



## Duramax™ Hyamp Long Handheld Torches

45° and 90° / 0.6 m (2 feet), 1.2 m (4 feet), and 1.8 m (6 feet)



Service Manual

808290 | Revision 1 | English

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- ☒ **Education:** Registration gives you free access to online product training content via the Hypertherm Cutting Institute.
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Go to **[www.hypertherm.com/registration](http://www.hypertherm.com/registration)** for easy and fast registration.

If you experience any problems with the product registration process, please contact [registration@hypertherm.com](mailto:registration@hypertherm.com).

## For your records

Serial number: \_\_\_\_\_

Purchase date: \_\_\_\_\_

Distributor: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Maintenance notes: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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# ***Duramax Hyamp Long Handheld Torches***

## **Service Manual**

808290  
Revision 1

English

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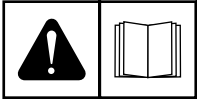
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## ENGLISH

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

Copies of the manuals may accompany the product in electronic and printed formats. You can also obtain copies of the manuals, in all languages available for each manual, from the "Documents library" at [www.hypertherm.com](http://www.hypertherm.com).

## DEUTSCH / GERMAN

**WARNUNG!** Bevor Sie ein Hypertherm-Gerät in Betrieb nehmen, lesen Sie bitte die Sicherheitsanweisungen in Ihrer Bedienungsanleitung sowie im *Handbuch für Sicherheit und Übereinstimmung* (80669C). Das Nichtbefolgen der Sicherheitsanweisungen kann zu Verletzungen von Personen oder Schäden am Gerät führen.

Bedienungsanleitungen und Handbücher können dem Gerät in elektronischer Form oder als Druckversion beiliegen. Alle Handbücher und Anleitungen können in den jeweils verfügbaren Sprachen auch in der „Dokumente-Bibliothek“ unter [www.hypertherm.com](http://www.hypertherm.com) heruntergeladen werden.

## FRANÇAIS / FRENCH

**AVERTISSEMENT!** Avant d'utiliser tout équipement Hypertherm, lire les consignes de sécurité importantes dans le manuel de votre produit et dans le *Manuel de sécurité et de conformité* (80669C). Le non-respect des consignes de sécurité peut engendrer des blessures physiques ou des dommages à l'équipement.

Des copies de ces manuels peuvent accompagner le produit en format électronique et papier. Vous pouvez également obtenir des copies de chaque manuel dans toutes les langues disponibles à partir de la « Bibliothèque de documents » sur [www.hypertherm.com](http://www.hypertherm.com).

## ESPAÑOL / SPANISH

**¡ADVERTENCIA!** Antes de operar cualquier equipo Hypertherm, leer las instrucciones de seguridad del manual de su producto y del *Manual de Seguridad y Cumplimiento* (80669C). No cumplir las instrucciones de seguridad podría dar lugar a lesiones personales o daño a los equipos.

Pueden venir copias de los manuales en formato electrónico e impreso junto con el producto. También se pueden obtener copias de los manuales, en todos los idiomas disponibles para cada manual, de la "Biblioteca de documentos" en [www.hypertherm.com](http://www.hypertherm.com).

## ITALIANO / ITALIAN

**AVVERTENZA!** Prima di usare un'attrezzatura Hypertherm, leggere le istruzioni sulla sicurezza nel manuale del prodotto e nel *Manuale sulla sicurezza e la conformità* (80669C). Il mancato rispetto delle istruzioni sulla sicurezza può causare lesioni personali o danni all'attrezzatura.

Il prodotto può essere accompagnato da copie elettroniche e cartacee del manuale. È anche possibile ottenere copie del manuale, in tutte le lingue disponibili per ogni manuale, dall'"Archivio documenti" all'indirizzo [www.hypertherm.com](http://www.hypertherm.com).

## NEDERLANDS / DUTCH

**WAARSCHUWING!** Lees voordat u Hypertherm-apparatuur gebruikt de veiligheidsinstructies in de producthandleiding en in de *Veiligheids- en nalevingshandleiding* (80669C). Het niet volgen van de veiligheidsinstructies kan resulteren in persoonlijk letsel of schade aan apparatuur.

De handleidingen kunnen in elektronische en gedrukte vorm met het product worden meegeleverd. De handleidingen, elke handleiding beschikbaar in alle talen, zijn ook verkrijgbaar via de "Documentenbibliotheek" op [www.hypertherm.com](http://www.hypertherm.com).

## DANSK / DANISH

**ADVARSEL!** Inden Hypertherm udstyr tages i brug skal sikkerhedsinstruktionerne i produktets manual og i *Manual om sikkerhed og overholdelse af krav* (80669C), gennelæses. Følges sikkerhedsvejledningen ikke kan det resultere i personskade eller beskadigelse af udstyret.

Kopier af manualerne kan ledsage produktet i elektroniske og trykte formater. Du kan også få kopier af manualer, på alle sprog der er til rådighed for hver manuel, fra "Dokumentbiblioteket" på [www.hypertherm.com](http://www.hypertherm.com).

## PORTUGUÊS / PORTUGUESE

**ADVERTÊNCIA!** Antes de operar qualquer equipamento Hypertherm, leia as instruções de segurança no manual do seu produto e no *Manual de Segurança e de Conformidade* (80669C). Não seguir as instruções de segurança pode resultar em lesões corporais ou danos ao equipamento.

Cópias dos manuais podem acompanhar os produtos nos formatos eletrônico e impresso. Também é possível obter cópias dos manuais em todos os idiomas disponíveis para cada manual na "Biblioteca de documentos" em [www.hypertherm.com](http://www.hypertherm.com).

## 日本語 / JAPANESE

**警告!** Hypertherm 機器を操作する前に、安全に関する重要な情報について、この製品説明書にある安全情報、および製品に同梱されている別冊の「安全とコンプライアンスマニュアル」(80669C)をお読みください。安全情報に従わないと怪我や装置の損傷を招くことがあります。

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。各説明書は、[www.hypertherm.com](http://www.hypertherm.com) の「ドキュメントライブラリ」から各言語で入手できます。

## 简体中文 / CHINESE (SIMPLIFIED)

**警告!** 在操作任何海宝设备之前, 请阅读产品手册和《安全和法规遵守手册》(80669C) 中的安全操作说明。若未能遵循安全操作说明, 可能会造成人员受伤或设备损坏。

随产品提供的手册可能提供电子版和印刷版两种格式。您也可从 "Documents library" (文档资料库) 中获取每本手册所有可用语言的副本, 网址为 [www.hypertherm.com](http://www.hypertherm.com)。

## NORSK / NORWEGIAN

**ADVARSEL!** Før du bruker noe Hypertherm-utstyr, må du lese sikkerhetsinstruksjonene i produktets håndbok og i *Håndboken om sikkerhet og samsvar* (80669C). Unnlattelse av å følge sikkerhetsinstruksjoner kan føre til personskade eller skade på utstyr.

Eksemplarer av håndbøkene kan medfølge produktet i elektroniske og trykte utgaver. Du kan også få eksemplarer av håndbøkene i alle tilgjengelige språk for hver håndbok fra dokumentbiblioteket på [www.hypertherm.com](http://www.hypertherm.com).

## SVENSKA / SWEDISH

**VARNING!** Läs häftet *säkerhetsinformationen i din produkts säkerhets- och efterlevnadsmanual* (80669C) för viktig säkerhetsinformation innan du använder eller underhåller Hypertherm-utrustning. Underlåtenhet att följa dessa säkerhetsinstruktioner kan resultera i personskador eller skador på utrustningen.

Kopior av manualen kan medfölja produkten i elektronisk och tryckform. Du hittar även kopior av manualerna i alla tillgängliga språk i dokumentbiblioteket (Documents library) på [www.hypertherm.com](http://www.hypertherm.com).

## 한국어 / KOREAN

**경고!** Hypertherm 장비를 사용하기 전에 제품 설명서와 안전 및 규정 준수 설명서 (80669C)에 나와 있는 안전 지침을 읽으십시오. 안전 지침을 준수하지 않으면 신체 부상이나 장비 손상을 초래할 수 있습니다.

전자 형식과 인쇄된 형식으로 설명서 사본이 제품과 함께 제공될 수 있습니다. [www.hypertherm.com](http://www.hypertherm.com) 의 'Documents library (문서 라이브러리)' 에서도 모든 언어로 이용할 수 있는 설명서 사본을 얻을 수 있습니다.

## ČESKY / CZECH

VAROVÁNÍ! Před uvedením jakéhokoliv zařízení Hypertherm do provozu si přečtěte bezpečnostní pokyny v příručce k produktu a v *Manuálu pro bezpečnost a dodržování předpisů* (80669C). Nedodržování bezpečnostních pokynů může mít za následek zranění osob nebo poškození majetku.

Kopie příruček a manuálů mohou být součástí dodávky produktu, a to v elektronické i tištěné formě. Kopie příruček a manuálů ve všech jazykových verzích, v nichž byly dané příručky a manuály vytvořeny, naleznete v „Knihovně dokumentů“ na webových stránkách [www.hypertherm.com](http://www.hypertherm.com).

## POLSKI / POLISH

OSTRZEŻENIE! Przed rozpoczęciem obsługi jakiegokolwiek systemu firmy Hypertherm należy się zapoznać z instrukcjami bezpieczeństwa zamieszczonymi w podręczniku produktu oraz w *Podręczniku bezpieczeństwa i zgodności* (80669C). Nieprzestrzeganie instrukcji bezpieczeństwa może skutkować obrażeniami ciała i uszkodzeniem sprzętu.

Do produktu mogą być dołączone kopie podręczników w formie elektronicznej i drukowanej. Kopie podręczników, w każdym udostępnionym języku, można również znaleźć w „Bibliotece dokumentów” pod adresem [www.hypertherm.com](http://www.hypertherm.com).

## РУССКИЙ / RUSSIAN

БЕРЕГИСЬ! Перед работой с любым оборудованием Hypertherm ознакомьтесь с инструкциями по безопасности, представленными в руководстве, которое поставляется вместе с продуктом, а также в *Руководстве по безопасности и соответствию* (80669J). Невыполнение инструкций по безопасности может привести к телесным повреждениям или повреждению оборудования.

Копии руководств, которые поставляются вместе с продуктом, могут быть представлены в электронном и бумажном виде. Копии руководств на всех языках, на которые переведено то или иное руководство, можно также загрузить в разделе «Библиотека документов» на веб-сайте [www.hypertherm.com](http://www.hypertherm.com).

## SUOMI / FINNISH

VAROITUS! Ennen minkään Hypertherm-laitteen käyttöä lue tuotteen käyttöoppaassa olevat turvallisuusohjeet ja *turvallisuus- ja vaatimustenmukaisuusohje* (80669C). Turvallisuusohjeiden laiminlyönti voi aiheuttaa henkilökohtaisen loukkaantumisen tai laitevahingon.

Käyttöoppaiden kopiot voivat olla tuotteen mukana elektronisessa ja tulostetussa muodossa. Voit saada käyttöoppaiden kopiot kaikilla kielillä ”latauskirjastosta”, joka on osoitteessa [www.hypertherm.com](http://www.hypertherm.com).

## БЪЛГАРСКИ / BULGARIAN

ПРЕДУПРЕЖДЕНИЕ! Преди да работите с което и да е оборудване Hypertherm, прочетете инструкциите за безопасност в ръководството на вашия продукт и „Инструкция за безопасност и съответствие“ (80669C). Неспазването на инструкциите за безопасност би могло да доведе до телесно нараняване или до повреда на оборудването.

Копия на ръководствата може да придружават продукта в електронен и в печатен формат. Можете да получите копия на ръководствата, предлагани на всички езици, от „Documents library“ (Библиотека за документи) на адрес [www.hypertherm.com](http://www.hypertherm.com).

## ROMÂNĂ / ROMANIAN

AVERTIZARE! Înainte de utilizarea oricărui echipament Hypertherm, citiți instrucțiunile de siguranță din cadrul manualului produsului și din cadrul *Manualului de siguranță și conformitate* (80669C). Nerespectarea instrucțiilor de siguranță pot rezulta în vătămare personală sau în avarierea echipamentului.

Produsul poate fi însoțit de copii ale manualului în format tipărit și electronic. De asemenea, dumneavoastră puteți obține copii ale manualelor, în toate limbile disponibile pentru fiecare manual, din cadrul secțiunii „Bibliotecă documente” aflată pe site-ul [www.hypertherm.com](http://www.hypertherm.com).

## TÜRKÇE / TURKISH

UYARI! Bir Hypertherm ekipmanını çalıştırmadan önce, ürün kullanımı kılavuzunda ve *Güvenlik ve Uyumluluk Kılavuzu'nda* (80669C) yer alan güvenlik talimatlarını okuyun. Güvenlik talimatlarına uyulmaması durumunda kişisel yaralanmalar veya ekipman hasarı meydana gelebilir.

Kılavuzların kopyaları, elektronik ve basılı formatta ürünle birlikte verilebilir. Her biri tüm dillerde yayınlanan kılavuzların kopyalarını [www.hypertherm.com](http://www.hypertherm.com) adresindeki “Documents library” (Dosyalar kitaplığı) başlığından da elde edebilirsiniz.

## MAGYAR / HUNGARIAN

VIGYÁZAT! Mielőtt bármilyen Hypertherm berendezést üzemeltetne, olvassa el a biztonsági információkat a termék kézikönyvében és a *Biztonsági és szabálykövetési kézikönyvben* (80669C). A biztonsági utasítások betartásának elmulasztása személyi sérüléshez vagy a berendezés károsodásához vezethet.

A termékhez a kézikönyv példányai elektronikus és nyomtatott formában is mellékelve lehetnek. A kézikönyvek példányai (minden nyelven) a [www.hypertherm.com](http://www.hypertherm.com) weboldalon a „Documents library” (Dokumentum könyvtár) részben is beszerezhetők.

## ΕΛΛΗΝΙΚΑ / GREEK

ΠΡΟΕΙΔΟΠΟΙΗΣΗ! Πριν θέσετε σε λειτουργία οποιονδήποτε εξοπλισμό της Hypertherm, διαβάστε τις οδηγίες ασφαλείας στο εγχειρίδιο του προϊόντος και στο *Εγχειρίδιο ασφάλειας και συμμόρφωσης* (80669C). Η μη τήρηση των οδηγιών ασφαλείας μπορεί να επιφέρει σωματική βλάβη ή ζημία στον εξοπλισμό.

Αντίγραφα των εγχειριδίων μπορεί να συνοδεύουν το προϊόν σε ηλεκτρονική και έντυπη μορφή. Μπορείτε, επίσης, να λάβετε αντίγραφα των εγχειριδίων σε όλες τις γλώσσες που διατίθενται για κάθε εγχειρίδιο από την ψηφιακή βιβλιοθήκη εγγράφων (Documents library) στη διαδικτυακή τοποθεσία [www.hypertherm.com](http://www.hypertherm.com).

## 繁體中文 / CHINESE (TRADITIONAL)

警告！在操作任何 Hypertherm 設備前，請閱讀您產品手冊和《安全 and 法務遵從手冊》(80669C) 內的安全指示。不遵守安全指示可能會導致人身傷害或設備損壞。

手冊複本可能以電子和印刷格式隨附產品提供。您也可以在此 [www.hypertherm.com](http://www.hypertherm.com) 的「文檔資料庫」內獲取所有手冊的多語種複本。

## SLOVENŠČINA / SLOVENIAN

OPOZORILO! Pred uporabo katerekoli Hyperthermove opreme preberite varnostna navodila v priročniku vašega izdelka ter v *Priročniku za varnost in skladnost* (80669C). Neupoštevanje navodil za uporabo lahko povzroči telesne poškodbe ali materialno škodo.

Izdelku so lahko priloženi izvodi priročnikov v elektronski ali tiskani obliki. Izvode priročnikov v vseh razpoložljivih jezikih si lahko prenesete tudi iz knjižnice dokumentov “Documents library” na naslovu [www.hypertherm.com](http://www.hypertherm.com).

## SRPSKI / SERBIAN

UPOZORENJE! Pre rukovanja bilo kojom Hyperthermovom opremom pročitajte uputstva o bezbednosti u svom priručniku za proizvod i u *Priručniku o bezbednosti i usaglašenosti* (80669C). Oglašavanje o praćenje uputstava o bezbednosti može da ima za posledicu ličnu povredu ili oštećenje opreme.

Može se dogoditi da kopije priručnika prate proizvod u elektronskom i štampanom formatu. Takođe možete da pronađete kopije priručnika, na svim jezicima koji su dostupni za svaki od priručnika, u “Biblioteci dokumenata” (“Documents library”) na [www.hypertherm.com](http://www.hypertherm.com).

## SLOVENČINA / SLOVAK

VÝSTRAHA! Pred použitím akéhokolvek zariadenia od spoločnosti Hypertherm si prečítajte bezpečnostné pokyny v návode na obsluhu vášho zariadenia a v *Manuáli o bezpečnosti a súlade s normami* (80669C). V prípade nedodržania bezpečnostných pokynov môže dôjsť k ujme na zdraví alebo poškodeniu zariadenia.

Kópia návodu, ktorá je dodávaná s produktom, môže mať elektronickú alebo tlačенú podobu. Kópie návodov, vo všetkých dostupných jazykoch, sú k dispozícii aj v sekcii z „knihnice Dokumenty“ na [www.hypertherm.com](http://www.hypertherm.com).

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## Introduction

Hypertherm's CE-marked equipment is built in compliance with standard EN60974-10. The equipment should be installed and used in accordance with the information below to achieve electromagnetic compatibility.

The limits required by EN60974-10 may not be adequate to completely eliminate interference when the affected equipment is in close proximity or has a high degree of sensitivity. In such cases it may be necessary to use other measures to further reduce interference.

This cutting equipment is designed for use only in an industrial environment.

## Installation and use

The user is responsible for installing and using the plasma equipment according to the manufacturer's instructions.

If electromagnetic disturbances are detected then it shall be the responsibility of the user to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the cutting circuit, see *Earthing of the workpiece*. In other cases, it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases, electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

## Assessment of area

Before installing the equipment, the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

- a. Other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the cutting equipment.
- b. Radio and television transmitters and receivers.
- c. Computer and other control equipment.
- d. Safety critical equipment, for example guarding of industrial equipment.
- e. Health of the people around, for example the use of pacemakers and hearing aids.
- f. Equipment used for calibration or measurement.
- g. Immunity of other equipment in the environment. User shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures.
- h. Time of day that cutting or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

## Methods of reducing emissions

### Mains supply

Cutting equipment must be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply.

Consideration should be given to shielding the supply cable of permanently installed cutting equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the cutting mains supply so that good electrical contact is maintained between the conduit and the cutting power source enclosure.

## Maintenance of cutting equipment

The cutting equipment must be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the cutting equipment is in operation. The cutting equipment should not be modified in any way, except as set forth in and in accordance with the manufacturer's written instructions. For example, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

## Cutting cables

The cutting cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

### Equipotential bonding

Bonding of all metallic components in the cutting installation and adjacent to it should be considered.

However, metallic components bonded to the workpiece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode (nozzle for laser heads) at the same time.

The operator should be insulated from all such bonded metallic components.

### Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, for example, ship's hull or building steel work, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitances selected according to national regulations.

Note: The cutting circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury, for example, by allowing parallel cutting current return paths which may damage the earth circuits of other equipment. Further guidance is provided in IEC 60974-9, Arc Welding Equipment, Part 9: Installation and Use.

### Screening and shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire plasma cutting installation may be considered for special applications.

### Attention

Genuine Hypertherm parts are the factory-recommended replacement parts for your Hypertherm system. Any damage or injury caused by the use of other than genuine Hypertherm parts may not be covered by the Hypertherm warranty, and will constitute misuse of the Hypertherm Product.

You are solely responsible for the safe use of the Product. Hypertherm does not and cannot make any guarantee or warranty regarding the safe use of the product in your environment.

### General

Hypertherm Inc. warrants that its Products shall be free from defects in materials and workmanship for the specific periods of time set forth herein and as follows: if Hypertherm is notified of a defect (i) with respect to the plasma power supply within a period of two (2) years from the date of its delivery to you, with the exception of Powermax brand power supplies, which shall be within a period of three (3) years from the date of delivery to you, and (ii) with respect to the torch and leads within a period of one (1) year from its date of delivery to you, with the exception of the HPRXD short torch with integrated lead, which shall be within a period of six (6) months from the date of delivery to you, and with respect to torch lifter assemblies within a period of one (1) year from its date of delivery to you, and with respect to Automation products one (1) year from its date of delivery to you, with the exception of the EDGE Connect CNC, EDGE Connect T CNC, EDGE Connect TC CNC, EDGE Pro CNC, EDGE Pro Ti CNC, MicroEDGE Pro CNC, and ArcGlide THC, which shall be within a period of two (2) years from the date of delivery to you, and (iii) with respect to HyIntensity fiber laser components within a period of two (2) years from the date of its delivery to you, with the exception of laser heads and beam delivery cables, which shall be within a period of one (1) year from its date of delivery to you.

This warranty shall not apply to any Powermax brand power supplies that have been used with phase converters. In addition, Hypertherm does not warranty systems that have been damaged as a result of poor power quality, whether from phase converters or incoming line power. This warranty shall not apply to any product which has been incorrectly installed, modified, or otherwise damaged.

Hypertherm provides repair, replacement or adjustment of the Product as the sole and exclusive remedy, if and only if the warranty set forth herein properly is invoked and applies. Hypertherm, at its sole option, shall repair, replace, or adjust, free of charge, any defective Products covered by this warranty which shall be returned with Hypertherm's prior authorization (which shall not be unreasonably withheld), properly packed, to Hypertherm's place of business in Hanover, New Hampshire, or to an authorized Hypertherm repair facility, all costs, insurance and freight pre paid by the customer. Hypertherm shall not be liable for any repairs, replacement, or adjustments of Products covered by this warranty, except those made pursuant to this paragraph and with Hypertherm's prior written consent.

The warranty set forth above is exclusive and is in lieu of all other warranties, express, implied, statutory, or otherwise with respect to the Products or as to the results which may be obtained therefrom, and all implied warranties or conditions of quality or of merchantability or fitness for a particular purpose or against infringement. The foregoing shall constitute the sole and exclusive remedy for any breach by Hypertherm of its warranty.

Distributors/OEMs may offer different or additional warranties, but Distributors/OEMs are not authorized to give any additional warranty protection to you or make any representation to you purporting to be binding upon Hypertherm.

### Patent indemnity

Except only in cases of products not manufactured by Hypertherm or manufactured by a person other than Hypertherm not in strict conformity with Hypertherm's specifications and in cases of designs, processes, formulae, or combinations not developed or purported to be developed by Hypertherm, Hypertherm will have the right to defend or settle, at its own expense, any suit or proceeding brought against you alleging that the use of the Hypertherm product, alone and not in combination with any other product not supplied by Hypertherm, infringes any patent of any third party. You shall notify Hypertherm promptly upon learning of any action or threatened action in connection with any such alleged infringement (and in any event no longer than fourteen (14) days after learning of any action or threat of action), and Hypertherm's obligation to defend shall be conditioned upon Hypertherm's sole control of, and the indemnified party's cooperation and assistance in, the defense of the claim.

### Limitation of liability

**In no event shall Hypertherm be liable to any person or entity for any incidental, consequential direct, indirect, punitive or exemplary damages (including but not limited to lost profits) regardless of whether such liability is based on breach of contract, tort, strict liability, breach of warranty, failure of essential purpose, or otherwise, and even if advised of the possibility of such damages. Hypertherm shall not be liable for any losses to Distributor based on down time, lost production or lost profits. It is the intention of the Distributor and Hypertherm that this provision be construed by a court as being the broadest limitation of liability consistent with applicable law.**

### National and local codes

National and local codes governing plumbing and electrical installation shall take precedence over any instructions contained in this manual. In no event shall Hypertherm be liable for injury to persons or property damage by reason of any code violation or poor work practices.

# Warranty

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## Liability cap

In no event shall Hypertherm’s liability, if any, whether such liability is based on breach of contract, tort, strict liability, breach of warranties, failure of essential purpose or otherwise, for any claim, action, suit or proceeding (whether in court, arbitration, regulatory proceeding or otherwise) arising out of or relating to the use of the Products exceed in the aggregate the amount paid for the Products that gave rise to such claim.

## Insurance

At all times you will have and maintain insurance in such quantities and types, and with coverage sufficient and appropriate to defend and to hold Hypertherm harmless in the event of any cause of action arising from the use of the products.

## Transfer of rights

You may transfer any remaining rights you may have hereunder only in connection with the sale of all or substantially all of your assets or capital stock to a successor in interest who agrees to be bound by all of the terms and conditions of this Warranty. Within thirty (30) days before any such transfer occurs, you agree to notify in writing Hypertherm, which reserves the right of approval. Should you fail timely to notify Hypertherm and seek its approval as set forth herein, the Warranty set forth herein shall be null and void and you will have no further recourse against Hypertherm under the Warranty or otherwise.

