

**Foreword**

This clutch is engineered for HPV100 Spec Class kart racing. Follow the instructions in this manual for maintenance. This clutch is a dry "direct drive" lock-up style with positive engagement at 5000 RPM.

**Crankshaft Preparation**

The taper on the crankshaft (See Fig. 1) must match the taper in the Clutch Drive Hub or the Clutch will not fit securely. In order to check for proper fit, mark the crankshaft with an ink marking pen. Slide the Clutch Hub onto the crankshaft and turn slowly by hand 180 degrees. Remove the Clutch Hub and inspect the crankshaft. A good match is achieved when the ink is wiped off the entire length of the taper after you have rotated the Clutch Hub. If a bad match occurs, lap the Hub and the crankshaft with fine lapping compound. Clean off the lapping compound before installation.

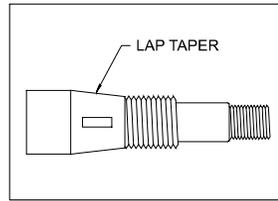


Fig. 1 Crankshaft

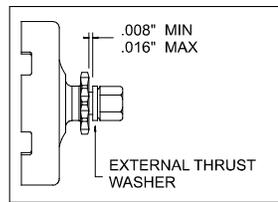


Fig. 2 End Play

**Installation To HPV100 Engine**

1. Insert Woodruff Key into crankshaft.
2. Slide clutch Drive Hub assembly onto taper of crankshaft. Be sure the keyway in the Drive Hub is aligned with the Woodruff Key.
3. Install Coned Safety Washer (item 7), Jam Nut (item 6) and tighten until Coned Safety Washer is flat. (450 inch pounds)
4. Install the Internal Thrust Washer (item 5). Due to manufacturing tolerances, three sizes of the Internal Thrust Washer are provided with each Clutch. It is important to install the washer that provides proper clearance to allow the drum to spin free after the Starter Nut (item 1) is tight. (See fig. 2) **Note: Chamfered side of washer faces engine.**
5. Apply lithium grease to the Roller Bearing (item 3) before installing the Drum.
6. Install the Drum with Bearing onto the crankshaft.
7. Install the External Thrust Washer (item 2). **Note: Chamfered side of washer faces engine.**
8. Thread on the Starter Nut (item 1) and tighten to 300 in. lbs. Optional Spanner Wrench (P/N 99-5139) is designed to prevent the crankshaft from turning while tightening the Starter Nut.

**End Play** (See Fig. 2)

End Play is important to allow Drum to spin free. Check end play with feeler gage after Starter Nut is tightened. Too little clearance will cause binding while too much will cause chain alignment problems. Min. .008" Max .016"

**Starting Engine & Entering Track**

The Clutch is designed to permit easy starting with a battery operated Gun Starter. The Gun Starter should have a 5/16" Allen style hex drive.

When starting the engine be sure to keep the brake engaged in order to prevent any sudden acceleration. When the engine starts, the Clutch will be in neutral until the engine reaches approximately 4000 RPM. At about 4000 RPM the clutch will start to engage and the kart will start to move. Since the Clutch engages at a low RPM, driving technique will be the same as a direct drive vehicle. This reduces clutch wear for less maintenance cost.

**Stall Speed**

The Spec stall speed maximum is 5000 RPM. For tech the minimum spring adjustment height is .236" and there is no maximum height however do not exceed .260". Use lockite on the retainers to prevent them from working loose.

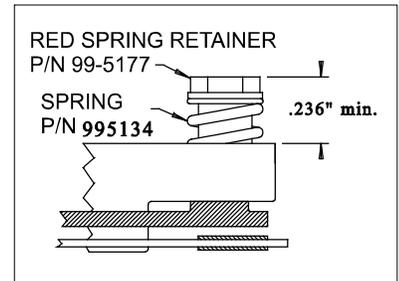


Fig. 4 Tech Specification Of Retainer Height

**Clutch Removal**

1. Remove the Starter Nut ( item 1). Note: Clutch Spanner (P/N 99-5139) is designed to fit around the Drive Hub (item 12) to prevent the crankshaft from turning when loosening nut.
2. Remove the External Thrust Washer (item 2), Drum (item 4), Roller Bearing (item 3) and Internal Thrust Washer (item 5). If bearing is hard to remove it is helpful to file or sand the burr of the crankshaft edge.
3. Remove Jam Nut (item 6) & Coned Safety Washer (item 7) Nut is normal RH thread
4. Remove the Clutch Drive Hub (item 12) using an optional Clutch Puller (P/N 99-5140)

## Maintenance and Repair

Due to the extreme demands of Racing it is important to properly maintain your Clutch in order to obtain maximum performance.

