

CARBONETIC Carbon Clutch operating instructions

Thank you very much for your purchase of the CARBONETIC carbon clutch. Please read these instructions before operating the carbon clutch.

Warranty

- If the installation is impossible due to defective or incorrect parts, the proper parts will be supplied by ATS&ACROSS.
- Once the clutch is installed or used in anyway, there will not be any warranty.

Warning

- It is extremely important that the flywheel is properly installed since an improperly installed flywheel might cause a serious accident. Use new bolts of proper length for flywheel assembly. Refer to the service manual for tightening torque.
- Clean the splines of input shaft and apply light transmission oil. Do not use heavy grease since grease tends to attract the dust and might cause insufficient clutch disengagement.

Attention

- The installation should be performed by an experienced mechanic at a properly equipped garage.
- CARBONETIC clutch should be installed only to the car/transmission specified by each model number.
- A long time half clutch operation will generate too much heat and will cause an engagement problem.
- Use only CARBONETIC genuine parts for maintenance and adjustment of the clutch

Disclaimer

CARBONETIC products are manufactured for racing use. The user shall determine the suitability of our products and assume all the risks and responsibility in connection with their use. Regarding the legality of the products, the local laws vary from state to state. Please check with your local law enforcement.

Operating a carbon clutch

Single, Twin, and Triple carbon clutch

- A break in is important because special film is needed to be formed on the carbon disks. A large torque application and slippage without this film will shorten the life of the carbon disks. The break in period is roughly 800 to 1000 miles.
- Do not attempt to speed up break in and the formation of the film. The clutch engagement at high rpm and extensive use of half clutch might risk warping of steel parts and ultimately will shorten the life of the clutch.
- Warm up is strongly recommended for an abrupt start. Please refer to the “Warm up of disk” section below.
- If a carbon clutch slips, the rev goes up instantly and you will notice immediately. If you experience slippage, ease up on the accelerator and then start accelerating gradually. Keeping up the rev with slippage will only wear down the disks.
- A short half clutch is recommended to avoid slippage and too much frictional wear.
- A carbon disk wears down evenly at normal operation and ultimately becomes very thin. At that point, the disk might break but it is not abnormal.

Single carbon clutch

- In order to increase the torque delivery, a type r disk is used for the single carbon clutches. The type r disk has more bite at high temperature. Once the temperature of the disk exceeds a certain point, the torque delivery increases dramatically, but at the same time it might cause a shudder at the engagement of the clutch. When the temperature of the disk goes down, the shudder also stops.

Warm up of disk

- Perform warm up only when there is a risk of slippage (abrupt start or drag racing start). Too much warm up will cause warping and excessive wear .
- Drag racing is very tough to the clutch. In order to minimize the impact, please perform a warm up for the disks. Maintain half clutch 3 seconds at around 2,000 rpm, and rest 20 to 30 seconds. Repeat the process 5 to 10 times. **Do not engage half clutch for more than 3 seconds and do not use higher rpm .** It will produce too much heat and damage the clutch.

CARBONETIC carbon clutch installation

- Removal of the transmission. Please follow the service manual of the car.
- Clearing of input shaft - Please clean the splines of the input shaft. Check any damage or deformation of the splines and if there are, use a new parts.
- For a clutch with casing. If you remove the casing from flywheel, use new bolts for re-assembly. The tightening torque is 2.0 kg-m (14.5 lb-ft)
- Flywheel assembly. Please pay the extra attention for the flywheel attachment since the inappropriate flywheel assembly might cause a very serious accident. Use new bolts for the attachment and use the right tightening torque specified by the service manual of the car.