## Waterjet product warranty coverage

Product	Parts coverage
HyPrecision pumps	27 months from the ship date, or 24 months from the date of proven installation, or 4,000 hours, whichever occurs first
PowerDredge abrasive removal system	15 months from the ship date or 12 months from the date of proven installation, whichever occurs first
EcoSift abrasive recycling system	15 months from the ship date or 12 months from the date of proven installation, whichever occurs first
Abrasive metering devices	15 months from the ship date or 12 months from the date of proven installation, whichever occurs first
On/off valve air actuators	15 months from the ship date or 12 months from the date of proven installation, whichever occurs first
Diamond orifices	600 hours of use with the use of a thimble filter and compliance with Hypertherm’s water quality requirements

Consumable parts are not covered by this warranty. Consumable parts include, but are not limited to, high-pressure water seals, check valves, cylinders, bleed-down valves, low-pressure seals, high-pressure tubing, low- and high-pressure water filters and abrasive collection bags. All third-party pumps, pump accessories, hoppers, hopper accessories, dryer boxes, dryer box accessories and plumbing accessories are covered by the respective manufacturers' warranties and not covered by this warranty.

## Section 1

### Specifications

---

#### Introduction

The Duramax Hyamp torch line includes 45° long handheld torches fitted with either 0.6 m (2 foot) or 1.2 m (4 foot) extensions and 90° long handheld torches fitted with 0.6 m (2 foot), 1.2 m (4 foot), or 1.8 m (6 foot) extensions. The extensions offer increased reach in difficult to access areas. You can use these long handheld torches with the following Powermax® power supplies:

- Powermax45 XP
- Powermax65
- Powermax85
- Powermax105
- Powermax125

The Duramax Hyamp long handheld torches were designed to be used with the Powermax125, but they can also be used with the Powermax45 XP, Powermax65, Powermax85, and Powermax105 with the exception of the torches with the 46-m (150-foot) leads.

The Duramax Hyamp long handheld torches with 46-m (150-foot) torch leads must be used with a Powermax125. Duramax Hyamp long handheld torches with 46-m (150-foot) leads cannot be used with any other Powermax systems.



**IMPORTANT:** If your Powermax125 has a serial number of 125-007943 or lower, you must install a new DSP board (428119). Make sure that the DSP board is at Revision C or higher.





For more information about using the Duramax Hyamp long handheld torches with the 46-m (150-foot) torch leads on Powermax125 systems, see the *Duramax Hyamp 46-m (150-foot) Torch and Torch Leads Field Service Bulletin* (810260).

# 1 – Specifications

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Hypertherm's FastConnect™ system makes it easy to remove the torch for transport or to switch from one torch to another if your cutting applications require the use of multiple torches. The torches are cooled by ambient air and do not require special cooling procedures.

Duramax Hyamp long handheld torches comply with IEC 60974-7. They are not suitable for cutting under water or for use in the rain or snow.

	<b>WARNING!</b>
	<b>Do not submerge the torch in water while cutting. Putting the torch head under water while there is an active arc can result in electric shock.</b>



## Torch configurations and weights

The Duramax Hyamp long handheld torches ship in one of the configurations shown in *Table 1*. *Table 1* lists each configuration and its corresponding weight.

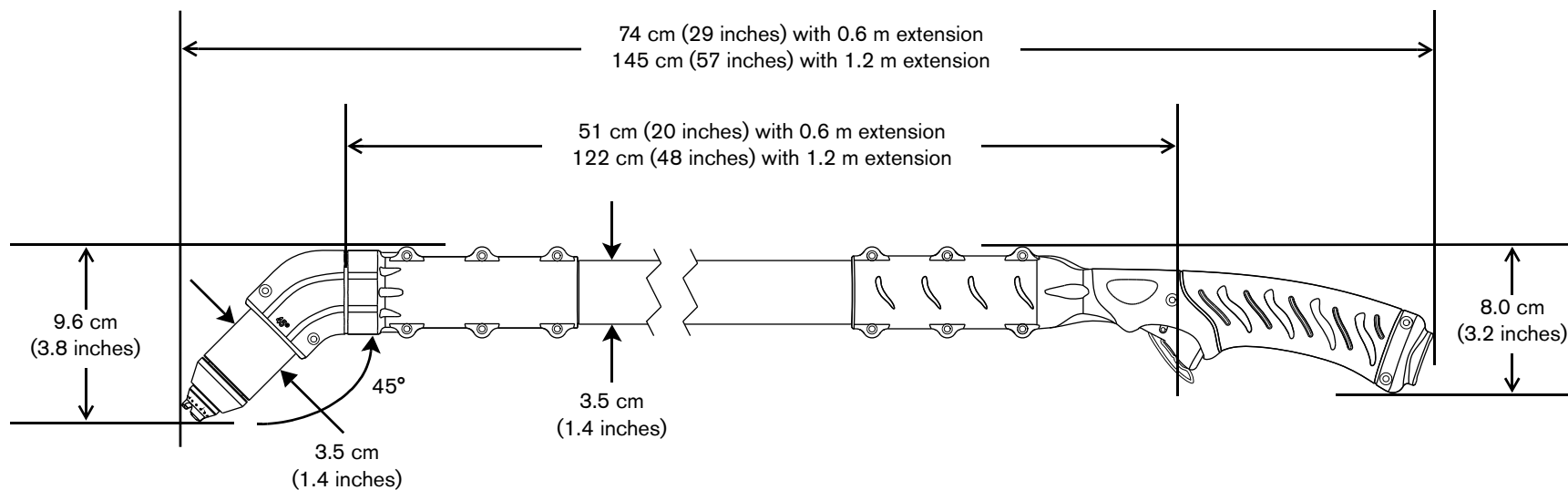


These weights do not include consumables.

**Table 1**

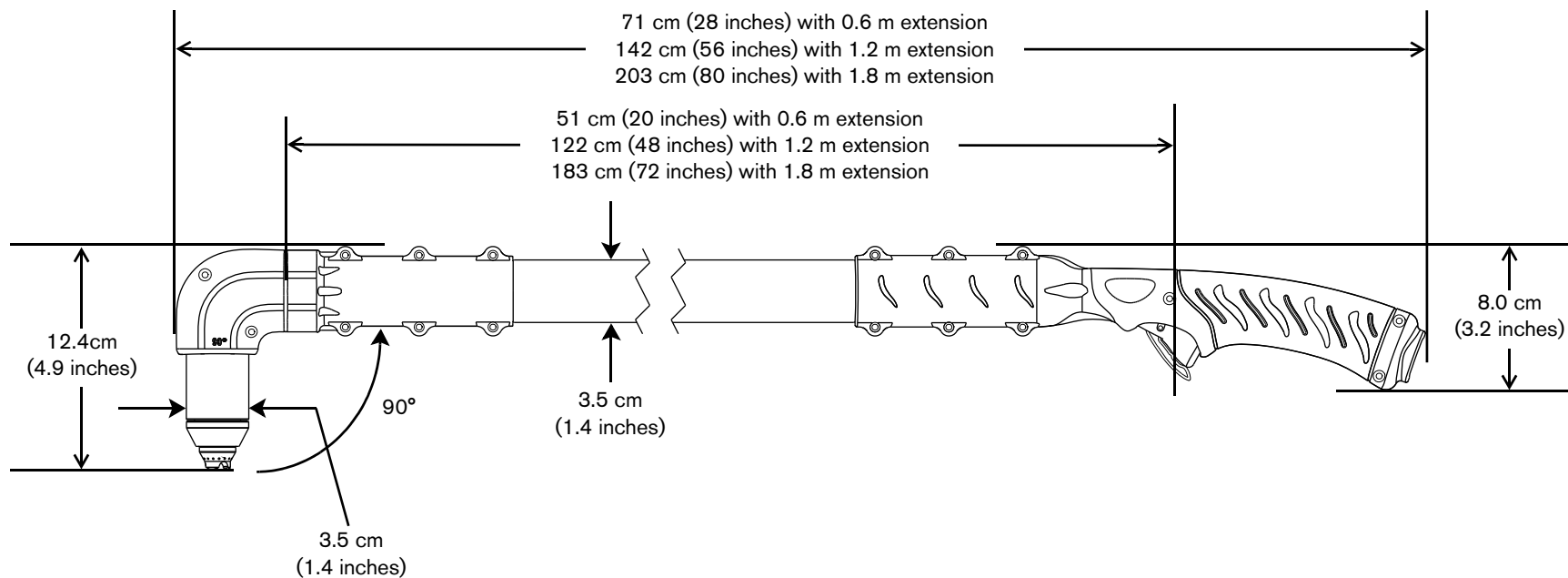
<b>Torch configuration</b>	<b>Weight</b>
45° Duramax Hyamp 0.6 m (2 foot) torch with 7.6 m (25 foot) lead	4.2 kg (9.2 pounds)
45° Duramax Hyamp 0.6 m (2 foot) torch with 15.2 m (50 foot) lead	6.9 kg (15.1 pounds)
45° Duramax Hyamp 1.2 m (4 foot) torch with 7.6 m (25 foot) lead	5.2 kg (11.4 pounds)
45° Duramax Hyamp 1.2 m (4 foot) torch with 15.2 m (50 foot) lead	7.9 kg (17.3 pounds)
45° Duramax Hyamp 1.2 m (4 foot) torch with 46 m (150 foot) lead (for Powermax125 only)	18.3 kg (40.3 pounds)
90° Duramax Hyamp 0.6 m (2 foot) torch with 7.6 m (25 foot) lead	4.2 kg (9.2 pounds)
90° Duramax Hyamp 0.6 m (2 foot) torch with 15.2 m (50 foot) lead	6.9 kg (15.1 pounds)
90° Duramax Hyamp 1.2 m (4 foot) torch with 7.6 m (25 foot) lead	5.2 kg (11.4 pounds)
90° Duramax Hyamp 1.2 m (4 foot) torch with 15.2 m (50 foot) lead	7.9 kg (17.3 pounds)
90° Duramax Hyamp 1.2 m (4 foot) torch with 46 m (150 foot) lead (for Powermax125 only)	18.3 kg (40.3 pounds)
90° Duramax Hyamp 1.8 m (6 foot) torch with 7.6 m (25 foot) lead	5.7 kg (12.6 pounds)
90° Duramax Hyamp 1.8 m (6 foot) torch with 15.2 m (50 foot) lead	8.4 kg (18.5 pounds)

## 45° Duramax Hyamp long handheld torch dimensions



Torch dimensions will vary depending on the type of consumables installed. This figure shows handheld shielded consumables installed.

## 90° Duramax Hyamp long handheld torch dimensions



Torch dimensions will vary depending on the type of consumables installed. This figure shows handheld shielded consumables installed.



## Section 2

### Torch Setup

---

This section explains how to set up your Duramax Hyamp long handheld torch and choose the appropriate consumables for the job.

You can use the long handheld torch with any of the following Powermax systems. Refer to your system's Operator Manual for operation, maintenance, troubleshooting, and parts information related to the power supply.

- Powermax45 XP (809240)
- Powermax65 (806650)
- Powermax85 (806650)
- Powermax105 (807390)
- Powermax125 (808080)



You can download these manuals from [www.hypertherm.com](http://www.hypertherm.com) by clicking the "Documents library" link and searching for the part numbers listed above.

### Consumable life

How often you need to change the consumables on your torch will depend on a number of factors:

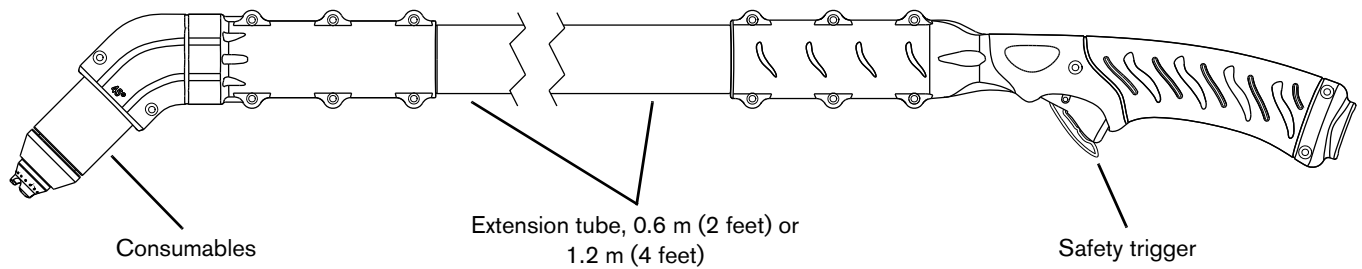
- The thickness of the metal being cut.
- The average length of the cut.
- The air quality (presence of oil, moisture, or other contaminants).
- Whether you are piercing the metal or starting cuts from the edge.
- Proper torch-to-work distance when gouging.
- Proper pierce height.
- Whether you are cutting in “continuous pilot arc” mode or normal mode. Cutting with a continuous pilot arc causes more consumable wear.

Under normal conditions, the nozzle will wear out first when hand cutting. As general rule, a set of consumables lasts approximately 1 to 3 hours of actual “arc on” time for 105 – 125 A hand cutting. Cutting at lower amperages may yield longer consumable life. You will find more information about proper cutting techniques in *Operation* on page 29.

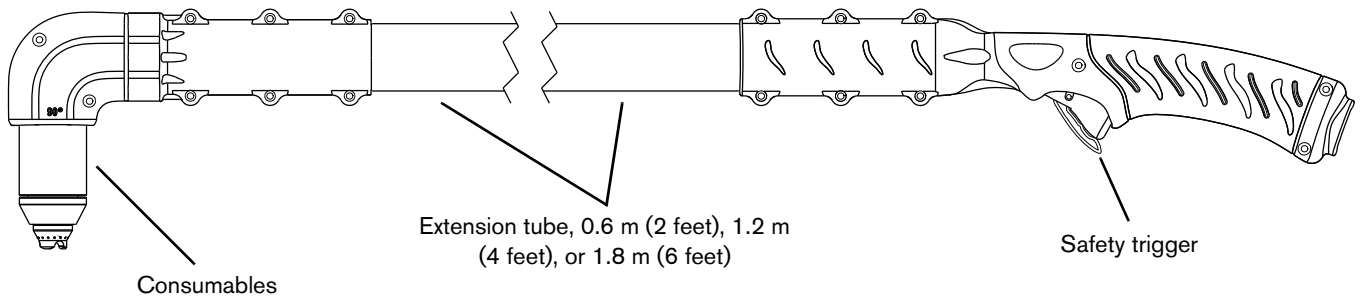
## Long handheld torch components

The Duramax Hyamp 45° and 90° long handheld torches ship without consumables installed.

### Duramax Hyamp 45° long handheld torch



### Duramax Hyamp 90° long handheld torch



Choose the hand torch consumables

Hypertherm includes a starter consumable kit (428099) with your Duramax Hyamp torch. The 45° and 90° long handheld torches use the same consumables.

Hand torches use shielded consumables. Therefore, you can drag the torch tip along the metal.

Consumables for hand cutting are shown below. Notice that the retaining cap and electrode are the same for cutting, gouging, and FineCut® applications. Only the shield, nozzle, and swirl ring are different. Also notice that specific consumables are not available for cutting at 85 A. Use the standard (drag-cutting) 105/125 A consumables to cut at 85 A.

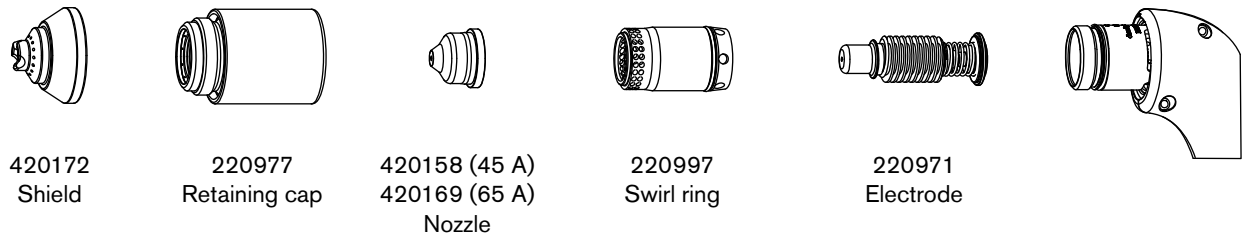
For higher cut quality on thin materials (approximately 4 mm/10 GA or less), you may prefer to use FineCut consumables, or use a 45 A nozzle and reduce the amperage to that setting.

More consumables are available for this torch, but can require testing to find the optimal settings. You can find information about consumables at [www.hypertherm.com](http://www.hypertherm.com).

Drag-cutting 105/125 A consumables

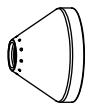


Drag-cutting 45 A and 65 A consumables

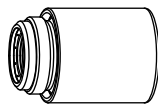




Maximum Removal gouging consumables



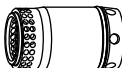
420112  
Shield



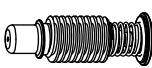
220977  
Retaining cap



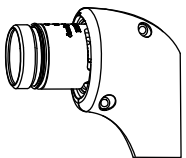
420001  
Nozzle



220997  
Swirl ring



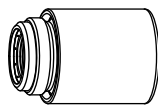
220971  
Electrode



FineCut consumables



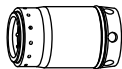
420152  
Shield



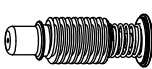
220977  
Retaining cap



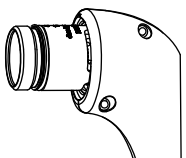
420151  
Nozzle



420159  
Swirl ring



220971  
Electrode



Install the hand torch consumables

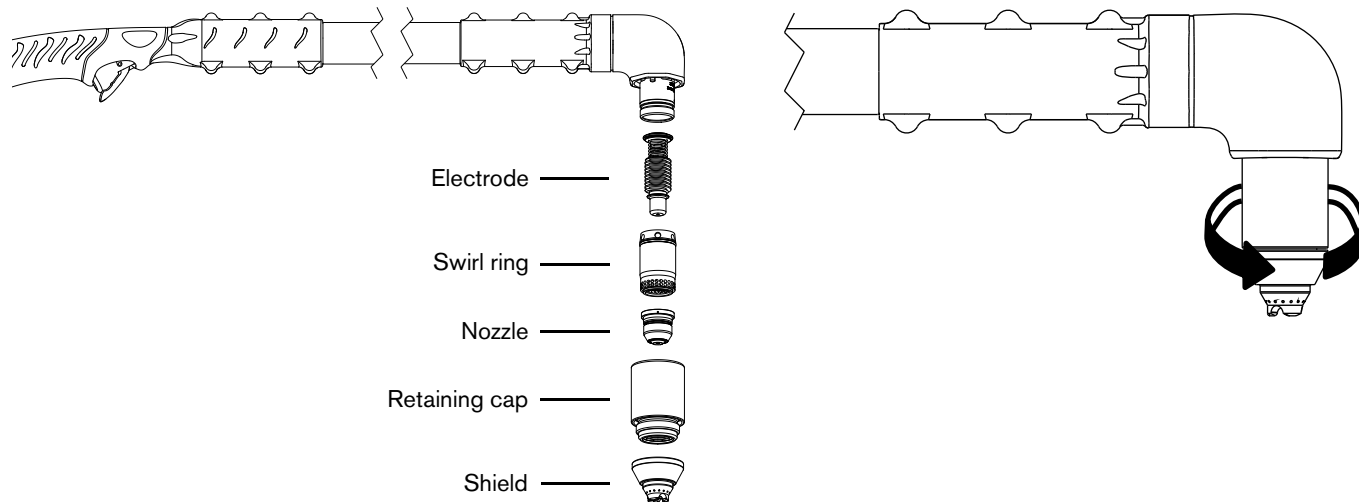
		<p><b>WARNING!</b></p> <p><b>INSTANT-ON TORCHES</b></p> <p><b>PLASMA ARC CAN CAUSE INJURY AND BURNS</b></p>
	<p><b>The plasma arc comes on immediately when the torch trigger is activated. Make sure the power is OFF before changing consumables.</b></p>	

To operate the long handheld torch, a complete set of consumable parts must be installed: shield, retaining cap, nozzle, swirl ring, and electrode. Torches ship without consumables installed. Pull off the vinyl cap before installing your consumables.

## 2 – Torch Setup

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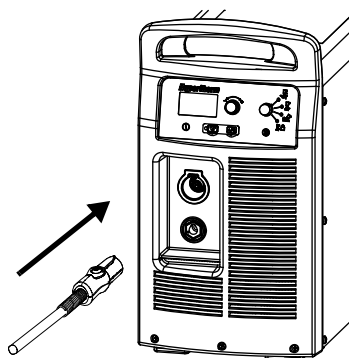
With the power switch in the OFF (O) position, install the torch consumables as shown.



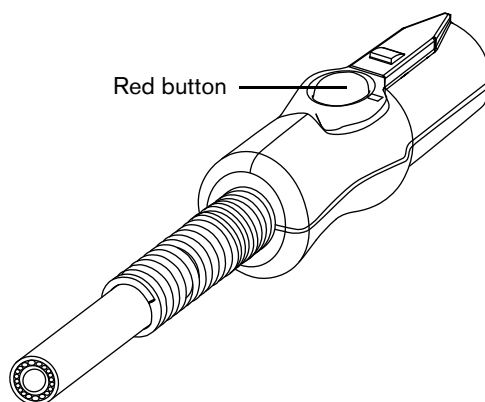
## Connecting the torch lead

The Powermax systems and torches are equipped with FastConnect, a quick-disconnect system for connecting and disconnecting handheld and machine torch leads. When connecting or disconnecting a torch, first turn OFF the system.

To connect the torch, push the connector into the receptacle on the front of the power supply.






To remove the torch, press the red button on the connector and pull the connector out of the receptacle.





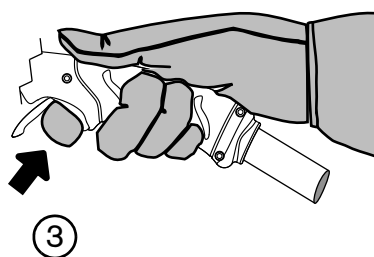
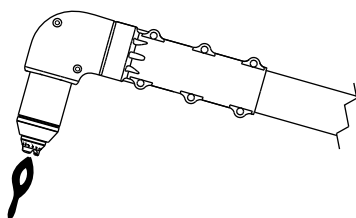
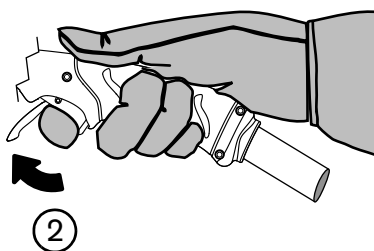
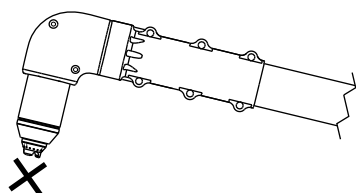
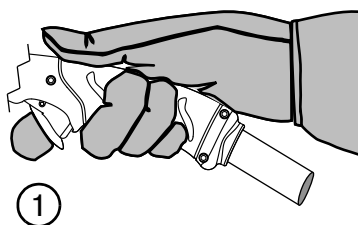
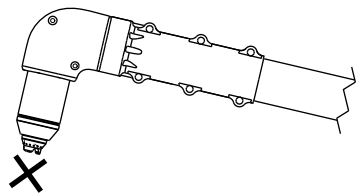
## Using the hand torch

		<p><b>WARNING!</b></p> <p><b>INSTANT-ON TORCHES</b></p> <p><b>PLASMA ARC CAN CAUSE INJURY AND BURNS</b></p>
<p>The plasma arc comes on immediately when the torch trigger is activated. The plasma arc will cut quickly through gloves and skin.</p> <ul style="list-style-type: none"><li>■ Wear correct and appropriate protective equipment.</li><li>■ Keep hands, clothing, and objects away from the torch tip.</li><li>■ Do not hold the workpiece and keep your hands clear of the cutting path.</li><li>■ Never point the torch toward yourself or others.</li></ul>		

	<p><b>WARNING!</b></p> <p><b>CAREFULLY OPERATE AND STORE THE LONG TORCH</b></p>
<p>Beware of hot, falling debris when cutting at waist-height or higher. Keep the cutting area clear to avoid injury or property damage.</p> <p>Make sure that conditions are safe before cutting in difficult to access areas where visibility is poor. Always account for falling debris.</p> <p>Store the long torch in a safe place when not in use. Do not leave it lying on the ground, as this can present a tripping hazard or result in damage to the torch or lead if stepped on or run over.</p>	

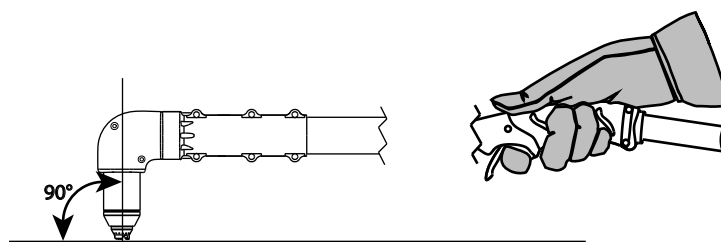
## Operate the safety trigger

The long hand torches are equipped with a safety trigger to prevent accidental firings. When you are ready to use the torch, flip the trigger's safety cover forward (toward the torch head) and press the red torch trigger.

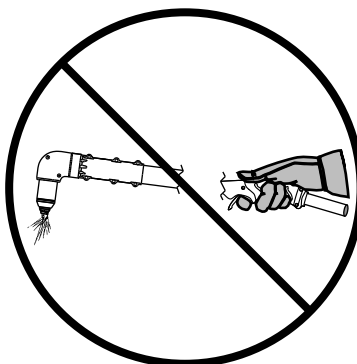


## Hand torch cutting guidelines

- Drag the torch tip lightly along the workpiece to maintain a steady cut.
- While cutting, make sure that sparks exit from the bottom of the workpiece. The sparks should lag slightly behind the torch as you cut (15 – 30° angle from vertical).
- If sparks spray up from the workpiece, move the torch more slowly, or set the output current higher.
- With either hand torch, hold the torch nozzle perpendicular to the workpiece so that the nozzle is at a 90° angle to the cutting surface. Observe the cutting arc as the torch cuts.

