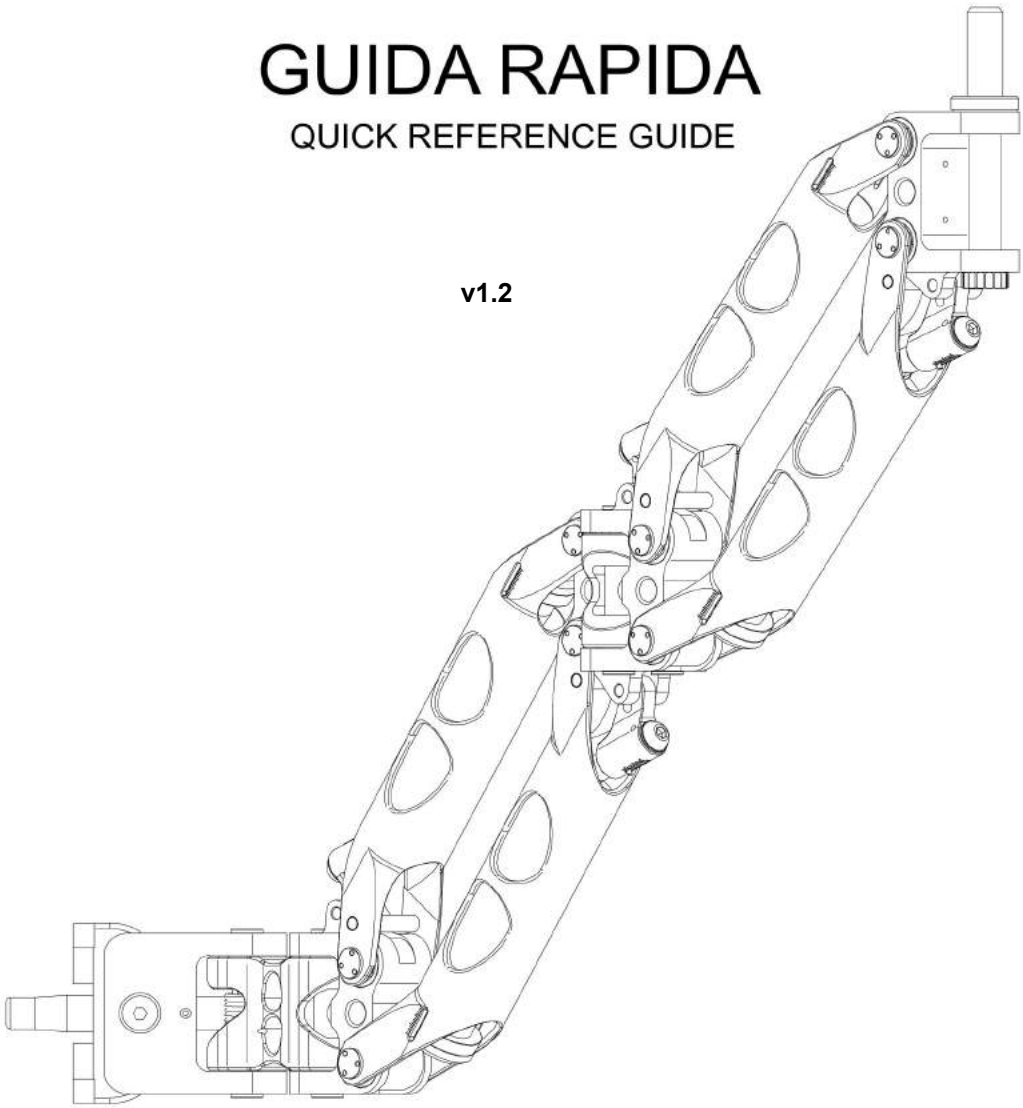
ARMX1™

GUIDA RAPIDA

QUICK REFERENCE GUIDE

v1.2



smartsystem

Indice generale

General Index

Introduzione

Congratulazioni per l'acquisto di SmartCAM ARM X1

Prima di poter usare il braccio SmartCAM ARM X1, è necessario aver compreso appieno tutte le regolazioni ed il principio di funzionamento dello stesso.

Il braccio di stabilizzazione SmartCAM ARM X1 è stato progettato con l'unico scopo di sostenere carichi provenienti da attrezzature cinematografiche installate su di uno sled con attacco standard da 5/8".

E' vietato e perseguibile l'utilizzo di tale attrezzatura con finalità diverse da quanto previsto.

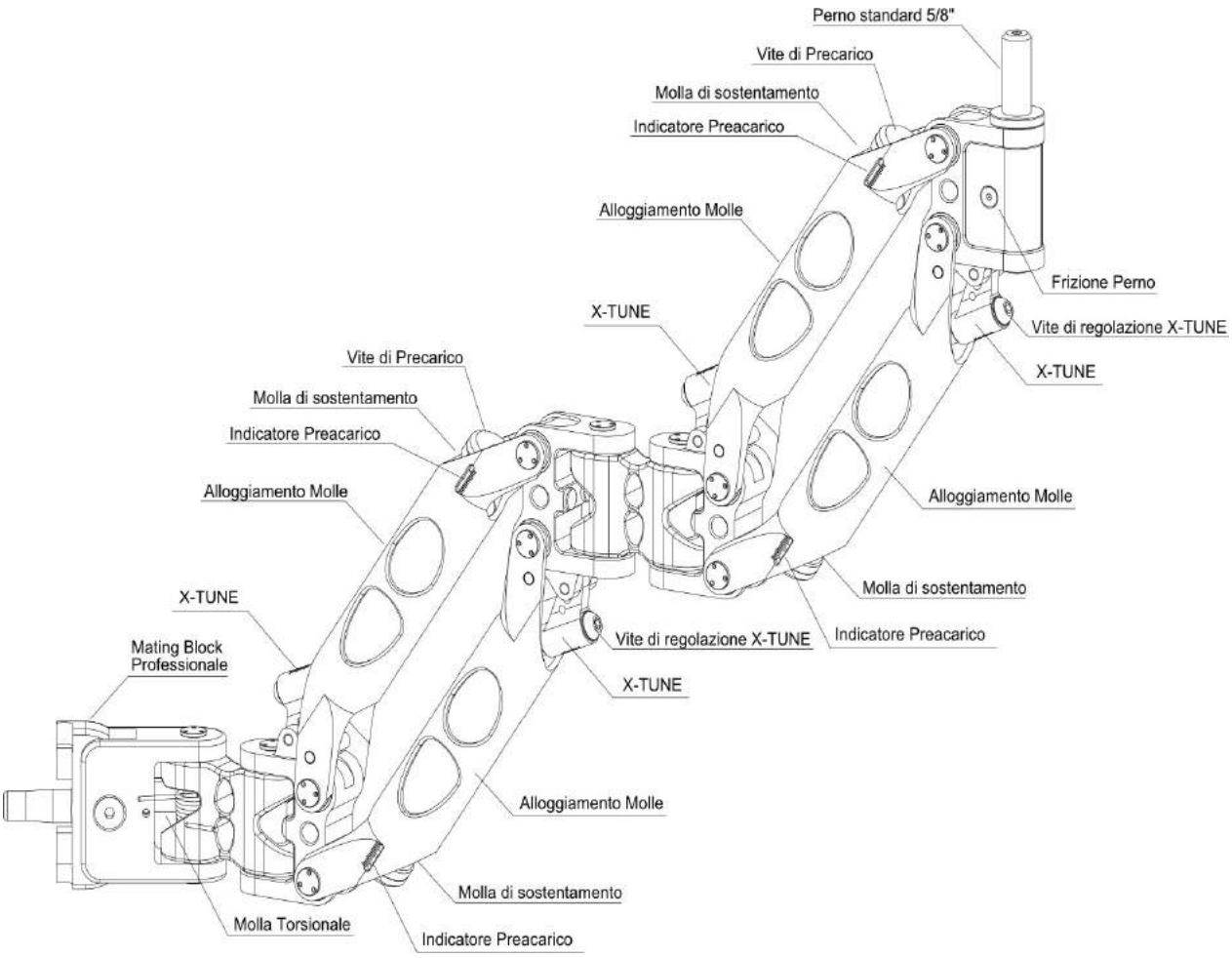
SmartCAM ARM X1 è totalmente compatibile con tutti i sistemi steadycam professionali attualmente presenti sul mercato, grazie all'aggancio a corpetto standard (Standard Arm Mating Block) ed al pin per lo sled di dimensioni pari a 5/8".

Il braccio si compone di 2 segmenti collegati, ognuno dei quali costituisce un parallelogramma. All'interno di ogni elemento che costituisce i singoli parallelogrammi è alloggiato il sistema di ammortizzazione costituito da una cartuccia a molla facilmente estraibile e dal suo sistema di regolazione del precarico.

Tutti gli snodi e gli elementi mobili di X1 sono supportati da cuscinetti in gabbia di acciaio e Water Proof. Evitate comunque condizioni estreme per prevenire che la sporcizia penetri all'interno del sistema.

- Per ragioni di sicurezza attenetevi alle istruzioni presenti in questo manuale
- Non sovraccaricate il braccio oltre le categorie di peso descritte in questo manuale
- E' vietato aprire e/o smontare anche solo parzialmente la struttura del braccio, pena l'annullamento della garanzia.

Overview



Sostituzione e regolazione delle molle

All'inizio ed al termine di ogni sessione di lavoro, è consigliabile assicurasi che le molle del braccio siano scariche.

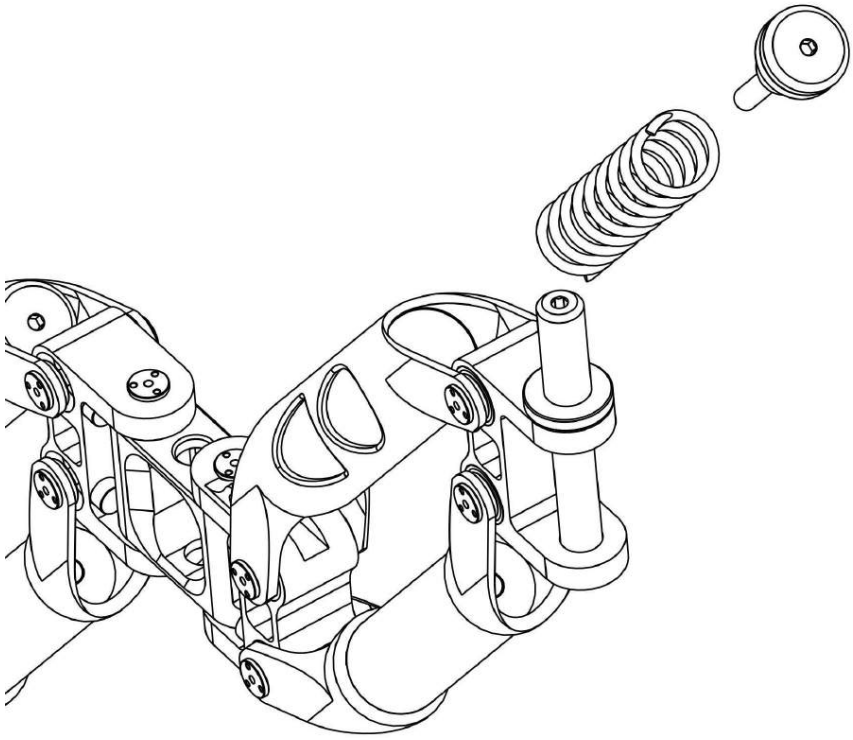
Arm X1 viene fornito di serie con 2 kit di molle a costante elastica differente:

- Medium (per carichi medio-leggeri) [COLORE BLUE]
- Heavy (per carichi pesanti) [COLORE NERO]

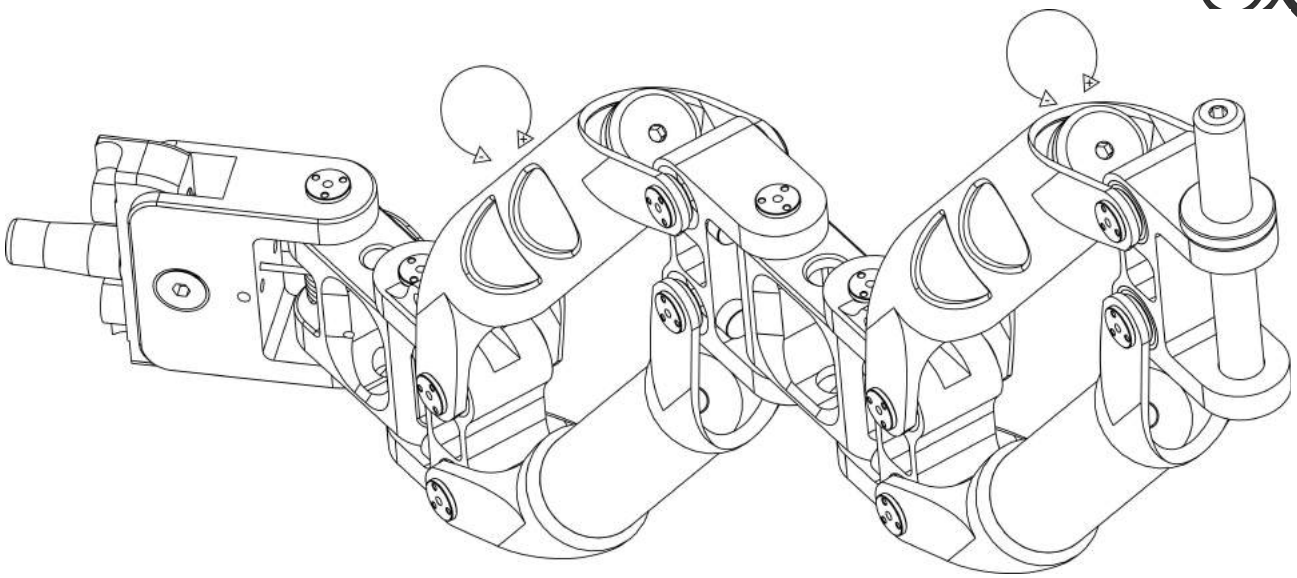
Arm X1 è dotato di quattro alloggiamenti per molle permettendo all'utente di operare in completa libertà ed in base al carico applicato sul braccio stesso. E' infatti possibile lavorare con solo una molla per quadrilatero in modo da minimizzare il peso complessivo

dell’attrezzature e massimizzare lo sfruttamento della molla stessa.

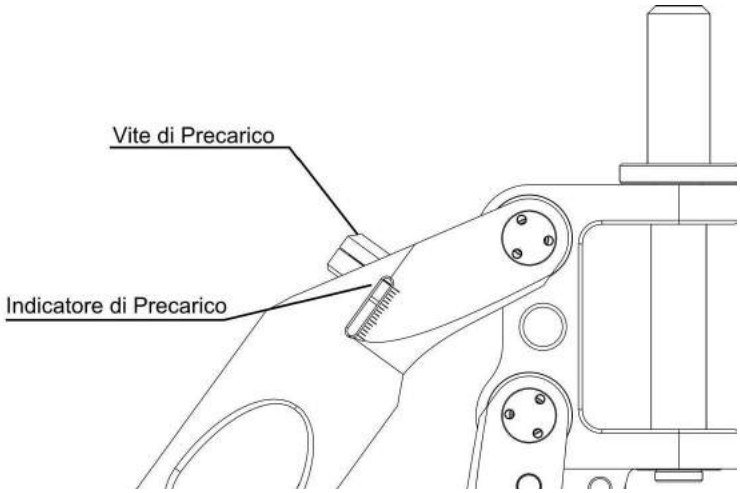
La sostituzione / rimozione delle molle è un procedimento semplice e veloce. Per una maggiore rapidità si consiglia di seguire questa procedura:



1. Adagiare Arm X1 su un piano possibilmente pulito ed asciutto
2. Tramite la chiave a brugola n.5, ruotando in senso anti-orario, procedere ad allentare le vite di precarico della molla fino al completo disimpegno dalla struttura
3. Sfilare la vite di precarico
4. Sfilare la molla presente nell’alloggiamento
5. Inserire la molla maggiormente indicata per il carico da supportare
6. Procedere a reinserire ed avvitare, in senso orario, la vite di precarico precedentemente rimossa



7. Avvitare la vite di regolazione del precarico fino ad allineare il piattello della vite stessa con il primo riferimento presente nell'indicatore di precarico (come mostrato in figura)



L'allineamento del piattello della vite di registro con il primo riferimento dell'indicatore di precarico garantisce il corretto inserimento ed installazione della molla all'interno dell'alloggiamento.

https://www.youtube.com/watch?v=Cnv94zYLm1w

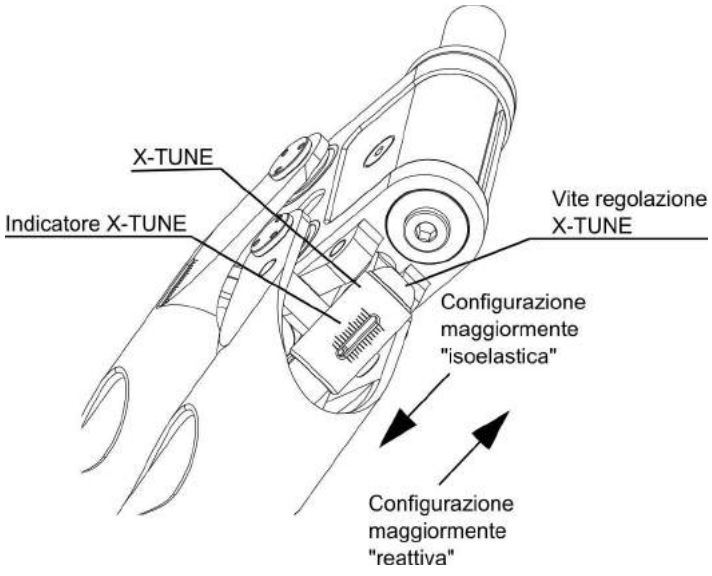
Il modo corretto di utilizzare un sistema Steadycam è quello di precaricare le molle in modo tale che gli elementi dei singoli parallelogrammi siano **paralleli al terreno durante la sessione di lavoro (**cioè con braccio correttamente installato sul Vostro corpetto e Sled collegato al perno 5/8" del vostro SmartCAM Arm X1).

Nel caso in cui, precaricando al massimo le molle, il braccio non dovesse trovarsi nella condizione di parallelismo rispetto al terreno, è necessario sostituire le molle con quelle direttamente successive in ordine di costante elastica.

Seguire il diagramma di carico allegato in modo da trovare la migliore combinazione di molle in base al carico applicato. Arm X1 non necessita che tutte e quattro le molle siano tarate in equal misura

http://download.smartsystem.it/Load_Diagram_X1_v2019.pdf

X-TUNE



Il braccio di stabilizzazione ARM X1 di SmartSystem è dotato di un esclusivo sistema di regolazione del comportamento dinamico del braccio stesso denominato **X-TUNE.**

X-TUNE opera in modo sinergico con le molle correntemente installate nel braccio.

Non solo è possibile scegliere se avere un braccio reattivo oppure morbido e leggero, ma è possibile tarare in modo indipendente le quattro molle installate su X1.

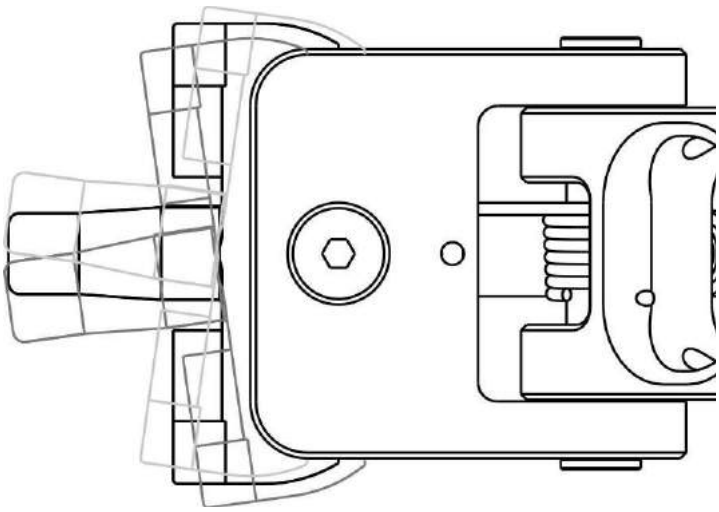
Anche X-TUNE è dotato di scala graduata che permette all'utente di regolare in modo preciso e ripetibile ogni singolo elemento attivo.

Regolando la vite di X-TUNE in modo tale che l'indicatore tenda a spostarsi verso l'alloggiamento molle, avremo un sistema morbido tendente all'isoelastico.

Operando invece uno spostamento opposto di X-TUNE, otterremo un sistema maggiormente reattivo (comodo in situazioni di corsa o car-mount).

X-TUNE provoca uno spostamento dello stelo della relativa molla. E' sempre necessario rieffettuare una calibrazione del precarico una volta modificato il settaggio di X-TUNE

Regolazione dell'inclinazione del braccio



E' possibile variare l'angolazione di tilt del braccio SmartCAM ARM X1 grazie alle due viti presenti nel mating block. Tale regolazione è strettamente correlata alla postura dell'operatore.

Per questa operazione è necessario munirsi della stessa chiave con cui si regola il precarico delle molle (chiave n.5).

Le due viti presenti operano in contrapposizione in modo tale da poter bloccare il braccio

in qualsiasi posizione si renda necessaria.

Ipotizziamo che il braccio sia configurato per essere collegato ad un corpetto con attacco sul lato destro dell'operatore.

Nel caso in cui, una volta installato il braccio sul Vostro corpetto (Vest Lite o equivalente) ed assunta una postura eretta, il braccio dovesse:

Tendere verso destra :

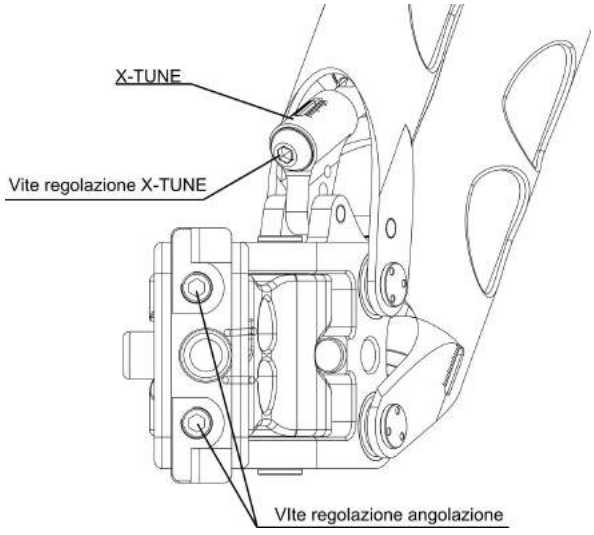
1. Allentare la vite superiore ed avvitare la vite inferiore fino a quando non verificherete il bilanciamento del braccio (sempre mantenendo la postura eretta)
2. Avvitare la vite superiore fino a bloccare il braccio nella posizione voluta

Tendere verso sinistra :

1. Allentare la vite inferiore ed avvitare la vite superiore fino a quando non verificherete il bilanciamento del braccio (sempre mantenendo la postura eretta)
2. Avvitare la vite inferiore fino a bloccare il braccio nella posizione voluta

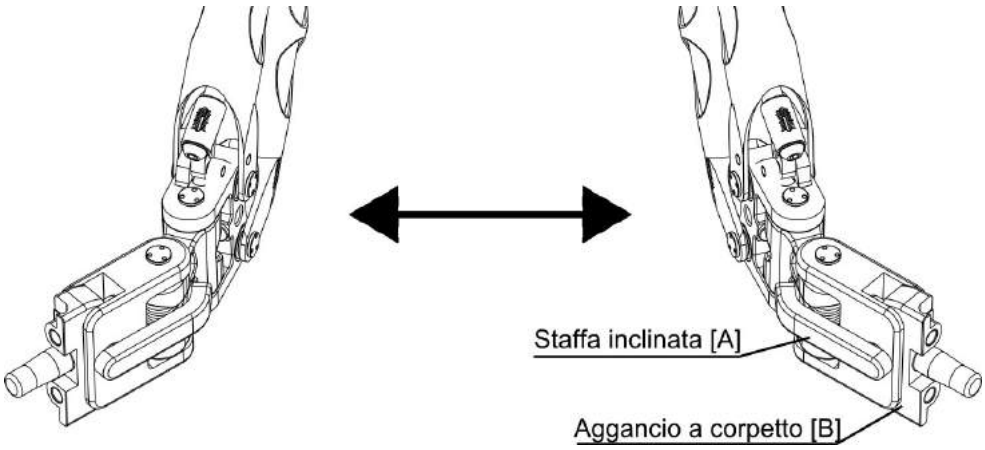
Si raccomanda di eseguire sempre questa regolazione dopo aver indossato il corpetto (SmartCAM Vest lite o equivalente) ed averlo serrato correttamente al Vostro corpo.

Si ricorda infine che l'asse rappresentato dal perno 5/8" del Vostro braccio X1 deve essere il più possibile parallelo all'asse del Vostro corpo.



Cambio del verso del braccio

Il cambio del verso del braccio si rende necessario qualora l'attrezzatura debba essere utilizzata da operatori destrorsi o sinistrorsi allo stesso tempo. Questa operazione può essere compiuta in brevissimo tempo e con estrema facilità.

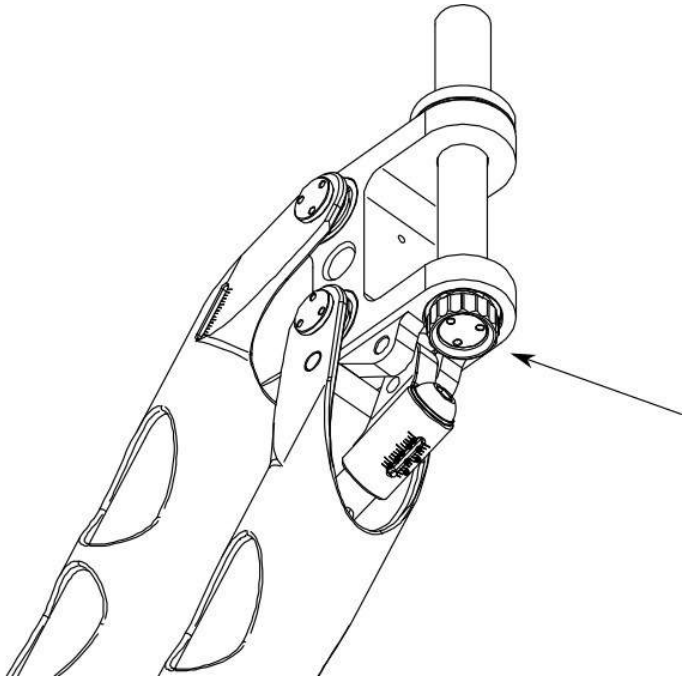


Svitare con la chiave in dotazione la vite che tiene il mating block serrato al resto del braccio. Estrarre la staffa inclinata (A) che precarica la molla torsionale presente nello snodo a ridosso del mating block. Girare il verso dell'aggancio a corpetto (B) e riassmblare la staffa inclinata [A] dal lato opposto a quello precedente. A questo punto tenendo con una mano lo snodo leggermente inclinato secondo il verso della staffa, inserire la vite e serrare il mating block .

E' possibile visualizzare un video illustrativo al seguente link:

https://www.youtube.com/watch?v=waYNCr1qN3o

Bloccaggio Arm Post



Prima di iniziare una sessione di lavoro si consiglia sempre di verificare il corretto serraggio del pomello di bloccaggio degli Arm Post di X1. Tale sistema, permette un rapido cambio tra differenti Arm Post.

Checklist generale

Prima di iniziare il proprio lavoro, è consigliabile verificare la seguente checklist:

1. Assicurarsi di aver indossato correttamente il Vostro Corpetto (SmartCAM Vest lite o simile)
2. Verificare di aver precaricato correttamente le molle del Vostro Arm X1 secondo la procedura precedentemente elencata
3. Assicurarsi di aver controllato i serraggi del Vostro Sled e tutta la componente elettrica di base
4. Assicurarsi che il perno 5/8” sia ben serrato.
5. Regolare correttamente l’inclinazione dell’asse 5/8” del braccio rendendolo il più possibile parallelo al Vostro corpo agendo sia sull’inclinazione di tilt (rotazione destra-sinistra, come precedentemente spiegato), sia tramite i fissaggi che troverete sul Vostro corpetto (rotazione fronte-retro).

Manutenzione

Non utilizzare solventi alcoolici o prodotti detergenti per la pulizia del vostro Arm X1. Per i componenti in metallo Vi consigliamo della carta assorbente lievemente intrisa di acqua distillata.

Gli snodi sono completamente a tenuta stagna e di conseguenza non lubrificare alcuna parte in movimento rotatorio.

L'alloggiamento delle molle è protetto contro polvere e sporcizia.

Materiali utilizzati

Arm X1 è un prodotto costituito utilizzando i seguenti materiali (in varia percentuale) :

- Alluminio 7075
- Fibra di Carbonio
- Acciaio C45 / Acciaio FE360B / AISI314
- Bronzo

I materiali ed i trattamenti a cui gli stessi sono stati sottoposti per la fabbricazione sono compatibili con la corrente normativa **ROHS.**

Smaltimento

Provvedere allo smaltimento del Vostro Arm X1 operando in conformità alle norme vigenti, rivolgendosi agli organismi preposti e/o ad imprese specializzate nella rottamazione di materiali metallici e/o nello smaltimento dei rifiuti.

Il nostro ufficio tecnico è a vostra completa disposizione in caso di dubbi o chiarimenti in merito lo smaltimento della Vostro Arm X1

Avvertenze di carattere generale

Tutte le volte che intendete utilizzare il sistema di stabilizzazione SmartSystem dovete **prima** ispezionare attentamente ogni singolo componente per assicurarvi che la Vostra sessione di lavoro sia sicura per Voi e per la Vostra attrezzatura.

Durante l'ispezione, assicuratevi che la parte meccanica del sistema sia in ordine e funzionante e che le connessioni elettriche e video siano state eseguite correttamente.