Flywheel tightening torque

For other cars — use the torque specified by the manufacturer's service manual

Skyline GT-R, R32, R33, R34 tightening torque 14.5 -15.5 kg-m (104.9 - 112.1 lb-ft).
 Silvia S13, S14, S15 tightening torque 8.5 - 9.5 kg-m (61.5 - 68.7 lb-ft).
 EG6,EK4, EK9, DC2 tightening torque 10.5kg-m.
 CN9A, CP9A, & CT9A tightening torque 13.5kg-m.
 FC3S & FD3S tightening torque 6.2kg-m.
 Subaru WRX GC8,GDA,GDB tightening torque 7.6kg -m. (55.0 lb-ft)

- Use the stock clutch release parts. A big slave cylinder, different shape pivot and clutch fork might cause the insufficient disengagement due to the change of clutch stroke
- Set the free travel (pedal play) between clutch pedal and master cylinder and the location of the pedal stopper to the stock specification
- Remove the cover-ASSY, pressure plate, clutch plate A, clutch plate B, clutch hub from the flywheel. The casing is fixed to the flywheel. Pressure plate and clutch hub have the top and bottom sides. It might be a good idea to mark the direction at this point. Clutch has been assembled in the right direction when it is shipped out from the factory.
- Install the flywheel to the engine
- Sequence of clutch assembly - clutch plate B, clutch hub, clutch plate A, clutch plate B (clutch plate A ==>), Pressure plate, and cover ASSY. Please refer to the diagram in the separate sheet.
- Pressure plate assembly. (If the pressure plate is not fixed to the cover) The hook of the pressure plate should face the cover.
- Cover ASSY (tentative tightening) assembly. Tighten the bolt in a diagonal sequence. Do not tighten fully until the disk and bearing are aligned correctly.
- Attach the cover ASSY to the casing lightly and use a centering tool to match the center of the hub to the center of the crank shaft. (This process is very important to center the disk and hub on the flywheel)
- With the disk aligned, tighten the attaching bolts. **Tightening torque for cover bolt 1.8 - 2.0 kg —m**

- **Release parts assembly** By referring to the service manual , follow the proper procedure for your car. Pay enough attention not to damage the splines of input shaft against the clutch plate. Unnecessary pressure will damage the disks. Make sure you use a transmission jack.
- **Clutch fork (release fork) location.** While the clutch bearing is in contact with clutch spring, make sure the clutch fork is almost making a right angle with the mission axis. If the angle is out by more than 5 degrees , a change of spline sleeve size might be necessary.
- **Air removal from slave cylinder** If the assembly involves loosening a bolt on the slave cylinder to relocate or realign the laying pipe, air removal (bleeding) becomes necessary.
- **Clutch pedal adjustment.** Adjust the rod between the pedal and the master cylinder so that the free travel is as close as zero. It is important to make the free travel as small as possible but never set it negative - refer to another page (free travel adjustment)

Brake in Drive around 800 to 1000 miles on the street. A drag race type start during the brake in period will significantly reduce the life of carbon clutch. Also please avoid a dyno test at full power before finishing the brake in period.

