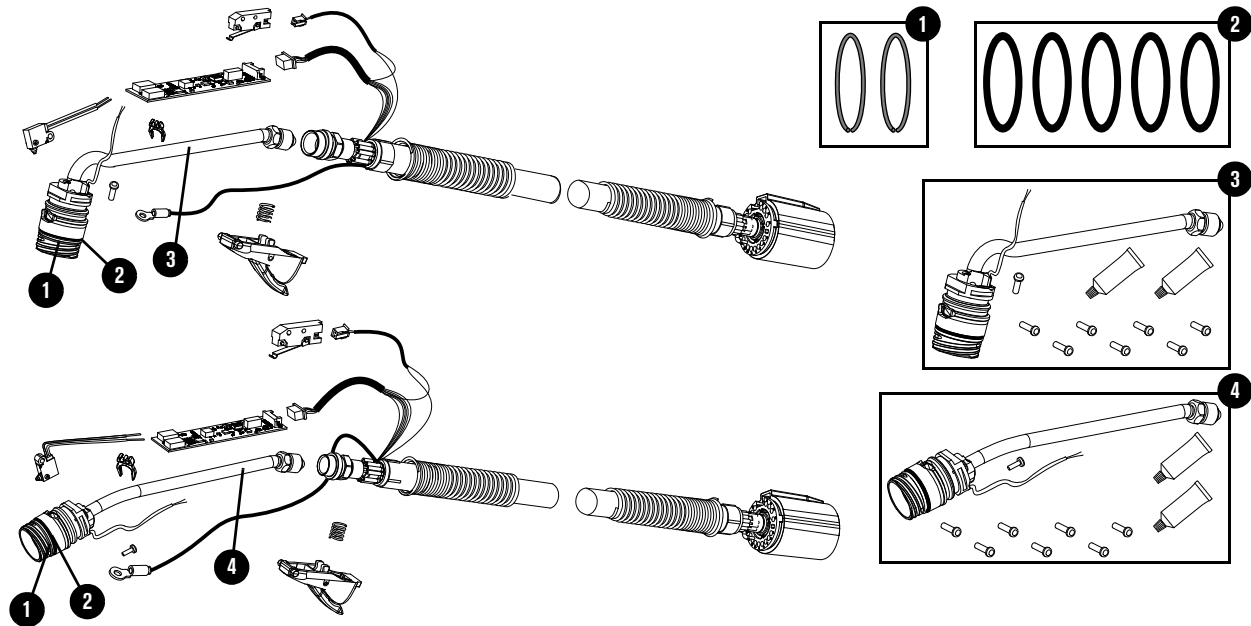
\* Can also be ordered separately as kit 428182 (quantity: 5).

\*\* Can also be ordered separately as kit 428958 (quantity: 1).

\*\*\* Can also be ordered separately as kit 428148 (quantity: 7).

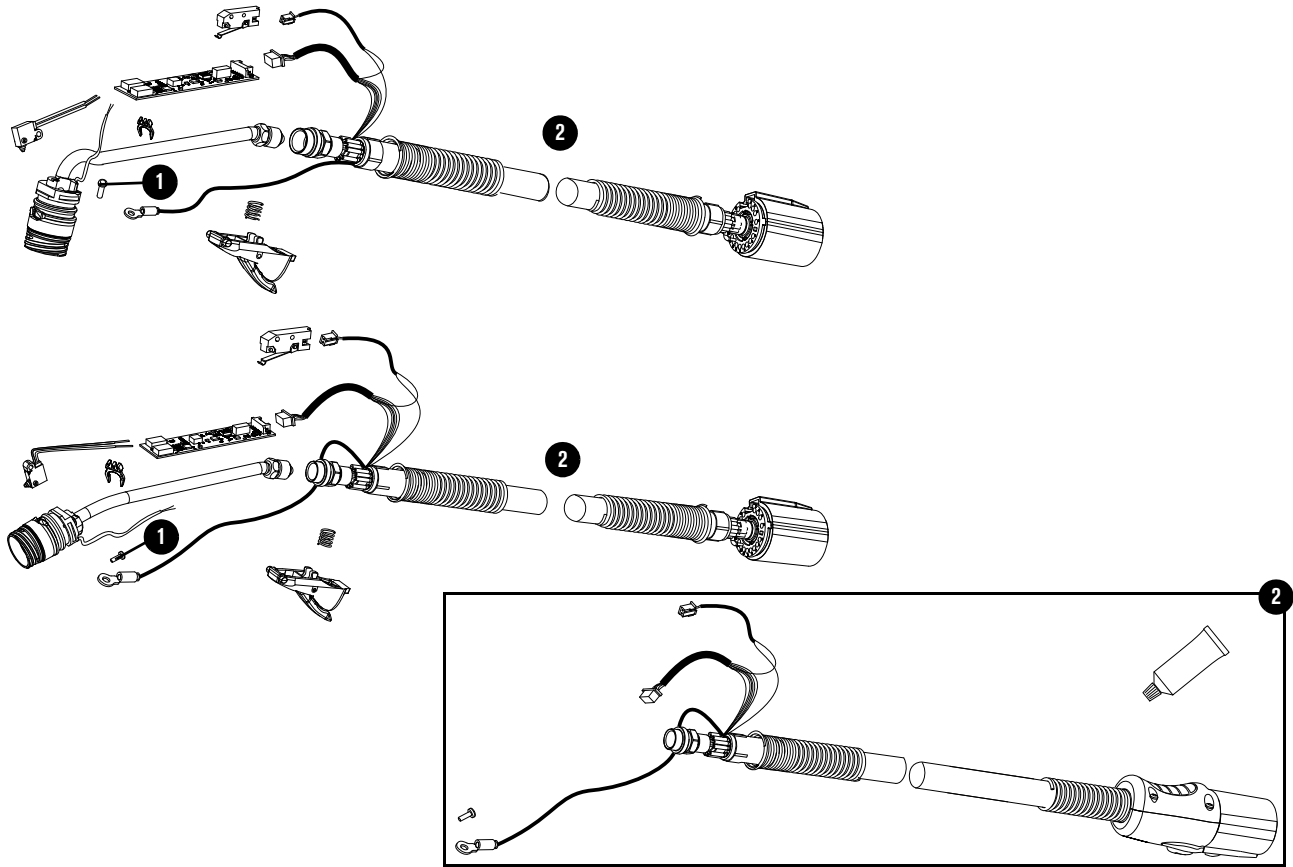


## 75° and 15° hand torch body and O-ring



Item	Part number	Description and kit contents
1	528066	Kit: Torch contact ring (for torch head)
	420931	Torch contact ring (2)
2	428950	Kit: O-rings for torch body
	058021	O-ring for any SmartSYNC torch (5)
3	428858	Kit: Body for 75° hand torch
	420582	Main body replacement for 75° hand torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle** (7)
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***
	330103	Thread locker, 0.5 ml (0.017 fl oz)
4	428857	Kit: Body for 15° hand torch
	420630	Main body replacement for 15° hand torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle** (7)
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***
	330103	Thread locker, 0.5 ml (0.017 fl oz)
<p>* Can also be ordered separately as part number 075903 (quantity: 1).</p> <p>** Can also be ordered separately as kit 428148 (quantity: 7).</p> <p>*** Can also be ordered separately as part number 027055 (quantity: 1).</p>		

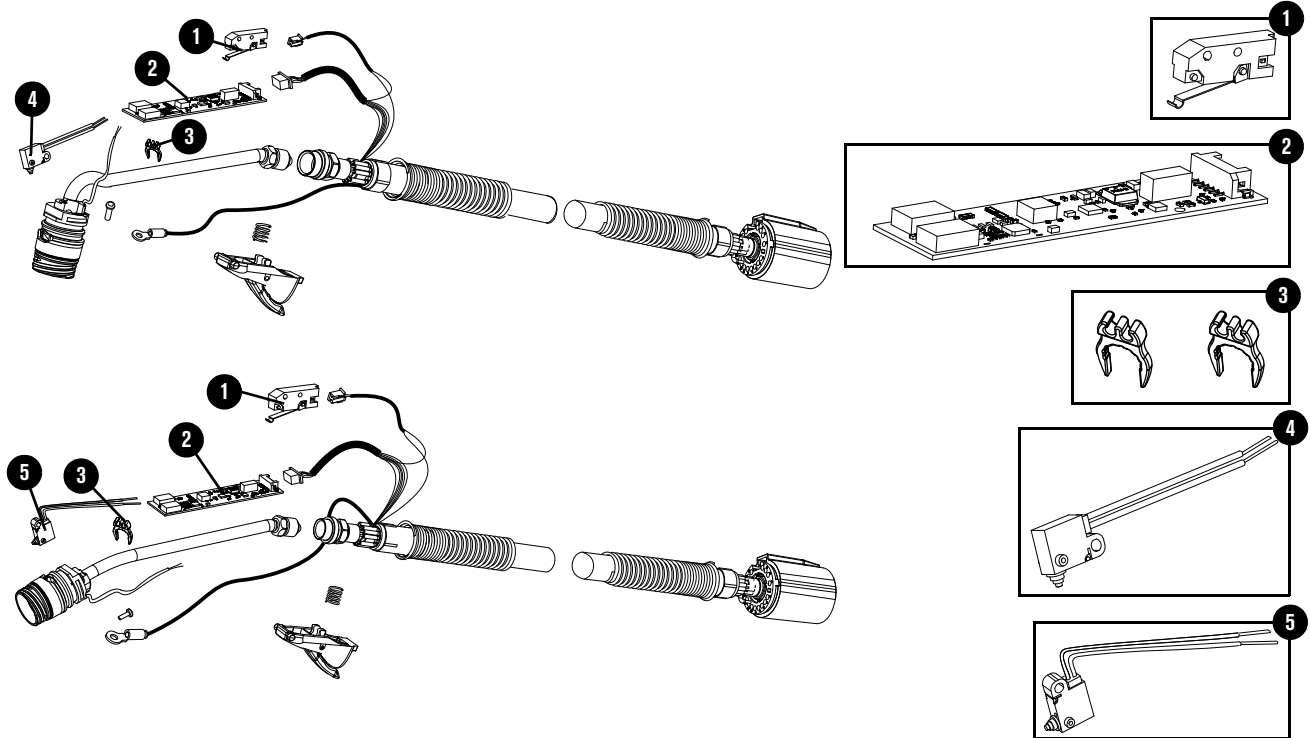
## 75° and 15° hand torch lead and terminal screw



Item	Part number	Description and kit contents
1	075903	Terminal screw (1/4 inch) for pilot arc wire
2	428852	Kit: Lead for hand torch, 7.6 m (25 foot)
	428853	Kit: Lead for hand torch, 15 m (50 foot)
	428854	Kit: Lead for hand torch, 23 m (75 foot)
	229849	Lead for kit 428852, 7.6 m (25 foot)
	229850	Lead for kit 428853, 15 m (50 foot)
	229851	Lead for kit 428854, 23 m (75 foot)
	210735	Data plate: SmartSYNC torch (not shown)
	210729	Label: SmartSYNC torch lead (not shown)
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	330103	Thread locker, 0.5 ml (0.017 fl oz)

\* Can also be ordered separately as part number 075903 (quantity: 1).

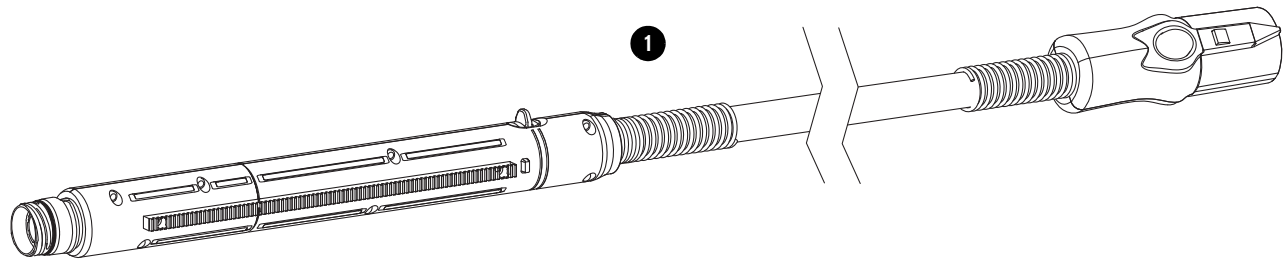
## 75° and 15° hand torch switches and PCB



Item	Part number	Description and kit contents
1	428958	Kit: Start switch
		005684   Start switch for hand torch
2	428869	Kit: Radio-frequency (RF) torch PCB for hand torch
		141463   RF torch PCB for hand torch
3	428877	Kit: Clip for RF wires
		104912   Clip for RF wires (2)
4	428865	Kit: Cap-sensor switch for 75° hand torch
		005710   Cap-sensor switch for 75° hand torch
5	428864	Kit: Cap-sensor switch for 15° hand torch
		005722   Cap-sensor switch for 15° hand torch

## Full-length machine torch parts

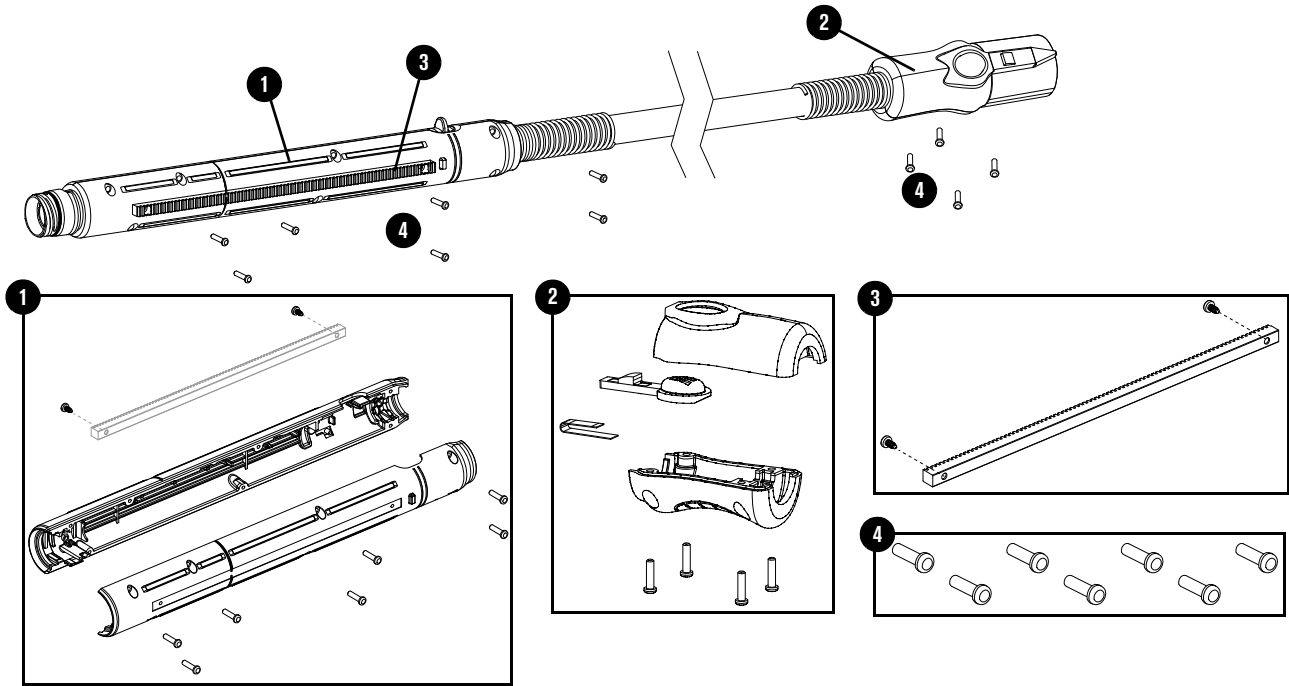
### Full-length machine torch assemblies



Item	Part number	Description
1	059719	Full-length machine torch assembly with 7.6 m (25 foot) lead*
1	059720	Full-length machine torch assembly with 10.7 m (35 foot) lead*
1	059721	Full-length machine torch assembly with 15 m (50 foot) lead*
1	059722	Full-length machine torch assembly with 23 m (75 foot) lead*

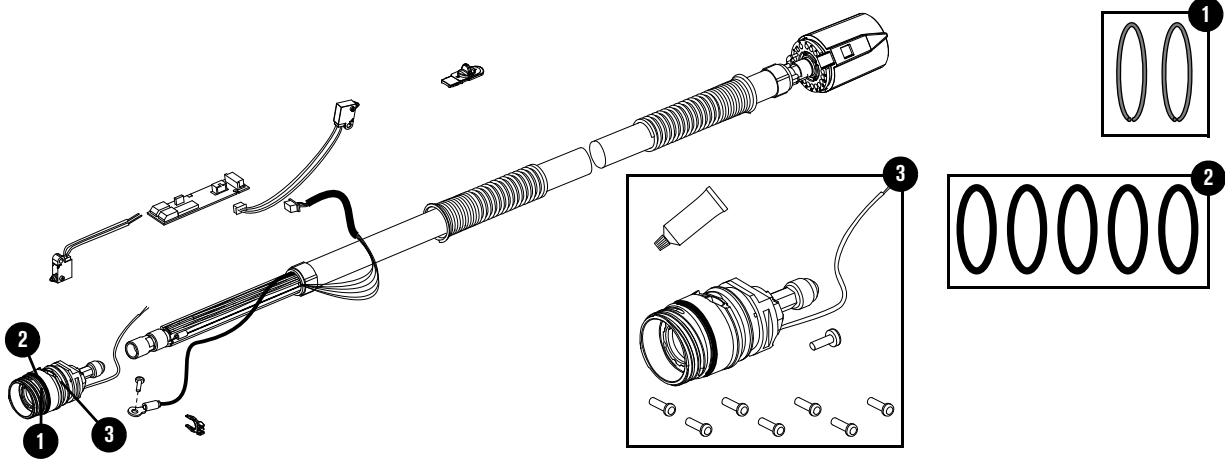
\* The torch assembly does not include a cartridge. For a full list of the cutting and gouging cartridges available, refer to the *Powermax65/85/105 SYNC Parts Guide* (810490).

## Full-length machine torch exterior parts



Item	Part number	Description and kit contents
1	428874	Kit: Shell for full-length machine torch*
	101457	Shell for full-length machine torch
	075714	Screws for shell** (7)
	075418	Screws for gear rack (2)
2	428863	Kit: Quick-disconnect shell (shell with button – does not include torch lead or connector)
	420565	Shell for torch quick-disconnect
	220681	Latch with red button
	127197	Lever for latch
	075714	Screws for shell** (4)
3	428703	Kit: Removable gear rack with screws
	420504	Gear rack for full-length machine torch
	075418	Screws for gear rack (2)
4	428148	Kit: Screws for torch handle or quick-disconnect shell
	075714	Screws for torch handle or quick-disconnect shell (7)
* Does not include gear rack.		
** Can also be ordered separately as kit 428148 (quantity: 7).		

## Full-length machine torch body and O-ring



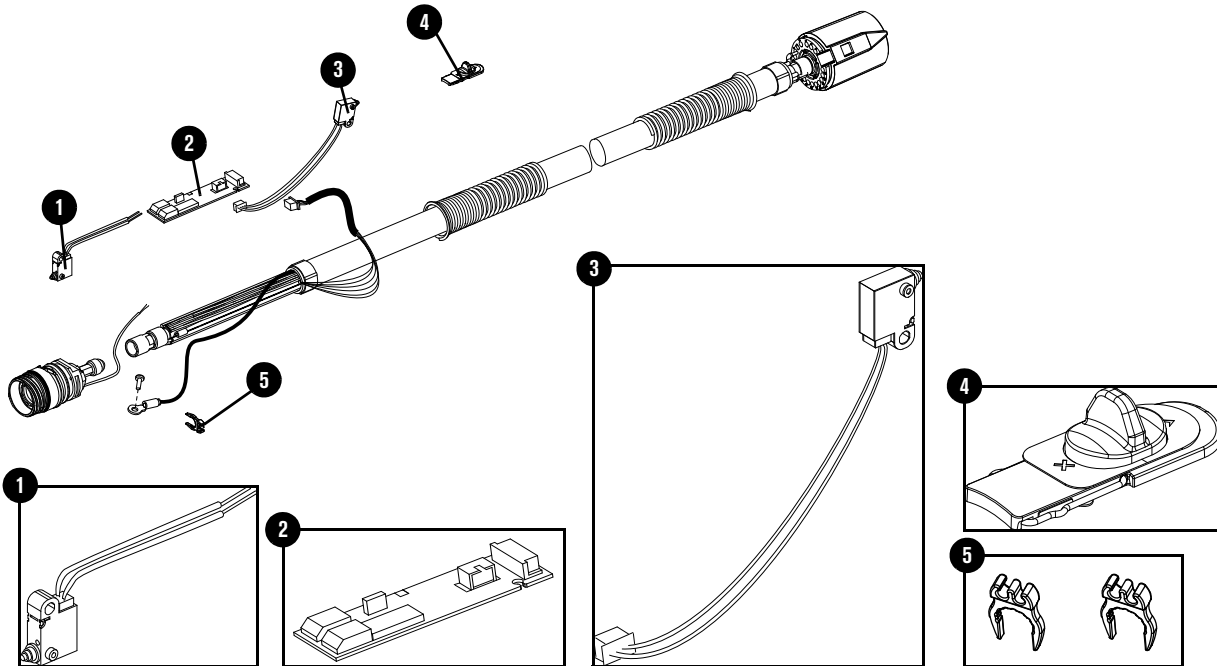
Item	Part number	Description and kit contents
1	528066	Kit: Torch contact ring for torch head
	420931	Torch contact ring (2)
2	428950	Kit: O-rings for torch body
	058021	O-ring for any SmartSYNC torch (5)
3	428859	Kit: Body for full-length machine torch
	420544	Main body replacement for full-length machine torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle (7)**
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***

\* Can also be ordered separately as part number 075903 (quantity: 1).

\*\* Can also be ordered separately as kit 428148 (quantity: 7).

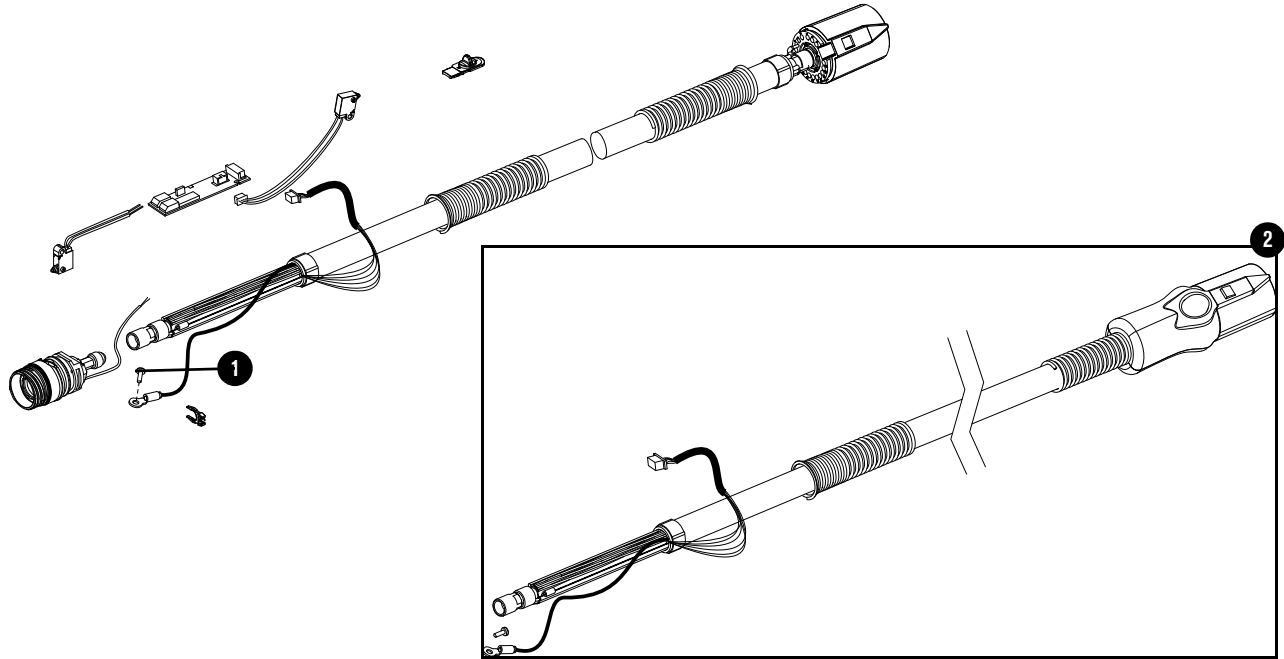
\*\*\* Can also be ordered separately as part number 027055 (quantity: 1).