Solo quando sarete sicuri che tutto il sistema sia perfettamente operante, allora potrete iniziare la Vostra sessione di lavoro. Questa pre-ispezione deve essere condotta tutte le volte che intendete utilizzare il sistema di stabilizzazione SmartSystem. SmartSystem consiglia l'acquisto della Docking Bracket per il parking e per il bilanciamento dello Sled. In caso abbiate deciso di non utilizzare la docking bracket per bilanciare e preparare lo sled all'aggancio al braccio, siate molto accorti nell'alzare ed abbassare lo sled. Il vostro Sled potrebbe essere molto pesante e causare lesioni alla schiena. Ogni volta che state per attaccare lo sled al sistema che state indossando, piegate le gambe, invece della schiena; lo stesso dicasi quando lo staccate. Se usate il sistema di notte o in condizioni di scarsa luminosità dovete prestare molta attenzione all'ambiente che vi circonda. Cercate di avere almeno un assistente. Se siete in una zona trafficata, siate accorti alle automobili che possono sopraggiungere. Se usate il sistema vicino all'acqua prestate ancora più attenzione. In questo caso vi consigliamo di avere accanto almeno due assistenti. Qualora doveste cadere in acqua, restate calmi, non fatevi prendere dal panico. Anche se le parti imbottite del corpetto possono fungere da salvagente, ricordate che il corpetto non è un giubbotto galleggiante; se siete caduti in acqua con la vostra attrezzatura, sganciate al più presto i 4 cricchetti, le due fibbie sopra le spalle e quelle nei fianchi.

Mettetevi subito in salvo.

La cinghia gialla presente nel vostro giubbetto SmartCAM VEST lite rappresenta un valido punto di ancoraggio per facilitare le operazioni di recupero in caso di incidente. Vi consigliamo di utilizzare delle protezioni per le ginocchia. L'utilizzo di queste protezioni vi proteggerà le ginocchia dalle eventuali cadute in avanti.

Non correte mai troppo veloci e non spingetevi mai oltre i vostri limiti fisici. Cadere durante una corsa con tutto il Vostro equipaggiamento può causare gravi ed irreparabili lesioni a voi ed alla vostra attrezzatura. Non utilizzate mai il sistema di stabilizzazione sotto l'effetto di droga o alcol o farmaci che possano alterare il livello di attenzione o vigilanza.

Tutti gli accessori ed i prodotti della linea SmartCAM sono indirizzati ad una utenza professionale e ben formata per quanto riguarda le riprese tramite supporti di stabilizzazione.

Garanzia

La ditta SmartSystem Srl Unipersonale, con sede in Via del Commercio, 22F, 61032 FANO (PU) - ITALY - Proprietaria del marchio SmartSystem e dei brand ad essa collegati, accorda una garanzia limitata territorialmente di 24 mesi sui prodotti a partire dal giorno di consegna al cliente finale (compratore). Solo su determinati prodotti, tale garanzia verrà esplicitamente estesa.

Nell'ambito della garanzia verranno eliminate gratuitamente eventuali deficienze di funzionamento imputabili a difetti di fabbricazione o di materiale.

La ditta si riserva la possibilità di decidere tra l'eventualità di eliminare il difetto oppure consegnare un nuovo prodotto al cliente.

Eventuali reclami dovranno essere comunicati dal cliente, subito dopo l'accertamento del difetto, dietro presentazione della scheda di garanzia, debitamente compilata, oppure a titolo sostitutivo, del contratto di acquisto del primo compratore.

Dalla garanzia sono esclusi eventuali danni causati da un uso improprio e/o errato dell'attrezzatura, da cariche statiche oppure danni meccanici.

La garanzia non ha più valore in caso di riparazioni o interventi da parte del compratore e di terzi non autorizzati e di modifiche arbitrarie della scheda di garanzia.

Le riparazioni potranno essere effettuate solo da persone o punti espressamente autorizzati dal costruttore stesso.

Rivolgersi sempre a centri di assistenza autorizzati

Richiedere sempre il numero di RMA prima di inviare il prodotto

Introduction

Congratulations on the purchase of SmartCAM Arm X1

Before using SmartCAM Arm X1, you must have fully understood all the information about the adjustment and the operating modes of our product.

SmartCAM Arm X1 has been specifically designed for the purpose of supporting video accessories installed on a sled with a standard 5/8" arm mating block.

It is forbidden and punishable by law the use of the equipment for different purposes.

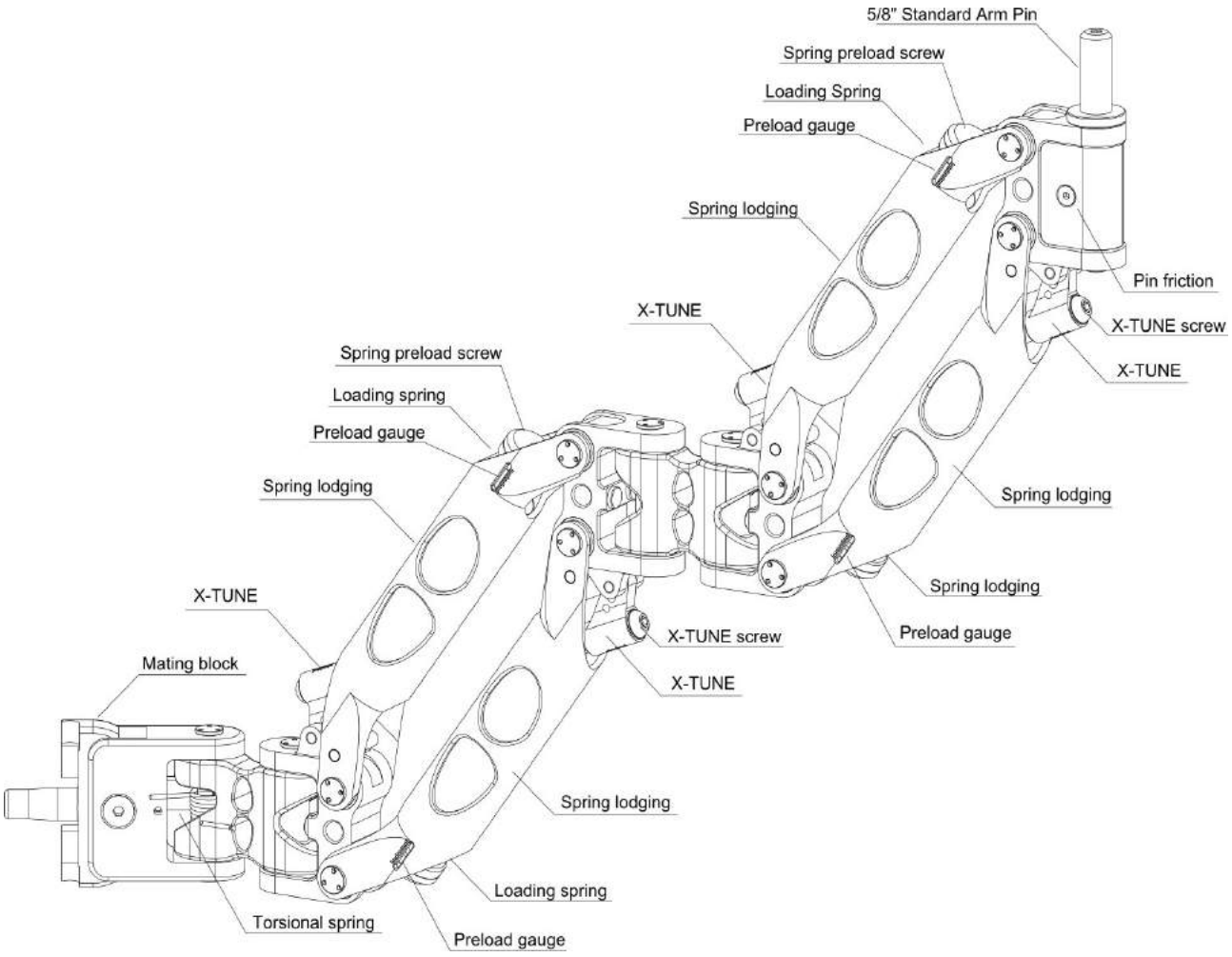
SmartCAM Arm X1 is fully compatible with any professional steadycam system currently on the market, thanks to the Standard Arm Mating Block and the 5/8" sled pin.

The arm consists of two connected elements: each one is a parallelogram. The suspension system is lodged in the parallelograms: it consists of a removable spring cartridge and a preload adjustment system. All articulated joints and mobile elements are supported by waterproof and steel caged bearings.

Avoid to submit your equipment to extreme conditions.

- For safety reasons, read and follow the instructions in this manual
- Do not overload your arm over the weight categories suggested in this manual
- The stabilization system, since it's movable and articulated, may modify environmental light with its movement. We recommend you extreme caution.
- This equipment has been specifically designed for professional video operators and it is exclusively addressed to them.
- Do not open or dismantle, even partially, the equipment otherwise the warranty won’t be valid.

Overview



Springs substitution and setting

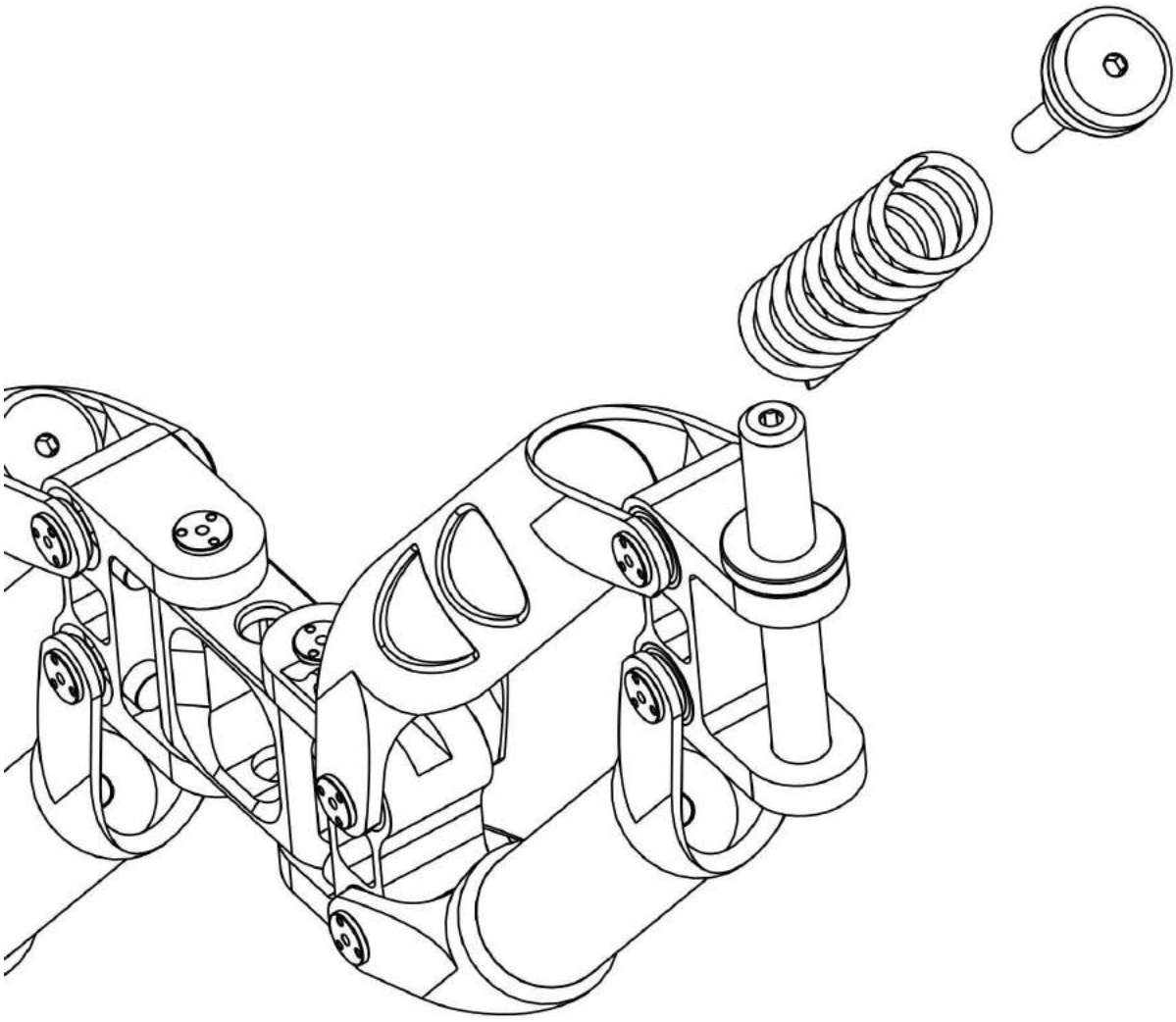
At the beginning and at the end of each session, you have to make sure that the arm springs are unloaded.

As standard, Arm X1 provides two springs kits with a different spring rate:

- Medium (for medium-light loads) [BLUE]
- Heavy (for heavy loads) [BLACK]

Arm X1 is equipped with four spiring lodgings, giving to the user the freedom to operate as he prefer, referring to the load applied to the Arm itself.

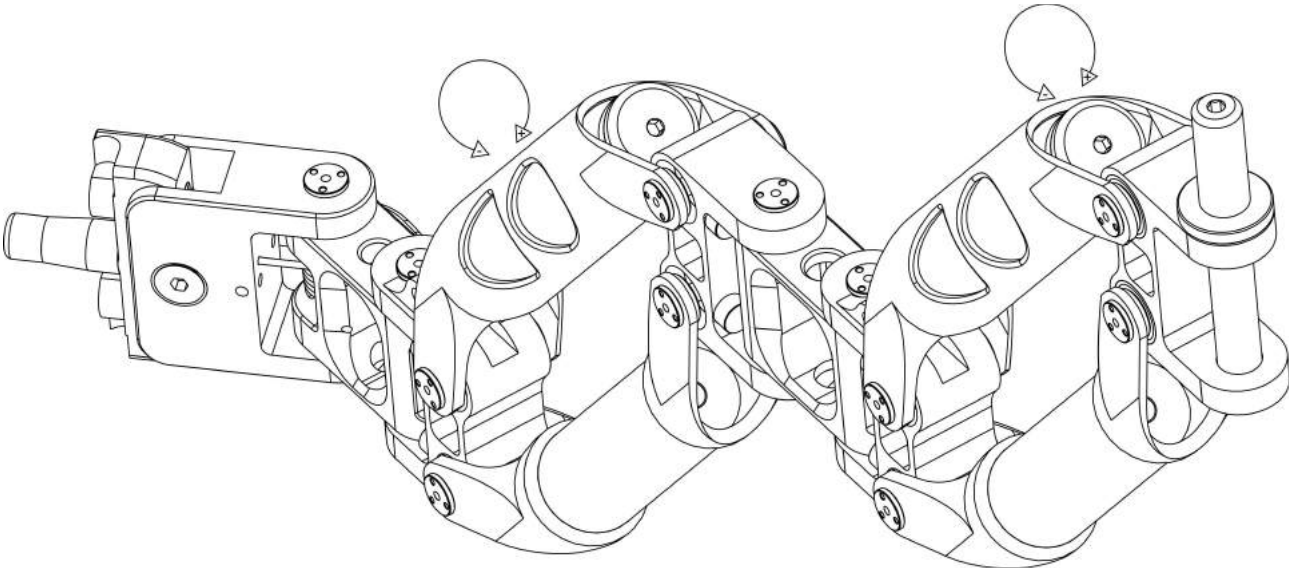
It's also possible to work with only one spring for every parallelogram, in order to minimize the total weight of the equipment and to maximize the use of the spring force.



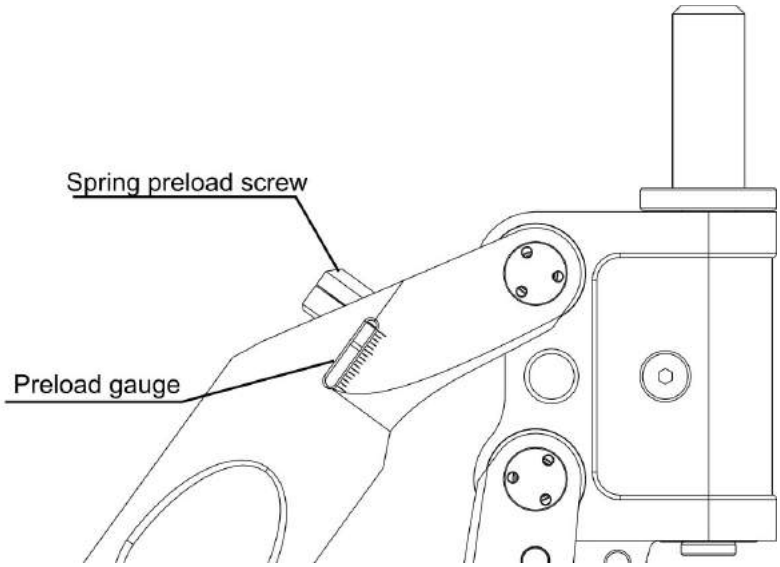
The springs replacement is simple and quick. We recommend you to follow the following steps:

1. Put your Arm X1 on a clean and dry surface.
2. Using the Allen key No. 5, rotate anti-clockwise the arm to loosen the pre-load screws up to the full release.

3. Remove the preload screw.
4. Remove the spring you'll find in the lodging.
5. Insert the more suitable spring (read and follow the load diagram).
6. Put back and tighten, clockwise, the preload screw previously removed.



7. Tighten the preload screw until the small plate of the screw itself will be aligned to the first mark in the preload indicator. (as shown in the picture)



The alignment of the preload screw small plate to the first mark grants a right installation of the spring inside the slot.

https://www.youtube.com/watch?v=Cnv94zYLm1w

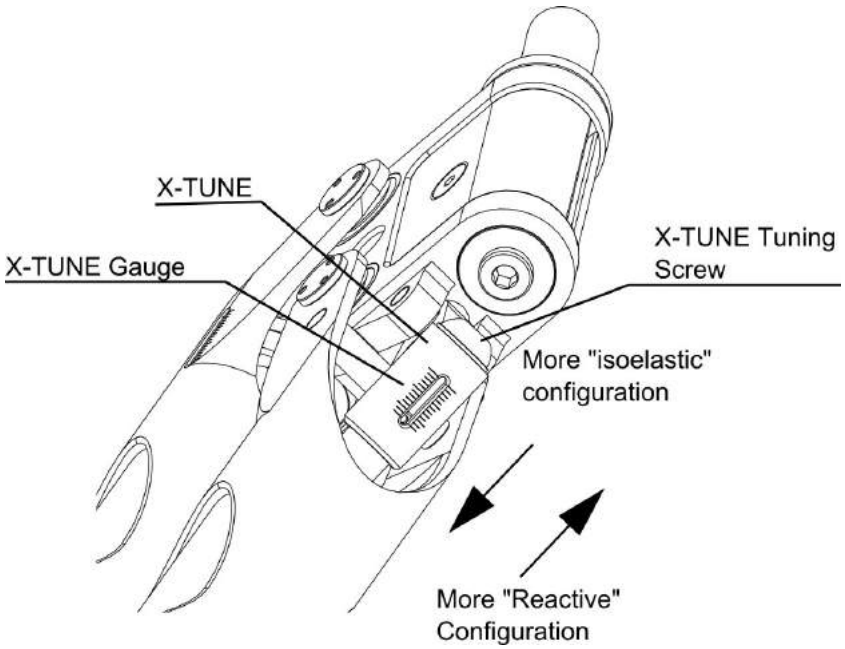
The right configuration of a Steadycam system implies the springs to be preloaded to see that the parallelogram's sides will be **parallel to the ground in normal operating conditions** (i.e. With arm correctly installed on the Vest and loaded with the sled).

If the arm's parallelograms shouldn't be parallel to the ground with fully preloaded springs, it could be necesssary to replace the springs with the ones that have an higher spring constant.

Please follow the load diagram attached to your X1 to create the best spring combination in relationship to the weight to hold up. Arm X1 doesn't need an equal preloading of the 4 springs used.

http://download.smartsystem.it/Load_Diagram_X1_v2019.pdf

X-TUNE



The SmartSystem Arm X1 is equipped with an exclusive tuning system called X-TUNE. It let to change the dynamic behaviour of the Arm itself.

X-TUNE works in synergy with the springs that are installed in the arm.

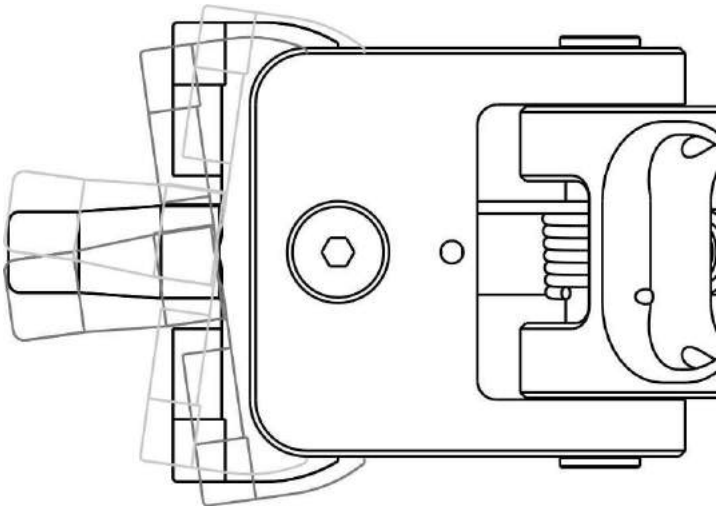
Thanks to the X-TUNE system the steadycam operator will be able to decide if configure the arm to be reactive or soft, quasi-isoelastic.

X-TUNE setting is **per spring** and it is equipped with a graduated scale allowing the user to set up every active arm component with an extreme precision.

Adjusting the X-TUNE screw in order to move the marker closer to the spring slot will transform the arm in a more soft system, tending to isoelastic. Otherwise, distancing the marker from the spring slot, will transform the system in a more reactive arm (the best solution for camera car or running takes).

X-TUNE causes the movement of the spring stem. It's always necessary to recalibrate the preload once the X-TUNE setting has changed.

Tilt Adjustment



Thanks to two screws on the mating block, you can change the tilt-on angle of your Arm X1. The tilting adjustment is closely related to the operator posture.

If you need to adjust it, use the Allen Key number 5.

The two screws can lock the arm in any required position.

Assuming that the arm is configured to be connected to a vest with the arm mating block on the operator right side:

If the arm pulled to the right :

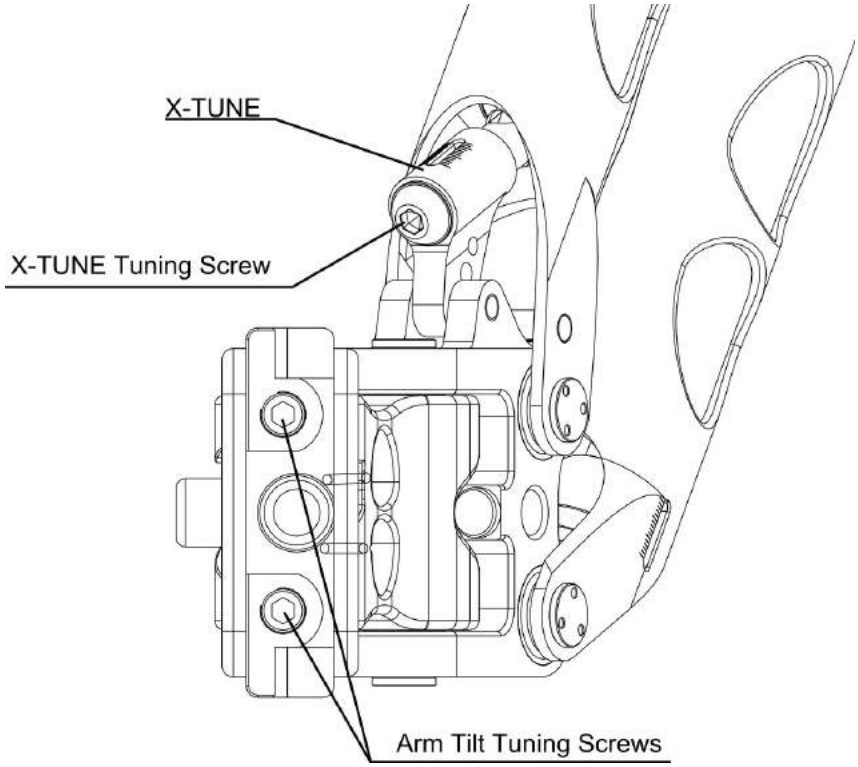
1. Loosen the upper screw and tighten the lower one until the arm gets balanced (while you are bolt upright).
2. Tighten the upper screw until the arm gets locked in the desired position.

If the arm pulled to the left :

1. Loosen the lower screw and tighten the upper one until the arm gets balanced (while you are bolt upright).
2. Tighten the lower screw until the arm gets locked in the desired position.

We recommend you to perform always this adjustment after wearing the vest (SmartCAM Vest Lite or similar) and have it tightened to your body.

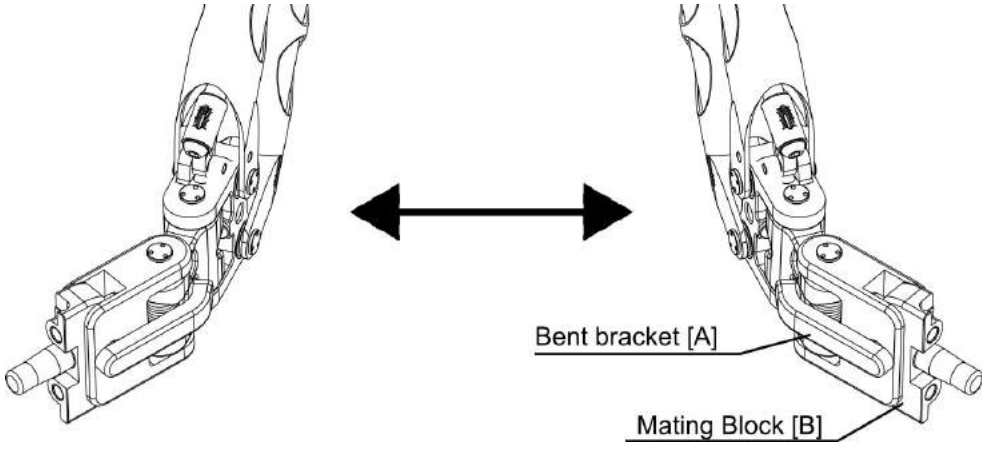
Remember that the 5/8" pin-axis of your arm must be as much parallel as possible to your body axis.



Left / Right handed set up

The arm can be used either by right or left-handed operators.

For this reason, it is possible to change the arm's working side very quickly and easily.



Using the supplied key n.5, loosen the tilt adjustment screws and remove the screw that holds the mating block bolted to the Arm. Remove the bent bracket [A] which preloads the spring in the joint of the mating block. Flip the mating block side [B] and replace back the

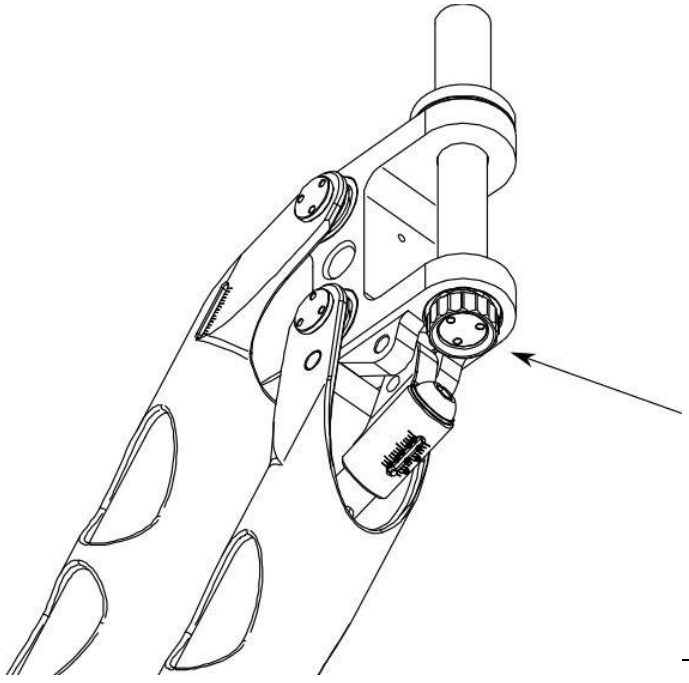
bent braket [A] on the opposite side.

Holding the joint slightly inclined in the arm's way, insert the screw and tighten it to the mating block.

Here you are a simple video about this section.

https://www.youtube.com/watch?v=waYNCr1qN3o

Arm Post Locking



Before starting a working session, please be aware to check if the locking knob of the X1 Arm post is correctly tightened.

General Checklist

Before starting your working session, make sure:

1. To wear properly your SmartCAM Lite Vest (or similar).
2. To preload properly the springs of your Arm X-1 in accordance to the procedure described above
3. To check that the Sled is properly fastened and the electrical elements.
4. To check that the 5/8” pivot has been weel tightened.
5. To adjust your arm's tilt, lining it up as much parallel as possible to your body either through the tilt action (right-left rotation, as explained above) and through the fastening system located on your Vest (front-back rotation).

Maintenance

Do not use alcoholic solvents or detergents to clean your Arm X1. To clean metal components, we recommend you to use a paper towel lightly soaked in distilled water.

Joints are completely sealed: therefore do not lubricate any moving motion parts.

The spring lodging is protected against dust and dirt.

MATERIALS

Arm X1 is made with the following materials (in various percentages) :

- Aluminium 7075
- Carbon Fibre
- Steel C40 / Steel FE360B / AISI314
- Bronze

Materials and treatments to which the materials have been submitted for fabrication are compatible with the current **ROHS** directive.

Disposal

Dispose of Your Arm X1 in accordance with current regulations. Address to special

authorities or companies in charge of scrapping metallic materials and waste disposal.

Please, contact our technical department for any doubts or questions concerning the disposal of your Arm.

General warnings

Whenever you want to use your Smartsystem stabilization system, you must first carefully check out each component and make sure that your session is safe for you and your equipment.

During the inspection, make sure that the mechanical parts of your system work properly and that the electrical and video connections and video are properly plugged in.

After making sure that the whole system is perfectly working, you can start your work session. This pre-inspection must be conducted every time you want to use your Smartsystem stabilization system.

SmartSystem recommends the purchase of the Docking Bracket for locking and balancing the Sled. If you don't use the docking bracket to balance and prepare the sled to be connected to the arm, be very careful when you handle it. Your sled may be very heavy and cause back injuries.

Whenever you connect the sled to the system, bend your legs instead of the back; do the same when you release it.

If you use the system at night or in low light conditions, look out for the surrounding environment. Have at least one assistant. If you're in a busy area, look out for cars.

Be careful, if you use the system near water. In this case you should have at least two assistants. If you fall into the water, stay calm, do not panic. Although the vest padded parts may serve as a life jacket, remember that the vest is not a floating jacket. If you have fallen into the water with your equipment, first release the 4 ratchets, then remove the buckles on your shoulders and around your hips. Flee to safety.

The yellow belt on your SmartCAM VEST lite jacket is a good anchor point in case you need to be rescued.

We recommend you to use knee guards. The use of these guards will protect you from any possible tumble forward.