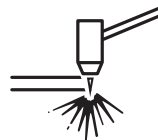


- If you fire the torch unnecessarily, you will shorten the life of the nozzle and electrode.



- Pulling or dragging the torch along the cut is easier than pushing it.
- For straight-line cuts, use a straight edge as a guide.
- To keep the torch head steady and slightly above the workpiece while cutting, you can use the skeleton cutting sled kit (428809) or similar aid.

#### Start a cut from the edge of the workpiece



The photographs in this section show a regular Duramax hand torch; however, the cutting, piercing, and gouging techniques shown are the same for the Duramax Hyamp long handheld torches.

1. With the ground clamp attached to the workpiece, hold the torch nozzle perpendicular (90°) to the edge of the workpiece.



2. Press the torch's trigger to start the arc. Pause at the edge until the arc has cut completely through the workpiece.

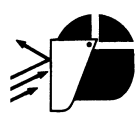
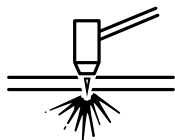


3. Drag the torch tip lightly across the workpiece to proceed with the cut. Maintain a steady, even pace.





## Pierce a workpiece



### WARNING!

**SPARKS AND HOT METAL CAN INJURE EYES AND BURN SKIN**

When firing the torch at an angle, sparks and hot metal will spray out from the nozzle. Point the torch away from yourself and others. Always wear proper protective equipment including gloves and eye protection.

1. With the ground clamp attached to the workpiece, hold the torch at an approximate 30° angle to the workpiece with the torch tip within 1.5 mm (1/16 inch) of the workpiece before firing the torch.



2. Fire the torch while still at an angle to the workpiece. Slowly rotate the torch to a perpendicular (90°) position.



### 3 – Operation

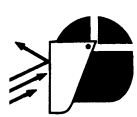
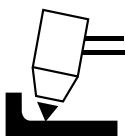
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3. Hold the torch in place while continuing to press the trigger. When sparks exit below the workpiece, the arc has pierced the material.



4. When the pierce is complete, drag the nozzle lightly along the workpiece to proceed with the cut.

## Gouge a workpiece

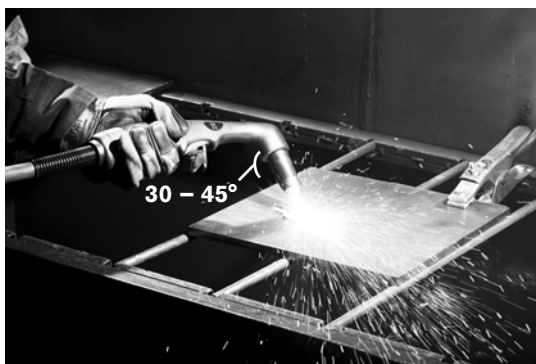


### WARNING!

**SPARKS AND HOT METAL CAN INJURE EYES AND BURN SKIN**

**When firing the torch at an angle, sparks and hot metal will spray out from the nozzle. Point the torch away from yourself and others. Always wear proper protective equipment including gloves and eye protection.**

1. Hold the torch so that the torch tip is slightly above the workpiece before firing the torch.
2. Hold the torch at a 30 – 45° angle to the workpiece, with a small gap between the torch tip and the workpiece. Press the trigger to obtain a pilot arc. Transfer the arc to the workpiece.



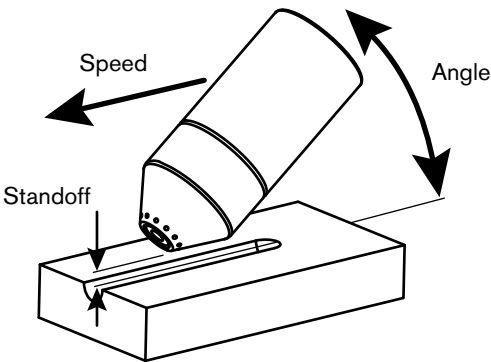
3. Change the torch's angle as needed to achieve the desired dimensions for the gouge. Refer to *Varying the gouge profile* on page 37 and *125 A gouging profile chart* on page 37.
4. Maintain the same angle to the workpiece as you feed into the gouge. Push the plasma arc in the direction of the gouge you want to create. Keep a small distance between the torch tip and the molten metal to avoid reducing consumable life or damaging the torch.




Gouge profile

You can vary the gouge profile by varying the:

- Speed of the torch over the workpiece
- Torch-to-work standoff distance
- Angle of the torch to the workpiece
- Current output of the power supply



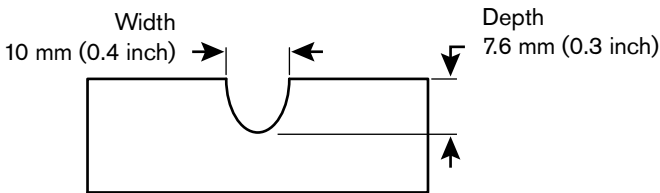
Operating parameters (125 A)	
Speed	508 – 1270 mm/min (20 – 50 ipm)
Standoff	6.4 – 10.2 mm (1/4 – 2/5 inch)
Angle	30 – 35°

 This section provides a 125 A gouging profile for reference, but the tips in *Varying the gouge profile* (below) apply regardless of the power output. Refer to the Powermax45 XP, Powermax65, Powermax85, or Powermax105 Operator Manual for more information on gouging with those power supplies.

Typical gouging profile

125 A

Metal removal rate on mild steel 12.5 kg/hour (27 pounds/hour)



## Varying the gouge profile

Follow these recommendations to change the gouge profile as needed:

- **Increasing the speed** of the torch will **decrease width** and **decrease depth**.
- **Decreasing the speed** of the torch will **increase width** and **increase depth**.
- **Increasing the standoff** of the torch will **increase width** and **decrease depth**.
- **Decreasing the standoff** of the torch will **decrease width** and **increase depth**.
- **Increasing the angle** of the torch (more vertical) will **decrease width** and **increase depth**.
- **Decreasing the angle** of the torch (less vertical) will **increase width** and **decrease depth**.
- **Increasing the current** of the power supply will **increase width** and **increase depth**.
- **Decreasing the current** of the power supply will **decrease width** and **decrease depth**.

## 125 A gouging profile chart

The following tables show the 125 A gouging profile at 30° and 35° on mild steel. These settings are intended to serve as a starting point to help you determine the best gouging profile for a given cutting job. Adjust these settings as needed for your application, table, power output, and power supply to obtain the desired result.

**Table 2 – Metric**

Torch angle	Standoff (mm)	Speed (mm/min)	Depth (mm)	Width (mm)	Width/depth ratio
30°	6.3	508	7.9	8.4	1.06
		762	6.6	7.6	1.16
		1016	5.5	6.6	1.21
		1270	4.4	6.1	1.38
	10.1	508	7.6	9.8	1.30
		762	6.1	8.7	1.43
		1016	4.8	7.3	1.50
		1270	4.2	7.0	1.66
35°	6.3	508	7.5	6.8	0.92
		762	5.7	6.5	1.13
		1016	4.5	5.7	1.26
		1270	4.2	5.2	1.24
	10.1	508	7.3	8.1	1.12
		762	5.7	7.5	1.30
		1016	5.7	6.4	1.12
		1270	4.4	6.0	1.35

### 3 – Operation

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Table 3 – English

Torch angle	Standoff (inches)	Speed (ipm)	Depth (inches)	Width (inches)	Width/depth ratio
30°	0.25	20	0.31	0.33	1.06
		30	0.26	0.30	1.16
		40	0.22	0.26	1.21
		50	0.17	0.24	1.38
	0.40	20	0.30	0.39	1.30
		30	0.24	0.34	1.43
		40	0.19	0.29	1.50
		50	0.17	0.28	1.66
35°	0.25	20	0.30	0.27	0.92
		30	0.23	0.26	1.13
		40	0.18	0.22	1.26
		50	0.17	0.21	1.24
	0.40	20	0.29	0.32	1.12
		30	0.23	0.30	1.30
		40	0.23	0.25	1.12
		50	0.18	0.24	1.35

## **Common hand-cutting faults**

The torch does not cut completely through the workpiece. The causes can be:

- The cut speed is too fast.
- The consumables are worn.
- The metal being cut is too thick for the selected amperage.
- Gouging consumables are installed instead of drag-cutting consumables.
- The ground clamp is not attached properly to the workpiece.
- The gas pressure or gas flow rate is too low.
- Gouging mode is selected on the power supply.

Cut quality is poor. The causes can be:

- The metal being cut is too thick for the amperage.
- The wrong consumables are being used (gouging consumables are installed instead of drag-cutting consumables, for example).
- The torch is moving too quickly or too slowly.

The arc sputters and consumable life is shorter than expected. The causes can be:

- Moisture in the gas supply.
- Incorrect gas pressure.
- Consumables incorrectly installed.
- The consumables are worn.

The consumables show unexpected damage or wear after piercing thicker metal (16 mm [5/8 inch] or thicker). The causes can be:

- Blowback from starting the arc while the shield is resting flat against the workpiece.
  - To avoid this, hold the torch at an angle to the workpiece, or slightly above or to the side of the workpiece, before starting the arc. Then drag lightly along the workpiece to continue the cut.



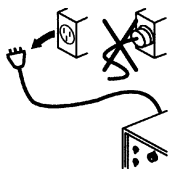





## Section 4

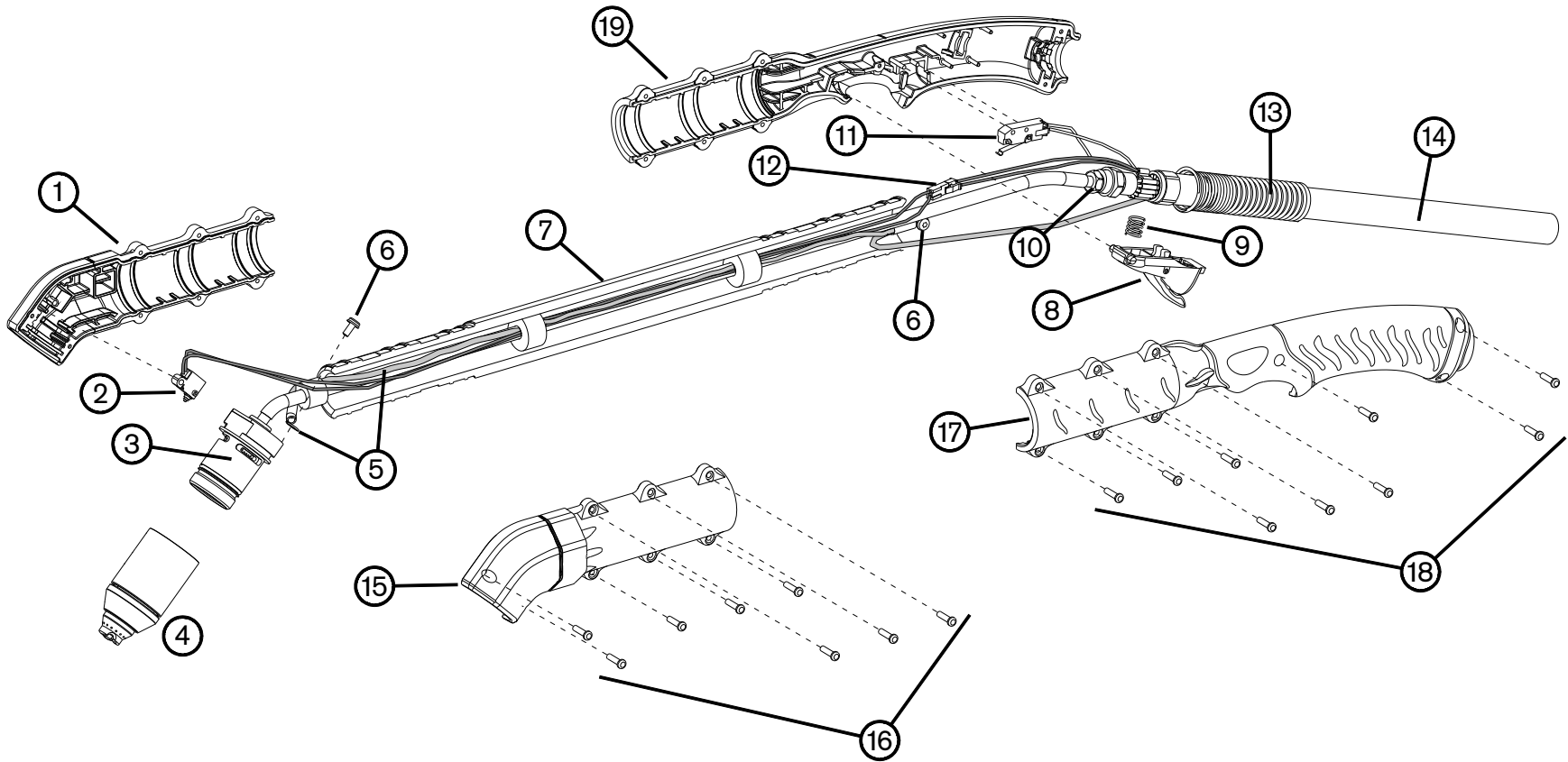
### Component Replacement

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		<b>WARNING!</b> <b>ELECTRIC SHOCK CAN KILL</b>
	<b>Disconnect electrical power before performing any maintenance.</b> <b>The maintenance procedures in this section must be performed by a qualified service technician.</b> <b>See the <i>Safety and Compliance Manual (80669C)</i> for more safety precautions.</b>	

 Many of the illustrations in the following procedures show the 90° torch. However, the procedures are the same for both the 45° and 90° torches unless otherwise noted.

## Duramax Hyamp 45° long handheld torch components

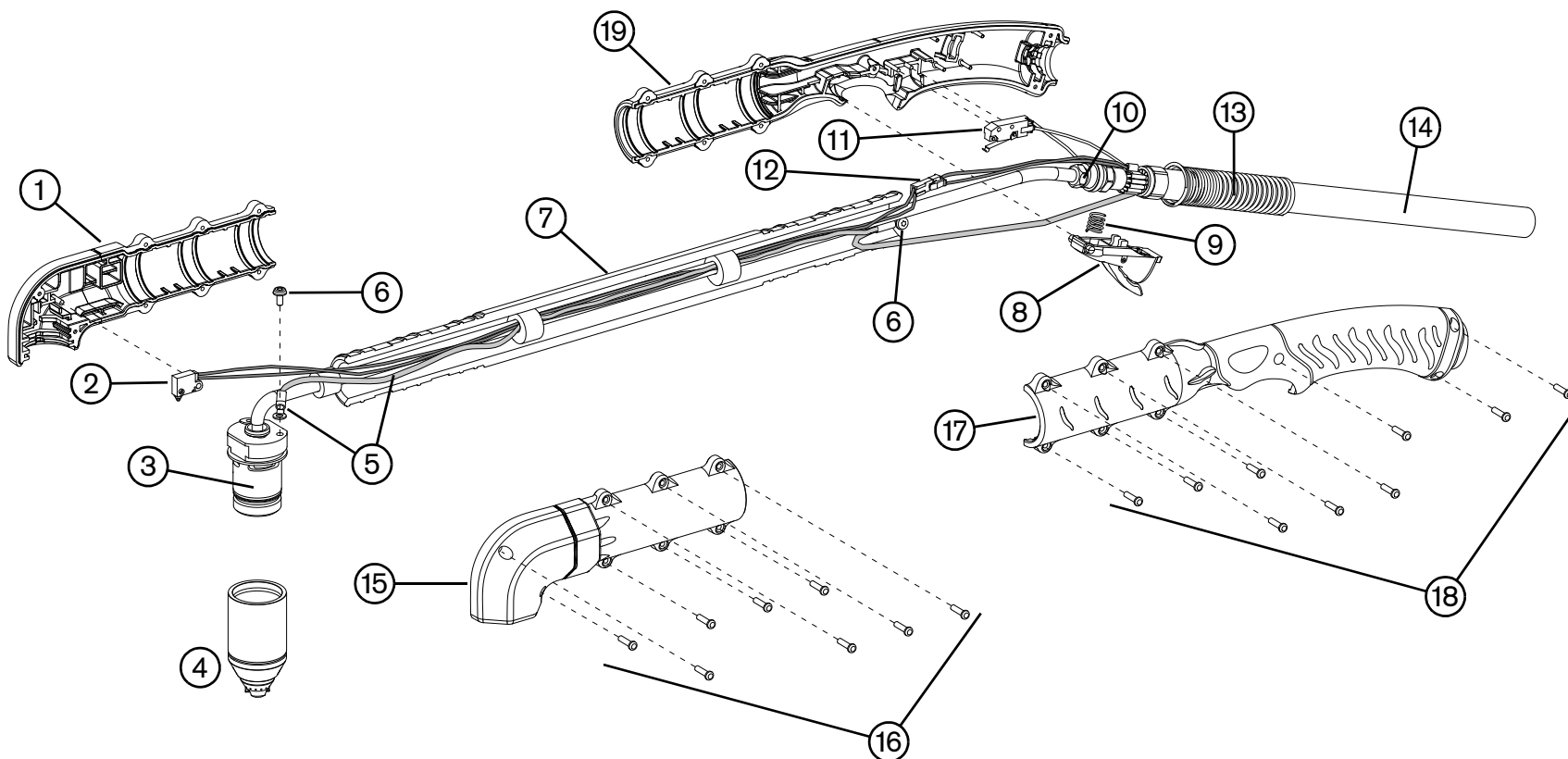


- 1 Front shell, right side
- 2 Cap-sensor switch
- 3 Torch body (torch head plus gas tube)
- 4 Consumables
- 5 Pilot arc wire
- 6 Pilot terminal screw (2)
- 7 Extension tube

- 8 Trigger
- 9 Spring
- 10 Gas tube fitting's flange
- 11 Start switch
- 12 Cap-sensor switch connector
- 13 Strain relief
- 14 Torch lead

- 15 Front shell, left side
- 16 Screws for front shell (8)
- 17 Handle, left side
- 18 Screws for handle (9)
- 19 Handle, right side

## Duramax Hyamp 90° long handheld torch components



- 1 Front shell, right side
- 2 Cap-sensor switch
- 3 Torch body (torch head plus gas tube)
- 4 Consumables
- 5 Pilot arc wire
- 6 Pilot terminal screw (2)
- 7 Extension tube

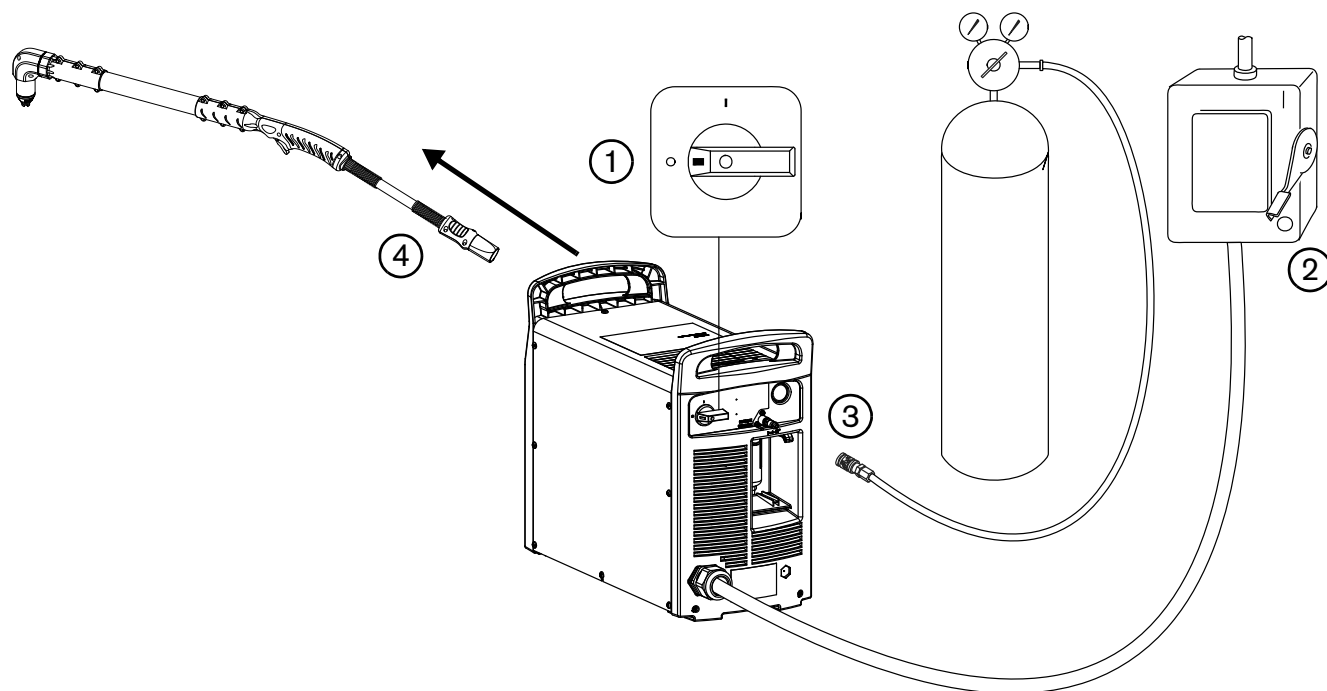
- 8 Trigger
- 9 Spring
- 10 Gas tube fitting's flange
- 11 Start switch
- 12 Cap-sensor switch connector
- 13 Strain relief
- 14 Torch lead

- 15 Front shell, left side
- 16 Screws for front shell (8)
- 17 Handle, left side
- 18 Screws for handle (9)
- 19 Handle, right side

### Disconnect the power, gas supply, and torch

1. Turn the plasma power supply switch to OFF (O).
2. Turn the line disconnect switch to OFF (O).
3. Disconnect the gas supply hose from the plasma power supply.
4. Disconnect the torch from the plasma power supply.

Figure 1



## Replace the handle

**Kit**

428277

**Description***Kit: Duramax Hyamp long handheld torch handle replacement*

### Remove the handle

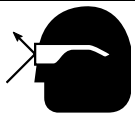
All replacement procedures for the Duramax Hyamp long handheld torches require the removal of the handle that surrounds the trigger. To replace the handle, you need to remove the internal components from the handle.

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Place the torch on a flat surface with the left handle facing up.



The left handle is the side with the screws.

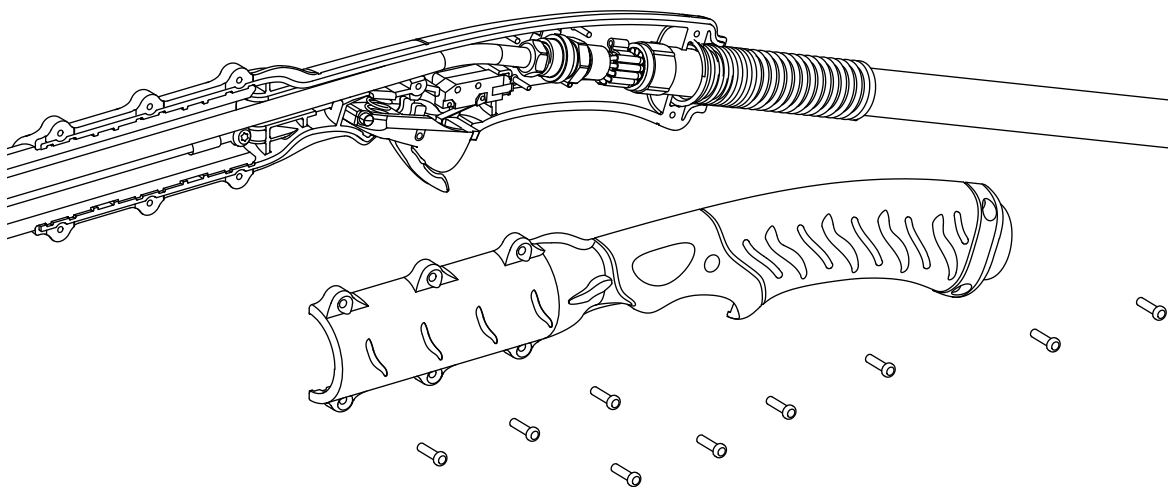
3. Clamp the torch lead in place to keep it from moving.
4. Remove the screws from the left handle.

**CAUTION!**

**Wear eye protection, as the trigger spring can launch out of the handle.**

5. Insert a blade screwdriver between the handles, and gently twist the screwdriver to pry up the left handle. Being careful to keep the trigger spring from launching out of the handle, lift the left side of the handle away from the torch.

