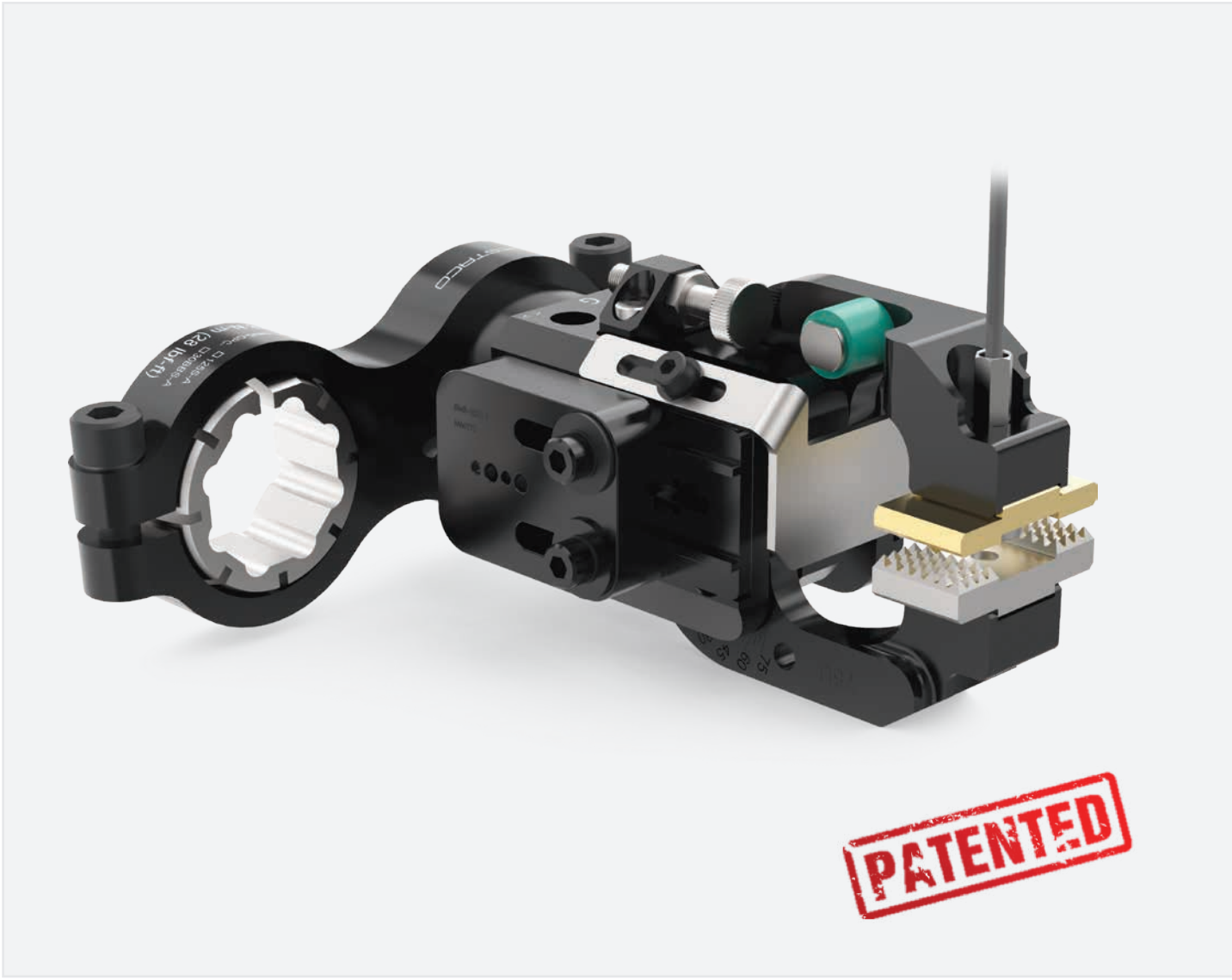
84N5 Series Service Manual



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Contents

HAZARD SYMBOLS	
SYMBOL	**DEFINITION**
⚠ CAUTION	**Indicates a situation which, if not avoided, could result in damage to the unit, equipment, or environment.**
⚠ WARNING	**Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

Personal Protective Equipment (PPE)

The personal protective equipment (PPE) described below must be provided by the unit owner and be worn by the responsible operating personnel when working with the unit.

Wear protective gloves

Wear safety shoes

Wear ear protectors

Wear a safety helmet

Wear safety goggle

Electric Shock Hazard

1. Tip Replacement:

Note:

- Top and bottom tips should be replace at the same time.
- Separate Tip Kits of different configurations are available; refer Table.6 in BOM section Page 26.
- Tips provided in kits, components not sold separately.

Serrated & Polyurethane tips:

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to replace tips.
2. Remove the existing tip by unscrewing the M6 screw in the jaw using 4mm Allen key (see Fig.1).
3. Insert the new tip in the same position, apply Loctite 242 or equivalent to the BHCS screw & tighten to 6 Nm. Repeat step for bottom jaw.

Note:

- For in-Jaw part present sensor, see Page 14 for sensor tip replacement.

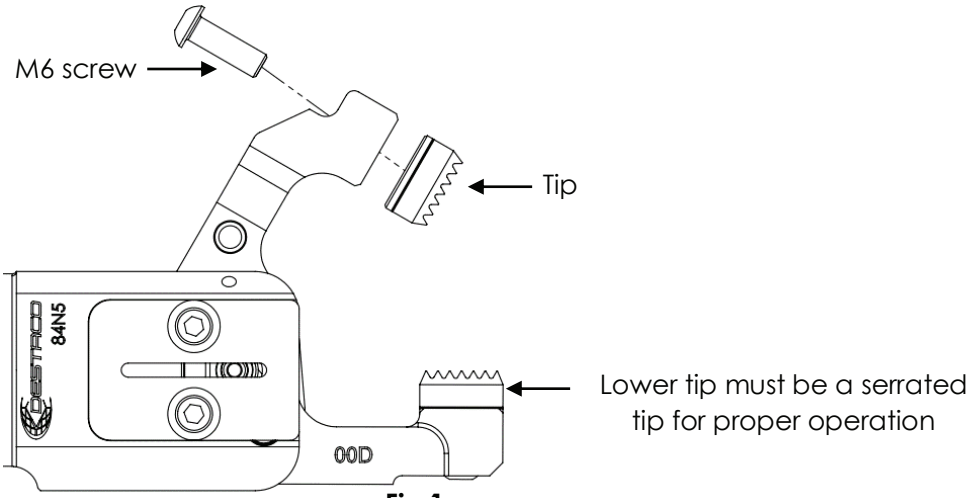


Fig.1

Cone tips: (Note: Cone tip is only used on the top jaw)

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to replace tips.
2. Remove the existing Cone Tip by unscrewing it using 13mm wrench (see Fig.2).
3. Insert the new cone tip in the same position, apply Loctite 242 or equivalent to the tip and tighten using 13mm wrench to 6Nm.
4. Repeat the serrated tip replacement step for bottom jaw.

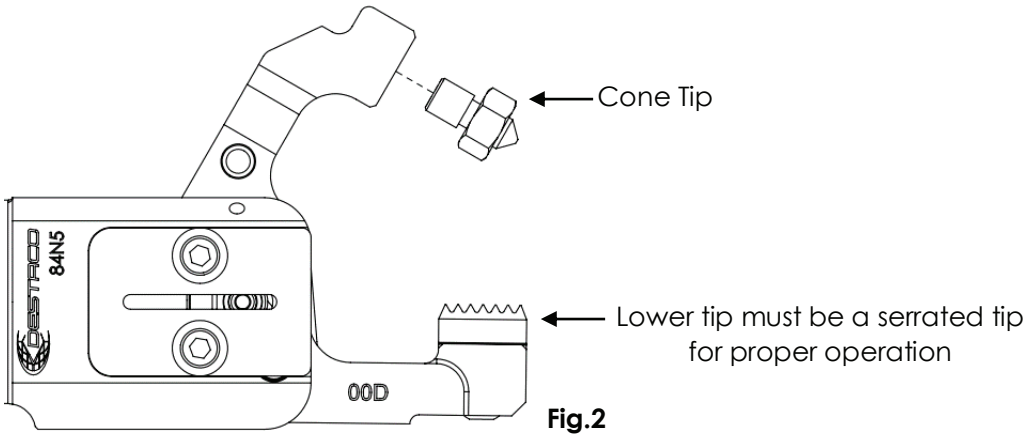


Fig.2

Flat tips:

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to replace tips.
2. Remove the existing tip by unscrewing the In-Jaw tip screw in the jaw using 4mm Allen key (see Fig.3).
3. Insert the new tip in the same position, apply Loctite 242 or equivalent to the screw & tighten to 6 Nm. Repeat step for bottom jaw.

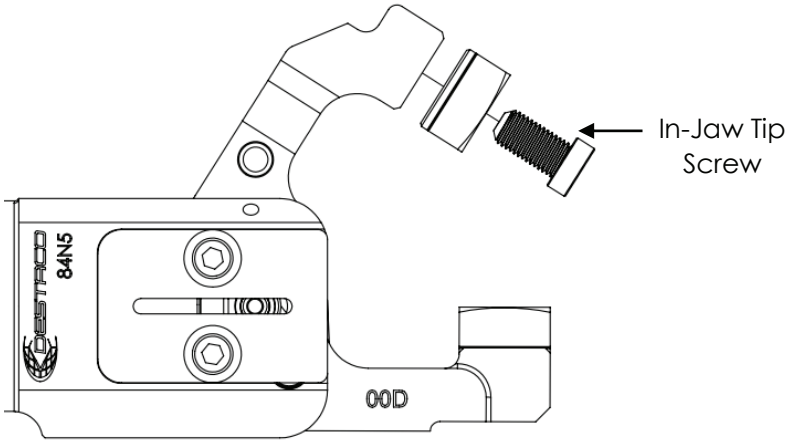


Fig.3

2. Blank Stop:

Note:

- Blank Stop Kit (Part No 8MH-1053-1) available, refer Table.3 in BOM section Page 26
- Replaceable blank stop provided in a kit, components not sold separately.

1. Fully open the gripper jaws with air pressure.

⚠ WARNING Remove air pressure from gripper prior to attempting to replace blank stop.

2. Remove the existing Blank Stop by unscrewing the M4 screw using 3mm Allen key (see Fig.4).
3. Insert the new Blank Stop on the chamfered face of the gripper body and tighten it with the M4 screw using 3mm Allen key to 6Nm (see Fig.5).
4. The Blank Stop is adjustable to the required position through the slots present in the sheet stop.
5. Jaw openings exceeding 60° opening the blank stopper must remain away from the body due to jaw protrusion (see Fig.6).

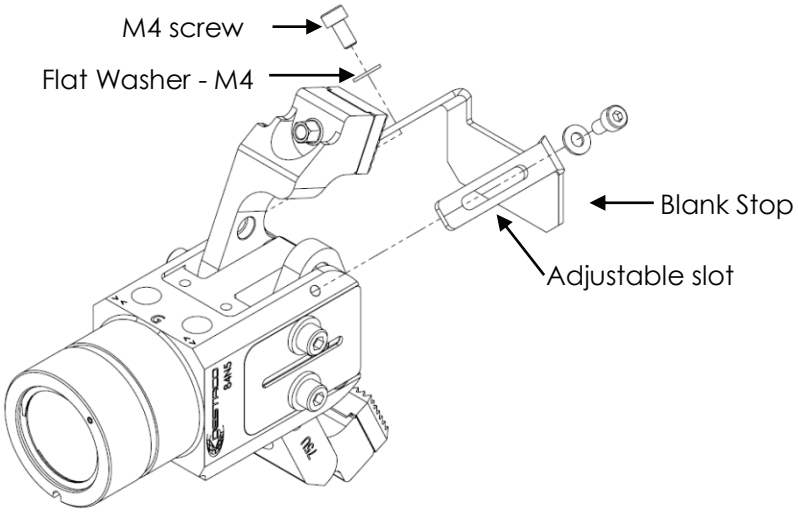


Fig.4

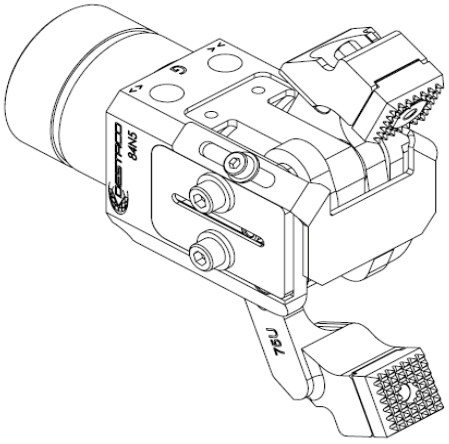


Fig.5

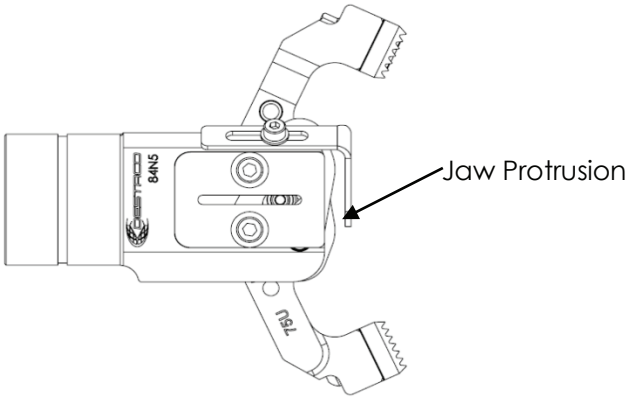


Fig.6

Note:

- For PA Jaw style (i.e. 90°) a Blank Stop option is not available.