Do not run too fast and do not push yourself beyond your physical limits. A tumble while

you run with all your equipment may cause serious and irreparable injuries to you and to your equipment.

Never use the stabilization system under the influence of drugs, alcohol or medication that may alter the level of your attention or supervision.

All SmartCAM accessories and products are specifically designed for professional operators well-aware of the risks arising from the use of a cameras stabilization system.

Warranty

SmartSystem Unipersonale Srl headquarter is located in Via del Commercio, 22F, 61032 FANO(PU), ITALY. Smartsystem main brand and all the other brands associated with it are property of Smart-System Srl Unipersonale.

Your SmartSystem equipment is guaranteed against any manufacturing or material defects for 24 months from the date of delivery to the customer. Warranty will cover any functioning issues related to manufacturing or material faults.

In this case, the company reserves the right to decide whether eliminating the defect or providing the customer with a new product.

Any claims due to manufacturing or materials faults must be communicated by the customer, upon presentation of the warranty card, properly completed, or of a proof of purchase.

The warranty, which will expire after 24 months, will not be extended either by a complaint, or by subsequent executions. Damage caused by accident, misuse, do-it-yourself repairs or modification, repair by unauthorised service centre, static charges or mechanical damages is not covered by the warranty.

Furthermore, warranty won't be valid neither in case the warranty card is arbitrarly modified.

Repairs must be made only by authorized service centres.

Always request the RMA number before sending us the product

Steadicam® M-2™ System Manual

STEADICAM®

LIT-888000, RevA

STEADICAM

Table of contents

TIP: *This table of contents is hyperlinked to navigate you through the respective pages. Jump back to this page by clicking on any page number throughout the manual. Easy.*

TIFFEN®
Helping Create the World's Greatest Images®

The Tiffen Company
90 Oser Avenue
Hauppauge, NY 11788
Visit us at Tiffen.com

Evolution of the Steadicam M-Series

The Steadicam M-2 is the most integrated and adaptable Steadicam system ever created. Not only does the M-2 offer a lighter weight and lower cost high-end system, it also features the revolutionary Steadicam Volt™ technology built right in for a sleeker, more versatile rig!

The Volt electronics are seamlessly integrated into the low-profile top stage, and inside the all-new gimbal, to decrease the distance between the top of the gimbal and the top of the stage, as well as reduce weight. This revolutionary technology is designed to complement rather than oppose normal operating by actively assisting in holding virtually any tilt or roll angle, including a perfectly level horizon. This gentle assistance helps remove the unwanted effects of wind, acceleration, or natural body movement in the captured image.

The M-2 also takes the concept of modularity to a whole new level. Each component offers options for customization:

Rigid carbon fiber posts are available in a variety of lengths and diameters (1.75" 2 or 3-section post, and 1.58" standard or short-post.) The sled base can be built with either Gold mount or V-lock battery plates. A hot-swappable 3rd battery mount is available. The lightweight, redesigned, quick-release monitor mount uses industry-standard 60mm rod spacing and is compatible with a variety of professional monitors. The gimbal fits multiple post sizes. And both standard and tilt top stages are available with or without Volt electronics built in.

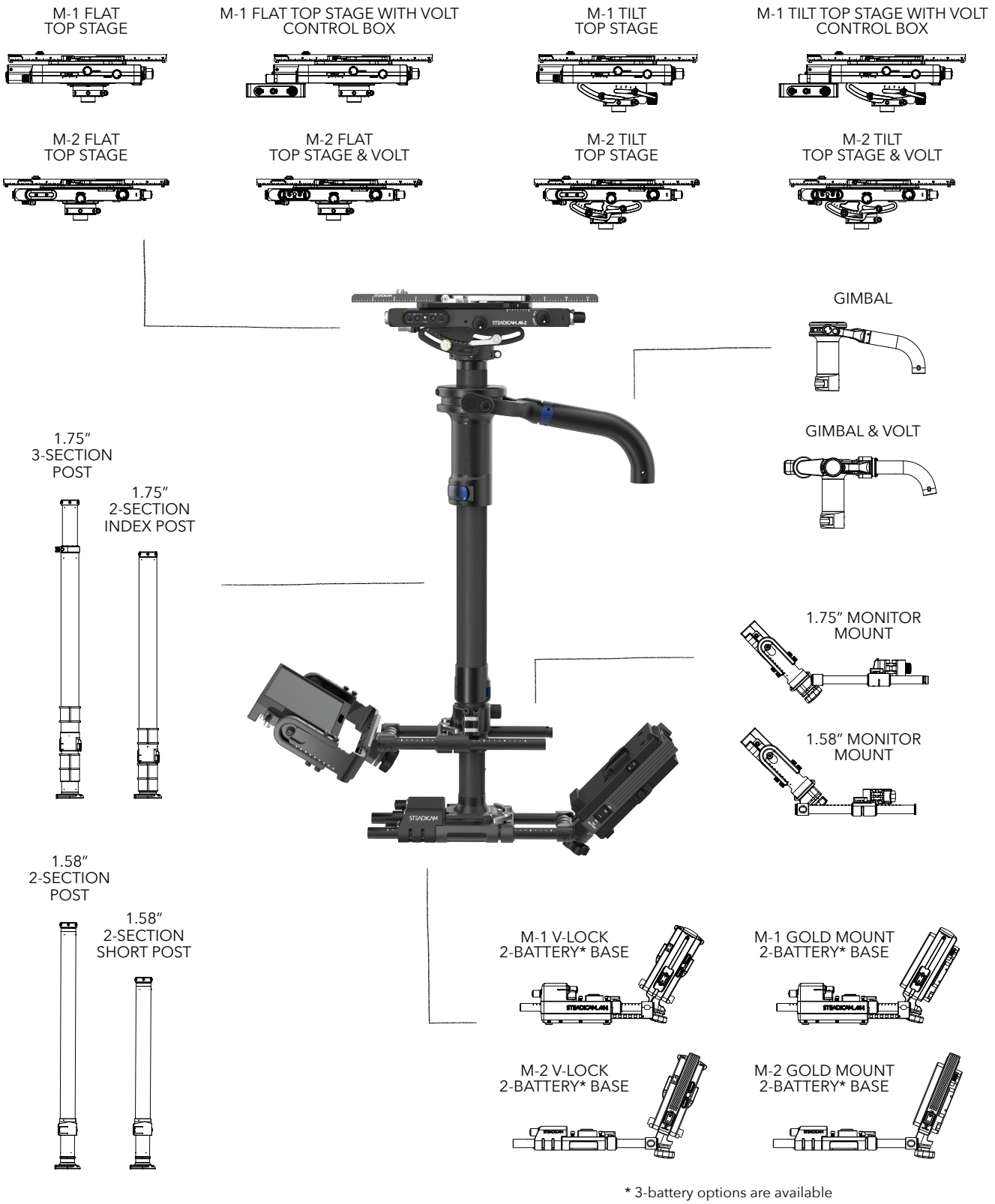
This modularity allows M-1 and M-2 components to be configured in multiple combinations to suit each operator's preferences, or additional pieces can be purchased for adapting the sled, based on the needs of your projects.

The Steadicam Modular series is super configurable, rigid, precise, tool-free, highly-adjustable and fast. Above all, it's as close to future-proof as a rig can be.

Good luck with your new Steadicam M-2!

NOTE: *Just like the M-2, this manual is intended for experienced, professional Steadicam operators. As such, it includes mostly technical information about the hardware. If you're interested in learning more about operating, go pick up a copy of The Steadicam Operator's Handbook, by Jerry Holway and Laurie Hayball. And if you haven't attended a Steadicam Workshop yet, come take one of our amazing week-long Gold-level workshops, and bring your new M-2! Sign up at: Tiffen.com/flysteadicam*

Steadicam modular components map



* 3-battery options are available

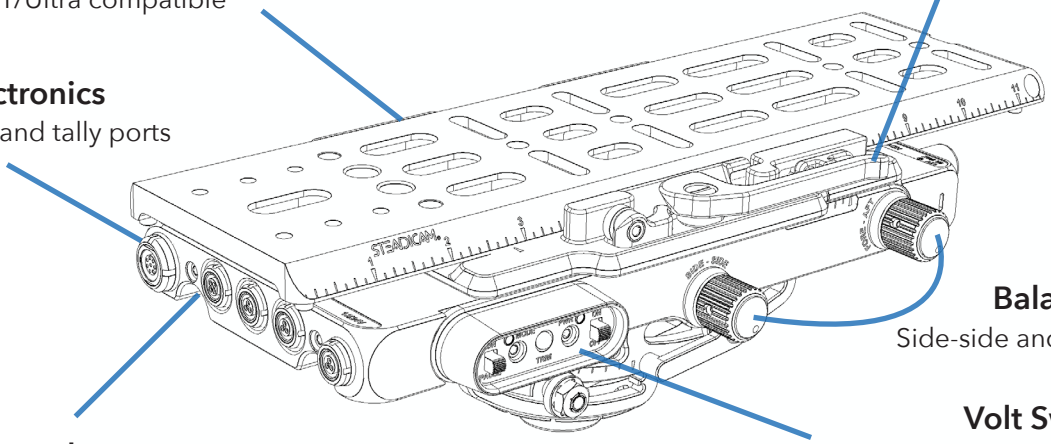
TIP: *Find a list of accessories, including the long gimbal handle and 3rd battery mounts, on page 52. Or visit Tiffen.com/steadicam for the very latest in modular components and accessories for M-1 and M-2 systems.*

Stage components

Dovetail Plate
Maximum rigidity and mounting options
Index marks for repeatability
M-1/Ultra compatible

Clamp Lever
Safety latch design with drop-in loading
Adjustable tension

Front Electronics
Power, Volt and tally ports



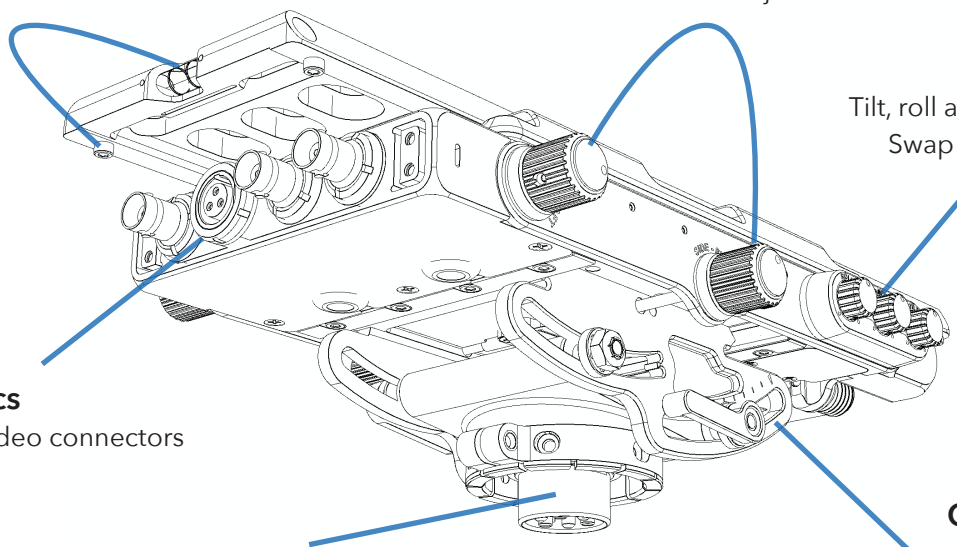
Balance Drive Knobs
Side-side and fore-aft adjustment

Volt Switch Box
For optional VOLT electronics
Power, pause and trim control with LEDs
Swappable with Dial Box

Accessory Rod Mounts
LWS 15mm by 60mm spacing
For Steadicam accessories and custom applications

Dovetail Plate Extras
Glow-in-the-dark bubble level
Safety stops

Balance Drive Knobs
Fore-aft and side-side adjustment



Volt Dial Box
Tilt, roll and damping adjusters
Swap sides to face operator

Rear Electronics
High-definition video connectors
Power ports

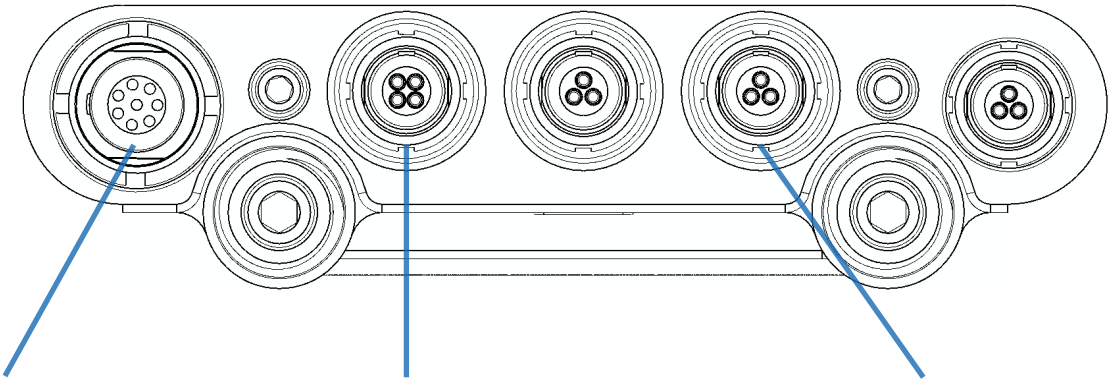
Optional Tilt Stage
Tilt up or down 10˚
Dual locks ensure rigidity
Index marks for repeatability

Stage Connector
Modular mechanical and electronics junction
Compatible with M-1 and M-2 posts
Indexed for exact alignment

NOTE: *The stage section of this user guide covers product numbers M2-TSF, M2-TSFV, M2-TST, and M2-TSTV. For product numbers M1-TSF, and M1-TST, refer to the original M-1 manual (LIT-815000.)*

Inputs and outputs

Front Electronics

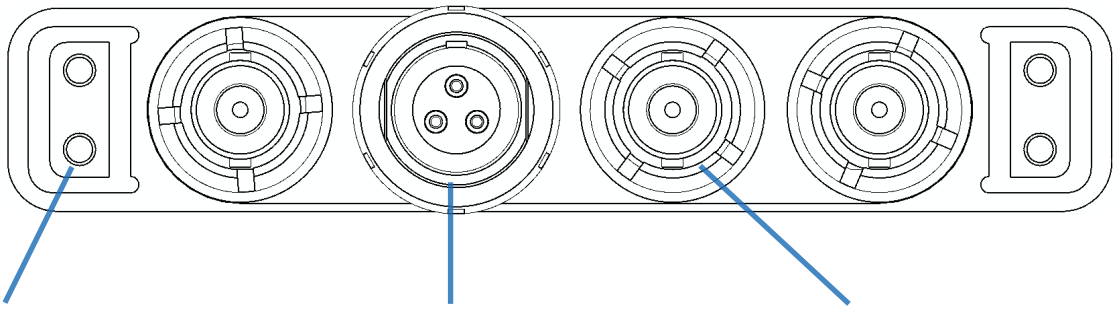


Volt gimbal connector
LEMO® 8-pin 1B connector
Rotates 90˚ for cable routing
Included on ALL top stages

Tally IN/OUT port
LEMO® 4-pin 0B connector
Use with available tally sensor

Triple 12/24V ports
LEMO® 3-pin 0B connectors
Outer port rotates 90˚
12 volts supplied at all times
12 and 24 volts simultaneously
when in 24V mode

Rear Electronics



Dual P-Tap ports
12 volts supplied at all times
Oriented for cable management
Self-resetting 5A fuse protected

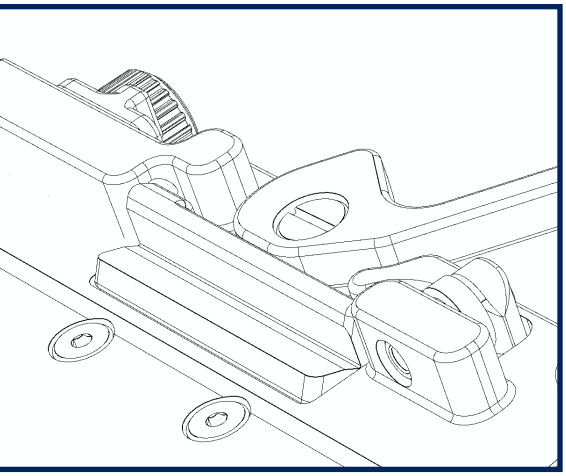
Camera power port
LEMO® 3-pin 2B connector
12 volts supplied at all times
12 and 24 volts simultaneously
when in 24V mode

Triple HD video ports
HD-SDI compatible
Direct connections to the base
Color coded at each end

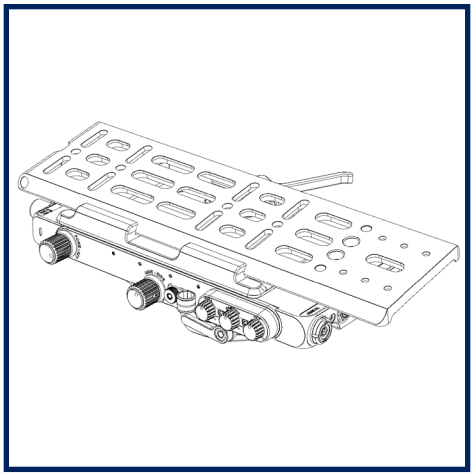
NOTES: *Tally sensitivity is set at maximum from the factory with active LO tally input signal, and this should work for most users. Contact Tiffen service for instructions on adjusting tally sensitivity and setting to active HI, if required.*
Also, there is a covered micro-USB port on the underside of the stage. This is ONLY for Volt firmware updates at the factory.

Camera dovetail clamp

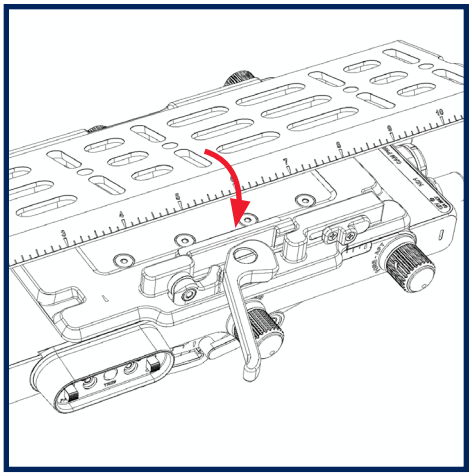
The dovetail lock system is designed to ensure reliable camera safety. Mounting and removing the camera on the M-Series stages encourages you to keep at least one hand on the camera at all times, until it is securely fastened. With your camera mounted to the dovetail plate, follow these steps:



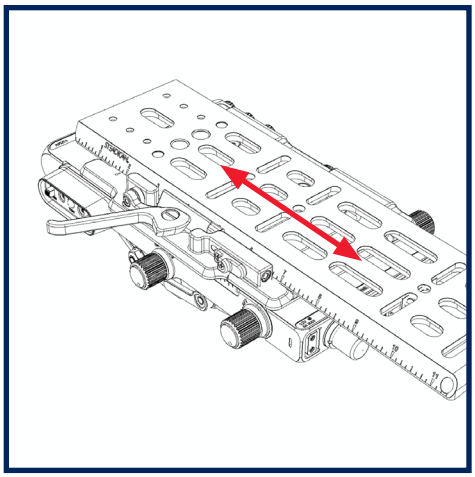
The stage is ready for the camera plate. Note that the dovetail lock and clamp lever are both open.



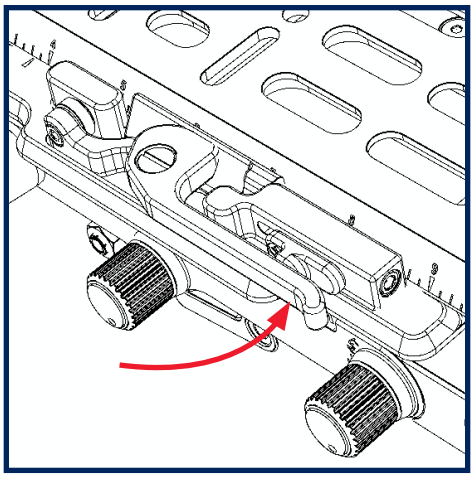
Place the dovetail against the passive side of the clamp, and tilt the plate into the dovetail lock.



The weight of the camera will press the lock down and release the safety latch. You'll hear a satisfying click!

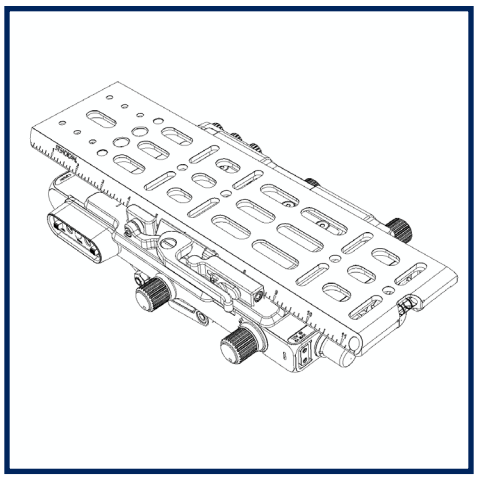


The camera and plate can be moved fore and aft for coarse balancing, but the safety stops prevent it from sliding off.

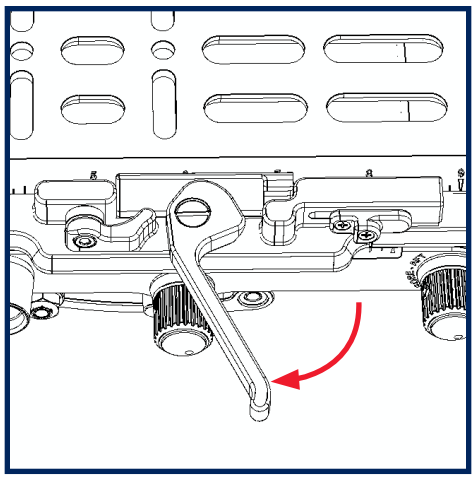


Close the clamp lever to firmly secure the dovetail and camera to the stage.

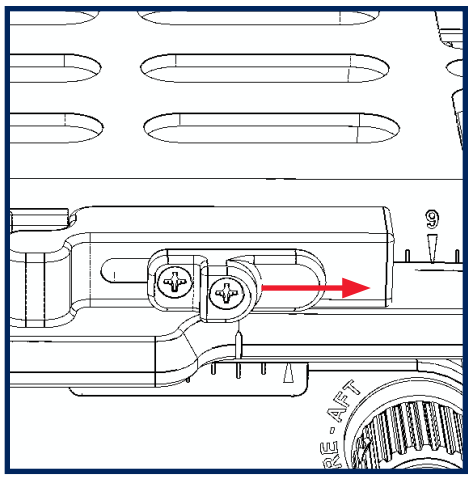
NOTE: *If the dovetail lock has been pressed down while the dovetail plate was out, you will have to slide the safety latch to the right to reopen the lock. Click!*



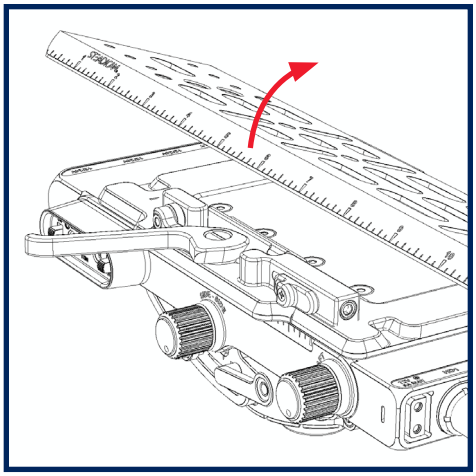
Removing the camera is basically the reverse. Secure the camera with your left hand.



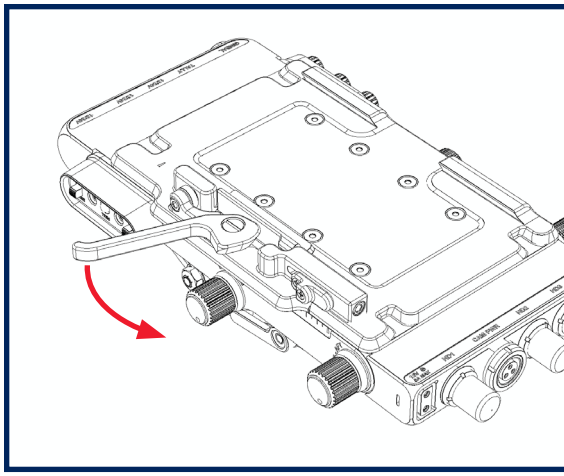
Open the clamp lever.
The dovetail is still retained by the safety latch.



Push and hold the safety latch to the right.



Keeping the safety latch held to the side, tilt the dovetail plate out of the dovetail lock.

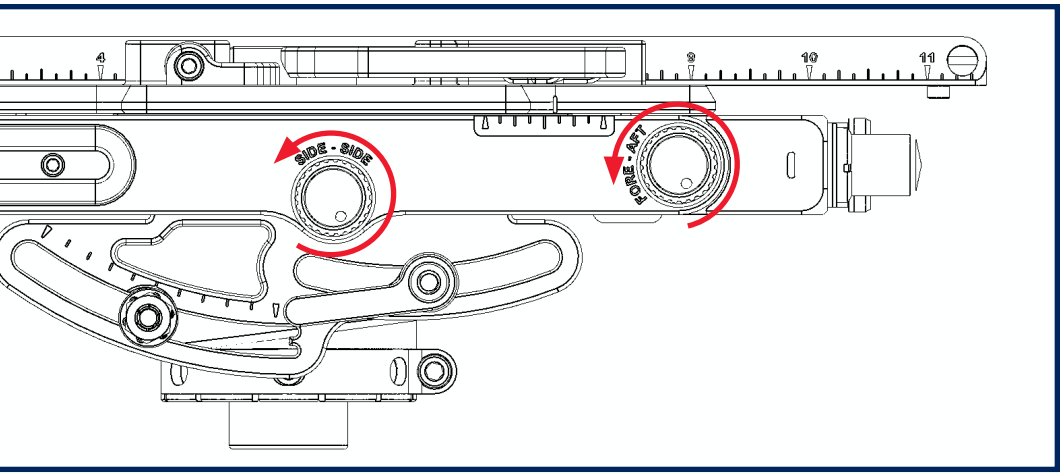


Close the clamp lever so nothing catches on it! To reinstall the dovetail, you'll open the lever and slide the safety latch.

CAUTION: *Do not remove the safety screws from the underside of the dovetail plate, or it could slide out of the stage if you forget to lock the clamp lever!*

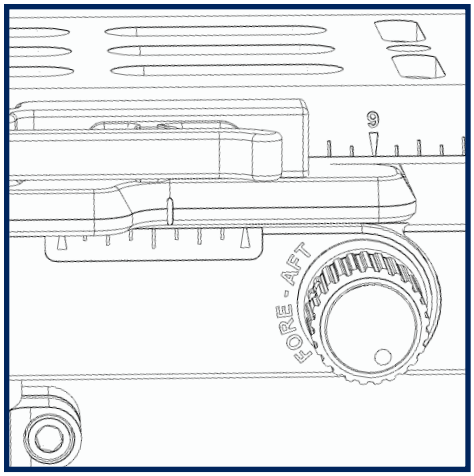
Balance drives

Each knob has a twin on either side of the stage so you can adjust the balance from either side of the rig. With the coarse balancing done, and the camera locked in place, fine balancing can be finished with the adjustment knobs. Think about the knobs as turning towards the front or rear of the stage. The knobs turn clockwise on one side and counterclockwise on the other side for the same stage movement.

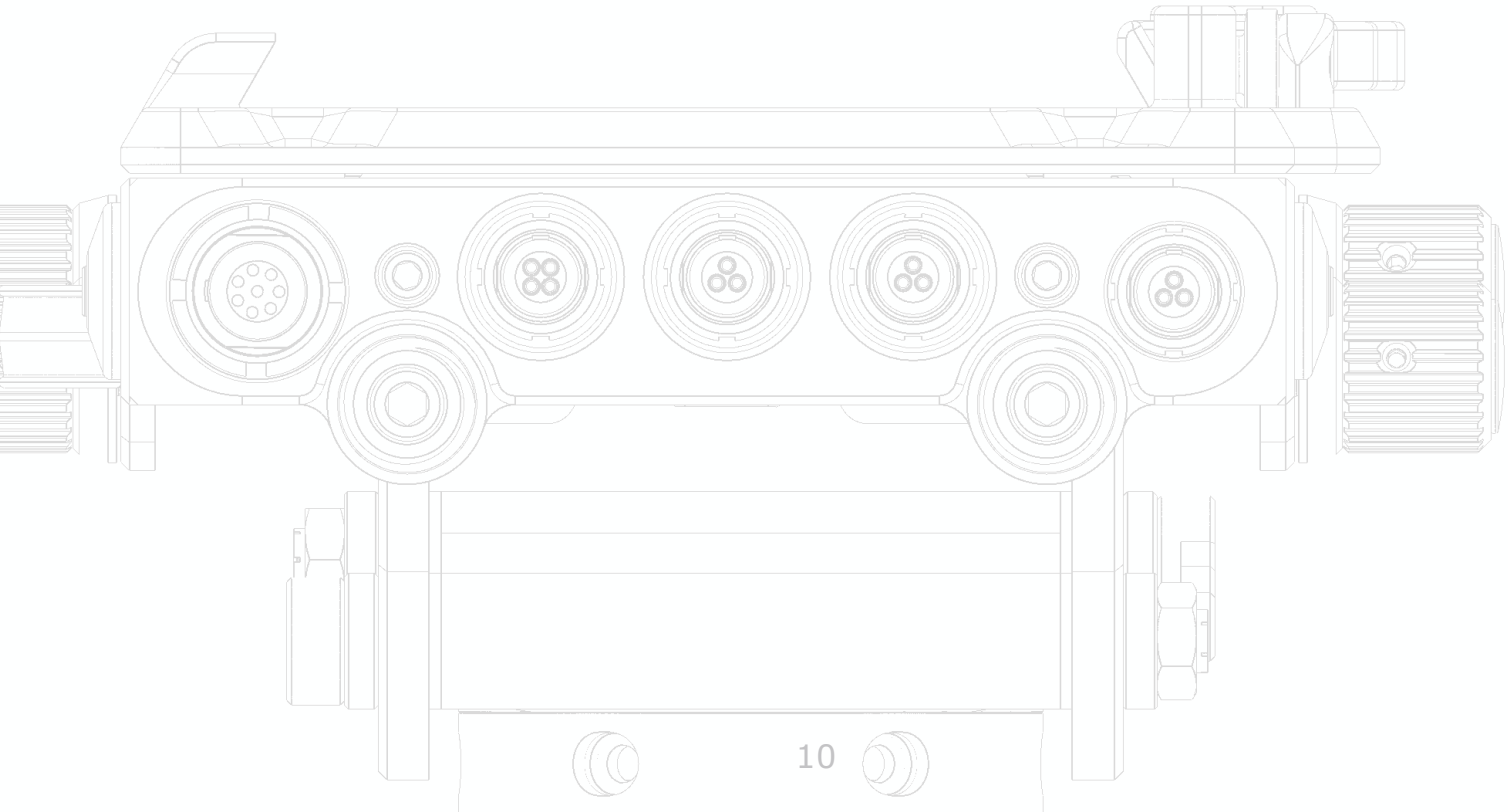


Side-side adjustment knob: Turning towards the front of the rig will move the camera weight to the LEFT.