### 1. Roller Bearing Item 3

Since the EXPD-A Clutch is a dry clutch, there is no oil supply for the bearing. It is necessary to apply lubricant to the bearing in order to prevent extreme wear or seizure to the crankshaft. Lithium grease works best. Apply grease or spray Tri-flow into bearing before each track session.

### 2. Sprocket / Drum Assembly Item 4

Oiling the chain before each track session will increase the life of the sprocket. A worn or chipped chain should be replaced as it will quickly wear out the sprocket. The drum should be replaced when the teeth are worn to a sharp point. Note: Use chain oil ... Tri-flow is not chain oil

### 3. Friction Disc Item 10 tech item

The Friction Disc has a steel core with ceramic friction material bonded to the surface. It should be inspected after four hours of use. Replace if lugs are worn or cracked or if lining is worn below .122" thick.

### 4. Springs Item 13 p/n 995134 *tech item*

The springs are made from stainless steel. They will last many hours and only need to be replaced when broken or collapsed below .465" free length. **Warning: New springs must not exceed .505" free length and max. wire dia. .065"**

### 5. Pressure Plate Item 11 tech item

The Pressure Plate is precision ground on the surface that engages the friction disc. This surface should be checked periodically for warp and/or wear. Replace when badly warped or worn or studs loose. Minimum thickness .150"

### 6. Drive Hub Item 12 tech item

Remove the Levers (item 16) from the Drive Hub, check for wear in the slotted area after 10 hours running time. Badly worn slots will cause poor performance. Tech item max width .700" x .670"min. also width at lever contact area max .380" min .370"

### 7. Fixed Plate Item 9 tech item

Replace when worn below .125" or badly glazed

### 8. Levers Item 16

The pivot hole in the lever is subject to a stress due to frictional loading from centrifugal force. This causes the pivot hole to eventually elongate. Inspect the levers for pivot hole wear or flat spots whenever you rebuild the clutch.

### 9. Dowel pins item 15

The Dowel Pins must absorb high stress from the levers. Replace after 10 hours of use to avoid breakage.

### 10. Thrust Washers and Nuts

Visually inspect during teardown and replace if cracked or damaged.

## Clutch Assembly

1. Clean parts with disc brake cleaner. Disc brake cleaner comes in an aerosol spray can and is available at most automotive parts stores. **Do not use gasoline to clean the Clutch!**

2. Apply anti-seize or grease to the Dowel Pins (item 15). Slide Dowel Pins into the Levers (item 16). Groups of 3.

3. Insert Pressure Plate (item 11) into the Drive Hub (item 12).
4. Place each Spring (item 13) over a corresponding Pressure Plate Stud. Next, screw the Red Retainer (item 14) onto each Stud until the desired height of .246" is obtained. (See Fig. 4)
5. Lay the Friction Disc (item 10) onto the flat side of the Pressure Plate.
6. Place the Fixed Plate (item 9) over the Drive Hub and align the 3 holes in the Fixed Plate with the Drive Hub Holes.
7. Apply anti-seize to Screws (item 8) and insert into the bolt holes in the Hub (item 12). Tighten Screws to 50 in. lbs. Note: These Screws should not be tightened past 50 in. lbs. or they will be difficult to remove.
8. Clutch is ready for installation on crankshaft.
9. Refer to Clutch Installation on page 1.

