

**WARNING! DO NOT DISASSEMBLE.**

Spring tension can cause injury.  
Return to Tregaskiss for service.



## **TECHNICAL GUIDE**

### **For Robotic Safety Clutch**

- **WIRING DIAGRAM**
- **PARTS LIST**
- **SWITCH OPERATION,  
REPLACEMENT & SETTING**
- **SPECIFICATIONS**

*Certified ISO 9001:2008  
Please read instructions prior to use.  
Save this manual for future reference.*

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## WARRANTY

Product is warranted to be free from defects in material and workmanship for the period specified below after the sale by an authorized Buyer. Should there be a defect please refer to our Return Merchandise Policy.

<b>PRODUCT</b>	<b>WARRANTY PERIOD</b>
TOUGH GUN™ Robotic MIG Guns	180 days
TOUGH GUN Reamer	1 year
TOUGH GARD™ Spatter Cleaner	1 year
TOUGH GUN Robotic Peripherals (Clutch, Sprayer, Wire Cutter, Mounting Arms)	1 year
Low-Stress Robotic Unicables (LSR Unicables)	2 years

Tregaskiss reserves the right to repair, replace or refund the purchase price of non-conforming product. Product found not defective will be returned to the Buyer after notification by Customer Service.

Tregaskiss makes no other warranty of any kind, expressed or implied, including, but not limited to the warranties of merchantability or fitness for any purpose. Tregaskiss shall not be liable under any circumstances to Buyer, or to any person who shall purchase from Buyer, for damages of any kind, including, but not limited to any, direct, indirect incidental or consequential damages or loss of production or loss of profits resulting from any cause whatsoever, including, but not limited to, any delay, act, error or omission of Tregaskiss.

Genuine Tregaskiss™ parts must be used for safety and performance reasons or the warranty becomes invalid. Warranty shall not apply if accident, abuse, or misuse damages a product, or if a product is modified in any way except by authorized Tregaskiss personnel.

## SAFETY

### **CALIFORNIA PROPOSITION 65 WARNING**

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer.

This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after use.*

(California Health & Safety Code Section 25249.5 at seq.)



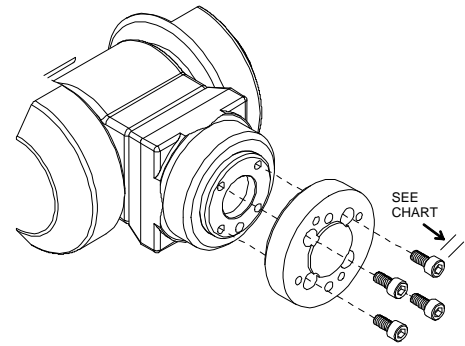
# 1.0 - INSTALLATION

## STEP #1

### INSTALLING INSULATING DISC TO ROBOT

- Ensure robot face is in SYNC before mounting insulating disc.
- Install insulating disc with mounting bolts (not supplied).
- Torque screw 45 in.-lbs. (5 Nm).

M6	M5
HEAD HEIGHT MAX.	HEAD HEIGHT MAX.
0.236" (6 mm)	0.197" (5 mm)

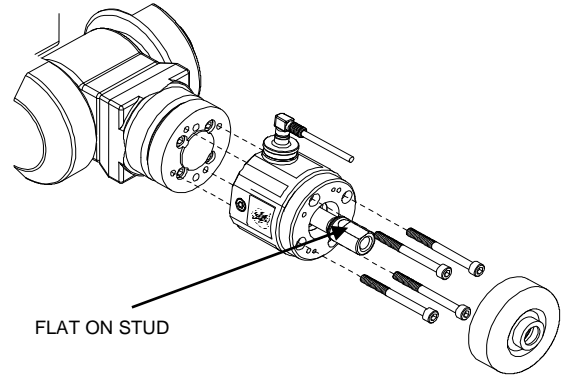


## STEP #2

### INSTALLING CLUTCH TO INSULATING DISC

- Remove dust boot and install safety mount with bolts supplied.
- Ensure that switch assembly is facing up.
- Reinstall dust boot.
- Torque screw 45 in.-lbs. (5 Nm).