Fore-aft adjustment knob: Turning towards the front of the rig will move the camera weight FORWARD.

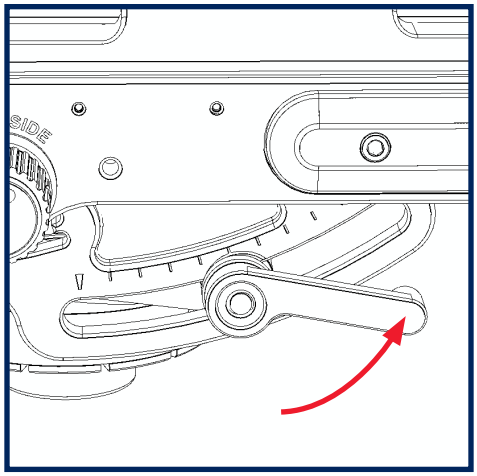


TIP: Starting with the stage centered fore-aft and side to side leaves the most room for adjustment.

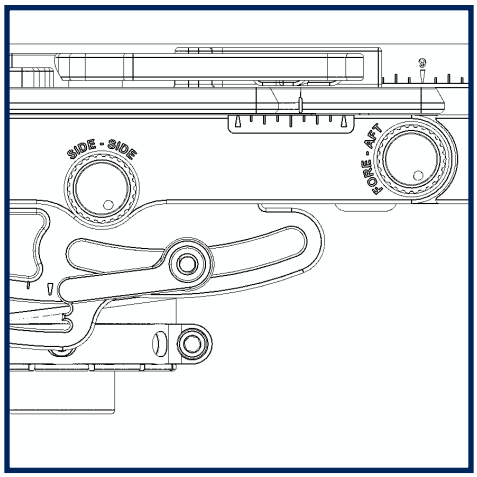


Tilt stage

The tilt stage option enables you to easily tilt the camera relative to the post, which allows you to maintain dynamic balance while panning, and helps control headroom. It's also very useful in low mode. The tilt stage of the M-2 offers 10˚ of upward or downward tilt.



Unlock both tilt lock clamps. There's one on each side of the stage. Open about a half-turn, and tilt the stage as you prefer.



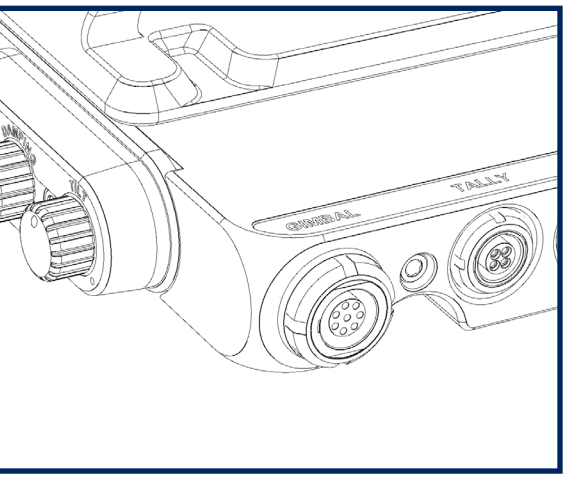
Lock both clamps and re-balance slightly fore-aft.

NOTES: *The scale on both sides of the tilt stage is handy for repeating setups. For example, if you have a tilt you prefer for framing you do frequently, the scale allows you to dial it in quickly without any guesswork, saving time.*
Also, the nut on the far side of each clamp can be adjusted to fine tune the locking orientation of the tilt lock clamps.

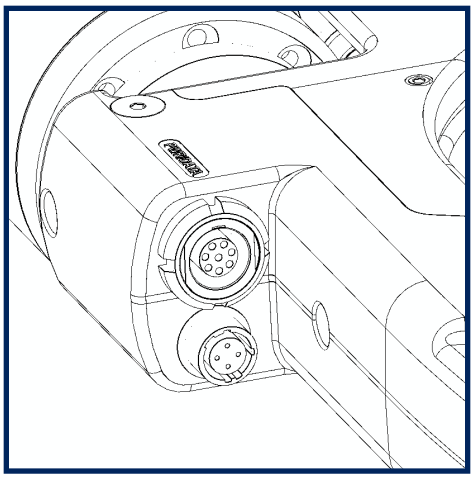
Volt system operation

The optional, integrated M-2 Volt takes the groundbreaking electronic assistance to the next phase of integration with professional mechanical stabilizers. If you're already familiar with the Volt, the same parts are there. The same adjustments are there. The same transparent assistance is there. Included below are some basics, but read the Volt manual to get the full picture: Tiffen.com/pages/volt-system.

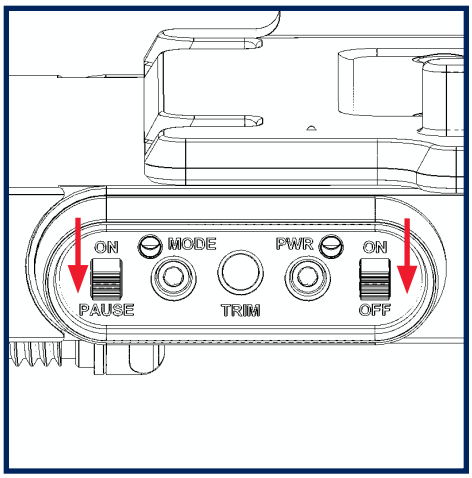
IMPORTANT: For optimal performance, balance your sled neutral (no drop time at all) when flying Volt.



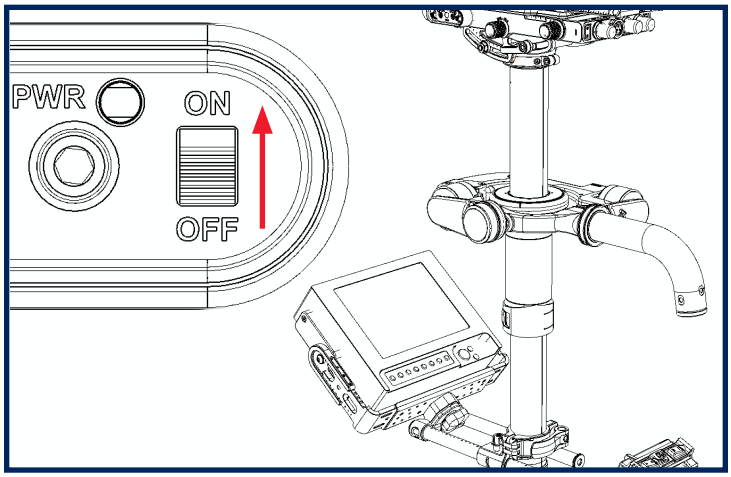
Plug the gimbal cable into the port at the top stage, and wrap a couple loops around the post on its way down to the gimbal.



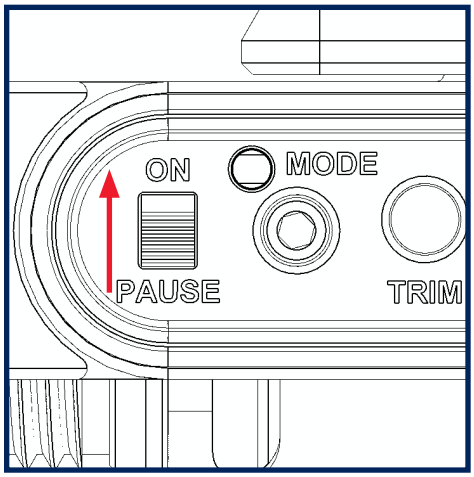
Plug in the cable at the gimbal. Make sure the pan encoder cable is also plugged in next to it.



Confirm that the Volt is switched OFF, and in PAUSE mode, before powering up your sled.

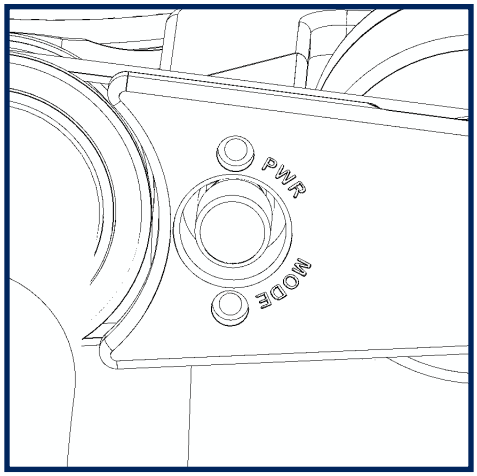


Align the gimbal handle along the REAR of the post, and simultaneously power on the Volt.



When the rig is up, and you're ready to go, run the Volt by switching the pause switch to ON.

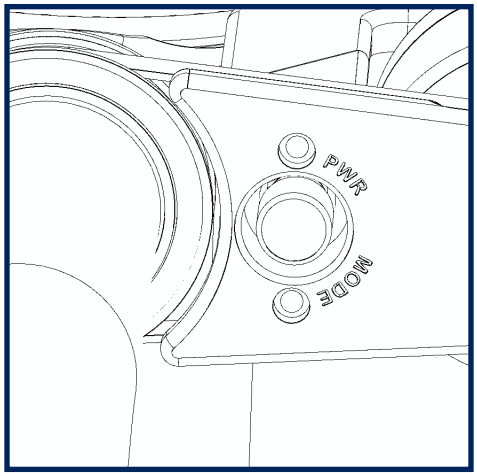
NOTE: *Unlike with the external Volt box, goofy and regular operators* ***BOTH*** *align the gimbal handle to the rear of the post, regardless of which side the Volt control boxes are placed on the M-2.*



LONG pressing the gimbal thumb button switches operating modes from normal to friction, and back again.

Normal mode simulates a traditionally balanced Steadicam, returning to a trimmed tilt angle. Volt displays solid green LEDs.

Friction mode holds the sled tilt, and requires force to change tilt position, like a fluid head. Volt displays pulsing green LEDs.



SHORT pressing the gimbal thumb button creates a tilt trim in normal mode.

Hold the sled at your desired tilt angle, and short press the button. The new trim is memorized immediately. This can be done on the fly, even during a shot, a huge benefit to your operating.

WARNING: *Use the Tiffen Padded Dock to protect Volt electronics, as well as make docking and balancing easier. Other methods of docking may damage the unit!*

The three dials on the dial box allow you to customize the behavior of the Volt in two axes, roll and tilt, independently. Additionally, the damping dial controls how the system returns the sled to vertical. Here are some general guides to the three knobs.

The ROLL dial controls the strength of the motors along the roll axis. Start with low assist and add strength as needed.

Damping works like friction to keep the sled from oscillating. Use as little as possible, in proportion to your TILT strength.

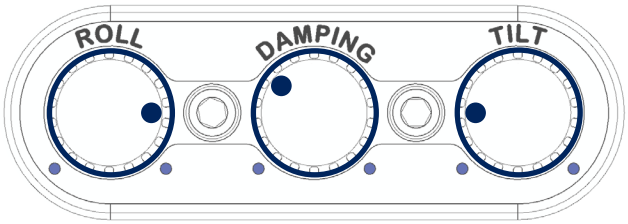
The TILT dial controls the strength of the motors along the tilt axis. This alters behavior in the two modes:

- **In normal mode,** more tilt strength equates to stronger artificial bottom-heaviness.
- **In friction mode,** more tilt strength equates to firmer hold at the operator's set post angle, like the drag on a fluid head.

To set the ROLL trim, SHORT-press the trim button on the stage and position the sled to the new level position while the LEDs blink for 5 seconds. When LED blinking stops, your new horizon position will be stored in memory. Set independently for high or low modes

Reset the roll trim by long-pressing for more than 6 seconds. Previous tilt trim is maintained.

Try these settings for the different situations listed. These recipes are just a starting point; experiment with reduced strength and work up to exactly what works best for you, and for each shot.



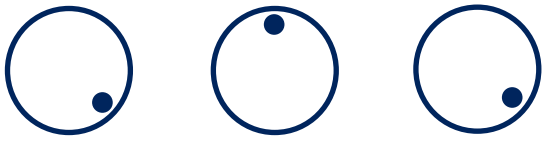
TYPICAL MODE
Every day operating, easy tilt.

ROCK AND ROLL
Free to tilt or roll Dutch angles.

GYRO SIMULATOR
Tilt and roll set to 11!

WHIP PANS
Roll/tilt equal, vertical post.

VEHICLE MODE
High roll/tilt resistance.



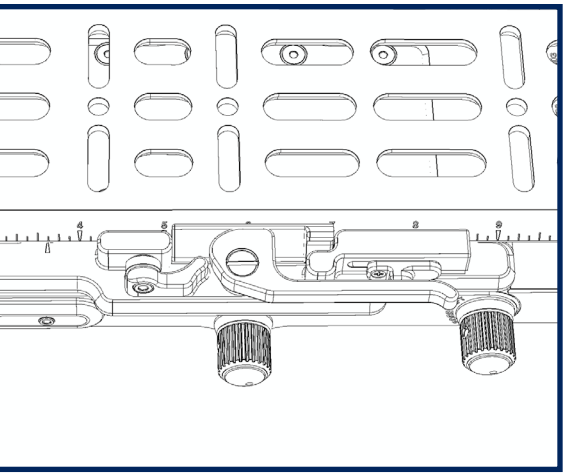
FRICTION MODE
Like a fluid head, TILT is drag.

SO MANY TILTS
Normal mode, when tilting more than 60˚ from vertical.

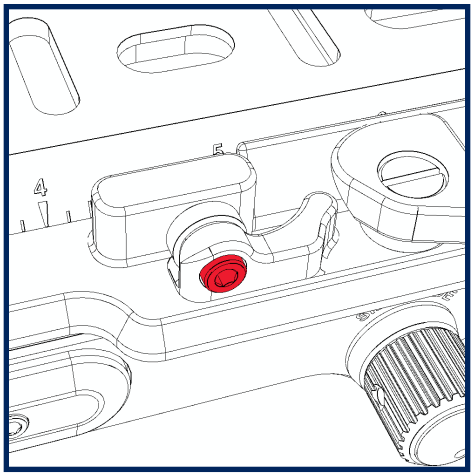
NOTE: *Read the Volt manual at Tiffen.com/pages/volt-system (LIT-817001) for everything else you need to know about the Volt.*

Adjustments and maintenance

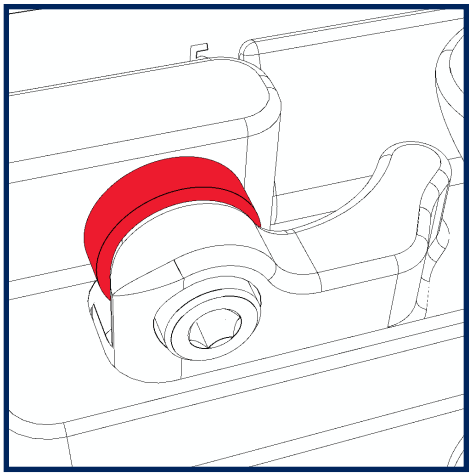
The dovetail clamp creates tremendous clamping force with very little pressure at the clamp lever. When the rig is new, get accustomed to the feel of each mechanism so that you can determine if one needs attention later. The ideal adjustment will not allow the dovetail to slide, even with the heaviest camera, but remains easy to close fully.



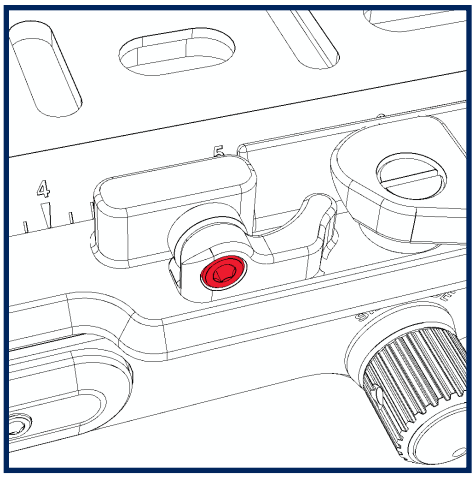
Begin with the dovetail installed, and the clamp lever closed.



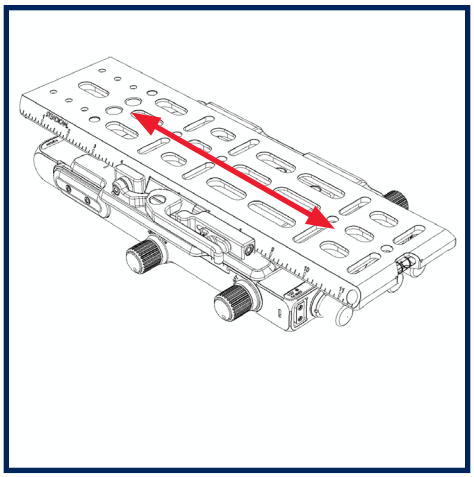
Use a 7/64" Allen wrench to loosen the lock screw approximately one-half turn.



Turn the adjustment wheel to dial in the tension. Turn clockwise to tighten, counterclockwise to loosen. Make small adjustments.



Re-tighten the lock screw before testing the clamp.

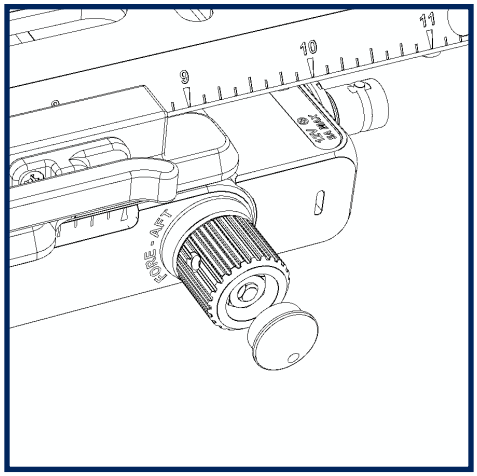


Test to see if the dovetail clamp holds firmly by trying to move the dovetail plate with your hands. Test the clamp lever movement. Repeat adjustment if necessary.

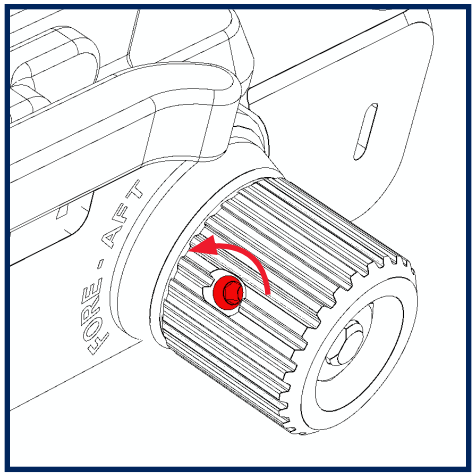
NOTE: *Never mess with the small set screws along the sides of the stage!*

If the fore/aft or side-to-side drive knobs exhibit free play, your balancing accuracy may be compromised. However, over-tightening can be worse than being a little loose, so approach these adjustments with care.

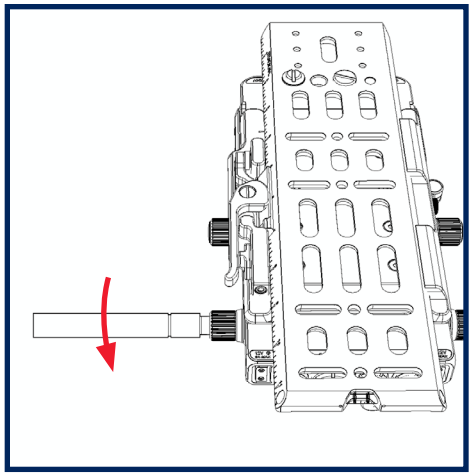
Tighten the stage drive knobs in pairs; BOTH fore/aft or BOTH side/side knobs. Each pair of knobs share an axle and should be tensioned evenly.



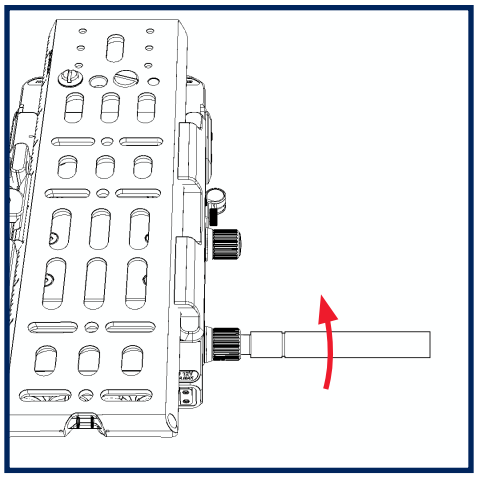
Remove the covers on one PAIR of stage drive knobs. A penknife or fine blade screwdriver works nicely.



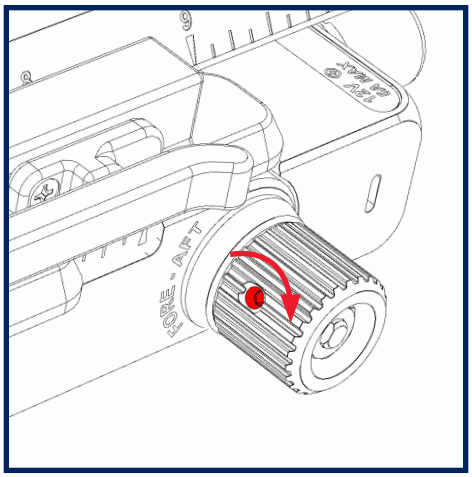
Loosen both locking set screws one-half turn with a 1/16" Allen wrench. You do not need to remove the set screws.



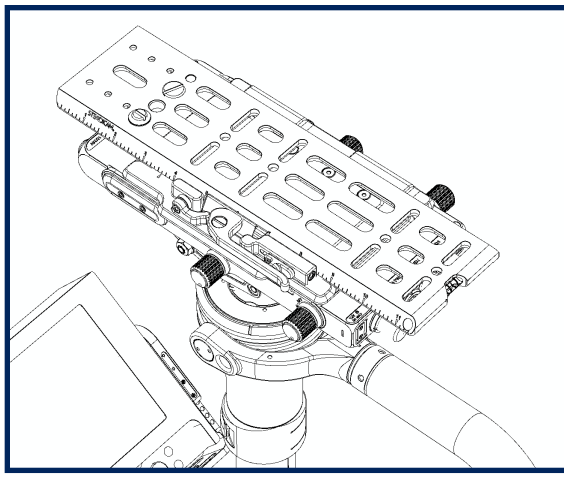
Use the supplied tool (815-7971) to hand-tighten one nut a small amount.



Tighten the nut on the opposite side a small amount as well. Adjust the tension a little at a time and sneak up on the perfect setup.



Re-tighten both locking set screws before testing the drive knobs.

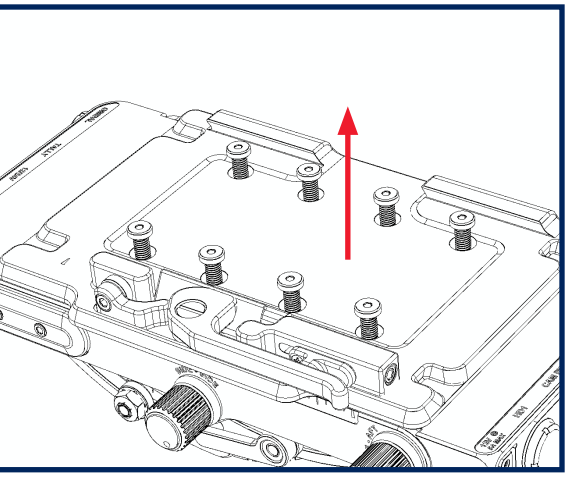


The knobs should not be overly tight, but should not have any slack. When you're satisfied with the feel of the drive, replace the nut covers.

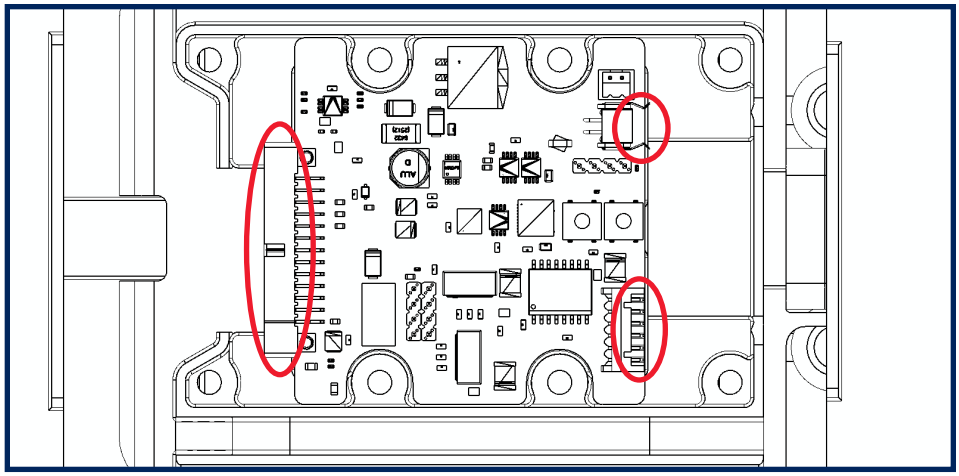
Installing Volt electronics

The Volt electronics are hidden inside the top stage, just beneath the dovetail clamp. All M-2 sleds are pre-wired to easily upgrade to Volt. Factory installation is recommended, but it's not too difficult.

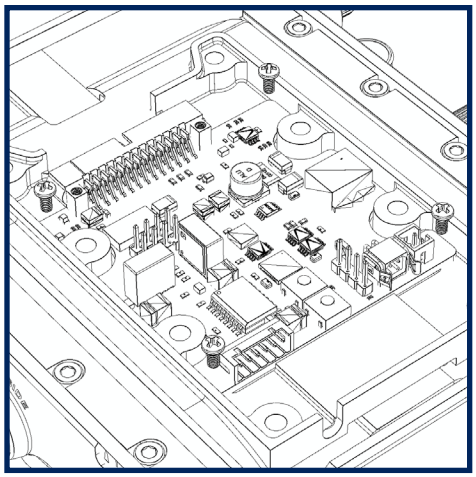
CAUTION: Take proper ESD protection when installing the Volt control board into the stage, and confirm that no batteries are installed on the sled at time of installation.



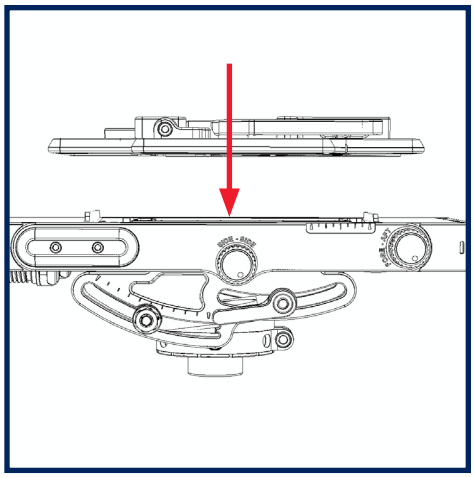
Remove the eight hex screws securing the dovetail clamp to the top stage chassis. Carefully lift the stage top STRAIGHT off.

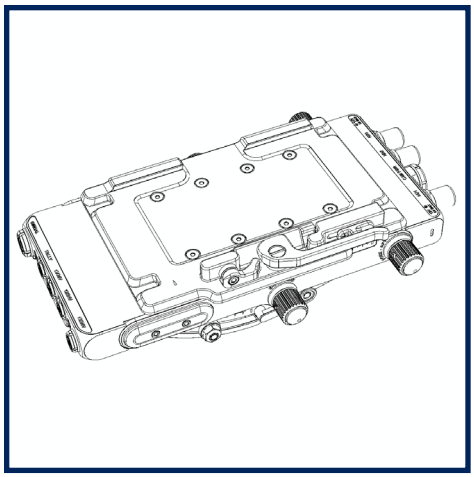


Inside, you'll find three cable sets with connectors that attach to the Volt circuit board, the largest is at the front of the stage. Align the circuit board as shown, and plug them in. Make sure each connector is orientated properly, and be gentle!



Fasten the Volt brain to the stage chassis with the four included screws, one in each corner.





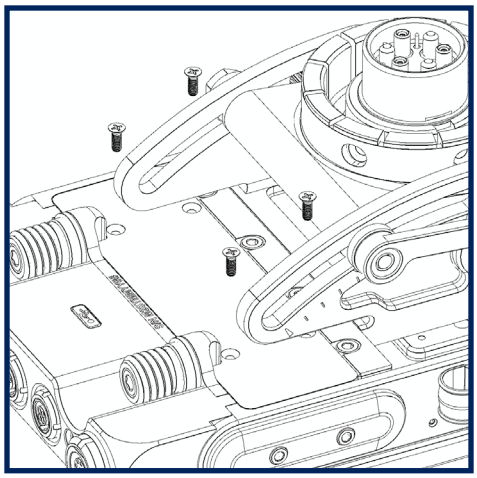
Replace the stage top STRAIGHT down onto the stage. DO NOT slide the top into place, which may damage the VOLT electronics. DO NOT pinch any cables, and ensure internal power cables can slide freely.

Finish by fastening the stage top with the eight hex screws.

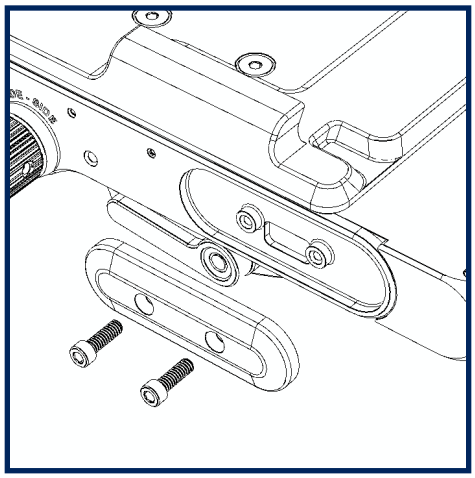
NOTE: *There are buttons and jumpers on the Volt electronics for programming the board. DO NOT touch unless instructed to do so!*

Installing or moving Volt control boxes

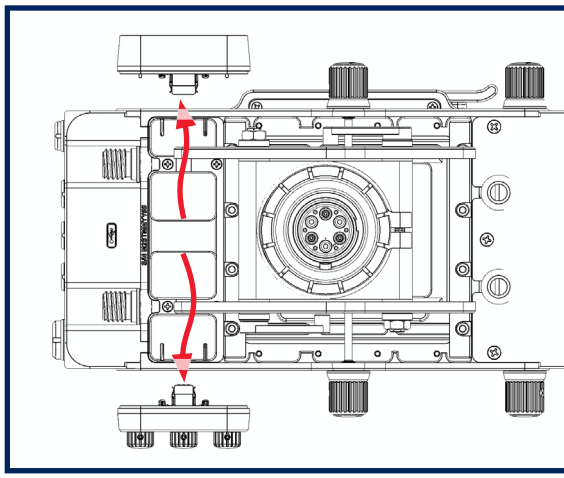
Inside the stage nose are connectors for the Volt control boxes. Installation is straight forward, as shown. Or, you may wish to swap sides of the boxes, so the dials face an operator with regular or goofy stance.