3. Jaw Replacement:

Note:

- Jaw Kits of different configurations available, refer Table.2 in BOM section Page 26
- Jaws are sold in kits, components's not sold separately

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to replace jaws.
2. Remove the tips from upper and lower jaw as per the steps under **tip replacement** (see Fig.7).
3. Remove the two side plates in the body of the gripper by unscrewing the M5 screw using 4mm Allen key (see Fig.8).

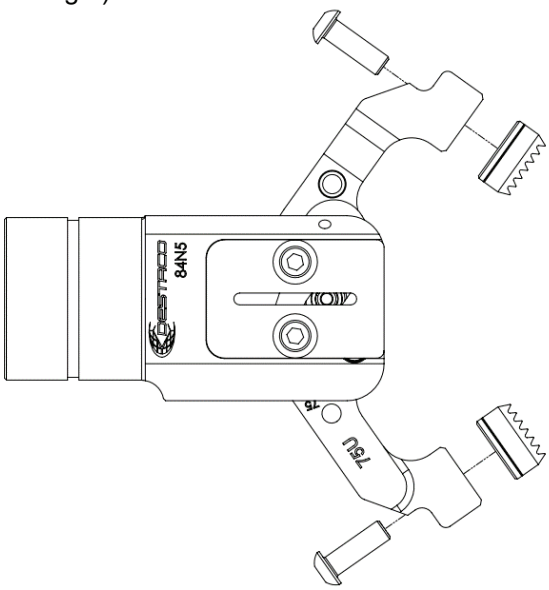


Fig.7

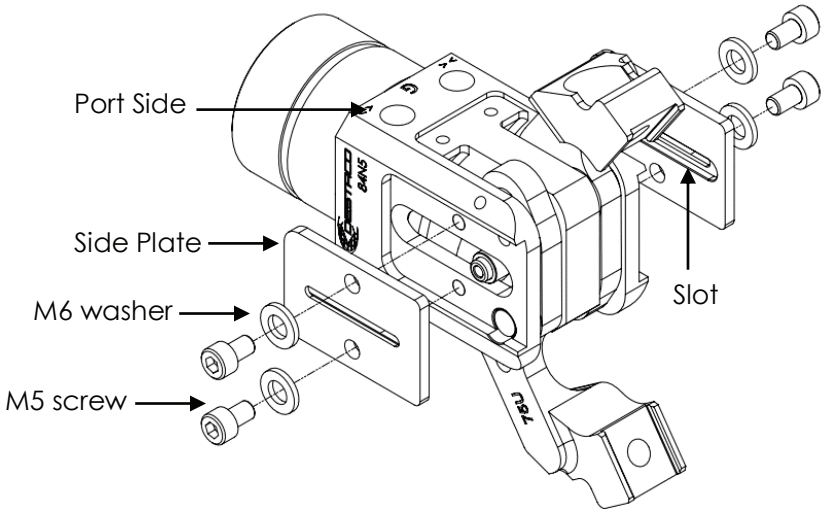


Fig.8

4. Important: Remove upper jaw first. Remove the Cam pin and the Cam bushing which pass thru the jaw and the piston clevis (see Fig.9).
5. Remove the upper pivot pin, in contact with the gripper body and jaw using a rod having diameter Ø4mm or smaller. Push the pivot pin with the rod thru the gripper body and remove. Remove the top jaw from the gripper (see Fig.10).

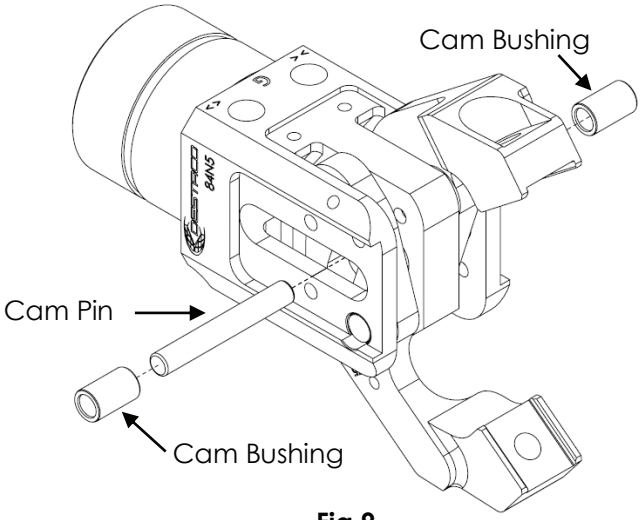


Fig.9

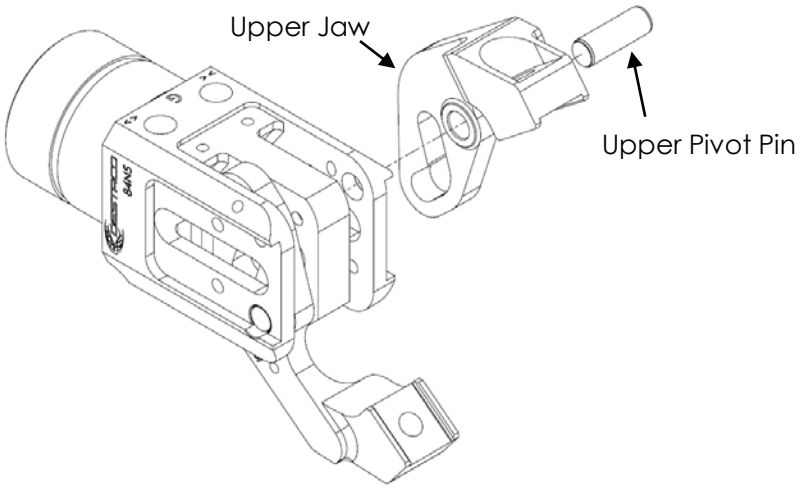


Fig.10

6. Repeat the above step (5) for lower jaw (see Fig.11).

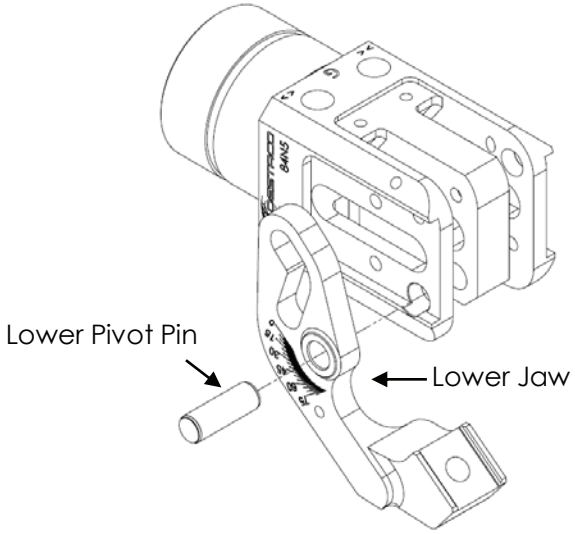


Fig.11

7. Replacement jaw: Apply NYE 368 RHEOLUBE or equivalent grease to the jaw cam surface, pivot pinhole of the jaw and gripper body and to the pivot pin (see Fig.12).

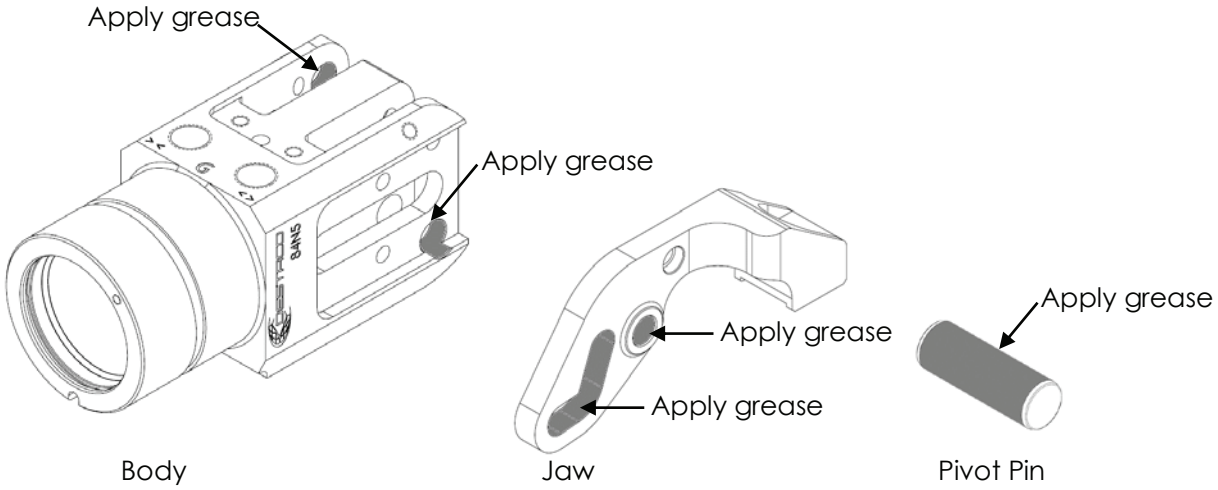


Fig.12

8. Insert the jaw between the trident structure of the body and position it such that the jaw pivot pin hole is aligned to the pivot pin hole in the gripper body. Insert the pivot pin so that the jaw pivots freely around it (see Fig.13).
9. Repeat the above step (7 & 8) for the lower jaw (see Fig.11 & Fig.14).

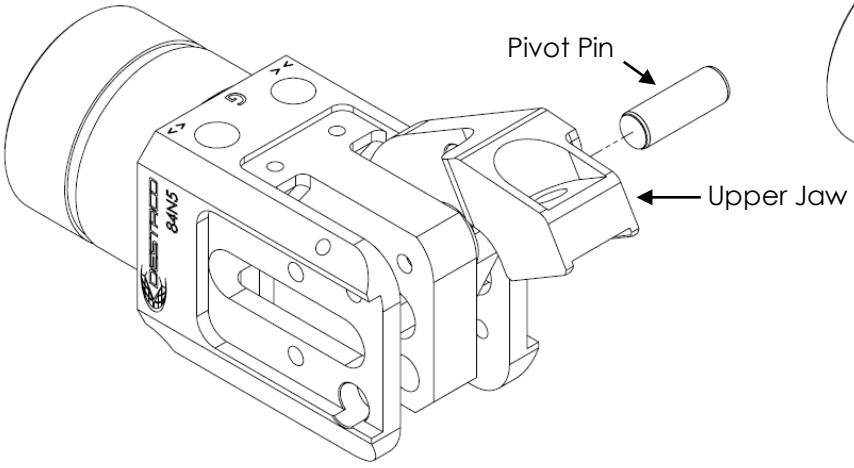


Fig.13

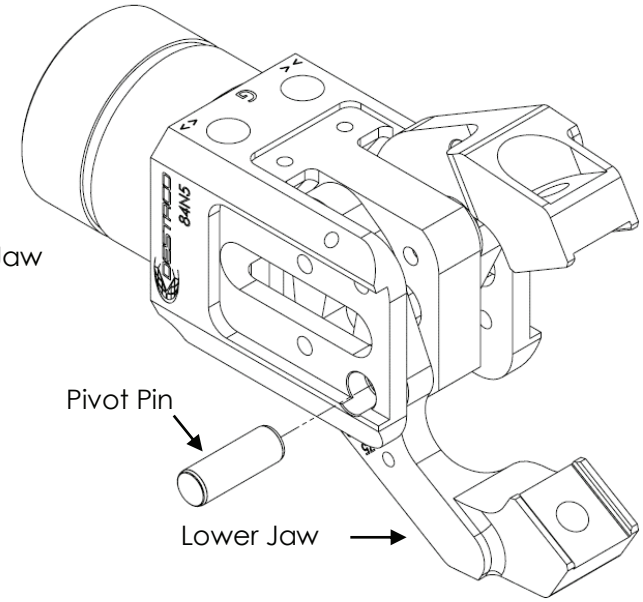


Fig.14

10. Apply NYE 368 RHEOLUBE or equivalent grease to the cam pin, cam bushing and clevis cam driver hole (see Fig.15).

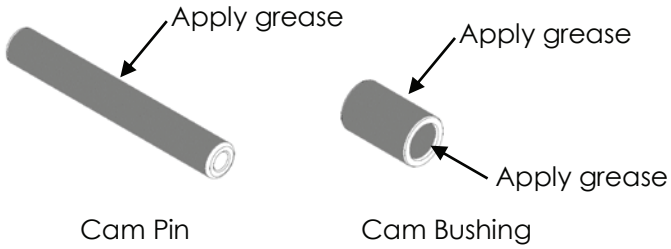


Fig.15

11. Insert the cam pin thru the two jaws cam slot and thru the hole in the clevis cam driver. After cam pin insertion, insert the cam bushing on each cam pin end until they touch the clevis cam driver. The bushings must seat properly and move freely within the jaw cam slot and during operation (see Fig.16 & Fig.17).