**Figure 2**

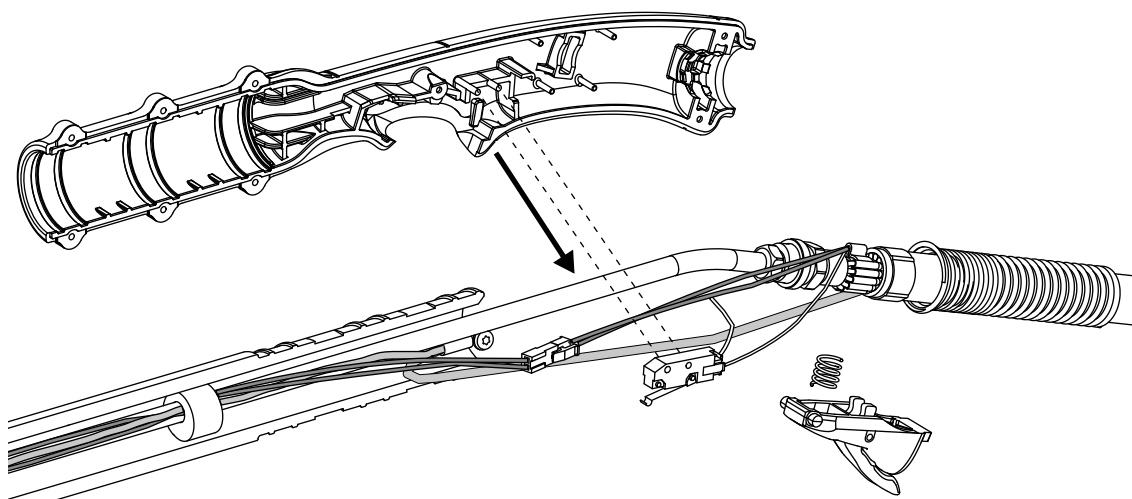


## 4 – Component Replacement

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6. While holding the spring in place, slide the trigger and spring up and out of the handle. Set them aside.
7. The handle fits snugly around the extension tube. While holding the extension tube, gently press the right side of the handle away from the extension tube and torch lead to remove it.
8. Use a blade screwdriver to pry the start switch off the 2 mounting posts.

**Figure 3**



## **Install the handle**

1. Lay the right side of the handle under the torch assembly with the inside of the handle facing up.



If you are installing a new handle, apply the “H” label to the right side of the handle and the “Duramax Hyamp” label to the left side of the handle.

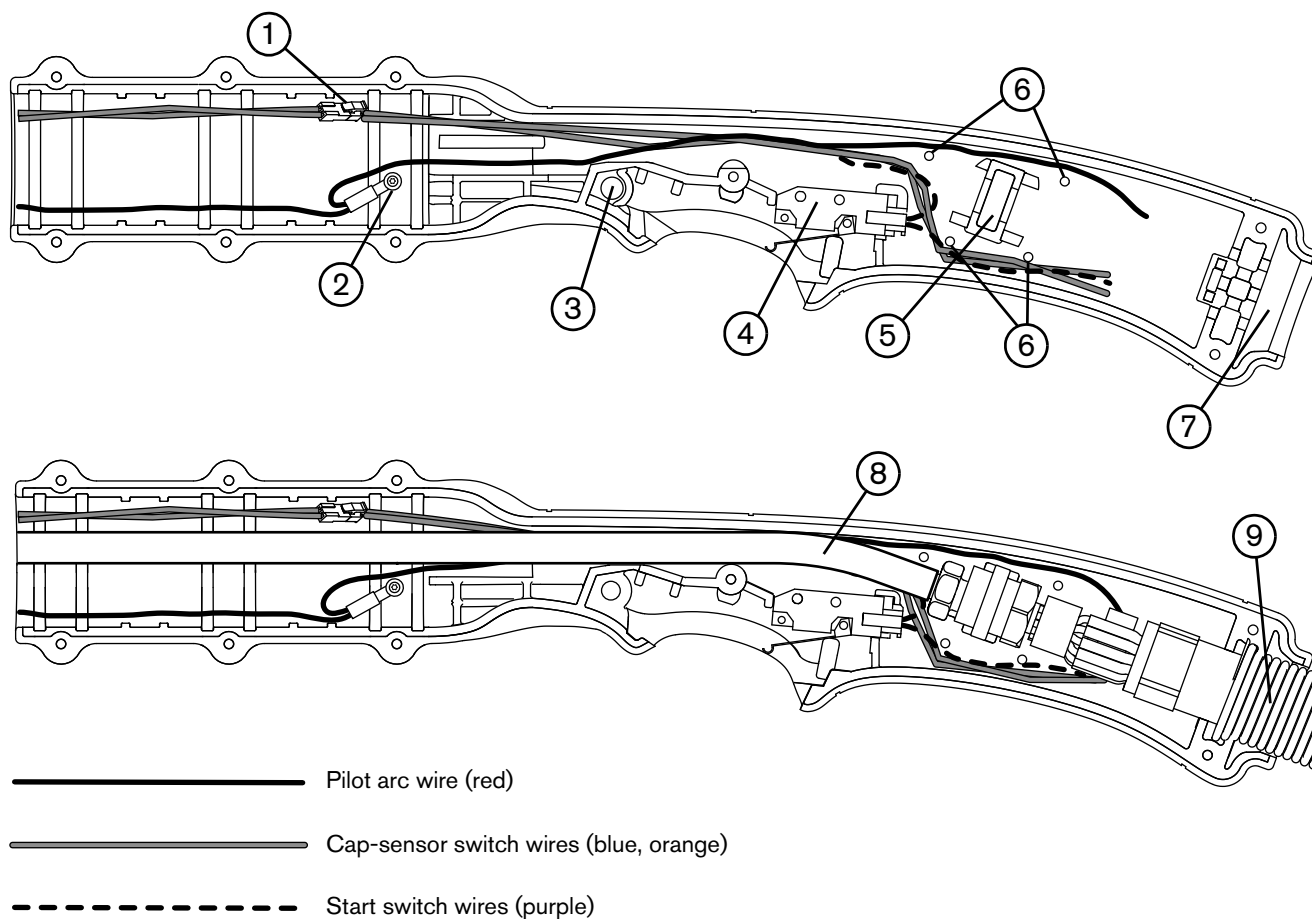
2. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.
3. Press the start switch onto the 2 mounting posts in the handle. See *Figure 4* on page 48.



Putting the start switch in the handle at this point helps to correctly position the pilot arc and cap-sensor wires.

4. The right side of the handle contains 4 posts around the slot for the gas tube fitting's flange. (See *Figure 4*.) Position the wires around these posts as follows:
  - a. Route the blue and orange cap-sensor switch wires and the purple start switch wire below the bottom 2 posts.
    - Gently push the cap-sensor switch connector into the extension tube. Position the connector between the gas tube and the side of the extension tube that will be closest to the right handle.
  - b. Route the red pilot arc wire above the top 2 posts.
    - Gently push the pilot terminal screw (encased in heatshrink) into the extension tube. Position the screw between the gas tube and the side of the extension tube that will be closest to the left handle.
  - c. Make sure the wires do not run over the gas tube or across the slot for the gas tube fitting's flange. All 4 wires must sit behind the gas tube in the torch handle, as shown in *Figure 4*.

Figure 4 – Wire routing in handle with gas tube and torch lead hidden (top) and shown (bottom)




- 1 Cap-sensor switch connector
- 2 Pilot terminal screw
- 3 Trigger's pivot hole
- 4 Start switch
- 5 Slot for gas tube fitting's flange

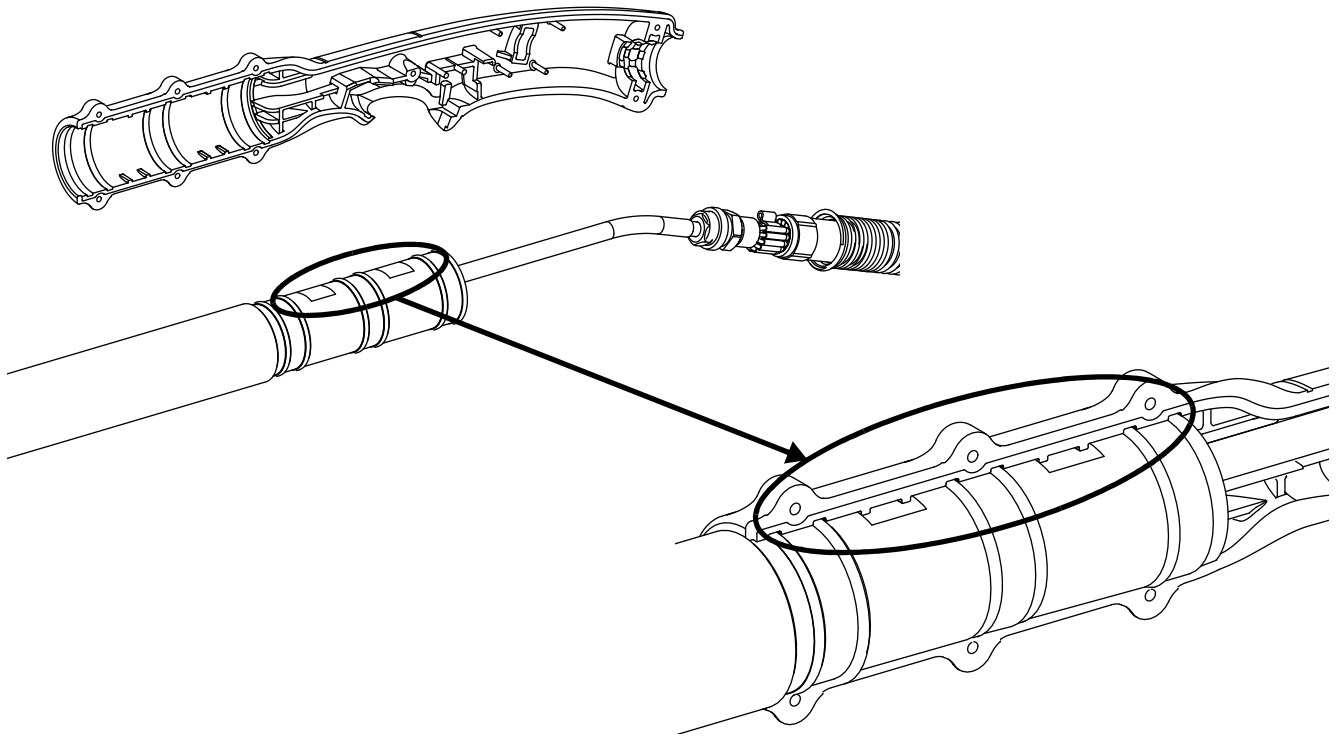
- 6 Posts for routing the wires
- 7 Slot for torch lead strain relief
- 8 Gas tube
- 9 Torch lead strain relief




5. Line up the right handle with the extension tube. The small ribs in the molding of the handle will rest in the flat square grooves on the extension tube, as shown in *Figure 5*.
6. Press the extension tube into the torch handle while guiding the gas tube and strain relief into the handle. Keep the wires properly positioned.

 If the handle does not align with the flat grooves on the extension tube as shown in *Figure 5*, you can grip the extension tube with one hand and the gas tube and torch handle with the other and then rotate slightly until the handle and tube align properly.

**Figure 5**



7. Align the gas hose fitting's flange with the slot in the handle. See *Figure 4* on page 48.

 Bend the gas tube slightly, if needed, to fit properly in the torch handle.

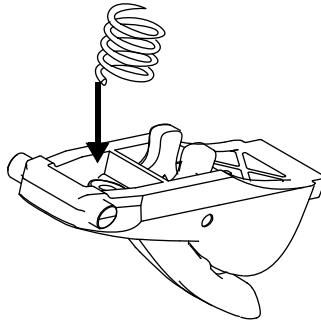
8. Align the strain relief with the strain relief slot in the handle. See *Figure 4* for the location of the strain relief slot.

## 4 – Component Replacement

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9. Compress the trigger spring into the front half of the trigger. Slide the trigger and spring into place.

**Figure 6**



10. Make sure the cap-sensor switch connector and the pilot terminal screw (encased in heatshrink) are completely inside the extension tube.
11. Being careful that the handle and gas fitting flange do not pinch the wires, align the left half of the handle with the right half.
12. Install the handle screws loosely, and verify that the:
- ❑ Trigger pivots are both located in the trigger pivot holes by pulling the trigger a few times. (See *Figure 4* on page 48.)
  - ❑ Flat square grooves on the extension tube align with where the handles meet. (See *Figure 5* on page 49.)
  - ❑ Wires are not pinched where the handles meet.
13. Tighten the handle screws to 15.0 kg·cm (13 inch·pounds).
14. Reconnect the torch and gas supply, and turn ON (I) the power.

## Replace the front shell

Kit	Description
428278	Kit: Duramax Hyamp 45° long handheld torch front shell replacement
428279	Kit: Duramax Hyamp 90° long handheld torch front shell replacement

### Remove the front shell

Several replacement procedures for the Duramax Hyamp long handheld torches require the removal of the front shell that surrounds the torch head. To replace the front shell, you need to remove the torch head and cap-sensor switch from the shell.

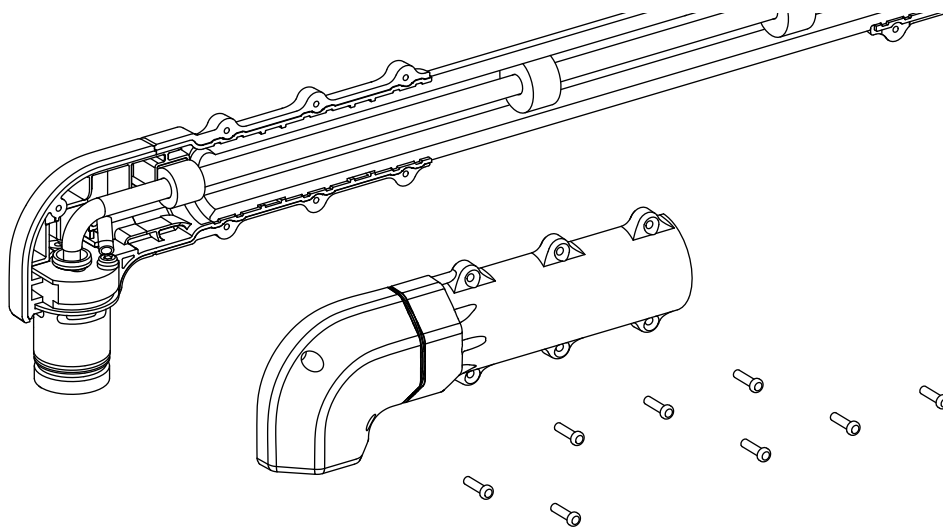
1. Turn OFF (●) the power, disconnect the gas supply, and disconnect the torch.
2. Remove the consumables from the torch.
3. Place the torch on a flat surface with the left front shell facing up.



The left shell is the side with the screws.

4. Clamp the torch lead in place to keep it from moving.
5. Remove the screws from the left front shell.
6. Lift the left side of the front shell away from the torch.

Figure 7

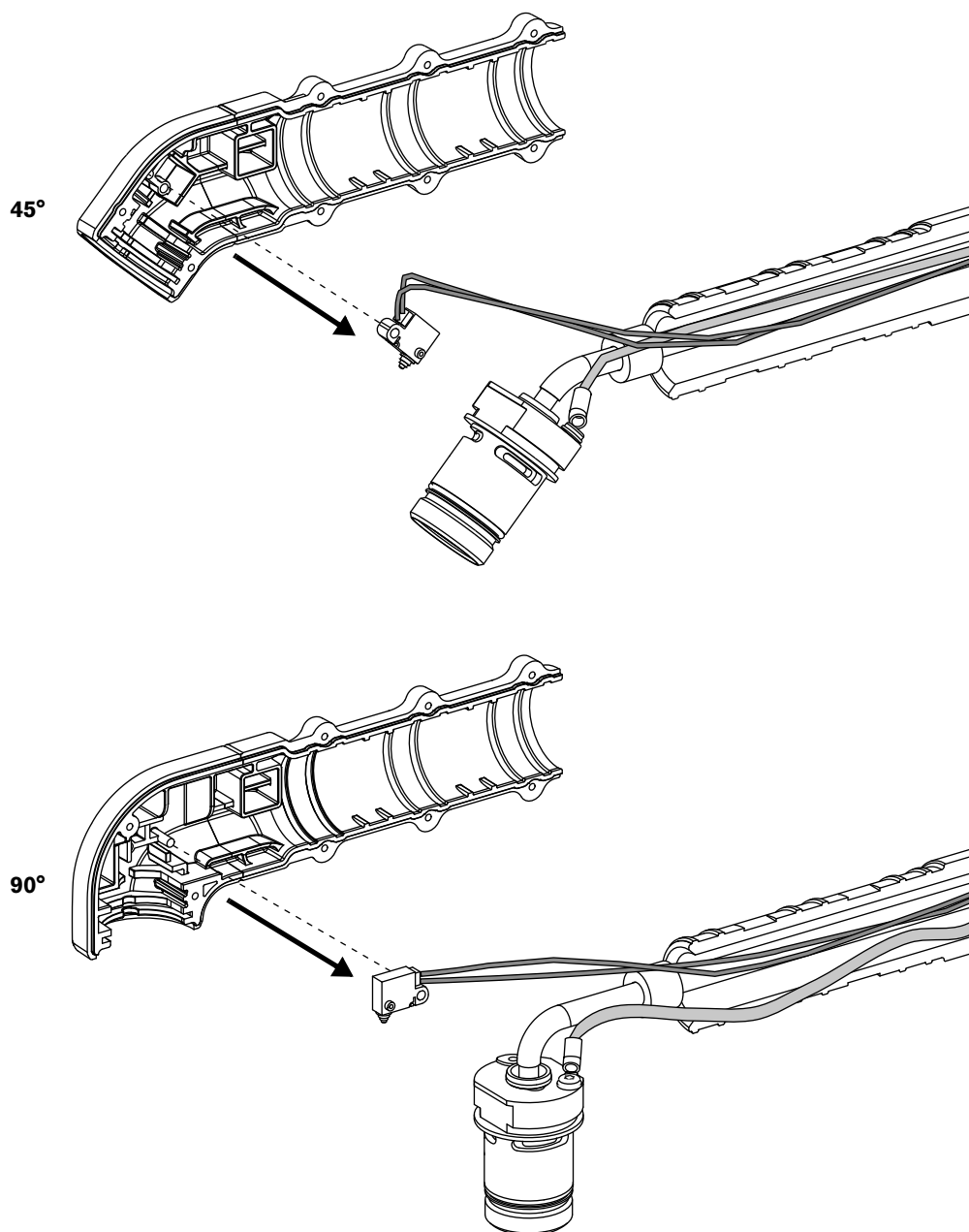


## 4 – Component Replacement

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7. The torch body and extension tube fit snugly into the right side of the front shell. While holding the extension tube, gently press the right side of the shell away from the extension tube and torch body to remove it.
8. Slide the cap-sensor switch off its mounting post.

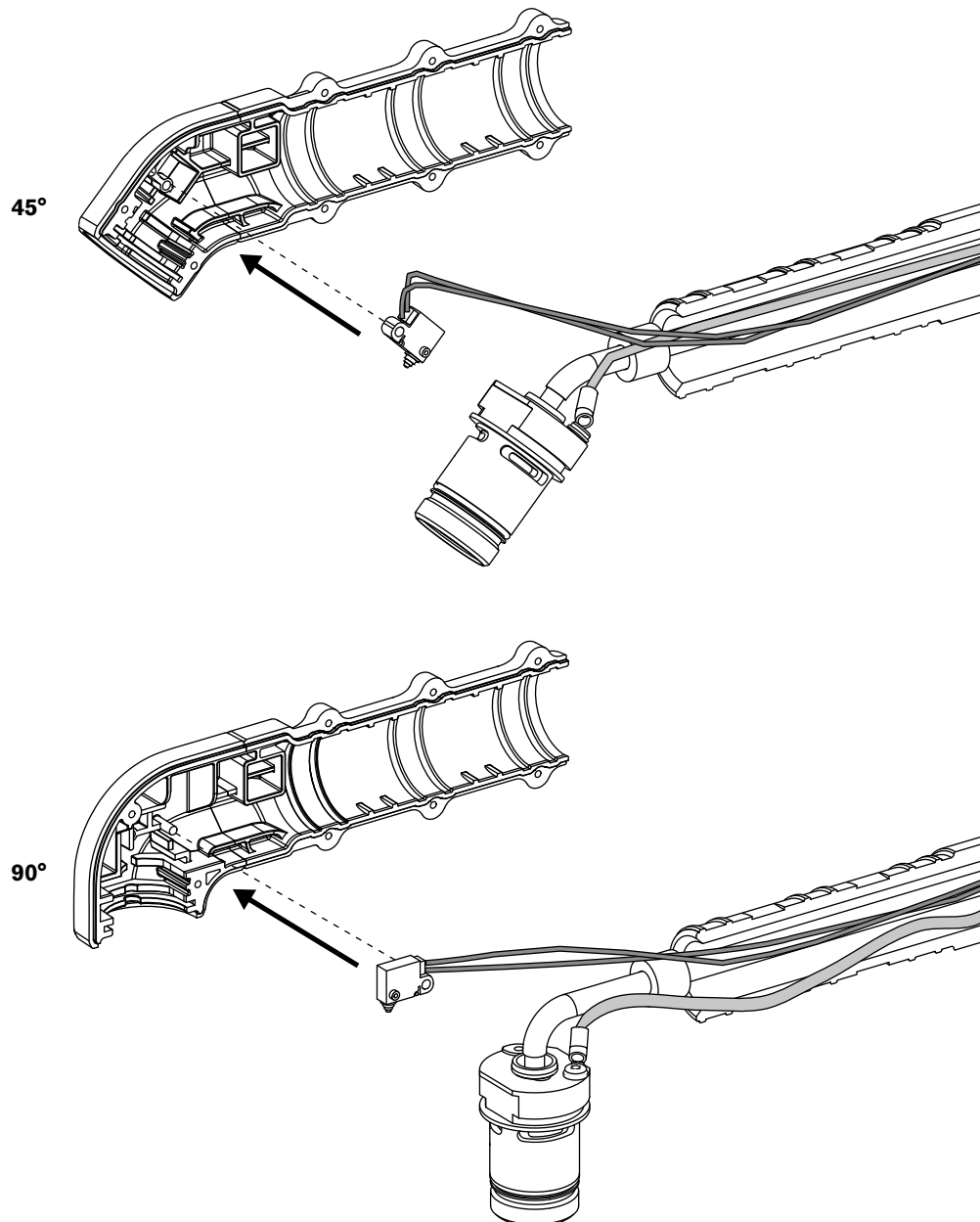
**Figure 8 – Remove cap-sensor switch from 45° (top) and 90° (bottom) front shell**



### **Install the front shell**

1. Make sure that the pilot terminal screw on the torch head is tightened to 17.3 kg·cm (15 inch·pounds).
2. Make sure the consumables have been removed from the torch.
3. Lay the right side of the front shell on a flat surface with the inside facing up.
4. Clamp the torch lead in place to keep it from moving.
5. Press the cap-sensor switch into its post hole and onto its mounting post in the shell.

**Figure 9 – Install cap-sensor switch in 45° (top) and 90° (bottom) front shell**



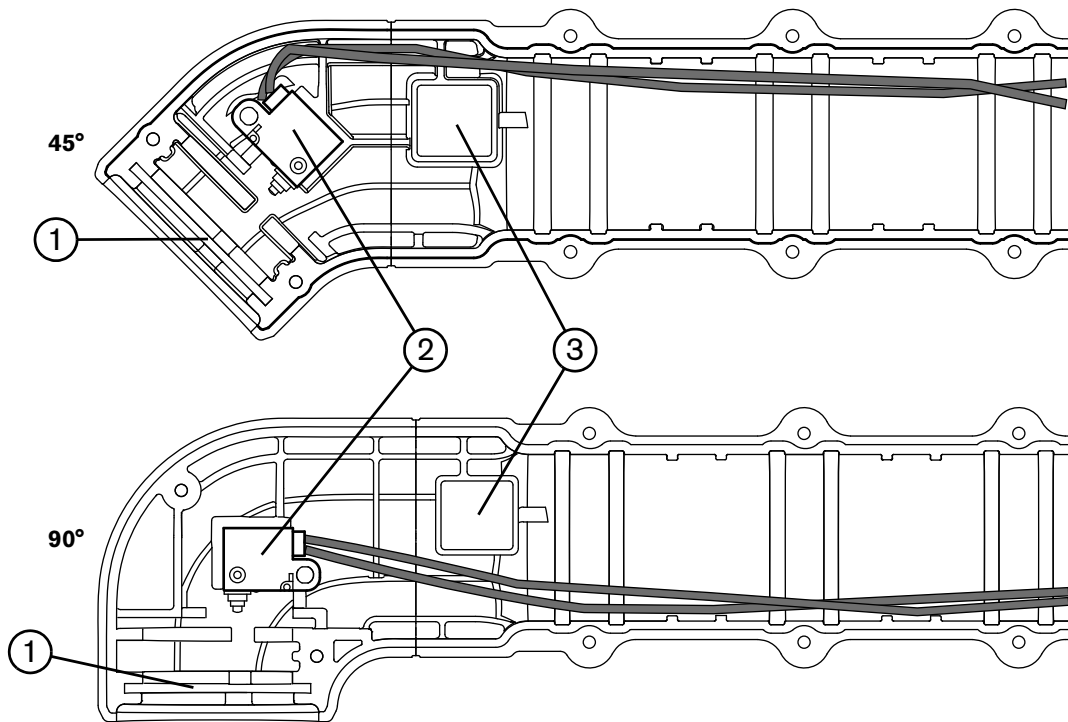
## 4 – Component Replacement

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6. Route the cap-sensor wires as shown in *Figure 10*.