## Full-length machine torch switches and PCB



Item	Part number	Description and kit contents
1	428866	Kit: Cap-sensor switch for full-length machine torch
	005711	Cap-sensor switch for full-length machine torch
2	428870	Kit: RF torch PCB for full-length, mini machine, or robotic torch
	141466	RF torch PCB for full-length, mini machine, or robotic torch
3	428868	Kit: Switch assembly for torch-lock slider for full-length machine torch
	005712	Switch assembly for torch-lock slider for full-length machine torch
4	428872	Kit: Torch-lock slider for full-length machine torch
	229848	Torch-lock slider for full-length machine torch (with yellow and green label)
5	428877	Kit: Clip for RF wires
	104912	Clip for RF wires (2)

## Full-length machine torch lead and terminal screw



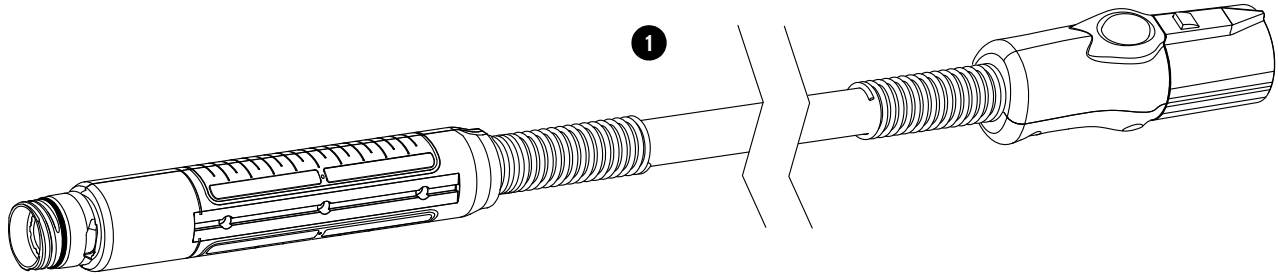
Item	Part number	Description and kit contents
1	075903	Terminal screw (1/4 inch) for pilot arc wire
2	428848	Kit: Lead for full-length machine torch, 7.6 m (25 foot)
	428849	Kit: Lead for full-length machine torch, 10.7 m (35 foot)
	428850	Kit: Lead for full-length machine torch, 15 m (50 foot)
	428851	Kit: Lead for full-length machine torch, 23 m (75 foot)
	229853	Lead for kit 428848, 7.6 m (25 foot)
	229854	Lead for kit 428849, 10.7 m (35 foot)
	229855	Lead for kit 428850, 15 m (50 foot)
	229856	Lead for kit 428851, 23 m (75 foot)
	210735	Data plate: SmartSYNC torch (not shown)
210729	Label: SmartSYNC torch lead (not shown)	
	075903	Terminal screw (1/4 inch) for pilot arc wire*

\* Can also be ordered separately as part number 075903 (quantity: 1).



## Mini machine and 180° robotic torch parts

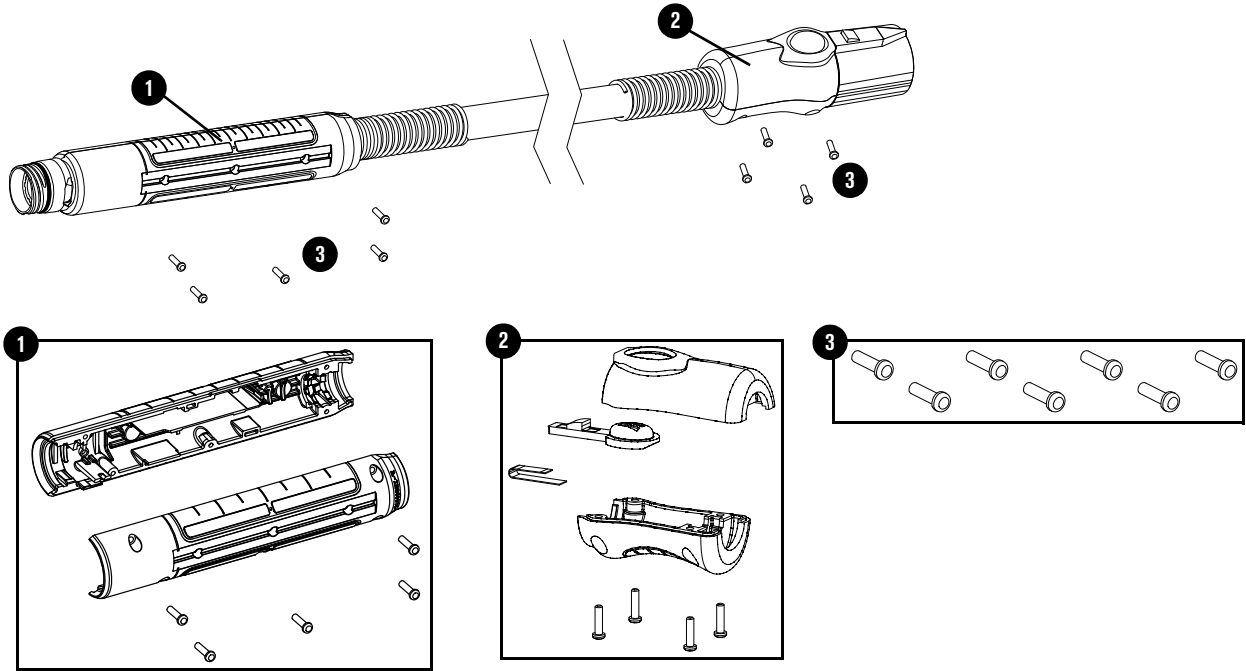
### Mini machine and 180° robotic torch assemblies



Item	Part number	Description
1	059733	Mini machine and 180° robotic torch assembly with 4.6 m (15 foot) lead*
1	059734	Mini machine and 180° robotic torch assembly with 7.6 m (25 foot) lead*
1	059735	Mini machine and 180° robotic torch assembly with 15 m (50 foot) lead*

\* The torch assembly does not include a cartridge. For a full list of the cutting and gouging cartridges available, refer to the *Powermax65/85/105 SYNC Parts Guide* (810490).

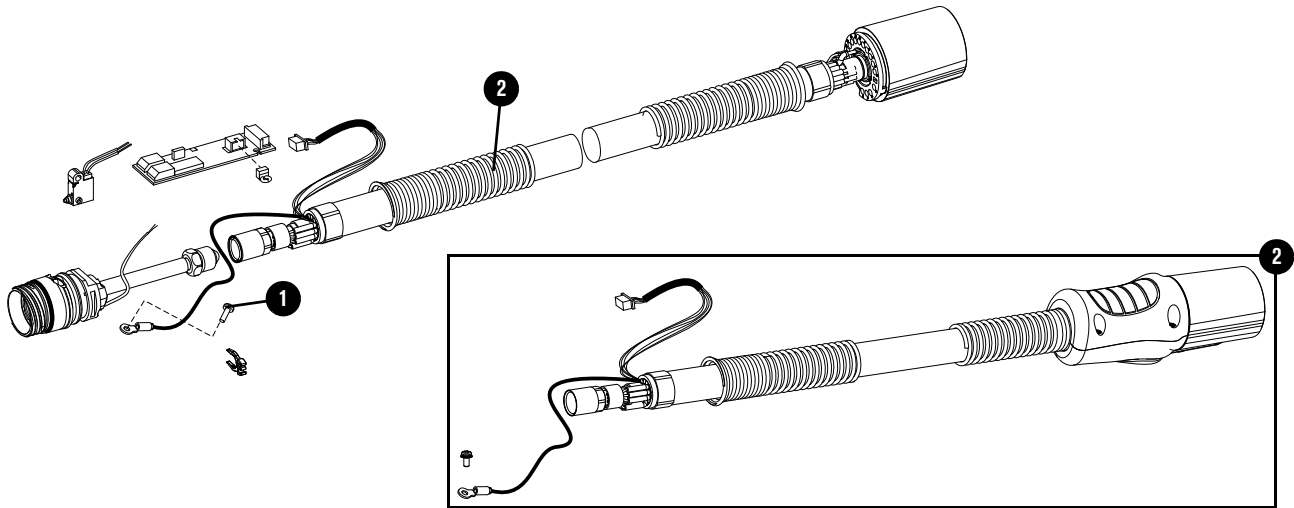
## Mini machine and 180° robotic torch exterior parts



Item	Part number	Description and kit contents
1	428896	Kit: Shell for mini machine and 180° robotic torch
	101458	Shell for mini machine and 180° robotic torch
	075714	Screws for shell* (5)
2	428863	Kit: Quick-disconnect shell (shell with button – does not include torch lead or connector)
	420565	Shell for torch quick-disconnect
	220681	Latch with red button
	127197	Lever for latch
	075714	Screws for shell* (4)
3	428148	Kit: Screws for torch shell
	075714	Screws for torch handle or quick-disconnect shell (7)

\* Can also be ordered separately as kit 428148 (quantity: 7).

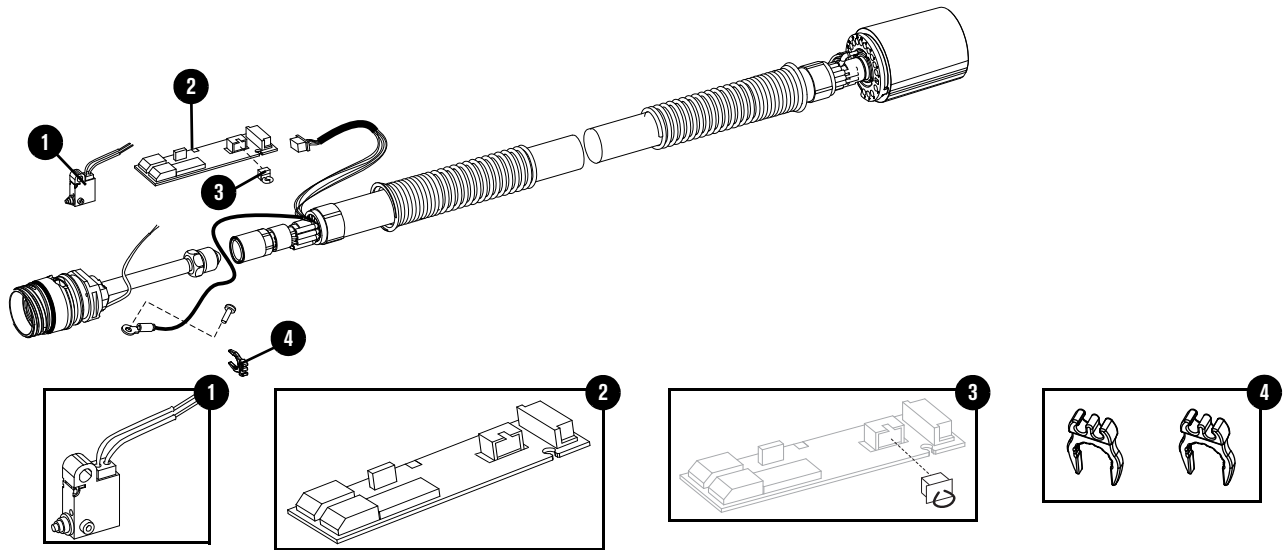
## Mini machine and 180° robotic torch lead and terminal screw



Item	Part number	Description and kit contents
1	075903	Terminal screw (1/4 inch) for pilot arc wire
2	428901	Kit: Lead for mini machine and robotic torch, 4.6 m (15 foot)
	428900	Kit: Lead for mini machine and robotic torch, 7.6 m (25 foot)
	428903	Kit: Lead for mini machine and robotic torch, 15 m (50 foot)
	229966	Lead for kit 428901, 4.6 m (15 foot)
	229967	Lead for kit 428900, 7.6 m (25 foot)
	229969	Lead for kit 428903, 15 m (50 foot)
	210735	Data plate: SmartSYNC torch (not shown)
	210729	Label: SmartSYNC torch lead (not shown)
	075903	Terminal screw (1/4 inch) for pilot arc wire*

\* Can also be ordered separately as part number 075903 (quantity: 1).

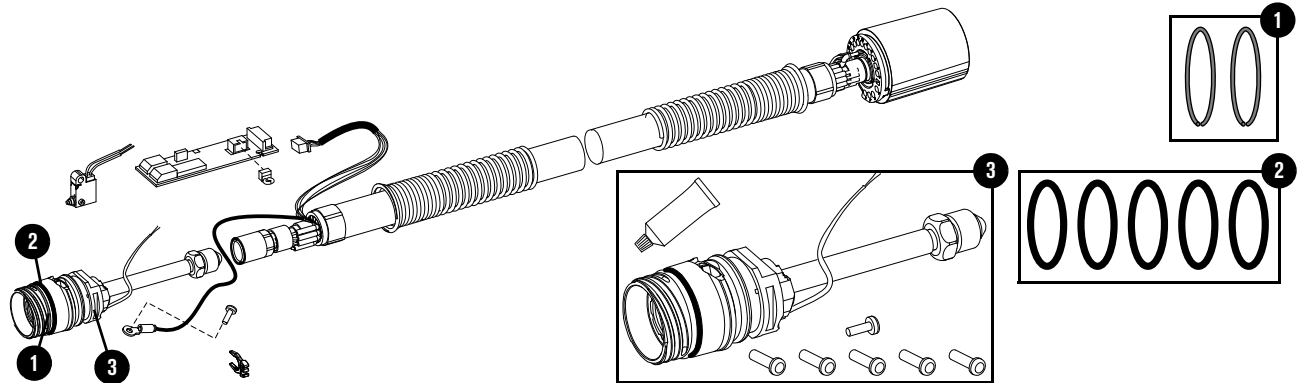
## Mini machine and 180° robotic switch and PCB



Item	Part number	Description
1	428867	Kit: Cap-sensor switch for mini machine and 180° robotic torch
	005723	Cap-sensor switch for mini machine and 180° robotic torch
2	428870	Kit: RF torch PCB for full-length, mini machine, or robotic torch
	141466	RF torch PCB for full-length, mini machine, or robotic torch
3	428899	Kit: Jumper wire for RF torch PCB for mini machine or robotic torch*
	005724	Jumper wire for RF torch PCB for mini machine or robotic torch
4	428877	Kit: Clip for RF wires
	104912	Clip for RF wires (2)

\* Does not include RF torch PCB.

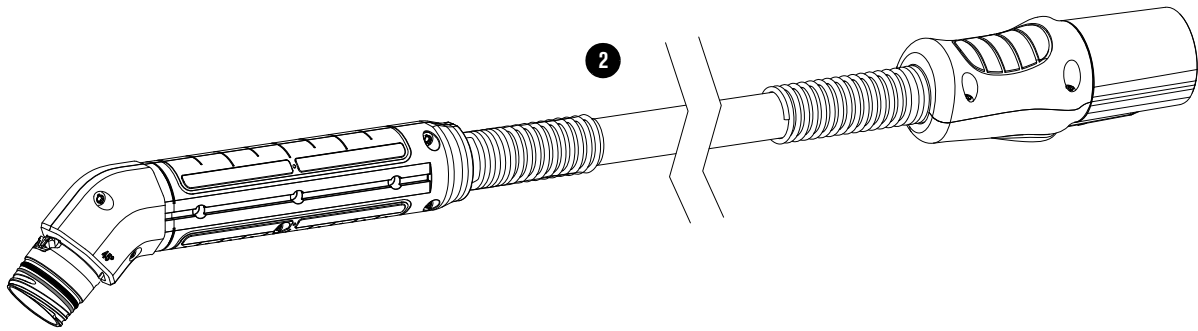
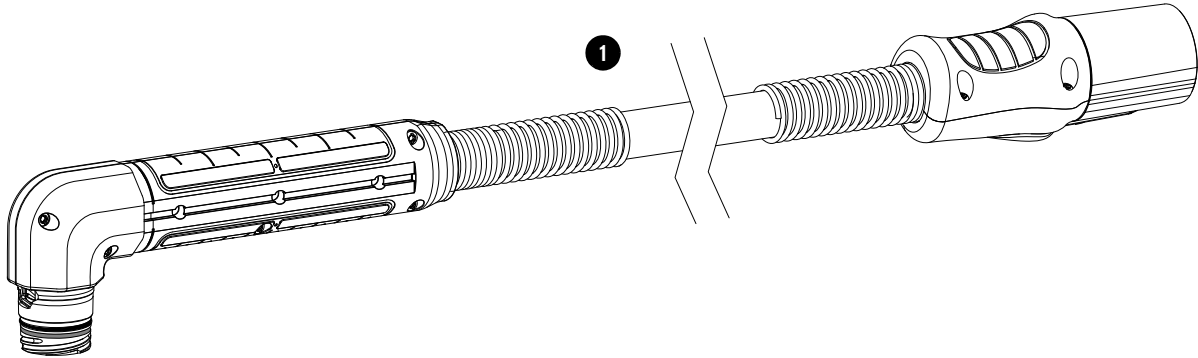
## Mini machine and 180° robotic torch body and O-ring



Item	Part number	Description
1	528066	Kit: Torch contact ring (for torch head)
	420931	Torch contact ring (2)
2	428950	Kit: O-rings for torch body
	058021	O-ring for any SmartSYNC torch (5)
3	428860	Kit: Body for mini machine and 180° robotic torch
	420754	Main body replacement for mini machine and 180° robotic torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle** (5)
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***
<p>* Can also be ordered separately as part number 075903 (quantity: 1).</p> <p>** Can also be ordered separately as kit 428148 (quantity: 7).</p> <p>*** Can also be ordered separately as part number 027055 (quantity: 1).</p>		

## 90° and 45° robotic torch parts

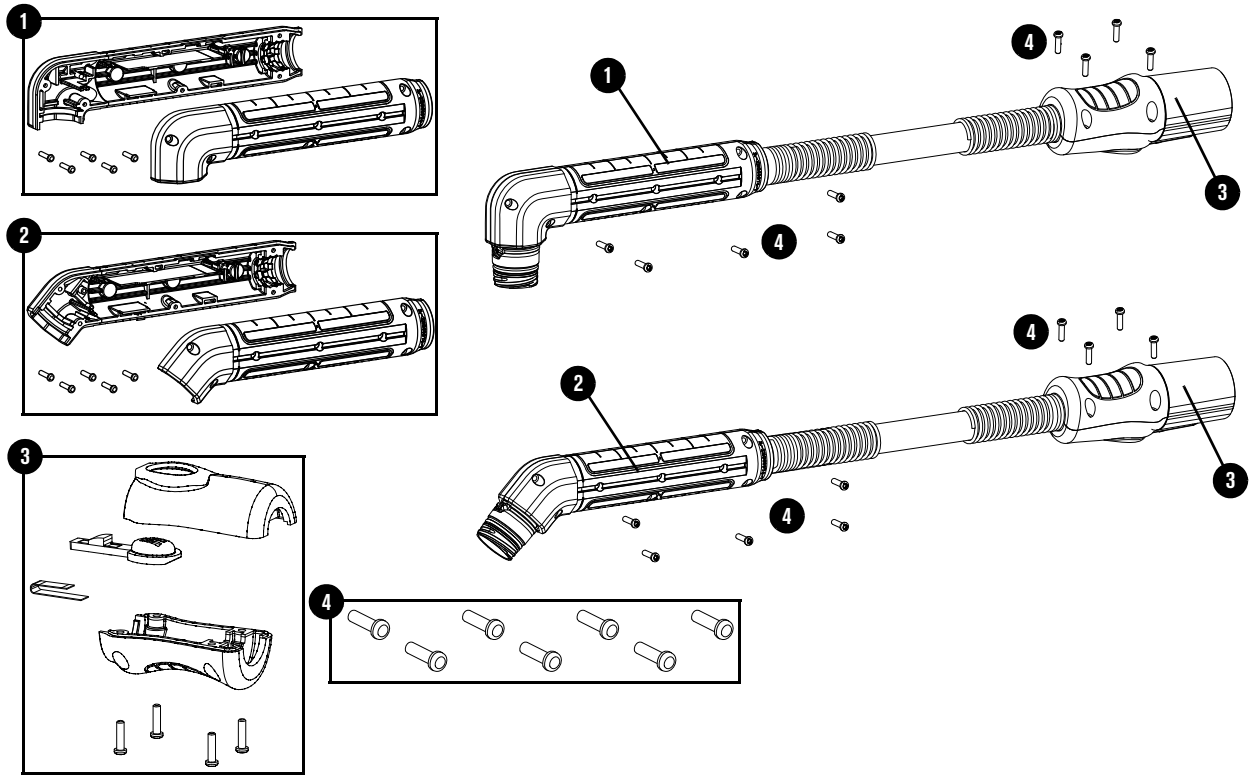
### 90° and 45° robotic torch assemblies



Item	Part number	Description
1	059731	90° robotic torch assembly with 7.6 m (25 foot) lead*
1	059732	90° robotic torch assembly with 15 m (50 foot) lead*
1	059767	90° robotic torch assembly with 23 m (75 foot) lead*
2	059729	45° robotic torch assembly with 7.6 m (25 foot) lead*
2	059730	45° robotic torch assembly with 15 m (50 foot) lead*
2	059766	45° robotic torch assembly with 23 m (75 foot) lead*

\* The torch assembly does not include a cartridge. For a full list of the cutting and gouging cartridges available, refer to the *Powermax65/85/105 SYNC Parts Guide* (810490).

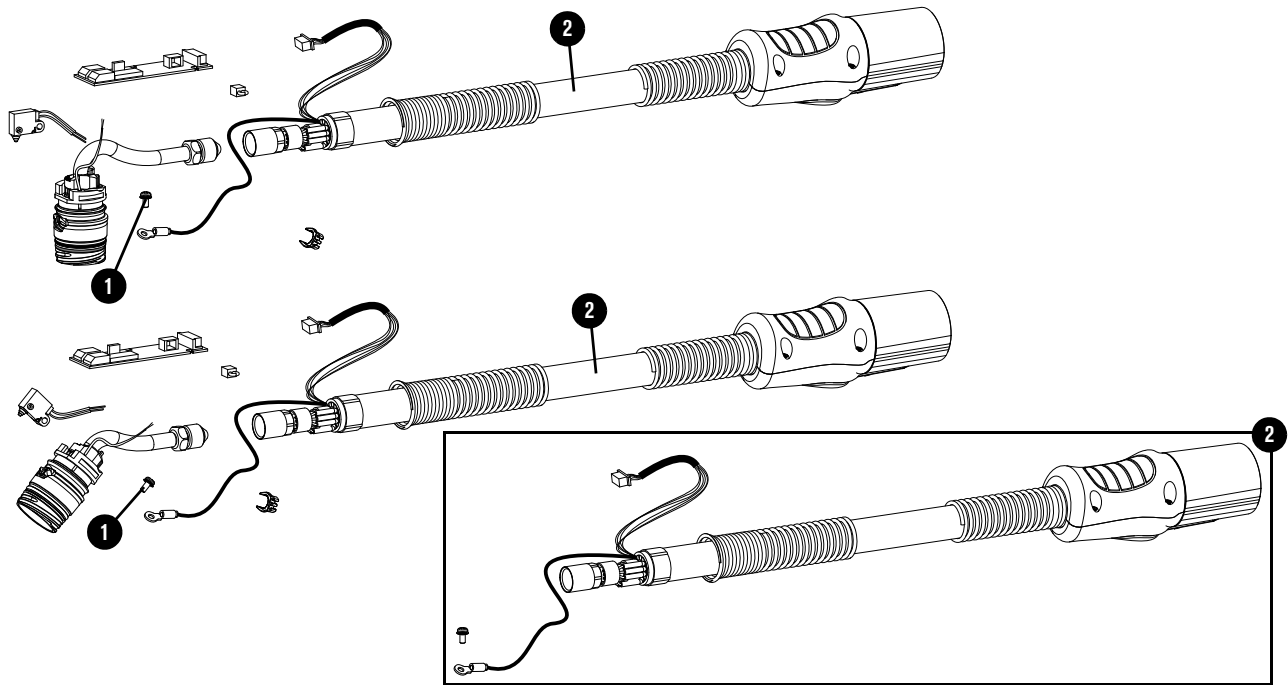
## 90° and 45° robotic torch exterior parts



Item	Part number	Description and kit contents
1	428898	Kit: Shell for 90° robotic torch
	101481	Shell for 90° robotic torch
	075714	Screws for shell* (5)
2	428897	Kit: Shell for 45° robotic torch
	101480	Shell for 45° robotic torch
	075714	Screws for shell* (5)
3	428863	Kit: Quick-disconnect shell (shell with button – does not include torch lead or connector)
	420565	Shell for torch quick-disconnect
	220681	Latch with red button
	127197	Lever for latch
	075714	Screws for shell* (4)
4	428148	Kit: Screws for torch shell
	075714	Screws for torch handle or quick-disconnect shell (7)

\* Can also be ordered separately as kit 428148 (quantity: 7).

## 90° and 45° robotic torch lead and terminal screw

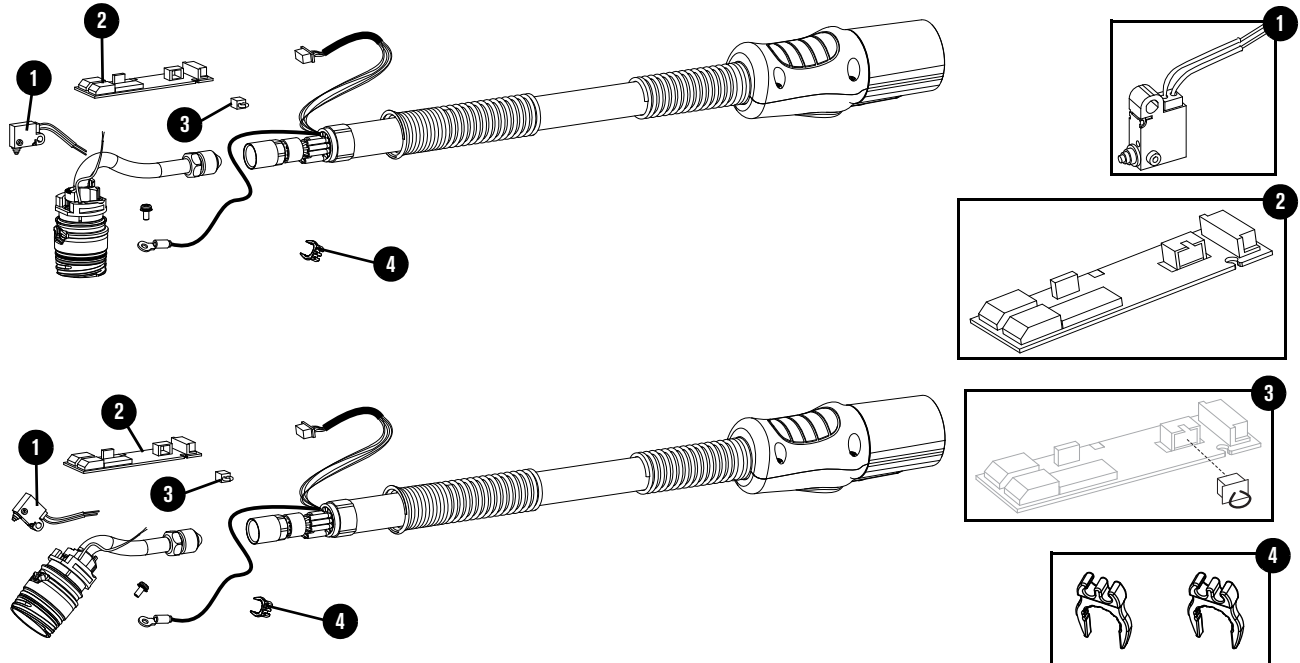


Item	Part number	Description and kit contents
1	075903	Terminal screw (1/4 inch) for pilot arc wire
2	428900	Kit: Lead for mini machine and robotic torch, 7.6 m (25 foot)
	428903	Kit: Lead for mini machine and robotic torch, 15 m (50 foot)
	428904	Kit: Lead for mini machine and robotic torch, 23 m (75 foot)
	229967	Lead for kit 428900, 7.6 m (25 foot)
	229969	Lead for kit 428903, 15 m (50 foot)
	229970	Lead for kit 428904, 23 m (75 foot)
	210735	Data plate: SmartSYNC torch (not shown)
	210729	Label: SmartSYNC torch lead (not shown)
	075903	Terminal screw (1/4 inch) for pilot arc wire*

\* Can also be ordered separately as part number 075903 (quantity: 1).