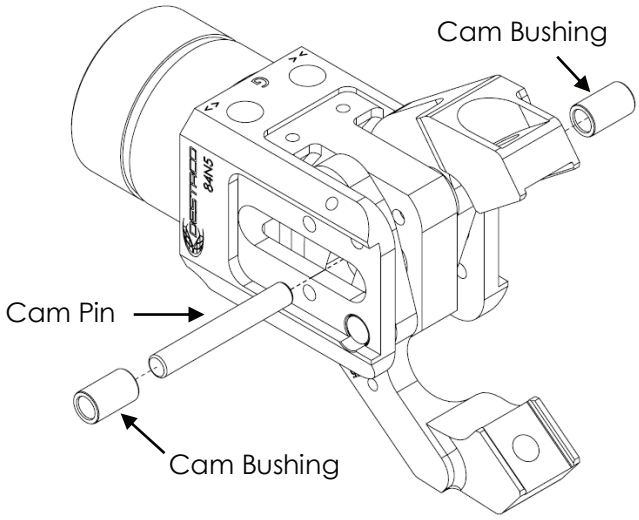


Fig.16

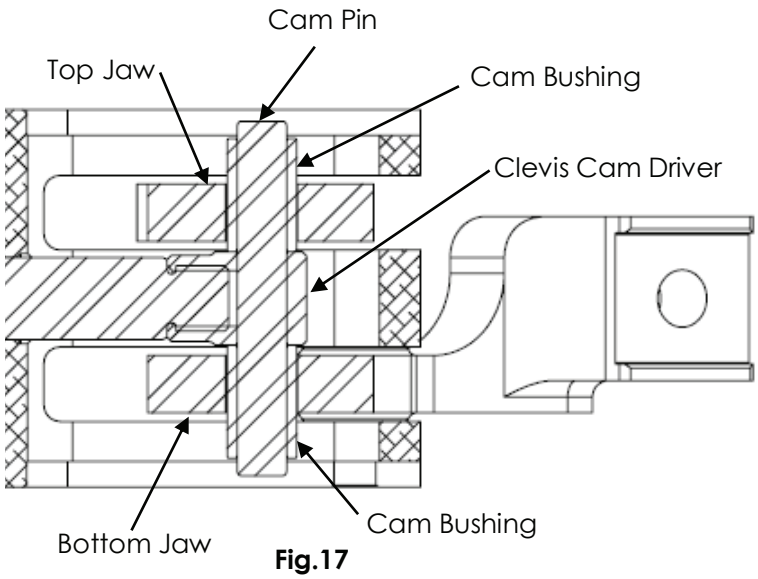


Fig.17

12. Check if both the jaws are moving synchronously by linearly moving the cam pin by hand.
13. Insert the side plate on either side of the gripper body such that the exposed end of the cam pin is in the slot provided in the side plate. Apply the Loctite 242 or equivalent to M5 screw and tighten it using 4mm Allen key to 6Nm (see Fig.18).

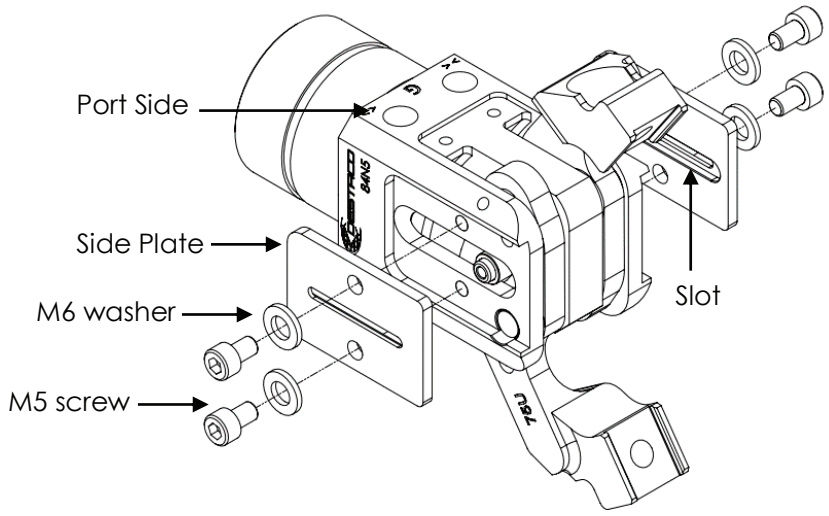


Fig.18

14. Connect the pneumatic supply to the ports and check the gripper actuation.

4. Jaw Open Angle Replacement & Adjustment:

Note:

- Separate Open Angle Adjustment Kit (Part No 8MH-1052-1) available, refer Table.4 in BOM section Page 26
- Components not sold separately

Replacement:

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove Air pressure from gripper prior to replacing the open angle adjust.
2. Remove the existing Stopper Mount and Stopper Knob by unscrewing the M4 screw using 3mm Allen key (see Fig.19).
3. Remove the existing Bumper Mount and Bumper Shock by unscrewing the M5 screw using 4mm Allen key (see Fig.19).
4. Mount the new Stopper Knob and M6 nut to the Stopper Mount, insert the Stopper Mount, Stopper Knob and M6 nut assembly to the top face of gripper body and tighten it with the M4 screw using 3mm Allen key to 6Nm.
5. Insert the Bumper Shock and Bumper mount to the upper jaw and tighten it with M5 screw using 4mm Allen key to 6Nm.

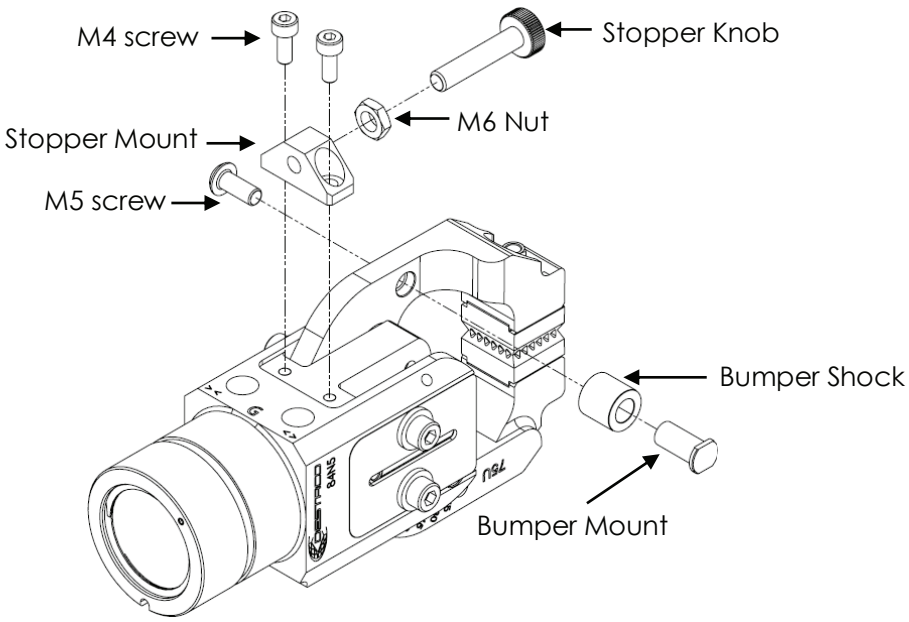


Fig.19

Adjustment:

6. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to adjust opening angle.
7. Using 10mm wrench loosen the M6 nut of the Stopper Knob.
8. Rotate the Stopper Knob by hand to move it linearly until the required opening angle of jaw is obtained (see Fig.20). The angle (0° to 75°) is etched on the jaw surface for reference (see Fig.21).
9. Tighten the M6 nut of Bumper shock using 10mm wrench after angle adjustment.

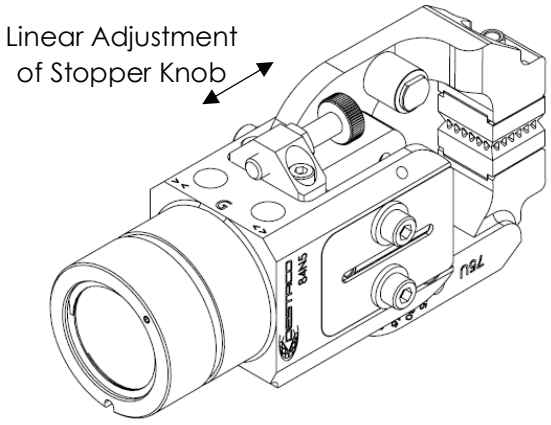


Fig.20

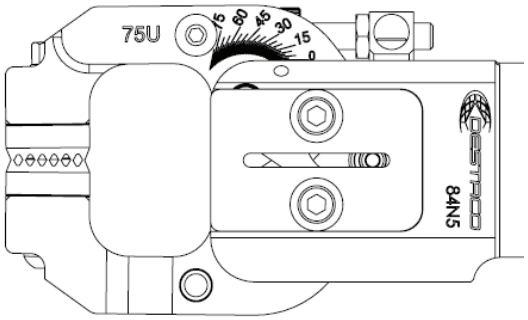


Fig.21

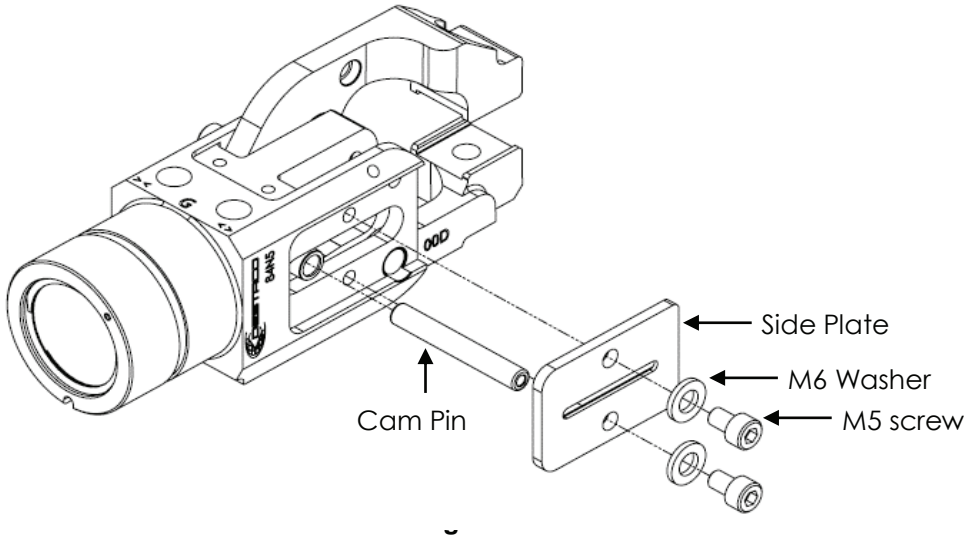
5. Sensors:

Side Mount Sensor:

Note:
- Separate Side Mount Sensor Kit of PNP or NPN type available, refer Table.8 in BOM section Page 27
- Kit components not sold separately

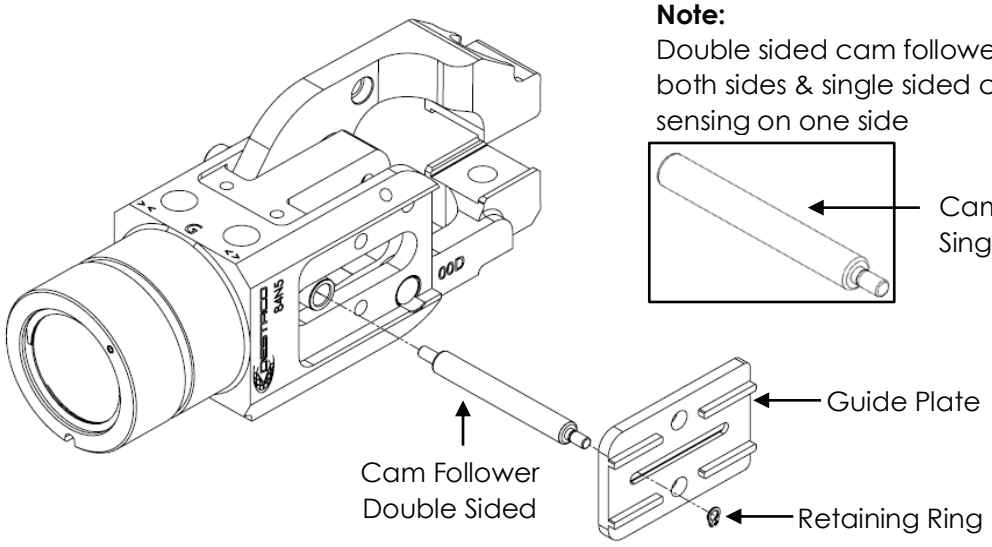
1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove air pressure from gripper prior to attempting to mount side mount sensor.
2. Side mount sensor can be mounted on either side or both sides of the gripper body.
3. Remove the M5 screw, M6 washer, Side Plate & Cam Pin from the gripper (see Fig.22).