- ❑ **45° torches:** Position the wires above the gas tube and above the protective foam that is wrapped around the gas tube.
- ❑ **90° torches:** Position the wires underneath (or behind) the gas tube and below the protective foam that is wrapped around the gas tube.


**Figure 10 – Wire routing in 45° (top) and 90° (bottom) front shell**



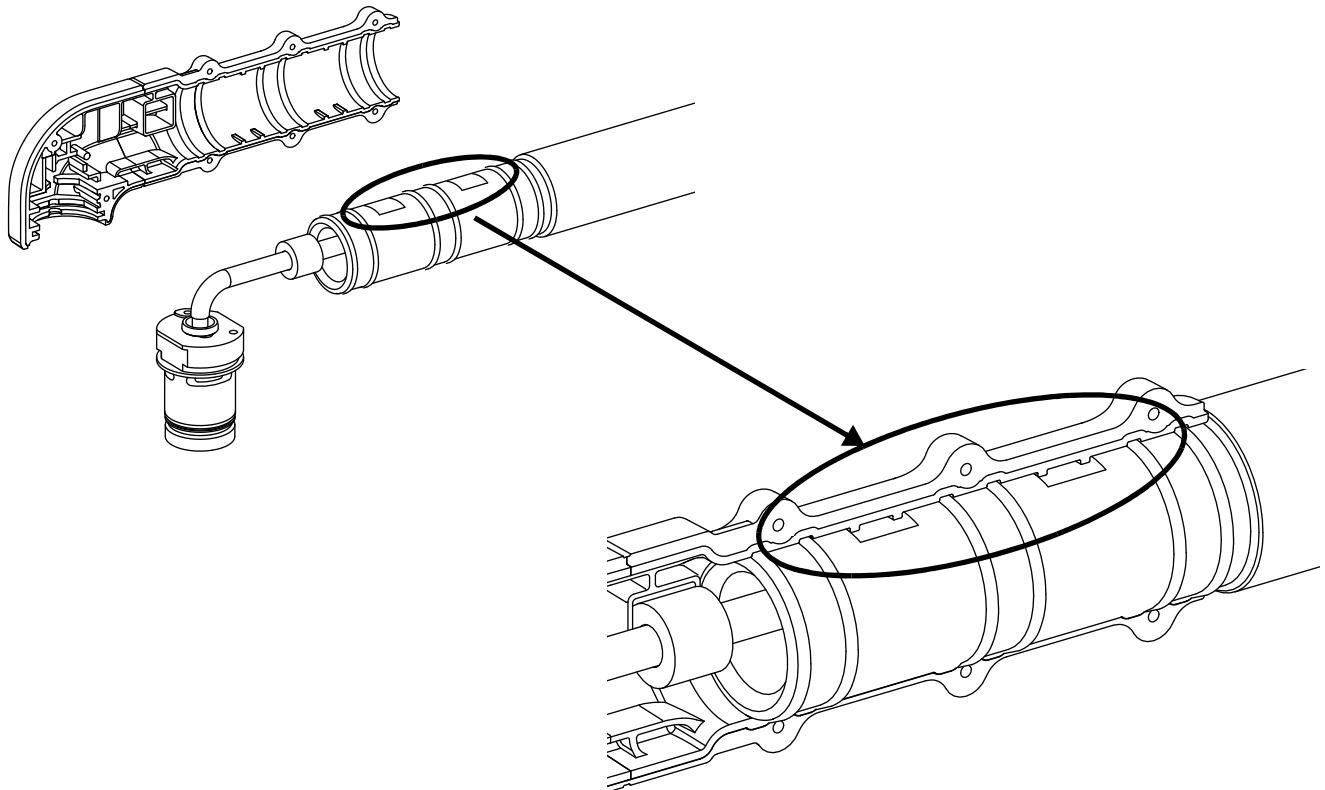
- 1 Slot for torch head
- 2 Cap-sensor switch

- 3 Slot for foam strip wrapped around the gas tube


7. Line up the right front shell with the extension tube. The small ribs in the molding of the shell will rest in the flat square grooves on the extension tube, as shown in *Figure 11*.
8. Press the torch body and extension tube into the right front shell. Align the torch head with the slot in the shell. See *Figure 10*, above.

 If the shell does not align with the flat grooves on the extension tube as shown in *Figure 11*, grip the extension tube with one hand and the torch head and shell with the other and then rotate slightly until the shell and tube align properly.

**Figure 11**



9. Make sure the pilot arc wire is angled toward the gas tube and that the wire terminal is not pressed against the ribs or plastic housing in the right front shell.
10. Being careful that the front shell does not pinch the wires, align the left half of the shell with the right half. Make sure the flat grooves on the extension tube align with where the shells meet.
11. Install the front shell screws. Tighten to 15.0 kg·cm (13 inch·pounds).
12. If the O-ring on the torch body is dry, lubricate it and the threads with a thin layer of silicone lubricant.

 Silicone lubricant is included in several of the replacement kits.

13. Install the consumables.

### Replace the trigger assembly

**Kit**

428156

**Description***Kit: Duramax Hyamp hand torch trigger replacement (with spring)*

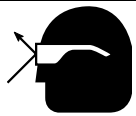
### Remove the trigger assembly

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Place the torch on a flat surface with the left handle facing up.



The left handle is the side with the screws.

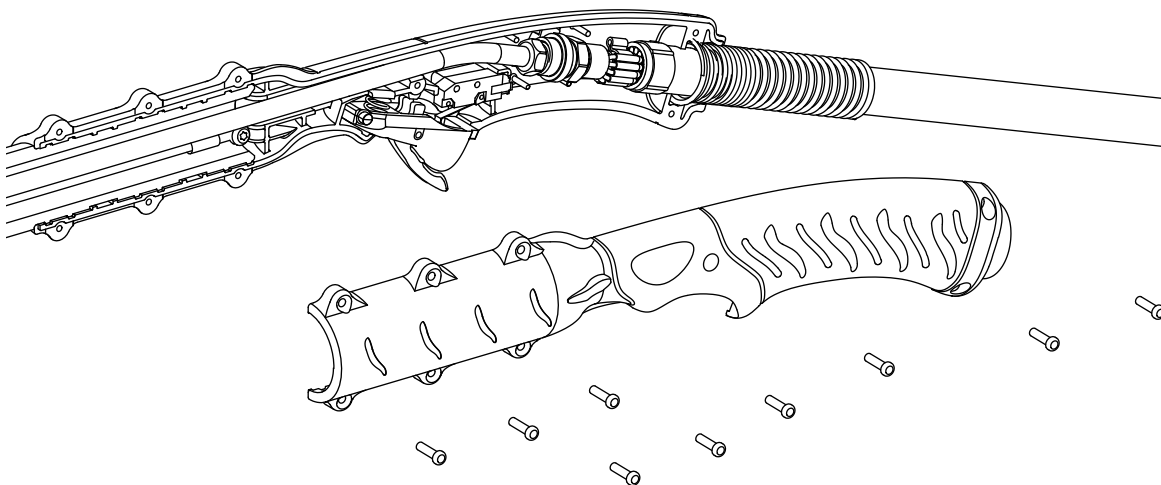
3. Clamp the torch lead in place to keep it from moving.
4. Remove the screws from the left handle.

**CAUTION!**

**Wear eye protection, as the trigger spring can launch out of the handle.**

5. Insert a blade screwdriver between the handles, and gently twist the screwdriver to pry up the left handle. Being careful to keep the trigger spring from launching out of the handle, lift the left side of the handle away from the torch.

**Figure 12**



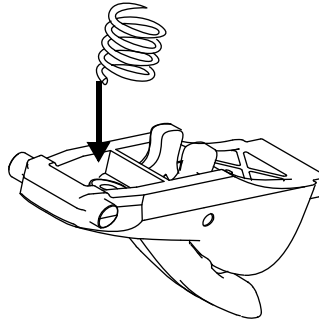
6. While holding the spring in place, slide the trigger and spring up and out of the handle.



**Install the trigger assembly**

1. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.
2. Compress the new trigger spring into the front half of the new trigger. Slide the trigger and spring into place.

**Figure 13**



3. Make sure the cap-sensor switch connector and the pilot terminal screw (encased in heatshrink) are completely inside the extension tube.
4. Being careful that the handle and gas fitting flange do not pinch the wires, align the left half of the handle with the right half.
5. Install the handle screws loosely, and verify that the:
  - ❑ Trigger pivots are both located in the trigger pivot holes by pulling the trigger a few times. (See *Figure 4* on page 48.)
  - ❑ Flat square grooves on the extension tube align with where the handles meet. (See *Figure 5* on page 49.)
  - ❑ Wires are not pinched where the handles meet.
6. Tighten the handle screws to 15.0 kg·cm (13 inch·pounds).
7. Reconnect the torch and gas supply, and turn ON (I) the power.

### Replace the start switch

#### Kit

428162

#### Description

*Kit: Duramax Hyamp hand torch start switch replacement*

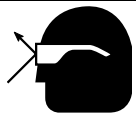
### Remove the start switch

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Place the torch on a flat surface with the left handle facing up.



The left handle is the side with the screws.

3. Clamp the torch lead in place to keep it from moving.
4. Remove the screws from the left handle.

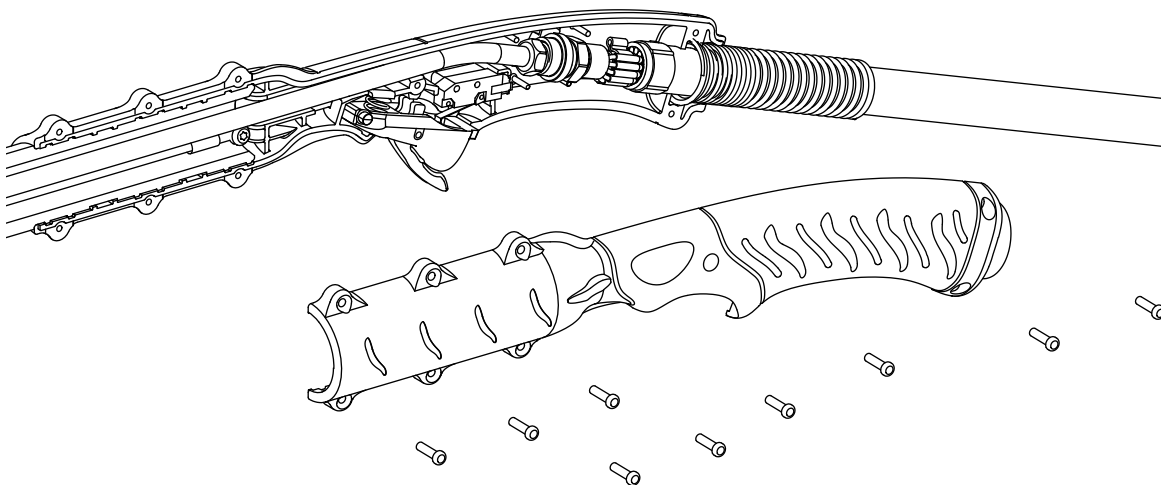


#### CAUTION!

**Wear eye protection, as the trigger spring can launch out of the handle.**

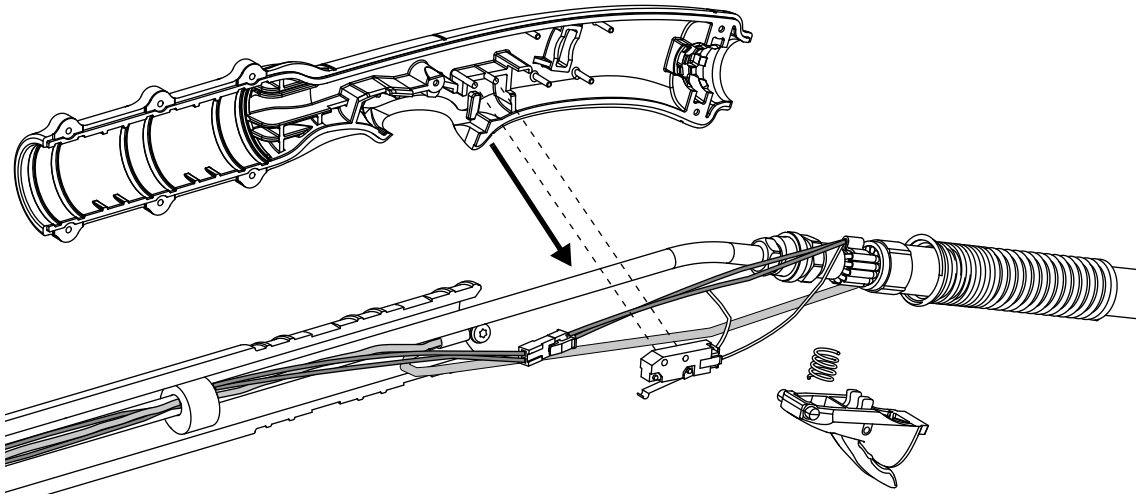
5. Insert a blade screwdriver between the handles, and gently twist the screwdriver to pry up the left handle. Being careful to keep the trigger spring from launching out of the handle, lift the left side of the handle away from the torch.

Figure 14



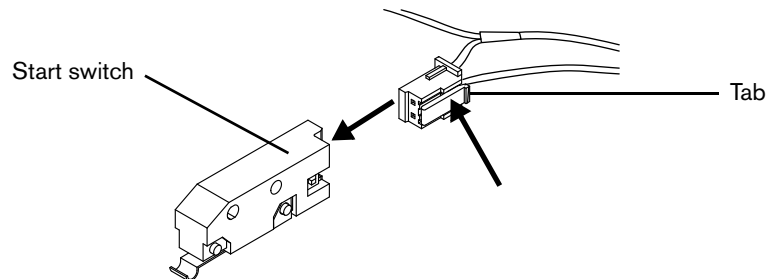
6. While holding the spring in place, slide the trigger and spring up and out of the handle. Set them aside.
7. Use a blade screwdriver to pry the start switch off the 2 mounting posts.

Figure 15



8. Disconnect the start switch by pushing the tab and pulling the start switch away from the connector.

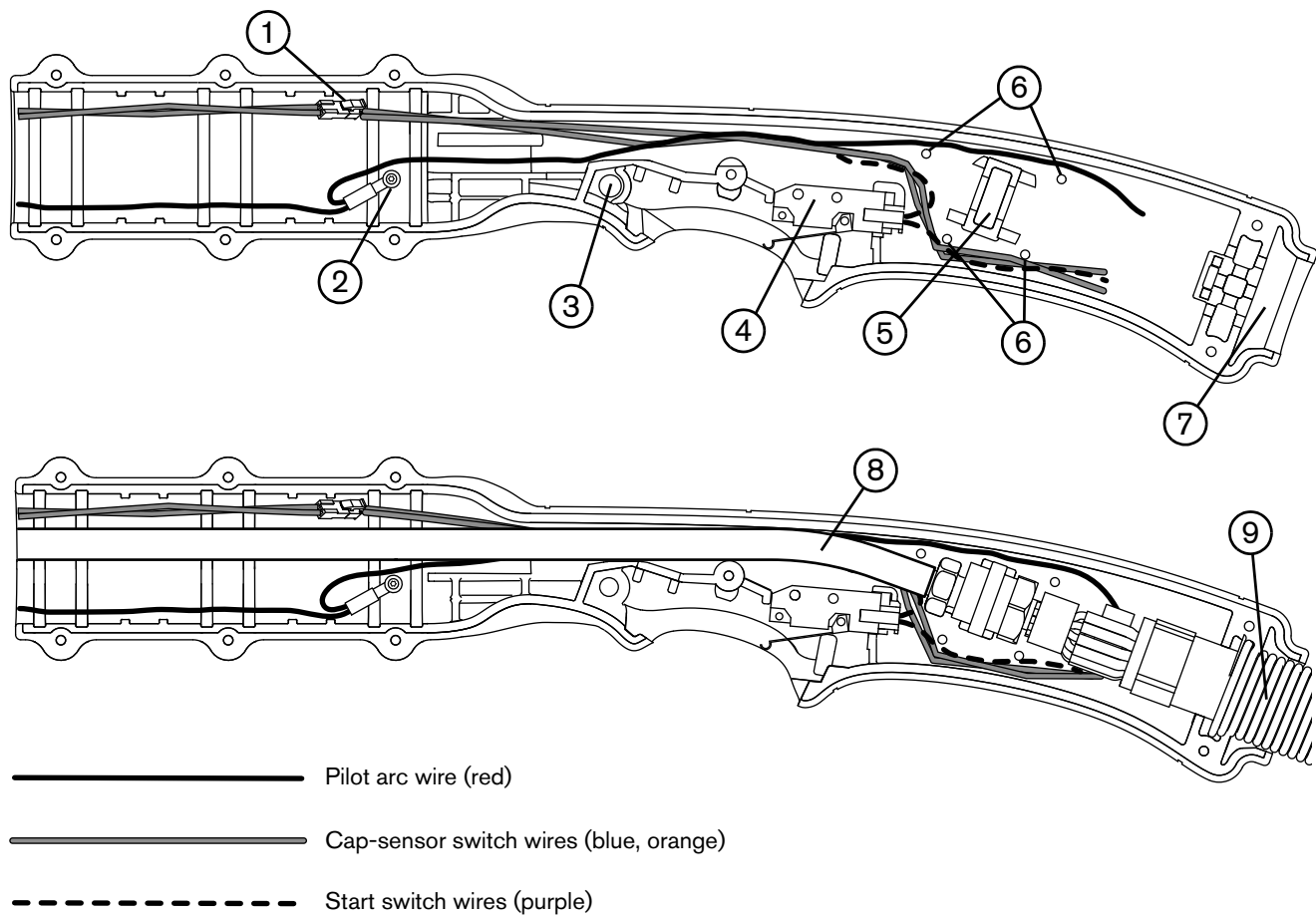
Figure 16



### Install the start switch

1. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.
2. Connect the new start switch by pushing the mating plug into the socket.
3. Press the new start switch onto the 2 mounting posts in the handle. See *Figure 17*.
4. Verify the wires are correctly positioned around the 4 posts in the handle, as shown in *Figure 17*. Make sure the wires do not run over the gas tube or across the slot for the gas tube fitting's flange. All 4 wires must sit behind the gas tube in the handle.

**Figure 17 – Wires and start switch positioned in handle with gas tube and torch lead hidden (top) and shown (bottom)**



- 1 Cap-sensor switch connector
- 2 Pilot terminal screw
- 3 Trigger's pivot hole
- 4 Start switch
- 5 Slot for gas tube fitting's flange

- 6 Posts for routing the wires
- 7 Slot for torch lead strain relief
- 8 Gas tube
- 9 Torch lead strain relief

5. Verify the gas hose fitting's flange aligns with the slot in the handle. See *Figure 17*, above.
6. Verify the strain relief aligns with the strain relief slot in the handle. See *Figure 17*, above.
7. Compress the trigger spring into the front half of the trigger. Slide the trigger and spring into place.
8. Make sure the cap-sensor switch connector and the pilot terminal screw (encased in heatshrink) are completely inside the extension tube.
9. Being careful that the handle and gas fitting flange do not pinch the wires, align the left half of the handle with the right half.
10. Install the handle screws loosely, and verify that the:
  - ❑ Trigger pivots are both located in the trigger pivot holes by pulling the trigger a few times. (See *Figure 17*, above.)
  - ❑ Flat square grooves on the extension tube align with where the handles meet. (See *Figure 5* on page 49.)
  - ❑ Wires are not pinched where the handles meet.
11. Tighten the handle screws to 15.0 kg·cm (13 inch·pounds).
12. Reconnect the torch and gas supply, and turn ON (I) the power.

### Replace the torch body

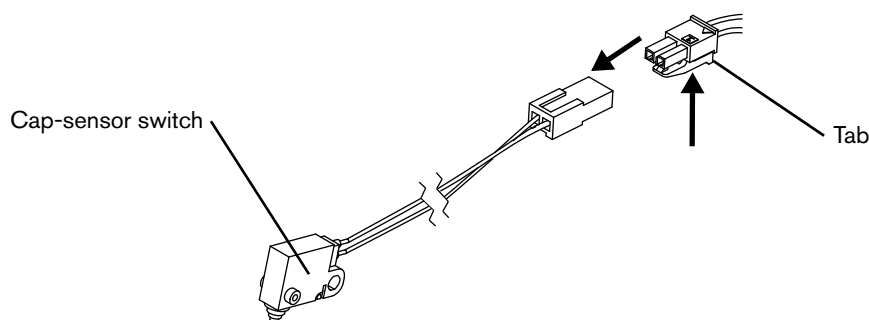
Kit	Description
428282	<i>Kit: Duramax Hyamp 45° long handheld torch body replacement (torch head plus gas tube), 0.6 m (2 feet) – includes pilot arc wire, cap-sensor switch, and foam strips</i>
428284	<i>Kit: Duramax Hyamp 45° long handheld torch body replacement (torch head plus gas tube), 1.2 m (4 feet) – includes pilot arc wire, cap-sensor switch, and foam strips</i>
428283	<i>Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 0.6 m (2 feet) – includes pilot arc wire, cap-sensor switch, and foam strips</i>
428285	<i>Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 1.2 m (4 feet) – includes pilot arc wire, cap-sensor switch, and foam strips</i>
428821	<i>Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 1.8 m (6 feet) – includes pilot arc wire, cap-sensor switch, and foam strips</i>

The torch body assembly is made up of the torch head and the long gas tube. The torch body kits listed above also include a pilot arc wire and a cap-sensor switch.

### Remove the torch body

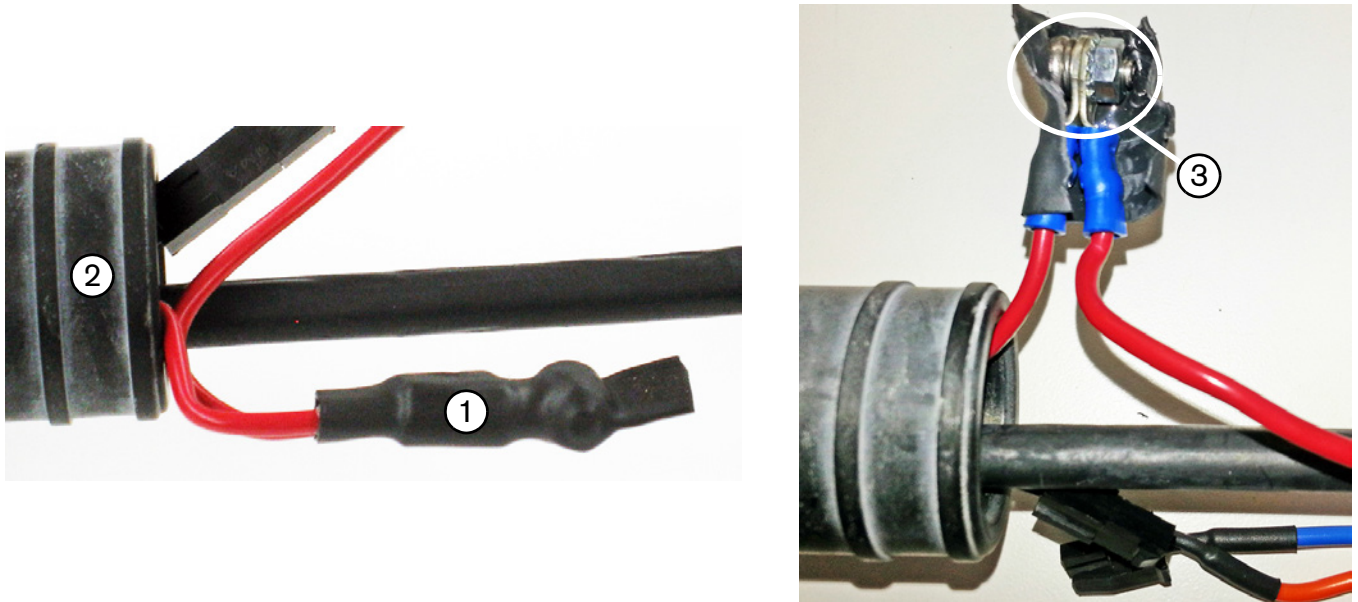
1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Remove all components from the upper and lower parts of the torch, including the consumables. See *Remove the handle* on page 45 and *Remove the front shell* on page 51.
3. Gently pull the cap-sensor switch connector and the pilot terminal screw (encased in heatshrink) out of the trigger end of the extension tube.
4. Disconnect the cap-sensor switch at the trigger end of the extension tube by pressing the tab on the connector and pulling the connector apart.

Figure 18



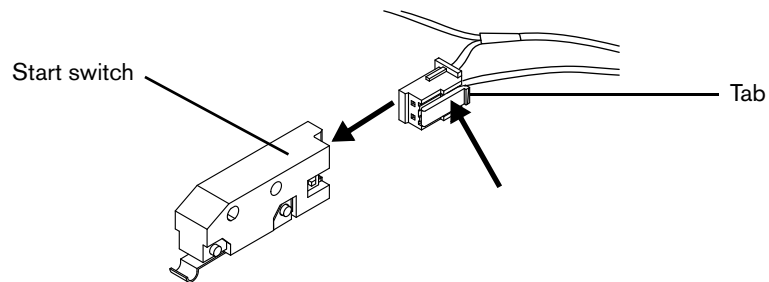
5. Carefully cut the heatshrink ① at the trigger end of the extension tube ② to reveal the pilot terminal screw and nut ③. Remove the pilot terminal screw and nut and set them aside.