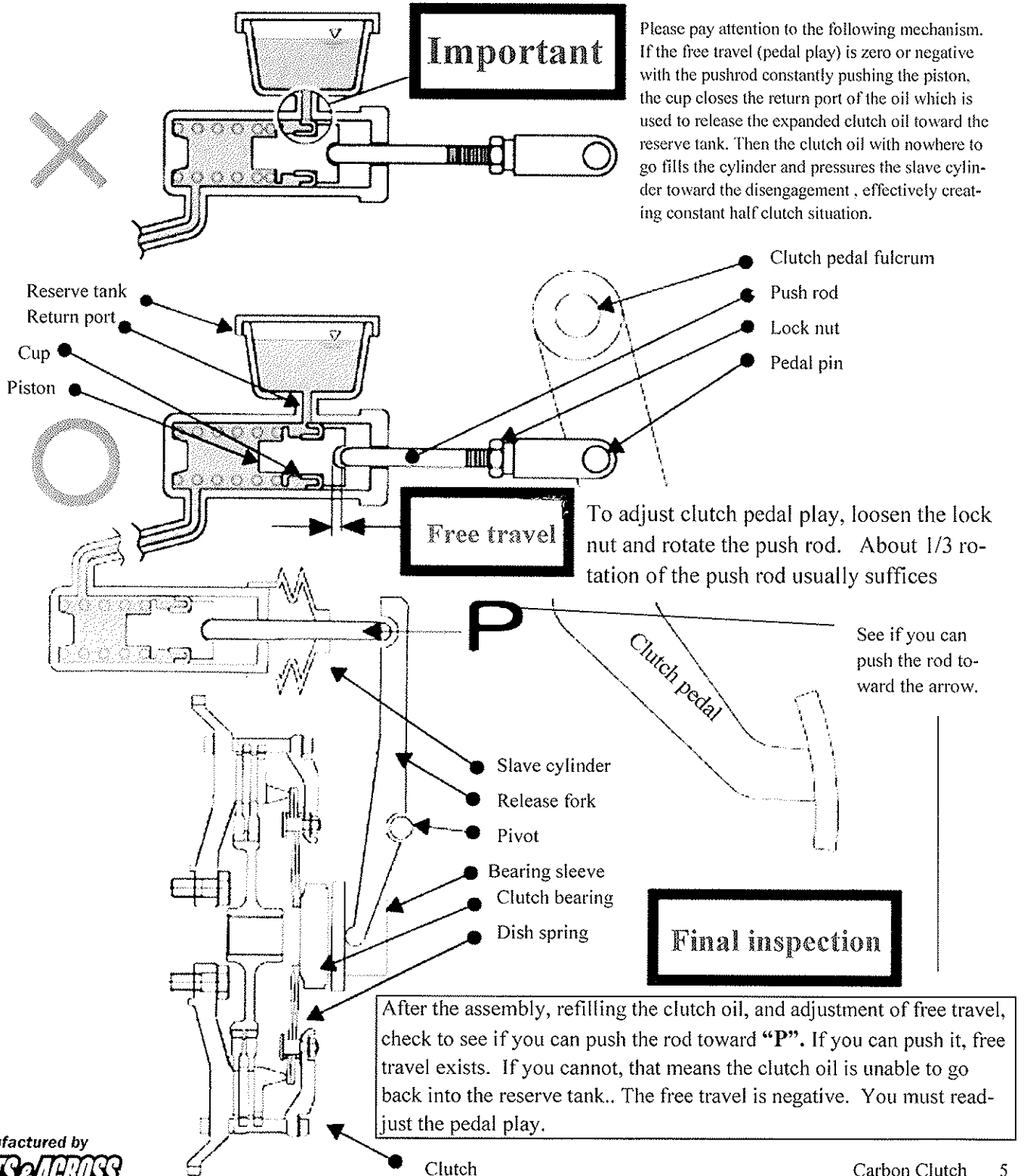
Avoid a long half clutch Long half clutch causes heat accumulation and hastens the warping of pressure plate and floating plate resulting in a disengagement problem and difficulty of changing gears. For an extended life of carbon clutch, try to engage the clutch with as little half clutch as possible. Carbon plates have a property of lubrication and can handle a very short clutch engagement with little half clutch.

Clutch pedal free travel adjustment

Incorrect adjustment on push-rod and piston behind the clutch pedal could lead to