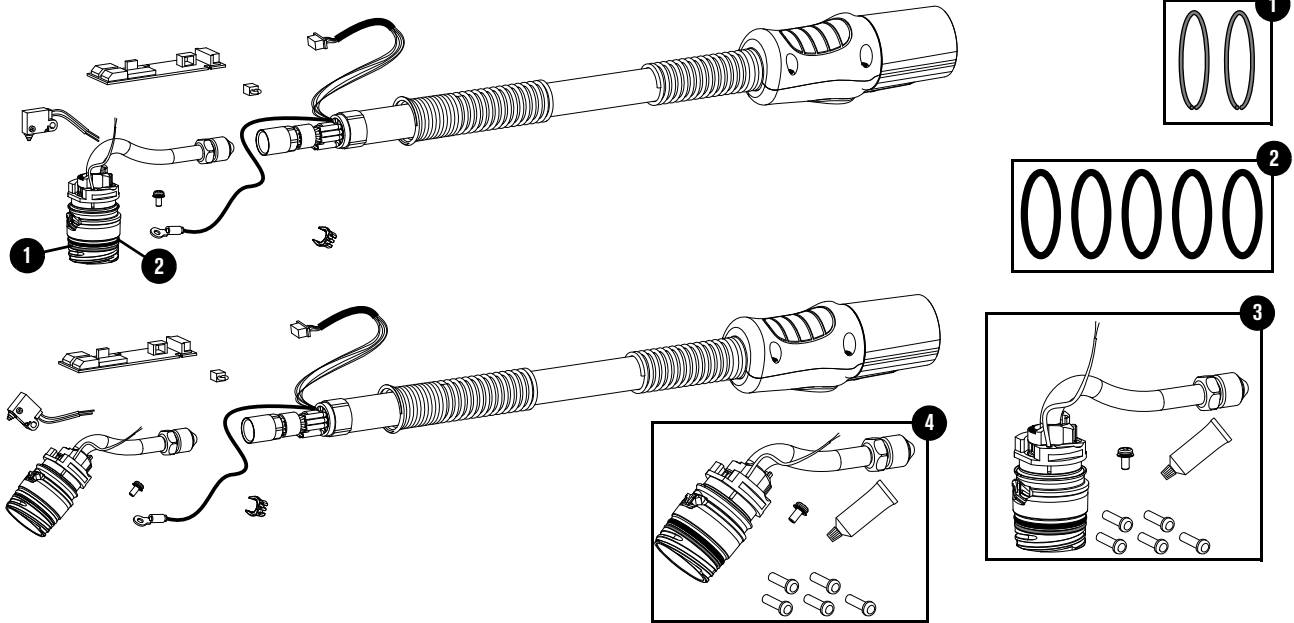
### 90° and 45° robotic switch and PCB



Item	Part number	Description
1	428867	Kit: Cap-sensor switch for mini machine or robotic torch
	005723	Cap-sensor switch for mini machine or robotic torch
2	428870	Kit: Torch RF PCB for full-length, mini machine, or robotic torch
	141466	RF torch PCB for full-length, mini machine, or robotic torch
3	428899	Kit: Jumper wire for RF torch PCB for mini machine or robotic torch*
	005724	Jumper wire for RF torch PCB for mini machine or robotic torch
4	428877	Kit: Clip for RF wires
	104912	Clip for RF wires (2)

\* Does not include RF torch PCB.

## 90° and 45° robotic torch body and O-ring



Item	Part number	Description
1	528066	Kit: Torch contact ring (for torch head)
	420931	Torch contact ring (2)
2	428950	Kit: O-rings for torch body
	058021	O-ring for any SmartSYNC torch (5)
3	428862	Kit: Body for 90° robotic torch
	420756	Main body replacement for 90° robotic torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle** (5)
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***
4	428861	Kit: Body for 45° robotic torch
	420755	Main body replacement for 45° robotic torch
	075903	Terminal screw (1/4 inch) for pilot arc wire*
	075714	Screws for torch handle** (5)
	027055	Silicone lubricant, 7.4 ml (0.25 fl oz)***
<p>* Can also be ordered separately as part number 075903 (quantity: 1).</p> <p>** Can also be ordered separately as kit 428148 (quantity: 7).</p> <p>*** Can also be ordered separately as part number 027055 (quantity: 1).</p>		

## Find torch replacement parts by part number

---

Use this list to find the page number for a part number in [Service Parts](#) on page 13.

Part number .....	Page
059719.....	20
059720.....	20
059721.....	20
059722.....	20
059723.....	14
059724.....	14
059725.....	14
059726.....	14
059727.....	14
059728.....	14
059729.....	30
059730.....	30
059731.....	30
059732.....	30
059733.....	25
059734.....	25
059735.....	25
059766.....	30
059767.....	30
075903.....	18, 24, 27, 32
428148.....	15, 21, 26, 31
428156.....	16
428182.....	16
428703.....	21
428848.....	24
428849.....	24
428850.....	24
428851.....	24
428852.....	18
428853.....	18
428854.....	18
428855.....	15
428856.....	15
428857.....	17
428858.....	17
428859.....	22
428860.....	29

428861.....	34
428862.....	34
428863.....	15, 21, 26, 31
428864.....	19
428865.....	19
428866.....	23
428867.....	28, 33
428868.....	23
428869.....	19
428870.....	23, 28, 33
428871.....	16
428872.....	23
428873.....	16
428874.....	21
428877.....	19, 23, 28, 33
428896.....	26
428897.....	31
428898.....	31
428899.....	28, 33
428900.....	27, 32
428901.....	27
428903.....	27, 32
428904.....	32
428950.....	17, 22, 29, 34
428958.....	19
528066.....	17, 22, 29, 34

# 3

## ***Prepare to Do the Part Replacement***

These steps **must** be completed before you start installing a replacement part.

### **Get the replacement part kit**

---

Do one of the following:

- If you already have the kit, continue with this section.
- If you need to order the kit, refer to [Service Parts](#) on page 13.

### **Get the tools**

---

- Assorted TORX® screwdrivers
- Blade screwdriver
- Clamp
- Grounded wrist strap (or similar grounding accessory)
- Anti-static container to store PCB
- Eye protection
- 1/4-inch, 3/8-inch, 1/2-inch, and 5/8-inch wrenches (for torch body or torch lead replacement only)

## Prevent injury to yourself and others

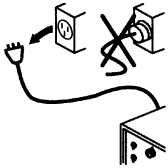
The following precautions apply to all of the procedures in this manual.

### **WARNING**



#### **ELECTRIC SHOCK CAN KILL**

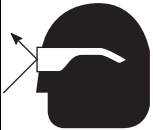
Disconnect electric power before doing installation or maintenance. You can get a serious electric shock if electric power is not disconnected. Electric shock can seriously injure or kill you.



All work that requires removal of the plasma power supply outer cover or panels must be done by a qualified technician.

Refer to the *Safety and Compliance Manual (80669C)* for more safety information.

### **CAUTION**



Wear eye protection. The trigger spring can eject from the right side of the torch handle.

## Prevent damage to the RF torch PCB

The following precaution applies to all of the procedures in this manual.

### **NOTICE**



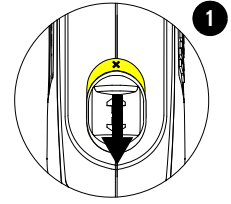
Static electricity can cause damage to printed circuit boards (PCBs). Use correct precautions when you touch PCBs.

Keep PCBs in antistatic containers.

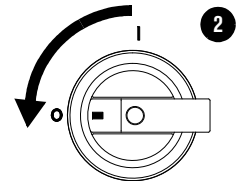
Put on a grounded wrist strap when you touch PCBs.

## Disconnect the power from the cutting system

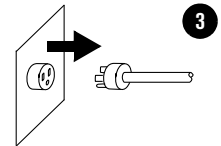
1. Lock the torch.



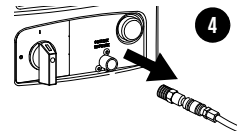
2. Set the power switch on the plasma power supply to OFF (O).



3. Disconnect the power cord from the power source.



4. Disconnect the gas supply.

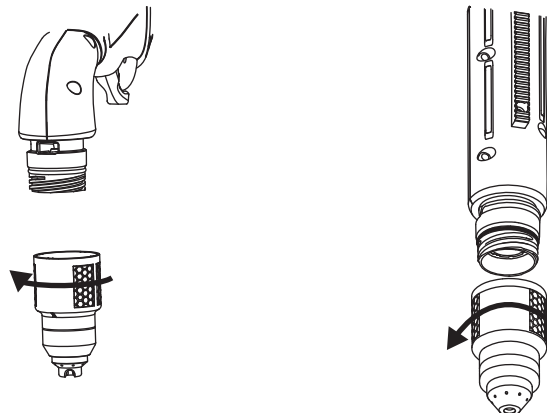


## Remove the Hypertherm cartridge

### NOTICE

To prevent damage to the cap-sensor switch, always remove the cartridge before you start any replacement procedure.

Turn the cartridge counter-clockwise to remove the cartridge.

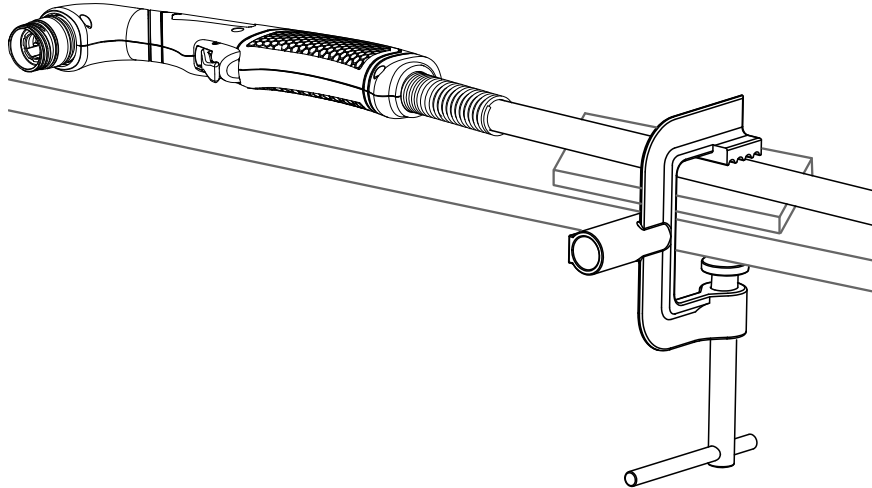


## Put a clamp on the torch lead

---

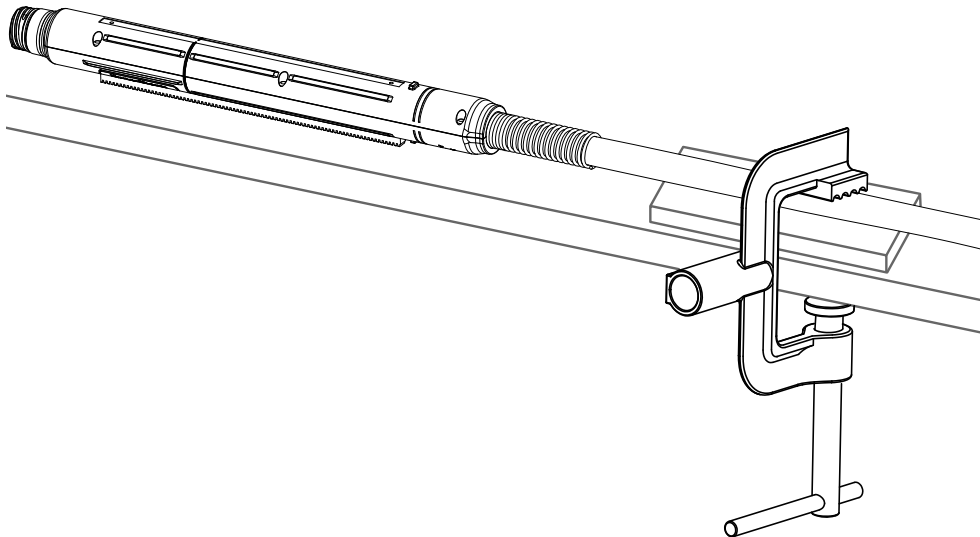
1. Put the torch on a flat surface so that the left side of the torch handle or shell points up. The left side of the torch handle is the side with the screws.
2. Put a clamp on the torch lead to hold the torch in position. Put the clamp 150 mm – 300 mm (6 inches – 12 inches) from the torch handle or shell.


**Figure 1** – 75° hand torch with clamp



 This figure shows a 75° hand torch but the procedure is the same for all torches.

**Figure 2** – Full-length machine torch with clamp



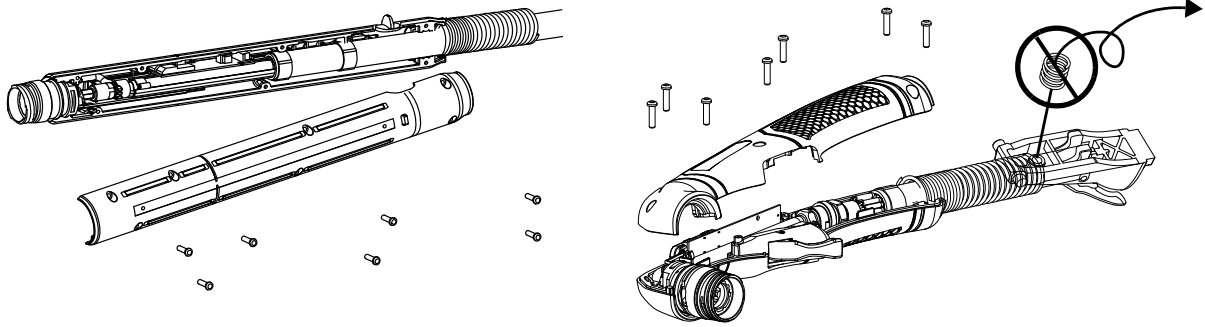
 This figure shows a full-length machine torch but the procedure is the same for all torches.



## Remove the left side of the torch handle or shell

---

1. Remove the screws from the torch handle.
2. Lift the left side of the torch handle away from the torch. For a hand torch, do not let the trigger spring eject from the torch handle.
3. Remove the left side of the torch handle.



## Get a photograph of the torch

---

If possible, get a photograph of the torch components in their correct positions. You can use the photograph as a reference as you replace parts.

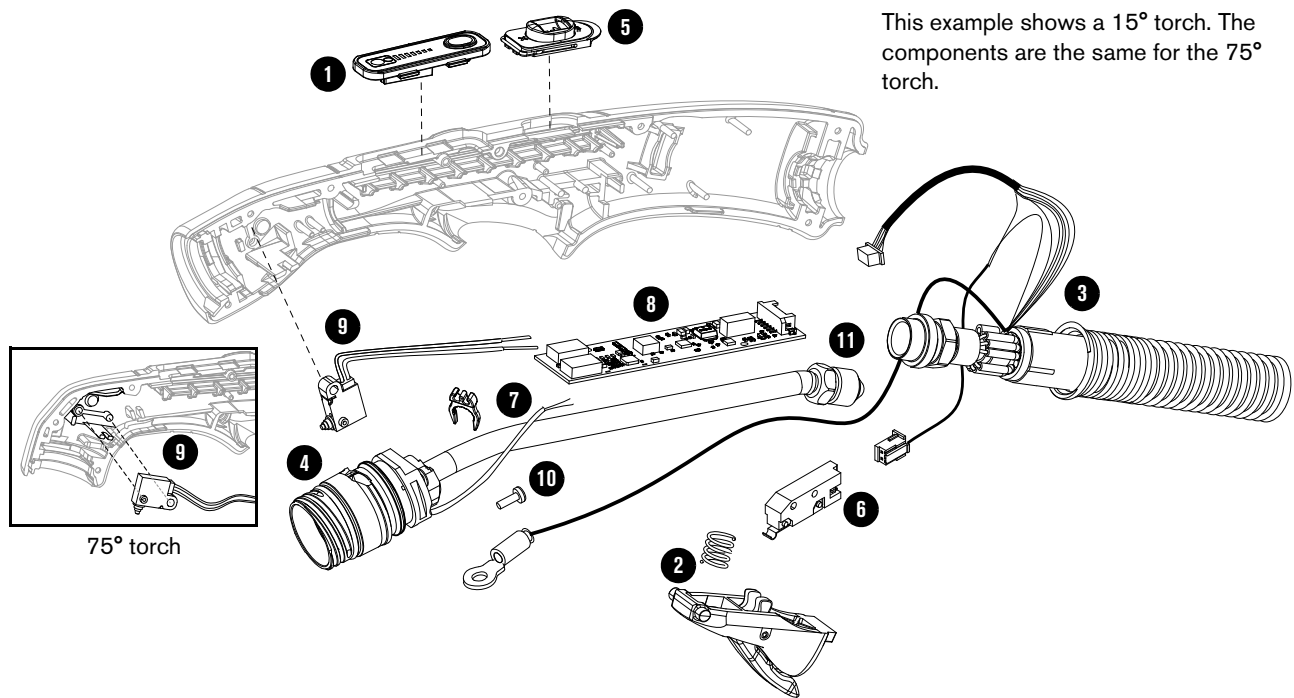


### **3** *Prepare to Do the Part Replacement*

# 4

## Hand Torch Part Replacement Procedures

Figure 3 – 15° and 75° hand torch components



This example shows a 15° torch. The components are the same for the 75° torch.

- 1 Amperage-adjustment control
- 2 Trigger and trigger spring
- 3 Torch lead
- 4 Torch body
- 5 Torch-lock slider
- 6 Start switch

- 7 Radio-frequency (RF) wire and clip
- 8 RF torch PCB
- 9 Cap-sensor switch
- 10 Pilot terminal screw
- 11 Gas fitting

## Disassemble the hand torch

---

This procedure shows how to fully disassemble the torch. This includes removal of all of the torch components from the right side of the torch handle, and how to disconnect all of the wires.

**It is not always necessary to fully disassemble the torch.** Only remove and disconnect the components and wires that you must for each replacement part.

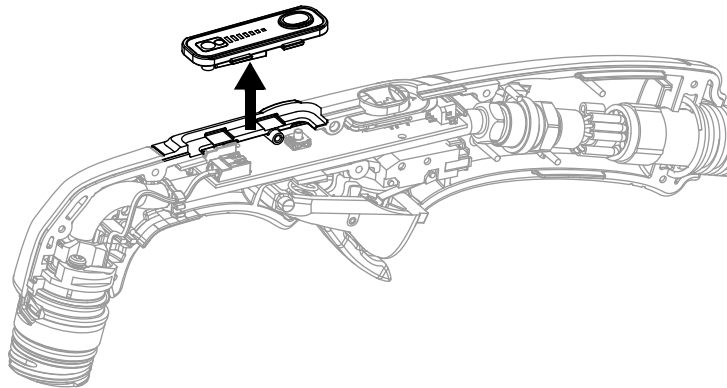
### Before you begin

Complete the procedures in [Prepare to Do the Part Replacement](#) on page 37:

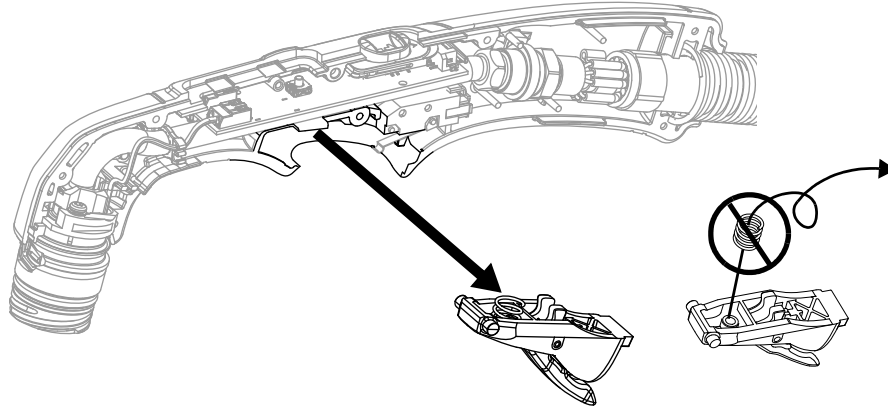
1. [Disconnect the power from the cutting system](#) on page 39.
2. [Remove the Hypertherm cartridge](#) on page 39.
3. [Put a clamp on the torch lead](#) on page 40.
4. [Remove the left side of the torch handle or shell](#) on page 41.
5. [Get a photograph of the torch](#) on page 41.

### Remove the components from the torch handle

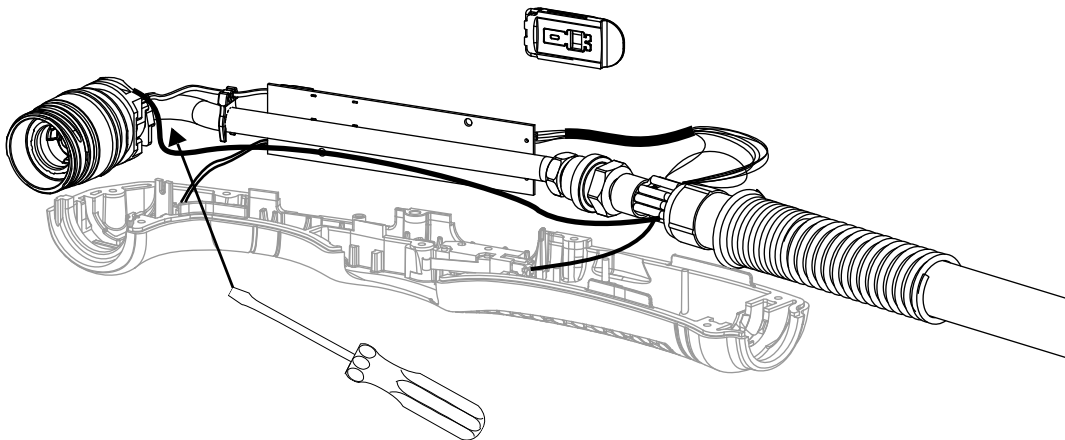
1. Lift the amperage-adjustment control out of the torch handle.



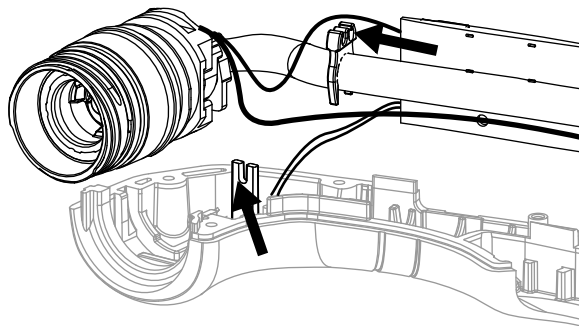
- Keep the trigger spring compressed with your finger while you remove the trigger and spring from the right side of the torch handle. Do not let the trigger spring eject from the torch handle.



- Carefully lift the torch lead, body, PCB, and attached wires from the right side of the torch handle. Use a screwdriver as a lever under the torch body to help you remove the torch body. **Do not bend the gas tube. Do not pinch wires between the screwdriver and the torch handle.**



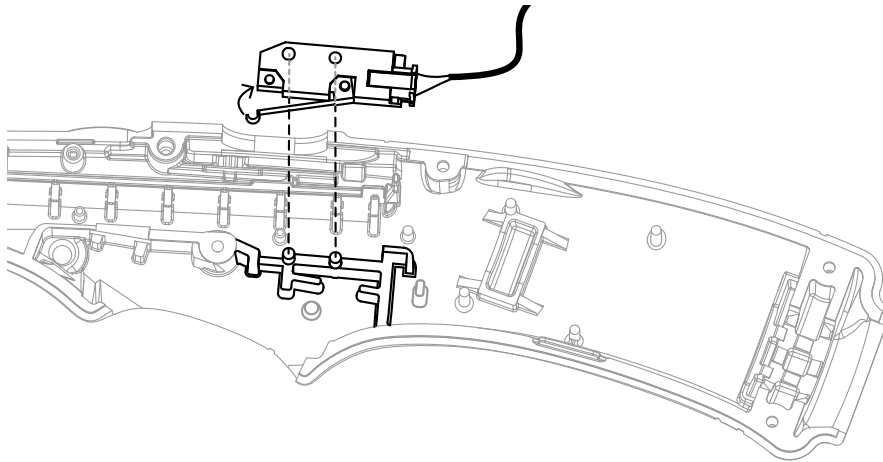
- Remove the torch-lock slider.
- Lift the RF wire out of the RF wire routing post and RF wire clip.