Figure 19



6. Disconnect the start switch by pushing the tab and pulling the start switch away from the connector.

Figure 20



## 4 – Component Replacement

7. Use 2 wrenches to loosen the gas fitting ① that secures the torch body's gas tube ② to the torch lead ③. Separate the torch body from the torch lead. (See *Figure 21*.)



Heating the gas fitting can help loosen the threadlocker and make removing the torch body easier. Slowly heat only the fitting with a heat gun until you can easily loosen the fitting.



### CAUTION!

**Do not apply heat to the wires. Heating the wires can damage the connections in the torch lead.**

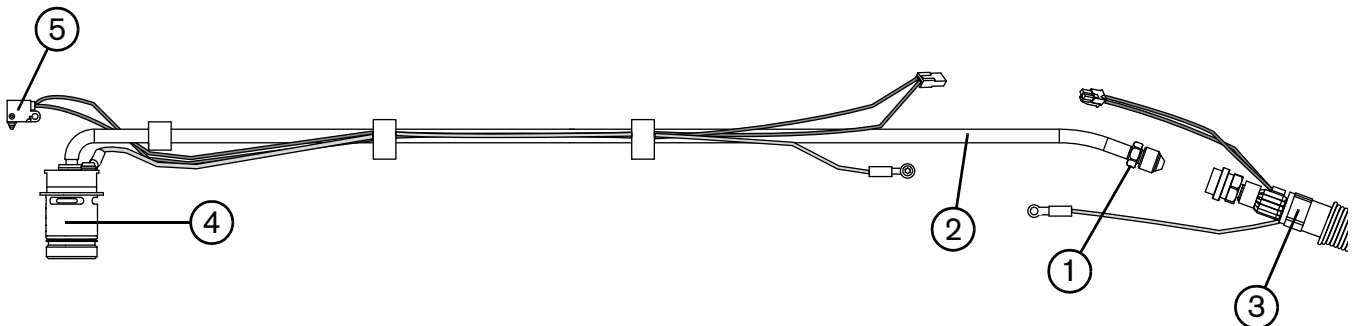


### CAUTION!

**Always use 2 wrenches to properly loosen and tighten the hex nuts and bolts mentioned in these procedures. A strong threadlocker is used to assemble the torch, and loosening the nuts incorrectly can damage the threads.**

8. Cover the end of the gas line on the torch lead with tape to keep dirt and other contaminants from getting in the gas line.
9. Pull the torch body out of the extension tube.
10. Make sure the torch head ④ and cap-sensor switch ⑤ have been removed from the front shell.

**Figure 21**




The 0.6 m (2 foot) torches contain only 1 foam strip around the middle of the torch body; the 1.2 m (4 foot) torches (pictured above) contain 2 foam strips around the middle of the torch body; the 1.8 m (6 foot) torches contain 3 foam strips around the middle of the torch body.



### Install the torch body

1. Use a small strip of electrical tape to temporarily secure the very ends of the pilot arc wire and cap-sensor wires to the gas tube.
2. Slide the extension tube over the torch body and up to the torch head.
3. Are you reinstalling the existing torch body or replacing the torch body with a new one?
  - ❑ If you are reinstalling an **existing torch body**, clean the conical surface of the gas tube fitting to remove any dried or loose threadlocker. Apply a fresh drop of threadlocker to the threads of the gas tube fitting on the torch body.
  - ❑ If you are installing a **new torch body**, be careful not to get any threadlocker on the conical surface of the gas tube fitting to prevent damage to the torch. Apply a drop of threadlocker, included in the kit, to the threads of the gas tube fitting on the new torch body.

 The drop should not be wider than 2 threads in diameter.


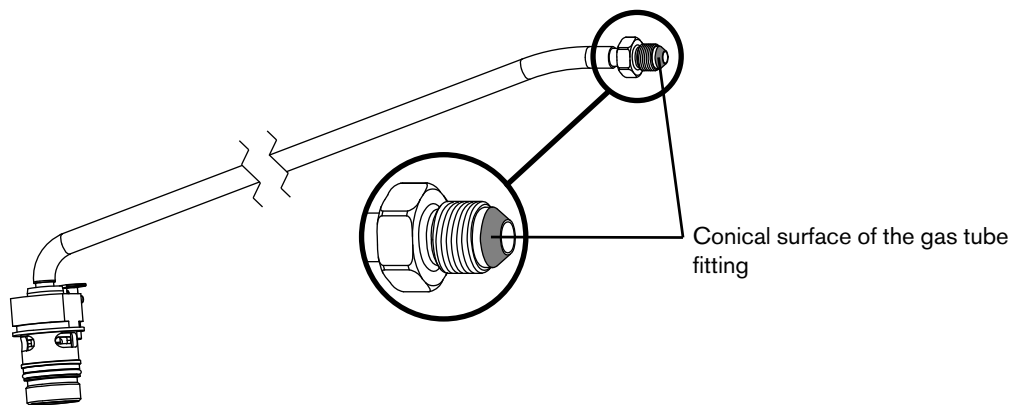
	<h3>CAUTION!</h3>
<p><b>Do not get any threadlocker on the conical surface of the gas tube fitting to avoid causing damage to the torch. If any threadlocker does get on this surface, clean it off immediately.</b></p>	

Figure 22

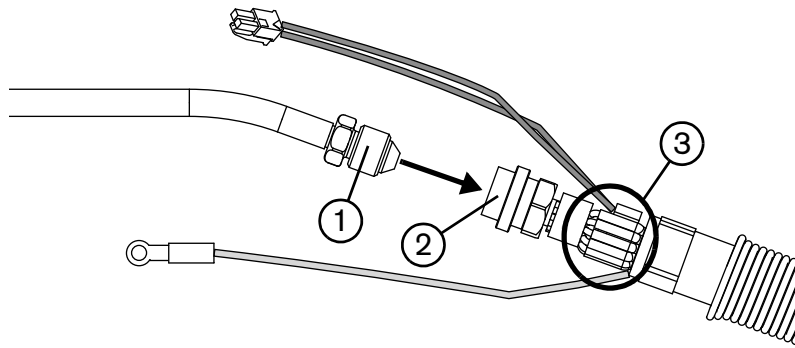


## 4 – Component Replacement

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4. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.
5. Remove the tape that you placed over the end of the gas line on the torch lead in *step 8* on page 64.
6. Thread the conical end ① of the gas tube into the torch lead ② until snug. The torch lead's white wires ③ must be facing up.

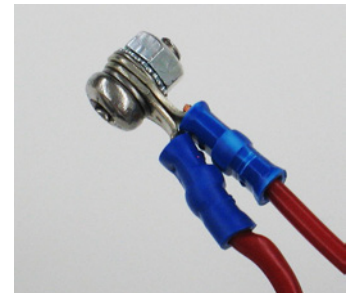
**Figure 23**



7. Use 2 wrenches to tighten the gas fitting that secures the torch body to the torch lead to 69.1 kg·cm (60 inch-pounds).
8. Remove the electrical tape from the pilot arc wire and cap-sensor wires that you applied in *step 1*, above.
9. Use the pilot terminal screw and nut you removed in *step 5* on page 63 to connect the red pilot arc wire from the torch lead with the red pilot arc wire from the torch body. Tighten the screw to 17.3 kg·cm (15 inch-pounds).

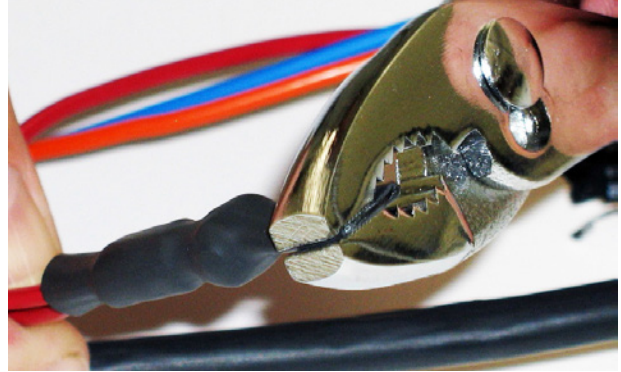
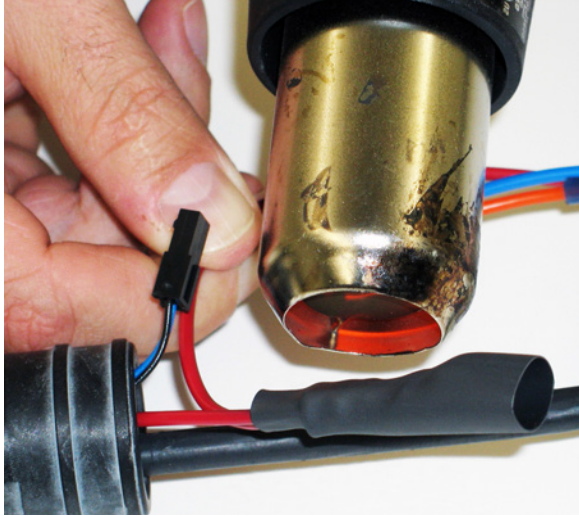


Keep in mind that the pilot arc wire from the torch lead must be routed under the gas tube when the torch handle is put back together.



10. Cover the pilot terminal screw and nut with the heatshrink included in the kit, as follows:
  - a. Leave 10 mm (3/8 inch) excess heatshrink above the screw.
  - b. Use a heat gun to warm the heatshrink until it adheres to the screw.
  - c. Close the end of the heatshrink by crimping it with a pair of pliers.

Figure 24

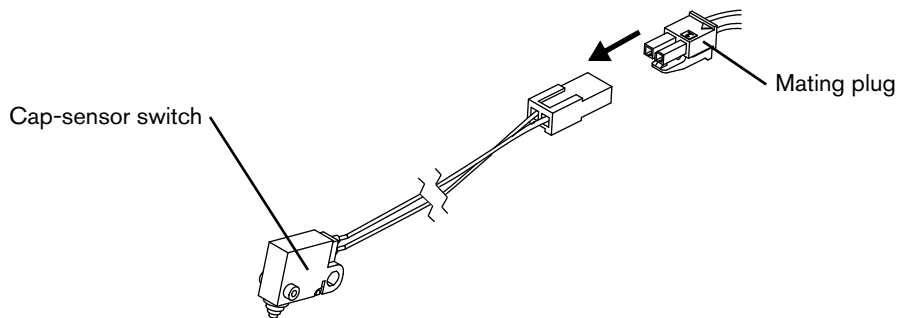


### CAUTION!

**Do not apply heat to the wires. Heating the wires can damage the connections in the torch lead.**

11. Connect the cap-sensor switch to the torch lead by pushing the mating plug on the torch lead wires into the socket near the trigger end of the extension tube.

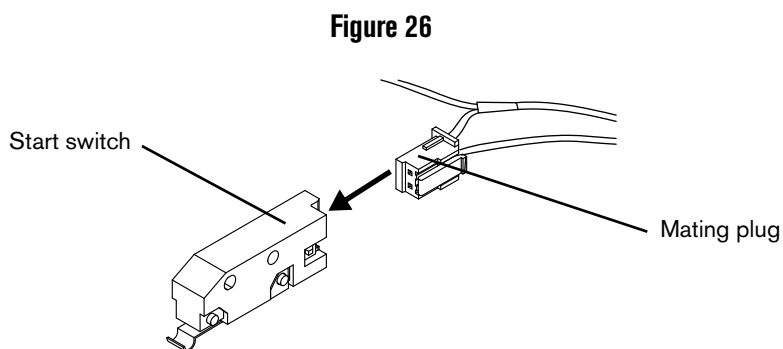
Figure 25



## 4 – Component Replacement

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12. Connect the start switch by pushing the mating plug into the socket.



13. Reinstall the front shell. See *Install the front shell* on page 53.
14. Reinstall the rest of the torch components and the torch handle. See *Install the handle* on page 47.

## Replace the pilot arc wire

<b>Kit</b>	<b>Description</b>
428290	<i>Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 0.6 m (2 feet)</i>
428291	<i>Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 1.2 m (4 feet)</i>
428823	<i>Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 1.8 m (6 feet)</i>

## Remove the pilot arc wire

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Remove all components from the upper and lower parts of the torch, including the consumables. See *Remove the handle* on page 45 and *Remove the front shell* on page 51.
3. Remove the torch body from the rest of the torch. See *Remove the torch body* on page 62.

## 4 – Component Replacement

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4. Remove the pilot terminal screw ① from the torch head.
5. **0.6 m (2 foot) torches:** Mark where the foam strip ② is wrapped around the middle of the torch body's gas tube so that you can install a new strip in the same place.  
**1.2 m (4 foot) torches:** Mark where the 2 foam strips ② are wrapped around the middle of the torch body's gas tube so that you can install new strips in the same place.  
**1.8 m (6 foot) torches:** Mark where the 3 foam strips ② are wrapped around the middle of the torch body's gas tube so that you can install new strips in the same place.


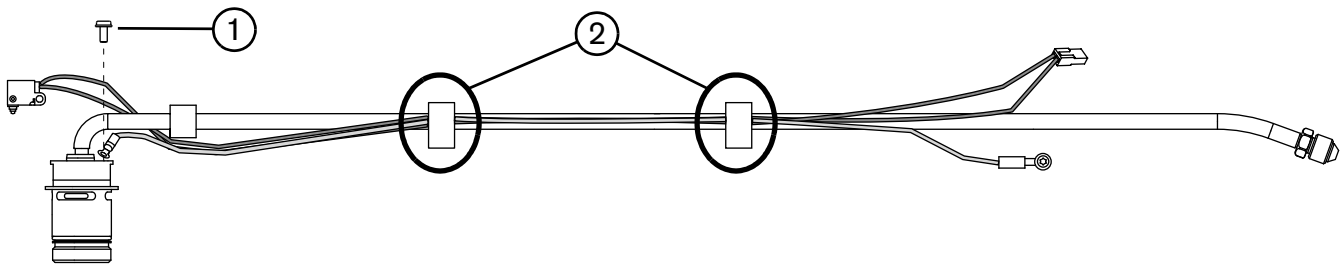


 Do not remove the foam strip at the top of the gas tube (near the torch head).

Figure 27



 The 0.6 m (2 foot) torches contain only 1 foam strip around the middle of the torch body; the 1.2 m (4 foot) torches (pictured above) contain 2 foam strips around the middle of the torch body; the 1.8 m (6 foot) torches contain 3 foam strips around the middle of the torch body.

6. Peel the foam strip or strips off of the gas tube and discard. Also discard the red pilot arc wire.

 Do not discard the cap-sensor switch (and wires).

### Install the pilot arc wire


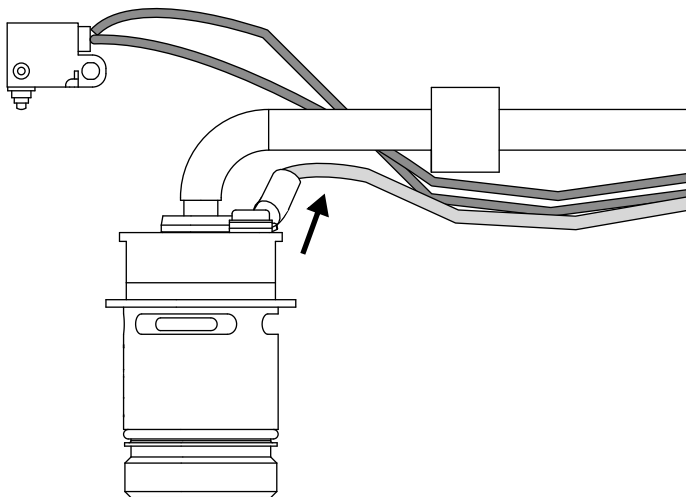
1. Make sure the consumables have been removed from the torch.
  2. Locate a new pilot terminal screw, included in the kit.
  3. Use the new screw to attach the new pilot arc wire to the torch head.
    - ❑ Angle the pilot arc wire towards the gas tube. Carefully bend the wire terminal as needed.
-  Keep in mind that the pilot arc wire terminal must not press against the ribs or plastic housing in the right front shell when the torch is put back together.
- ❑ Tighten the screw to 17.3 kg·cm (15 inch-pounds).

Figure 28



4. Lay the right side of the front shell on a flat surface with the inside facing up.
5. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.

## 4 – Component Replacement

6. Press the cap-sensor switch into its post hole and onto its mounting post in the front shell. (See *Figure 29*.)

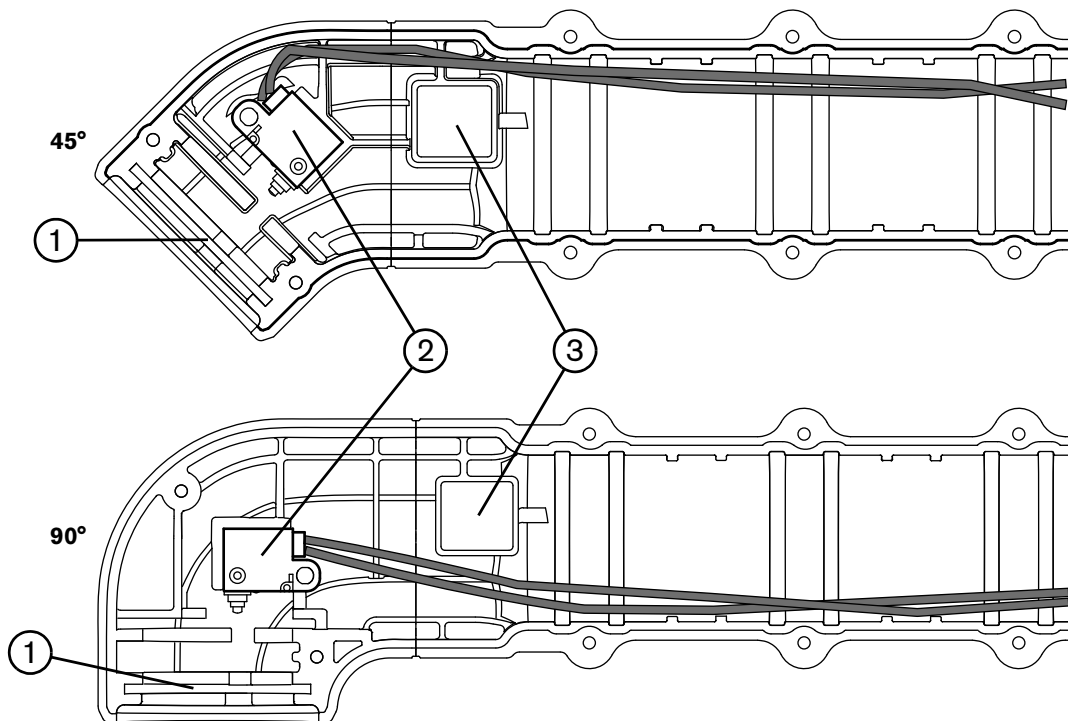


Putting the cap-sensor switch in the shell at this point ensures the switch is positioned properly before you wrap the new foam strips around the cap-sensor wires.

7. Position the cap-sensor wires as shown in *Figure 29*.

- ❑ **45° torches:** Position the wires above the gas tube and above the protective foam that is wrapped around the gas tube.
- ❑ **90° torches:** Position the wires to run under the foam strip and to remain behind the gas tube.

**Figure 29 – Wire routing in 45° (top) and 90° (bottom) front shell**



1 Slot for torch head

2 Cap-sensor switch

3 Slot for foam strip wrapped around the gas tube

8. Press the torch body into the front shell. Align the torch head with the slot in the shell. (See *Figure 29*.)

9. Make sure the pilot arc wire terminal is not pressed against the ribs or plastic housing in the right front shell.



Position the pilot arc wire terminal correctly to help protect it from damage over time.



10. Straighten the pilot arc wire and the cap-sensor wires towards the end of the gas tube. Do not pull the wires too tight, and make sure the wires are not knotted or twisted.



Leave a small amount of slack in the wires so you can position them as needed around the gas tube and to prevent too much stress on connection points.

11. Apply the first foam strip. Grip the gas tube, pilot arc wire, and cap-sensor wires below the front shell. Hold the wires in place as you wrap a new foam strip from the kit around the gas tube and the wires.
- ❑ **0.6 m (2 foot) torches:** Apply the foam strip at the position you marked in *step 5* in the previous procedure. (See *Figure 27* on page 70.) Skip to *step 14*.
  - ❑ **1.2 m (4 foot) and 1.8 m (6 foot) torches:** Apply the foam strip at the position closest to the torch head. (See *Figure 27* on page 70.) Continue with the next step.
12. Apply the second foam strip. Straighten out the wires below the foam strip you just applied. Grip the gas tube and wires below the foam strip, and wrap another foam strip from the kit around the gas tube and the wires. Apply the foam strip at the second of the positions you marked in *step 5* in the previous procedure.
- ❑ **1.2 m (4 foot) torches:** Skip to *step 14*.
  - ❑ **1.8 m (6 foot) torches:** Continue to the next step.
13. **1.8 m (6 foot) torches:** Straighten out the wires below the foam strip you just applied. Grip the gas tube and wires below the foam strip, and wrap another foam strip from the kit around the gas tube and the wires. Apply the foam strip at the third of the positions you marked in *step 5* in the previous procedure. Continue to the next step.
14. Reinstall the torch body. See *Install the torch body* on page 65.
15. Reinstall the front shell. See *Install the front shell* on page 53.
16. Reinstall the rest of the torch components and the torch handle. See *Install the handle* on page 47.

### Replace the cap-sensor switch

Kit	Description
428288	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 0.6 m (2 feet)
428289	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 1.2 m (4 feet)
428822	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 1.8 m (6 feet)

### Remove the cap-sensor switch

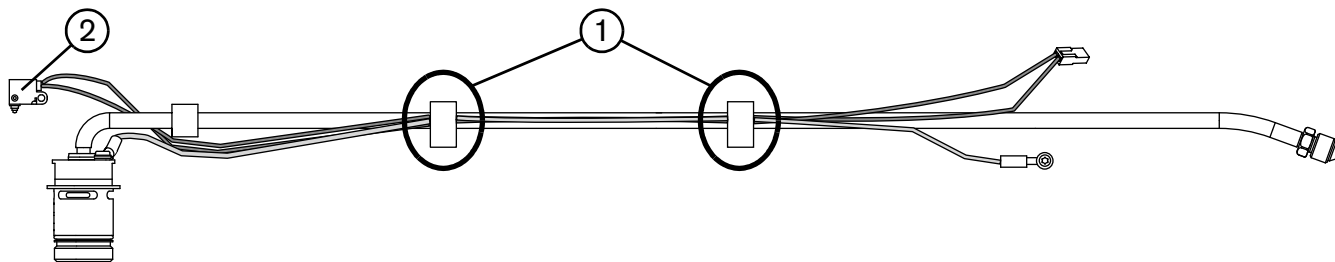
1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Remove all components from the upper and lower parts of the torch, including the consumables. See *Remove the handle* on page 45 and *Remove the front shell* on page 51.
3. Remove the torch body from the rest of the torch. See *Remove the torch body* on page 62.
4. **0.6 m (2 foot) torches:** Mark where the foam strip ① is wrapped around the middle of the torch body's gas tube so that you can install a new strip in the same place.  
**1.2 m (4 foot) torches:** Mark where the 2 foam strips ① are wrapped around the middle of the torch body's gas tube so that you can install new strips in the same place.  
**1.8 m (6 foot) torches:** Mark where the 3 foam strips ① are wrapped around the middle of the torch body's gas tube so that you can install new strips in the same place.



Do not remove the foam strip at the top of the gas tube (near the torch head).

5. Peel the foam strip or strips off of the gas tube and discard. Also discard the cap-sensor switch ②.

Figure 30



The 0.6 m (2 foot) torches contain only 1 foam strip around the middle of the torch body; the 1.2 m (4 foot) torches (pictured above) contain 2 foam strips around the middle of the torch body; the 1.8 m (6 foot) torches contain 3 foam strips around the middle of the torch body.

### Install the cap-sensor switch

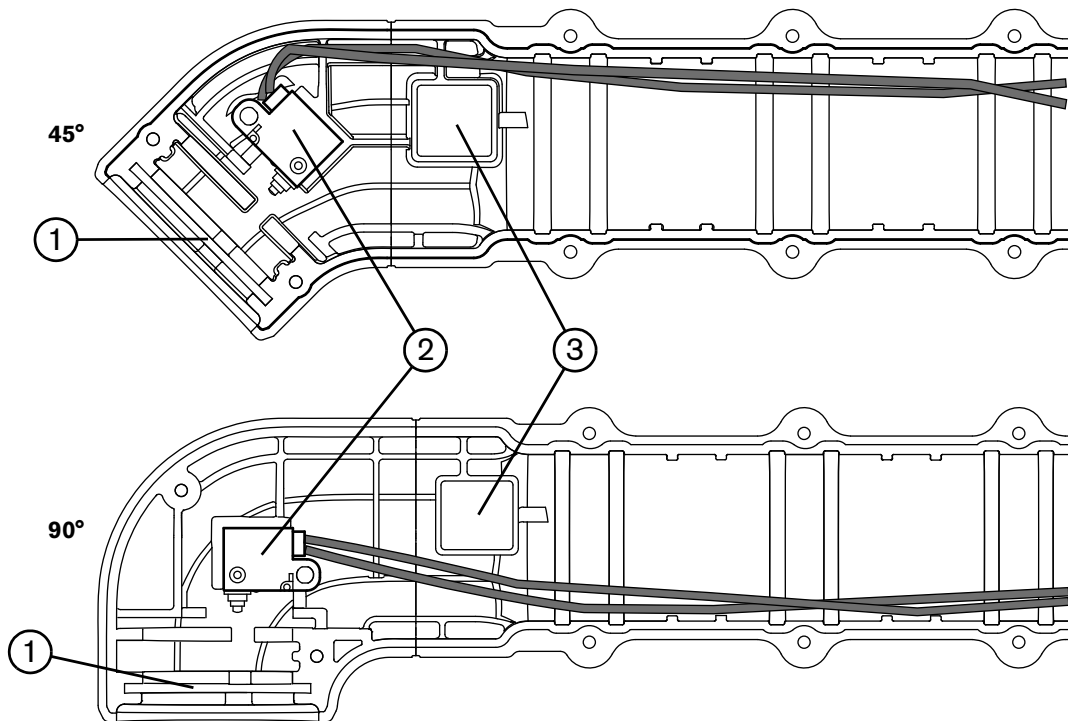
1. Lay the right side of the front shell on a flat surface with the inside facing up.
2. Clamp the torch lead in place, with the white wires facing up, to keep the lead from moving.
3. Make sure the consumables have been removed from the torch.
4. Press the new cap-sensor switch into its post hole and onto its mounting post in the shell. (See *Figure 31*.)