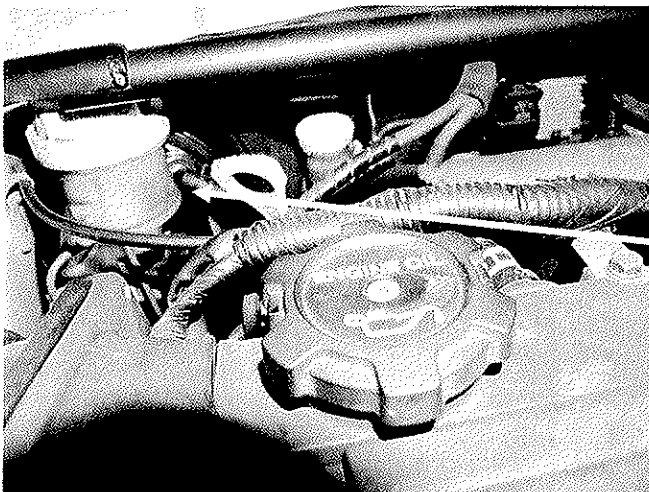
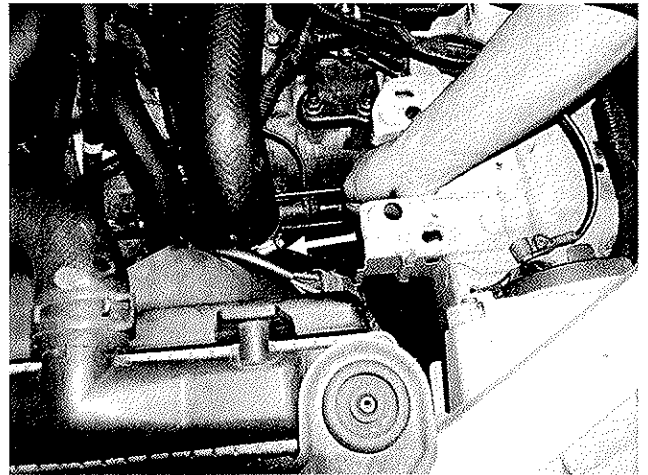
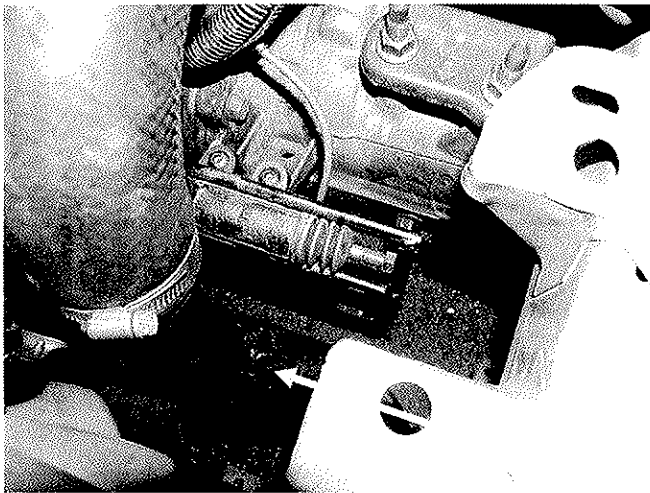
Increased pedal pressure	Worn down	Slippage	Malfunction under heat
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Refer to the diagram below and adjust the free travel of the pedal correctly





Clutch pedal free travel adjustment

The following pictures are examples of the previous page. The pictures are taken from ATS&ACROSS Mitsubishi Evo 7 which is equipped with CARBONETIC carbon twin clutch. You should be able to push the reverse rod inward and when you push the reverse rod, the level of fluid in the reservoir should go up.

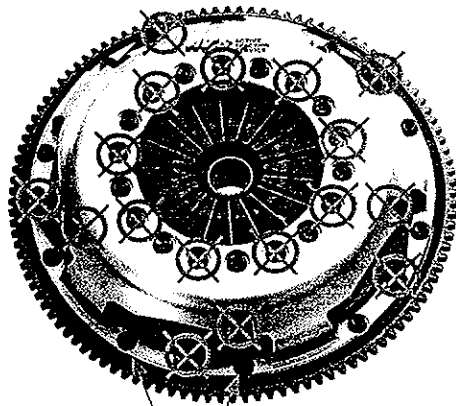


Push the rod to the direction of the arrow, the fluid level in the reservoir should go up. If you cannot press the rod, the free travel is negative and you have to make an adjustment.

下図の  マークのついたボルトとナットは、
緩めたり、締め付けたりしないでください。

Don't touch the bolts and nuts marked .

フライホイール取り付けボルト以外の、ナットや六角穴付きボルトは、
ゆるみ防止のために一定の強いトルクで締め付けてあり、ネジロックを併用しています。
これらを締め込み過ぎるとボルトやナットがネジ切れたり、変形してゆるみやすくな
りますので、さわらないでください。