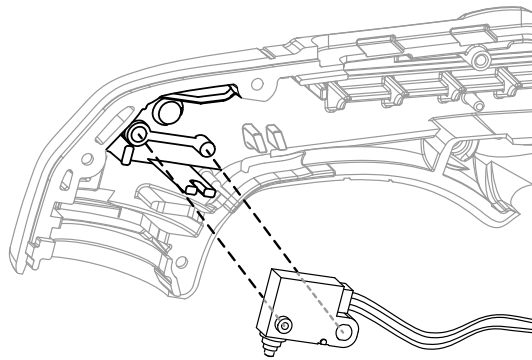
- Remove the RF wire clip.

## 4 Hand Torch Part Replacement Procedures

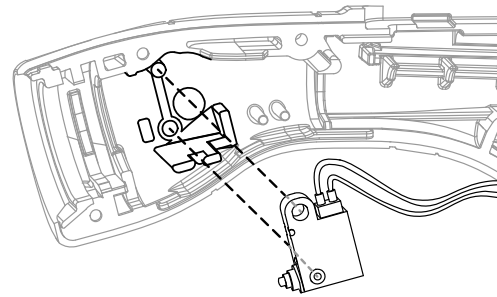
7. Push the metal lever against the start switch, and then lift the start switch off of the mounting posts.



8. Pull the cap-sensor switch off of the cap-sensor switch mounting stud.



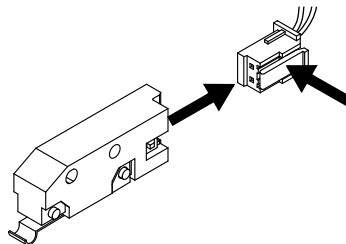
75° hand torch



15° hand torch

### Disconnect the torch components

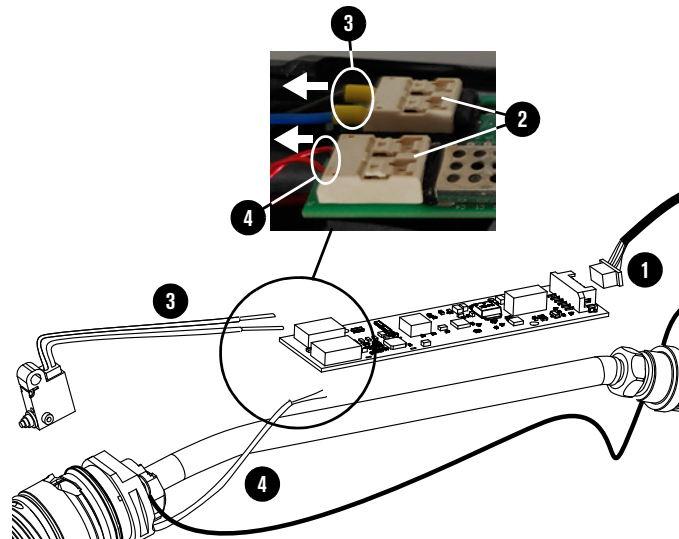
1. Remove the wire connector from the start switch. Push the plastic lever, and pull the wire connector out of the start switch.



2. Remove the 6-wire connector from the receptacle on the RF torch PCB. Do not pull the wires. Refer to [Figure 4](#) on page 47 for location.

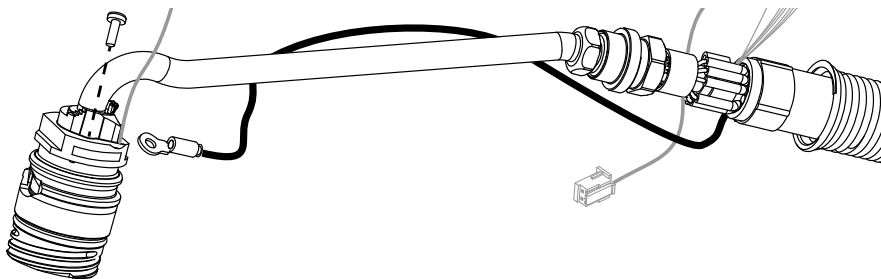
- 3.** Remove the wires from the 2-pin receptacles on the RF torch PCB. One wire at a time, push the lever on the 2-pin wire receptacle while you pull the wire straight out of the receptacle. It can be necessary to use some force, or push the wire into the receptacle before you pull it out. Refer to [Figure 4](#) on page 47 for location.
  - a.** Remove the blue and black cap-sensor switch wires from the receptacle.
  - b.** Remove the 2 red RF wires from the receptacle.

**Figure 4** – RF torch PCB connections for hand torch



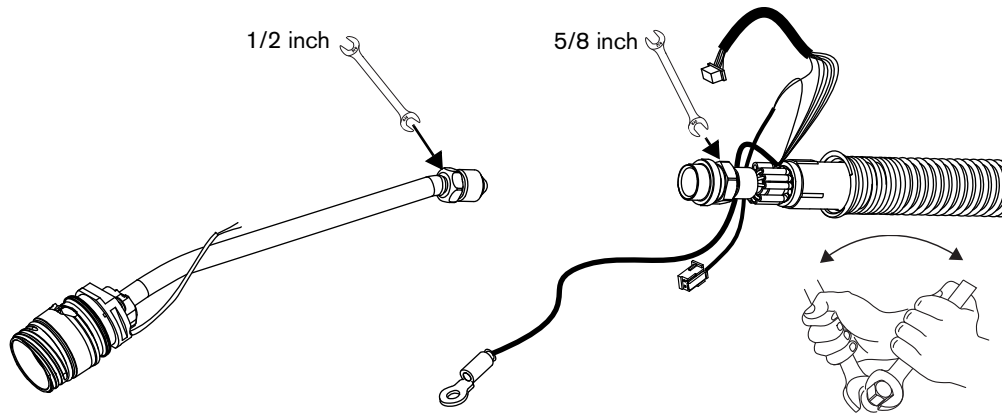
- |                         |  |
|-------------------------|--|
| 1 6-wire connector      | 3 Blue and black cap-sensor switch wires |
| 2 2-pin wire receptacle | 4 Red RF wires                           |

- 4.** Put the RF torch PCB in an anti-static container, unless you are replacing the RF torch PCB.
- 5.** Remove the pilot terminal screw.



## 4 Hand Torch Part Replacement Procedures

6. Use a 1/2-inch wrench and a 5/8-inch wrench to disconnect the gas fitting. The gas fitting is assembled in the factory using thread locker. Hypertherm recommends that you use some heat to loosen the gas fitting. **Do not overheat the torch wires.**



### **NOTICE**



To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

### **NOTICE**

Do not bend the gas tube. If you bend the gas tube, you will not be able to install the torch body in the torch handle again because it will not fit correctly.

### **NOTICE**

To prevent damage to the torch wires, do not overheat the torch wires.



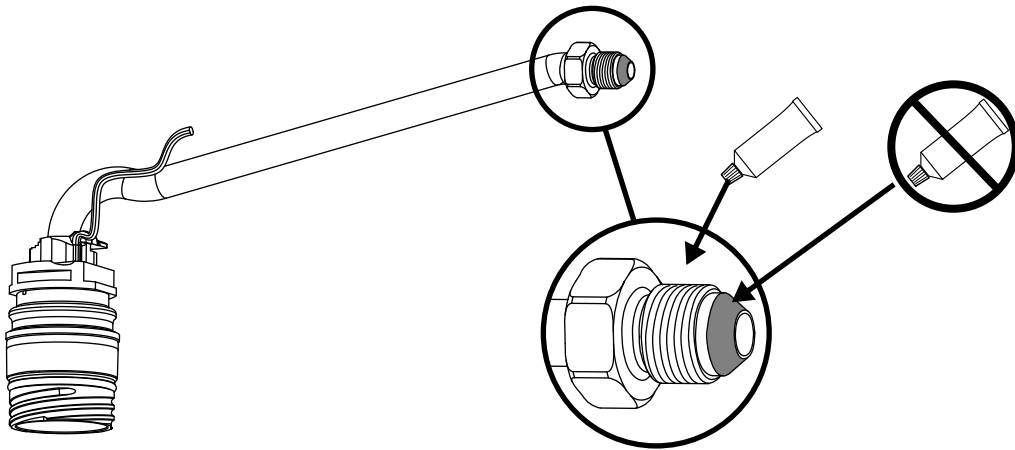
## Assemble the hand torch

This procedure shows how to fully assemble the torch. This includes installation of all of the torch components into the right side of the torch handle, and how to connect all of the wires.

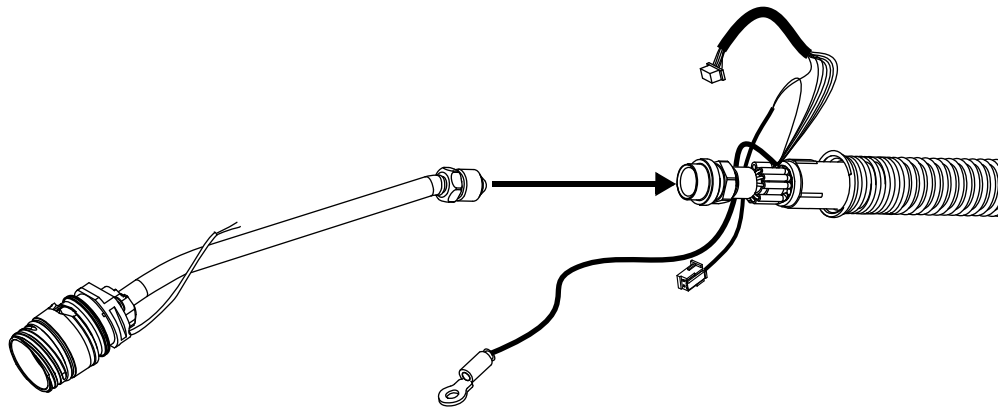
**It is not always necessary to fully disassemble the torch to do the part replacement procedure.** Do only the steps that are applicable.

### Connect the torch components

1. Apply a small quantity of thread locker to the first 2 or 3 threads of the gas fitting on the torch body. **Do not get thread locker on the conical surface of the fitting.**



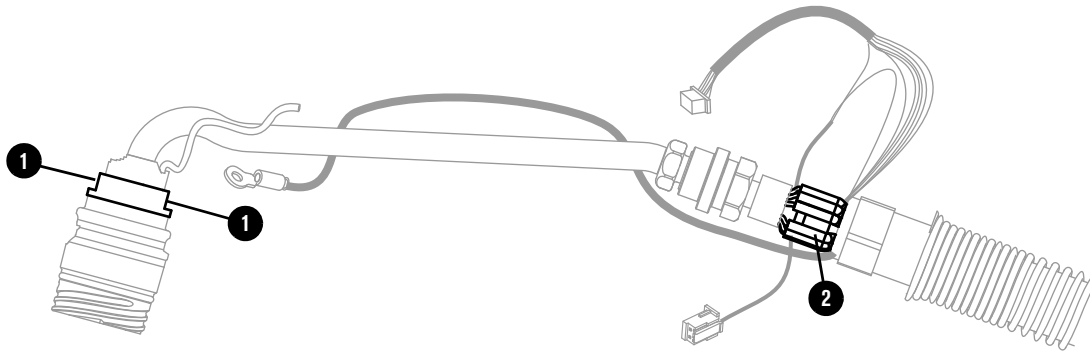
2. Attach the torch body to the torch lead as follows:
  - a. Tighten the gas fitting with your hand.



- b. Put the torch body and torch lead on a flat surface.
- c. Make sure that the flat sides of the torch body point up.

## 4 Hand Torch Part Replacement Procedures

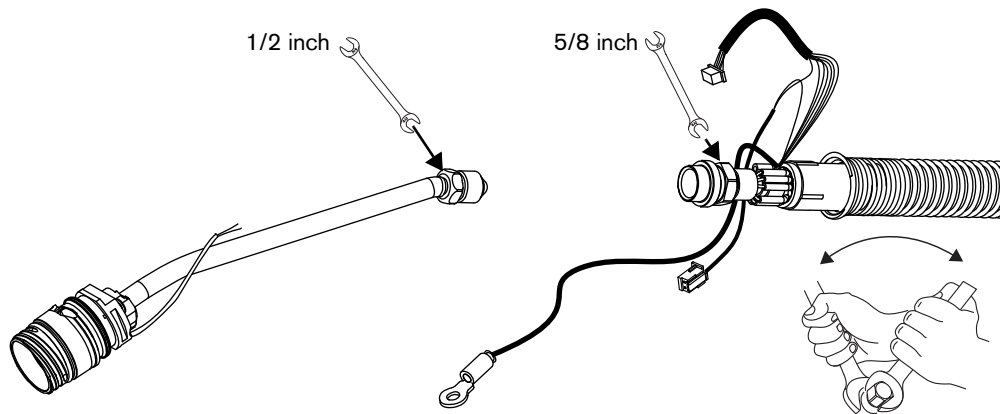
- d. Make sure that the white wires of the torch lead point up.



1 Flat sides of the torch body

2 White wires

- e. Use a 1/2-inch wrench and a 5/8-inch wrench to tighten the gas fitting. Tighten to 6.78 N·m (60 lbf·in). Do not tighten too much. Make sure that the torch body and torch lead stay aligned.



### NOTICE

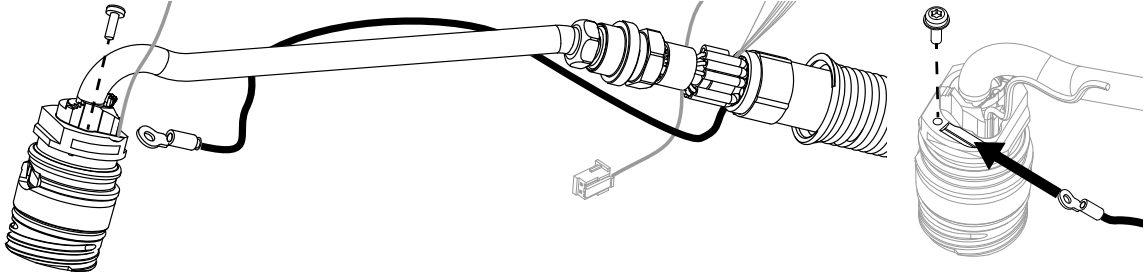


To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

### NOTICE

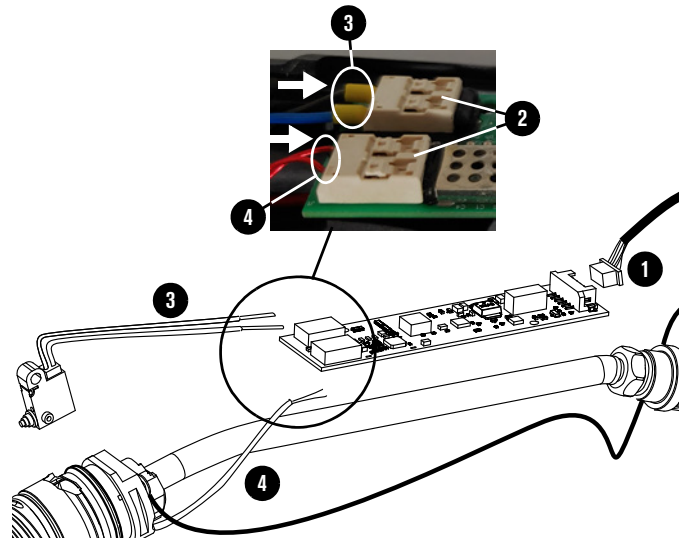
Do not bend the gas tube. If you bend the gas tube, you will not be able to install the torch body in the torch handle again because it will not fit correctly.

- 3.** Install the pilot terminal screw as follows:
  - a.** Make sure that the routing of the pilot arc wire is correct.
  - b.** Align the ring terminal of the pilot arc wire with the slot in the torch body.
  - c.** Attach the pilot arc wire to the torch body with the pilot terminal screw. Tighten to 1.13 N·m (10 lbf·in).



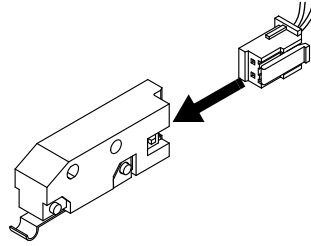
- 4.** Install the wires into the 2-pin receptacles on the RF torch PCB. Refer to [Figure 5](#) on page 51 for location.
  - a.** Push both wires of the cap-sensor switch into the 2-pin receptacle at the same time.
  - b.** Push both red RF wires into the 2-pin receptacle at the same time.
- 5.** Install the 6-wire connector into the receptacle on the RF torch PCB. Refer to [Figure 5](#) on page 51 for location.

**Figure 5** – RF torch PCB connections for hand torch



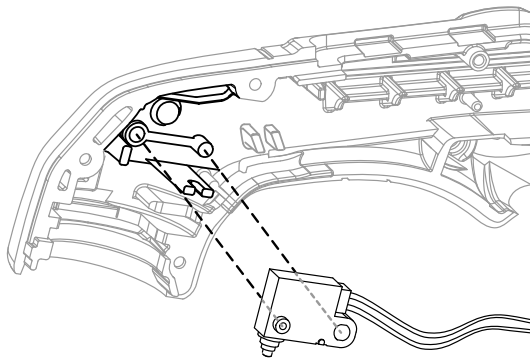
- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li><b>1</b> 6-wire connector</li> <li><b>2</b> 2-pin wire receptacle</li> </ol> | <ol style="list-style-type: none"> <li><b>3</b> Blue and black cap-sensor switch wires</li> <li><b>4</b> Red RF wires</li> </ol> |
|---|--|

6. Push the start-switch wire connector into the start switch until you hear a click.

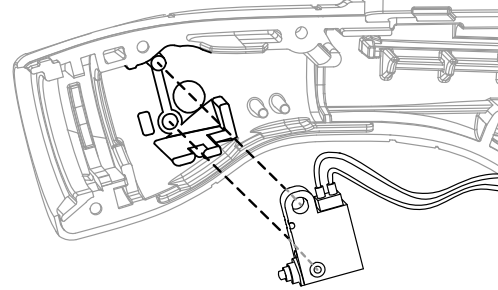


### **Install the torch components into the torch handle**

1. Put the cap-sensor switch onto the cap-sensor mounting stud in the right side of the torch handle.



75° hand torch

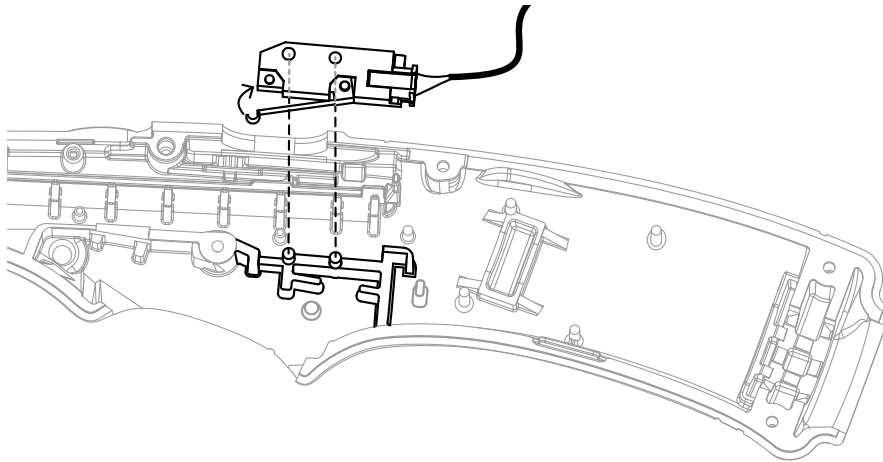


15° hand torch

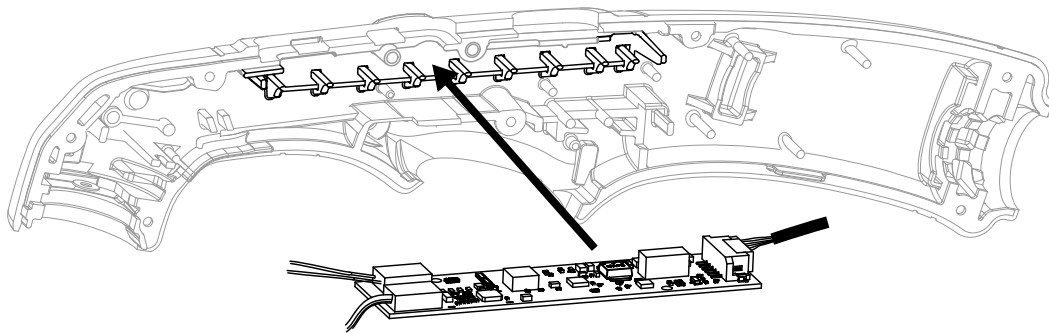
### **NOTICE**

Keep the cap-sensor switch flat in relation to the torch handle, especially with the 15° torch. The fit is tight, and you can break the cap-sensor switch if you use force.

2. Push the metal lever against the start switch, and then push the start switch onto the mounting studs in the torch handle.

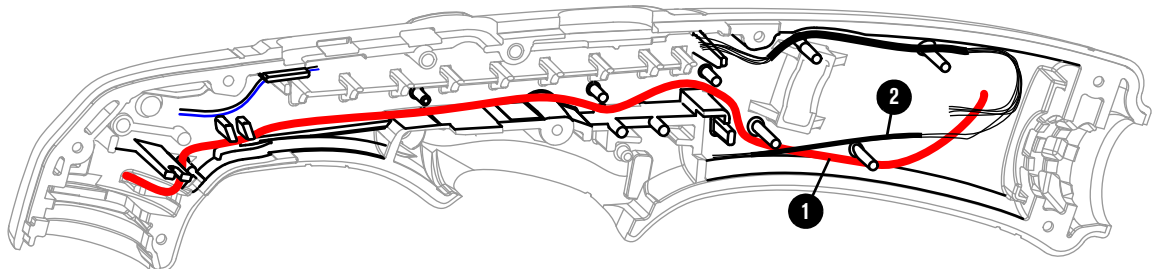


3. Align the RF torch PCB with the PCB mounting posts in the right side of the torch handle, and push the PCB loosely into the torch handle.



## 4 Hand Torch Part Replacement Procedures

4. Push the pilot arc wire and start-switch wires into the torch handle. Make sure that the routing of the wires is correct, as shown. Bend the wires as necessary, and use the wire routing studs.



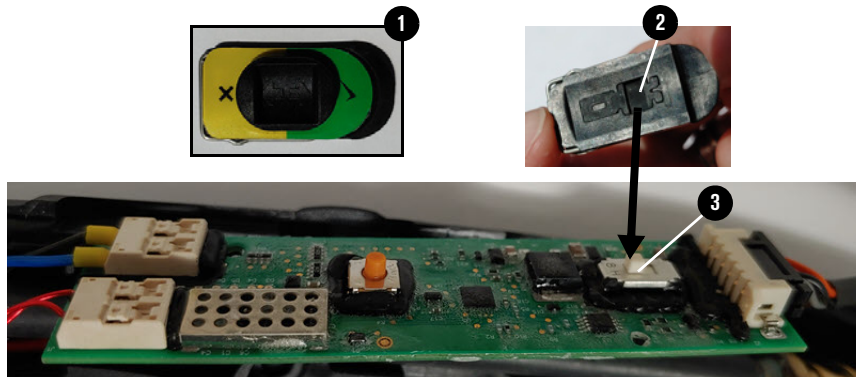
1 Pilot arc wire

2 Start-switch wires

5. Make sure that the torch-lock slider switch on the RF torch PCB is in the lock position.



6. Put the torch-lock slider on the torch-lock slider switch, with the yellow lock (X) label pointing to the torch body. Make sure that the torch-lock slider switch aligns with the recess in the bottom of the torch-lock slider.



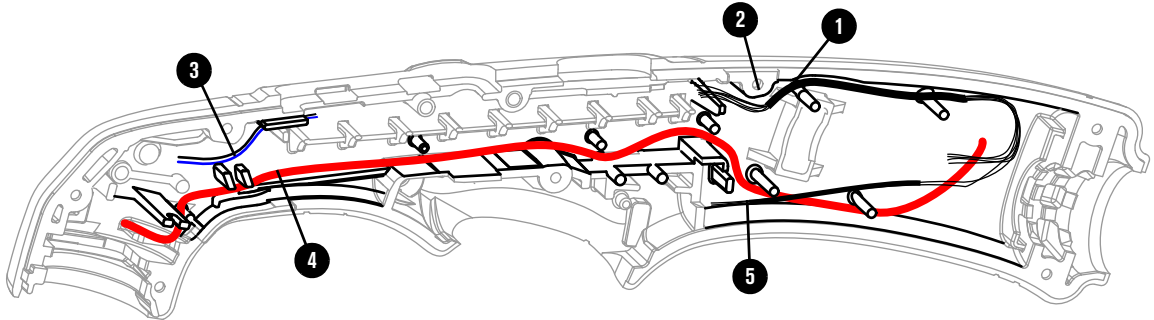
1 Torch-lock slider

3 Torch-lock slider switch

2 Recess in the torch-lock slider

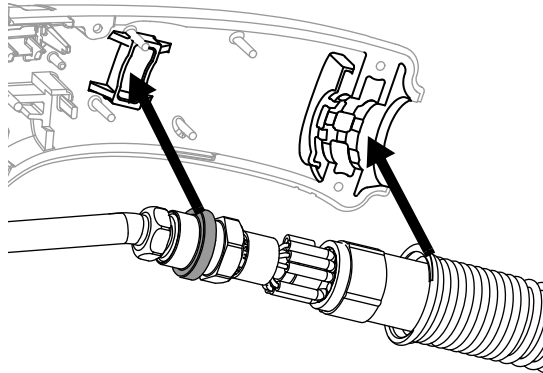
7. Hold the torch-lock slider in position and push the RF torch PCB fully into the torch handle.

8. Push the RF torch PCB and cap-sensor wires into the torch handle. Make sure that the RF torch PCB wires go around the screw boss.
9. Use the wire routing studs to make sure that the routing of all of the wires is correct, as shown.



