



FAULT FINDING

Trouble Shooting Clutch Systems

EXEDY



**DAIKIN
CLUTCH**

From DAIKIN to EXEDY

Our company pursues excellence in every aspect of our operations. To better express this attitude, in August 1995 we changed our name from Daikin Manufacturing Co., Ltd. to EXEDY Corporation. The new name was coined by combining “Excellence” and “Dynamic” — terms that describe our qualities as a corporation. At the same time we adopted a new corporate logo, composed of three curved lines that form an ‘X’, representing society, customers and employees. The colors used in the corporate logo - known as “excellent blue” and “dynamic red” - now serve as our corporate colors.

How to Use this Guide

Clutches transmit power for gear shifting and stopping.

The essential qualities of a clutch are:

- Sure disengagement
- Smooth engagement
- Efficient gear change
- Performance and durability
- Absorption of noise and vibration from the engine and power train.

Clutch efficiency depends on the make of car, the clutch usage, as well as maintenance of the clutch. You must choose and fit the appropriate clutch to the vehicle and know how to install, use and operate the clutch correctly. Many clutch complaints and problems are caused by factors other than the clutch component itself — incorrect usage, faulty fitting and poor maintenance can all contribute to the fault. This manual shows a wide range of clutch problems which can occur and lists the reasons for the problem. EXEDY has been supplying and servicing clutches in the market place for many years with advanced technological know-how and much experience gained from supplying the Original Equipment market. We are sure you will appreciate both our service and our Fault Finding Guide fitting, operating and maintaining your clutch.

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Leaders in drivetrain technology

As a leading manufacturer of drivetrain components, EXEDY Corporation is committed to providing superior products, technology and services. We bring decades of experience and a wealth of know-how to our efforts to develop products that meet the needs of today's industries.

Already at the top of our field, EXEDY is now moving forward toward new challenges in the 21st century.

Getting it right the first time ...

With any clutch problem it is vital to diagnose the cause of clutch malfunction. Here are two examples in which merely replacing the clutch would not have fixed the fault.

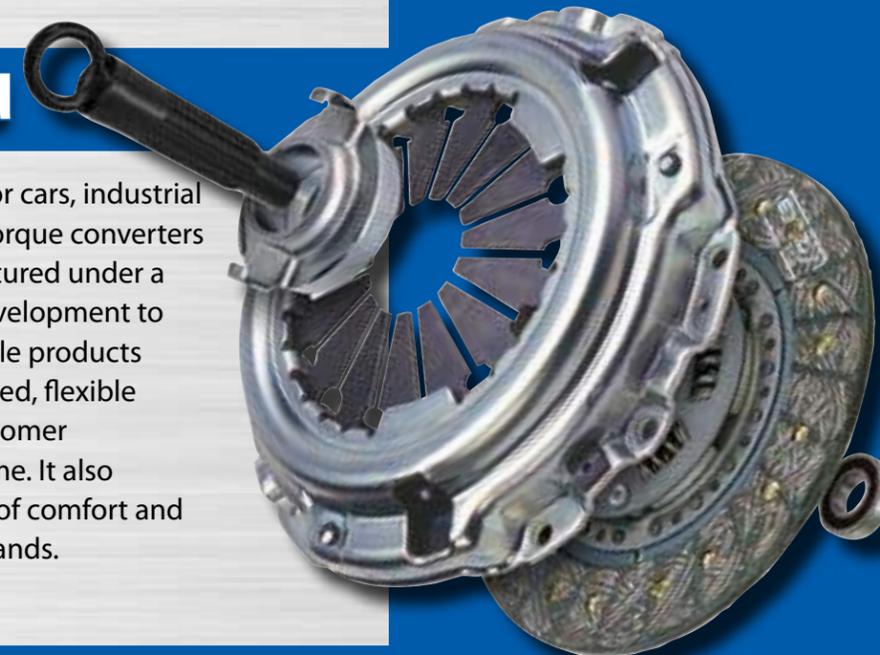
For example...

The Fault	The Fix
Difficult disengagement	Check hydraulics before replacing the clutch
Slipping clutch	Check thrust bearing for free travel before replacing the clutch

DO NOT ASSUME ON ANY CLUTCH REPLACEMENT

Industry Standard

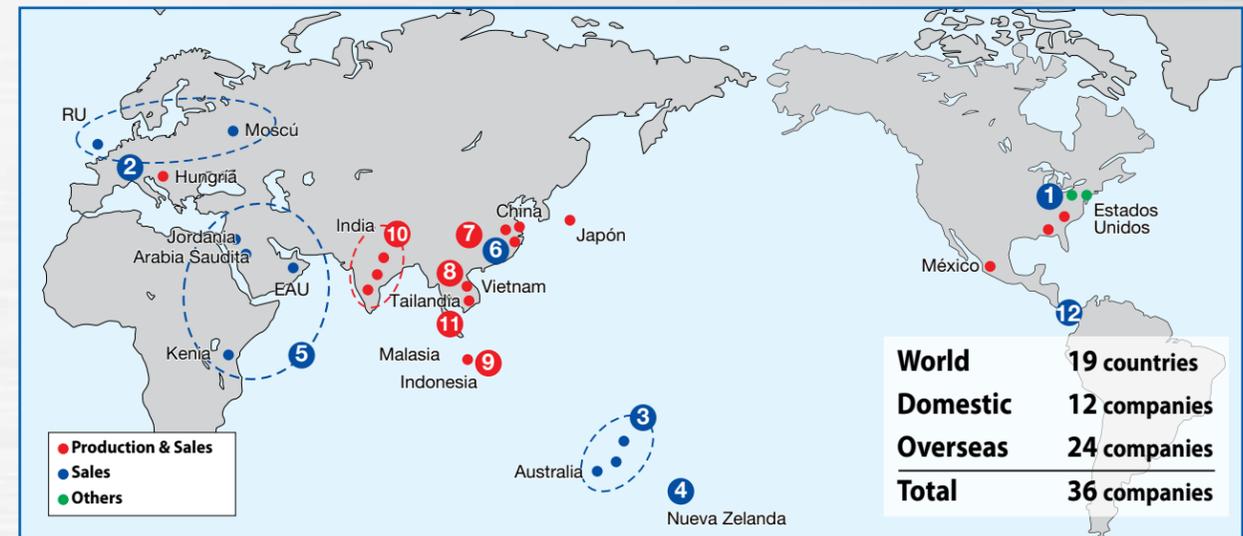
EXEDY's product lines range from clutches for cars, industrial machinery and construction machinery to torque converters and transmissions. Each product is manufactured under a system that integrates all processes from development to assembly and inspection, assuring the reliable products our customers have come to expect. Advanced, flexible production systems do more than meet customer requirements in quality, cost and delivery time. It also results in products that offer the high levels of comfort and operability today's competitive market demands.