Note: Remove the side plate on opposite side to ease assembly if necessary.



4. Mount the Cam Follower & Guide Plate to the gripper (see Fig.23)
5. Insert Retaining Ring to the slot provided in Cam Follower (see Fig.24)

Note: It is recommended to sense blank on retaining ring side for sensors on both sides option



Note:
Double sided cam follower will be used for sensing on both sides & single sided cam follower will be used for sensing on one side

Fig.23

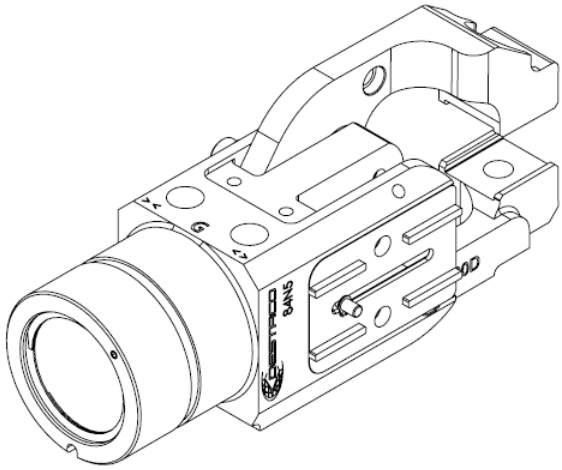


Fig.24

6. Mount the Inductive Sensor to Sensor Carriage with M3 Flat Head Screw (see Fig.25)

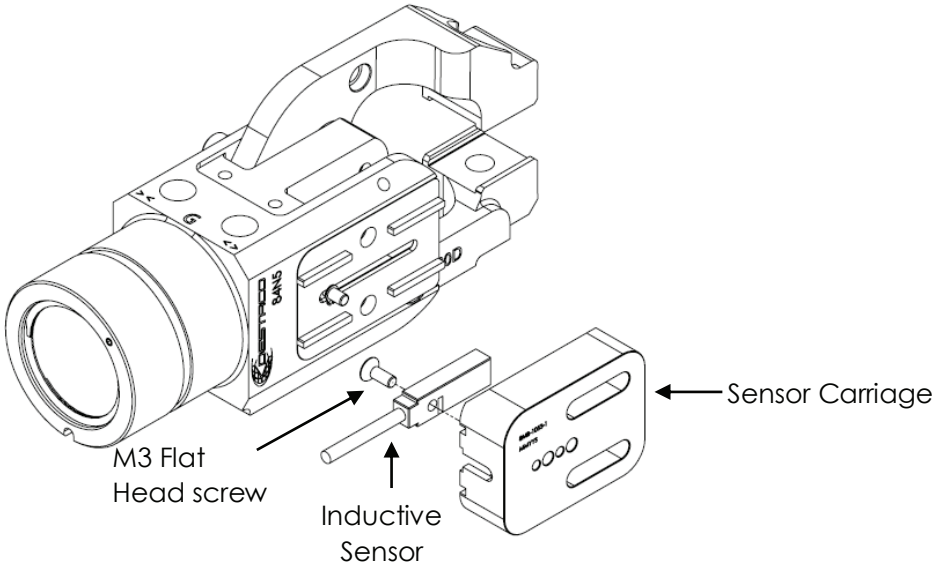


Fig.25

7. Mount the Sensor Carriage to the gripper with M5 Flat Washer, M5 Schnorr Serrated Washer & M5 Screw (see Fig.26)

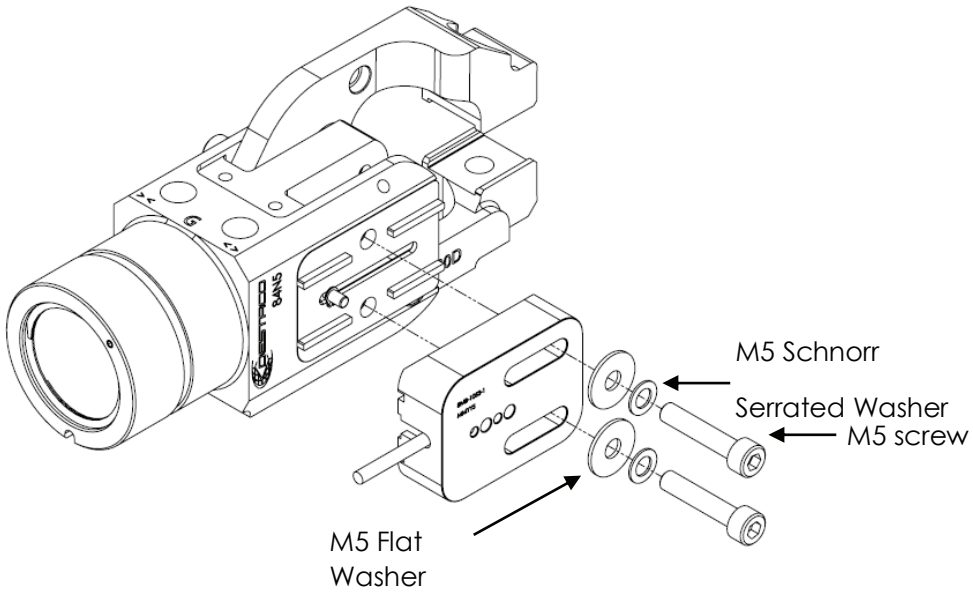


Fig.26

Sensor Arrangement for different Sensing Options

Single Sheet and Full Close Sensing Option

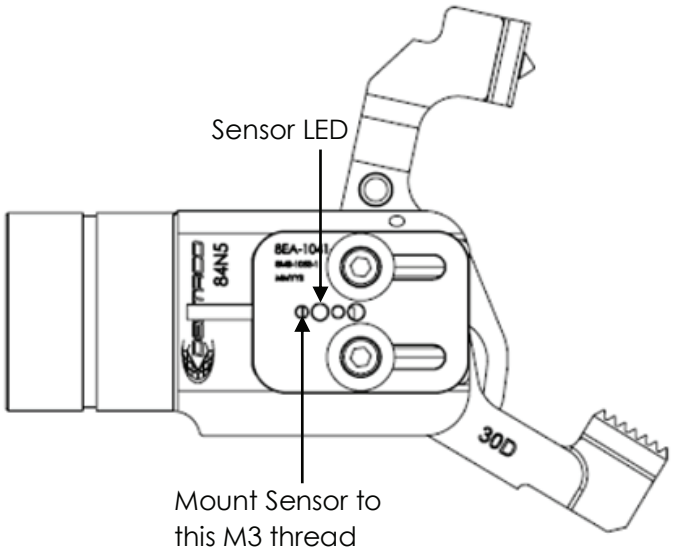


Fig.27

Full Open Sensing Option

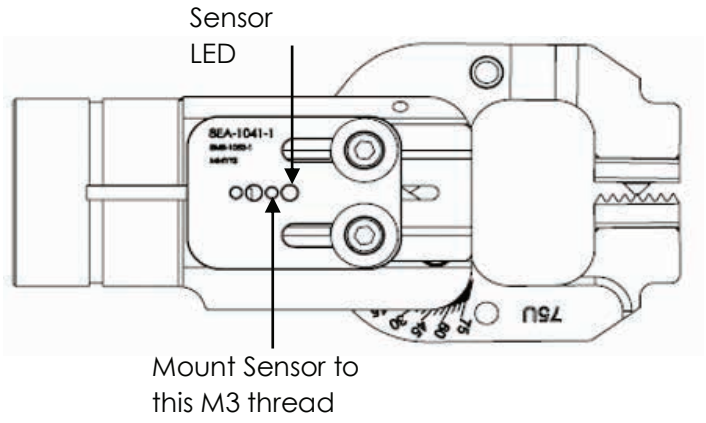


Fig.28

Note: For Sensor set to sense 0.5 ~ 0.9 mm thickness, the sensor will trigger for gripper Closed condition (empty) too.

Setting of Side Mount Sensor:

1. Use the sensors to sense gripper Open and Close condition, Single and Double Blank conditions.
2. Actuate the gripper with Pneumatic air supply before setting the sensor to obtain accurate sensor positioning

⚠ WARNING **Air pressure is required to set sensors accurately. Keep hands clear of gripper jaws**

Gripper Open Condition

3. Slide the sensor carriage all the way forward (see Fig.29)
4. Snug the screw
5. Open the Gripper
6. If sensor triggers tighten completely, if not slide the sensor carriage backwards until the sensor triggers and then tighten completely

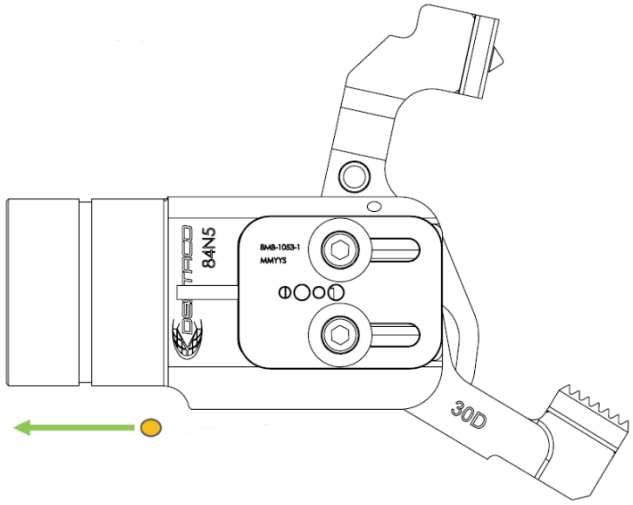


Fig.29

Gripper Close Condition

1. Slide the sensor carriage all the way back (see Fig.30)
2. Snug the screw
3. Close the Gripper
4. If sensor triggers tighten completely, if not slide the sensor carriage forward until the sensor triggers and then tighten completely

Note: Close sensing is not available for blank size less than 0.5mm.

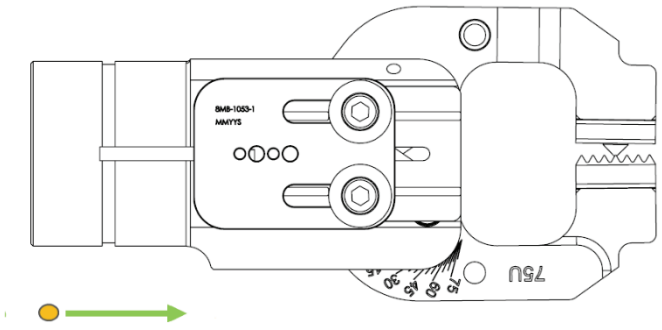


Fig.30

1. Slide the sensor carriage all the way back (see Fig.31)
2. Snug the screw
3. Close the Gripper on the Sheet
4. If sensor triggers tighten completely, if not slide the sensor carriage forward until the sensor triggers and then tighten completely

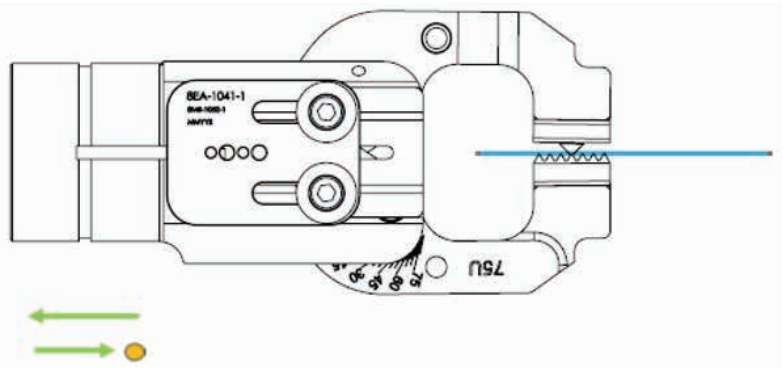


Fig.31

In-Jaw Part Present Sensor:

Note:

- Separate In-Jaw Part Sensor Kit of PNP or NPN type available, refer Table.9 in BOM section Page 27
- Components not sold separately.