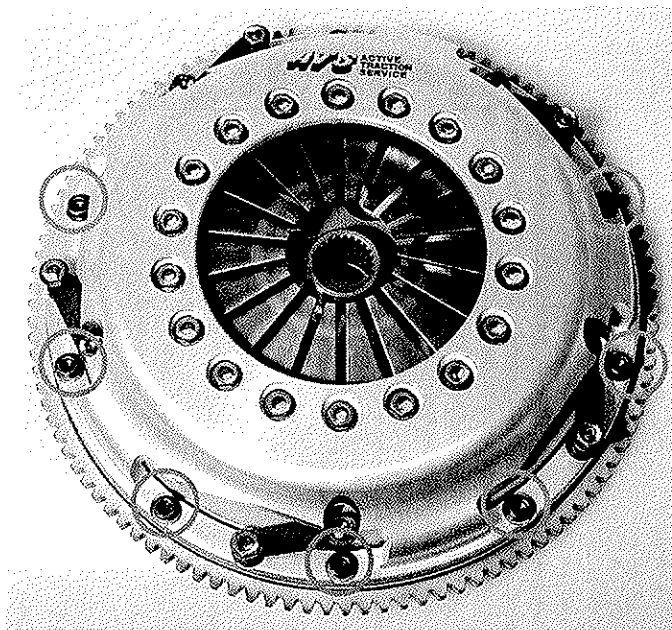
フライホイール取り付けボルト

The bolts and nuts (except for the ones used for attaching the cover to the fly-wheel or to the casing) are tightened properly at the factory using thread-lockers. Tightening those bolts and nuts excessively may cause the deformation or breakage. In the case you have to remove those bolts for disassembly or changing the parts, please refer to ATS&ACROSS.