- 1950** Incorporated as DAIKIN Manufacturing Co., Ltd.
- 1973** Established DYNAX Corporation in Hokkaido.
- 1975** Ueno Division Started in Mie.
- 1977** Established DAIKIN Clutch U.S.A., Inc.(present EGP)
- 1981** Kawagoe plant started in Saitama.
- 1995** Changed Corporate name from "Daikin Mfg. Co., Ltd." to "EXEDY Corporation"
- 1997** Listed on 1st Section of Tokyo Stock Exchange.
- 1999** **QS-9000 & ISO9001** Certified in March
- 2000** **ISO14001** Certified in June
- 2001** Strategic Alliance with Aisin Seiki Co., Ltd.
- 2004** **ISO/TS16949** Certified in June



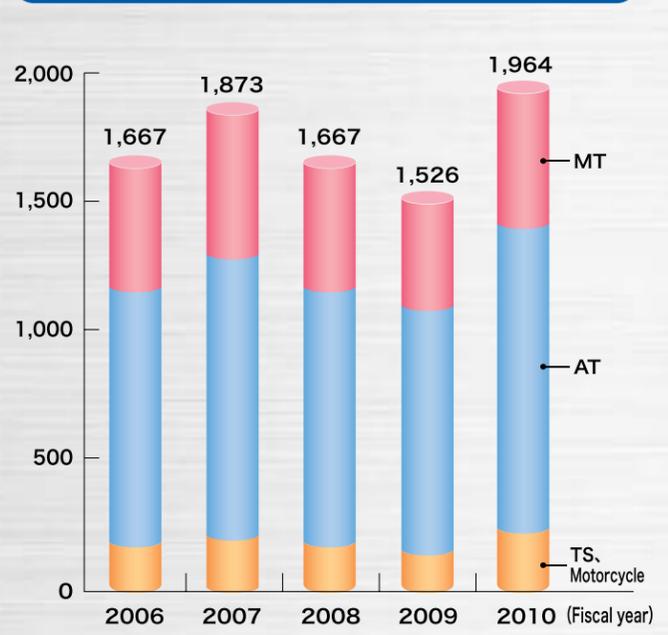
Expectation of the new head building



Aftermarket Group

<p>① EXEDY Globalparts Corporation (Michigan, U.S.A.) 8601 Haggerty Road South, Belleville, MI 48111, U.S.A. TEL: 1-734-397-3333 FAX: 1-734-397-7300</p>		<p>⑦ EXEDY Chongqing Co., Ltd. (Chongqing, China) No.4 Longjing Road, North New Economic Development Zone, Chongqing, 401142, CHINA TEL: 86-23-62924439 FAX: 86-23-62900348</p>	
<p>② EXEDY Clutch Europe Ltd. (Cheshire, U.K.) Unit 2, Rokeby Court, Manor Park, Runcorn, Cheshire, WA7 1RW, U. K. TEL: 44-1928-571850 FAX: 44-1928-571852</p>		<p>⑧ EXEDY (Thailand) Co., Ltd. (Chonburi, Thailand) 700/316 Moo 6, Bangna-Trad Road, Tumbon Don Hua Roh, Amphur Muang, Chonburi 20000, THAILAND TEL: 66-38-214-423 FAX: 66-38-214-422</p>	
<p>③ EXEDY Australia Pty. Ltd. (Melbourne, Australia) 21 Fiveways Boulevard, Keysborough, Victoria 3173, AUSTRALIA TEL: 61-3-9701-5556 FAX: 61-3-9701-5684</p>		<p>⑨ P.T. EXEDY Indonesia (Karawang, Indonesia) Jl. Permata V Lot EE 3 Kawasan Industri KIC Karawang 41361 Jawa Barat, Indonesia TEL: 62-21-89114666 FAX: 62-21-89114568</p>	
<p>④ EXEDY New Zealand Ltd. (Auckland, New Zealand) 151 Wairau Road Glenfield Auckland, NEW ZEALAND TEL: 64-9-444-0901 FAX: 64-9-444-0903</p>		<p>⑩ EXEDY India Ltd. (Greater Noida, India) Plot No.L-4, M.I.D.C. Industrial Area, Chikalthana, Aurangabad 431 210, Maharashtra, no M.H.INDIA TEL: 91-240-2484014 FAX: 91-240-2484403</p>	
<p>⑤ EXEDY Middle East Fzco (Dubai, U.A.E.) P.O.BOX 18199, Warehouse No. ZE5 & ZE6 Jebel Ali Free Zone, Jebel Ali Dubai, U.A.E TEL: 971-4-883-2244 FAX: 971-4-883-2500</p>		<p>⑪ EXEDY India Ltd. (Aurangabad, India) Plot No.9, Udyog Kendra Industrial Area, Greater Noida, 201 304, U.P., INDIA TEL: 91-750-3131000 FAX: 91-120-2397086</p>	
<p>⑥ EXEDY Guangzhou Co., Ltd. (Guangzhou, China) No.406 E-Area, Longfu Car Accessories Centre, Hengfu Road, Guangzhou, CHINA TEL: 86-20-83489166 FAX: 86-20-83489370</p>		<p>⑫ EXEDY (Malasia) Sdn. Bhd. (Negeri Sembilan, Malasia) PT 16748, Jalan Permata 1/5, Arab-Malaysian Industrial Park 71800 Nilai, Negeri Sembilan, MALASIA TEL: 60-6-7992988 FAX: 60-6-7996388</p>	
<p>⑬ EXEDY Latin America, S.A. (Marbella, Panama City) P.H. World Trade Center, Piso 3, Oficina 303 Marbella, Panama City, Republic of Panama P.O. Box number 0832-00599 TEL: 507-395-7122/7123 FAX: 507-395-7124</p>			

Consolidated Sales (Unit : ¥100 million)



Established	July 1950	
President & CEO	Haruo Shimizu	
No. of Employees As of 3/31/2011	Consolidated	13,112
	Non-Consolidated	3,615
Sales (FY2010) [\$1=¥83.15]	Consolidated	US\$ 2,36 Bil. [Yen 196.4 bil.]
	Non-Consolidated	US\$ 1,3 Bil. [Yen 109.0 bil.]



Attention : Please follow the guidelines below to prevent accidents and injuries.

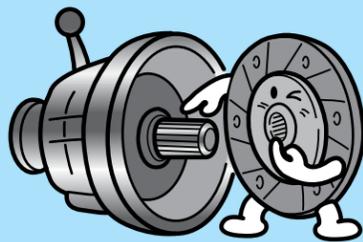
Clutch Disc

1 Pre-assembly check

Prior to assembly, confirm fitment of the clutch disc on the main drive shaft.

Why?

This pre-assembly check will confirm whether or not you have the correct part.

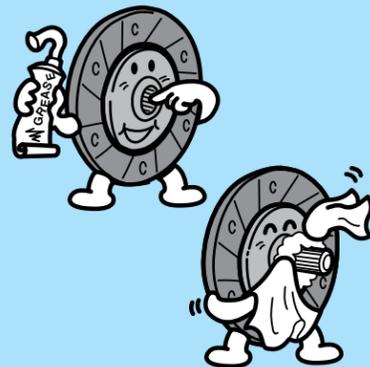


2 Wipe away excessive grease

Apply a thin layer of grease on the splines of the disc. Wipe away protruding grease.

Why?

Excessive grease can cause slippage and juddering.

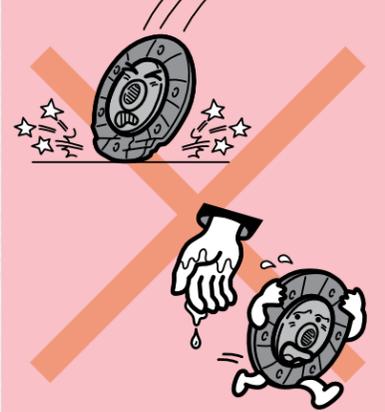


3 Do not handle with dirty hands

Make sure that the clutch disc is not handled with dirty hands or dropped.

Why?

Using a dropped clutch disc can cause gear engagement defects and juddering.

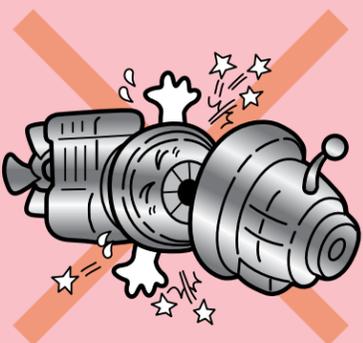


4 Do not force the insertion of the drive shaft

When assembling, insert the drive shaft smoothly.

Why?

Forced insertion will cause damage to the gear teeth and can cause gear engagement defects.