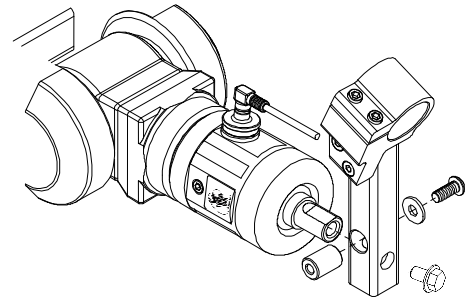
**NOTE:** Make sure "flat" on stud is oriented in home position (between switch and air assist hole) as shown.



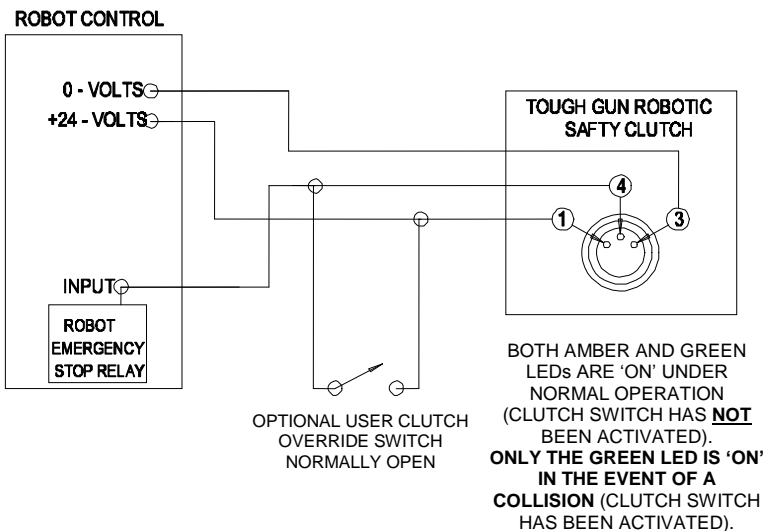
## STEP #3

### INSTALLING GUN MOUNT ARM TO CLUTCH

- Loosen lock screw and install gun mount 90° to the horizontal.
- Torque screw 50 in.-lbs. (6 Nm).
- Insert hex bolt through hole in arm and tighten to 50 in.-lbs. (6 Nm).



# 2.0 - WIRING DIAGRAM



**WARNING:** Current draw for relay may not exceed 200 ma (loading capacity of switch) or damage to switch will occur.

**RECOMMENDED RELAY** (if necessary)  
Potter & Brumfield 24-VDC 1.2 watts 50-mA.

**NOTE:** Pin #3 (0 volts DC) required to enable LEDs only.

PIN	COLOUR	DESCRIPTION
3	BLUE	0-VOLTS-DC
1	BROWN	+24 VOLTS -DC
4*	BLACK	OUTPUT +24-VDC

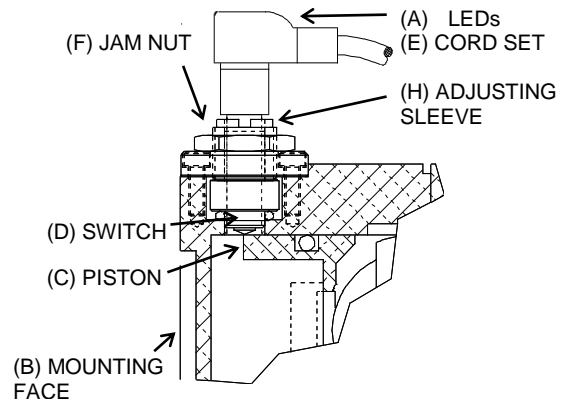
\*SIGNAL BACK TO THE ROBOT TO STOP MOTION

### 3.0 – SWITCH OPERATION / REPLACEMENT / SETTING

#### OPERATION

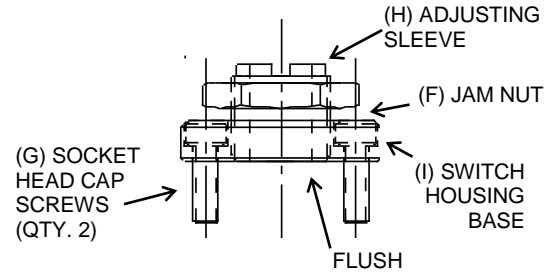
The TOUGH GUN Clutch is equipped with a normally closed switch for safe reliable operation. Remote indication of status is supplied by means of two LEDs (A) housed in connector on cord-set. The green LED indicates power on and the amber light indicates normal operating state.

During a crash or fault condition, piston is shifted towards mounting face (B) of clutch. The shifting of piston (C) activates switch (D) and drops out +24 volt signal (output), which will be indicated by amber light in cord-set deactivating. Upon correction or return to normal operating state, amber light will be on and +24 volt signal (output) re-established.