Remove the four screws, and remove this cover under the stage nose. You may have to adjust the stage side-to-side to access screws and slide out the cover.

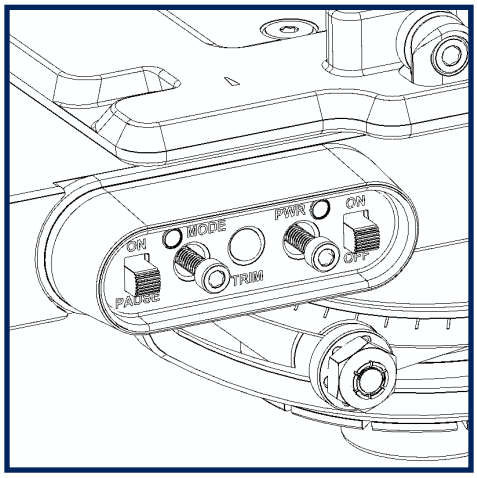


Unscrew the two hex screws in each cover or control box, and set aside the covers if you're installing. We'll reuse the hex screws.

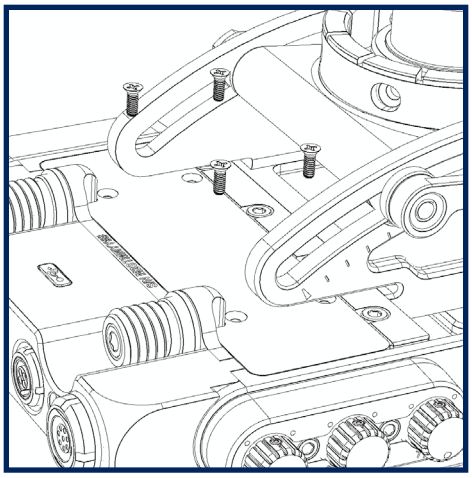


Choose which side for each control box; typically the dials face the operator for quick adjustments while shooting. Carefully route the cables out the respective sides of the stage:

- The switch box connector has 8 pins, the dial box has 6 pins.
- Plug in each box.



Fasten the boxes to the stage chassis with the hex screws, taking care that they're right-side-up.



Replace the underside cover, being careful not to pinch any wires, and fasten with the screws.

NOTE: *If you already own a Volt system, you can use it with the mustache box attached to the rods, same as on an M-1. We won't judge. But you can't remove the circuit board from the Volt box, and put it inside the M-2, because it doesn't fit.*

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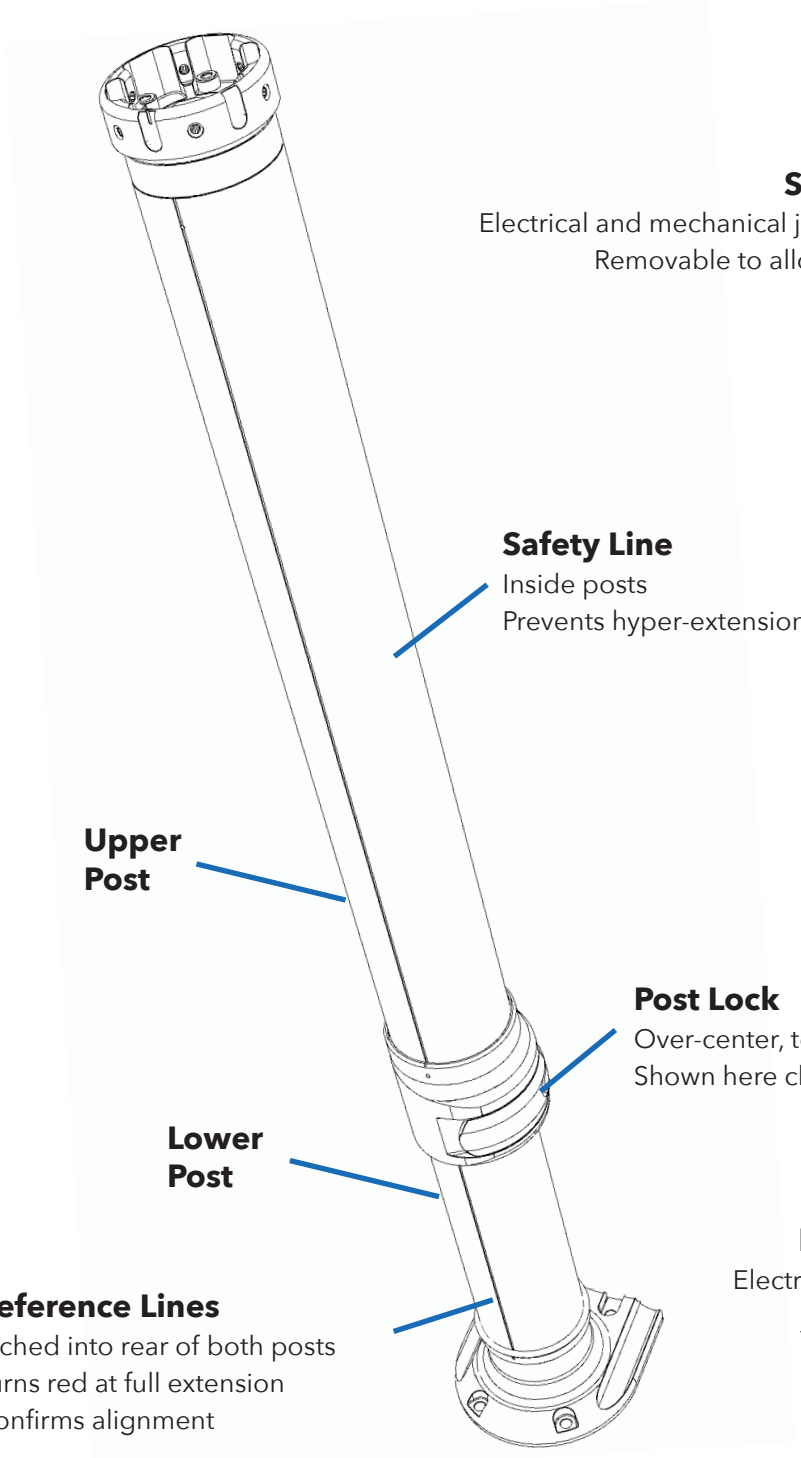
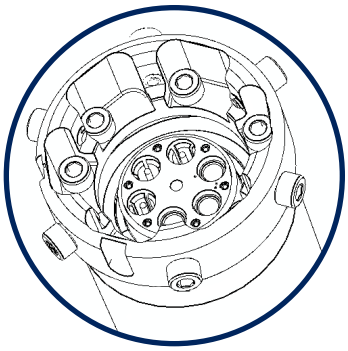
Post components

The new modular 1.58" posts for the M-2 system offer maximum rigidity whether they're built short, or at full extension, and they're compatible with the M-1 stage and base. This modularity allows users quick access to the stage, gimbal and base components for future upgrades, mods and maintenance.



Stage Connector
Electrical and mechanical junction to the stage
Removable to allow access to gimbal



Safety Line
Inside posts
Prevents hyper-extension

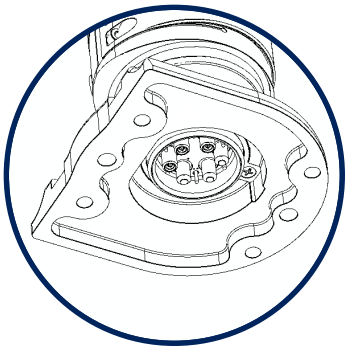
TIP: Check out the complete specifications for the two 1.58" and the two 1.75" posts at the back of this manual.

Upper Post

Post Lock
Over-center, tools-free lock
Shown here closed

Lower Post

Base Connector
Electrical and mechanical junction to the base



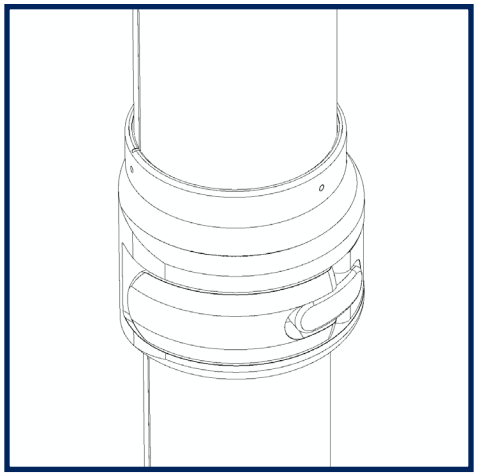
Reference Lines
Etched into rear of both posts
Turns red at full extension
Confirms alignment

NOTE: *The post section of this user guide covers product numbers 158-2SP, and 158-2SSP. For product numbers 175-2SIP, and 175-3SIP, refer to the original M-1 manual (LIT-815000.)*

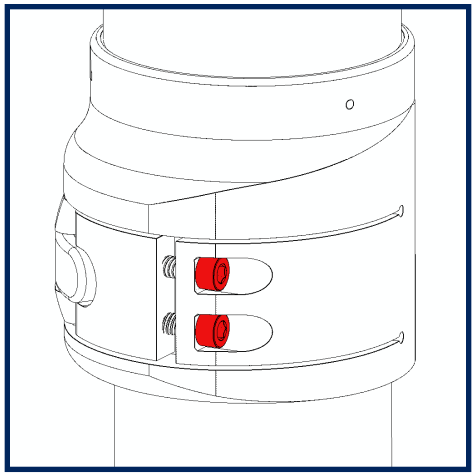
Post lock adjustment

The low-profile post clamps are easy to use and offer a positive lock. You should occasionally test to ensure the gimbal and post are being clamped fully by trying to move the components with the clamps closed. If the components slide with a camera on board, it will affect your drop time.

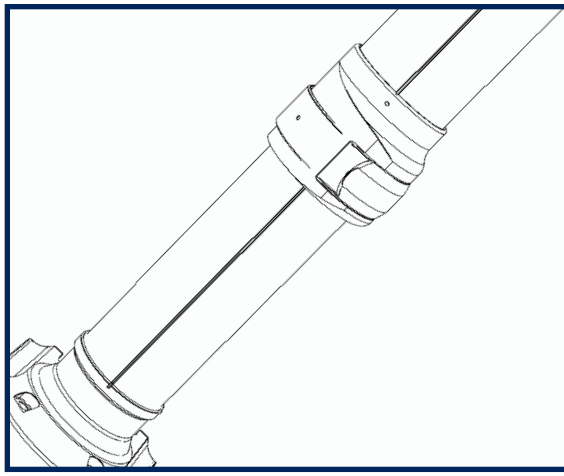
IMPORTANT: Do not over-tighten post clamps! They are strong enough to distort the carbon fiber post sections, but do not need to be that tight to hold. Use minimum clamping force while still holding securely.



The over-center lock on the post clamp is adjusted while the post clamp is closed.



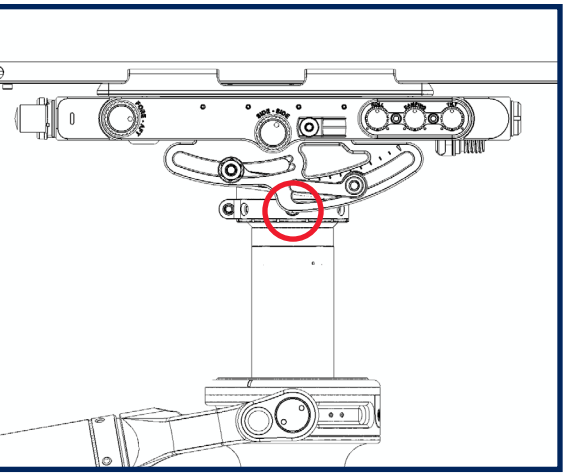
Use a 3/32" Allen wrench to turn each screw an equal, tiny amount. You don't want to over-tighten these, take your time.



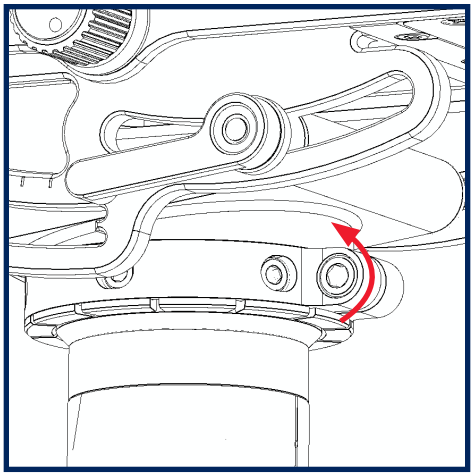
Test the action of the clamp lever, and the holding power of the clamp. Repeat if necessary.

Separating and connecting modular parts

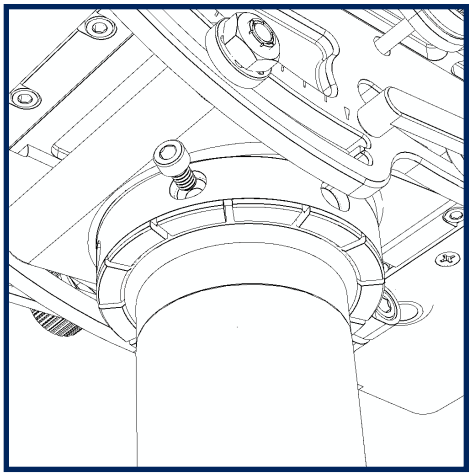
The three major components –the stage, post and base– all connect through the post connectors. You can easily gain access to your gimbal by removing the stage. Here's how it works:



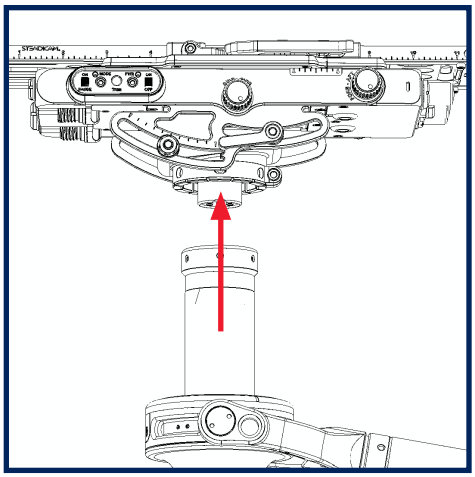
If you have a tilt stage, start with the tilt set slightly upward, which allows access to all screws.



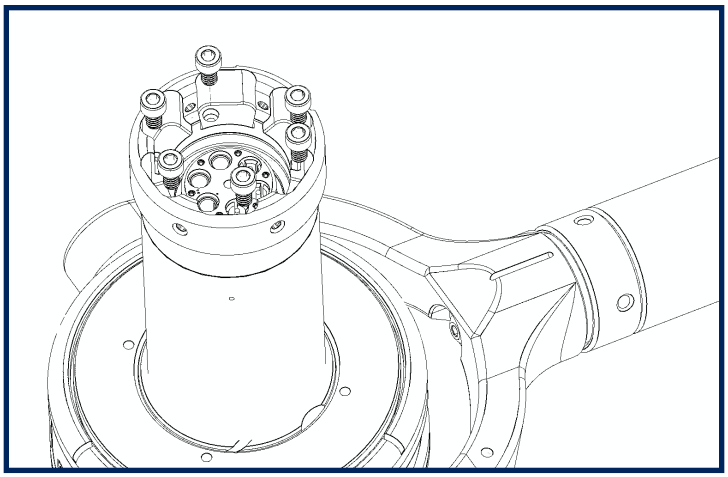
Use a 7/64" Allen wrench to loosen the clamp screw. This just needs to be loose, not removed.



Use a the same Allen wrench to remove the six screws from the post connector.



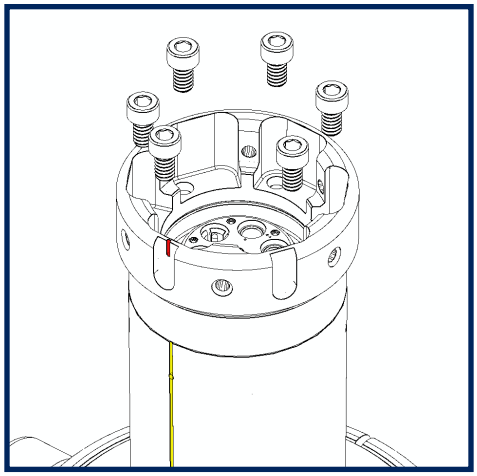
Pull the stage STRAIGHT up off the post. It may take a firm pull, but do not twist or force anything.



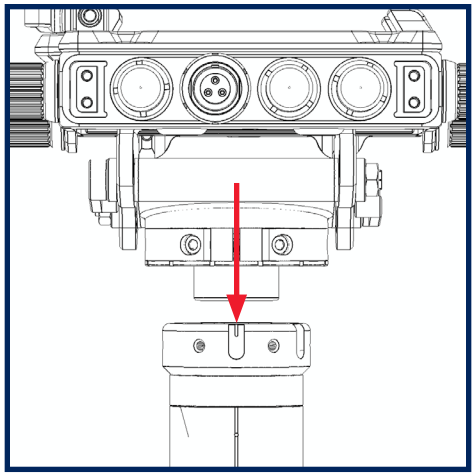
If you need access to the gimbal, remove the six stage connector screws and separate the connector from the top of the post. Your gimbal is now free to slide off for maintenance or to share with a friend!

NOTE: *If you'll be inspecting or cleaning your pan bearing, turn to page 32 for complete instructions.*

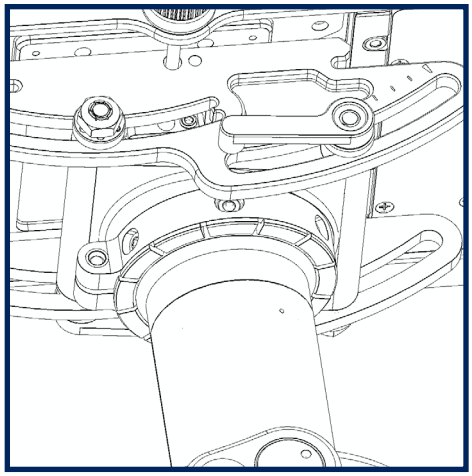
Reinstalling the stage is easy, but remember to only use the provided high-strength screws. All twelve in the clamp and stage connector are the same size and spec. Spares are available.



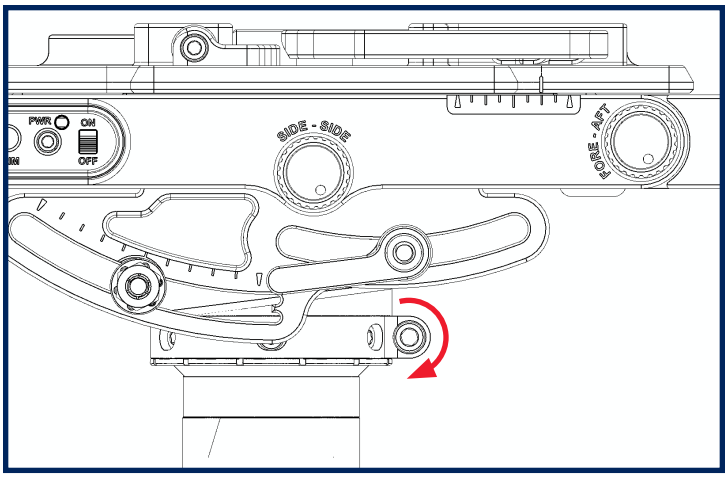
Align the stage connector's red mark with the post reference line, and carefully press into place. Tighten each screw a little bit, in a criss-cross pattern, until all are snug.



Align the center of the stage with the red line on the post connector. Press firmly until the stainless ring is flush.

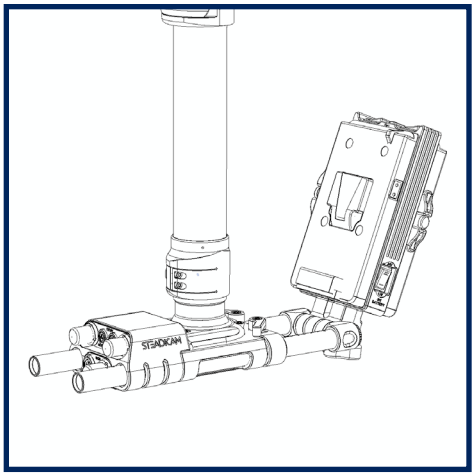


Install the six screws with a 7/64" Allen wrench. Tighten with ample torque to secure the stage.

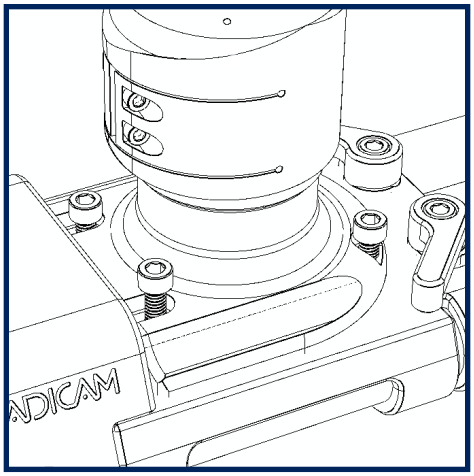


Snug down the single clamp screw, and you're ready to get back out there!

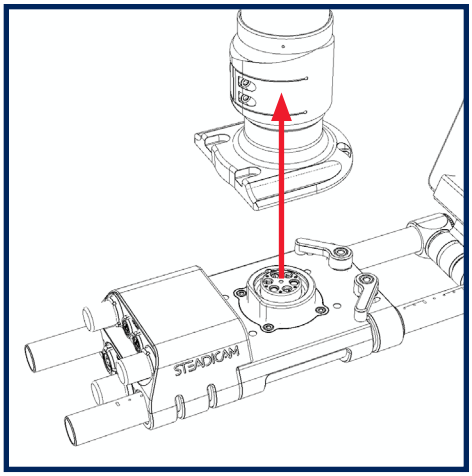
Removing or replacing the base is easier than the top stage, because there are fewer parts, and fewer of those high-strength screws. The base connector is the same as the stage connector. For years of trouble free use, don't force anything, and keep them clean while separated.



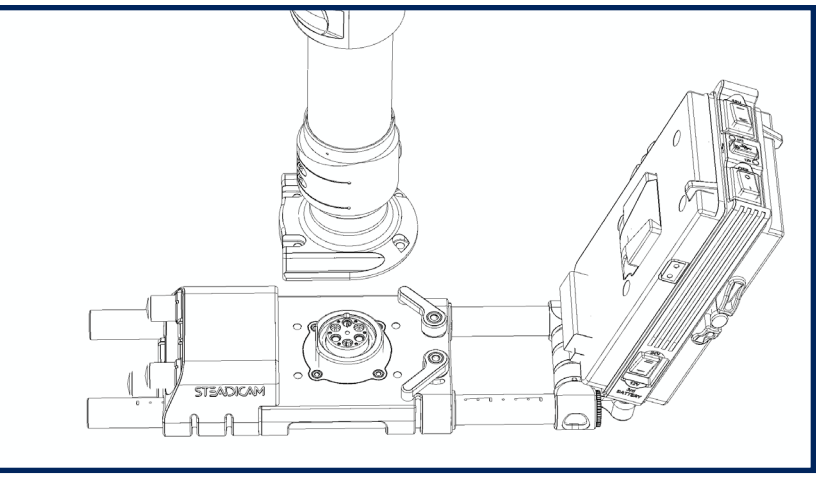
To remove the base, start by removing the monitor mount to make it easy to access the screws.



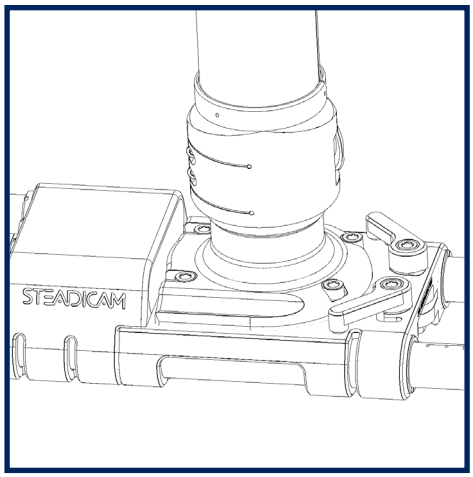
Use a 9/64" Allen wrench to remove the four screws from the post connector.



Pull the post STRAIGHT up off the base. It may take a firm pull, but do not twist or force anything.



To reinstall the post on the base, align the flat spot on the post connectors. The straight edge of the post foot will align behind the electronics box of the base.



Insert firmly until the post connector sits flush on the base and install the four screws. Tighten with ample torque to secure the post.

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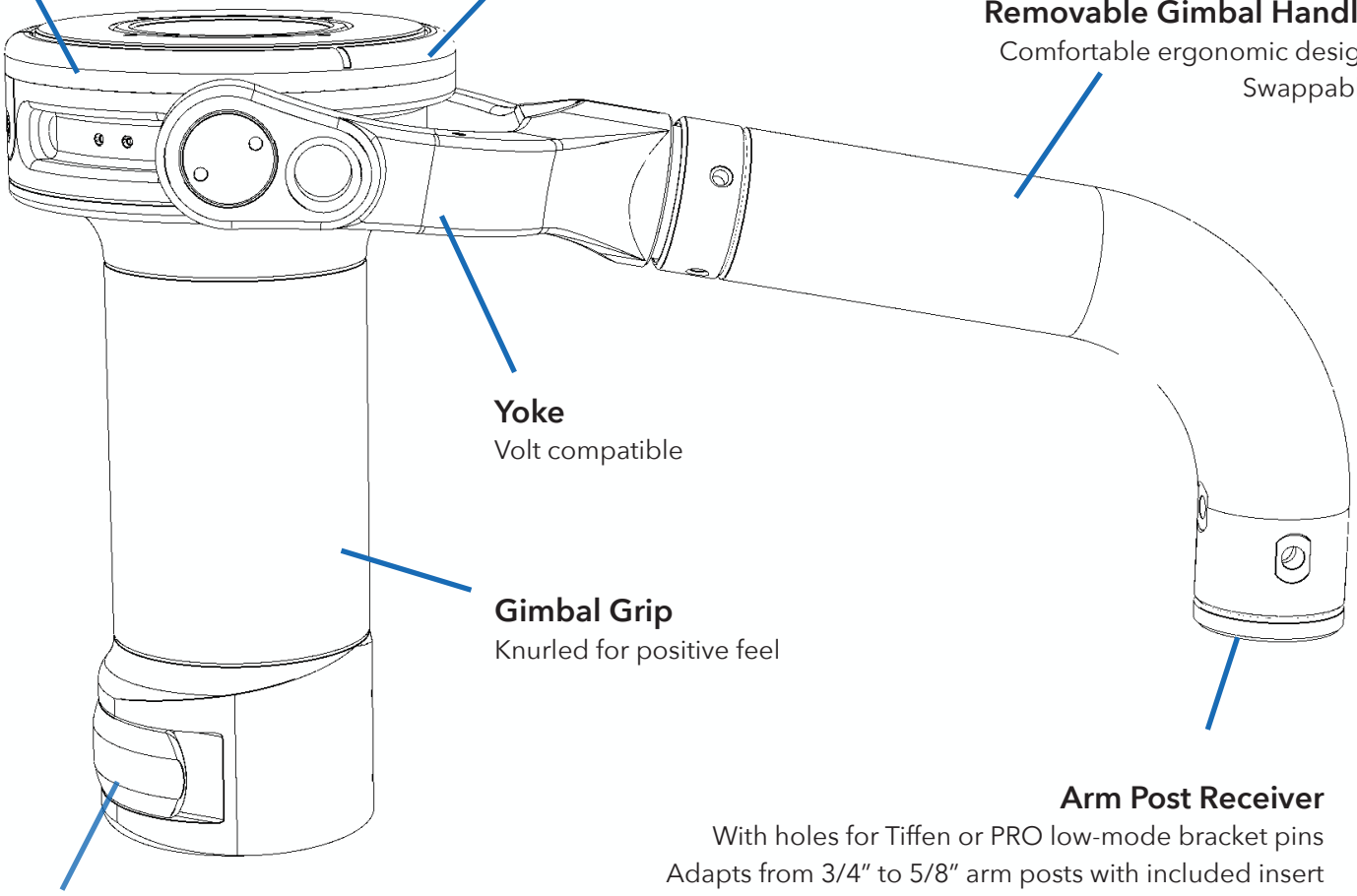
Gimbal components

The new M-2 gimbal builds upon the M-1 gimbal design, and integrates the Volt pan encoder ring within the gimbal body. This saves you precious gimbal height, and makes all M-2 gimbals even easier to upgrade and service later. With compatibility in mind, the gimbal fits 1.75", 1.58" and 1.5" post diameters.