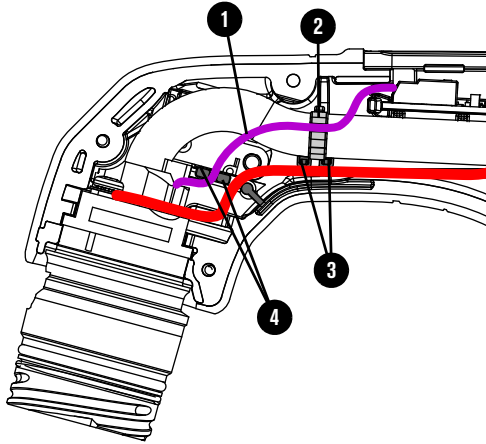
- |                      |                      |
|----------------------|----------------------|
| 1 RF torch PCB wires | 4 Pilot arc wire     |
| 2 Screw boss         | 5 Start-switch wires |
| 3 Cap-sensor wires   |                      |

10. Push the torch body fully into the torch handle.
11. Push the torch lead fully into the torch handle.
  - Push the gas hose fitting flange onto the support in the handle.
  - Align the torch lead strain relief with the recess in the handle, and push the strain relief into position.

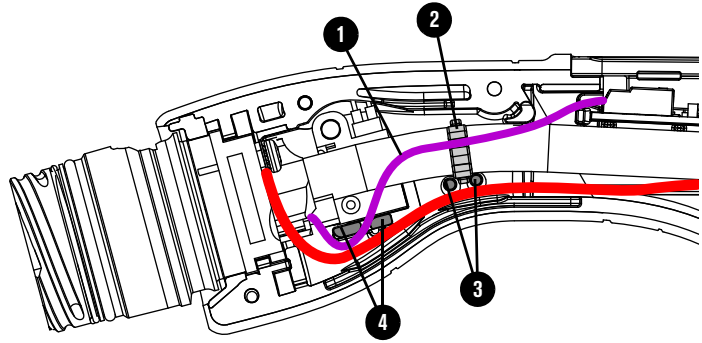


12. Push the RF wire clip onto the torch body. Make sure that the RF wire clip points up, and that the prong of the RF wire clip is between the 2 mounting studs inside the torch handle.

**13.** Put the RF wire through the routing post and into the slot in the RF wire clip.



75° hand torch



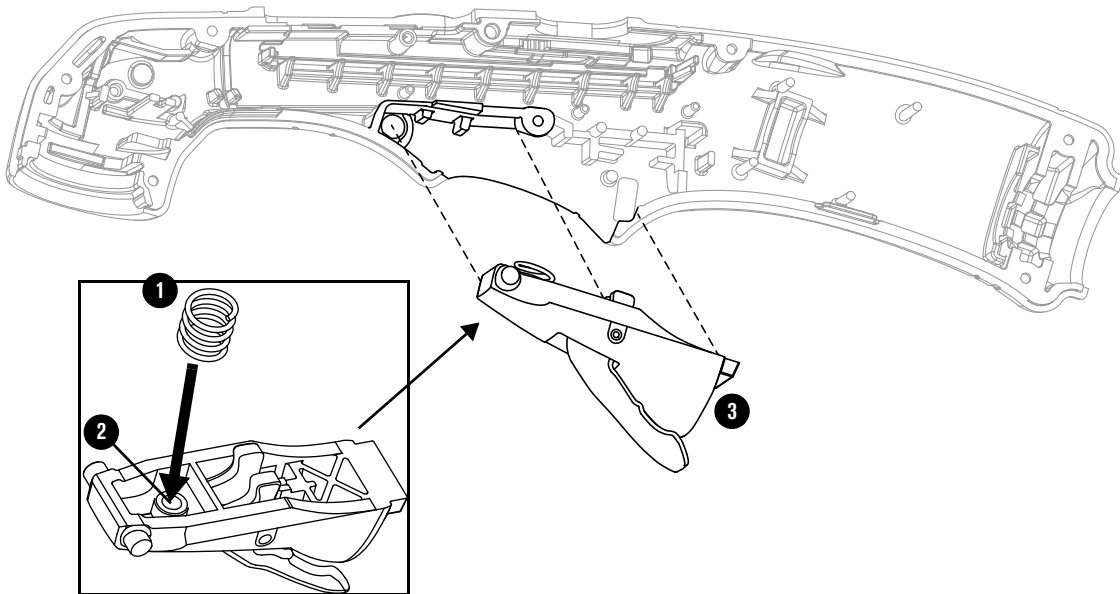
15° hand torch

- 1 RF wire
- 2 RF wire clip

- 3 2 mounting studs
- 4 Routing post

**14.** Put the trigger spring on the mounting stud in the trigger.

**15.** Fully compress the trigger spring. Keep the trigger spring compressed as you push the trigger assembly into the torch handle. Do not let the trigger spring eject from the torch handle.

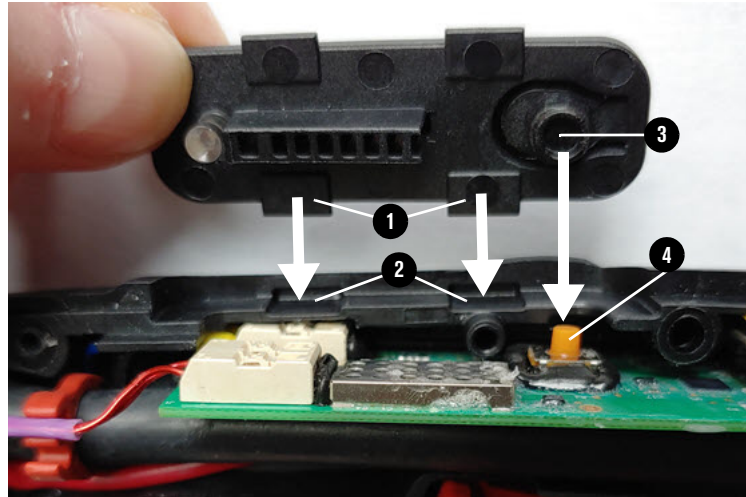


- 1 Trigger spring
- 2 Mounting stud

- 3 Trigger assembly



- 16.** Put the amperage-adjustment control into the torch handle.
  - a.** Put the 2 tabs of the amperage-adjustment control into the 2 recesses in the torch handle.
  - b.** Align the switch recess on the amperage-adjustment control with the amperage-adjustment switch on the RF torch PCB. Then put the amperage-adjustment control into position on the RF torch PCB and in the handle.



- 1 2 tabs
- 2 2 recesses

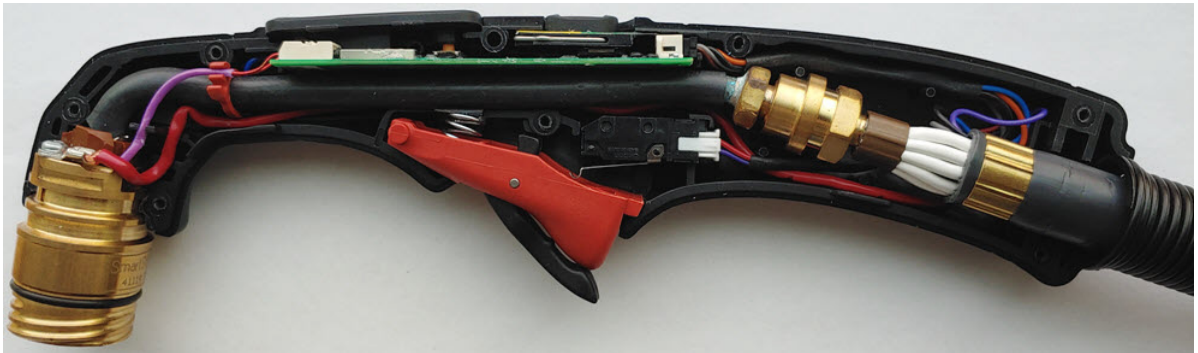
- 3 Switch recess
- 4 Amperage-adjustment switch

## Do a check of the component positions and wire routing

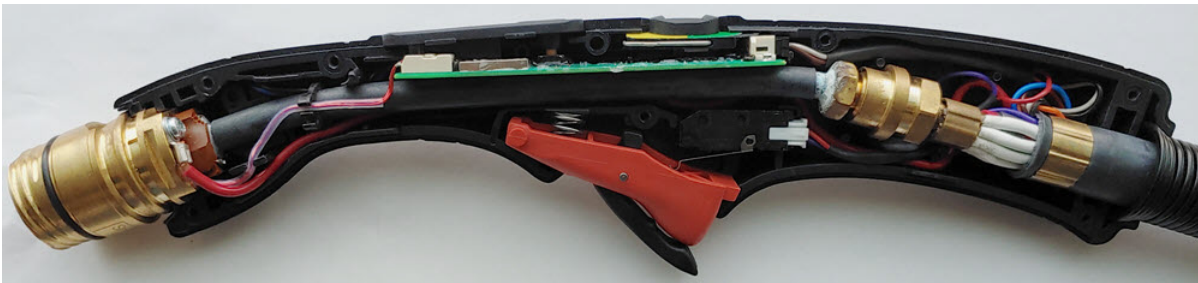
---

1. Make sure that all of the torch components are in the correct positions in the right side of the torch handle. Compare the appearance of the torch components with the photograph you got on [page 41](#), or with [Figure 6](#), [Figure 7](#), and [Figure 8](#).

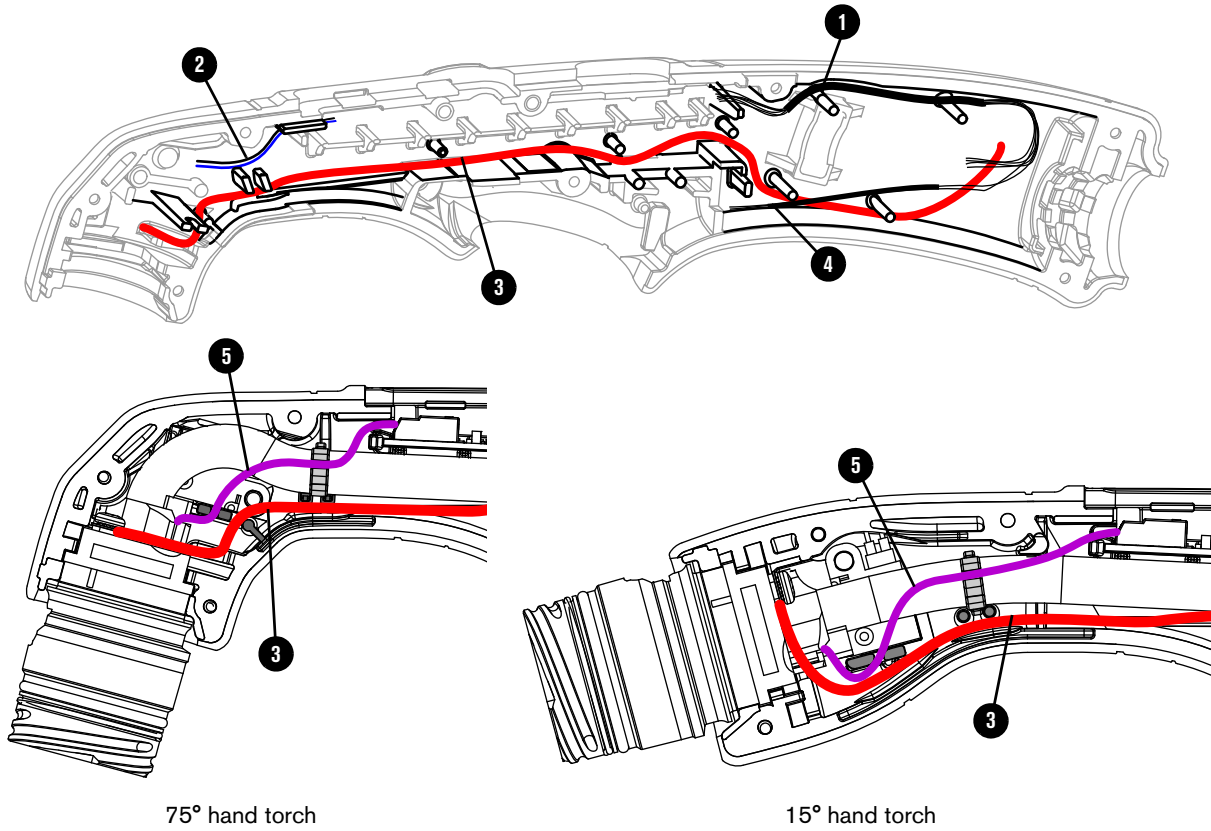
**Figure 6** – 75° hand torch components in correct positions



**Figure 7** – 15° hand torch components in correct positions



2. Make sure that the routing of all of the wires is correct, as shown.

**Figure 8** – Wire routing in correct positions

- 1 RF torch PCB wires
- 2 Cap-sensor switch wires
- 3 Pilot arc wire

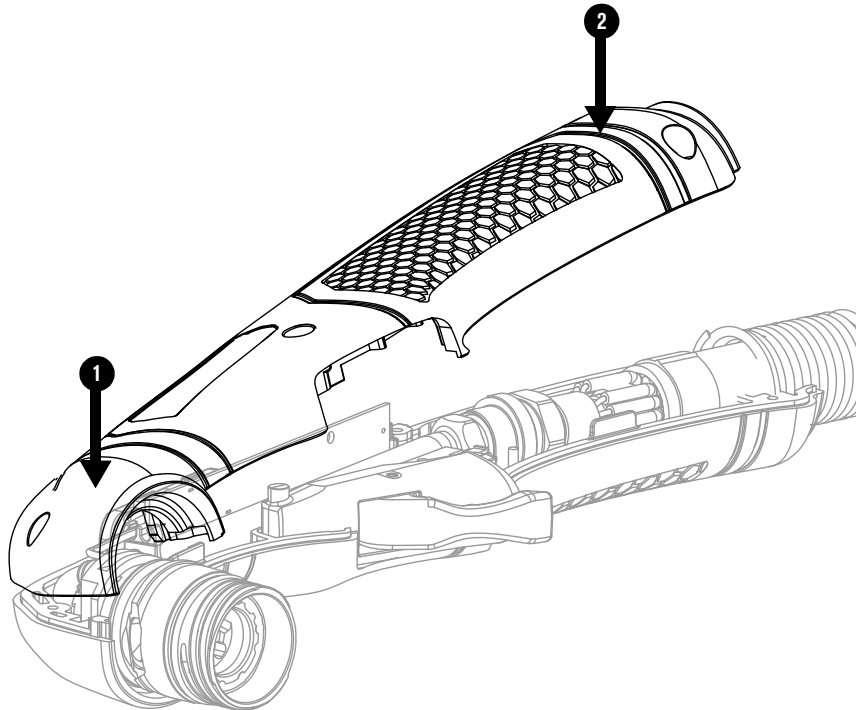
- 4 Start switch wires
- 5 RF wires

## Install the left side of the torch handle

### **NOTICE**

Do not cause damage to the wires inside the torch as you install the left side of the torch handle.

1. Align the left side of the torch handle with the right side of the torch handle. Push the left side of the torch handle onto the torch at the torch body end of the torch. Continue to push the left and right sides of the torch handle fully together.

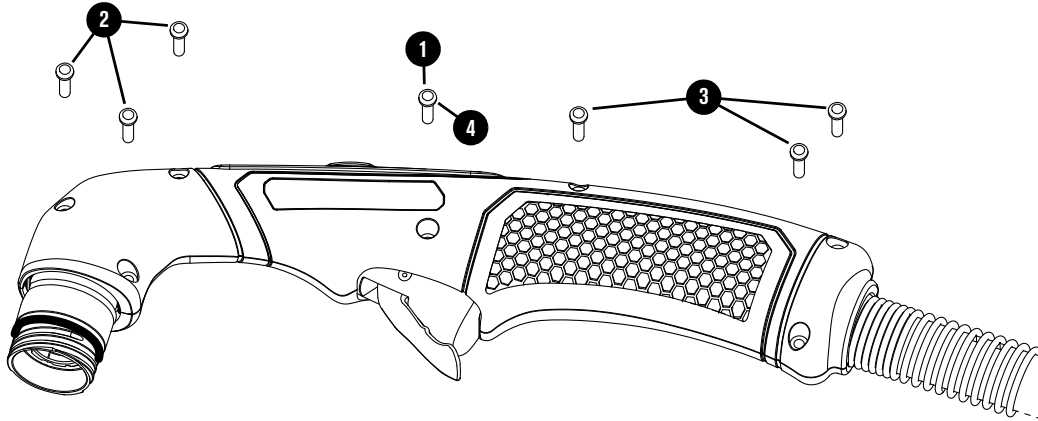


1 Torch-body end of the left torch handle

2 Torch-lead end of the left torch handle

2. Make sure that no wires are pinched between the handles. Make sure that the handles stay aligned.

3. Attach the left side of the torch handle to the right side of the torch handle with the 7 screws. Install the screws in the following sequence:
  - a. The middle of the torch.
  - b. The torch-body end of the torch.
  - c. The torch-lead end of the torch.
4. Tighten the screw in the middle of the torch handle again.



- |                               |                           |
|-------------------------------|---------------------------|
| 1 Middle of the torch         | 3 Torch-lead of the torch |
| 2 Torch-body end of the torch | 4 Middle of the torch     |

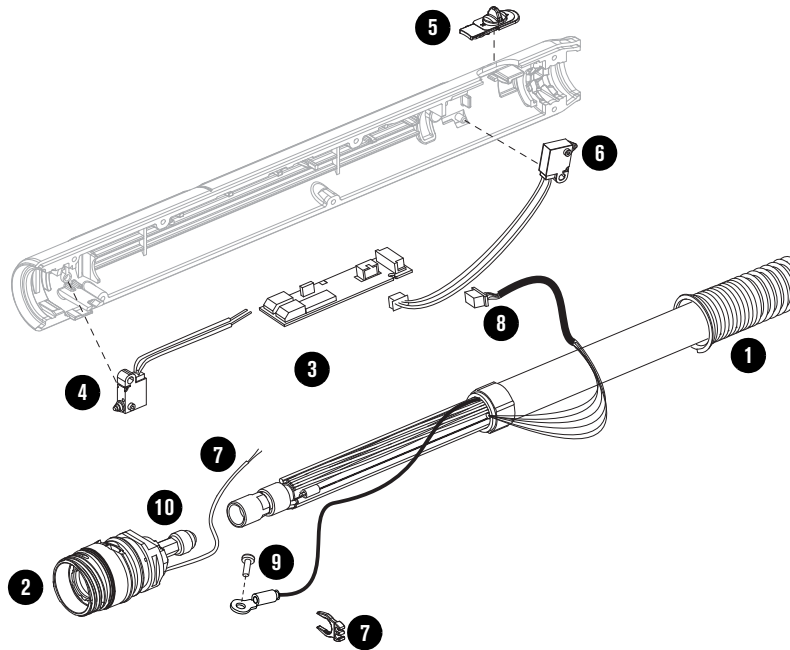
5. [Do a Check of the Torch Assembly](#) on page 97.

## **4** *Hand Torch Part Replacement Procedures*

# 5

## Full-Length Machine Torch Part Replacement Procedures

Figure 9 – Full-length machine torch components



- |                                  |   |
|----------------------------------|---|
| 1 Torch lead                     | 6 Switch assembly for torch-lock slider |
| 2 Torch body                     | 7 RF wires and clip                     |
| 3 Radio-frequency (RF) torch PCB | 8 RF torch PCB wires and connector      |
| 4 Cap-sensor switch              | 9 Pilot terminal screw                  |
| 5 Torch-lock slider              | 10 Gas fitting                          |

## Disassemble the full-length machine torch

---

This procedure shows how to fully disassemble the torch. This includes removal of all of the torch components from the right side of the torch shell, and how to disconnect all of the wires.

**It is not always necessary to fully disassemble the torch.** Only remove and disconnect the components and wires that you must for each replacement part.

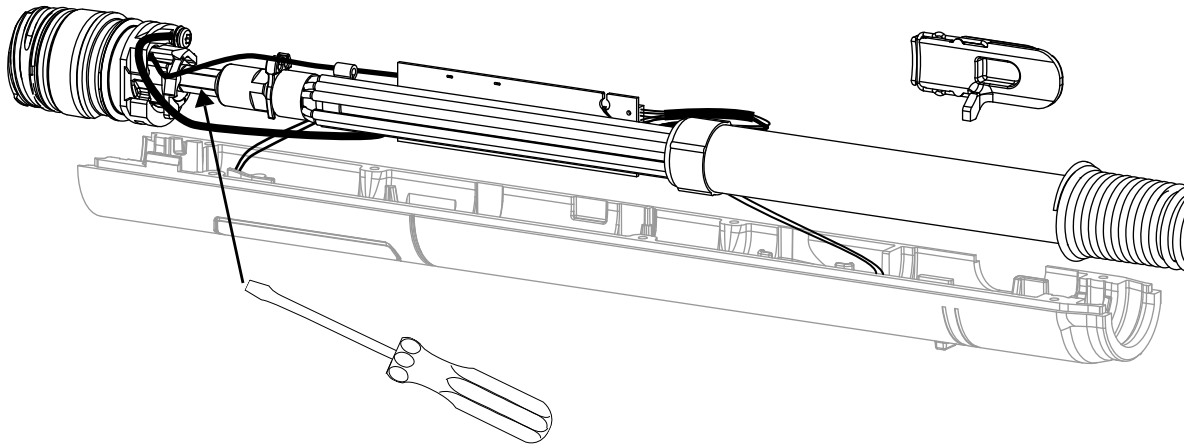
### Before you begin

Complete the procedures in [Prepare to Do the Part Replacement](#) on page 37:

1. [Disconnect the power from the cutting system](#) on page 39.
2. [Remove the Hypertherm cartridge](#) on page 39.
3. [Put a clamp on the torch lead](#) on page 40.
4. [Remove the left side of the torch handle or shell](#) on page 41.
5. [Get a photograph of the torch](#) on page 41.

### Remove the components from the torch shell

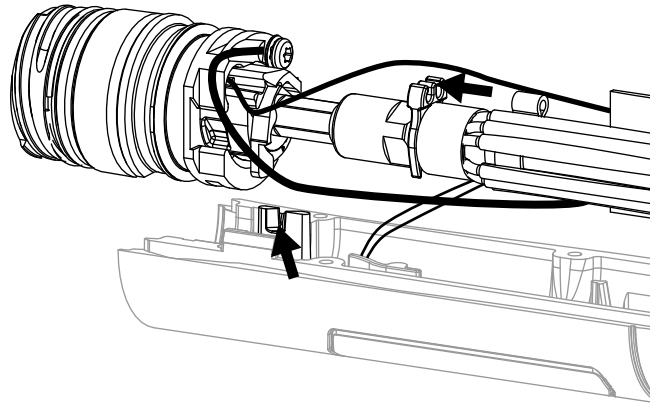
1. Carefully lift the torch lead, body, PCB, and attached wires from the right side of the torch shell. Use a screwdriver as a lever under the torch body to help you remove the torch body. **Do not pinch wires between the screwdriver and the torch shell.**



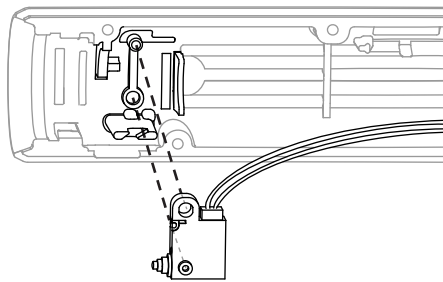
2. Remove the torch-lock slider.



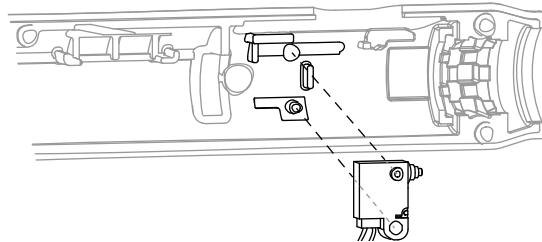
3. Lift the RF wire out of the RF wire routing post and the RF wire clip.



4. Remove the RF wire clip.
5. Pull the cap-sensor switch off of the cap-sensor switch mounting stud.



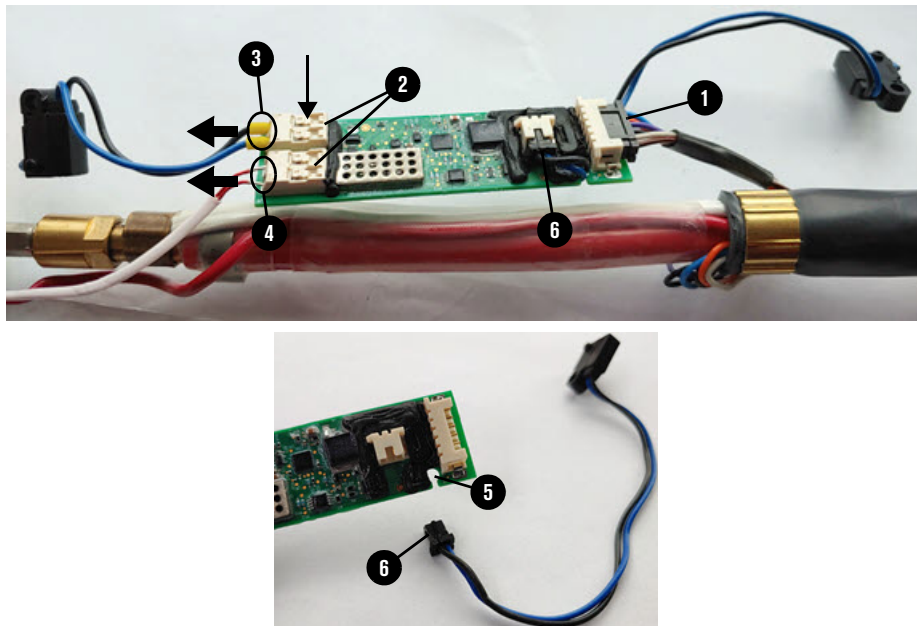
6. Pull the switch assembly for the torch-lock slider off of the switch mounting stud.