5 Do not use wet parts

Please do not use wet parts.

Why?

Using wet parts can cause gear engagement defects and juddering.

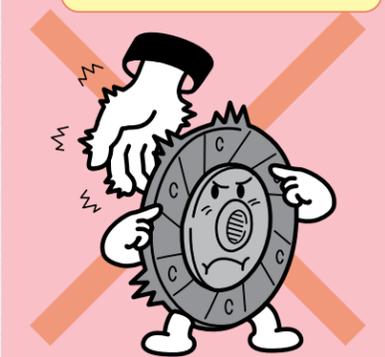


6 Do not handle with bare hands

Wear protective gloves when handling the clutch disc.

Why?

The facing includes glass structures and can irritate the skin if touched directly by hand.



Attention : Please follow the guidelines below to prevent accidents and injuries.

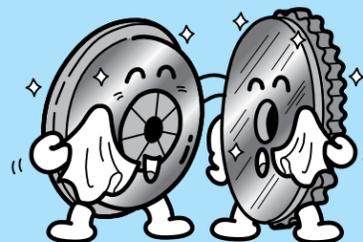
Clutch Cover

1 Wipe the friction surface

Wipe the friction surface of the clutch cover with a clean cloth.

Why?

If oil adheres to these surfaces, it can cause gear engagement defects and juddering.

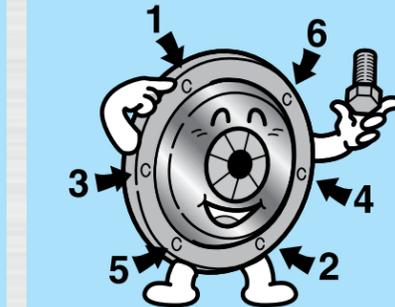


2 Fasten pairs of opposing bolts

When attaching the clutch cover, tighten the bolts in a diametrical pattern.

Why?

By tightening the bolts gradually and in a diametrical pattern, the cover will install evenly and prevent lever and gear engagement defects.

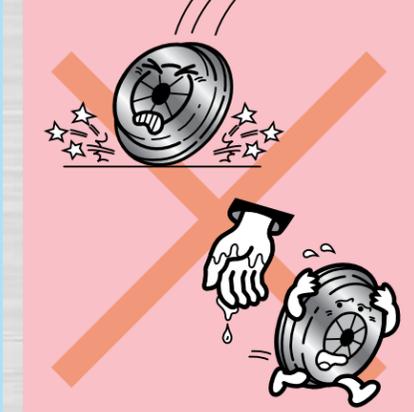


3 Do not handle with dirty hands

Make sure that the clutch disc is not handled with dirty hands or dropped.

Why?

Using a dropped clutch cover or a clutch cover that has been contaminated can cause gear engagement defects and juddering.



4 Do not use wet parts

Please do not use wet parts.

Why?

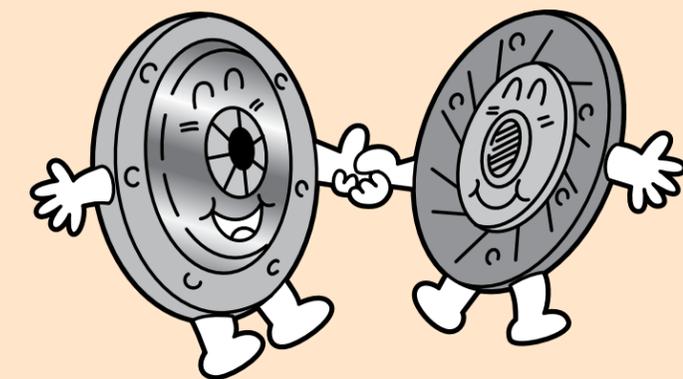
Rusting can cause gear engagement defects and juddering.



When changing the clutch, change it as a set of both the clutch disc and clutch cover.

Why?

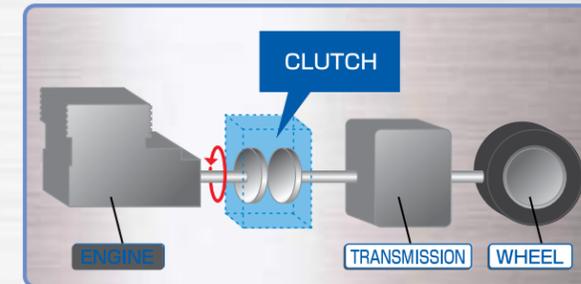
The clutch may have damaged or worn parts that may not be easily seen. Therefore, please replace the clutch disc and cover as a set to avoid unexpected problems.



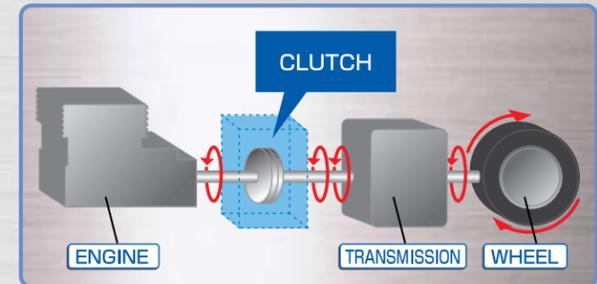
Four Main Functions of the Manual Clutch.

1. Function of transmitting the torque from the engine to the drivetrain.
2. Smoothly deliver the power from the engine to enable smooth vehicle movement.
3. Perform quietly and to reduce drive-related vibration.
4. Protect the drivetrain when given the inappropriate use. Given the situation, the EXEDY clutch will fail when given the inappropriate use intern to protect the rest of the drivetrain, similar to the function of an electric fuse.