#### REPLACEMENT

To replace switch complete the following. First, remove cord-set (E), jam nut (F) and two socket head cap screws (G). Now you may remove switch holder from clutch allowing switch assembly to be removed from housing. Before replacing new switch assembly in housing, turn adjusting sleeve (H) counterclockwise until sleeve is flush with switch housing base (reference Diagram #1). Insert switch assembly (reference Diagram #2) into housing and reattach housing assembly to clutch by means of two socket head cap screws. Reassemble jam nut on adjusting sleeve but do not tighten until switch is set in proper position. Reconnect cord-set to switch with power on. At this point, both LEDs should be on.



SWITCH HOUSING (PART # AS-707-12)  
DIAGRAM #1

#### SETTING

With both LEDs active, you may proceed to adjust switch for proper sensitivity. With jam nut free on adjusting sleeve, rotate adjusting sleeve clockwise using adjusting wrench until amber light is switched off (switch activated). Now slowly turn adjusting sleeve counterclockwise until amber LED is lit. At this point, switch is set for maximum sensitivity. Depending on application, you may wish to reduce sensitivity by further adjustment of adjusting sleeve (counterclockwise rotation) by additional 10-15 degree increments (approximately). Once desired sensitivity is achieved, lock position of switch by torquing jam nut (100 in.-lbs./11 Nm) on adjusting sleeve against switch housing base.

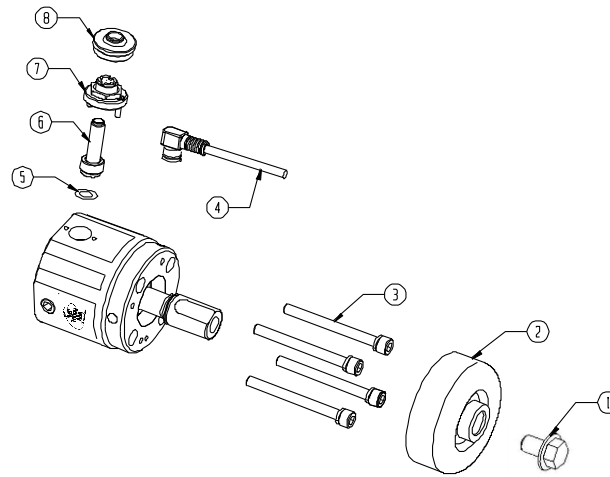


MICRO-SWITCH ASSEMBLY (PART # AS-708-13)  
DIAGRAM #2

### 4.0 – TROUBLESHOOTING

PROBLEM	CAUSE
ENSURING REPEATABILITY OF TCP	<ul style="list-style-type: none"> <li>CHECK NECK FOR DAMAGE; MOST OFTEN THE ROBOT HAS HAD SOME SORT OF CRASH AND THIS HAS RESULTED IN THE NECK BEING BENT. CHECK THE NECK BEFORE CHECKING OTHER COMPONENTS.</li> <li>ENSURE THAT THE TORQUE SPECS OF THE BOLTS FOR THE INSULATING DISC, CLUTCH, AND MOUNTING PIN ARE CORRECT. TOO MUCH TORQUE CAN CAUSE THE INSULATING DISC TO DEFORM, STRIP THREADS WHEN MOUNTING THE CLUTCH, AND DEFORM THE ALUMINUM ON THE MOUNTING ARM. ALL OF THESE WILL EFFECT TCP LOCATION. <ul style="list-style-type: none"> <li>INSULATING DISC ----- 45 in.-lbs. (5 Nm)</li> <li>CLUTCH BOLTS ----- 45 in.-lbs. (5 Nm)</li> <li>MOUNTING PINS ----- 50 in.-lbs. (6 Nm)</li> <li>SWITCH JAM NUT ----- 100 in.-lbs. (11 Nm)</li> </ul> </li> <li>ENSURE THE HOUSING IS FULLY SEATED IN THE GUN MOUNT AND THAT BOTH BOLTS ARE TIGHTENED WITH EVEN PRESSURE.</li> <li>ENSURE THAT IN BOTH THE QUICK CHANGE AIR-COOLED AND QUICK CHANGE WATER-COOLED, THAT THE NECKS ARE FULL SEATED AND TIGHTENED CORRECTLY.</li> </ul>