## Air Gap

*Air Gap is a tech item....Air Gap is the clearance necessary for proper clutch engagement and disengagement. Air Gap maximum is .040". To check Air Gap measure space between fixed plate and pressure plate then subtract the friction disc thickness. When Air Gap exceeds .040" install a new Friction Disc (See Fig. 5)*

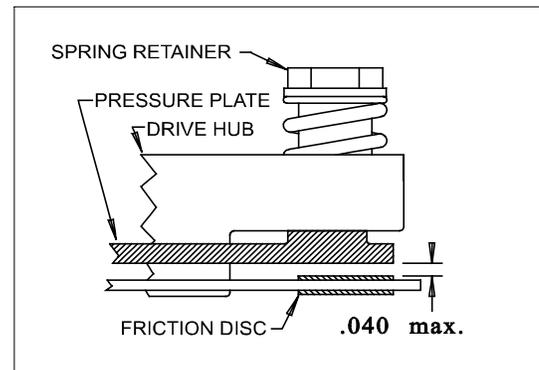
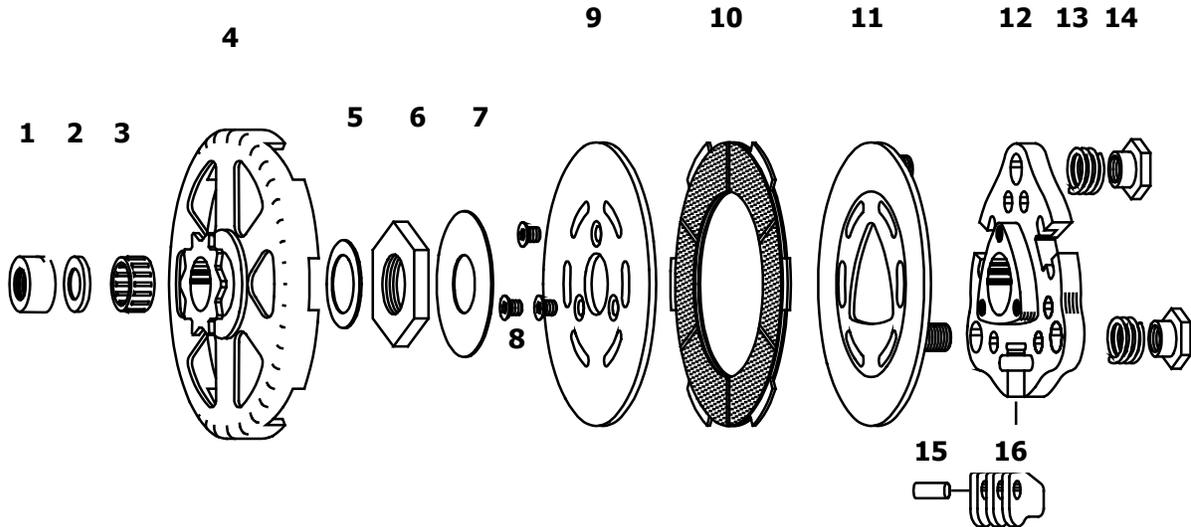


Fig. 5 Air Gap

**When replacing the drum it is important to install a new chain. Reason: a used chain will not seat correctly in the sprocket and premature failure or excessive wear may occur.**



Item Number	Part Number	Description	Units Required
	995153	EXPD II Clutch for HPV100 complete 10T	
	995154	EXPD II Clutch for HPV100 complete 11T	
1	995175	Starter nut M10x1	1
2	995121	Thrust washer, external	1
3	995123	Bearing	1
4	995166	Drum 10T 219 with bearing	optional
	995167	Drum 11T 219 with bearing	1
5	995124	Thrust washer 1.5mm	optional
	995125	Thrust washer 1.7mm	1
	995126	Thrust washer 1.8mm	optional
6	995127	Jam Nut M16x1	1
7	995128	Coned washer	1
8	995129	Screw M5x10 Flat head	3
9	995130	Fixed plate	1
10	995131	Friction disc	1
11	995146	Pressure Plate	1
12	995136	Drive hub	1
13	995134	Spring	3
14	995177	Retainer	3
15	995137	Dowel pin	3
16	995138	Lever	9
	995139	Spanner	optional
	995176	Puller tool	optional



**Puller**



**Spanner**