## Disconnect the torch components

1. Remove the 6-wire connector from the receptacle on the RF torch PCB. Do not pull the wires. Refer to [Figure 10](#) on page 66 for location.
2. Remove the wires from the 2-pin receptacles on the RF torch PCB. One wire at a time, push the lever on the 2-pin wire receptacle while you pull the wire straight out of the receptacle. It can be necessary to use some force, or push the wire into the receptacle before you pull it out. Refer to [Figure 10](#) on page 66 for location.
  - a. Remove the blue and black cap-sensor switch wires from the receptacle.
  - b. Remove the 2 red RF wires from the receptacle.
3. One wire at a time, remove the blue and black torch-lock switch wires from the notch in the RF torch PCB. Then pull the torch-lock switch connector out of the receptacle. Use your fingernails to pull out the connector. Do not pull the wires. Refer to [Figure 10](#) on page 66 for location.

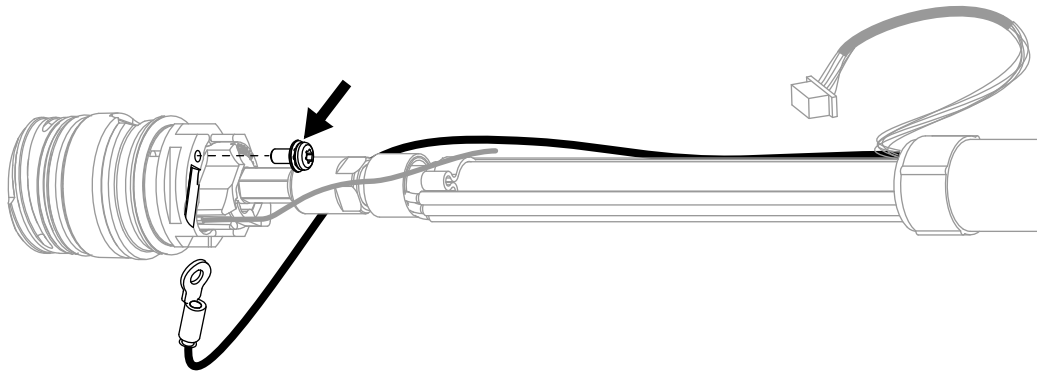
**Figure 10** – RF torch PCB connections for full-length machine torch



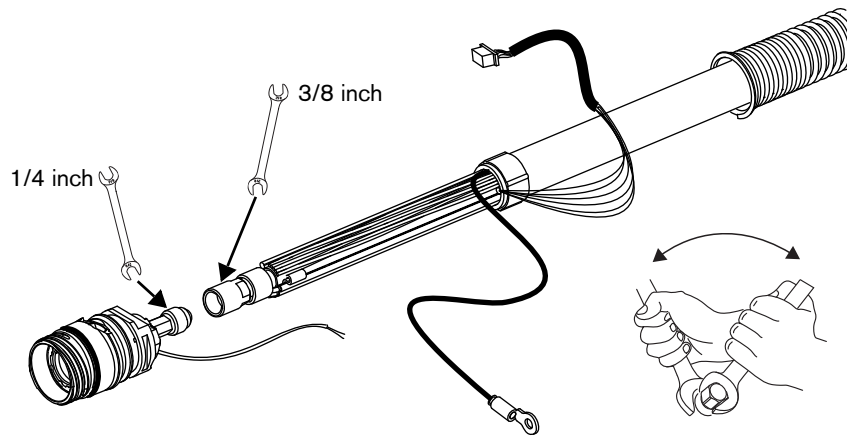
- |  |                               |
|--|-------------------------------|
| 1 6-wire connector                       | 4 Red RF wires                |
| 2 2-pin wire receptacle                  | 5 Notch in the RF torch PCB   |
| 3 Blue and black cap-sensor switch wires | 6 Torch-lock switch connector |

4. Put the RF torch PCB in an anti-static container, unless you are replacing the RF torch PCB.

5. Remove the pilot terminal screw.



6. Use a 1/4-inch wrench and a 3/8-inch wrench to disconnect the gas fitting. **Do not strip the gas fitting.**



## NOTICE



To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

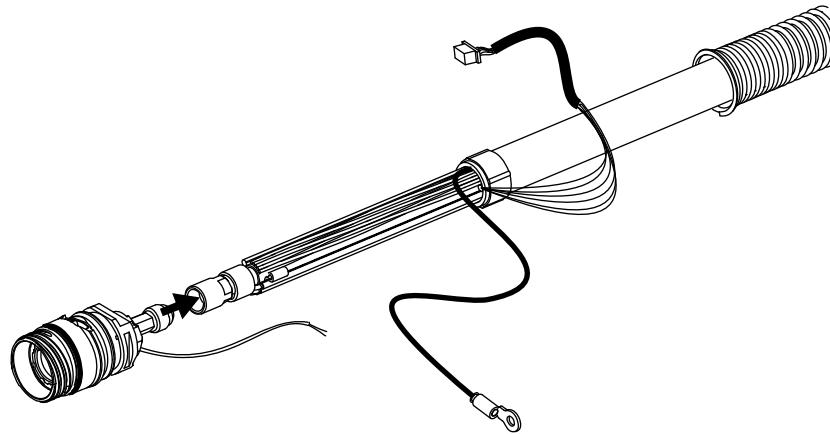
## Assemble the machine torch

This procedure shows how to fully assemble the torch. This includes installation of all of the torch components into the right side of the torch shell, and how to connect all of the wires.

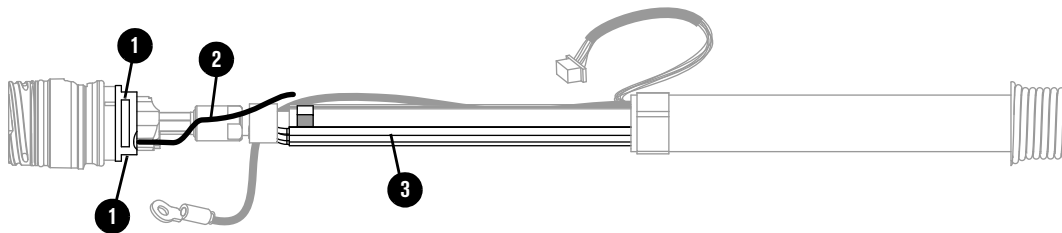
**It is not always necessary to fully disassemble the torch to do the part replacement procedure.** Do only the steps that are applicable.

### Connect the torch components

1. Attach the torch body to the torch lead as follows:
  - a. Tighten the gas fitting with your hand.



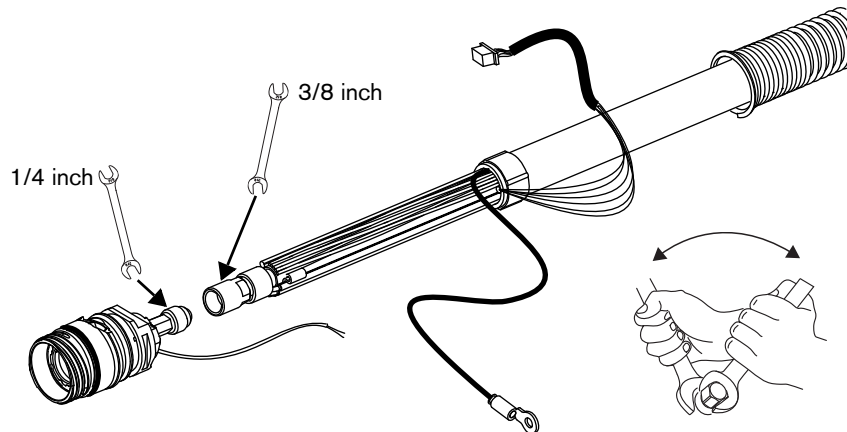
- b. Put the torch body and torch lead on a flat surface.
- c. Make sure that the flat sides of the torch body point up and that the RF wire is in the correct position as shown.
- d. Make sure that the white wires of the torch lead are on the opposite side from the RF torch PCB.



- 1 Flat sides of the torch body
- 2 RF wire

- 3 White wires

- e. Use a 1/4-inch wrench and a 3/8-inch wrench to tighten the gas fitting to 6.78 N·m (60 lbf·in). Make sure that the torch body and torch lead stay aligned. **Do not tighten too much. Do not strip the gas fitting.**

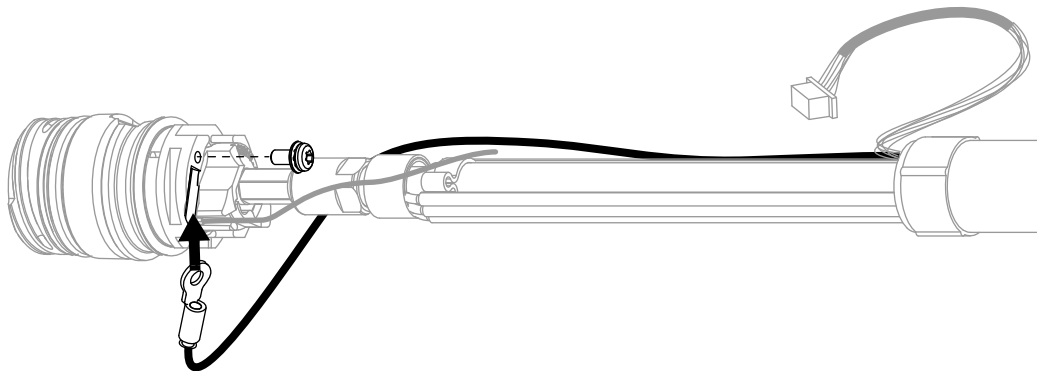


## NOTICE



To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

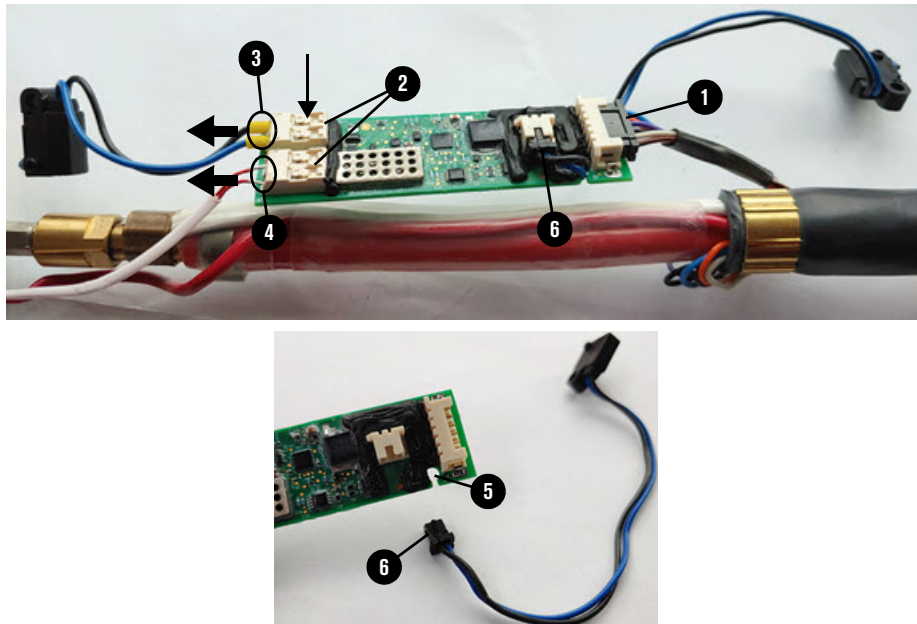
2. Install the pilot terminal screw as follows:
- Make sure that the routing of the pilot arc wire is correct.
  - Align the ring terminal of the pilot arc wire with the slot in the torch body.
  - Attach the pilot arc wire to the torch body with the pilot terminal screw. Tighten to 1.13 N·m (10 lbf·in).



## 5 Full-Length Machine Torch Part Replacement Procedures

3. Install the torch-lock switch connector into the receptacle. Put the blue and black torch-lock switch wires into the notch in the RF torch PCB. Refer to [Figure 11](#) on page 70 for location.
4. Install the wires into the 2-pin receptacles on the RF torch PCB. Refer to [Figure 11](#) on page 70 for location.
  - a. Push both wires of the cap-sensor switch into the 2-pin receptacle at the same time.
  - b. Push both red RF wires into the 2-pin receptacle at the same time.
5. Install the 6-wire connector into the receptacle on the RF torch PCB. Refer to [Figure 11](#) on page 70 for location.

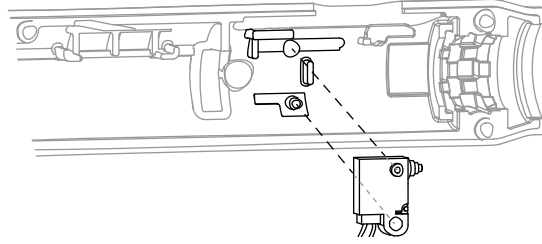
**Figure 11** – RF torch PCB connections for full-length machine torch



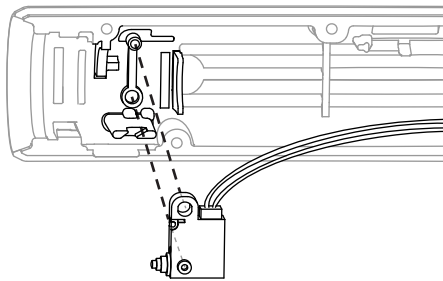
- |  |                               |
|--|-------------------------------|
| 1 6-wire connector                       | 4 Red RF wires                |
| 2 2-pin wire receptacle                  | 5 Notch in the RF torch PCB   |
| 3 Blue and black cap-sensor switch wires | 6 Torch-lock switch connector |

## Install torch components into the torch shell

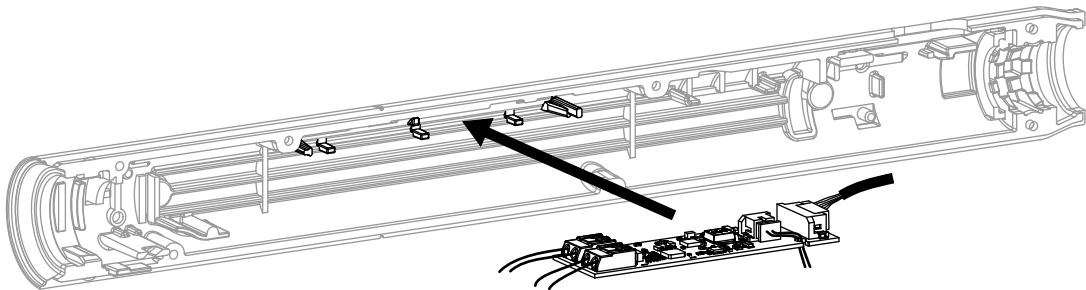
1. Put the torch-lock switch onto the stud in the right side of the torch shell.



2. Put the cap-sensor switch onto the cap-sensor mounting stud in the right side of the torch shell. Keep the cap-sensor switch flat in relation to the torch shell.

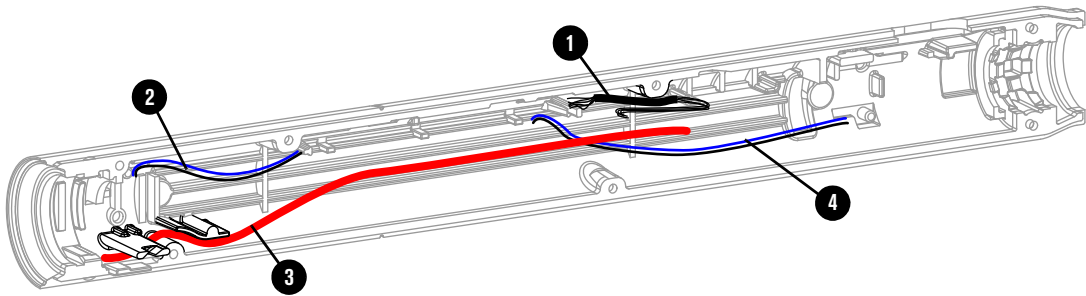


3. Align the RF torch PCB with the PCB mounting posts in the shell, and push the PCB into the torch shell.



4. Put the torch body and lead loosely into position in the shell.
5. Put the torch-lock switch wires into the shell. Hold them down with your finger.
6. Push the cap-sensor wires into the shell.
7. Push the pilot arc wire below the torch body and torch lead in the shell.
8. Push the RF torch PCB wires into the shell.

9. Make sure that the routing of all the wires is correct, as shown.

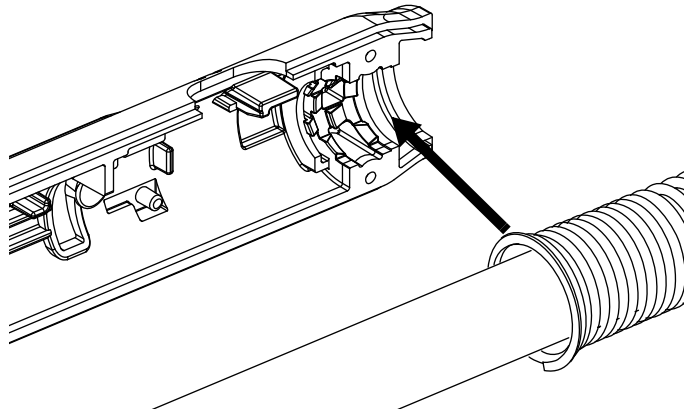


- 1 RF torch PCB wires
- 2 Cap-sensor wires

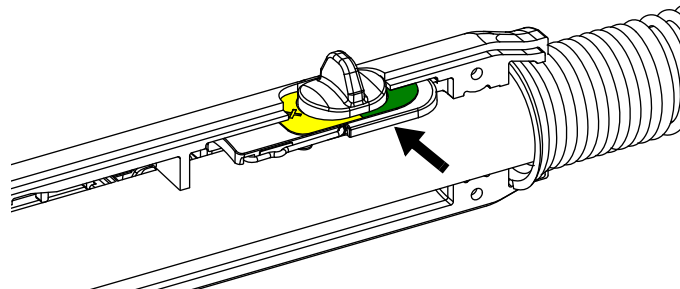
- 3 Pilot arc wire
- 4 Torch-lock switch wires

10. Push the torch body fully into the torch shell.

11. Align the torch lead strain relief with the recess in the shell, and push the strain relief into position.

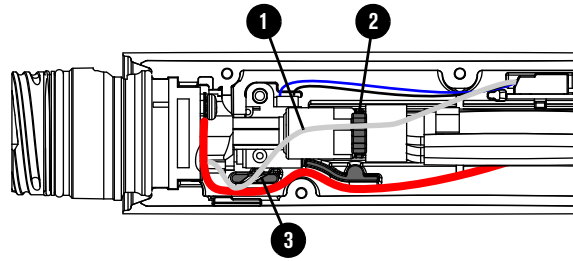


12. Install the torch-lock slider into the torch shell, with the yellow lock (X) label pointing to the torch body.





13. Push the RF wire clip onto the torch body. Make sure that the RF wire clip points up.
14. Put the RF wire through the routing post and into the slot in the RF wire clip.



- 1 RF wire
- 2 RF wire clip

- 3 Routing post

## Do a check of the component positions and wire routing

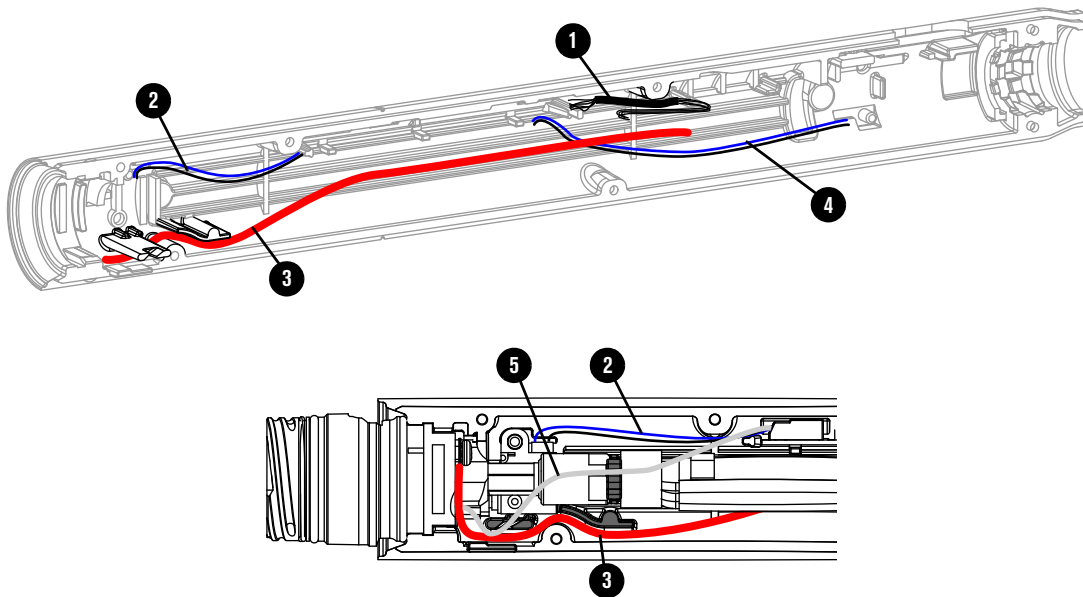
1. Make sure that all of the torch components are in the correct positions in the right side of the torch shell. Compare the appearance of the torch components with the photograph you got on [page 41](#), or with [Figure 12](#) / [Figure 13](#).

**Figure 12** – Full-length machine torch components in correct positions



2. Make sure that the routing of all of the wires is correct, as shown.

**Figure 13** – Wire routing in correct positions



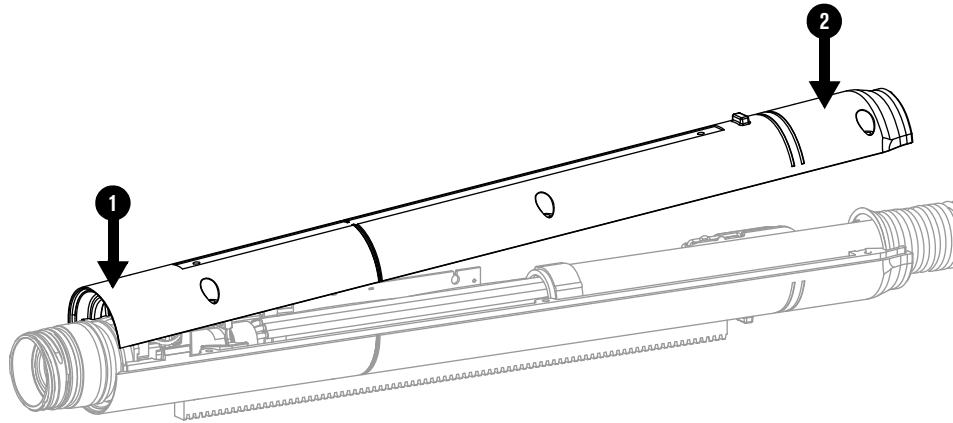
- |                           |                           |
|---------------------------|---------------------------|
| 1 RF torch PCB wires      | 4 Torch-lock switch wires |
| 2 Cap-sensor switch wires | 5 RF wires                |
| 3 Pilot arc wire          |                           |

## Install the left side of the torch shell

### NOTICE

Do not cause damage to the wires inside the torch as you install the left side of the torch shell.

1. Align the left side of the torch shell with the right side of the torch shell. Push the left side of the torch shell onto the torch at the torch-body end of the torch. Continue to push the left and right sides of the torch shell fully together.



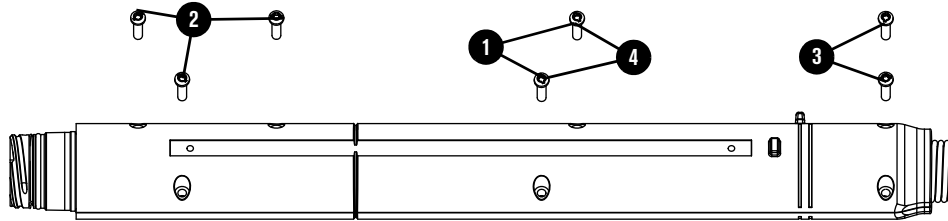
1 Torch-body end of the left torch shell

2 Torch-lead end of the left torch shell

2. Make sure that no wires are pinched between the shells. Make sure that the torch-lock switch is aligned correctly and can move freely. Make sure that the shells stay aligned.

## 5 Full-Length Machine Torch Part Replacement Procedures

3. Attach the left side of the torch shell to the right side of the torch shell with the 7 screws. Install the screws in the following sequence:
  - a. The middle of the torch.
  - b. The torch-body end of the torch.
  - c. The torch-lead end of the torch.
4. Tighten the screw in the middle of the torch shell again.



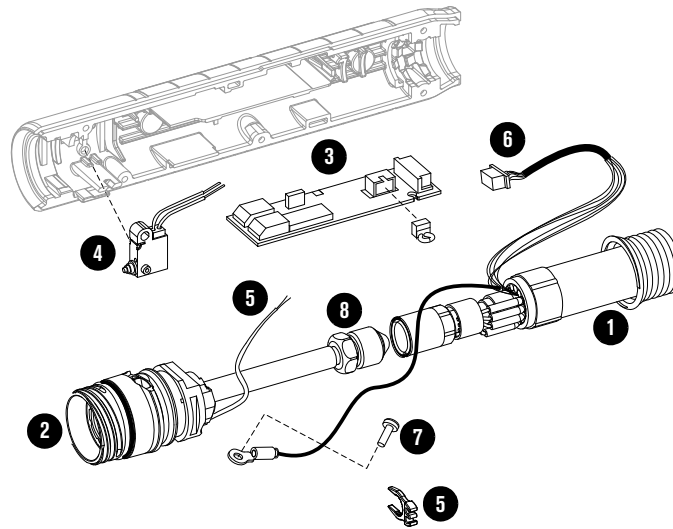
- |                               |                               |
|-------------------------------|-------------------------------|
| 1 Middle of the torch         | 3 Torch-lead end of the torch |
| 2 Torch-body end of the torch | 4 Middle of the torch         |

5. Make sure that the seam between the left and right sides of the torch shell is even. Make sure that the torch-lock slider moves freely.
6. [Do a Check of the Torch Assembly](#) on page 97.