1. Fully open the gripper jaws with air pressure.
   ⚠ WARNING Remove Air pressure from gripper prior to attempting to replace the in-jaw sensor.
2. Remove the existing in-jaw sensor housing from the upper jaw using 10mm and 6mm wrench (see Fig.32).
3. Insert the new sensor housing in the same position and tighten it using 10mm and 6mm wrench (see Fig.33).
4. Repeat the above step for Sensor tip replacement.

Note:

- Mounting the sensor is applicable to the upper jaw tip only.
- Insert the sensor connector through upper jaw prior to installing the sensor housing.

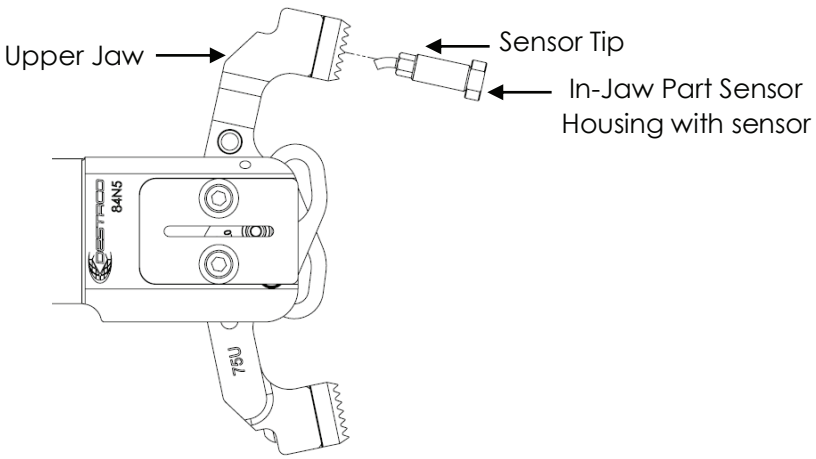


Fig.32

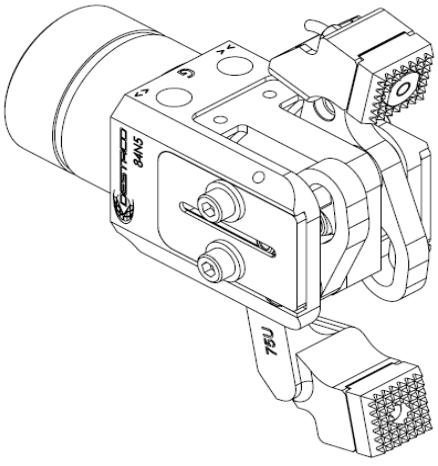


Fig.33

6. Seal Replacement:

Note:

- Separate Seal Kit (Part No SLKT-479) available, refer Table.7 in BOM section Page No.27
- Components not sold separately.

1. Fully close the gripper jaws with air pressure
   ⚠ WARNING Remove air pressure from gripper prior to attempting to replace seals.
2. Unseat the spiral retaining ring from the gripper body using a miniature/ small Screwdriver (see Fig.34).

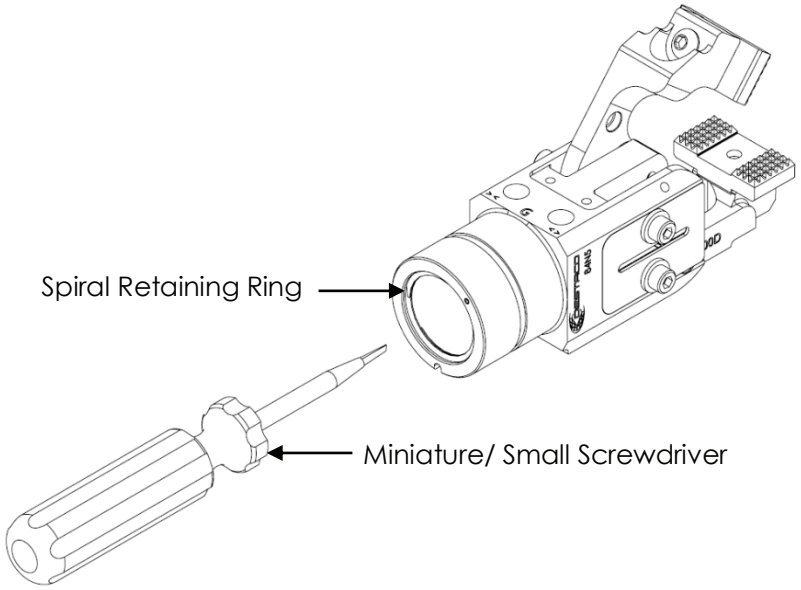


Fig.34

Plug Bore Seal Replacement:

3. Remove the plug bore from the gripper body; carefully remove the O-ring without damaging the plug bore (see Fig.35).
4. Apply Magnalube-G grease or equivalent to the new O-ring and to the cylindrical face of the plug bore, carefully insert a new O-ring in the plug bore groove. Be sure O-ring seats properly in the plug bore and not twisted.

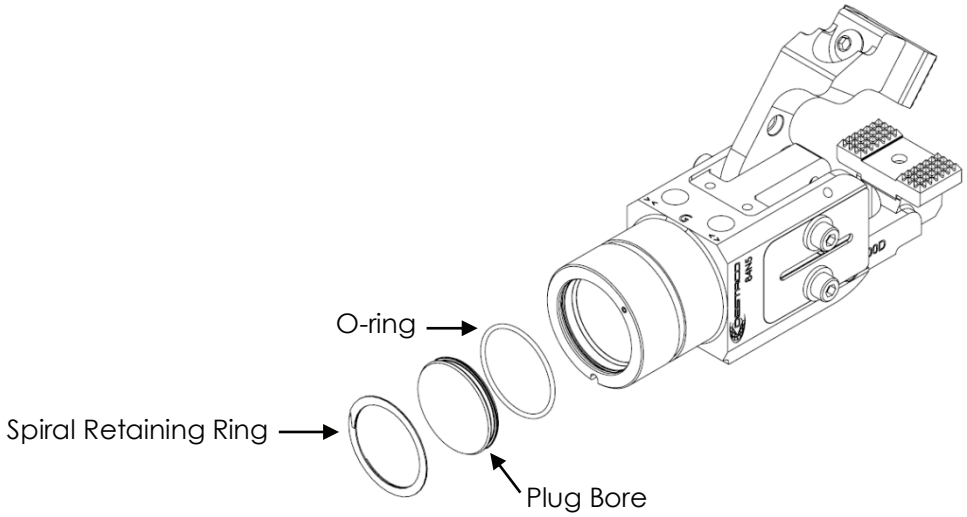


Fig.35

Piston Seal Replacement:

5. Remove the piston using the 84N Piston Spanner tool and a 13mm socket. Rotate piston in a counter-clockwise direction for loosening (see Fig.36).
6. Carefully remove piston seal and shock pad using a seal removal tool.
7. Apply Magnalube-G grease or equivalent to the replacement seal, shock pad and to the cylindrical face of the piston. Carefully insert the piston seal into the piston groove.

Note:

- Damage to the seal will reduce gripper performance.
- Damage to cylinder components will reduce gripper performance.

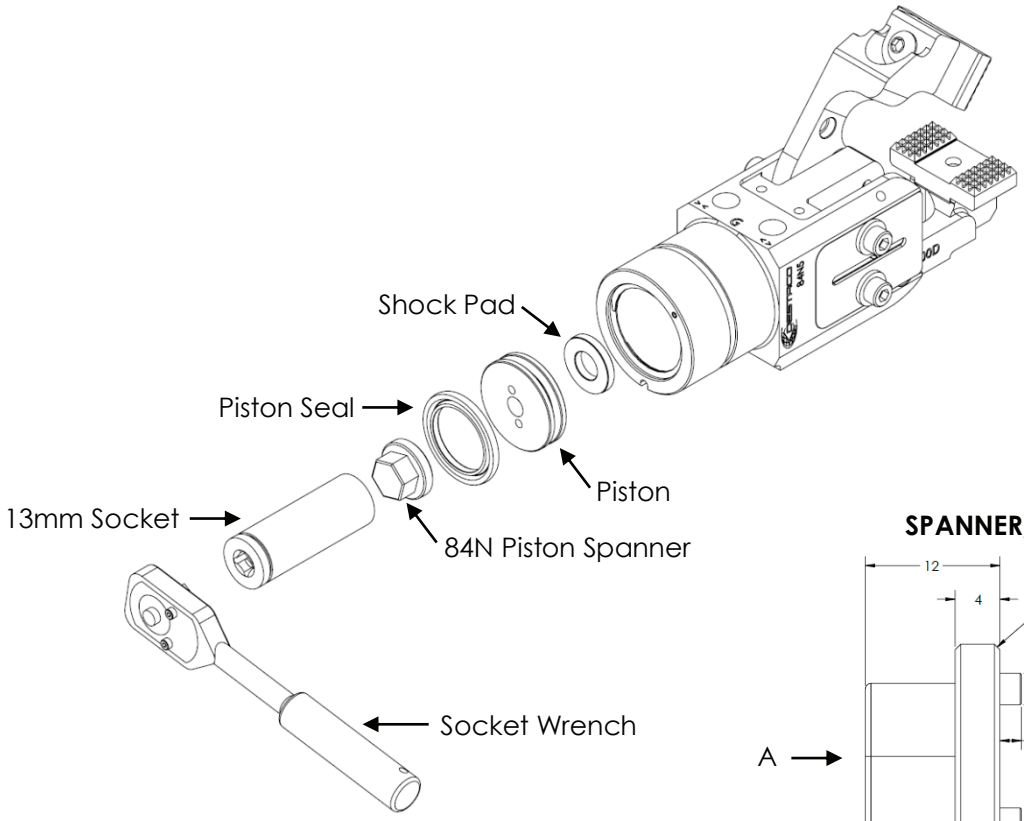
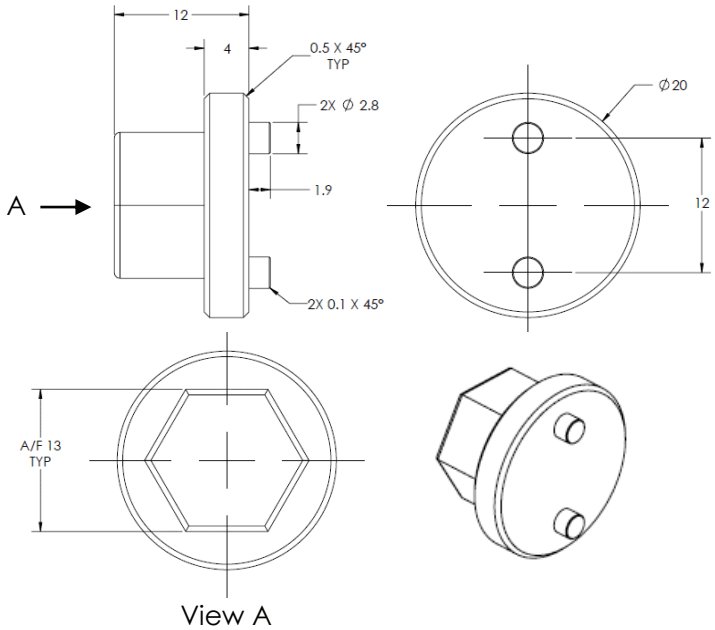


Fig.36

SPANNER; 84N PISTON Dimensions



8ZW-1008-1: SPANNER; 84N PISTON

Refer Table 10 on Page 25 for ordering

Rod Seal Replacement: (This step occurs after Piston Seal removal)

8. Remove the two Side Plates on the body of the gripper by unscrewing the M5 screw using 4mm Allen key (see Fig.37).

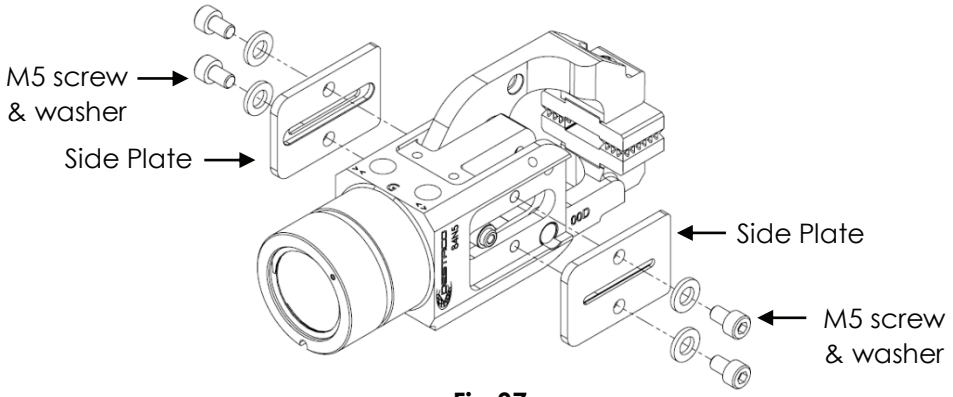


Fig.37

9. Remove the Cam Pin and Cam Bushings, which passes thru the jaws and the clevis cam driver (see Fig.38).

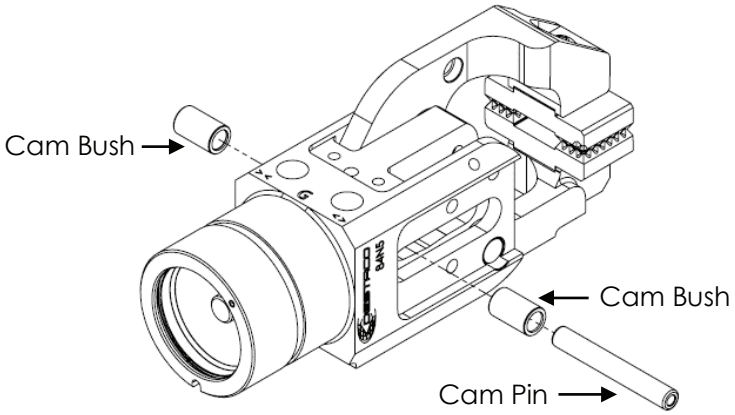


Fig.38

10. Rotate the Upper and Lower Jaw on its axis toward an open jaw position. Remove the Piston Rod connected to the Clevis CAM Driver by rotating the piston rod in a counter-clockwise direction (see Fig.39).
11. Remove the Clevis CAM Driver through the trident structure of gripper body (see Fig.39).