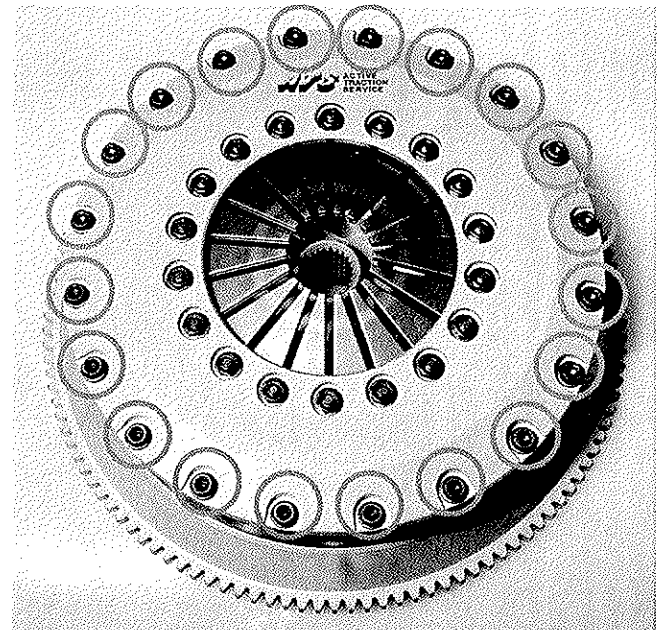


The bolt-nuts for cover to fly-wheel or casing are shown in the red circle

**Tightening torque for cover
ASSY to flywheel or casing is
2.0 kg-m (14.5 lb-ft)**



Compact type



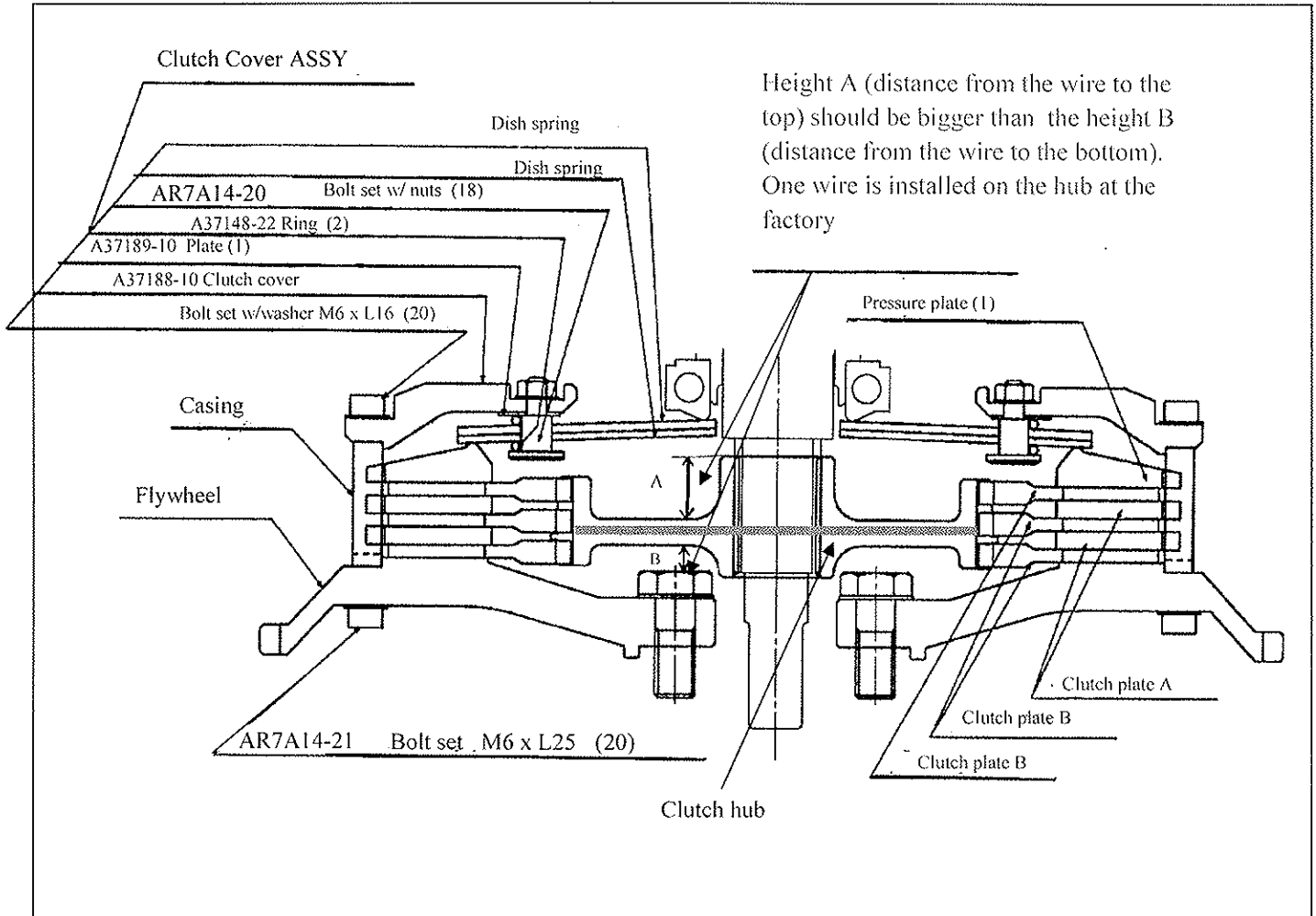
Casing type

CARBONETIC Carbon single clutch

Breaking in the clutch

- 1 The iron parts of the clutch (like pressure plate and flywheel) which contact with carbon disks have very small distortion due to the heat treatment. This might prevent the 100 % torque delivery due to the insufficient engagement. It is important to break in the clutch to mitigate this impact on the performance of the clutch from the distortion. The necessary duration of the break in depends on each clutch since each part has different distortion rate. The rough reference is 800 miles to 1000 miles street driving without hard engagement.
- 2 The clutch might slip if it is not broken in sufficiently. However, once the break in is complete, the slippage should disappear.
- 3 **Do not attempt to shorten the time of break in by engaging the clutch at high rpm or maintain half clutch for a longer duration.** (Half clutch should not be maintained more than 3 seconds during and after the break in even at a low 2,000 rpm). Those attempts only hasten the wearing down of carbon clutch disks and might cause further distortion of the pressure plate.
- 4 Drive normally on the street to break in the clutch. Avoid hard driving.
- 5 Please try to engage the clutch with as little half clutch as possible. Due to the lubrication property of carbon plate, the carbon clutch can handle fast engagement with little half clutch.