Pan Bearing
Inside outer ring
Dust protected

Volt Pan Encoder Ring
Inside, atop pan bearing
Lower total height

Removable Gimbal Handle
Comfortable ergonomic design
Swappable



Yoke
Volt compatible

Gimbal Grip
Knurled for positive feel

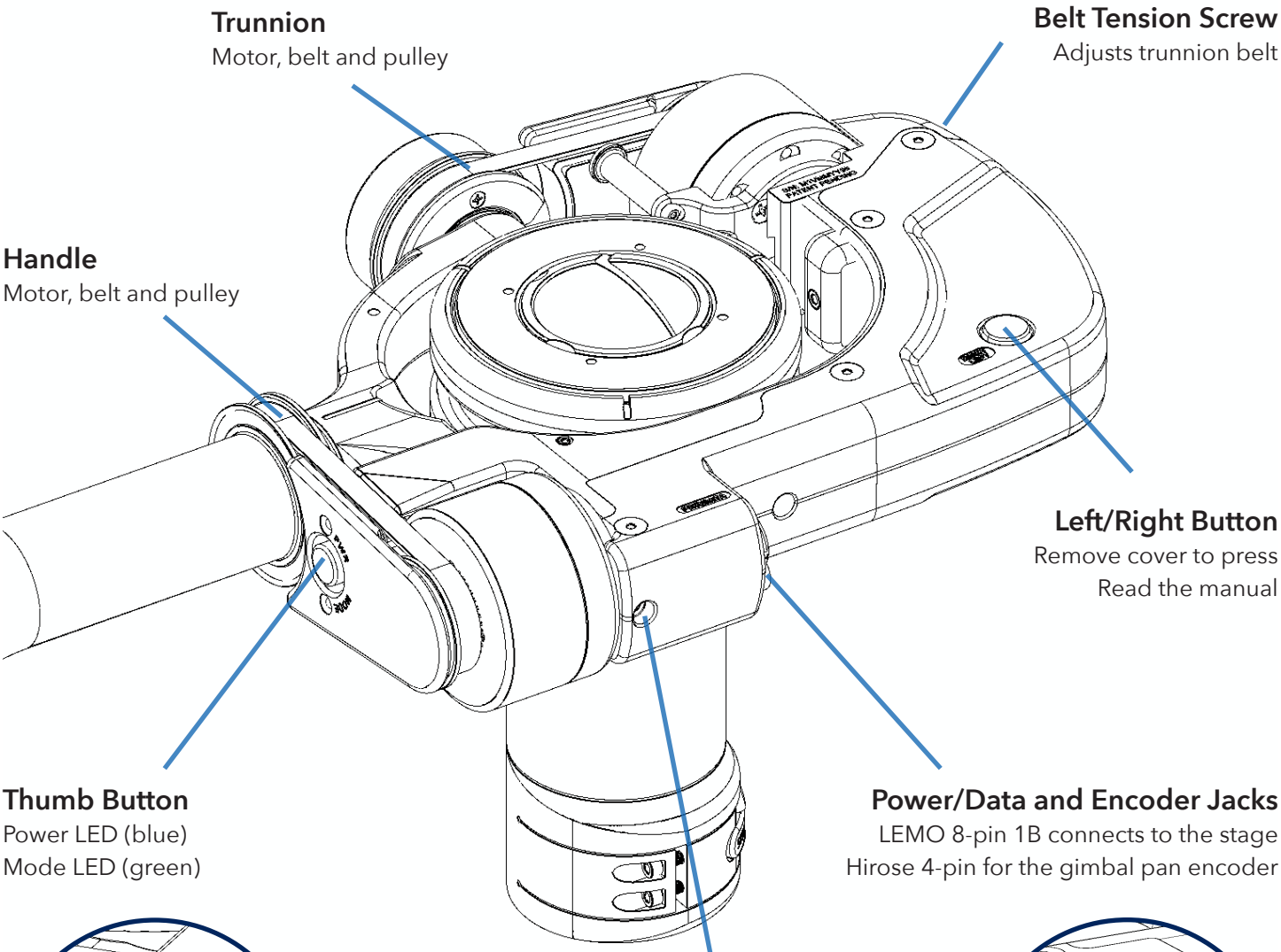
Arm Post Receiver
With holes for Tiffen or PRO low-mode bracket pins
Adapts from 3/4" to 5/8" arm posts with included insert
Optional insert for 1/2" posts: 888-7139-01

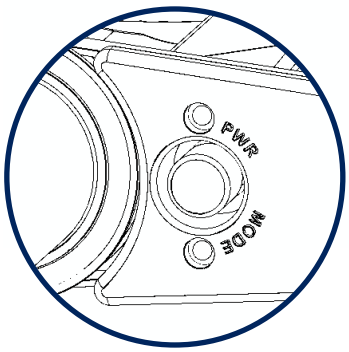
Clamp Lever
Over-center, tools free lock
Shown here closed

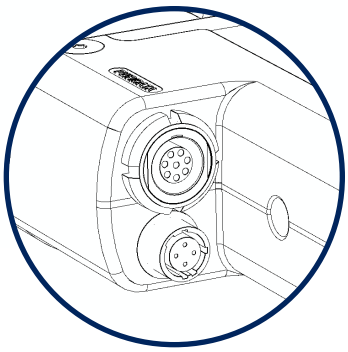
NOTE: *The gimbal section of this user guide covers product numbers M2-GIM, and M2-GIMV. For product numbers M1-GIM, and M1-GIMV, refer to the original M-1 manual (LIT-815000.)*

Gimbal with Volt components

Here we've added the Volt components. This is just the basics, so please refer to the Volt manual for the whole story; it's available at Tiffen.com/pages/volt-system. The gimbal is designed to work with the new Padded Docking Bracket to gain more gimbal height, protect the Volt hardware, and be easier on bearings.



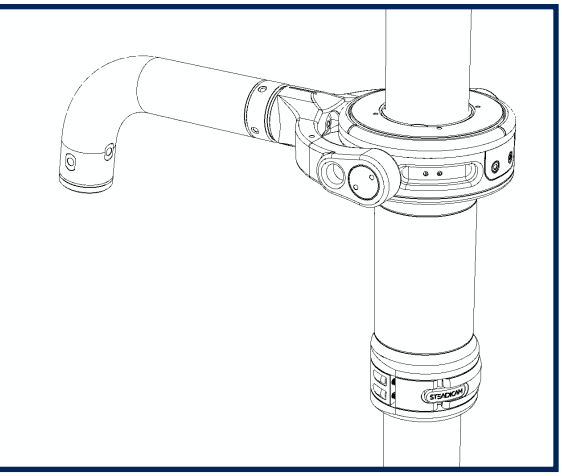




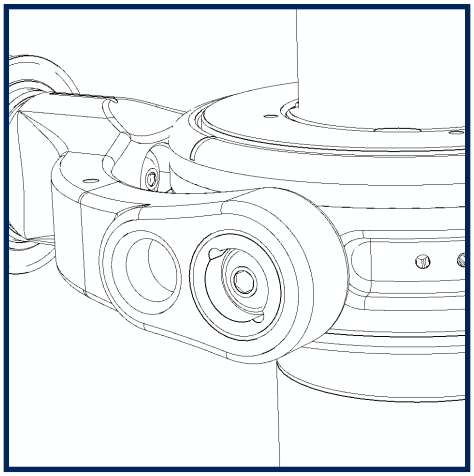
WARNING: *Docking methods other than the Tiffen padded dock may damage the unit! Use the padded dock to protect your Volt electronics, as well as make docking and balancing easier.*

M-2 Volt compared to M-1 Volt

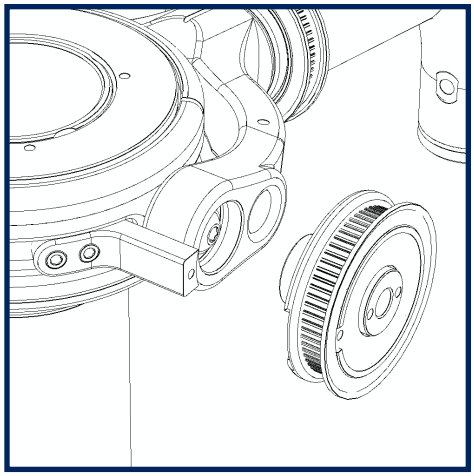
Volt integration into the new M-2 gimbal differs from an installation on an M-1 gimbal in two practical ways: the pan encoder is now internal, and the trunnion pulley has a different mechanism (similar to previous "upgrade kits" for U2/Archer/PRO gimbals.) Let's take a look at how installing the Volt onto an M-2 would be different, with all the other install steps in the Volt manual remaining the same.



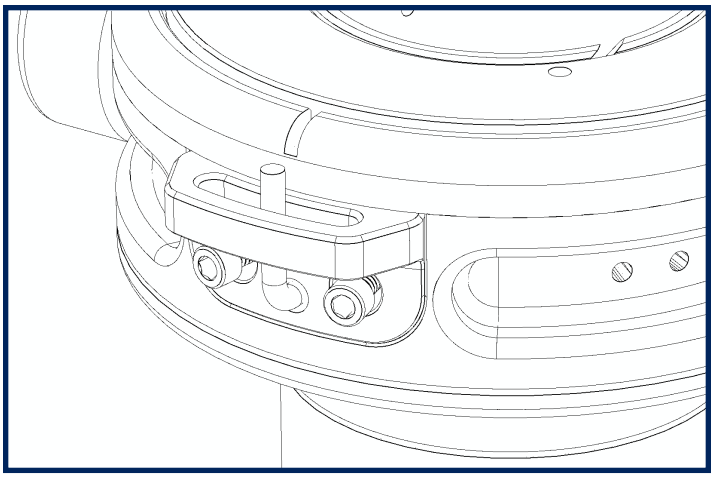
The gimbal remains on the post, and the trunnion screws remain in place. Use the Blue Whale tool to remove both side covers.



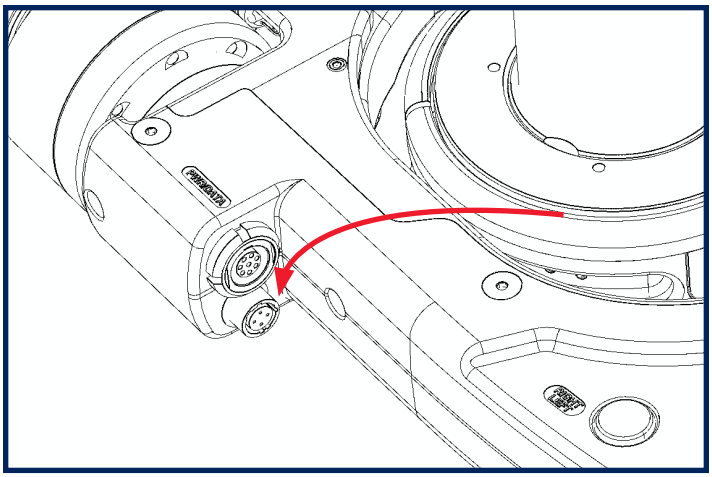
Replace the cover with a thread adapter over the trunnion screw, on the side of the gimbal where you'll mount the motor assembly.



The trunnion pulley threads onto the opposite side, no thread adapter necessary. Use the supplied Blue Whale tool to tighten the pulley in place.



Remove the tiny hex screws from the cover in the gimbal housing, and install the pan encoder in its place with the cable side up. Reuse the same two screws to fasten it.



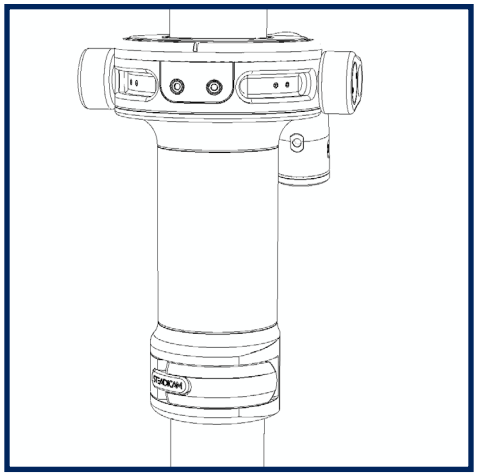
Route the encoder cable over the Volt body, to the side of the gimbal, and connect at the Encoder port.

NOTE: *For more information on the Volt system use and installation, refer to the Volt manual, LIT-817001.*

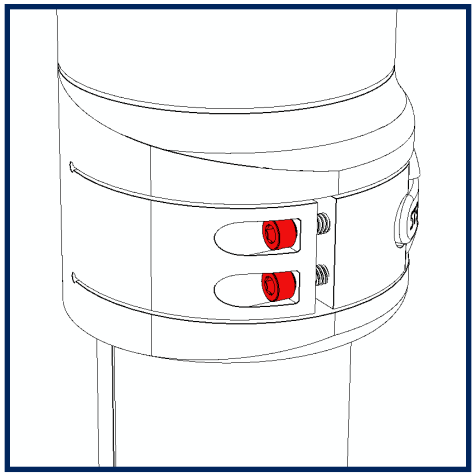
Gimbal clamp adjustment

The low-profile gimbal clamp is easy to use and offers a positive lock. You should occasionally test to ensure the post is being clamped fully by trying to move the gimbal with the clamps closed. If the gimbal slides with a camera on board, it will affect your drop time.

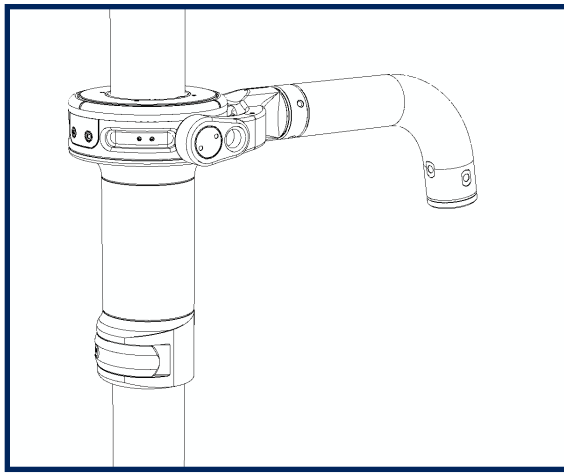
IMPORTANT: Do not over-tighten the gimbal clamp! It is strong enough to distort the carbon fiber post but does not need to be that tight to hold. Use minimum clamping force while still holding securely.



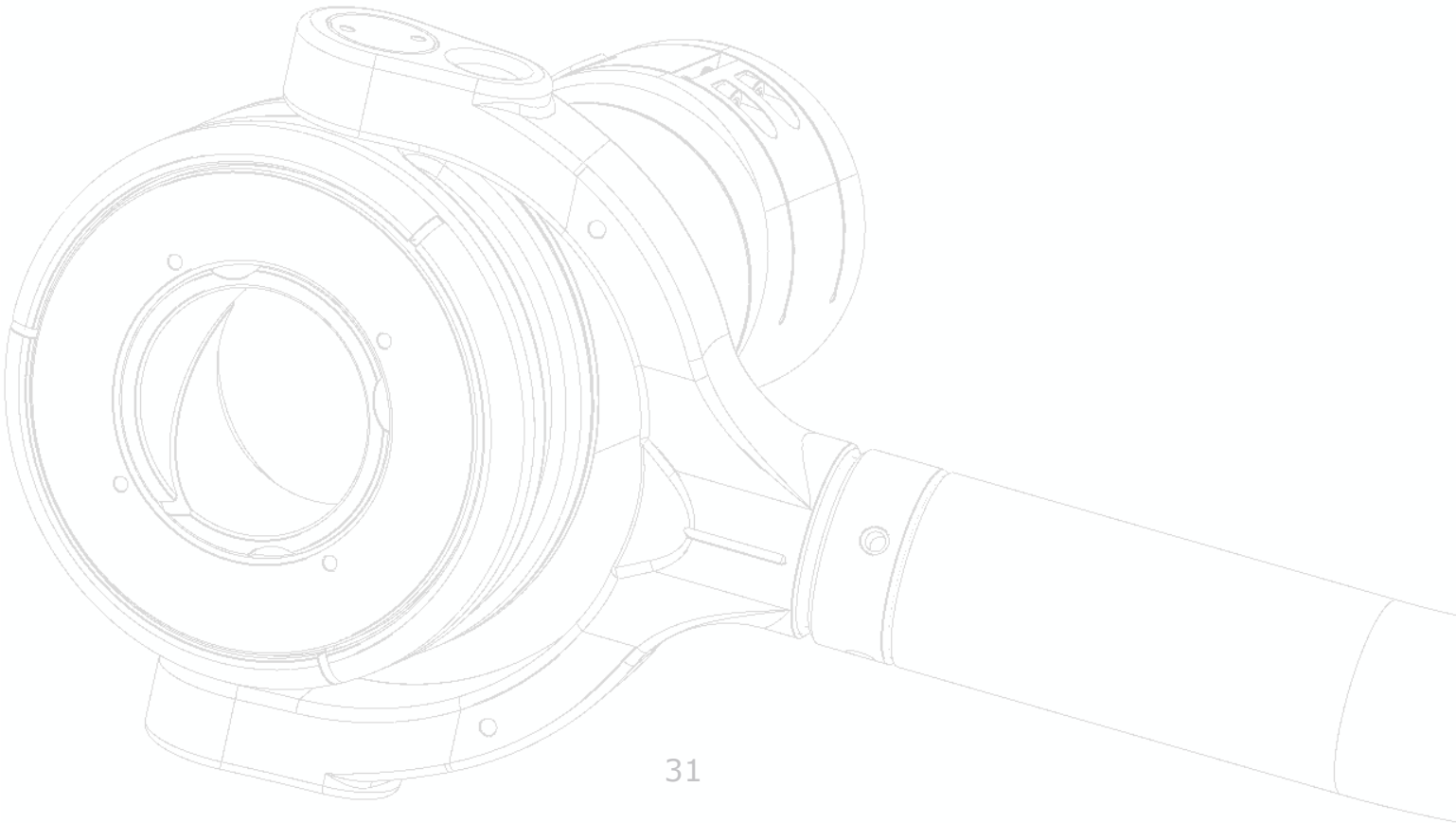
The over-center lock on the gimbal clamp is adjusted while the clamp is closed.



Use a 3/32" Allen wrench to turn each screw an equal, tiny amount. You don't want to over-tighten these, take your time.

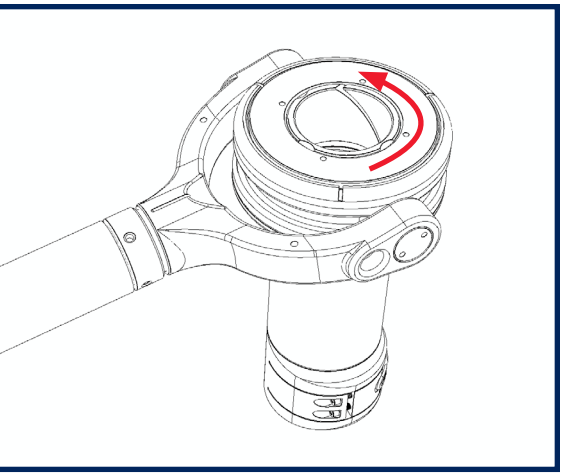


Test the action of the clamp lever and the holding power of the clamp, and repeat if necessary.

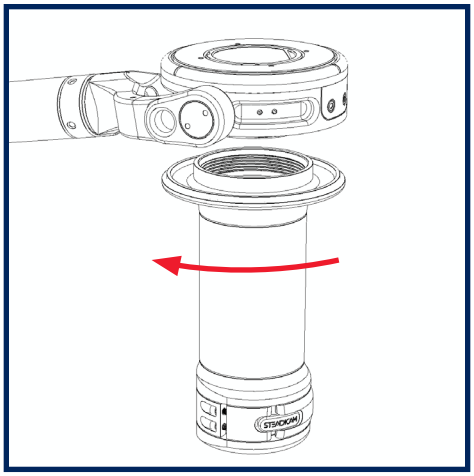


Pan bearing removal and cleaning

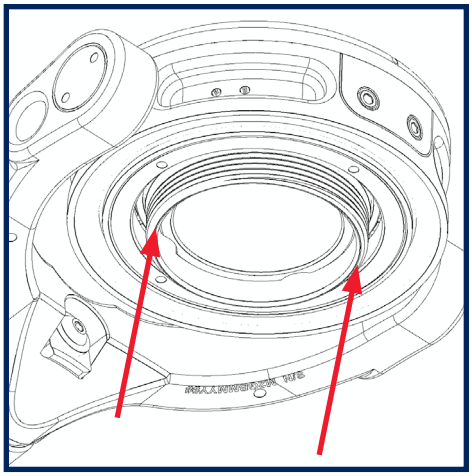
The modular nature of the M-2 encourages operators to take excellent care of their rigs. Cleaning the pan bearing from time to time will keep your M-2 performing at its best. Start by removing the gimbal from the post (see page 24), then grab the included Blue Whale tool (305-7115-02).



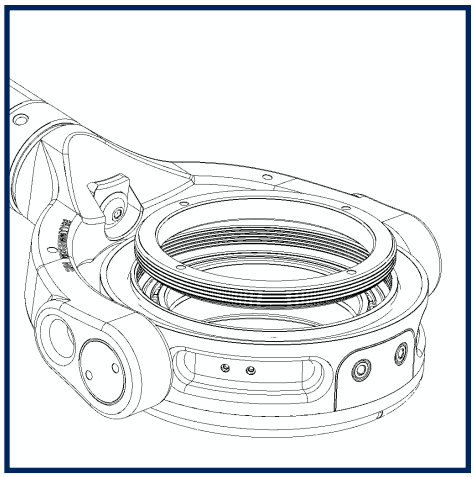
Use the “outside” pins of the Blue Whale tool to loosen the inner ring from the gimbal grip.



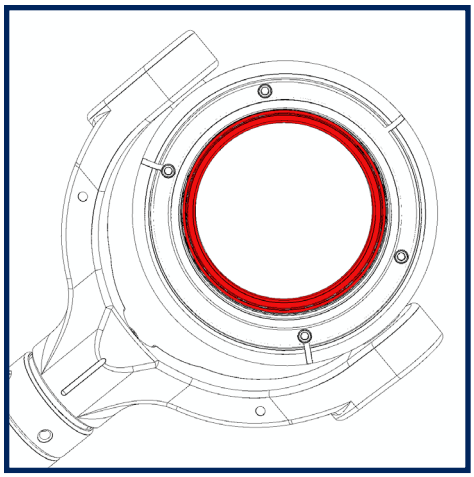
Unscrew the gimbal grip and set it aside.



Invert the gimbal, carefully press the inner ring out of the bearing, and set that aside.



Use the Blue Whale spanner to unscrew and remove the pan bearing lock.

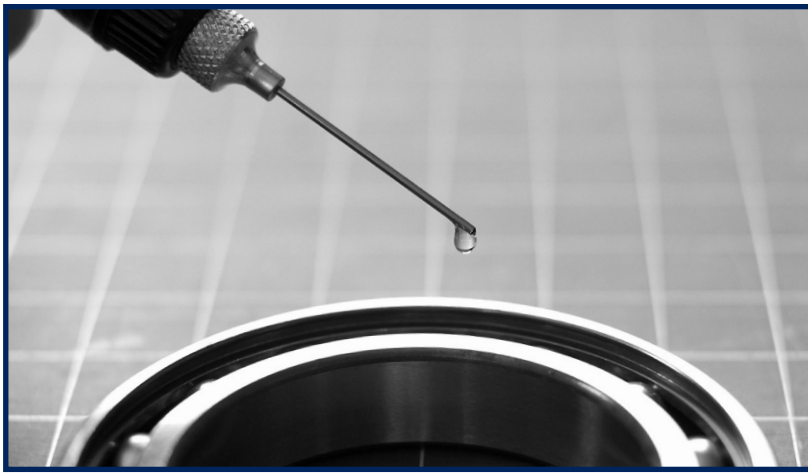


Applying even pressure to both sides, ease the pan bearing out of the gimbal. Never use tools to pry on a bearing!

With the pan bearing removed, spend an adequate amount of time to carefully clean out any contaminants within the bearing. Warning: our recommended solvent is **100%** acetone, so take the necessary precautions to keep it off of sensitive items (such as paint, plastic and skin) and always follow the manufacturer's safety recommendations. 100% acetone is commonly available as a beauty supply.

OPTION: Use an ultrasonic cleaner (commonly used for cleaning jewelry) and manufacturer recommended solutions and cleaning practices.

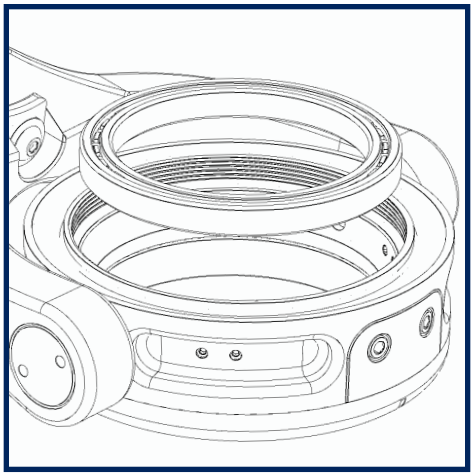
- In a glass container, add 100% acetone until the pan bearing is completely submerged.
- Soak for 10 minutes then gently agitate the acetone to release any contamination in the bearing.
- Resist the temptation to spin the bearing once you've washed away any lubricant!
- Drain and refill the container with fresh acetone and repeat until no more contaminants can be seen in the fluid.
- When the bearing is completely clean, let it air dry for a few minutes. **DO NOT** use compressed air to blow off excess acetone or dry bearings.
- Add 5 to 10 drops of Tiffen bearing oil (888-7116) on the bearing balls and ***slowly*** turn the bearing to distribute the oil.
- The pan bearing is now ready for install.
- Clean the other gimbal parts with a lint free rag and a small amount of acetone as needed.
- Please dispose of acetone in an environmentally conscious manner, or reuse it to clean less-sensitive items!



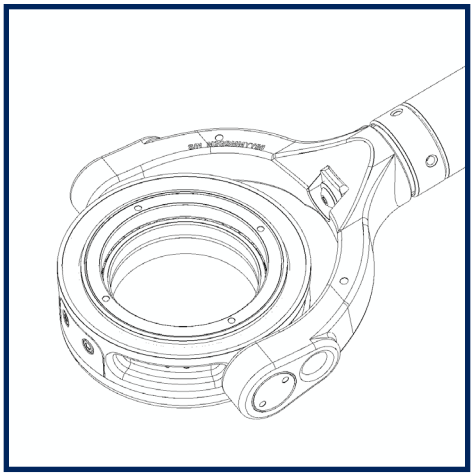
IMPORTANT: *Never spin a dry bearing! Doing so without lubricant can score the internals and lead to increased friction. Be patient and wait until you have applied oil before turning the pan bearing. It's not a fidget spinner, after all.*

Pan bearing replacement

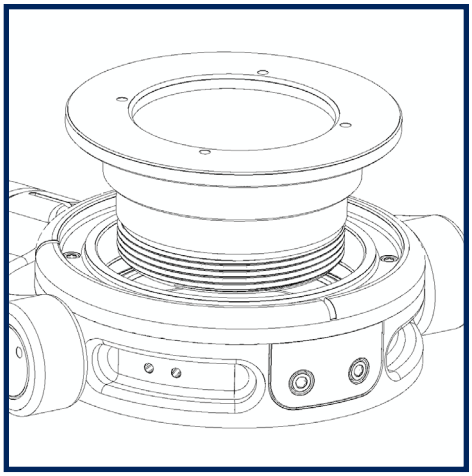
With everything inspected and cleaned, it's time to put it all back together. Don't remember where everything goes? No problem, just follow along:



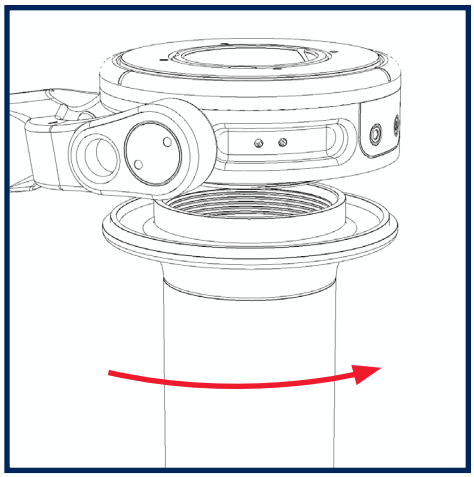
Carefully insert the pan bearing into the outer ring using light finger pressure. When properly aligned, the bearing will easily slip into position. If the bearing binds up while inserting, remove the bearing and start again, being sure to properly align.



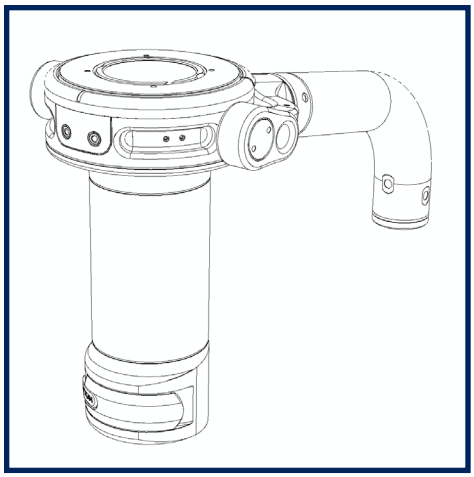
Install the pan bearing lock until finger tight to ensure proper threading, then finish tightening with the Blue Whale tool.



Slide the inner ring into the pan bearing. If aligned properly, the inner ring should slip into position with very light pressure.

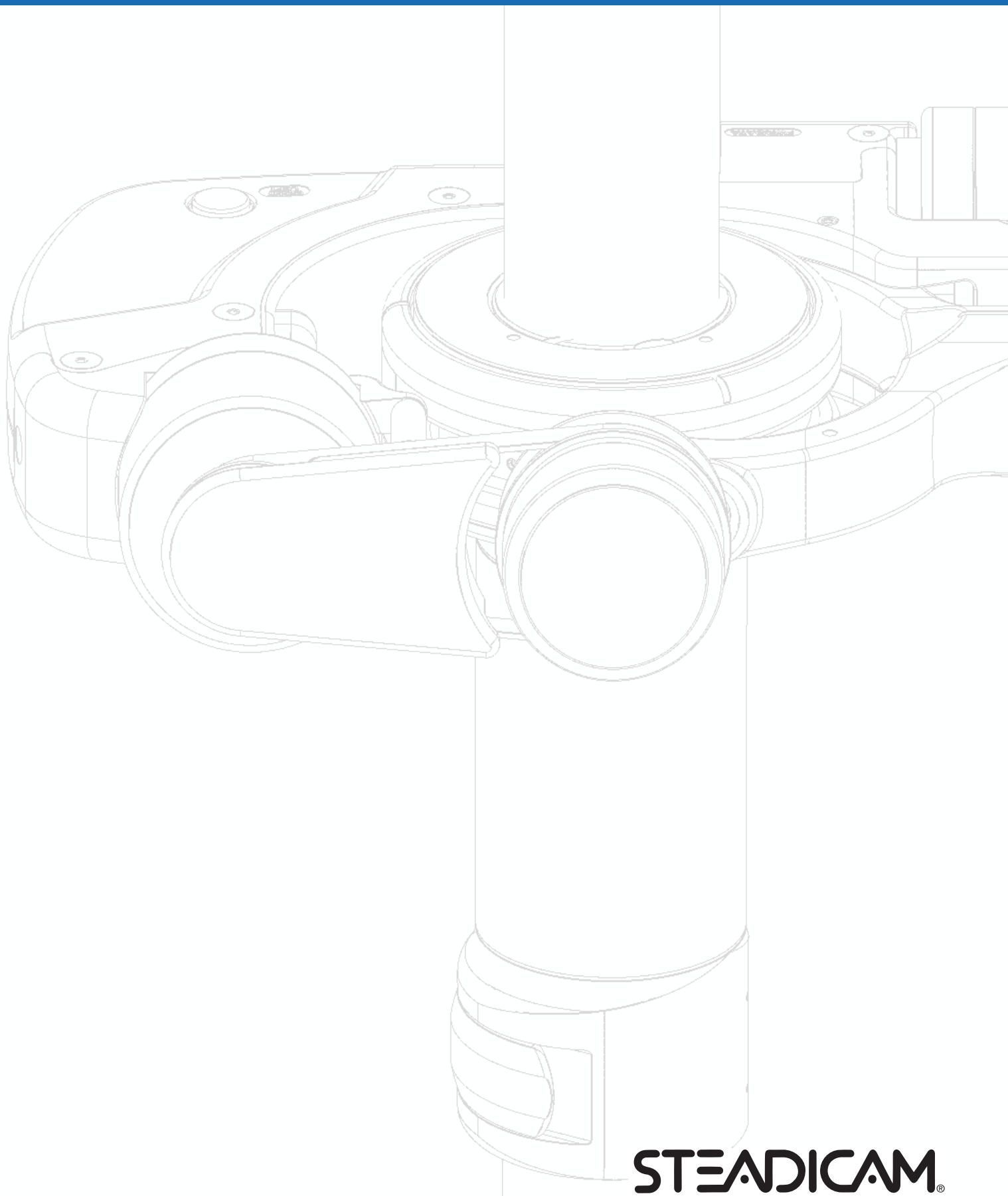


Hold on to the inner ring and screw on the gimbal grip until it's fully seated.