Putting the cap-sensor switch in the shell at this point ensures the switch is positioned properly before you wrap the new foam strips around the cap-sensor wires.

5. Position the cap-sensor wires as shown in *Figure 31*.
  - ❑ **45° torches:** Position the wires above the gas tube and above the protective foam that is wrapped around the gas tube.
  - ❑ **90° torches:** Position the wires to run under the foam strip and to remain behind the gas tube.

**Figure 31 – Wire routing in 45° (top) and 90° (bottom) front shell**



- 1 Slot for torch head
- 2 Cap-sensor switch

- 3 Slot for foam strip wrapped around the gas tube

6. Press the torch body into the front shell. Align the torch head with the slot in the shell. (See *Figure 31*.)

## 4 – Component Replacement

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7. Straighten the pilot arc wire and the cap-sensor wires towards the end of the gas tube. Do not pull the wires too tight, and make sure the wires are not knotted or twisted.



Leave a small amount of slack in the wires so you can position them as needed around the gas tube and to prevent too much stress on connection points.

8. Apply the first foam strip. Grip the gas tube, pilot arc wire, and cap-sensor wires below the front shell. Hold the wires in place as you wrap a new foam strip from the kit around the gas tube and the wires.
  - ❑ **0.6 m (2 foot) torches:** Apply the foam strip at the position you marked on the gas tube in *step 4* in the previous procedure. (See *Figure 30* on page 74.) Skip to *step 11*.
  - ❑ **1.2 m (4 foot) and 1.8 m (6 foot) torches:** Apply the foam strip at the position closest to the torch head. (See *Figure 30* on page 74.) Continue with the next step.
9. Apply the second foam strip. Straighten out the wires below the foam strip you just applied. Grip the gas tube and wires below the foam strip, and wrap another foam strip from the kit around the gas tube and the wires. Apply the foam strip at the second of the positions you marked in *step 4* in the previous procedure.
  - ❑ **1.2 m (4 foot) torches:** Skip to *step 11*.
  - ❑ **1.8 m (6 foot) torches:** Continue to the next step.
10. **1.8 m (6 foot) torches:** Straighten out the wires below the foam strip you just applied. Grip the gas tube and wires below the foam strip, and wrap another foam strip from the kit around the gas tube and the wires. Apply the foam strip at the third of the positions you marked in *step 4* in the previous procedure. Continue to the next step.
11. Make sure that the pilot terminal screw on the torch head is tightened to 17.3 kg·cm (15 inch·pounds).
12. Reinstall the torch body. See *Install the torch body* on page 65.
13. Reinstall the front shell. See *Install the front shell* on page 53.
14. Reinstall the rest of the torch components and the torch handle. See *Install the handle* on page 47.

## Replace the extension tube

<b>Kit</b>	<b>Description</b>
428280*	<i>Kit: Duramax Hyamp long handheld torch extension tube replacement, 0.6 m (2 feet)</i>
428281*	<i>Kit: Duramax Hyamp long handheld torch extension tube replacement, 1.2 m (4 feet)</i>
428820*	<i>Kit: Duramax Hyamp long handheld torch extension tube replacement, 1.8 m (6 feet)</i>

\* The extension tubes cannot be used to convert from one torch length to another torch length .

## Remove the extension tube

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Remove all components from the upper and lower parts of the torch, including the consumables. See *Remove the handle* on page 45 and *Remove the front shell* on page 51.
3. Remove the torch body from the rest of the torch. See *Remove the torch body* on page 62.
4. Discard the extension tube.

## Install the extension tube

1. Make sure the consumables have been removed from the torch.
2. Make sure that the pilot terminal screw on the torch head is tightened to 17.3 kg·cm (15 inch·pounds).
3. Install the new extension tube as you reinstall the torch body. See *Install the torch body* on page 65.
4. Reinstall the front shell. See *Install the front shell* on page 53.
5. Reinstall the rest of the torch components and the torch handle. See *Install the handle* on page 47.

### Replace the torch lead

Kit	Description
428159	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 7.6 m (25 feet)
428160	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 15 m (50 feet)
428762*	Kit: Duramax Hyamp hand torch lead replacement, 46 m (150 feet)

\* The 46-m (150-foot) torch leads must be used with a Powermax125. **IMPORTANT:** If your Powermax125 has a serial number of 125-007943 or lower, you must install a new DSP board (428119). Make sure that the DSP board is at Revision C or higher. See the *Duramax Hyamp 46-m (150-foot) Torch and Torch Leads Field Service Bulletin* (810260) for more information.

### Remove the torch lead

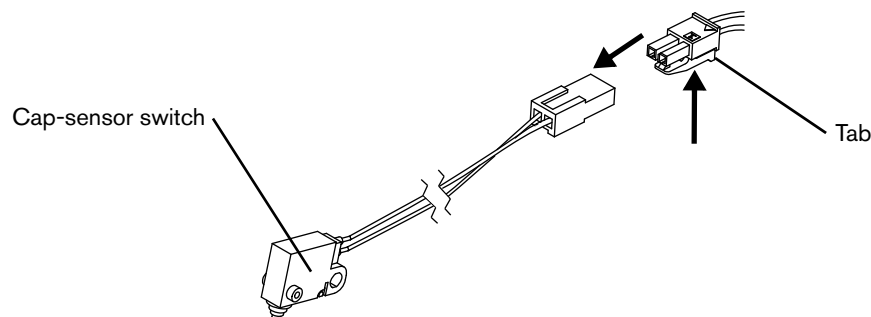
1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch from the power supply.
2. Remove all components from the torch handle. See *Remove the handle* on page 45.



You do not need to disassemble the front shell or remove the extension tube to install a new work lead.

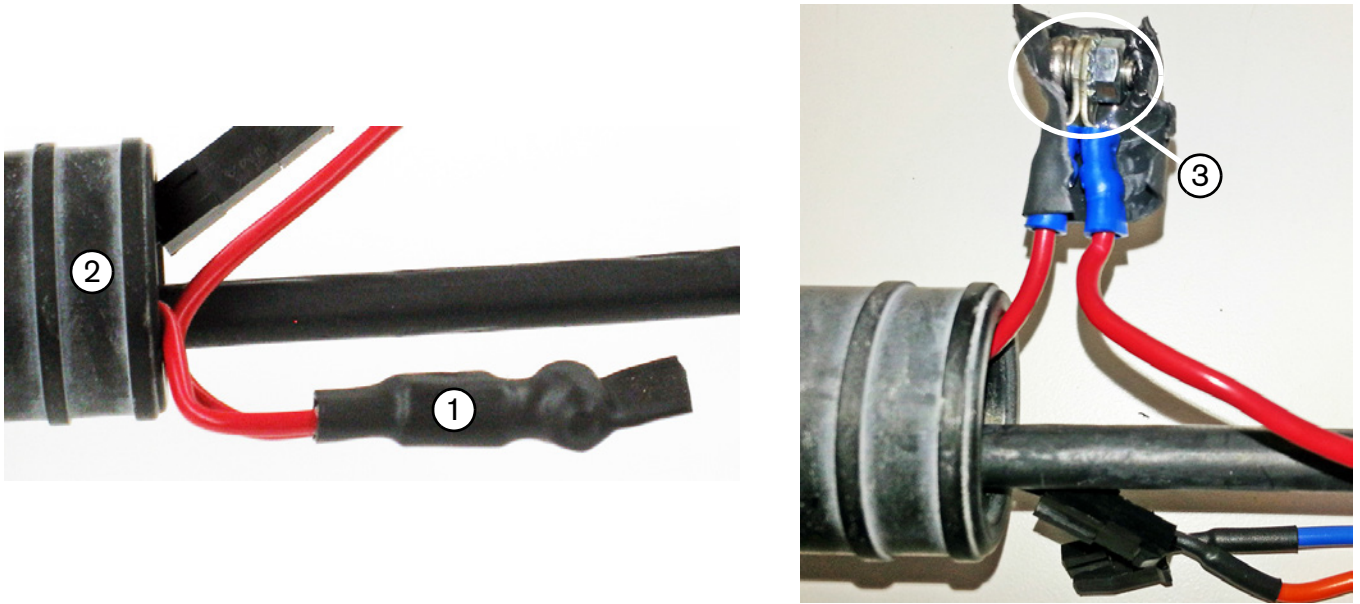
3. Gently pull the cap-sensor switch connector and the pilot terminal screw (encased in heatshrink) out of the trigger end of the extension tube.
4. Disconnect the cap-sensor switch at the trigger end of the extension tube by pressing the tab on the connector and pulling the connector apart.

Figure 32



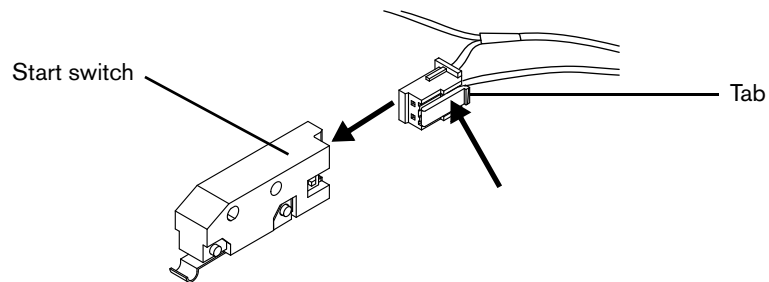
5. Carefully cut the heatshrink ① at the trigger end of the extension tube ② to reveal the pilot terminal screw and nut ③. Remove the pilot terminal screw and nut and set them aside.

Figure 33



6. Disconnect the start switch by pushing the tab and pulling the start switch away from the connector.

Figure 34



## 4 – Component Replacement

7. Use 2 wrenches to loosen the gas fitting ① that secures the torch body's gas tube to the torch lead ②. Separate the torch body assembly from the torch lead. See *Figure 35*.



Heating the gas fitting can help loosen the threadlocker and make removing the torch body easier. Use a heat gun to slowly heat only the fitting until you can easily loosen the fitting.



### CAUTION!

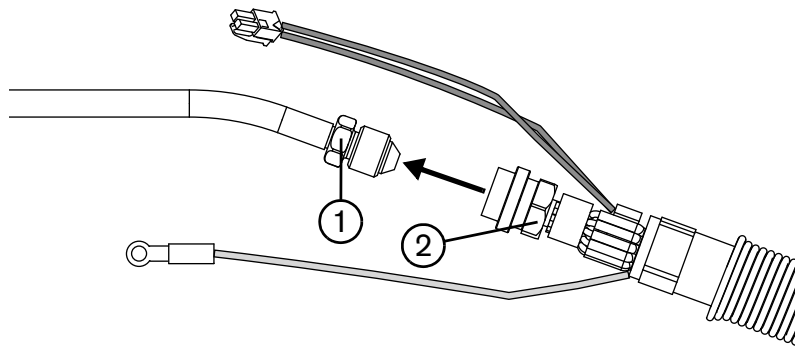
**Do not apply heat to the wires. Heating the wires can damage the connections in the torch lead.**



### CAUTION!

**Always use 2 wrenches to properly loosen and tighten the hex nuts and bolts mentioned in these procedures. A strong threadlocker is used to assemble the torch, and loosening the nuts incorrectly can damage the threads.**

Figure 35




8. Cover the end of the gas line on the torch lead with tape to keep dirt and other contaminants from getting in the gas line.



## Install the torch lead

1. Clean the conical surface of the gas tube fitting to remove any dried or loose threadlocker. Apply a fresh drop of threadlocker to the threads of the gas tube fitting on the torch body.

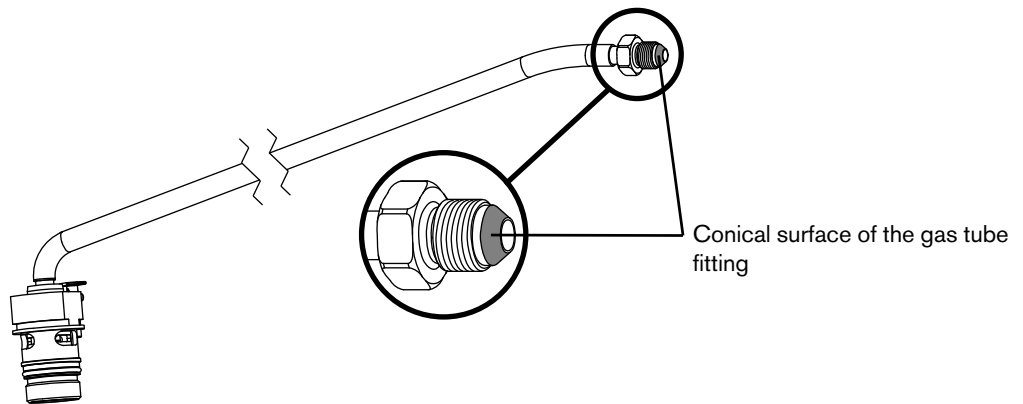
 The drop should not be wider than 2 threads in diameter.



### CAUTION!

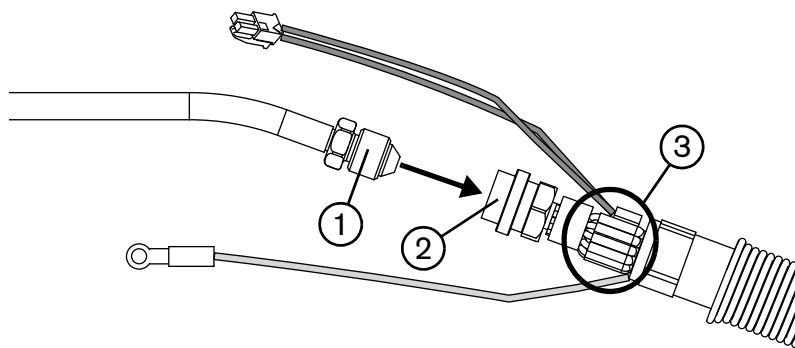
**Do not get any threadlocker on the conical surface of the gas tube fitting to avoid causing damage to the torch. If any threadlocker does get on this surface, clean it off immediately.**

Figure 36



2. Clamp the new torch lead in place, with the white wires facing up, to keep the lead from moving.
3. Remove the tape that you placed over the end of the gas line on the torch lead in *step 8* on page 80.
4. Thread the conical end ① of the gas tube into the new torch lead ② until snug. The lead's white wires ③ must be facing up.

Figure 37

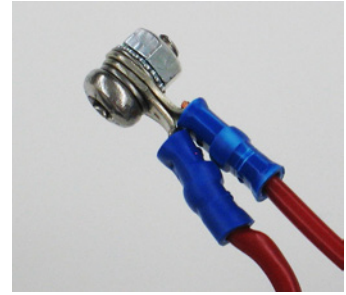


## 4 – Component Replacement

5. Use 2 wrenches to tighten the gas fitting that secures the torch body to the new torch lead to 69.1 kg-cm (60 inch-pounds).
6. Use the pilot terminal screw and nut you removed in *step 3* on page 78 to connect the red pilot arc wire from the torch lead with the red pilot arc wire from the torch body. Tighten the screw to 17.3 kg-cm (15 inch-pounds).

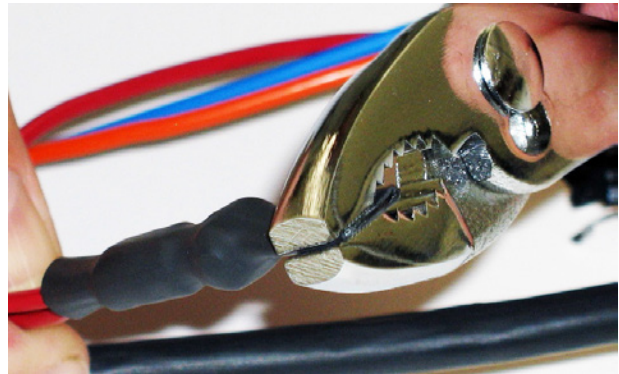


Keep in mind that the pilot arc wire from the torch lead must be routed under the gas tube when the torch handle is put back together.



7. Cover the pilot terminal screw and nut with the heatshrink included in the kit.
  - a. Leave 10 mm (3/8 inch) excess heatshrink above the screw.
  - b. Use a heat gun to warm the heatshrink until it adheres to the screw.
  - c. Crimp the end of the heatshrink with a pair of pliers.

Figure 38

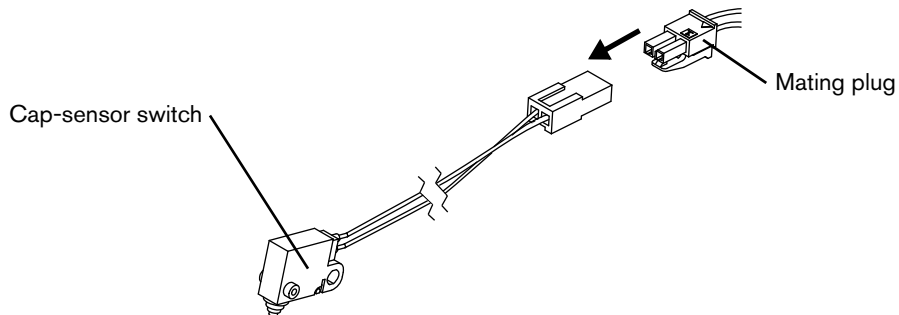


### CAUTION!

Do not apply heat to the wires. Heating the wires can damage the connections in the torch lead.

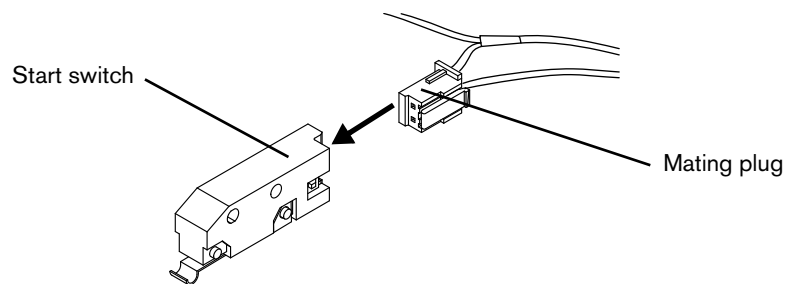
8. Connect the cap-sensor switch to the torch lead by pushing the mating plug on the torch lead wires into the socket near the trigger end of the extension tube.

Figure 39



9. Connect the start switch by pushing the mating plug into the socket.

Figure 40



10. Reinstall all of the torch components that you removed in *step 2* on page 78. See *Install the handle* on page 47.
11. Connect the new torch lead to the power supply.
12. Reconnect the gas supply, and turn ON (I) the power.

### Replace the quick disconnect housing

#### Kit

428260

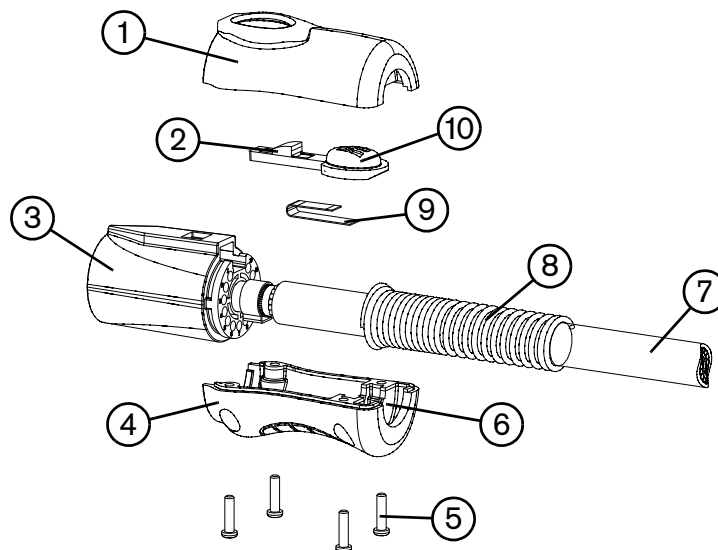
#### Description

*Kit: Duramax and Duramax Hyamp torch FastConnect replacement*

### Remove the quick disconnect housing

1. Turn OFF (O) the power, disconnect the gas supply, and disconnect the torch.
2. Remove the screws from the bottom half of the shell. (See *Figure 41*.)
3. Remove the 2 shell halves.
4. Remove the latch by using a blade screwdriver to press down firmly on the latch tab while pushing the tab down and out toward the lead.
5. Pull the spring out of the quick disconnect housing.

**Figure 41**




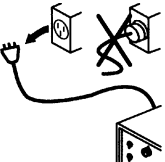
- |                            |                      |
|----------------------------|----------------------|
| 1 Top shell half           | 6 Strain relief slot |
| 2 Latch tab                | 7 Torch lead         |
| 3 Quick disconnect housing | 8 Strain relief      |
| 4 Bottom shell half        | 9 Spring             |
| 5 Screws (4)               | 10 Latch             |

### **Install the quick disconnect housing**

1. Place the new latch into the quick disconnect housing.
2. Hold up the end of the latch and insert the new spring under the latch.
3. Use a blade screwdriver to push the spring into the recess until it clicks into place.
4. Install the new shell halves onto the torch lead, making sure the strain relief fits in the slot of the shell and the wires are not pinched or do not interfere with the latch.
5. Install and tighten the screws.

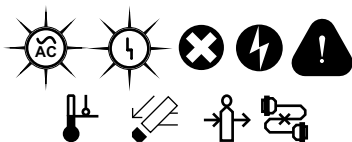


**Routine maintenance and troubleshooting**

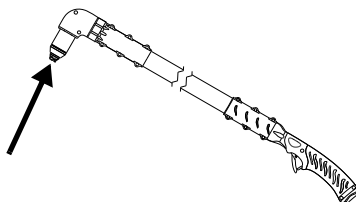
	<p><b>WARNING!</b> <b>ELECTRIC SHOCK CAN KILL</b></p>
	<p>Disconnect electrical power before performing any maintenance. See the <i>Safety and Compliance Manual</i> (80669C) for more safety precautions.</p>

### Perform routine maintenance tasks

#### Every use:



Check indicator lights and fault icons.  
Correct any fault conditions.

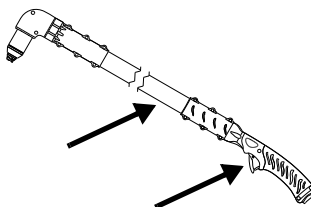


Inspect the consumables for proper installation and wear.

#### Every 3 months:



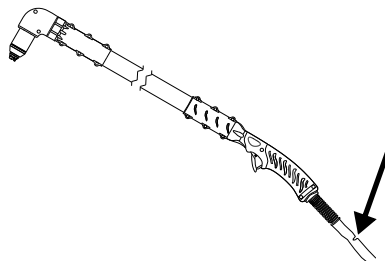
Replace any damaged labels.



Inspect the trigger for damage.  
Inspect the torch body for cracks and exposed wires.  
Inspect the extension tube for cracks or other damage.  
Replace any damaged parts.

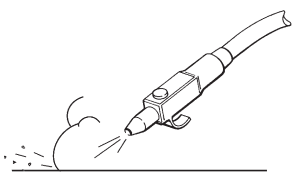


Inspect the power cord and plug.  
Replace if damaged.

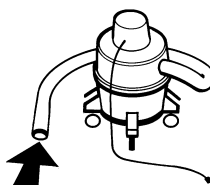


Inspect the torch lead. Replace if damaged.

#### Every 6 months:



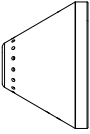



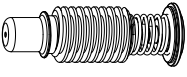
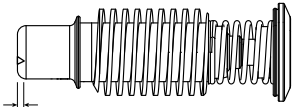
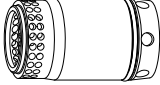
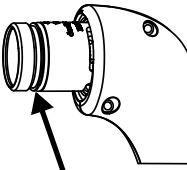
or



Clean the inside of the power supply with clean, dry, oil-free and moisture-free compressed air or a vacuum.