CARBONETIC Carbon Triple clutch diagram

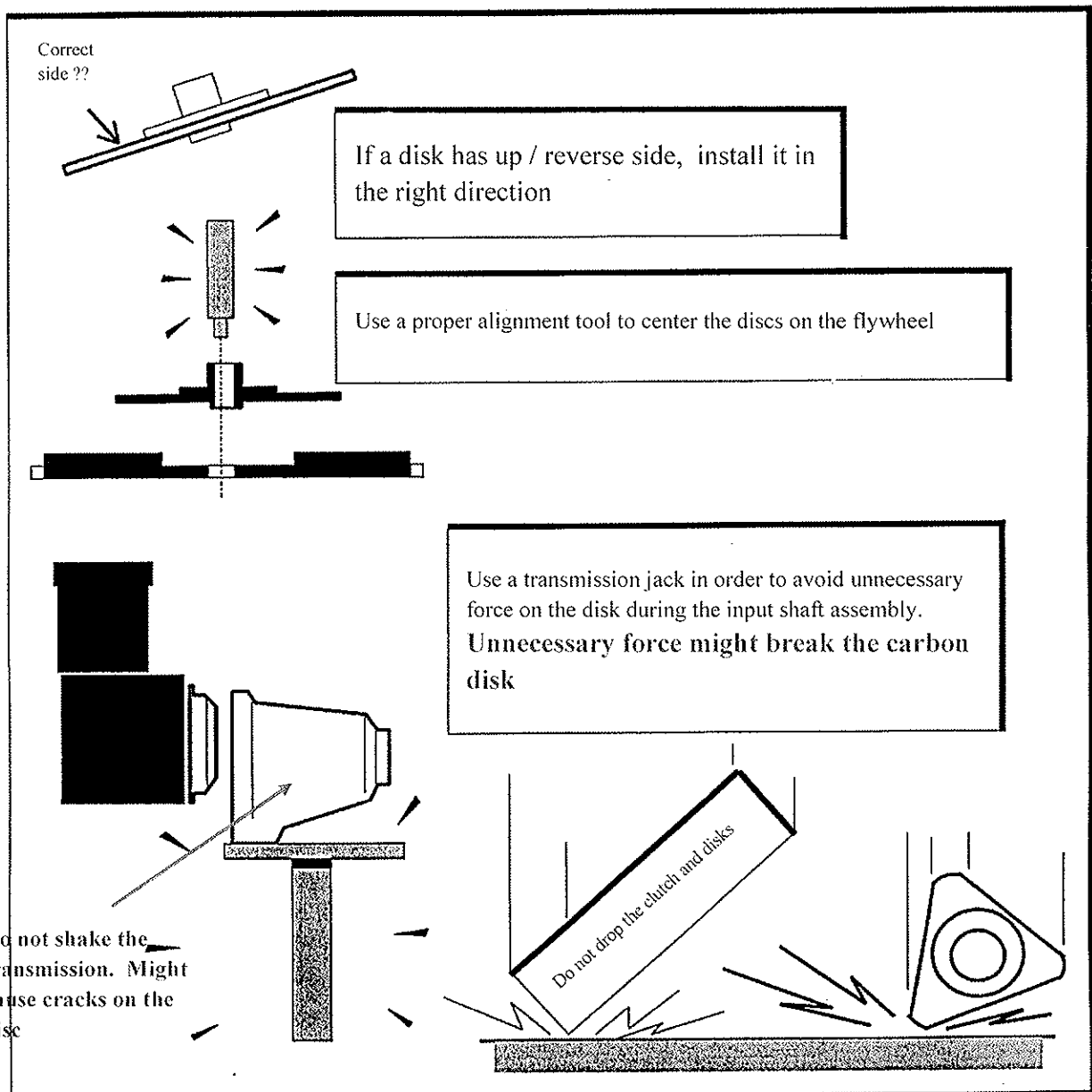


There are top side and bottom side for the pressure plate and clutch hub. Please pay attention to install them in the correct direction. Clutch plate A & B do not have the sides.

ATTENTION Important points for clutch assembly

CARBONETIC carbon disk is very strong and does not break under the normal use. However, under unusual circumstance it might break like when the significant force is applied perpendicular to the disk. Even though the disk might not break, the force might cause a crack and result in disk failure during the driving. In order to avoid the possible damage to the carbon disk, please pay the attention to the points described below.