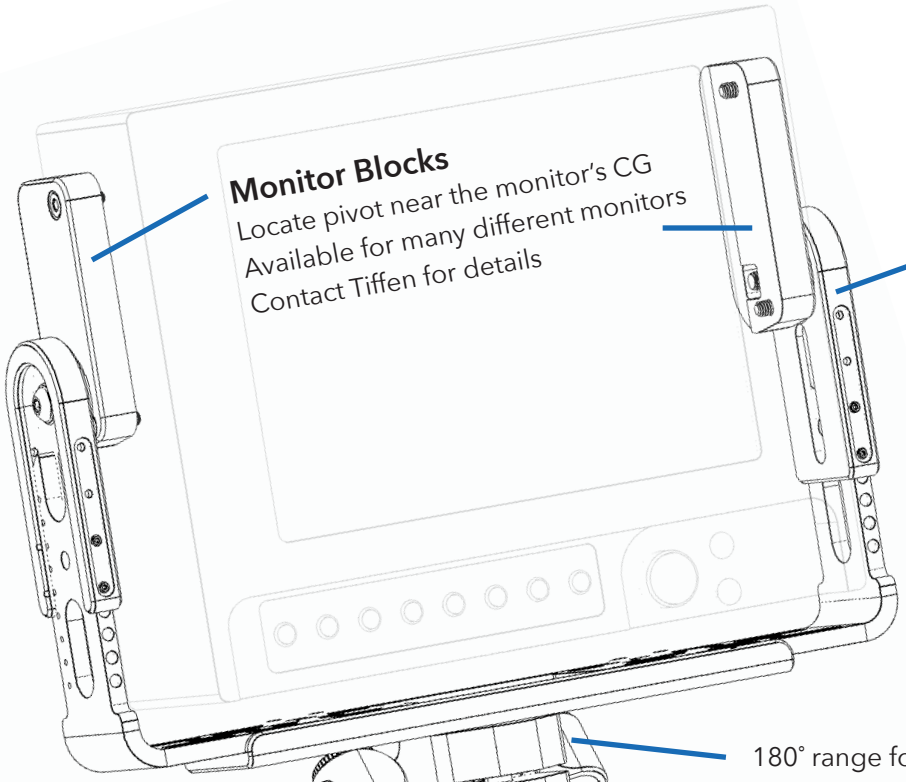
Use the "outer" pins of the Blue Whale spanner to tighten. And you're done!

***TIP:** A **small** amount of Tiffen bearing oil (888-7116) may be applied to the inside or outside of the bearing to aid reassembly, if necessary. DO NOT use grease anywhere!*



STEADICAM®

Monitor mount components



Monitor Blocks
Locate pivot near the monitor's CG
Available for many different monitors
Contact Tiffen for details

Universal Monitor Mount
Adjustable width and height

Monitor Pivot
180˚ range for unobstructed views
Adjustable friction

Pivot Clamp Knob
Secure tilt angle of mount

Monitor Rods
LWS 15mm by 60mm spacing
Standard 1/2"-13 threaded ends

Rod Clamp Levers
Lock or release the monitor rods

Post Clamp
Hinged quick-release
Opens 180˚

Post Clamp Lever
Over-center, tools free lock
Open and un-thread to release
Shown here closed

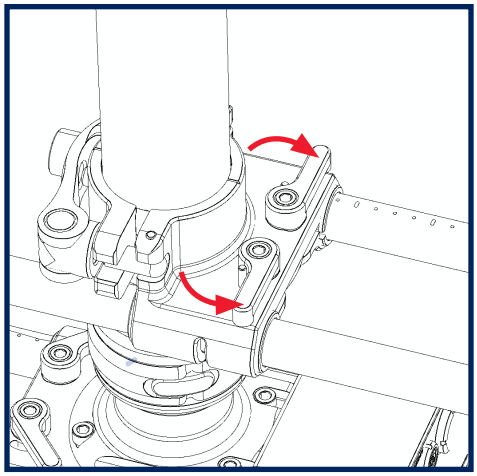
Rod Stops
Prevent it going bye-bye!
Simply threaded in

Lower Post Brake
To mount monitor clamp on lower post

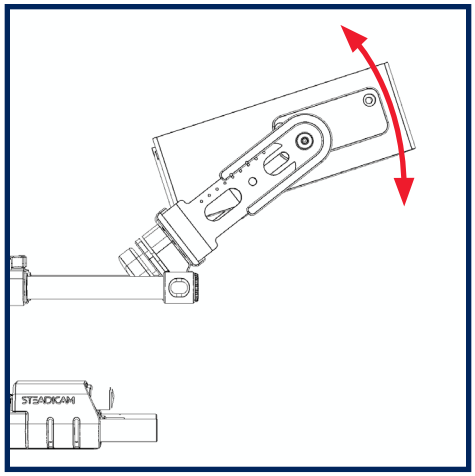
NOTE: *The monitor mount section of this user guide covers product number 158MB-UMM, for 1.58" posts. For product number 175MB-UMM, for 1.75" posts, refer to the original M-1 manual (LIT-815000.)*

Monitor mount positioning

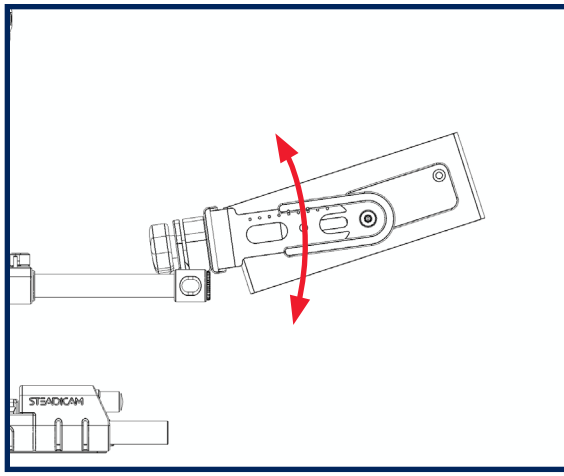
The M-2 monitor mount is intended to allow practically limitless mounting positions. The monitor can be positioned close to the post or far away. The mount can attach to either post. The monitor can be tilted to any angle and arched from upright to inverted. Many of the possibilities take mere seconds to achieve and none take more than a minute. Get creative and put that monitor where it helps you most!



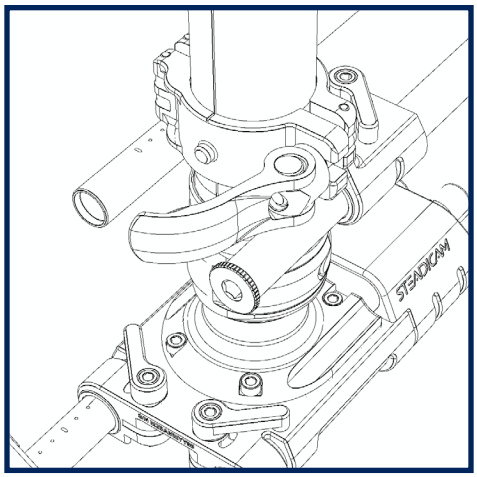
To move the monitor fore and aft on the rods, loosen the clamp levers and slide. Re-lock clamp levers to secure the monitor rods.



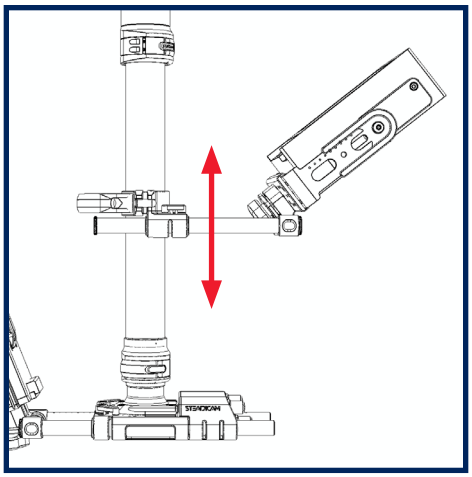
For fine angle adjustment, perhaps to reduce glare, just tilt the monitor by hand. No fasteners required.



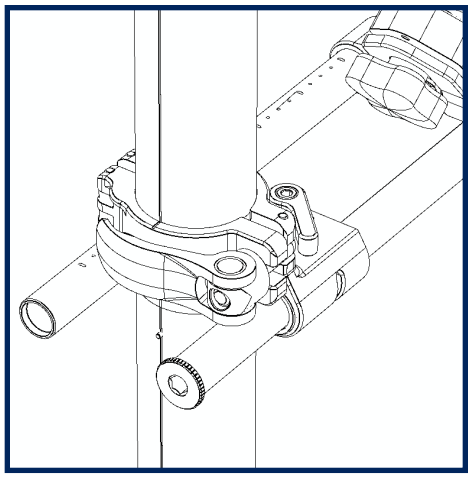
To pivot the monitor in an arc, loosen the pivot clamp knob and rotate the yoke around the monitor pivot.



To move the mount on the post, support the monitor and flip open the clamp lever.



Slide to the desired height, and align the mark on the post clamp with the reference line to ensure the monitor is square to the rig.

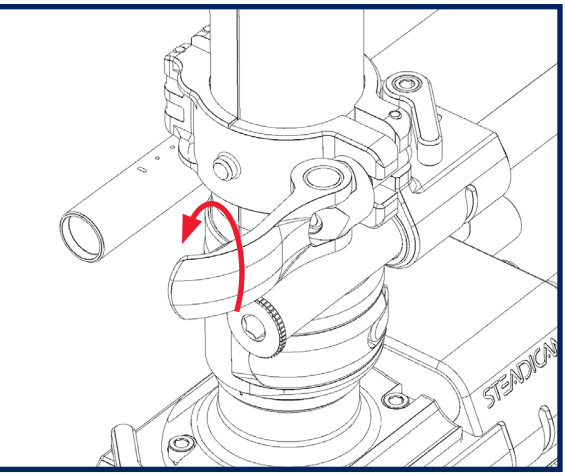


Lock the clamp lever to secure the monitor mount in place.

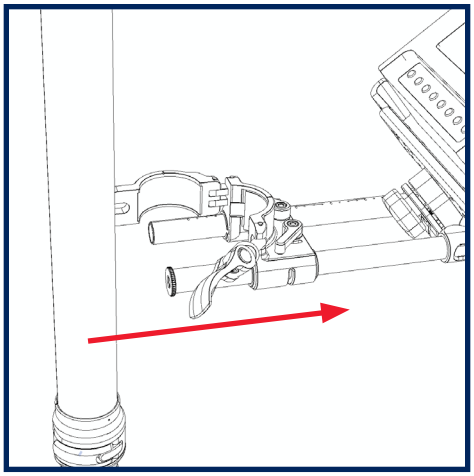
Clamp operation

You can easily move the monitor mount from the lower post to the gimbal post. While the mount is off the post, you may also flip it over so the monitor will be upright in low-mode.

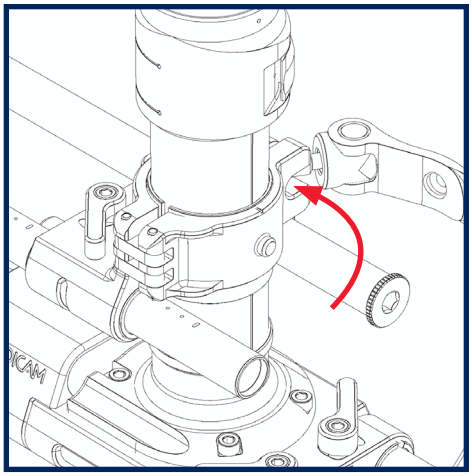
IMPORTANT: support the monitor with one hand while disengaging and engaging the clamp.



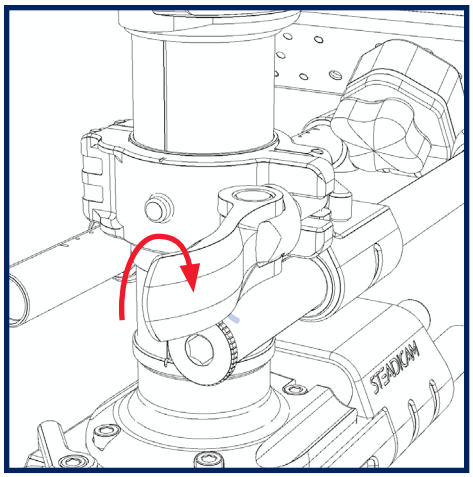
Open the clamp lever, and then turn the lever counter clockwise about 10 turns until it clears the swing arm.



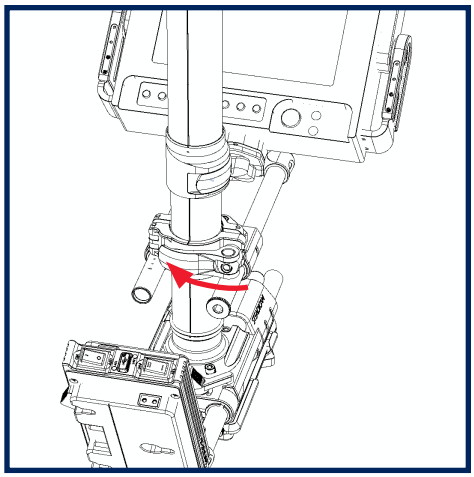
Pull the monitor away from the post. The post clamp will swing clear.



Reposition the monitor mount on the other post, or flip it over for low-mode. Close the clamp around the post or post brake.



Close the clamp lever around the clamp, and twist the lever about 10 turns back in, setting the clamp tension you prefer.



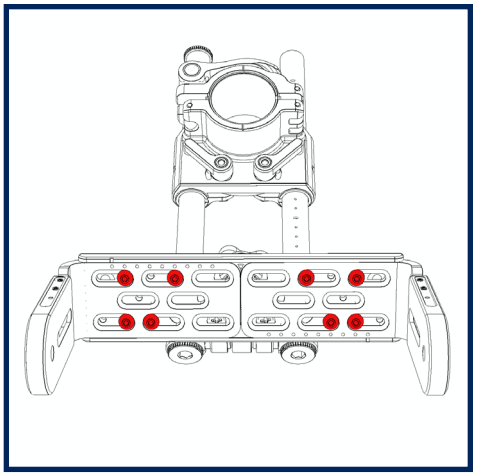
Confirm the marks are lined up with the reference line, so the monitor is square to the rig, and close the clamp lock.

NOTE: *If you replace the monitor rods with your own 15mm rods, always use the included thread-in stops to prevent the monitor from going AWOL.*

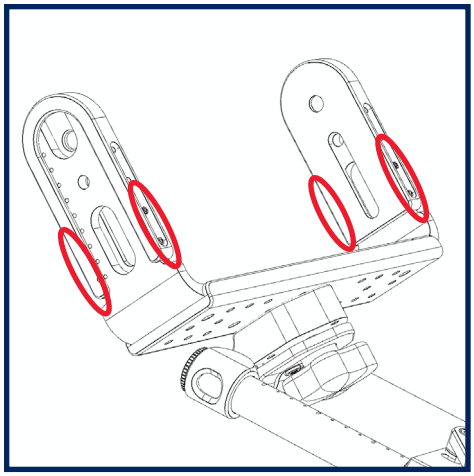
Monitor yoke adjustment

The universal monitor mount offers versatility and convenience to mount a variety of monitors near the monitor's center of gravity, and allows tools free adjustment once it is fitted.

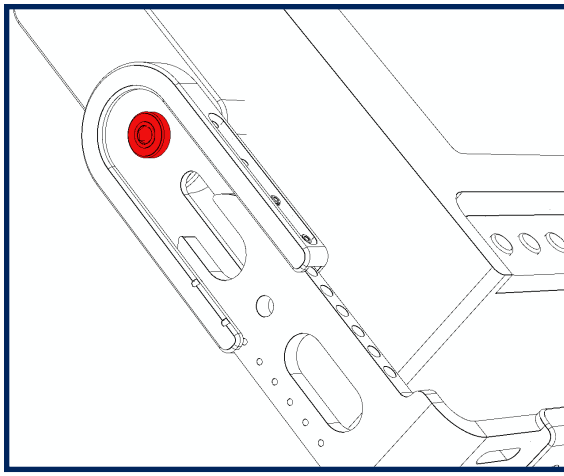
NOTE: Contact Tiffen for a selection of monitor blocks to fit your choice of professional monitor when upgrading or buying a spare.



Loosen these eight hex screws to adjust the width. You may need to re-arrange the screws in different threaded holes, but use all eight.

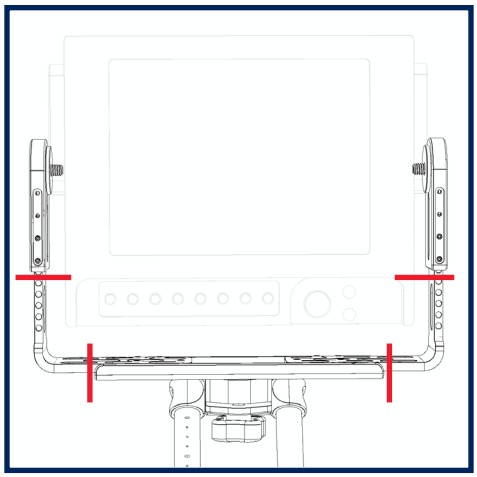


Loosen the eight set screws to adjust the height of the uprights. Fit the monitor height so it clears the yoke when flipped 360˚.

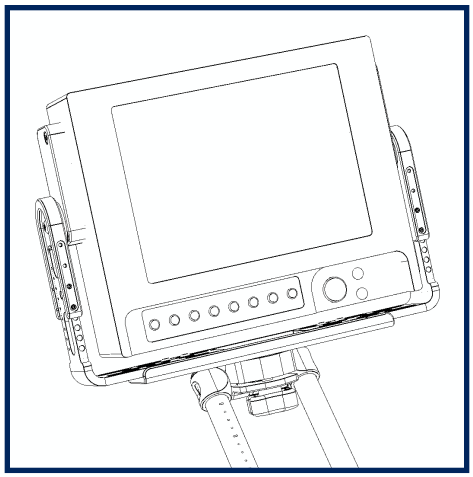


Install your monitor:

- Use supplied 1/4-20 screws to mount to monitors with 1/4-20 side mounting holes.
- Use 10-32 screws and supplied mounting block hardware that is monitor specific.



Use the markings to keep the monitor symmetrical side to side and on the uprights. Tighten all of the screws.

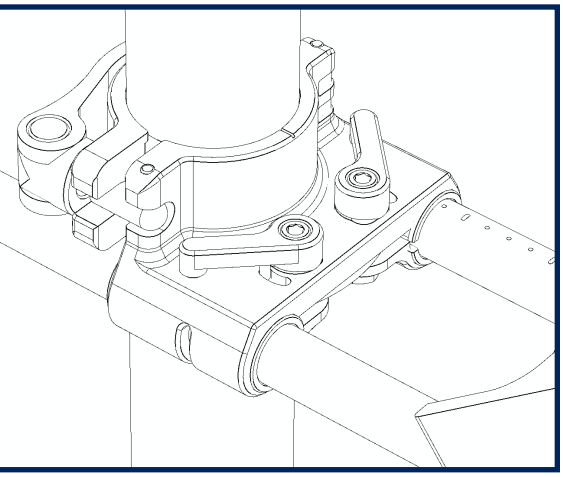


Double check that the monitor is square to the rig, is held securely in the yoke, and rotates smoothly.

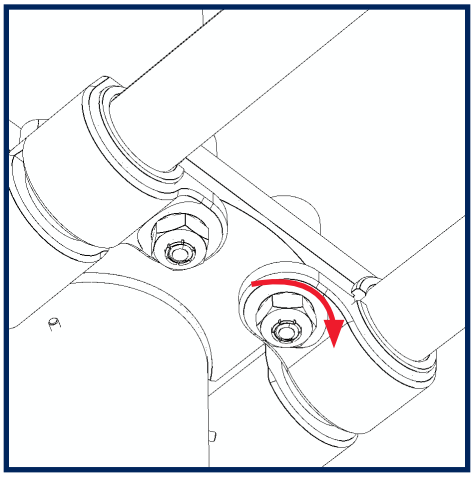
TIP: *The monitor can be offset left or right off center to help with view ability in some situations.*

Adjusting monitor clamps and hinge brakes

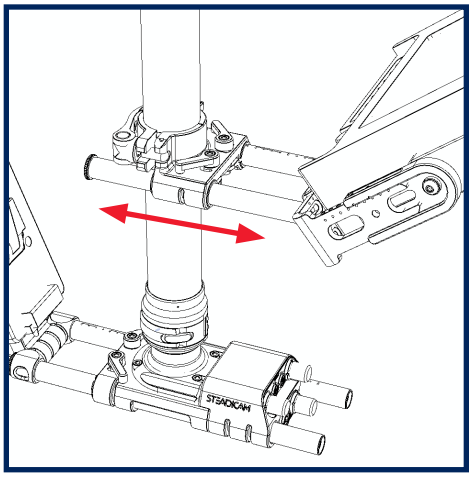
Though the levers only have a short 45˚ throw, the rod clamps hold the monitor rods securely when properly adjusted. If they slide with a camera on board it will affect your static balance.



Adjust the clamp locks with the clamp levers closed.

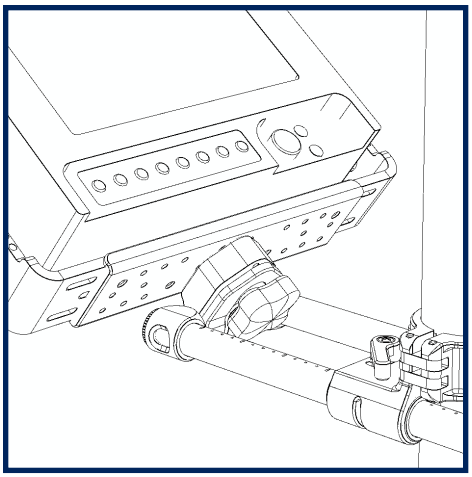


Turn each locknut a small amount with an 11/32" wrench. Test that the clamp levers open and close smoothly.

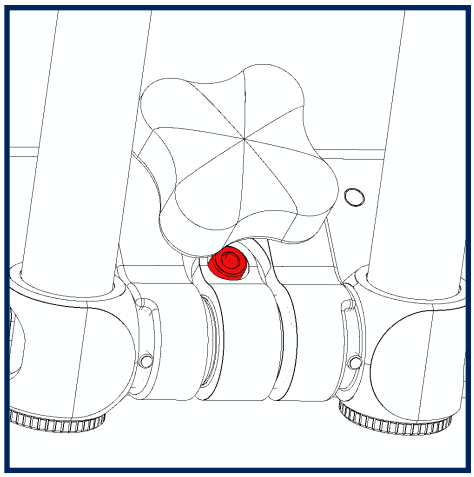


Test the holding power of the rod clamps to ensure the monitor or batteries will not slide when locked.

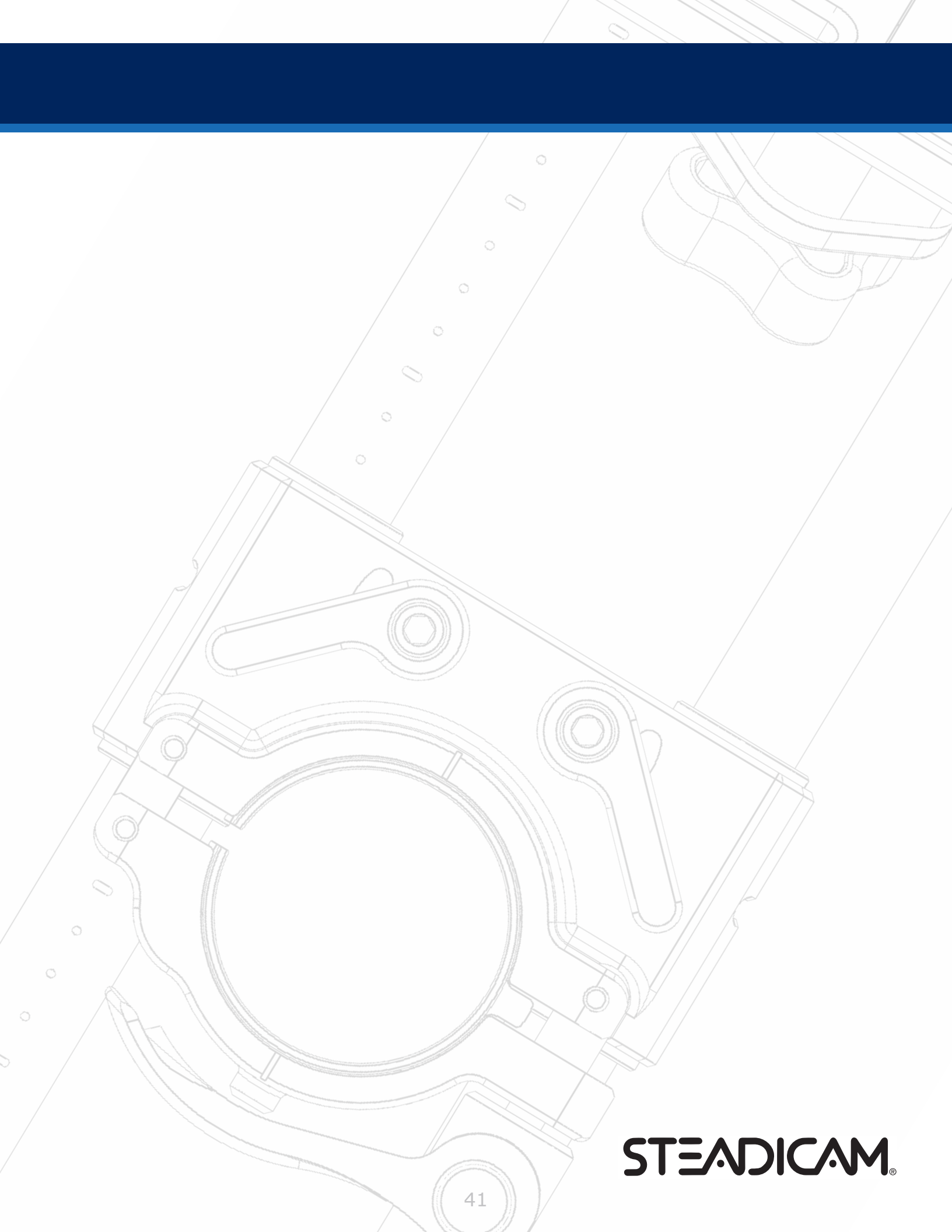
The monitor pivot has a built in friction brake to support the weight of your monitor while the clamp knob is open. If you prefer more or less friction, it's easy to adjust. Keep one hand on the monitor while making this adjustment:



Adjust the friction hinge with the clamp knob loose. This allows you to feel the effects of your changes.

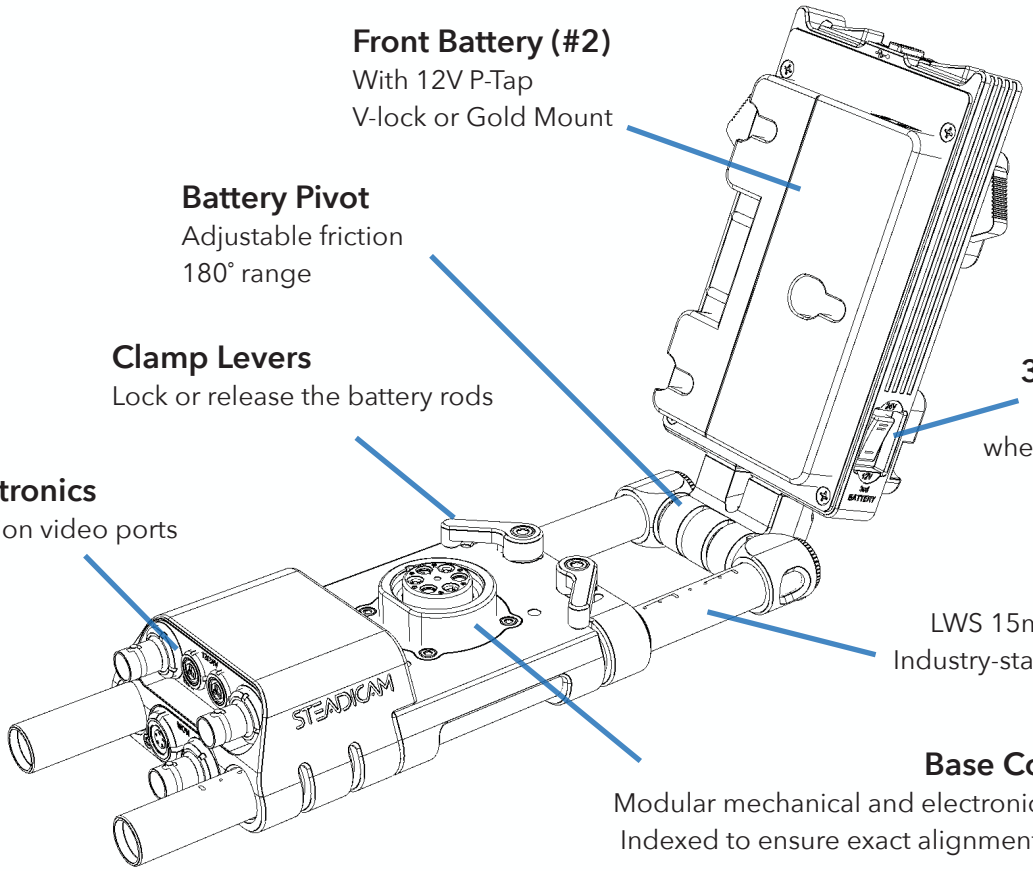


Use a 7/64" Allen wrench to either tighten or loosen the brake screw to achieve the desired amount of friction to support your setup.