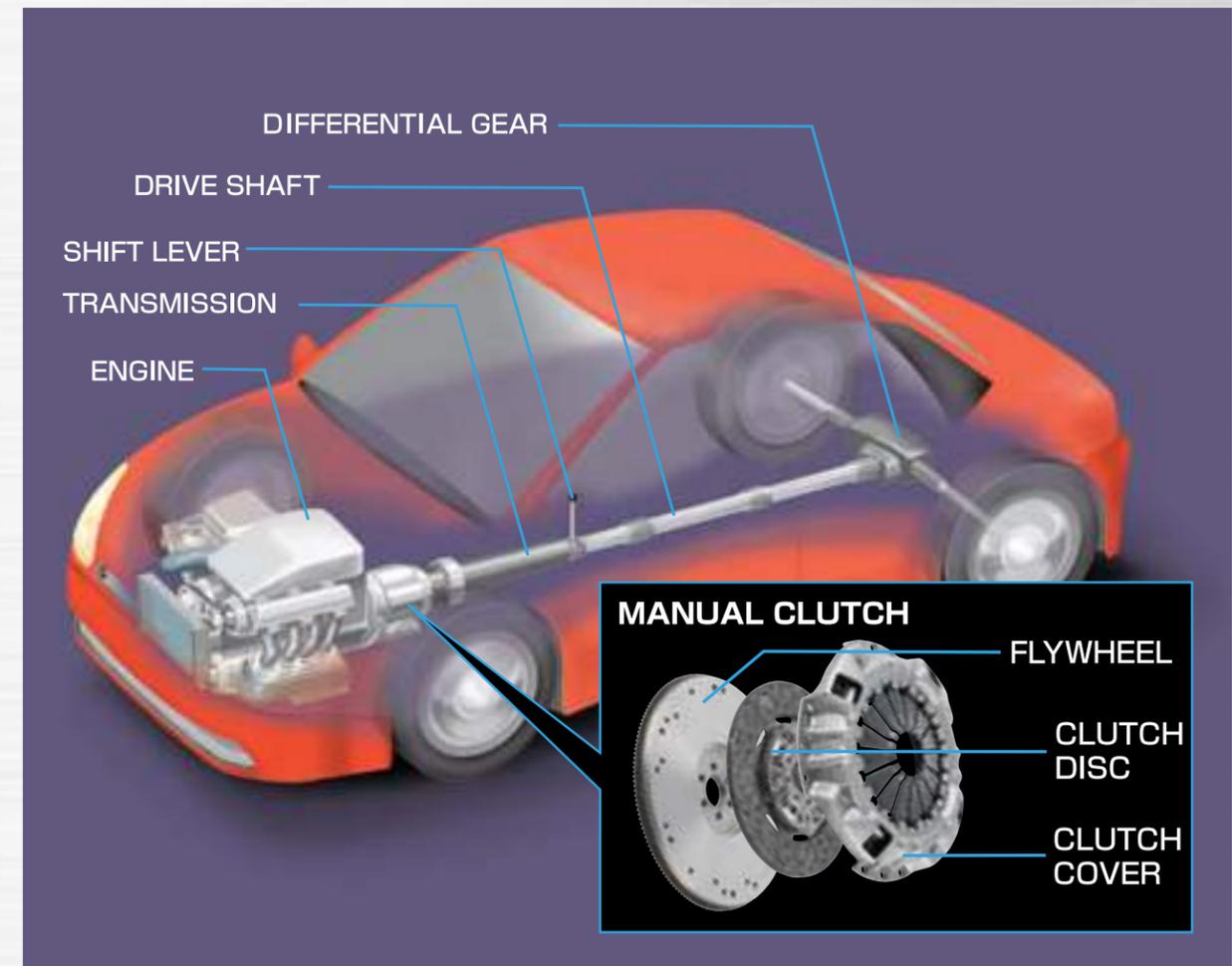
CLUTCH DISENGAGED



CLUTCH ENGAGED



Structure of the drivetrain and the clutch



Attention : The items in this parts list will be used at high revolution. Please follow the guidelines below or serious injury May occur.

Others

1 Ask a licensed mechanic

Have clutch replacement serviced by a licensed mechanic using the manufacturer specifications.

Why?

Defective repair work can lead to breakdowns and accidents.

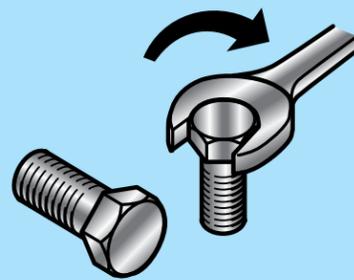


2 Use the specified bolts at the specified torque

Exedy clutch covers and flywheels use manufactured specified bolts, so please refer to the manufacturer maintenance guidelines for installation.

Why?

The breaking of bolts or insufficient bolt torque may cause bolts to fall out.

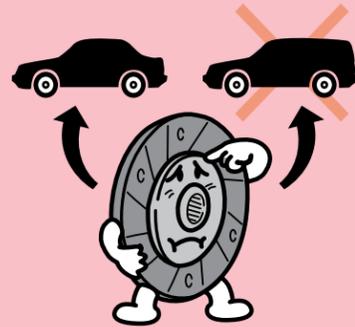


3 Do not use against instructions

Use the product that is developed for the specific application and model.

Why?

Using Exedy parts in non-compatible vehicles could cause a wide variety of complaints.



4 Do not use Exedy OEM replacement on a racing vehicle

Please do not use EXEDY OEM products on modified cars. Please use the sports clutch for performance or racing cars.

Why?

Remodeling for high power and installation of high-output engines in particular can cause clutch damage and lead to serious accidents.

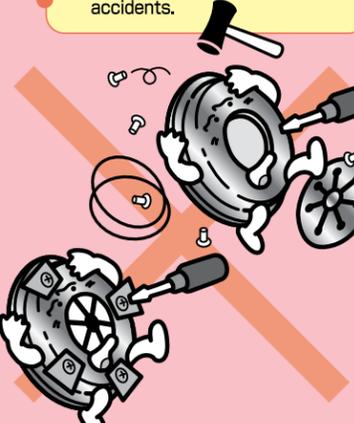


5 Do not remodel parts

Please do not dismantle or remodel Exedy parts.

Why?

Dismantling and remodeling can cause defects and breakage of parts, and lead to serious accidents.



6 Be careful of high temperatures

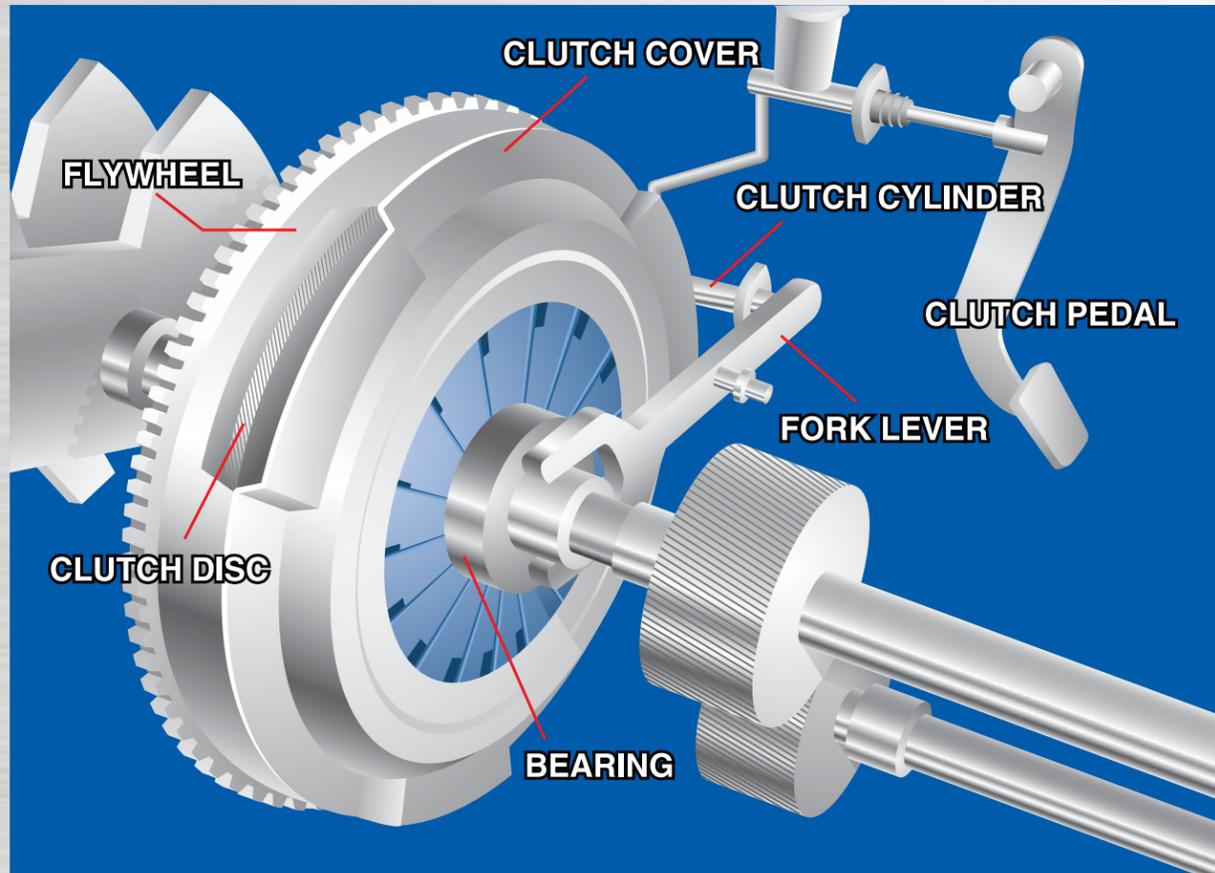
Be sure to work on the vehicle once the components have cooled down to normal temperatures.