## Inspect the consumables

Part	Inspect	Action
 Shield	The center hole for roundness.	Replace the shield if the hole is no longer round.
	The gap between the shield and the nozzle for accumulated debris.	Remove the shield and clean away any material.
 Nozzle	The center hole for roundness.   Good  Worn	Replace the nozzle if the center hole is not round.
 Electrode	 Max. 1.6 mm (1/16 inch)	Replace the electrode if the surface is worn or the pit depth is greater than 1.6 mm (1/16 inch) deep.
 Swirl ring	The surface inside the swirl ring for damage or wear and the gas holes for blockages.	Replace the swirl ring if the surface is damaged or worn or any of the gas holes are blocked.
	The O-ring for damage or wear.	If the O-ring is worn or damaged, replace it (428253).
	The length of the swirl ring.	If the length of the 220997 or 420159 swirl ring is less than 32 mm (1.27 inches), replace it.
 Torch O-ring	The surface for damage, wear, or a lack of lubrication.	If the O-ring is dry, lubricate it and the threads with a thin layer of silicone lubricant. If the O-ring is worn or damaged, replace it (428253).

### Basic troubleshooting

Table 4 provides an overview of the most common problems that can arise when using the Duramax Hyamp long handheld torches and explains how to solve them.



For troubleshooting information related to the power supply, as well as for an explanation of the fault icons and corresponding fault codes that appear in the power supply's LCD display, refer to the Operator Manual for your Powermax system.



If a fault occurs while using a generator, turn OFF the power supply, wait 60 – 70 seconds, and turn ON the power supply.

If you are unable to fix the problem by following this basic troubleshooting guide, or if you need further assistance:

1. Call your Hypertherm distributor or authorized Hypertherm repair facility.
2. Call the nearest Hypertherm office listed in the front of this manual.

**Table 4 – Troubleshooting guide**

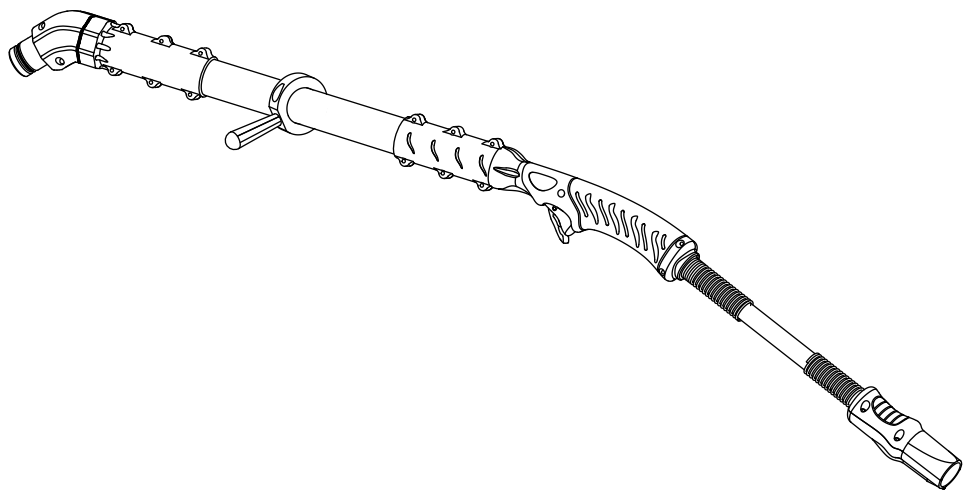
Problem	Solutions
The arc does not transfer to the workpiece.	<ul style="list-style-type: none"><li>▪ Clean the area where the ground clamp contacts the workpiece to ensure a good metal-to-metal connection.</li><li>▪ Inspect the ground clamp for damage, and repair as necessary.</li><li>▪ The pierce-height distance may be too large. Move the torch closer to the workpiece and fire the torch again.</li></ul>
The arc blows out, but re-ignites when the torch trigger is pressed again.	<ul style="list-style-type: none"><li>▪ Inspect the consumable parts and replace them if they are worn or damaged. See <i>Inspect the consumables</i> on page 89.</li><li>▪ Replace the gas filter element if it is contaminated. Refer to the Operator Manual for your Powermax system.</li><li>▪ Make sure the gas pressure is at the proper level.</li></ul>
The arc sputters and hisses.	<ul style="list-style-type: none"><li>▪ The gas filter element is contaminated. Replace the element. Refer to the Operator Manual for your Powermax system.</li><li>▪ Inspect the gas line for moisture. If necessary, install or repair the gas filtration to the power supply. Refer to the Operator Manual for your Powermax system.</li></ul>
The cut quality is poor.	<ul style="list-style-type: none"><li>▪ Verify that the torch is being used correctly. See <i>Operation</i> on page 29.</li><li>▪ Inspect the consumables for wear and replace as necessary. See <i>Inspect the consumables</i> on page 89.</li><li>▪ Check the air pressure and air quality.</li><li>▪ Verify that the cutting mode switch is in the proper position for the cutting operation.</li><li>▪ Verify that the correct consumables are installed.</li></ul>



Duramax Hyamp long handheld torch replacement parts

The entire Duramax Hyamp long handheld torch assembly with lead can be replaced, or individual component parts can be replaced.

Full torch assembly, 45° torch



Use the following part numbers to replace the entire Duramax Hyamp 45° long handheld torch assembly.

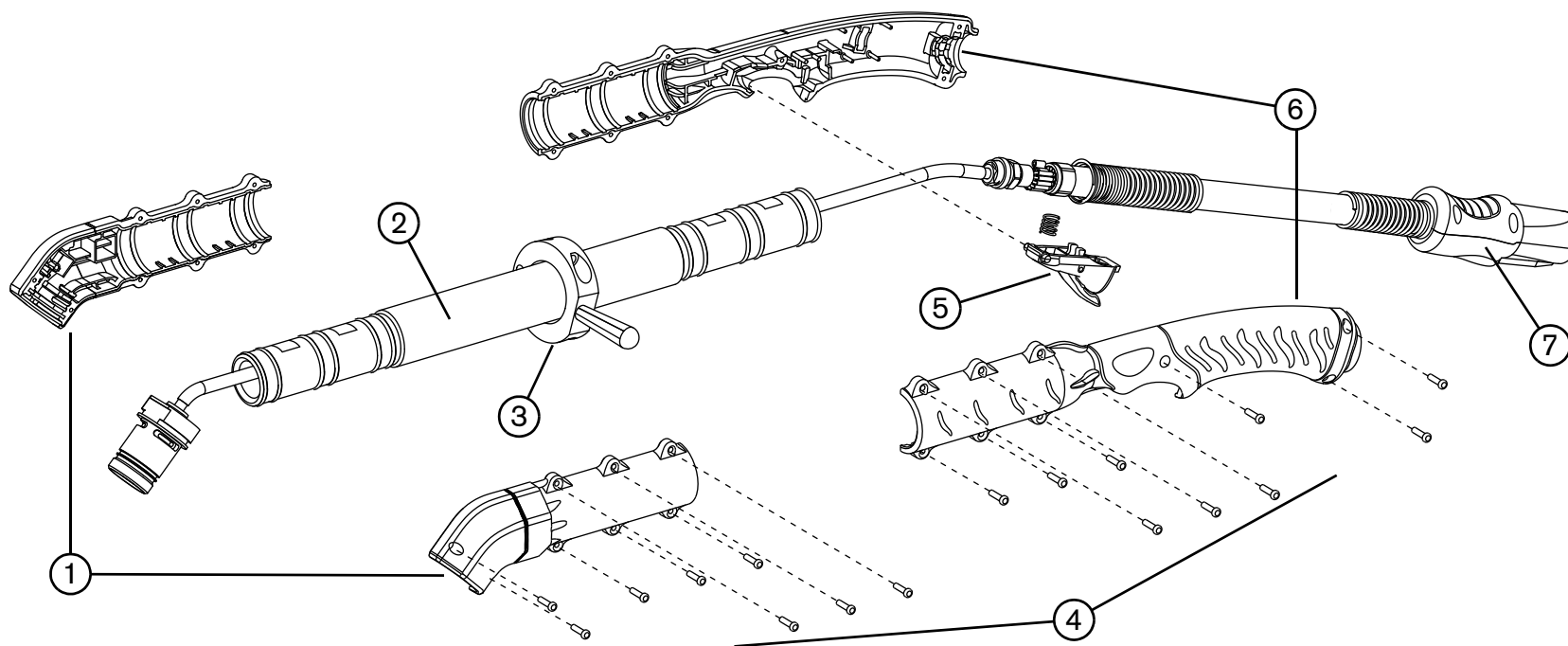


The torch assembly does not include consumables. See *Duramax Hyamp hand torch consumables* on page 100 for a list of consumable part numbers.

Part Number	Description
059562	Duramax Hyamp 45° long handheld torch assembly with 0.6 m (2 foot) extension and 7.6 m (25 foot) lead
059579	Duramax Hyamp 45° long handheld torch assembly with 0.6 m (2 foot) extension and 15 m (50 foot) lead
059567	Duramax Hyamp 45° long handheld torch assembly with 1.2 m (4 foot) extension and 7.6 m (25 foot) lead
059581	Duramax Hyamp 45° long handheld torch assembly with 1.2 m (4 foot) extension and 15 m (50 foot) lead
059667*	Duramax Hyamp 45° long handheld torch assembly with 1.2 m (4 foot) extension and 46 m (150 foot) lead

\* The Duramax Hyamp long torch with 46-m (150-foot) torch leads must be used with a Powermax125. **IMPORTANT:** If your Powermax125 has a serial number of 125-007943 or lower, you must install a new DSP board (428119). Make sure that the DSP board is at Revision C or higher. See the *Duramax Hyamp 46-m (150-foot) Torch and Torch Leads Field Service Bulletin* (810260) for more information.

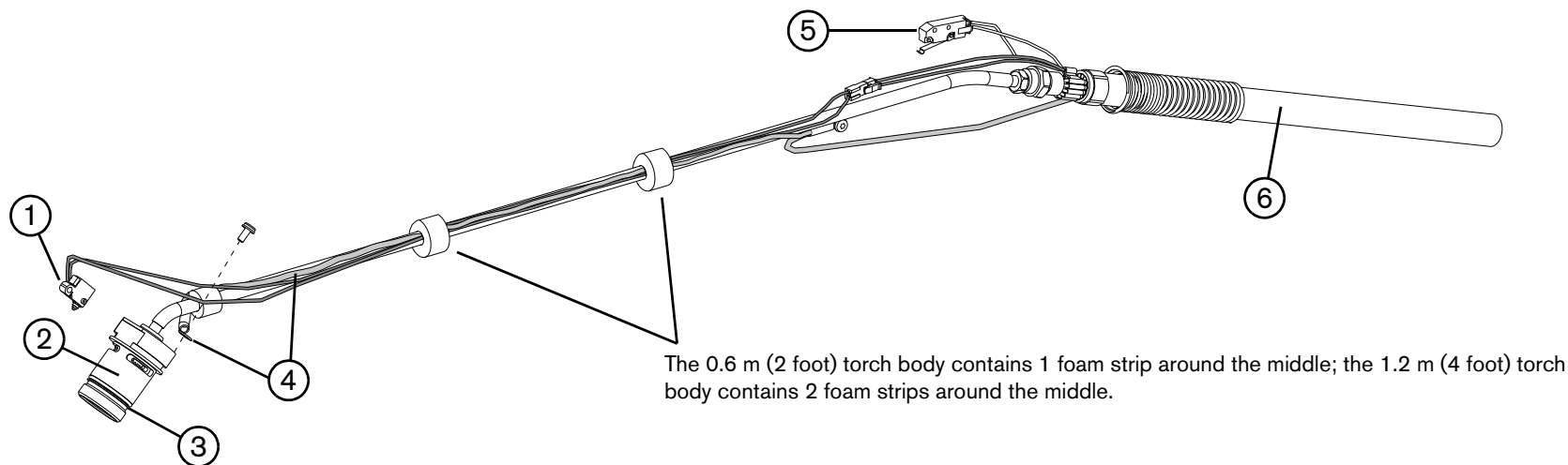
## External components, 45° torch



Item	Part Number	Description
1	428278	Kit: Duramax Hyamp 45° long handheld torch front shell replacement
2	428280*	Kit: Duramax Hyamp long handheld torch extension tube replacement, 0.6 m (2 feet)
2	428281*	Kit: Duramax Hyamp long handheld torch extension tube replacement, 1.2 m (4 feet)
3	428286+	Kit: Duramax Hyamp long handheld torch auxiliary handle replacement (with screws)
4	428287	Kit: Duramax Hyamp torch handle screws
5	428156	Kit: Duramax Hyamp hand torch trigger replacement (with spring)
6	428277	Kit: Duramax Hyamp long handheld torch handle replacement
7	428260	Kit: Duramax and Duramax Hyamp torch FastConnect replacement

\* The extension tubes cannot be used to convert a 0.6 m (2 foot) torch to a 1.2 m (4 foot) torch or to convert a 1.2 m (4 foot) torch to a 0.6 m (2 foot) torch.

+ The auxiliary handle comes with the 1.2 m (4 foot) torch; it can be ordered separately for the 0.6 m (2 foot) torch.

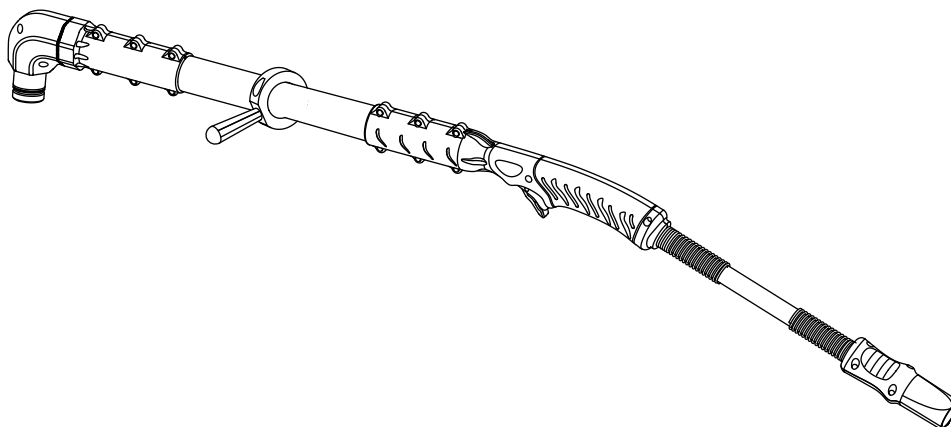
**Internal components, 45° torch**

Item	Part Number	Description
1	428288	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 0.6 m (2 feet)
1	428289	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 1.2 m (4 feet)
2	428282	Kit: Duramax Hyamp 45° long handheld torch body replacement (torch head plus gas tube), 0.6 m (2 feet) – includes pilot arc wire, cap-sensor switch, and foam strips
2	428284	Kit: Duramax Hyamp 45° long handheld torch body replacement (torch head plus gas tube), 1.2 m (4 feet) – includes pilot arc wire, cap-sensor switch, and foam strips
3	428253	Kit: Duramax Hyamp O-ring replacement (5)

Item	Part Number	Description
4	428290	Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 0.6 m (2 feet)
4	428291	Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 1.2 m (4 feet)
5	428162	Kit: Duramax Hyamp hand torch start switch replacement
6	428159	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 7.6 m (25 feet)
6	428160	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 15 m (50 feet)
6	428762*	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 46 m (150 feet)

\* The 46-m (150-foot) torch leads must be used with a Powermax125. **IMPORTANT:** If your Powermax125 has a serial number of 125-007943 or lower, you must install a new DSP board (428119). Make sure that the DSP board is at Revision C or higher. See the *Duramax Hyamp 46-m (150-foot) Torch and Torch Leads Field Service Bulletin* (810260) for more information.

### Full torch assembly, 90° torch



Use the following part numbers to replace the entire Duramax Hyamp 90° long handheld torch assembly.

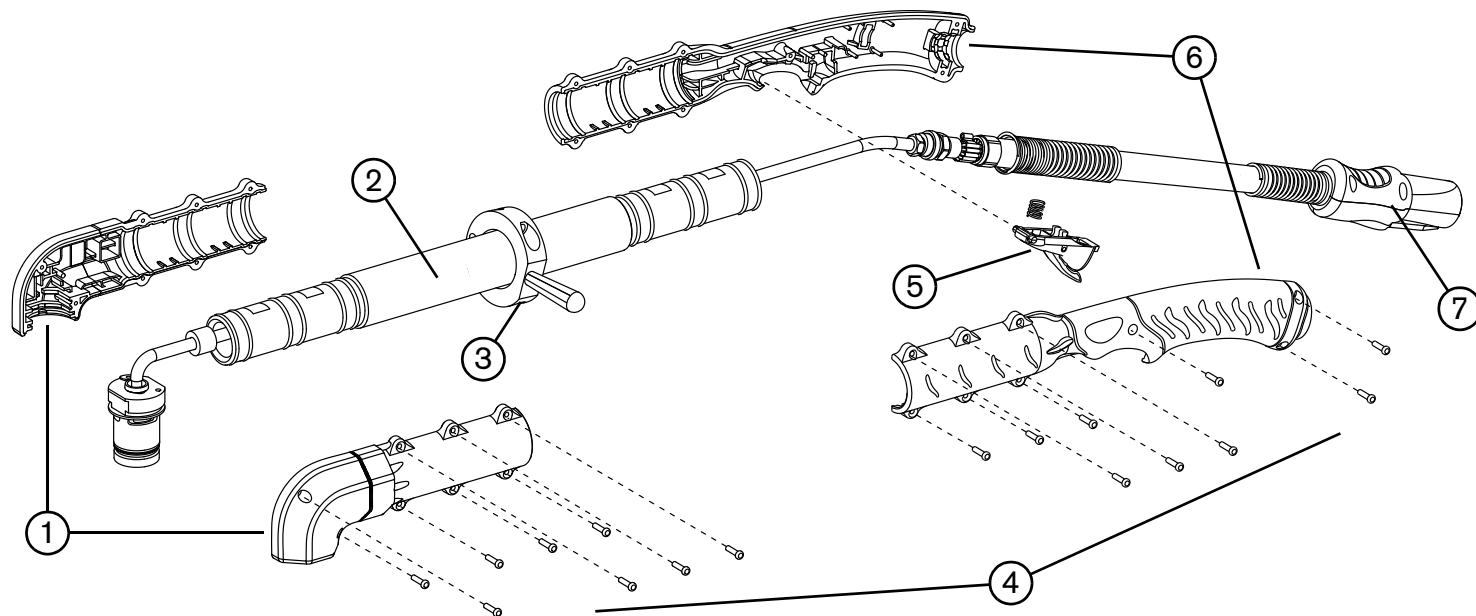


The torch assembly does not include consumables. See *Duramax Hyamp hand torch consumables* on page 100 for a list of consumable part numbers.

Part Number	Description
059563	Duramax Hyamp 90° long handheld torch assembly with 0.6 m (2 foot) extension and 7.6 m (25 foot) lead
059580	Duramax Hyamp 90° long handheld torch assembly with 0.6 m (2 foot) extension and 15 m (50 foot) lead
059568	Duramax Hyamp 90° long handheld torch assembly with 1.2 m (4 foot) extension and 7.6 m (25 foot) lead
059582	Duramax Hyamp 90° long handheld torch assembly with 1.2 m (4 foot) extension and 15 m (50 foot) lead
059668*	Duramax Hyamp 90° long handheld torch assembly with 1.2 m (4 foot) extension and 46 m (150 foot) lead
059623	Duramax Hyamp 90° long handheld torch assembly with 1.8 m (6 foot) extension and 7.6 m (25 foot) lead
059624	Duramax Hyamp 90° long handheld torch assembly with 1.8 m (6 foot) extension and 15 m (50 foot) lead



## External components, 90° torch

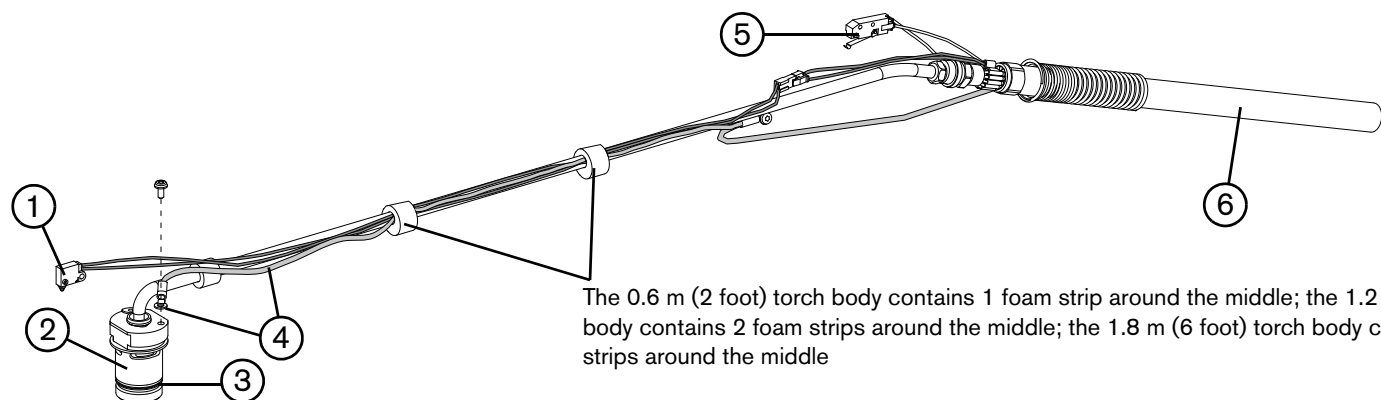


Item	Part Number	Description
1	428279	Kit: Duramax Hyamp 90° long handheld torch front shell replacement
2	428280*	Kit: Duramax Hyamp long handheld torch extension tube replacement, 0.6 m (2 feet)
2	428281*	Kit: Duramax Hyamp long handheld torch extension tube replacement, 1.2 m (4 feet)
2	428820*	Kit: Duramax Hyamp long handheld torch extension tube replacement, 1.8 m (6 feet)
3	428286+	Kit: Duramax Hyamp long handheld torch auxiliary handle replacement (with screws)
4	428287	Kit: Duramax Hyamp torch handle screws
5	428156	Kit: Duramax Hyamp hand torch trigger replacement (with spring)
6	428277	Kit: Duramax Hyamp long handheld torch handle replacement
7	428260	Kit: Duramax and Duramax Hyamp torch FastConnect replacement

\* The extension tubes cannot be used to convert from one torch length to another torch length.

+ The auxiliary handle comes with the 1.2 m (4 foot) torch and 1.8 m (6 foot) torch; it can be ordered separately for the 0.6 m (2 foot) torch.

## Internal components, 90° torch



Item	Part Number	Description
1	428288	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 0.6 m (2 feet)
1	428289	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 1.2 m (4 feet)
1	428822	Kit: Duramax Hyamp long handheld torch cap-sensor switch replacement, 1.8 m (6 feet)
2	428283	Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 0.6 m (2 feet) – includes pilot arc wire, cap-sensor switch, and foam strips
2	428285	Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 1.2 m (4 feet) – includes pilot arc wire, cap-sensor switch, and foam strips
2	428821	Kit: Duramax Hyamp 90° long handheld torch body replacement (torch head plus gas tube), 1.8 m (6 feet) – includes pilot arc wire, cap-sensor switch, and foam strips
3	428253	Kit: Duramax Hyamp O-ring replacement (5)
4	428290	Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 0.6 m (2 feet)
4	428291	Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 1.2 m (4 feet)
4	428823	Kit: Duramax Hyamp long handheld torch pilot arc wire replacement (with screws), 1.8 m (6 feet)

Item	Part Number	Description
5	428162	Kit: Duramax Hyamp hand torch start switch replacement
6	428159	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 7.6 m (25 feet)
6	428160	Kit: Duramax and Duramax Hyamp hand torch lead replacement, 15 m (50 feet)
6	428762*	Kit: Duramax Hyamp hand torch lead replacement, 46 m (150 feet)

\* The 46-m (150-foot) torch leads must be used with a Powermax125. **IMPORTANT:** If your Powermax125 has a serial number of 125-007943 or lower, you must install a new DSP board (428119). Make sure that the DSP board is at Revision C or higher. See the *Duramax Hyamp 46-m (150-foot) Torch and Torch Leads Field Service Bulletin* (810260) for more information.

### Duramax Hyamp hand torch consumables

#### Drag cutting

Part Number	Description
420172	Duramax Hyamp shield 45/65 A
420000	Duramax Hyamp shield 105/125 A
220977	Duramax Hyamp retaining cap
420158	Duramax Hyamp nozzle 45 A
420169	Duramax Hyamp nozzle 65 A
220975	Duramax Hyamp nozzle 105/125 A
220971	Duramax Hyamp electrode
220997	Duramax Hyamp swirl ring

#### Maximum Removal gouging

Part Number	Description
420112	Duramax Hyamp gouging shield
220977	Duramax Hyamp retaining cap
420001	Duramax Hyamp gouging nozzle
220971	Duramax Hyamp electrode
220997	Duramax Hyamp swirl ring

#### FineCut

Part Number	Description
420152	Duramax Hyamp FineCut shield
220977	Duramax Hyamp retaining cap
420151	Duramax Hyamp FineCut nozzle
220971	Duramax Hyamp electrode
420159	Duramax Hyamp FineCut swirl ring

**Accessory parts**

<b>Part Number</b>	<b>Description</b>
127169	Leather cutting gloves
127103	Face shield, shade 8 lens
017031	Helmet, shade 8 – 12 auto-dim with glasses
127105	Replacement lens for face shield, shade 8
428809	Kit: Skeleton cutting sled