# 6

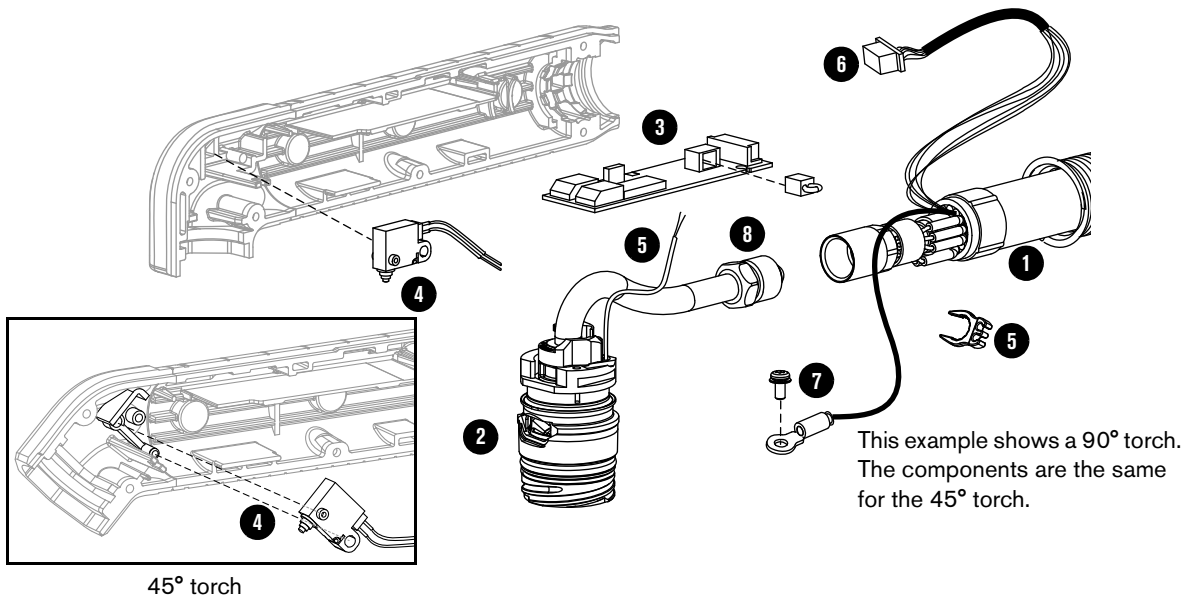
## **Mini Machine and Robotic Torch Part Replacement Procedures**

**Figure 14** – Mini machine / 180° robotic torch components



- |                                  |                                    |
|----------------------------------|------------------------------------|
| 1 Torch lead                     | 5 RF wires and clip                |
| 2 Torch body                     | 6 RF torch PCB wires and connector |
| 3 Radio-frequency (RF) torch PCB | 7 Pilot terminal screw             |
| 4 Cap-sensor switch              | 8 Gas fitting                      |

**Figure 15** – 90° and 45° robotic torch components



- |                     |                                    |
|---------------------|------------------------------------|
| 1 Torch lead        | 5 RF wires and clip                |
| 2 Torch body        | 6 RF torch PCB wires and connector |
| 3 RF torch PCB      | 7 Pilot terminal screw             |
| 4 Cap-sensor switch | 8 Gas fitting                      |

## Disassemble the mini machine or robotic torch

This procedure shows how to fully disassemble the torch. This includes removal of all of the torch components from the right side of the torch shell, and how to disconnect all of the wires.

**It is not always necessary to fully disassemble the torch.** Only remove and disconnect the components and wires that you must for each replacement part.

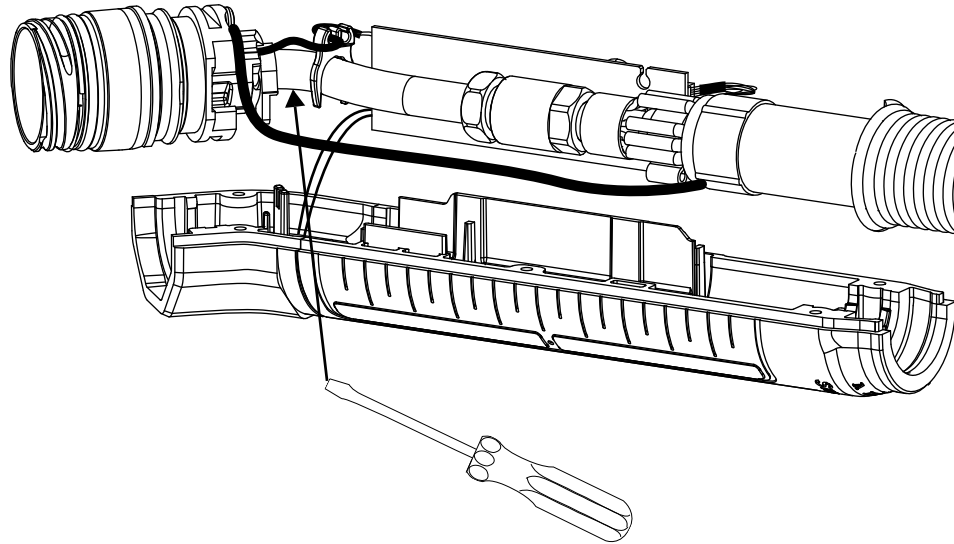
### Before you begin

Complete the procedures in [Prepare to Do the Part Replacement](#) on page 37:

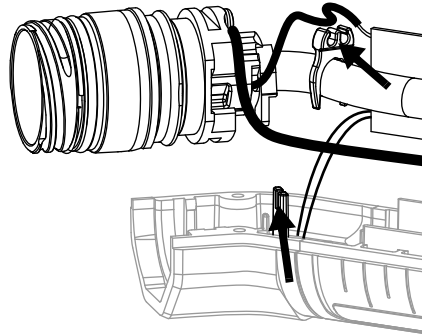
1. [Disconnect the power from the cutting system](#) on page 39.
2. [Remove the Hypertherm cartridge](#) on page 39.
3. [Put a clamp on the torch lead](#) on page 40.
4. [Remove the left side of the torch handle or shell](#) on page 41.
5. [Get a photograph of the torch](#) on page 41.

## Remove the components from the torch shell

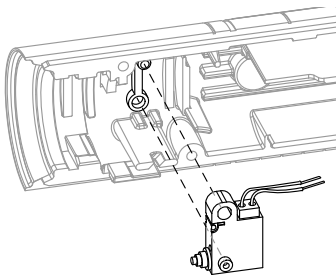
1. Carefully lift the torch lead, body, PCB, and attached wires from the right side of the torch shell. Use a screwdriver as a lever under the torch body to help you remove the torch body. **Do not bend the gas tube or torch lead. Do not pinch wires between the screwdriver and the torch shell.**



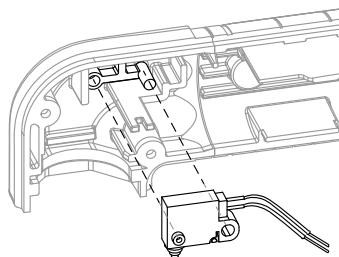
2. Lift the RF wire out of the RF wire routing post and the RF wire clip.



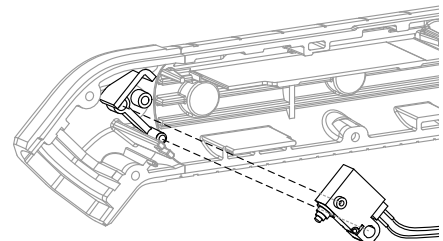
3. Remove the RF wire clip.
4. Pull the cap-sensor switch off of the cap-sensor switch mounting stud.



Mini machine / 180° torch



90° robotic torch

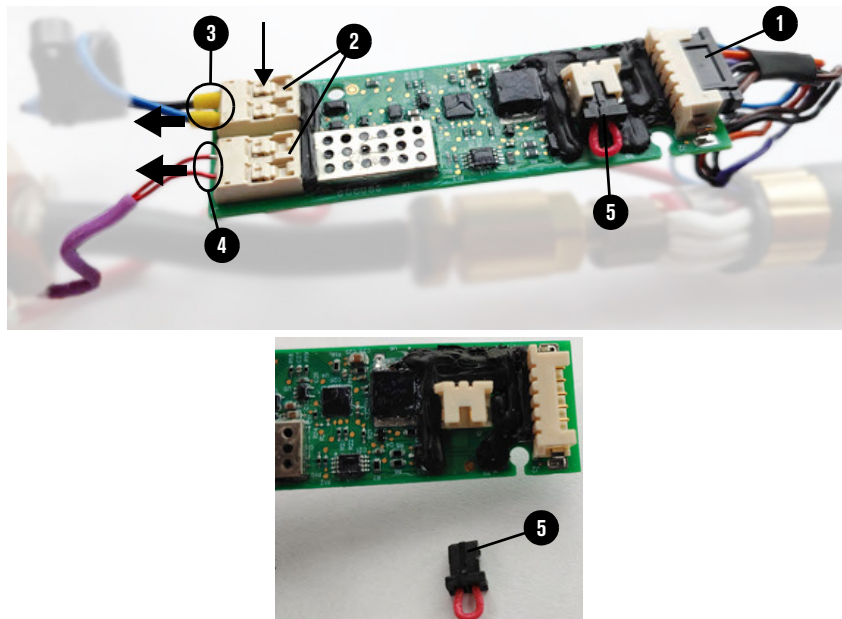


45° robotic torch

## Disconnect the torch components

1. Remove the 6-wire connector from the receptacle on the RF torch PCB. Do not pull on the wires. Refer to [Figure 16](#) on page 80 for location.
2. Remove the wires from the 2-pin receptacles on the RF torch PCB. One wire at a time, push the lever on the 2-pin wire receptacle while you pull the wire straight out of the receptacle. It can be necessary to use some force, or push the wire into the receptacle before you pull it out. Refer to [Figure 16](#) on page 80 for location.
  - a. Remove the blue and black cap-sensor switch wires from the receptacle.
  - b. Remove the 2 red RF wires from the receptacle.
3. Pull the jumper wire connector out of the receptacle. Do not pull on the wire. Refer to [Figure 16](#) on page 80 for location.

**Figure 16** – RF torch PCB connections for mini machine and robotic torch

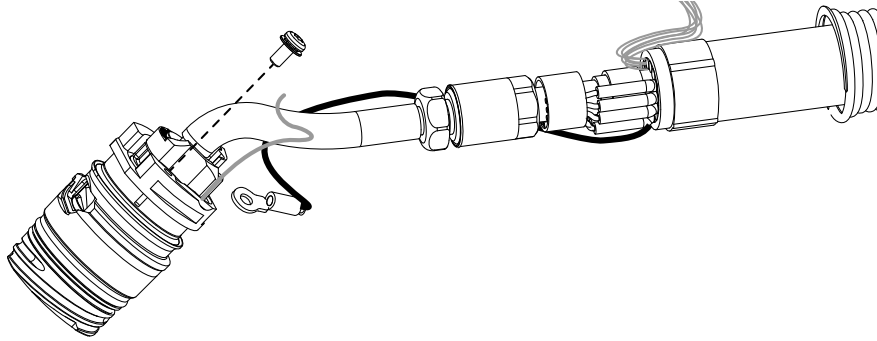


- |   |  |   |                       |
|---|--|---|-----------------------|
| 1 | 6-wire connector                       | 4 | Red RF wires          |
| 2 | 2-pin wire receptacle                  | 5 | Jumper wire connector |
| 3 | Blue and black cap-sensor switch wires |   |                       |

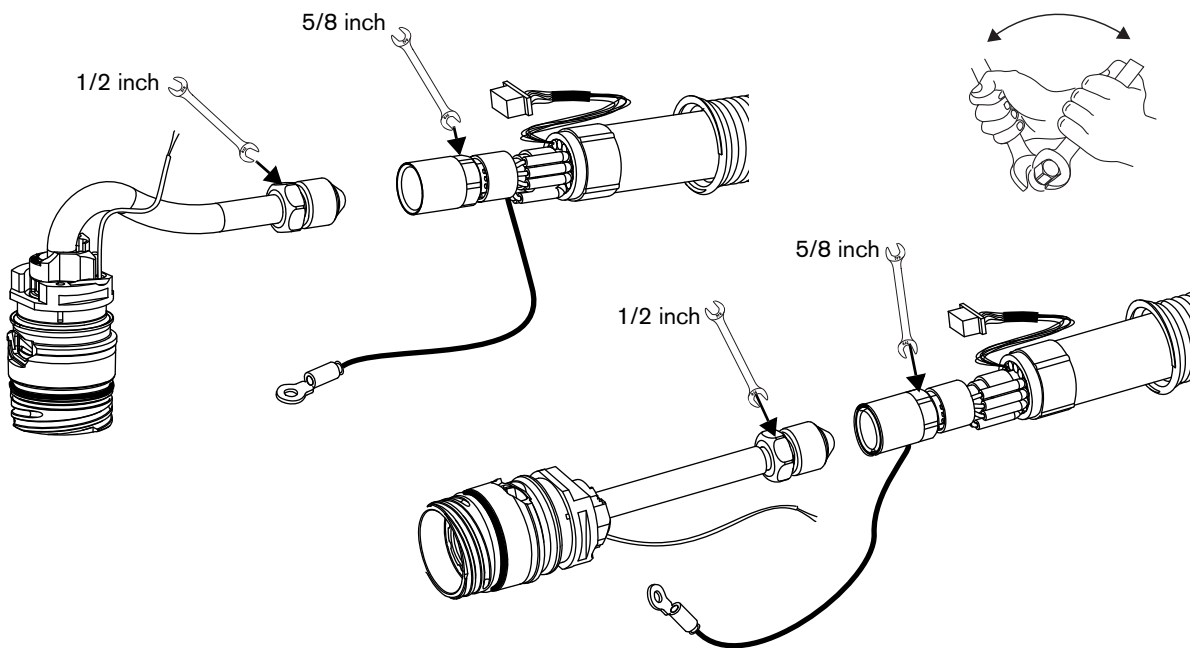
4. Put the RF torch PCB in an anti-static container, unless you are replacing the RF torch PCB.



5. Remove the pilot terminal screw.



6. Use a 1/2-inch wrench and a 5/8-inch wrench to disconnect the gas fitting. **Do not strip the gas fitting.**



### NOTICE



To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

### NOTICE

Do not bend the gas tube. If you bend the gas tube, you will not be able to install the torch body in the torch shell again because it will not fit correctly.

## Assemble the mini machine or robotic torch

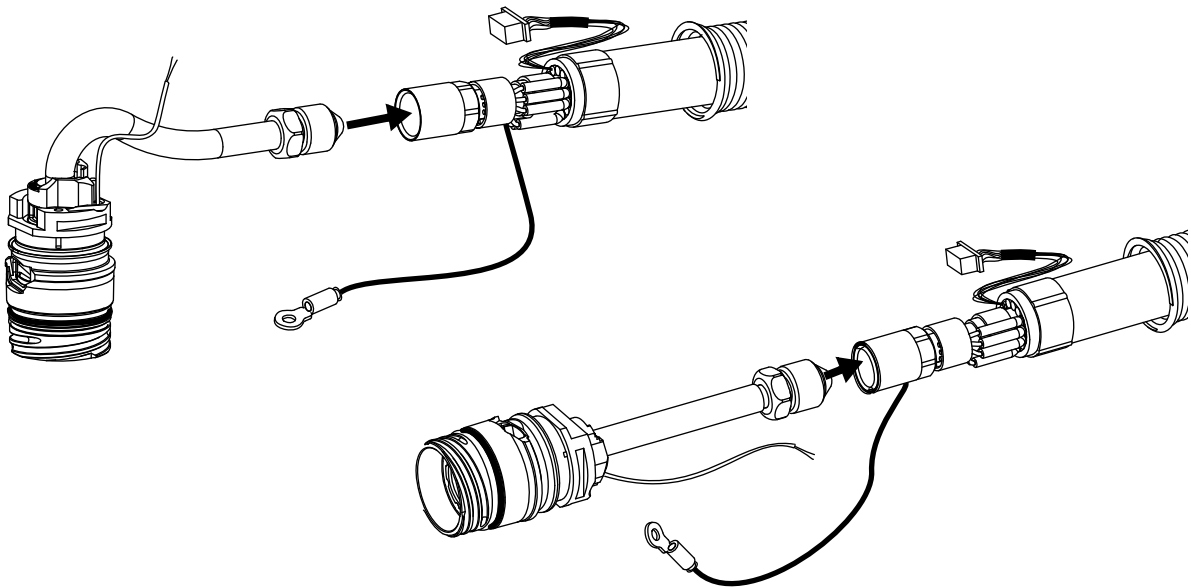
---

This procedure shows how to fully assemble the torch. This includes installation of all of the torch components into the right side of the torch shell, and how to connect all of the wires.

**It is not always necessary to fully disassemble the torch to do the part replacement procedure.** Do only the steps that are applicable.

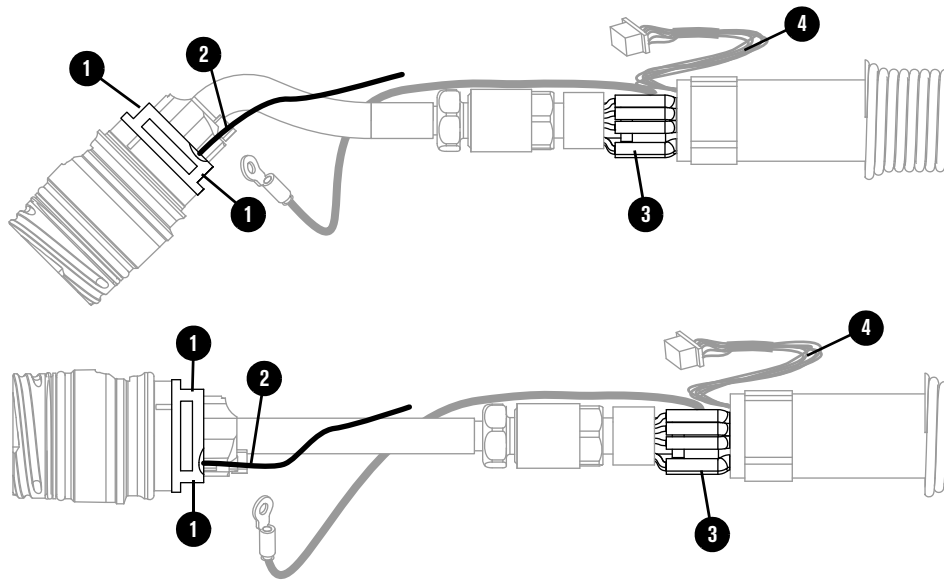
### Connect the torch components

1. Attach the torch body to the torch lead.
  - a. Tighten the gas fitting with your hand.



- b. Put the torch body and torch lead on a flat surface.

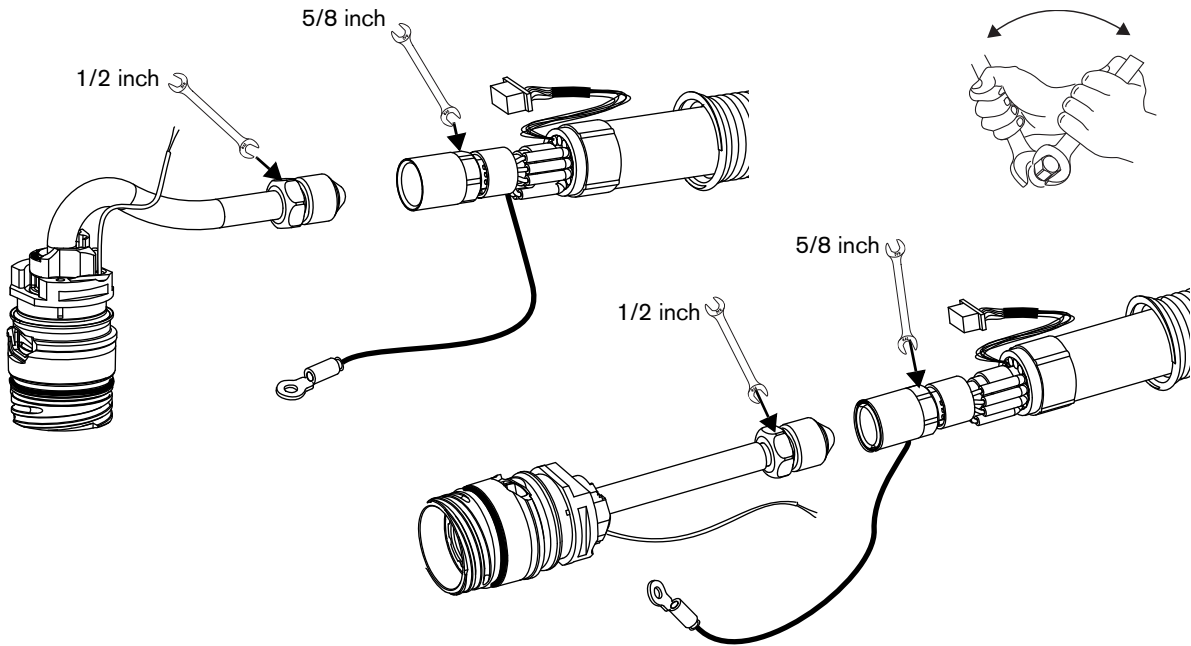
- c. Make sure that the flat sides of the torch body point up and that the RF wire is in the correct position as shown.
- d. Make sure that the white wires of the torch lead are on the opposite side from the RF torch PCB and that the RF torch PCB wires point to the PCB.



- 1 Flat sides of the torch body
- 2 RF wire

- 3 White wires
- 4 RF torch PCB wires

- e. Use a 1/2-inch wrench and a 5/8-inch wrench to tighten the gas fitting. Tighten to 6.78 N·m (60 lbf·in). Make sure that the torch body and torch lead stay aligned. **Do not tighten too much. Do not strip the gas fitting.**



### **NOTICE**

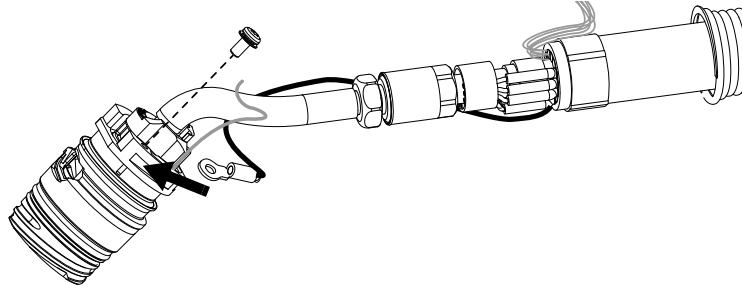


To prevent damage to the torch, always use 2 wrenches to loosen or tighten the gas fitting.

### **NOTICE**

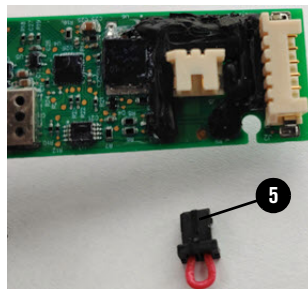
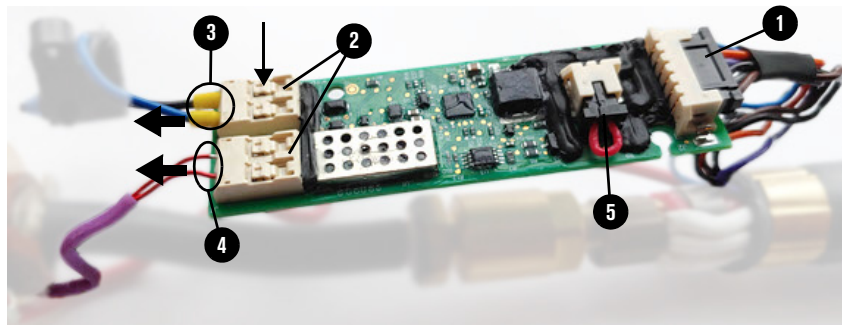
Do not bend the gas tube. If you bend the gas tube, you will not be able to install the torch body in the torch shell again because it will not fit correctly.

2. Install the pilot terminal screw as follows:
  - a. Make sure that the routing of the pilot arc wire is correct.
  - b. Align the ring terminal of the pilot arc wire with the slot in the torch body.
  - c. Attach the pilot arc wire to the torch body with the pilot terminal screw. Tighten to 1.13 N·m (10 lbf·in).



3. Install the jumper wire connector into the receptacle. Refer to [Figure 17](#) on page 85 for location.
4. Install the wires into the 2-pin receptacles on the RF torch PCB. Refer to [Figure 17](#) on page 85 for location.
  - a. Push both wires of the cap-sensor switch into the 2-pin receptacle at the same time.
  - b. Push both red RF wires into the 2-pin receptacle at the same time.
5. Install the 6-wire connector into the receptacle on the RF torch PCB. Refer to [Figure 17](#) on page 85 for location.