Why?

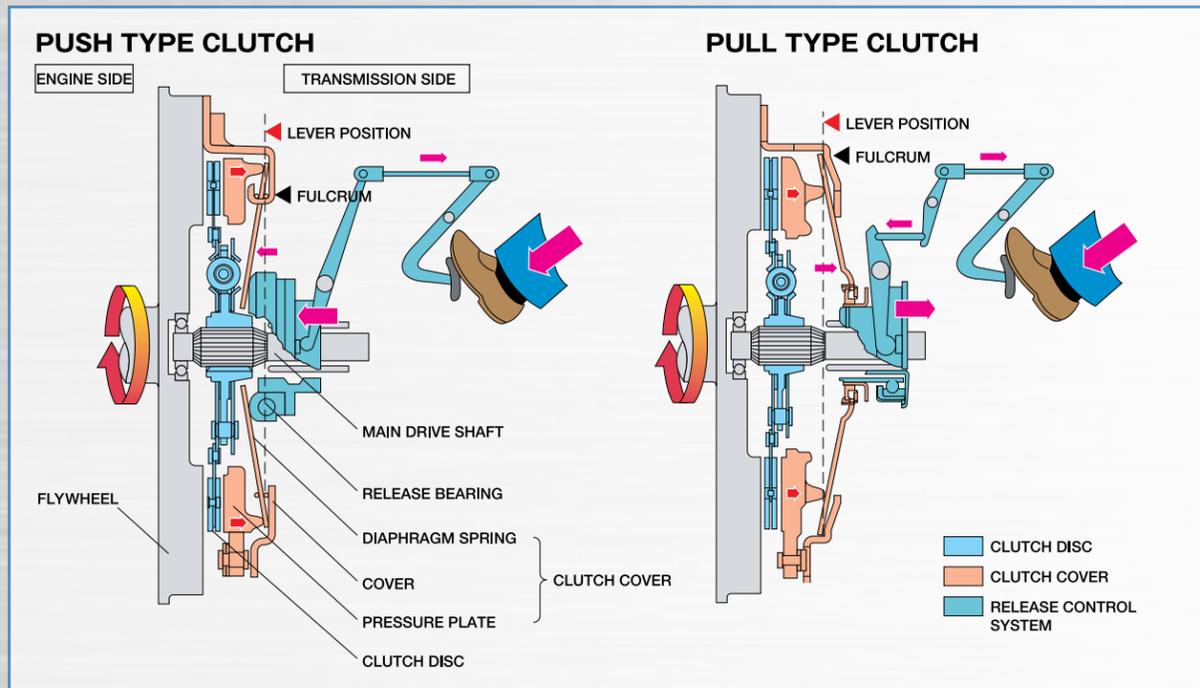
Working on hot machinery can cause work accidents such as burns.



PUSH TYPE MANUAL CLUTCH ASSEMBLY

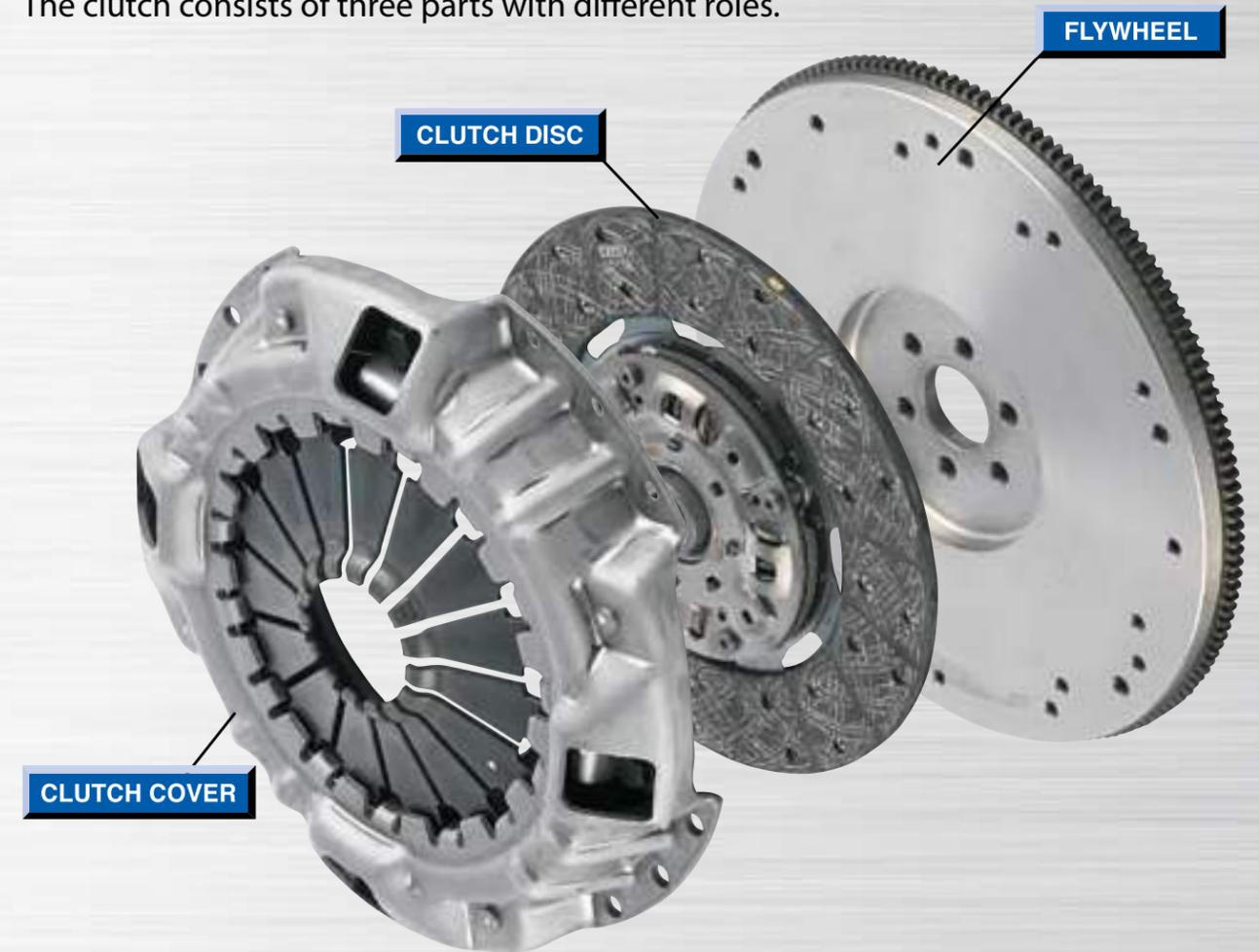


When the clutch pedal is pressed, a cable or hydraulic piston pushes on the release fork, which presses the throw-out bearing against the middle of the diaphragm spring. With the spring pushed, the clutch disc is then disconnected from the rotating flywheel that is attached to the engine. When the pedal is released, the disc will engage contact with the flywheel and transmit the torque from the engine to the rest of the drivetrain.