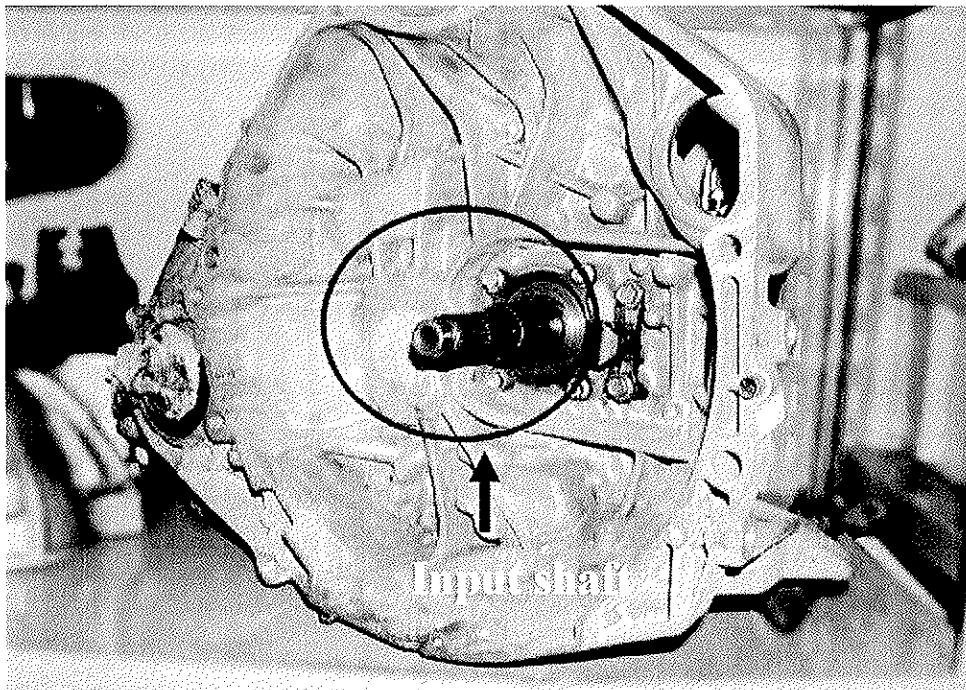
CARBONETIC carbon disk does not break unless excessive force is applied during the assembly. AT&ACROSS will not exchange the carbon disk broken due to a wrong handling.



Caution for clutch assembly

Inspect the input shaft splines for possible warp, twist, and rust before attaching the clutch to the mission. If there are any abnormalities, repair it or use new parts.

*** Checking abnormalities like deformation, twist, and warp of splines ***
Insert the clutch hub onto the input shaft splines and see if it slides smoothly.



Warning

The carbon discs will break if an input shaft with abnormalities is forcefully installed on the clutch.

Attention: When drag racing, please pay attention to:



Burnouts & dry hop without warm up will warp the pressure plate and floating plates !!

Burnouts - A method, at the start, to increase the tire grip to the maximum by intentionally inducing wheelspin and by generating heat in the tires.

Dry hop - A short practice launch. By bringing an engine up to a launch rpm, then launching to examine the tire grip and engine response. Depending on how the car reacts, you will adjust your launch rpm.

Before burnouts / dry hop, a warm up of the clutch is essential

- 1) With emergency brake applied, maintain the half clutch at 2,000 rpm for 3 sec
- 2) Disengage the clutch for 20 to 30 sec
- 3) Repeat the above mentioned process 5 to 10 times.

Do not - use higher rpm and more than 0.5 second duration for half clutch. It accelerates the wear down and could cause warping of the plates.

CARBONETIC carbon disc does not wear down as much and as fast as the metal disc. However, ATS&ACROSS will not be responsible for the possible negative impact on the durability of discs due to repeating this warm up process. Keep the duration of the half clutch as short as possible for the actual drag start.

Powershifting might cause the clutch to slip even though the horsepower is well within the rated range specified by ATS&ACROSS

Warning

Page 5, 10, & 12 are especially important. Please make sure you and your mechanic read those pages and follow.

Page 5 - clutch pedal free travel adjustment. If the free travel is not adjusted correctly (as described in the page with effective constant half clutch situation, the carbon discs wear out very quickly and cause early malfunction.

Page 10 - close to 100% of early failure/break of the carbon discs are caused by cracks made during the installment. Use a transmission jack and do not shake the transmission onto the engine at the installment.

Page 12 - Even though the carbon discs last much longer than metal under the same operation, they produces more heat. The heat accumulation from an extended half clutch (slipping clutch) at high RPM will warp the pressure plate causing early failure of the clutch. Our carbon clutch due to its surface lubricated characteristics (the surface of the carbon disc acts like as if oil is applied on it) can handle a rapid engagement. Use half clutch as short as possible, preferably less than 0.5 second.