STEADICAM®

Base and battery mount components



Front Battery (#2)
With 12V P-Tap
V-lock or Gold Mount

Battery Pivot
Adjustable friction
180˚ range

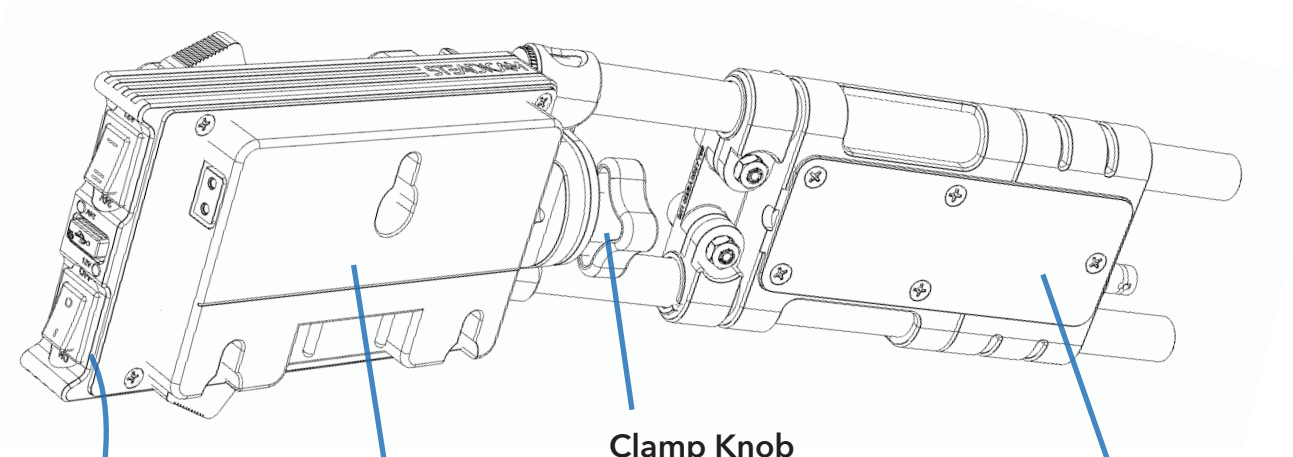
Clamp Levers
Lock or release the battery rods

3rd Battery Switch
Choose 12V or 24V
when running 3rd battery

Front Electronics
High-definition video ports
Power ports

Battery Rods
LWS 15mm by 60mm spacing
Industry-standard threaded ends

Base Connector
Modular mechanical and electronics junction
Indexed to ensure exact alignment with post



Rear Electronics
On/Off and 12/24V switches
LEDs indicate 12/24V mode
5V USB power port

Clamp Knob
Secure the angle of batteries

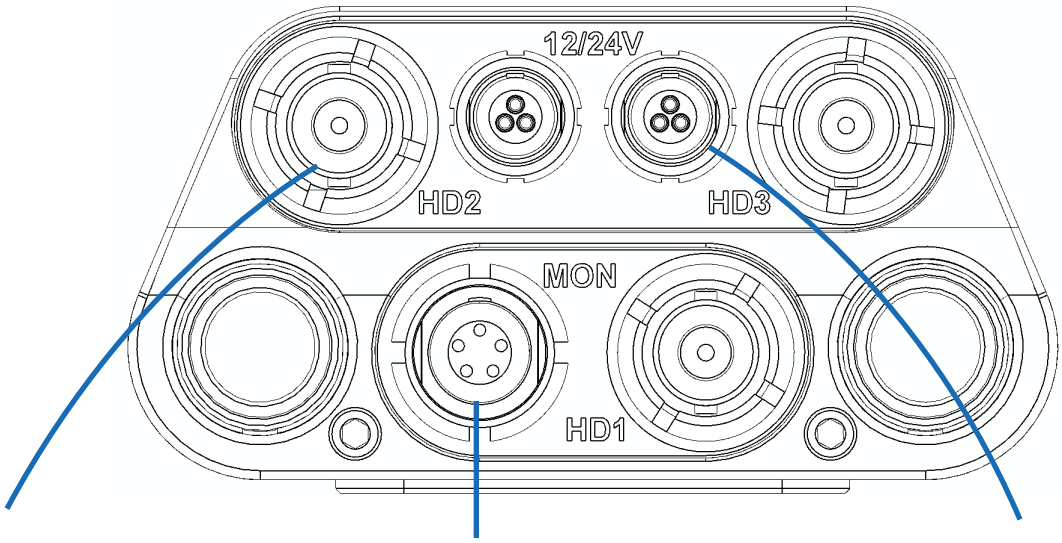
3rd Battery Port
Remove this cover to mount
Integrated wiring

Rear Battery (#1)
With 12V P-Tap
V-lock or Gold Mount

NOTE: *The base and battery mount section of this user guide covers product numbers M2-VLBASE and M2-GMBASE. For product numbers M1-VLBASE and M1-GMBASE, refer to the original M-1 manual (LIT-815000.)*

Base electronics

Front Electronics

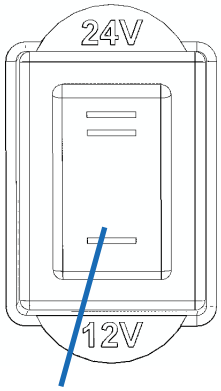


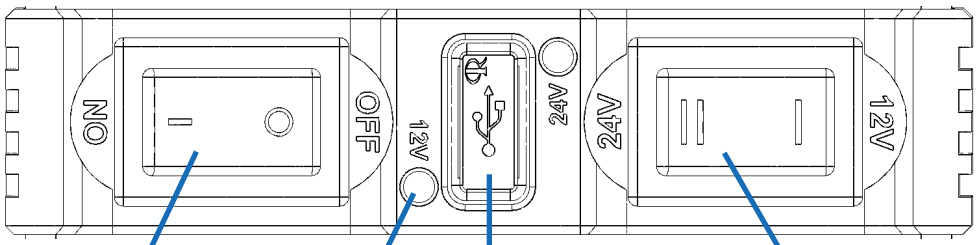
Triple HD video ports
HD-SDI compatible
Direct connections to the stage
Color coded at each end

Monitor Port
LEMO® 5-pin 1B connector
Power and tally signal
No SD video signal

Double 12/24V ports
LEMO® 3-pin 0B connector
12 volts supplied at all times
12 and 24 volts simultaneously when in 24V mode

Rear Electronics





3rd battery
12 Volt mode
24 Volt mode

Power Switch
Controls all power ports

Power LEDs
Indicate 12V or 24V

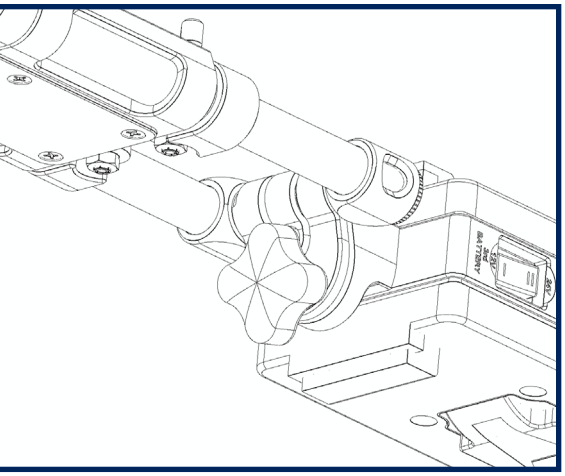
USB-A Port
5V, 1.5A output

12/24Volt Switch
12V with any battery combo
24V available with 2+ batteries

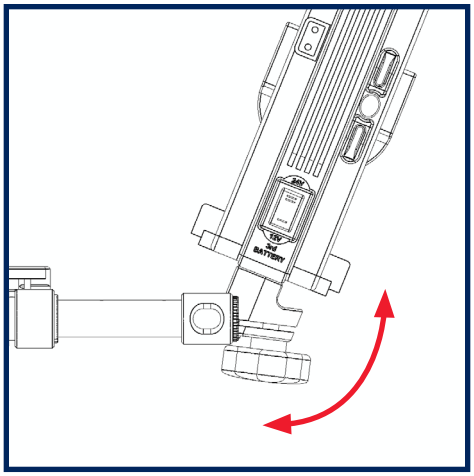
NOTE: *For a complete explanation of how the switches operate with a variety of batteries on board, see page 46.*

Battery positioning

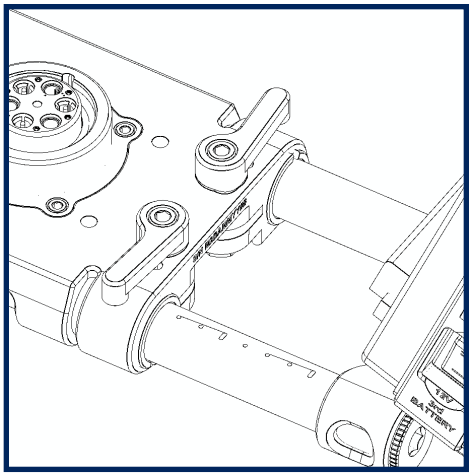
The battery mount can be brought in tight to the base for a whippy feel and plenty of leg clearance for switches. Or, the battery mount can be elongated to increase pan inertia and to balance a monitor placed way out front.



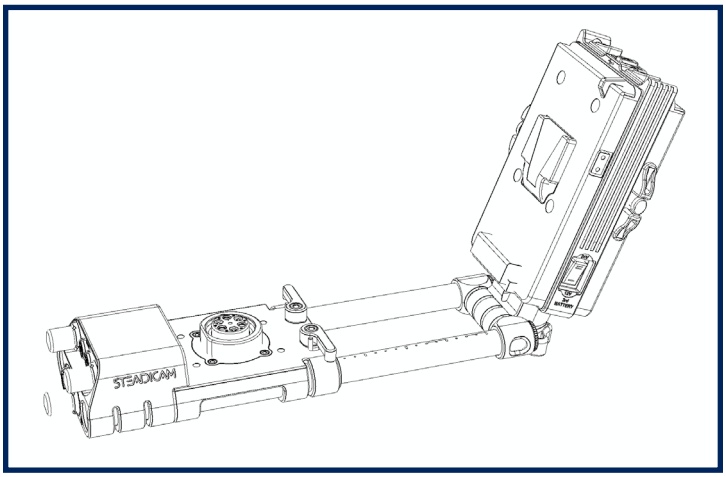
Support the batteries with one hand and loosen the battery clamp knob with the other.



Rotate the batteries to the angle you desire and re-tighten the battery clamp knob.



To slide the batteries, unlock the battery rods by rotating both clamp levers perpendicular to the battery rods.

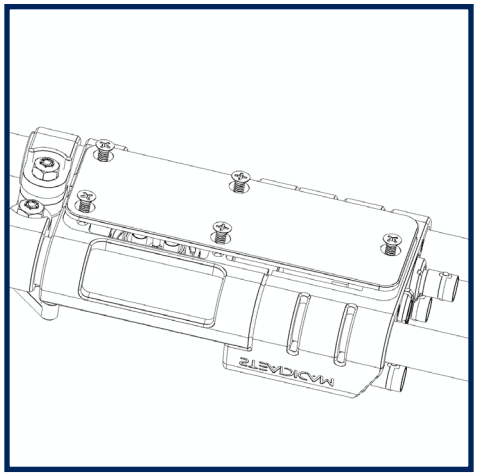


Slide the batteries to either balance the rig or move to your preferred position. Then re-lock the clamp levers before checking drop time.

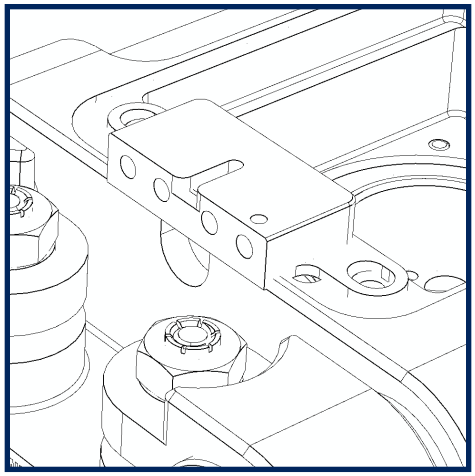
TIP: *Battery tilt friction can be adjusted just like the monitor mount.*

Installing the 3rd battery mount

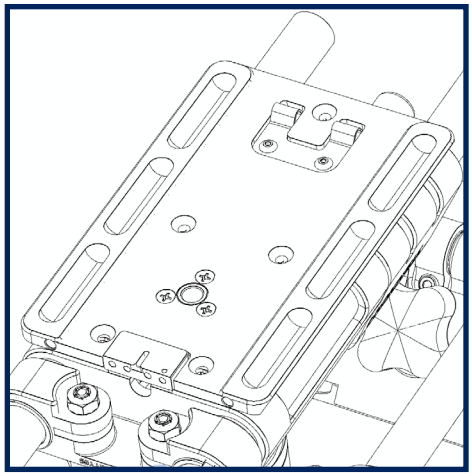
The optional 3rd battery mount has integrated wiring, so it doesn't use one of your power ports. Once you install the included short dovetail, the 3rd battery mount can slide on and off as needed.



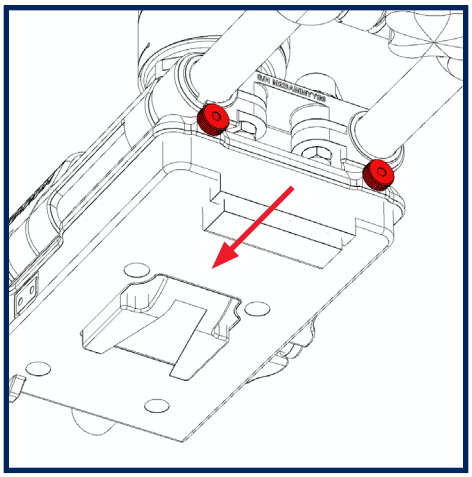
Remove the screws holding on the delrin base cover. You'll use the same screws to attach the dovetail, but set aside the cover.



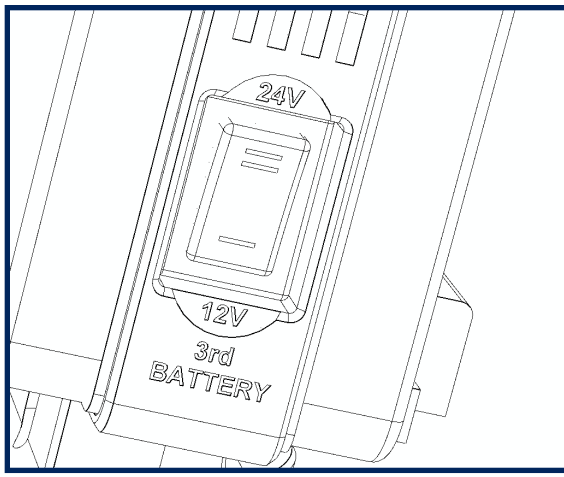
Reposition the pre-wired multi-pin block as shown, so it lines up with the screw holes and the space in the dovetail.



Install the dovetail with the screws. The sled is now ready to accept the battery mount.



Slide the 3rd battery mount onto the dovetail from the rear of the sled. Secure it in place with the two captive thumbscrews.



The switch on the side of the main battery mount is now active. Use it to select whether the 3rd battery is wired parallel (12V) or series (24V) with the rear (#1) battery.

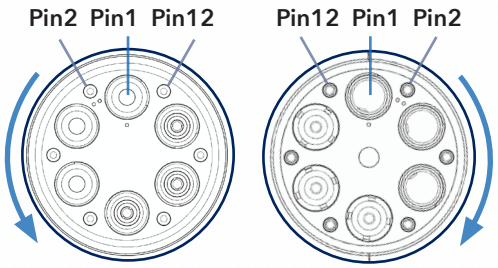
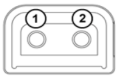
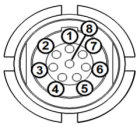
Three batteries, three switches

You're in full control of how batteries are combined on the M-2. The main ON-OFF switch turns power ON or OFF, except for P-taps on each battery mount. The main 12V/24V switch adds the #2 battery in series or parallel with battery #1. And the 3rd battery 12V/24V switch adds the 3rd battery in series or parallel with battery #1. Hot swapping is available with specific combinations, see below.

	BATTERY INSTALLED	#1 REAR			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	✗	✗	✗	✗
	12V Output	✓	✓	✓	✓
	24V Output	✗	✗	✗	✗
	BATTERY INSTALLED	#2 FRONT			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	✗	✗	✗	✗
	12V Output	✓	✓	✗	✗
	24V Output	✗	✗	✗	✗
	BATTERY INSTALLED	3RD BATTERY			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	✗	✗	✗	✗
	12V Output	✓	✓	✗	✗
	24V Output	✗	✗	✗	✗
	BATTERY INSTALLED	#1 REAR & #2 FRONT			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	1 & 2	1 & 2	✗	✗
	12V Output	✓	✓	✓	✓
	24V Output	✗	✗	✓	✓
	BATTERY INSTALLED	#1 REAR & 3RD BATTERY			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	1 & 3	✗	1 & 3	✗
	12V Output	✓	✓	✓	✓
	24V Output	✗	✓	✗	✓
	BATTERY INSTALLED	#2 FRONT & 3RD BATTERY			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	2 & 3	✗	✗	✗
	12V Output	✓	✓	✓	✗
	24V Output	✗	✓	✓	✗
	BATTERY INSTALLED	ALL THREE BATTERIES			
SWITCH	*ON/OFF*	ON	ON	ON	ON
	12/24	12V	12V	24V	24V
	3rd Battery	12V	24V	12V	24V
	HOT SWAP COMBINATIONS	1 & 2 & 3	1 & 2	1 & 3	2 & 3
	12V Output	✓	✓	✓	✓
	24V Output	✗	✓	✓	✓

STEADICAM
24V
12V
3rd
BATTERY

Connector diagrams and warnings

M-2 Connector Pinouts					
Connector Type	**Pin #**	**Description**			
Post/Stage/Base	1 2 3 4 5 6 7 8 9 10 11 12	PWR GND GND +12V VCC5V +24V LED_DATA HD3 TALLY HD2 LEDCLK HD1 GP6			
			Maximum Current	**Manuf. & P/N**	
BNC	n/a	n/a	n/a	AMPHENOL 112253	
P-TAP	1 2	PWR GND +12V	5A - Self Resetting Fuse Protected		
USB	1 2 3 4	+5v D- D+ PWR GND	1.5A	USB TYPE-A	
12/24V	1 2 3	PWR GND +12V +24V	8A	LEMO ECG.0B.303.CLL	
CAM PWR	1 2 3	PWR GND +12V +24V	17A	LEMO ECG.2B.303.CLL	
TALLY	1 2 3 4	PWR GND TALLY SENSE TALLY OUT PWR GND		LEMO ECG.0B.304.CLL	
MON	1 2 3 4 5	PWR GND +12V TALLY n/c n/c	9A	LEMO ECG.1B.305.CLL	
GIMBAL	1 2 3 4 5 6 7 8	PWR GND VB_SW_OUT GND GP3 GND GP4 GND GP5		LEMO ECG.1B.308.CLL	

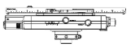
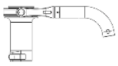
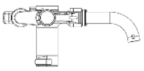
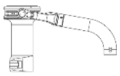
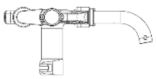
Warnings:

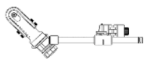
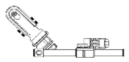
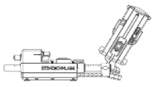
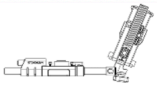
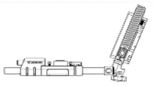
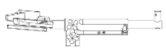
- When mounting “sandwiched” accessories to a battery mount with a battery on its back, in 24Volt mode, do so ONLY on the REAR #1 battery mount. Mounting it to the front #2 battery mount (closest to the post when upright) will damage the equipment in 24V mode. In 12V mode, any battery mount is safe.
- The 12 volt and 24 volt outputs on the M-2 are not regulated, so your actual voltage will be battery voltage. This is typically around 14.4V, and 29V respectively.

M-1 and M-2 features and specs

	Stage					
Feature Description	**M1-TSF**	**M1-TST**	**M2-TSF**	**M2-TSFV**	**M2-TST**	**M2-TSTV**
TILT +10°/-10°					√	√
TILT +0°/-15°		√				
NO TILT	√		√	√		
INTEGRATED VOLT ELECTRONICS & WIRING W/MICRO USB PROGRAMING				√		√
LARGE DOVETAIL PLATE	√	√				
LARGE DOVETAIL PLATE WITH BUBBLE LEVEL			√	√	√	√
INTEGRATED 60mm X 15mm ROD MOUNTS	√	√	√	√	√	√
P-TAP CONNECTORS (5A FUSE PROTECTED)	2	2	2	2	2	2
LEMO 2B 2-PIN CAMERA POWER CONN.	1	1	1	1	1	1
LEMO 0B 3-PIN POWER CONN	2	2	3	3	3	3
LEMO 0B 3-PIN ISO CONN	1	1				
LEMO 0B 4-PIN TALLY IN/OUT W/TALLY ELECTRONICS	1	1	1	1	1	1
HD-SDI BNC CONNECTORS	3	3	3	3	3	3
WEIGHT (lbs) WITH DOVETAIL PLATE	4.0	4.6	3.4	3.5	3.8	3.9
WEIGHT (kg) WITH DOVETAIL PLATE	1.8	2.1	1.5	1.6	1.7	1.8
	Post					
Feature Description	**175-2SIP**	**175-3SIP**	**158-2SP**	**158-2SSP**		
2-SECTION CARBON FIBER TELESCOPIC POST	√		√	√		
3-SECTION CARBON FIBER TELESCOPIC POST		√				
ROTATION INDEXED	√					
POST DIAMETER (in)	1.75	1.75	1.58	1.58		
POST DIAMETER (mm)	44.5	44.5	40.1	40.1		
LENGTH MAX (in)	35.7	48.4	38.9	29.1		
LENGTH MAX (mm)	908	1230	989	739		
WEIGHT (lbs)	2.3	2.5	1.6	1.4		
WEIGHT (kg)	1.0	1.1	0.7	0.6		
	Gimbal					
Feature Description	**M1-GIM**	**M1-GIMV**	**M2-GIM**	**M2-GIMV**		
3/4" ARM POST STANDARD	√	√	√	√		
5/8" ARM POST ADAPTABLE	√	√	√	√		
1/2" ARM POST ADAPTABLE			√	√		
1.5" POST ADAPTABLE	√	√	√	√		
1.58" POST ADAPTABLE	√	√	√	√		
1.75" POST ADAPTABLE	√	√	√	√		
WEIGHT (lbs)	2.1	4.5	2.1	4.3		
WEIGHT (kg)	0.9	2.0	1.0	2.0		
	Monitor Mount					
Feature Description	**175MB-UMM**	**158MB-UMM**				
60mm ROD SPACING		√				
100mm ROD SPACING	√					
1.75" POST ADAPTABLE	√					
1.58" POST ADAPTABLE		√				
WEIGHT (lbs)	1.9	1.8				
WEIGHT (kg)	0.9	0.8				
	Base					
Feature Description	**M1-VLBASE**	**M1-GMBASE**	**M2-VLBASE**	**M2-VL3B**	**M2-GMBASE**	**M2-GM3B**
VLOCK BATTERY MOUNT	√		√	√		
GOLD MOUNT BATTERY MOUNT		√			√	√
LEMO 0B 3-PIN POWER CONN	2	2	2	2	2	2
LEMO 0B 3-PIN ISO CONN	1	1				
LEMO 0B 5-PIN MON CONN	1	1	1	1	1	1
LEMO 2B 2-PIN POWER CONN.	1	1				
USB TYPE-A POWER CONN			1	1	1	1
HD-SDI BNC CONNECTORS	3	3	3	3	3	3
INTEGRATED BASE CHEESE PLATE	√	√				
24V CAPABLE	√	√	√	√	√	√
BATTERY ROD EXTENSION (in) POST TO BATTERY PIVOT	8.9	8.9	10.4	10.4	10.4	10.4
BATTERY ROD EXTENSION (mm) POST TO BATTERY PIVOT	226	226	265	265	265	265
WEIGHT (lbs)	4.6	4.6	3.0	3.8	3.0	3.8
WEIGHT (kg)	2.1	2.1	1.4	1.7	1.4	1.7

M-1 and M-2 part numbers

Model #		Description
TOP STAGE		
M1-TSF		M-1 Top Stage Flat with dovetail plate
M1-TST		M-1 Top Stage Tilt with dovetail plate
M2-TSF		M-2 Top Stage Flat with dovetail plate
M2-TSFV		M-2 Top Stage Flat with dovetail plate and internal Volt controller
M2-TST		M-2 Top Stage Tilt with dovetail plate
M2-TSTV		M-2 Top Stage Tilt with dovetail plate and internal Volt controller
GIMBAL		
M1-GIM		M-1 Gimbal 3/4"
M1-GIMV		M-1 Gimbal 3/4" with Volt Motor Drive and Padded Dock
M1-VCB		M-1 Volt Control Box
M1-V	STEADICAM	M-1 Volt Upgrade Kit with Padded Dock
M2-GIM		M-2 Gimbal 3/4" & 5/8" (817-7980 Padded Dock not included)
M2-GIMV		M-2 Gimbal 3/4" & 5/8" and Volt Motor Drive (817-7980 Padded Dock not included)
POST		
175-2SIP		1.75 2-Section Index Post (20.8"-35.7"/ 528mm-908mm)
175-3SIP		1.75 3-Section Post (20.7"-48.4"/527mm-1230mm)
158-2SP		1.58 2-Section Post (21.7"-38.9"/551mm-989mm)
158-2SSP		1.58 2-Section Short Post (17.8"-31.1"/ 451mm-790mm)

MONITOR MOUNT		
175MB-UMM		1.75 Monitor Bracket with Universal Monitor Mount
158MB-UMM		1.58 Monitor Bracket w Universal Monitor Mount
BASE		
M1-VLBASE		M-1 V-Lock Base 12/24v
815-7350-01		M-1 3rd Battery V-lock Mount with dovetail
800-7350-01		M-1 3rd Battery V-lock Mount 12/24v switch and dual Lemo (815-7945 required)
M1-GMBASE		M-1 Gold Mount Base 12/24v
815-7350-03		M-1 3rd Battery Gold Mount with dovetail
800-7350-02		M-1 3rd Battery Gold Mount 12/24v switch and dual Lemo (815-7945 required)
815-7945		3rd Battery Mount dovetail (for 800-7350-03 and 800-7350-02)
M2-VLBASE		M-2 V-Lock Base 12/24v
M2-VL3B		M-2 3rd Battery V-lock Mount with dovetail 12/24v
M2-GMBASE		M-2 Gold Mount Base 12/24v
M2-GM3B		M-2 3rd Battery Gold Mount with dovetail 12/24v
DOCKING BRACKET		
817-7980		M-Series Padded Docking Bracket

M-1 and M-2 accessories list

CASES & COVERS	
011-0358	M-Series Sled Hard Case
STANDS & BAGS	
FGS-900045	Matthews Balancing Stand
FGS-900046	Matthews Balancing Stand Wheels Set
FFR-000014	Steadicam Sand Bag (empty)
CABLES	
815-0121	4" 0B.303-0B.303 M-1 ISO Power Jumper Cable
257-0045	22" Right Angle 2B.303 to female XLR-4 12 Volt Accessory Cable
257-0046	22" Right Angle 2B.303 to Open Ended Volt 24V Accessory Cable
078-4122-01	24" BNC-BNC Video Cable
257-7930	36" 0B.304 Tally Cable with Sensor and Repeater
815-0119	36" 1B.308-1B.305 12V Monitor Cable 8-Pin LEMO to 5-Pin LEMO
815-0116	36" 1B.305-4-XLR 5-Pin LEMO to 4-Pin XLR4 Monitor cable with tally
815-0118	36" 1B.305-4-XLR 5-Pin LEMO to 4-Pin XLR4 Monitor cable
815-0117	16" 4-HRS-0B.303/BNC Return Monitor Cable
250-0093	22" Right Angle 2B.303 -2Pin Fischer 24V Arri Alexa Cable
800-0120	Right Angle 2B.303 to ARRI Amira/Alexa Mini Power Cable
800-0116	15" Right Angle 2B.303 RA-1B.306 12V Cable RED
ACCESSORIES & SPARES	
815-7935	Low Mode Bracket Kit
815-7138-02	M-1 Gimbal Long Handle, 3/4"
815-7138-03	M-1 Gimbal Handle, 5/8"
815-7920	MDR-3 15mm x 60mm Mounting Bracket
817-7915	MDR-2-3 Universal Mounting Plate
817-7960	MDR-3 Mounting Kit to M1-VCB
250-7977	Arm Post 5/8" to 3/4"
800-7900	Mitchell Vehicle Mount Large Socket Block
817-7500	Universal Monitor Mount. (Excludes Mounting Blocks).
817-7510-03	Monitor Mounting Block Kit Transvideo 6" Cinemonitor
817-7510-01	Monitor Mounting Block Kit Transvideo 7" Stargate
817-7510-04	Monitor Mounting Block Kit Transvideo 8" Cinemonitor
815-7517-02	Mon/Batt Rod: 15mm x 6"
815-7517-03	Mon/Batt Rod: 15mm x 8"
815-7517-04	Mon/Batt Rod: 15mm x 10"
250-7915	15mm Motor Rod Set & Bracket
815-7355	M-Series Dovetail Camera Mounting Plate
815-7945	6" Short Dovetail Plate
888-7660	M2 Short Dovetail for Base
815-7465	11.25" Long Dovetail Plate
078-1121	1/4"-20 Camera Mounting Screw
078-1122	3/8"-16 Camera Mounting Screw
800-7970	1 lb. Weight - 1/4-20 Thread
815-7970	M-Series tool kit
VOLT SPARES	
817-0135-01	44" RA-0B.308 Volt Motor Cable
817-0135	28" RA-0B.308 Volt Motor Cable
817-0131	10" RA-0B.303 Volt Power Cable
817-7129	Replacement Pulley Wheel, Trunnion. For M-1/M-2; Volt-1.5
817-7140	M-1 Volt Pan Sensor Assy
817-7149	M-1 Volt Encoder Ring Assy
817-7110	Volt Motor Drive Unit
817-7959	Volt Counterweight 1/4-20
BLT-115700	Volt Pan & Tilt Axis Belt
817-7904	15mm Rod Nut
817-7906	15mm x 1 3/8 M-F Rod Spacer
817-7945	60mm x 15mm Volt Rod Mounting Bracket

STEADICAM®

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