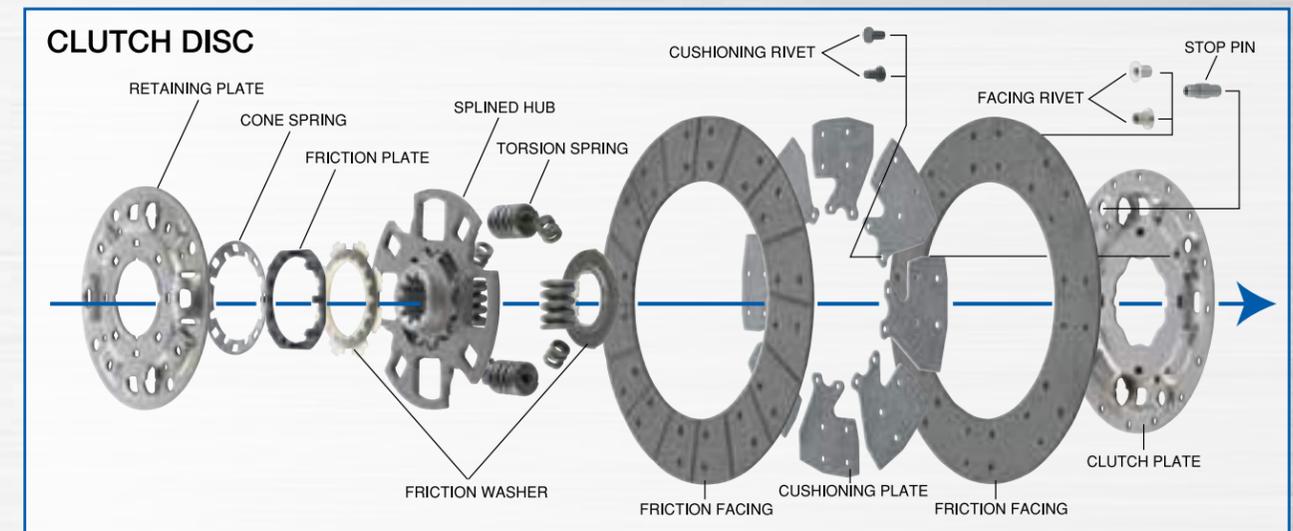
Function of transmitting the torque from engine smoothly.

The clutch consists of three parts with different roles.



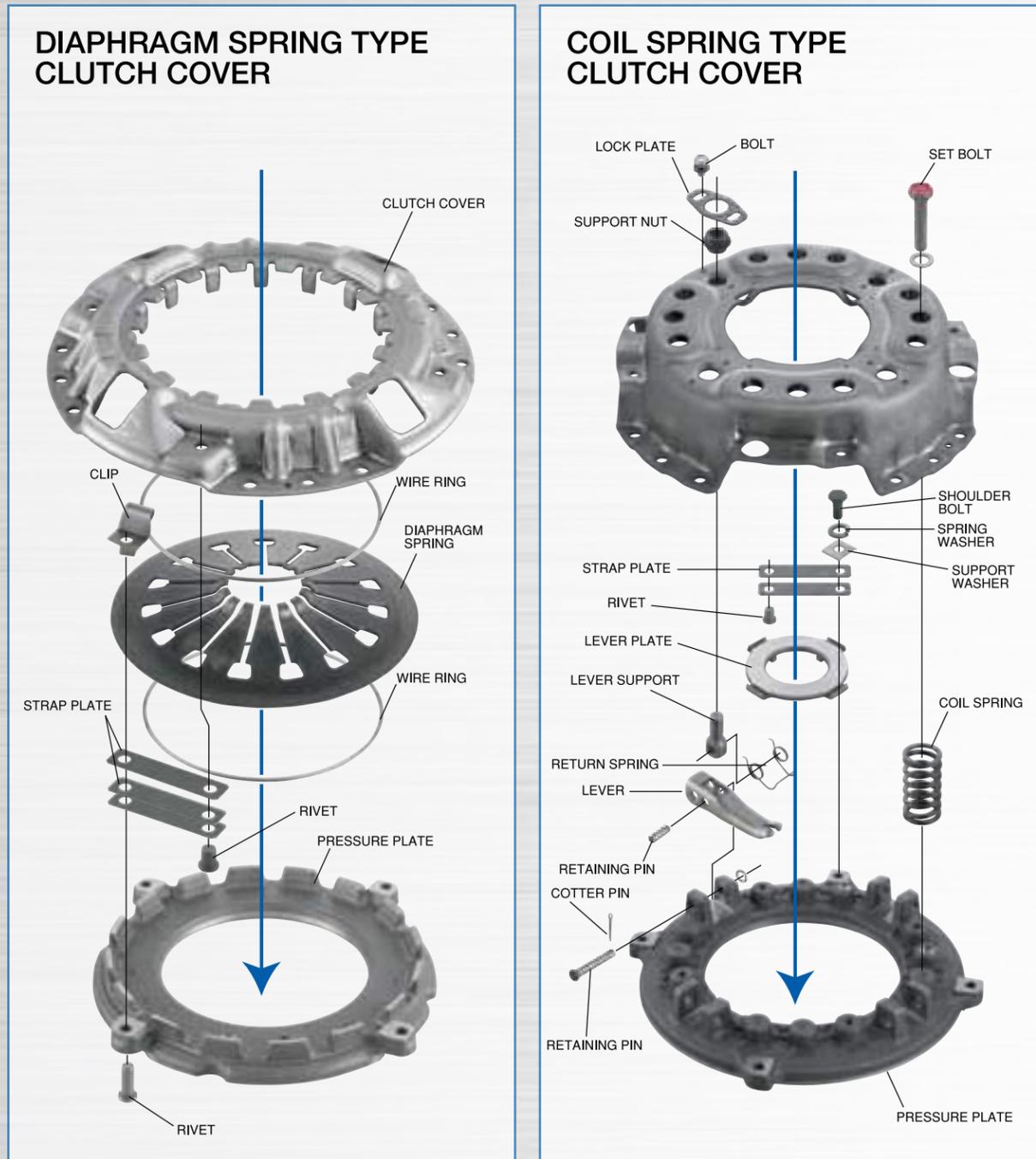
CLUTCH DISC

Engine torque can be cut off and transmitted by engaging or disengaging from the flywheel.