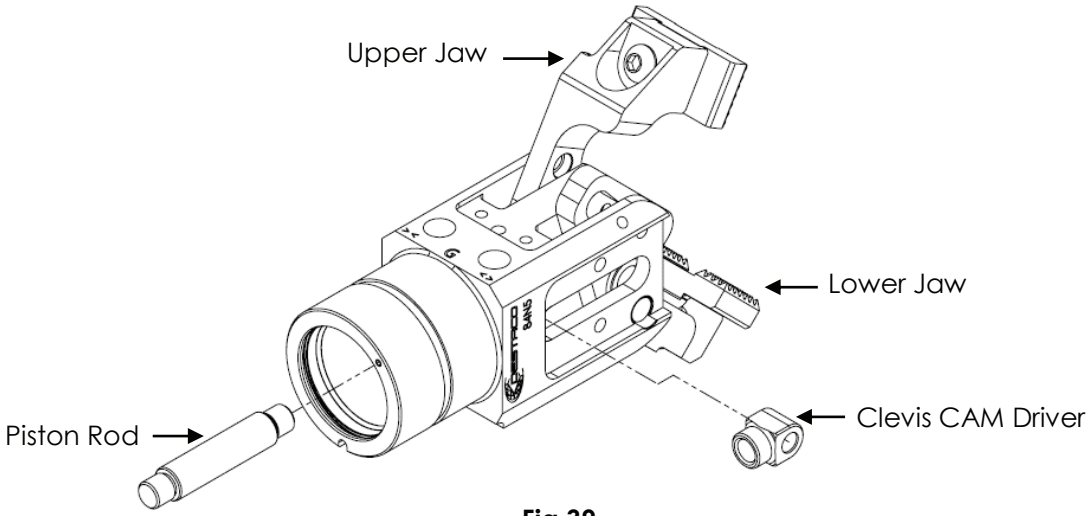


Fig.39

12. Remove the rod seal using a seal removal tool (see Fig.40 & Fig.41).

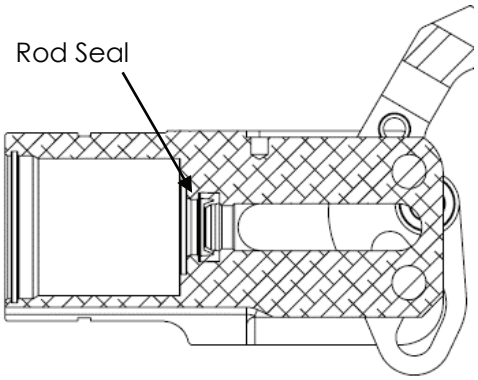


Fig.40

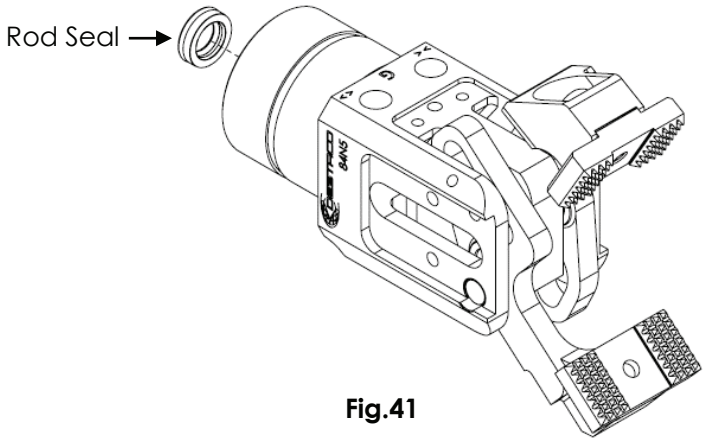


Fig.41

13. Apply Magnalube-G grease or equivalent to the replacement rod seal, the cylinder bore and seal groove of the gripper body.
14. Squeeze the rod seal and insert it in the seal groove of the gripper body. Press and properly seat the seal (see Fig.42).

Note: The seal direction should be as shown in Fig.39 (detail view F). The U-cup seal face should be facing the direction of the cylinder bore.

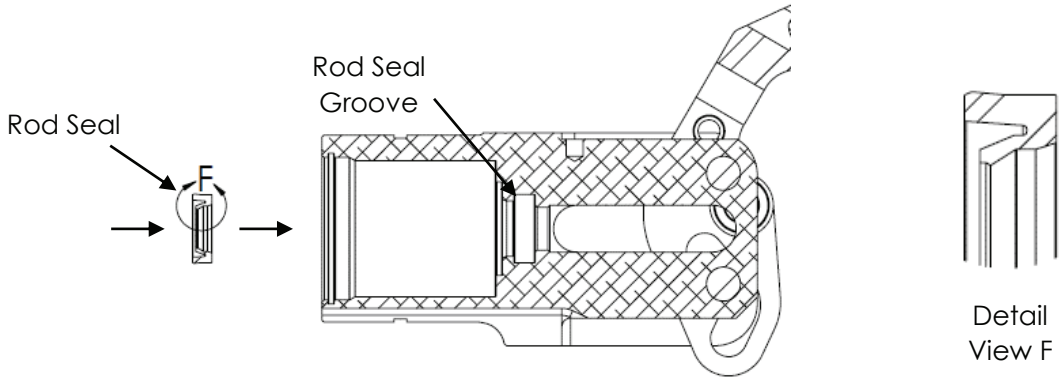


Fig.42

15. Check for proper seating of rod seal by inserting the piston rod and moving linearly (see Fig.43). The piston rod should move smoothly without restriction.

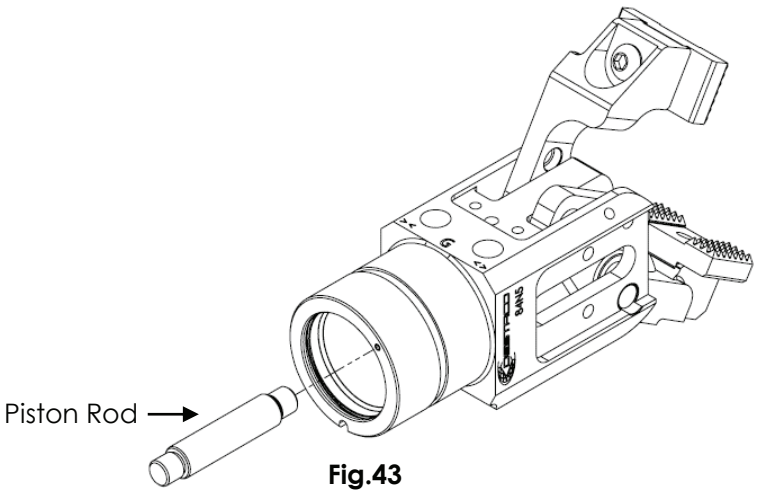


Fig.43

16. Mount the Clevis CAM Driver thru the trident structure on the body. Apply Loctite 271 or equivalent to one of the threaded ends of the piston rod. Insert the piston rod thru the cylinder bore into the clevis CAM driver. Turn clockwise securely fastening it into the clevis CAM driver (see Fig.44).

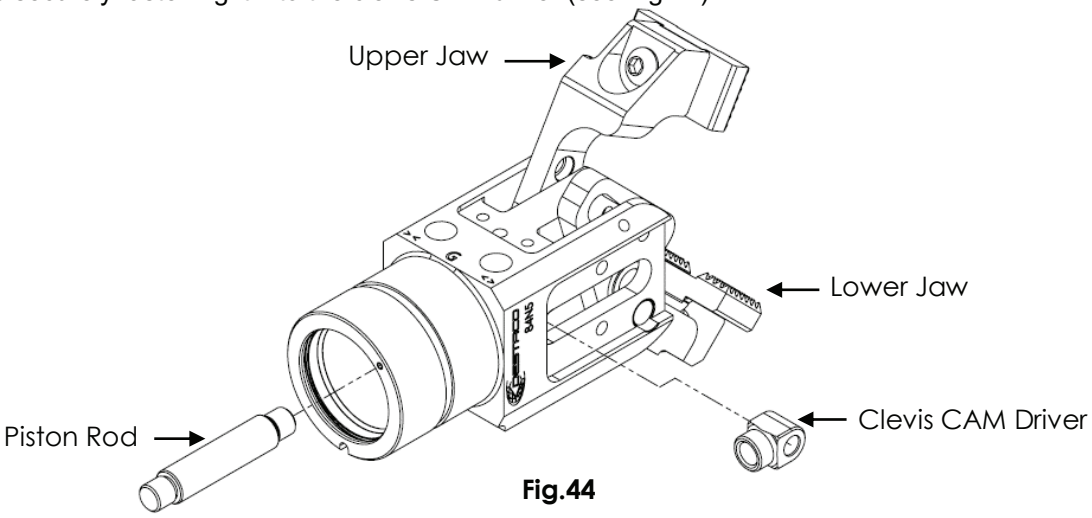


Fig.44

17. Insert the cam pin through the Clevis CAM Driver and the upper and lower jaw cam slots (see Fig.45).
18. Insert the cam bushing on each cam pin end until the bushings rests against the side of the clevis cam driver (see Fig.45).

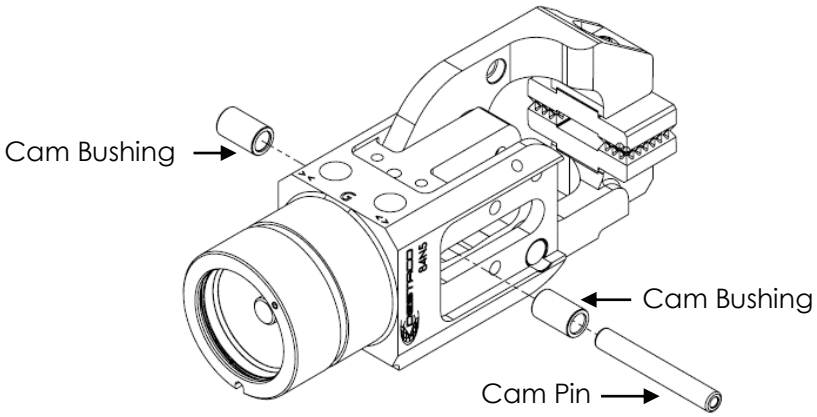


Fig.45

19. Attach the side plates to each side of the gripper body such that the exposed end of the cam pin is in the slot provided in the side plate. Apply Loctite 242 or equivalent to M5 screw and tighten it using 4mm Allen key to 6Nm (see Fig.46).

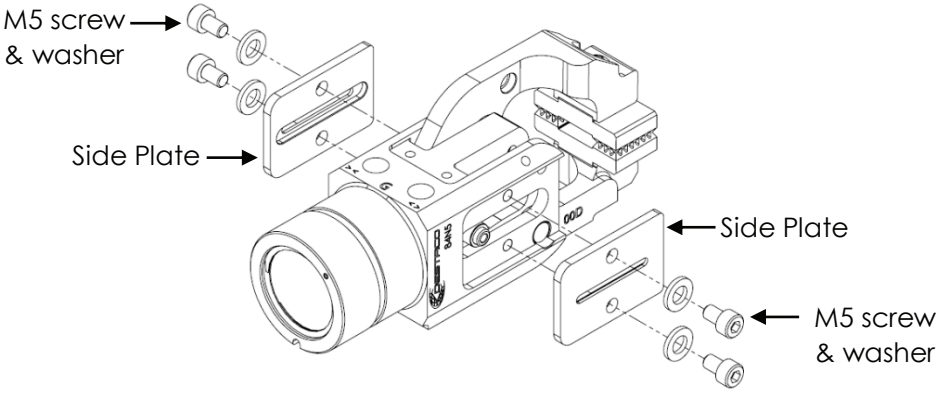


Fig.46

20. Apply Loctite 271 or equivalent to the threaded portion of the piston
21. Insert the piston with replacement seal & replacement shock pad in the cylinder body. Attach piston to the piston rod using the 84N Piston Spanner and 13mm socket. Rotate piston in the clockwise direction and tighten it to 6Nm (see Fig.47)

Note:

- Damage to the seal will reduce gripper performance
- Damage to the cylinder components will reduce gripper performance.