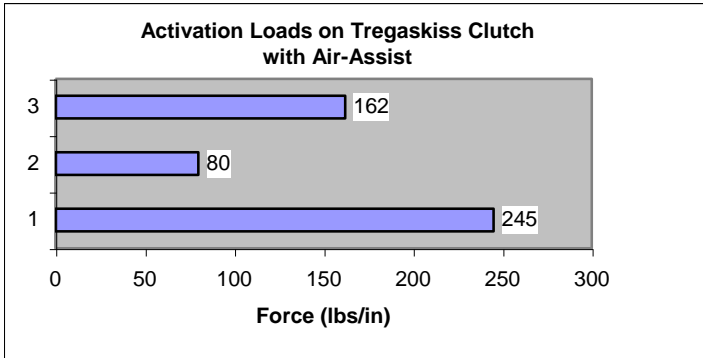
## 5.0 - EXPLODED VIEW & PARTS LIST



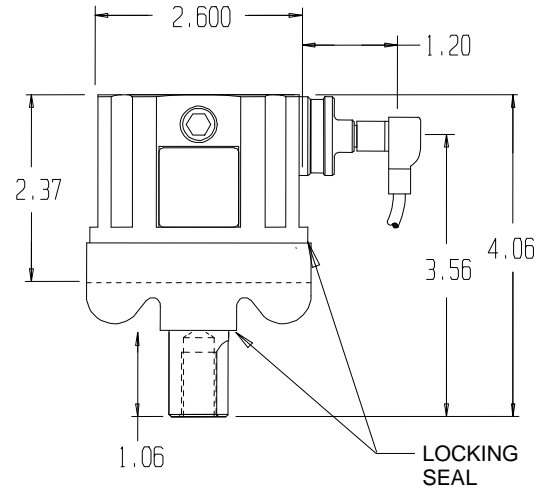
ITEM #	QTY / ASSY	PART #	DESCRIPTION
1	1	AS-309	CLUTCH BOLT
2	1	AS-707-11	DUST BOOT
3	4	AS-707-10	M6 X 1.0 X 65 S.H.C.S.
4	1	AS-708-14	CORD SET (AS-708-14-1 & AS-708-14-2)
	1	AS-708-14-1	JUMPER CABLE (12' - 3 m WITH L.E.D.s COILED)
	1	AS-708-14-2	JUMPER CABLE (15' - 5 m)
NOT SHOWN	1	AS-709-14	CABLE ASSEMBLY 2-PC MOTOMAN
NOT SHOWN	1	AS-709-14-2	MAIN CABLE ASSEMBLY MOTOMAN 5'
NOT SHOWN	1	AS-709-14-3	MAIN CABLE ASSEMBLY MOTOMAN 10'
5	1	194547-1	O-RING
6	1	AS-708-13	MICRO-SWITCH ASSEMBLY
7	1	AS-707-12	SWITCH HOUSING
	2	---	CAP SCREW - 5-40 X 3/8 SERIAL # 0001 TO 5393
	2	---	CAP SCREW - M3 X .5 X 10 AFTER SERIAL 5394
8	1	AS-707-16	SWITCH PROTECTOR
NOT SHOWN	1	AS-707-15	SWITCH ADJUSTING WRENCH
	1	AS-708	REPLACEMENT CLUTCH (WITH JUMPER AND LONG CORD)
	1	AS-720	REPLACEMENT CLUTCH (12' 3 m JUMPER CORD ONLY)
NOT SHOWN	1	AS-707-40	VELCRO CLUTCH CABLE WRAP
<b>INSULATING DISCS</b>			
		AS-101-01	BLANK
		AS-101-2	ABB® IRB-1400, IRB-1500, IRB-2000, IRB6 MILLER® MRV-2, MRV-10, FANUC® S6, 100 MOTOMAN® SK6, OTC MRV-6, DR-4400
		AS-101-4	ABB® IRB-2400
		AS-101-5	OTC DR200 / MILLER
		AS-101-6	OTC / MILLER
		AS-101-12	PANASONIC® W0500, ABB AC500
		AS-102-5	KUKA®
		AS-102-6	HITACHI® PW-10
		AS-102-7	MILACRON® T3-776
		AS-102-8	COMAU® SMART-3S®
		AS-102-10	MOTOMAN® K6, K10, HITACHI M6060,
		AS-102-11	HITACHI® M5030, M6030
		AS-102-12	PANASONIC® AW-500
		AS-102-13	INSULATING DISC
		AS-102-14	INSULATING DISC
		AS-103-3	FANUC ARCMATE® JR (55), SR (510)
		AS-103-4	KUKA®
		AS-104-3	MILACRON®
		AS-105-1	MILLER® MRK-5 / OTC
		AS-105-2	MILLER® MRH-2, MR-1000 / OTC
		AS-106-1	MOTOMAN® L10W, L106, PANASONIC® AW7000
		AS-106-3	MITSUBISHI® MZ10
		AS-106-4	PANASONIC AW-010A, AW-8010, VR-008A, VR006A AND VR-006ALII, PANASONIC® AW-005A, AW-010A
		AS-106-5	SAMSUNG® FARA AM1
		AS-106-7	MOTOMAN: SV3
		AS-106-8	FANUC ARC MATE 50IL
		AS-106-9	KAWASAKI FS-10L
		AS-107-1	NACHI® 7603
		AS-107-2	NACHI® VORG-35
		AS-107-3	NACHI® SC15
		AS-107-4	NACHI® SC 35-01
		AS-107-6	NACHI
		AS-107-7	NACHI SC06F-01, SC06F-02
		AS-110-1	PUMA® ALL, KAWASAKI® ALL