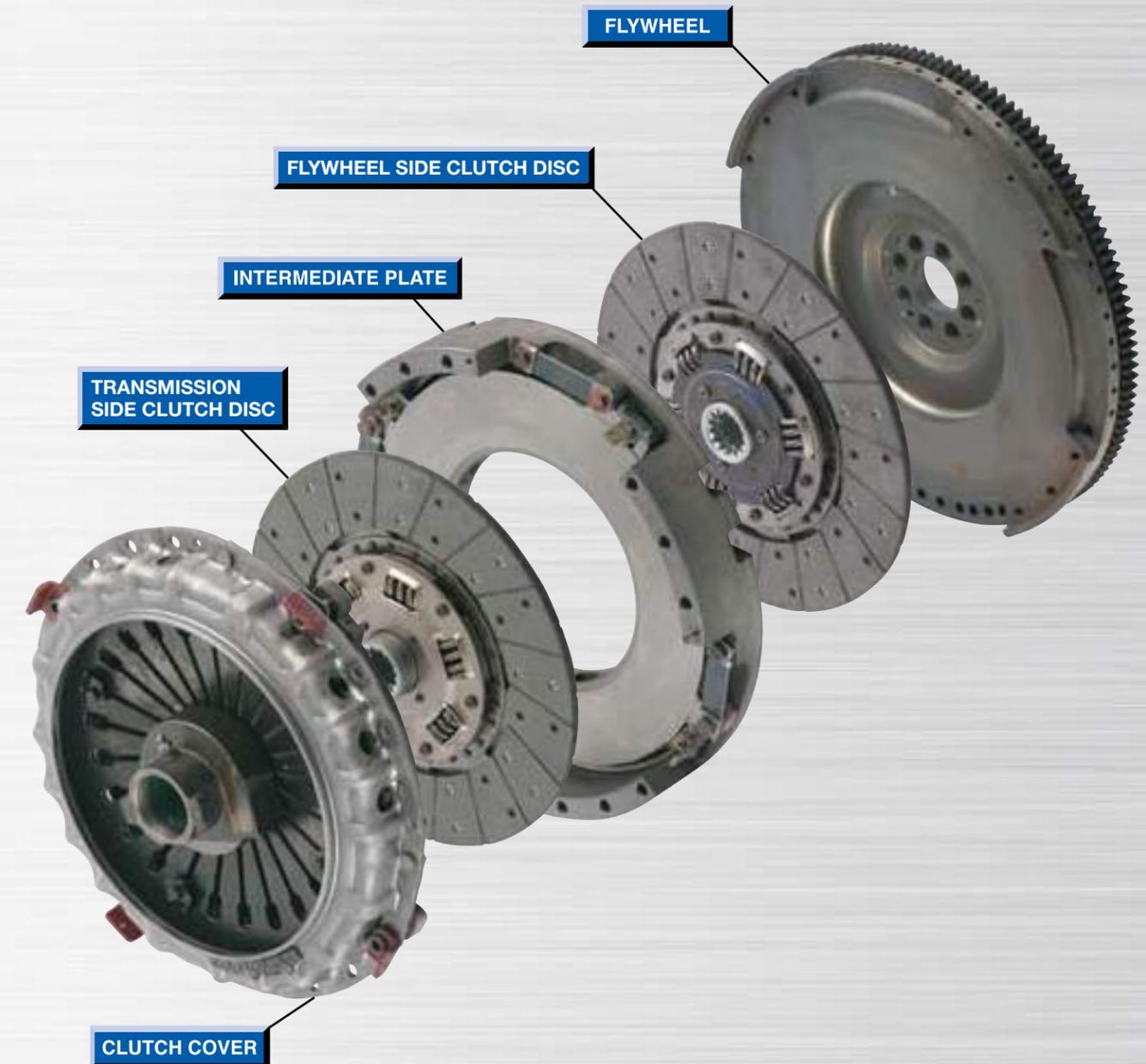


CLUTCH COVER

Clutch cover is to support clutch rotating system and transmit the engine torque by pushing the clutch disc.



Twin Plate Manual Clutch



ATTENTION:
Please make sure to break-in the clutch for 500 miles or more with easy street driving.
(No abuse, more shifting not only mileage)

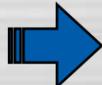
Noise Driveable

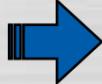
Idling

•Not depressing clutch pedal
 **5A, 5B, 5C, 5E**

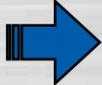
•Depressing clutch pedal
 **5C, 5D, 5F**

Starting

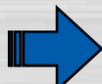
•Engagement
 •Open throttle (Acceleration)  **5G**

•Engagement  **5H**

Driving

•Acceleration, Deceleration  **5I**

Others

•Depressing clutch pedal  **5J**

Observe the sure signs of a worn clutch when removing.

1. Red dust.
2. Broken side plates or springs
3. Damaged torque stopper pins
4. Clutch disc with broken segments and broken friction material.
5. Broken or worn release bearing quills/gear box nose cone bearing slide.

Good Fitting Practice ...

Installing your new EXEDY/Daikin Clutch

1. Getting it right the first time. It is vital to diagnose the cause of clutch malfunction before clutch replacement, i.e. check hydraulic system - bearing free travel - clutch cable, oil leaks and check for any signs of red dust when old clutch is being removed. Any or all of these problems must be corrected before installing new clutch.
2. Ensure clutch supplied is correct for application. If you're unsure, consult your EXEDY/Daikin Clutch Catalogue or your supplier, as fitting a clutch to the wrong application will void the warranty.
3. Flywheel must be resurfaced or warranty void and check pilot bearing or bush and replace if necessary.
4. Before fitting, check clutch for any shipping damage. Next, check that clutch disc slides freely on gearbox shaft and then clean shaft splines. Lightly grease the shaft splines with high melting point grease. Always ensure bell housing is degreased and is free of dust and that fibres from the worn clutch are removed.
5. Check the clutch release fork for cracks, check the clutch cable for stretch signs and check the release bearing gear box quill/gear box main drive nose cone bearing slide for any wear. Always lightly grease this part where the bearing slides. This will allow smooth sliding of the bearing carrier. Always work the fork forward and backwards after installing bearing on the quill.
6. Place the clutch cover pressure plate assembly over the clutch disc, after checking that the disc is the right way around and the hub section of the disc does not foul on the casting of the clutch cover assembly or the flywheel. A suitable clutch aligning tool will ensure correct alignment, assist in ease of installation and avoid spline damage. (Burrs on splines are a major cause of difficult gear disengagement). Ensure pressure plate dowels are aligned to the cover. Tighten bolts in a diagonal pattern and never use air tools to install a clutch cover assembly.
7. Re-fit gear box, taking care not to bend the clutch disc. Never hang the gear box off the clutch disc or use any force to align gear box shaft.
8. Check all bell housing dowels are in correct position and tighten bell housing bolts. Ensure there is no dirt or foreign material between the mating surfaces of the engine and the bell housing.
9. Perform any clutch adjustment only to vehicle manufacturer's specifications.
10. Always check the clutch cable if you are unable to obtain disengagement when a new clutch is fitted. Start off your check process by replacing the cable and checking hydraulic system.
11. Road test vehicle and never abuse a newly fitted clutch. Allow 1000mi run in and always adjust free travel on your new clutch at 1000mi and 3000mi. Thereafter adjust at every 10,000 mi.

WARNING: Do not use EXEDY/Daikin clutches in any situation where engine RPM's may exceed manufacturer's specifications — a pressure plate could explode unexpectedly causing serious injury or death to vehicle occupants and bystanders. Clutch cover and bell housing will not protect against exploding pressure plates. Refer Application Catalog correct fitment.

Something wrong with clutch pedal

Page 20 Causes and Solutions

Heavy effort	Engine Running	➔	7A
Pedal not returning from the bottom		➔	7B
Engage, disengage at high position	•Shortly after replacement	➔	7C
	•After a while	➔	7D
Disengage at low position	•Shortly after replacement	➔	7E, 7F
	•After a while	➔	7F, 7G
Vibration when foot on pedal	•Disappear vibration when depressed	➔	7H
No free play/A lot of free play		➔	7I
Wobble		➔	7J

Something wrong with gear shift lever

Page 22 Causes and Solutions

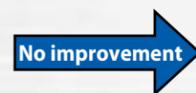
Unable to shift	•Before engine start	➔	9A
	•Whilst engine running	➔	9B
Heavy gear shift effort		➔	9B
Rasping sound during operation	•Noise on all gears	➔	9B
	•Noise on reverse gear	➔	9B
	•Noise on particular	➔	9C
Vibration on shift lever		➔	9D

Unable to drive

Page 22 Causes and Solutions

No acceleration Slow down	•Burning smell	➔	9E
Whip back and force harsh engagement	•Shortly after replacement	➔	9F
	•After a while	➔	9G
No drive gear	•Noisy clutch	➔	9H
Movement with depressing clutch pedal	•Heavy effort	➔	9I