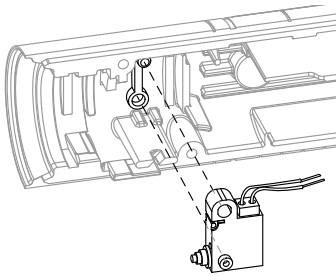
**Figure 17** – RF torch PCB connections for mini machine and robotic torch



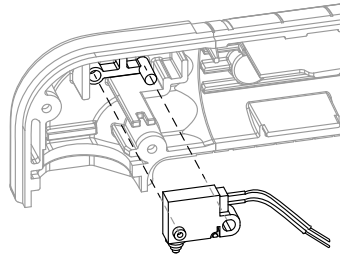
- |  |                         |
|--|-------------------------|
| 1 6-wire connector                       | 4 Stripped red RF wires |
| 2 2-pin wire receptacle                  | 5 Jumper wire connector |
| 3 Blue and black cap-sensor switch wires |                         |

## Install the torch components into the torch shell

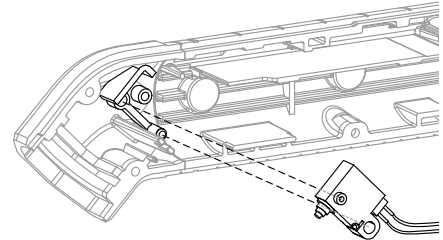
1. Put the cap-sensor switch onto the cap-sensor mounting stud in the right side of the torch shell. Keep the cap-sensor switch flat in relation to the torch shell.



Mini machine / 180° torch

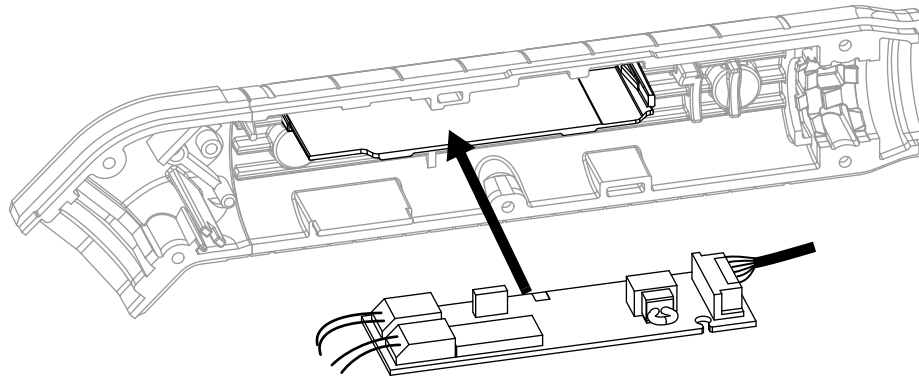


90° robotic torch



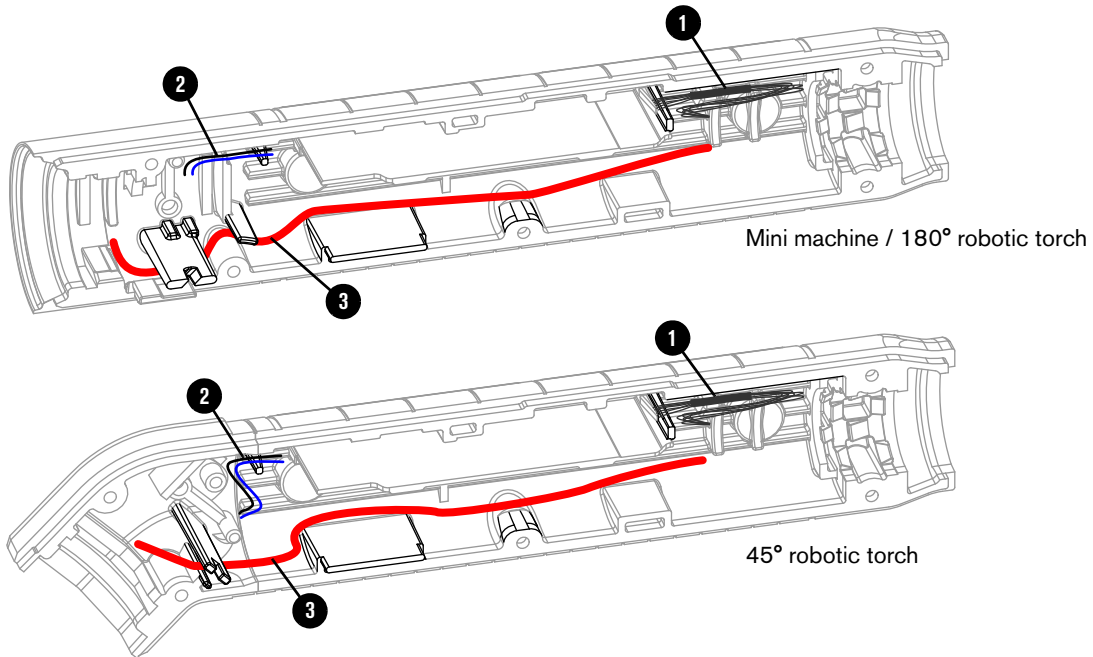
45° robotic torch

2. Align the RF torch PCB with the PCB slot in the shell, and push the PCB into the torch shell.



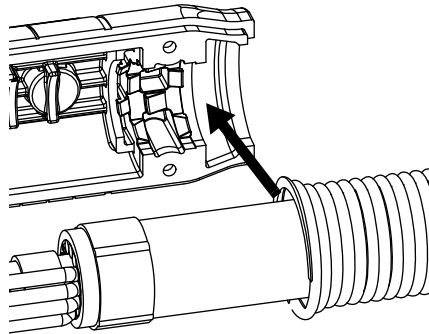
3. Put the torch body and lead loosely into position in the shell.
4. Push the cap-sensor wires into the shell. Make sure that the wires go around the stud.
5. Push the pilot arc wire below the torch body and lead in the shell.
6. Push the RF torch PCB wires into the shell.

7. Make sure that the routing of all the wires is correct, as shown.



- 1 RF torch PCB wires  
2 Cap-sensor wires  
3 Pilot arc wire

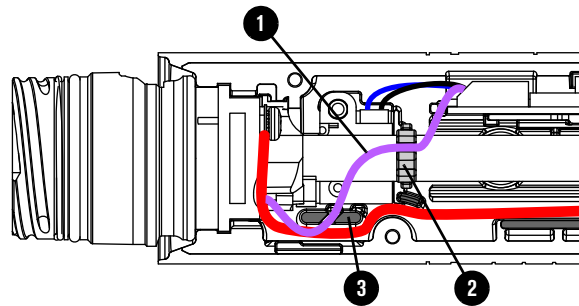
8. Push the torch body fully into the torch shell.
9. Align the torch lead strain relief with the recess in the shell, and push the strain relief into position.



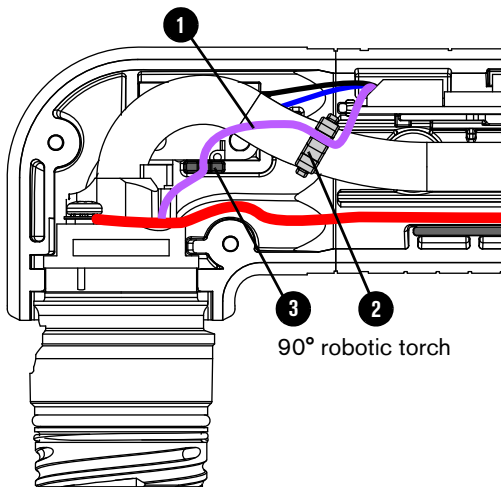
## 6 Mini Machine and Robotic Torch Part Replacement Procedures

10. Push the RF wire clip onto the torch body. Make sure that the RF wire clip points up.

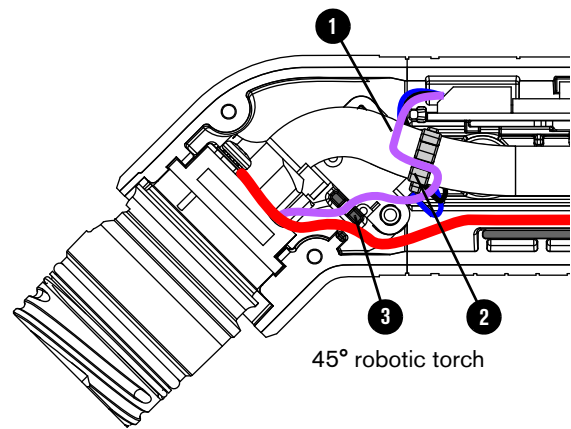
11. Put the RF wire through the routing post and into the slot in the RF wire clip.



Mini machine / 180° robotic torch



90° robotic torch



45° robotic torch

- 1 RF wire
- 2 RF wire clip

- 3 Routing post

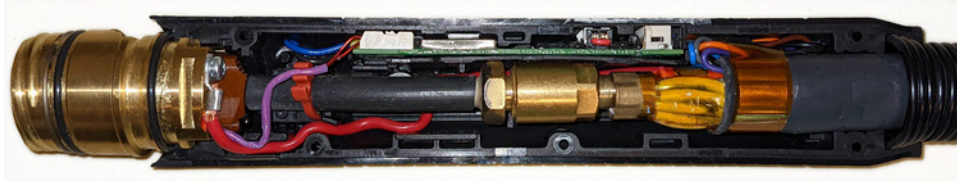


## Do a check of the component positions and wire routing

---

1. Make sure that all of the torch components are in the correct positions in the right side of the torch shell. Compare the appearance of the torch components with the photograph you got on [page 41](#), or with [Figure 18](#), [Figure 19](#), and [Figure 20](#).

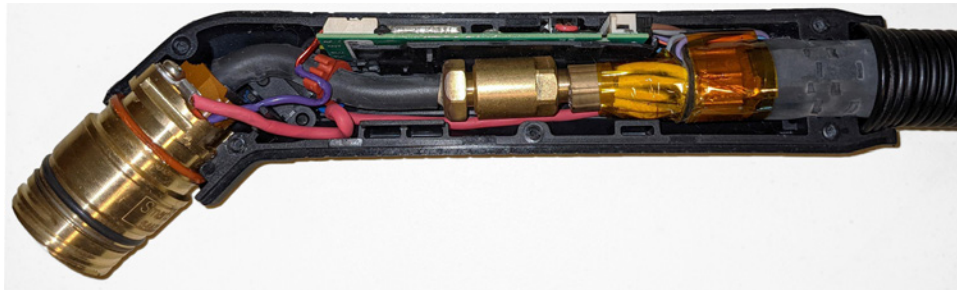
**Figure 18** – Mini machine and 180° robotic torch components in correct positions



**Figure 19** – 90° robotic torch components in correct positions

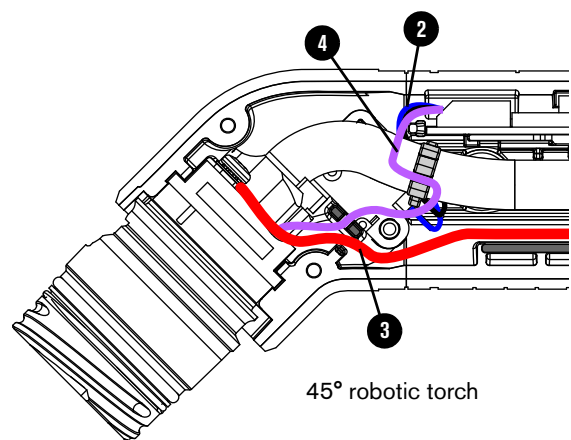
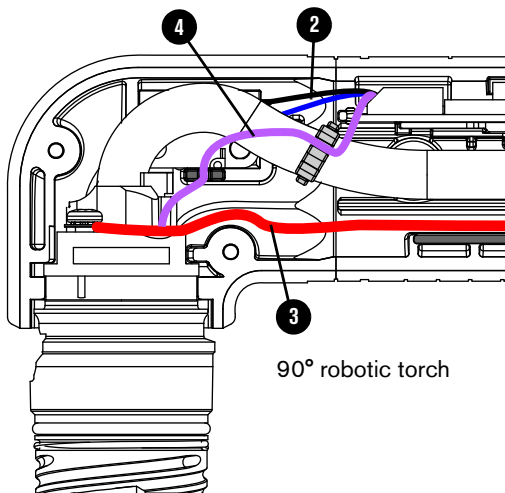
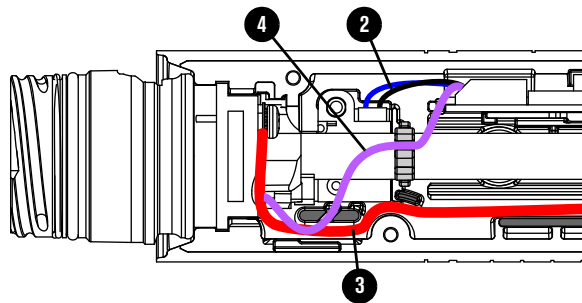
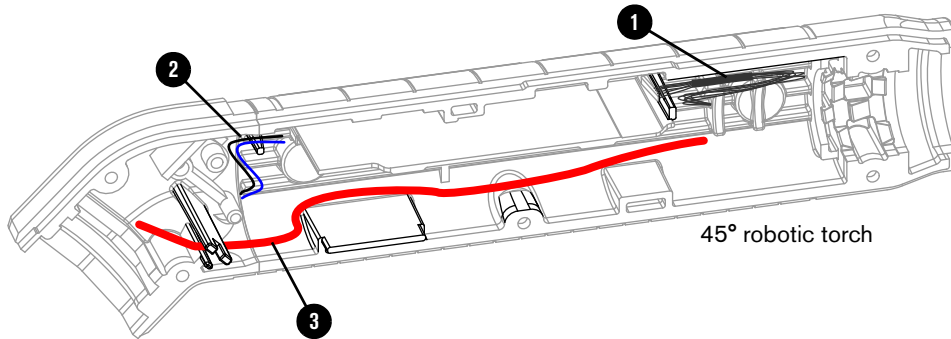
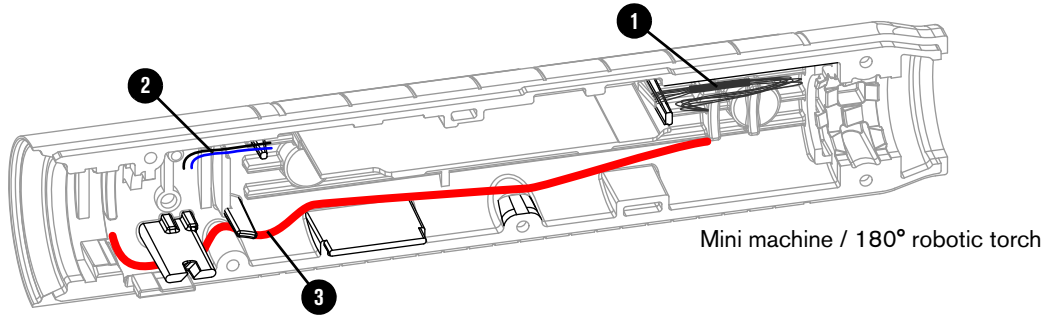


**Figure 20** – 45° robotic torch components in correct positions



2. Make sure that the routing of all of the wires is correct, as shown.

Figure 21 – Wire routing in correct positions



- 1 RF torch PCB wires
- 2 Cap-sensor switch wires

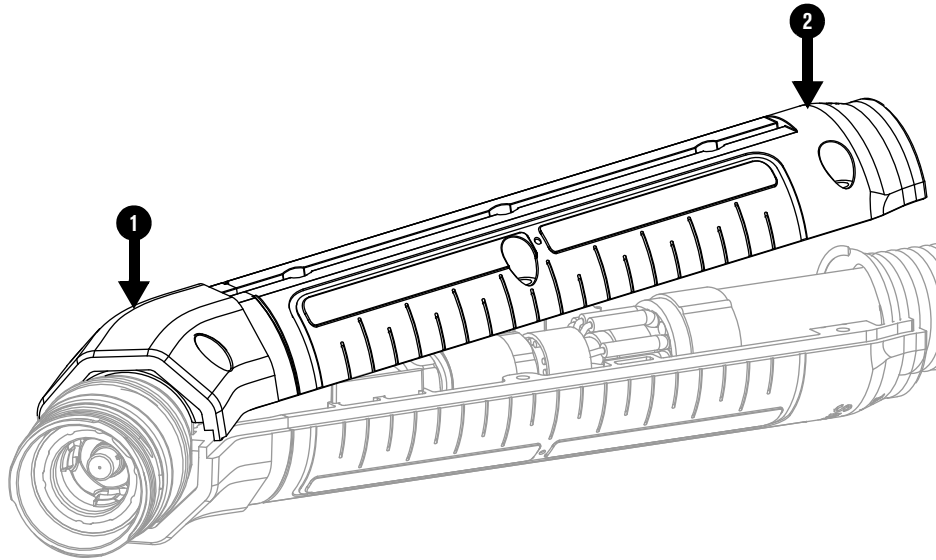
- 3 Pilot arc wire
- 4 RF wires

## Install the left side of the torch shell

### NOTICE

Do not cause damage to the wires inside the torch as you install the left side of the torch shell.

1. Align the left side of the torch shell with the right side of the torch shell. Push the left side of the torch shell onto the torch at the torch body end of the torch. Continue to push the left and right sides of the torch shell fully together.



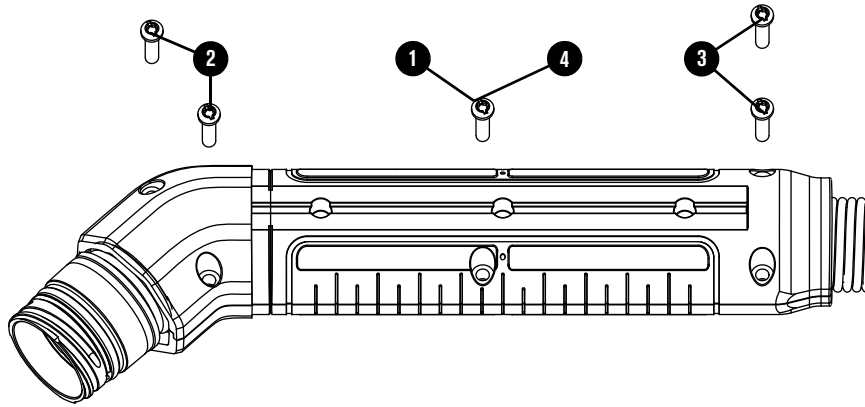
1 Torch-body end of the left torch shell

2 Torch-lead end of the left torch shell

2. **Make sure that no wires are pinched between the shells.** Make sure that the shells are still aligned.
3. Attach the left side of the torch shell to the right side of the torch shell with the 5 screws. Install the screws in the following sequence:
  - a. The middle of the torch.
  - b. The torch-body end of the torch.
  - c. The torch-lead end of the torch.

## 6 Mini Machine and Robotic Torch Part Replacement Procedures

4. Tighten the screw in the middle of the torch shell again.



1 Middle of the torch

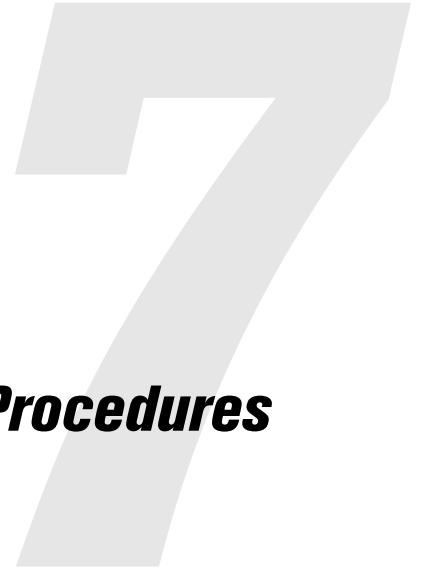
3 Lead-end of the torch

2 Torch-body end of the torch

4 Middle of the torch

5. Make sure that the seam between the left and right sides of the torch shell is even.

6. [Do a Check of the Torch Assembly](#) on page 97.



# ***Torch Lead Replacement Procedures***

## **Replace the torch quick-disconnect shell**

---

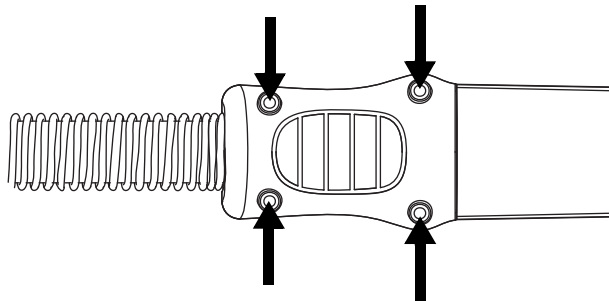
### **Before you begin**

Complete the following procedures:

1. [Disconnect the power from the cutting system](#) on page 39.
2. Disconnect the torch ([page 95](#)).
3. [Put a clamp on the torch lead](#) on page 40.

### **Remove the torch quick-disconnect shell**

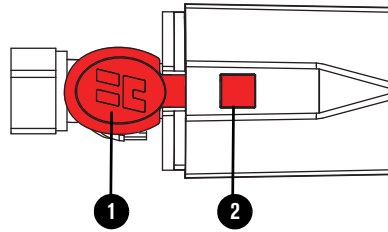
1. Remove the 4 screws from the torch quick-disconnect shell.



2. Remove the torch quick-disconnect shell. The shell is 2 pieces.

## 7 Torch Lead Replacement Procedures

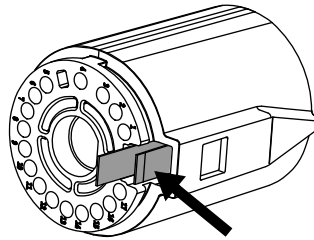
3. Remove the latch with the red button from the torch quick-disconnect housing:
  - a. Push and hold the red button.
  - b. Use a blade screwdriver to push on the latch tab while you pull the latch out of the torch quick-disconnect housing.



1 Red button

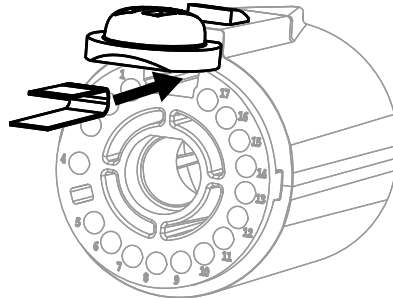
2 Latch tab

4. Remove the lever from the torch quick-disconnect housing.



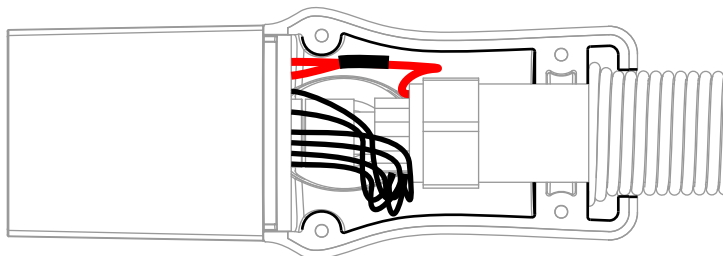
### Install the torch quick-disconnect shell

1. Put the latch with the red button into the torch quick-disconnect housing.
2. Hold the latch up and put the lever under the latch.



3. Push the lever into the torch quick-disconnect housing until it clicks into place.
4. Put the 2 new torch quick-disconnect shell pieces onto the torch lead.

5. Make sure that the strain relief fits in the slot of the shell and the wires are not pinched and do not cause interference with the latch.

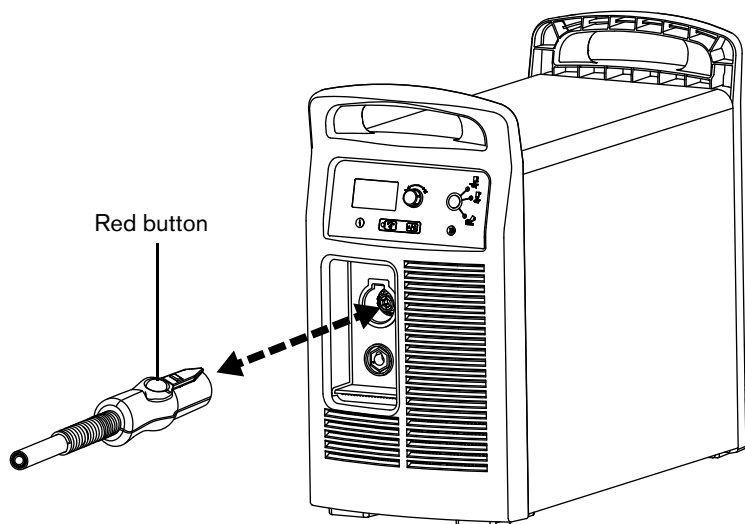


6. Install the 4 screws to attach the torch quick-disconnect shell.
7. Connect the torch ([page 95](#)).

## Replace the torch assembly with lead

---

1. [Disconnect the power from the cutting system](#) on page 39.
2. Disconnect the torch. Push the red button on the torch quick-disconnect and pull the connector out of the receptacle on the front panel of the plasma power supply.



3. Connect the torch. Push the torch quick-disconnect into the receptacle. The connector makes a click when it is fully engaged.



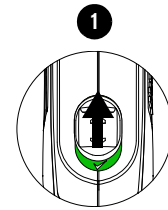


# 8

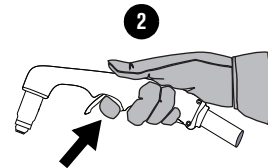
## ***Do a Check of the Torch Assembly***

Do a check of the following components to make sure that the torch is assembled correctly:

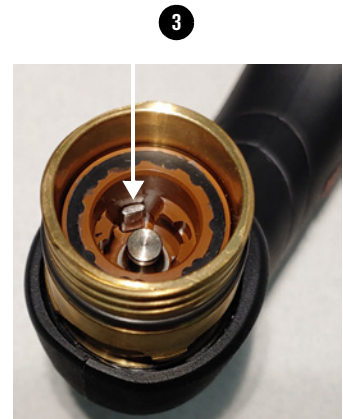
- 1. Torch-lock switch:** Unlock the torch. You must hear a click.



- 2. Trigger:** Pull the trigger. You must hear a click.



- 3. Cap-sensor tab in torch body:** Use a blade screwdriver to push down the cap-sensor tab inside the torch body. You must hear a click.



**8** *Do a Check of the Torch Assembly*