# 6.0 – TECHNICAL SPECIFICATIONS

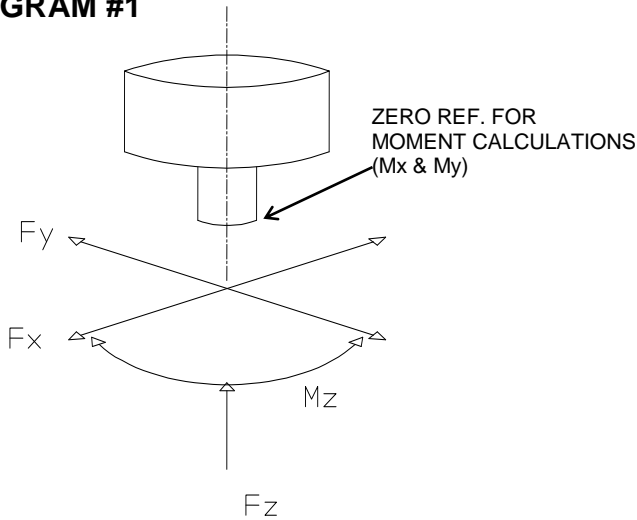
- Force and moment diagram for air assist (Refer to DIAGRAM #1)
- Range of travel
  - X and Y direction  $\pm 20^\circ$
  - Z direction .250"
  - Rotational  $\pm 360^\circ$
- Physical dimension (Refer to DIAGRAM #2)
- Weight - 1.99 lbs. / .91 kg.
- Trip/Activation points
  - X and Y direction  $\pm 1.0^\circ$
  - Z direction .018"
  - Rotational about Z axis  $\pm 1.0^\circ$
- Electrical data
  - Micro-Switch P.N.P. / N.C.
  - Operational voltage 10 to 30 V DC
  - Indicator LED



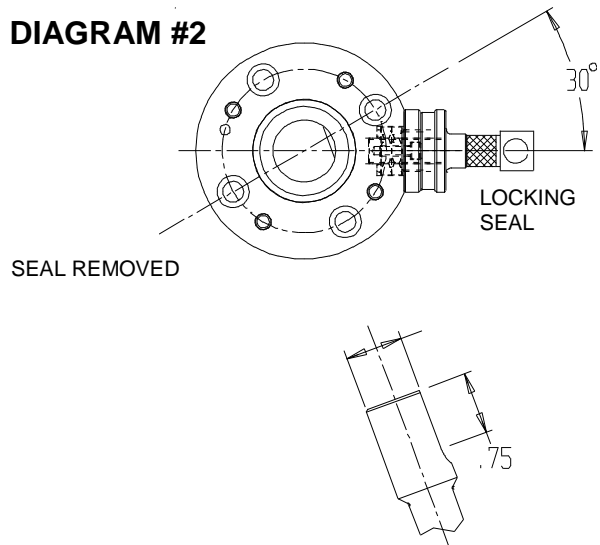
1. Fz Axial load (lbs.)
2. Fx, Fy Bending Load (lbs.)
3. Mz Torsion Load (in.-lbs.)



**DIAGRAM #1**



**DIAGRAM #2**



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