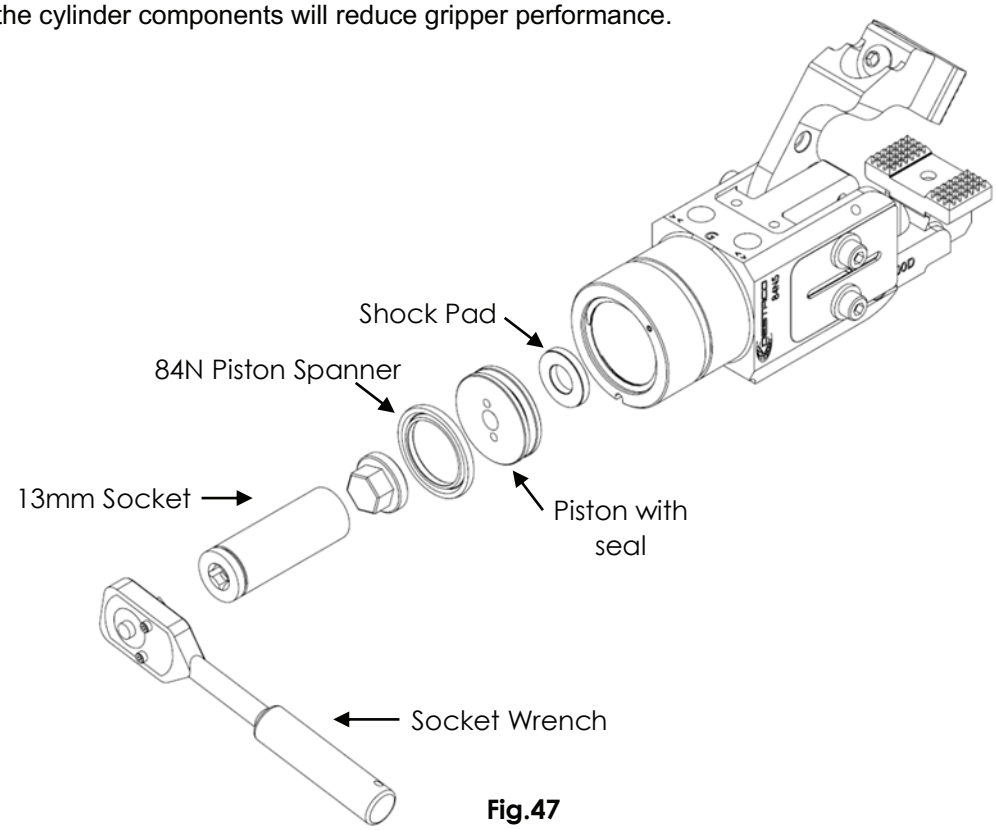


Fig.47

22. Insert the plug bore with replacement O-ring into the cylinder. Verify plug bore is seated flat into the cylinder bore stop. (see Fig.48).
23. Insert the spiral-retaining ring at the back-groove of the gripper body to secure the plug bore (see Fig.49).

⚠ WARNING Failure to use the correct retaining ring or properly seating ring may lead plug bore to dislodged during operation.

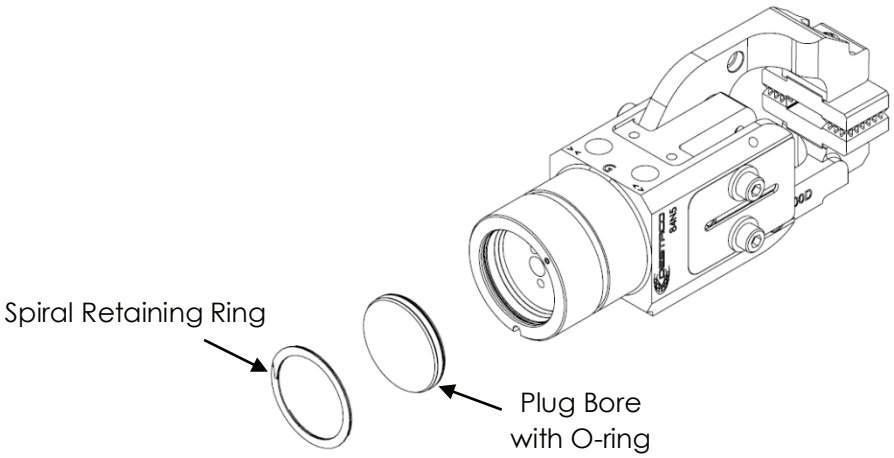


Fig.48

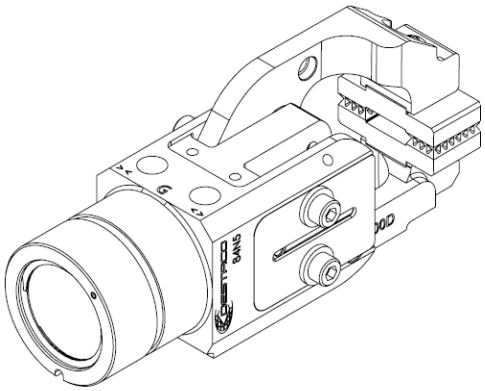


Fig.49

7. Gripper Manual Release:

Below steps to be followed to release the parts with no air condition.

⚠ WARNING Remove air supply from gripper before attempting to de-clamp.

1. Take a Ø3 rod/pin and insert it in the pin hole of the cam pin (see Fig.50).
2. Push the Ø3 rod/pin outward so that the piston moves to de-clamp condition and the gripper releases the blank (see Fig.47).

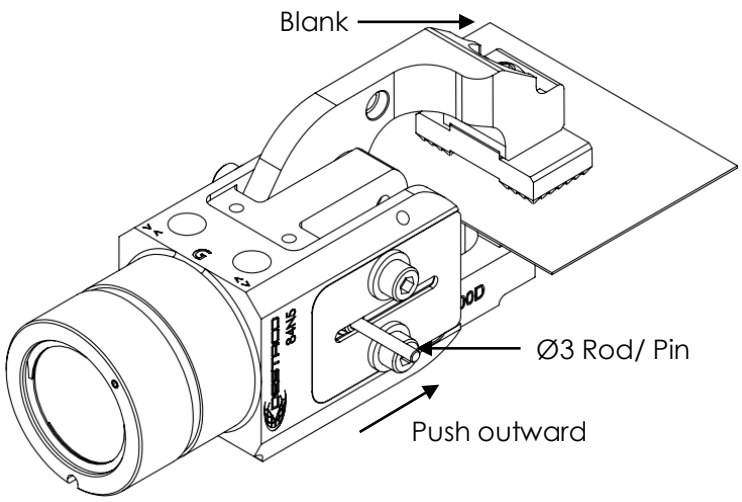


Fig.50

8. Gripper Mount Assembly:

Note:

- Separate Mounting kit options are available, refer Table.5 in BOM section Page 26
- Individual mounting components not sold separately.

1. Insert the mount stay in the groove section of the gripper body (see Fig.51).
2. Slide the mount onto the back of the gripper body (see Fig.52, 53).
3. Tighten the M8 screw using 6mm Allen key to 38Nm.

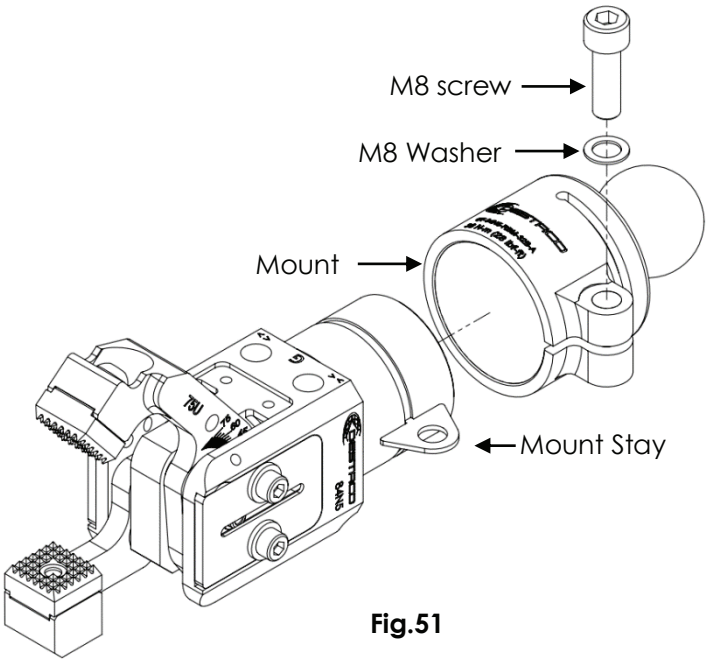


Fig.51

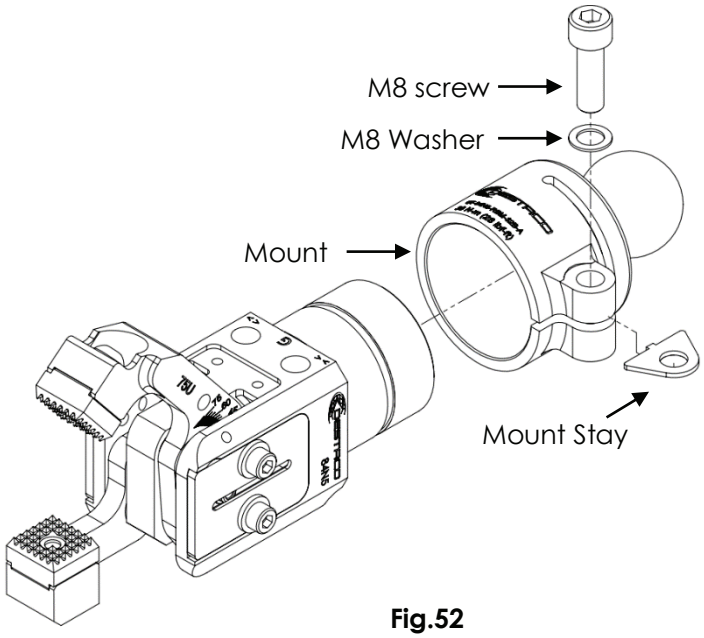


Fig.52

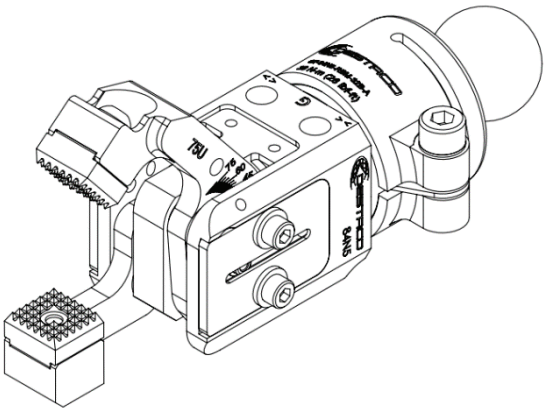


Fig.53

9. Lubrication and Maintenance Parts:

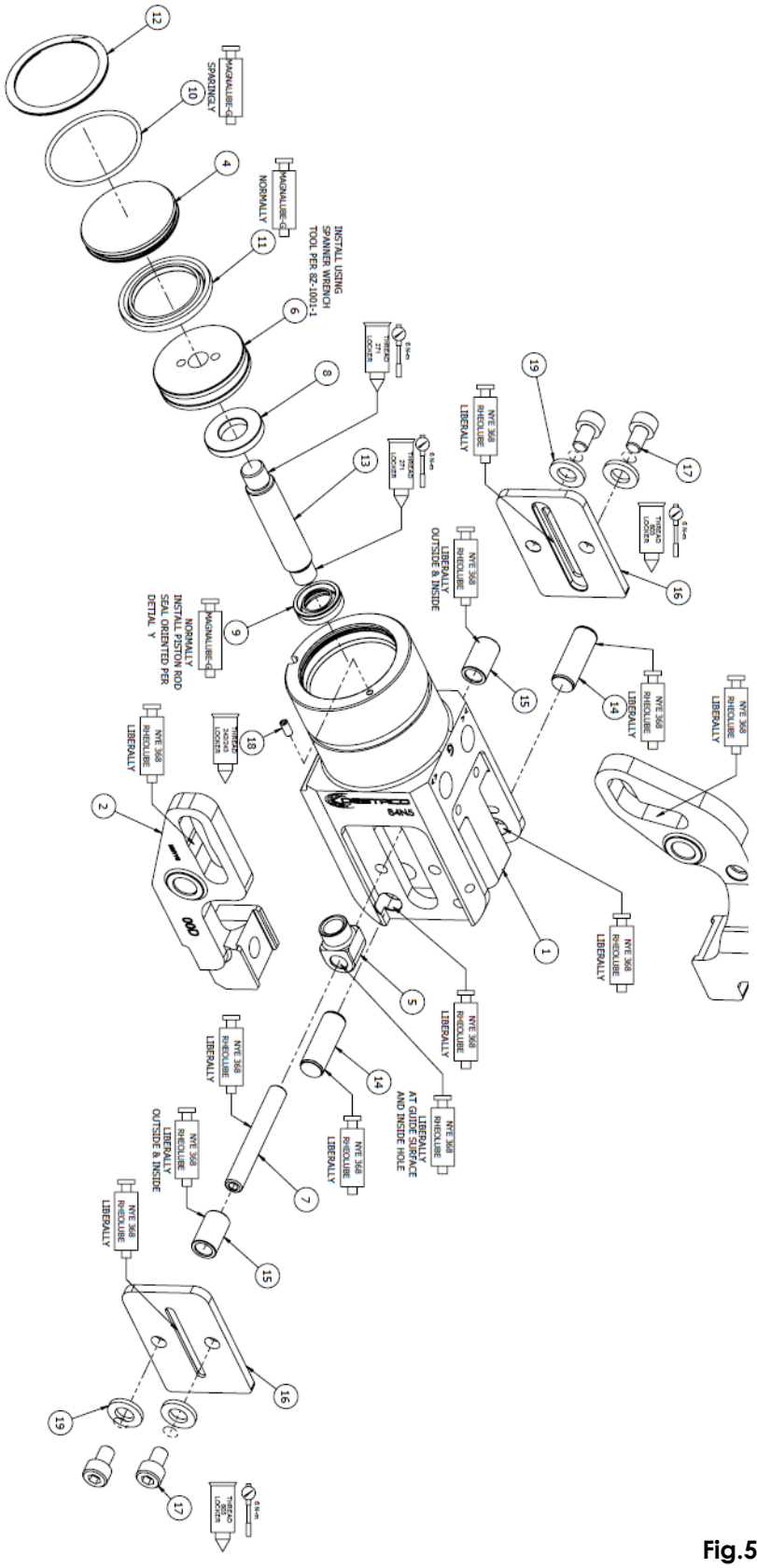


Fig.54 – 84N5 Exploded View

84N5 Bill of Materials

TABLE 1. GRIPPER ASSEMBLY		
ITEM NO.	DESCRIPTION	QTY.
1	GRIPPER BODY	1
2	JAW; LOWER	1
3	JAW; UPPER	1
4	PLUG; BORE	1
5	CLEVIS; CAM DRIVER	1
6	PISTON	1
7	FOLLOWER; CAM	1
8	PAD; SHOCK	1
9	SEAL; ROD U CUP	1
10	O-RING; CAP	1
11	SEAL; PISTON	1
12	SPIRAL RING; RETAINING	1
13	ROD; PISTON 75 DEGREE	1
14	PIVOT; PIN	2
15	BUSH; CAM	2
16	PLATE; GUIDE	2
17	SOCKET HEAD CAP SCREW; M5 X 08	4
18	SET SCREW	1
19	M6 WASHER	4

TABLE 2. JAW REPLACEMENT KIT	
PART NUMBER	DESCRIPTION
84N5-DA-KIT	KIT; STRAIGHT DOUBLE OPEN JAWS
84N5-FA-KIT	KIT; STRAIGHT FIXED LOWER JAW
84N5-PA-KIT	KIT; 90° JAW CONFIGURATION

TABLE 3. BLANK STOP KIT	
PART NUMBER	DESCRIPTION
8MH-1053-1	SHEET STOP KIT

TABLE 4. OPEN ANGLE ADJUSTMENT KIT	
PART NUMBER	DESCRIPTION
8MH-1052-1	OPEN ANGLE ADJUSTMENT KIT

Note: Components not sold separately, see available kits

TABLE 5. MOUNT KIT	
PART NUMBER	DESCRIPTION
GT-84N5-19M-A	MOUNT; 84N5 GRIPPER APPLE CORE 19mm
GT-84N5-20M-A	MOUNT; 84N5 GRIPPER APPLE CORE 20mm
GT-84N5-32B-A	MOUNT; 84N5 GRIPPER SIDE BALL 32mm
GT-84N5-B112-A	MOUNT; 84N5 GRIPPER SIDE BALL B112
GT-84N5-GPC-100S-A	MOUNT; 84N5 PARALLELCLAMP 1" SWIVEL
GT-84N5-GPC-125S-A	MOUNT; 84N5 PARALLELCLAMP 1 1/4" SWIVEL
GT-84N5-GPC-25MS-A	MOUNT; 84N5 PARALLEL CLAMP SWIVEL 25mm
GT-84N5-GPC-30BBS-A	MOUNT; 84N5 PARALLELCLAMP BODYBUILDER SWIVEL 30mm
GT-84N5-RBM-32B-A	MOUNT; 84N5 GRIPPER REAR BALL 32B
GT-84N5-RBM-B112-A	MOUNT; 84N5 GRIPPER REAR BALL B112
GT-84N5-RFM-2213-A	MOUNT; 84N5 GRIPPER REAR FLANGE 2213
GT-84N5-RSM-25MS-A	MOUNT; 84N5 GRIPPER REAR SWIVEL 25MS

TABLE 6. TIP KIT	
PART NUMBER	DESCRIPTION
8JD-1011-1	KIT; SINGLE CONE, BLACK TIP
8JD-1012-1	KIT; SINGLE CONE, SILVER TIP
8JD-1013-1	KIT; SINGLE CONE, GOLD TIP
8JD-1014-1	KIT; DOUBLE CONE, BLACK TIP
8JD-1015-1	KIT; DOUBLE CONE, SILVER TIP
8JD-1016-1	KIT; DOUBLE CONE, GOLD TIP
8JD-1017-1	KIT; SINGLE SERRATED, BLACK TIP
8JD-1018-1	KIT; SINGLE SERRATED, SILVER TIP
8JD-1019-1	KIT; SINGLE SERRATED, GOLD TIP
8JD-1020-1	KIT; DOUBLE SERRATED, BLACK TIP
8JD-1021-1	KIT; DOUBLE SERRATED, SILVER TIP
8JD-1022-1	KIT; DOUBLE SERRATED, GOLD TIP
8JD-1023-1	DOUBLE CONE, BLACK SENSOR TIP
8JD-1024-1	DOUBLE CONE, SILVER SENSOR TIP
8JD-1025-1	DOUBLE CONE, GOLD SENSOR TIP
8JD-1026-1	SINGLE SERRATED, BLACK SENSOR TIP
8JD-1027-1	SINGLE SERRATED, SILVER SENSOR TIP
8JD-1028-1	SINGLE SERRATED, GOLD SENSOR TIP
8JD-1034-1	DOUBLE SERRATED, BLACK SENSOR TIP
8JD-1035-1	DOUBLE SERRATED, SILVER SENSOR TIP
8JD-1036-1	DOUBLE SERRATED, GOLD SENSOR TIP

TABLE 7. SEAL KIT	
PART NUMBER	DESCRIPTION
SLKT-479	SEAL KIT

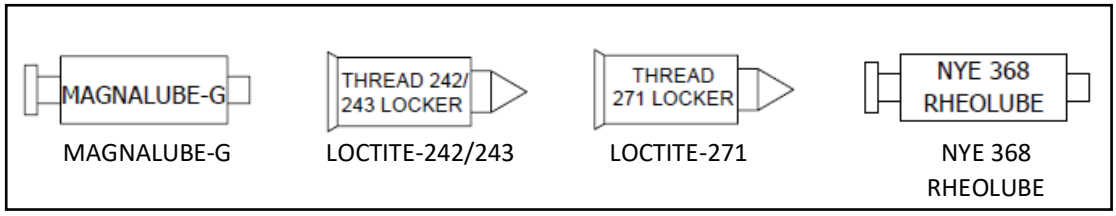
TABLE 8. 2-POINT SIDE MOUNT SENSING	
PART NUMBER	DESCRIPTION
8EA-1041-1	84N5 ADJUSTABLE SIDE SENSOR PNP KIT ASSEMBLY (INCL. 2 SENSORS)
8EA-1041-2	84N5 ADJUSTABLE SIDE SENSOR NPN KIT ASSEMBLY (INCL. 2 SENSORS)
8EA-1041-3	84N5 ADJUSTABLE SINGLE SIDE SENSOR PNP KIT ASSEMBLY
8EA-1041-4	84N5 ADJUSTABLE SINGLE SIDE SENSOR NPN KIT ASSEMBLY
OISA-004	PNP SENSOR
OISA-005	NPN SENSOR

TABLE 9. IN-JAW PART SENSOR	
PART NUMBER	DESCRIPTION
8EA-1033-1	PNP INDUCTIVE IN-JAW SENSOR
8EA-1034-1	NPN INDUCTIVE IN-JAW SENSOR

TABLE 10. SPECIAL TOOL KIT	
PART NUMBER	DESCRIPTION
8ZW-1008-1	SPANNER; 84N PISTON

Recommended Lubricants:

Table 11. Recommended Lubricants		
Sl. No	Lubricant Point	Lubricant
1	All Seals & Cylinder components	Magnalube-G
2	Metal sliding parts	NYE 368 Rheolube
3	All Screws	Loctite-242/243, Loctite-271



⚠ CAUTION It is important to use the specified lubricants for the parts else the parts will be damaged.

Fig.52 – 84N5 Lubricants

10. Troubleshooting Problem:

SL No	Problem	Possible Cause
1	**Gripper has lower grip force than normal**	• Worn or incorrect tips installed • Air pressure is too low • Defective valve • Pressurized air system is contaminated • Gripper mechanism is contaminated • Worn or leaking seals
2	**Gripper won't actuate**	• No air pressure to gripper • Worn or leaking seals • Gripper is worn out or broken
3	**Gripper actuates partially**	• Low air pressure at the gripper • Short actuation time from PLC • Interference with other components • Worn or leaking seals • Gripper requires maintenance • Gripper is broken
4	**Gripper has rough actuation**	• Defective valve • Pressurized air system is contaminated • Gripper mechanism is contaminated • Gripper requires maintenance
5	**Gripper actuates in reverse operation**	• Air lines reversed • Valve wired improperly • Error in PLC program
6	**Gripper will not release the part**	• Defective valve • Pressurized air system is contaminated • Gripper mechanism is contaminated • No air pressure to gripper • Fault in PLC program • Worn or leaking seals • Gripper is broken
7	**Gripper actuates slower than normal**	• Air pressure is too low • Defective valve • Pressurized air system is contaminated • Gripper mechanism is contaminated • Worn or leaking seals • Gripper requires lubrication
8	**Gripper actuates faster than normal**	• Air pressure is too high

9	**Gripper has more grip force than normal**	• Air pressure is too high
10	**Gripper has erratic grip force**	• Pressurized air system is contaminated • Gripper mechanism is contaminated • Worn or leaking seals • Gripper requires lubrication
11	**Gripper is marking the part**	• Air pressure is too high • Tips are damaged • Inquire about custom tips
12	**Gripper drops the part during motion**	• Worn or incorrect tips installed • Air pressure is too low • Defective valve • Pressurized air system is contaminated • Gripper mechanism is contaminated • Worn or leaking seals
13	**Part Presence not detecting**	• Sensor is damaged • Sensor is not positioned properly • Fault in PLC program • Faulty wire connection

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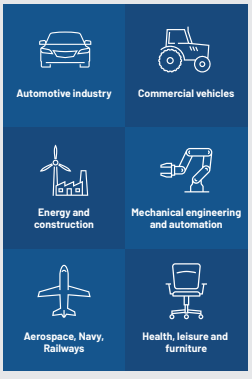

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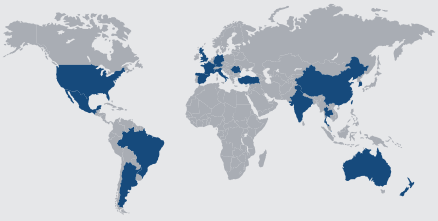

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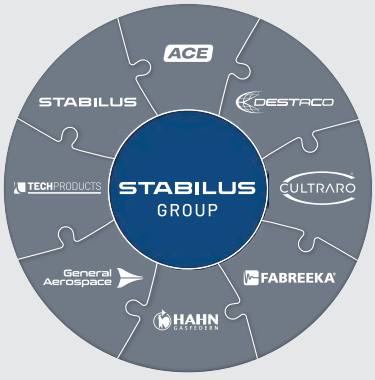

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