Causes and Solutions (Noisy Clutch) Check before replacing the clutch



Check after removing transmission

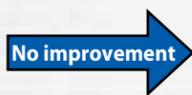
5A	<ul style="list-style-type: none"> • Confirm if noise disappears when the Clutch pedal is depressed. If the noise disappears when clutch pedal depressed, this is an idle gear rattle due to use of non specified, low viscosity oil. →Exchange with specified transmission oil. • In case of being backlash or looseness in control system→check installation
5B	<ul style="list-style-type: none"> • Abnormal idling RPM. Heavy vibration and rumblings. →Jack up engine and adjust to the normal idle speed.
5C	<ul style="list-style-type: none"> • Non removal of hold down bolts (hold down bolt type only) →Check if the Clutch Cover has red colored painted bolts through inspection hole. • Parts are damaged by excessive force during clutch replacement. →Check parts after removing transmission.
5D	<ul style="list-style-type: none"> • Interference between clutch disc and clutch cover due to over stroke. →Adjust clutch pedal free play.
5E	<ul style="list-style-type: none"> • Reconfirm whether the noise comes from the Clutch • Abnormal bearing on transmission. →Check bearing after removal of transmission.
5F	<ul style="list-style-type: none"> • Malfunction of release bearing or pilot bearing. →Check if Release Bearing was replaced with new one during Clutch replacement.
5G	<ul style="list-style-type: none"> • Interfering noise by jolting of driveline under driving torque. →Check the drivetrain, and engine mount installations for any signs of breakage and cracking.
5H	<ul style="list-style-type: none"> • Does release control system operate smoothly? →Inspect clutch booster itself, grease up at movable part. • Check wear condition of clutch disc. →Check wear condition through inspection hole or release fork area.
5I	<ul style="list-style-type: none"> • Driving gear rattle due to unspecified low viscosity of oil. →Exchange specified transmission oil. • Backlash or looseness on control system causes noise. →Check installation.
5J	<ul style="list-style-type: none"> • Grease up at movable part of clutch pedal, release fork and lever. • Inspect clutch booster. →In case of failure of clutch booster, repair according to the service manual.

<ul style="list-style-type: none"> • Check clutch compatibility.→Replace with suitable clutch, if not compatible. • Check backlash or free play at the movable part of release fork.→Adjust or repair according to service manual. • Check wear on main drive shaft and spline hub. →Worn out parts shall be replaced with new one. • Check damage on clutch cover or clutch disc. →Clutch may have failed if excessive force has been applied during installation.
<ul style="list-style-type: none"> • Removal of hold down bolts. →Failed parts shall be replaced with new one. • Failed parts shall be replaced with new one. →Clutch may be failed if excessive force has been applied during installation.
<ul style="list-style-type: none"> • Check whether there is an interference mark on clutch cover and clutch disc. →Failed parts shall be replaced with new one.
<ul style="list-style-type: none"> • Check bearing on transmission side whether there is backlash. →Repair according to service manual.
<ul style="list-style-type: none"> • Check damage and direction of a release bearing.→Replace with new one, if damaged. • Check backlash on a pilot bearing.→Replace with new one, if failed.
<ul style="list-style-type: none"> • Check tightness of flywheel bolts/ clutch cover bolts.→Replace with new one, if damaged.
<ul style="list-style-type: none"> • Check whether diaphragm finger tips were even. →Remove clutch cover, then reinstall same cover and tighten bolts. When you install the clutch cover, tighten bolts temporary by hand, then torque down in correct diagonal sequence one by one. • Check whether grease flew out on a clutch disc. →No adequate friction or noise. Replace with new clutch disc.
<ul style="list-style-type: none"> • Reconfirm compatibility.→Replace with adequate clutch, if not compatible. • Check whether grease flew out on a clutch disc. Replace with new one, if greased. →Deteriorate function of noise control and vibration control resulted in noise. Replace with new clutch disc, if greased. • Check backlash or free play at the joint of release fork.→Adjust to manufacturer's specification.
<ul style="list-style-type: none"> • Inspect slide portion at release bearing/fork. Grease up. • Replace with new parts, if damaged.

• In case of a failure without known cause, please apply a request that there be an investigation based on warranty certificate. Followings, however, are not eligible

1. Failure by wear or aging variation
2. 90 days or 3,000 miles under normal driving condition after installation

Causes and Solutions (Abnormal on clutch pedal) Check before replacing the clutch



Check after removing transmission

7A	<ul style="list-style-type: none"> Is a clutch booster normal? →Inspection according to service manual. Does control system operate smoothly? →Adjust or grease up.
7B	<ul style="list-style-type: none"> Is the clutch pedal height or free play appropriate? →Adjust pedal free play and rod projecting amount according to a service manual. Is a piston firmly fixed to a release cylinder? Is there any oil leakage from release cylinder, master cylinder or clutch pipe line? →In case of leakage, overhaul and repair. Is there air in clutch line? →work out air-bleeding.
7C	<ul style="list-style-type: none"> Is the clutch pedal height or pedal free play appropriate? →Adjust pedal free play and rod projection amount according to a service manual. Check whether the release cylinder operates properly..
7D	<ul style="list-style-type: none"> Is the clutch pedal height and free play adequate? If you reduce pedal free play excessively, the release bearing does not return and it may result in a change of engagement point in use. →Adjust pedal free play and rod projection amount to manufacturer's specification. Does a driver have a habit to drive with his foot on a clutch pedal or to use semi-disengagement frequently?→Check wear condition on a release fork through inspection hole. There is a possibility to wear clutch disc prematurely.
7E	<ul style="list-style-type: none"> Is the clutch pedal height or free play appropriate? →Adjust pedal free play or rod projecting amount according to a service manual →Check release cylinder whether it operates properly.
7F	<ul style="list-style-type: none"> Check oil leakage from a release cylinder, master cylinder and clutch line. →In case of leakage, overhaul or repair it according to a service manual. Is there air in clutch fluid line? →Bleed hydraulic system. Is there any failure on a release fork such as deformation? →Remove a transmission and replace it.
7G	<ul style="list-style-type: none"> Does a driver have a habit to drive with his foot on a clutch pedal or to use semi-disengagement frequently? Components will be over heated and distorted. It results in difficult to disengage gear. →Overhaul according to a service manual.
7H	<ul style="list-style-type: none"> Shortly after replacement the position of a release bearing is unstable and results in vibration. →Depress clutch pedal a couple of times to fit.
7I	<ul style="list-style-type: none"> Is the clutch pedal height and free play adequate? →Adjust the pedal height and free play to manufacturer's specification.
7J	<ul style="list-style-type: none"> Check looseness of pedal installation, and adjust free play. →Replace with new one, if failed.

<ul style="list-style-type: none"> Inspect slide portion at a release bearing/fork, a transmission retainer, etc. Grease up. →Replace damaged parts, if failed at slide portion. →Grease up periodically, if fixed intervals is specified by manufacturer. Check failure of release bearing, or direction of it. →Replace with new parts, if failed. Check compatibility of clutch cover. If you use unspecified clutch, clutch pedal effort becomes heavier or clutch pedal does not return from the bottom.
<ul style="list-style-type: none"> Check oil leakage from CSC, Concentrated Slave Cylinder, or smooth movement. →Replace with new components, if failed. Check wear or failure on the clutch cover and the clutch disc. →Replace with new components, if failed any. Educate a driver not to put his foot on a clutch pedal during driving.
<ul style="list-style-type: none"> Check distortion on the clutch disc or cover.→Replace with new if distorted. Check the backlash on a release fork/lever.→Adjust or repair according to a service manual. In case of lever type clutch cover, is it used with lever height adjustment? →It is not necessary to adjust lever height, because it is adjusted properly. Adjust it by release control system.
<ul style="list-style-type: none"> Inspect deformation and excessive wear condition of release fork and pivot etc. →Replace with new components, if damaged.
<ul style="list-style-type: none"> Frequent usage of semi-disengagement makes a clutch disc distort, and results in a change of disengagement point. →Replace with new one, if damaged. Educate a driver not to drive with his foot on a clutch pedal or not to use it in semi-disengagement frequently.
<ul style="list-style-type: none"> Check whether diaphragm fingers or levers are uneven. →Remove clutch cover, then reinstall same one and tighten bolts. When you install the clutch cover, tighten bolts temporary by hand, then torque down in correct diagonal sequence one by one.

• In case of a failure without known cause, please apply a request that there be an investigation based on warranty certificate. Followings, however, are not eligible
 1. Failure by wear or aging variation
 2. 90 days or 3,000 miles under normal driving condition after installation

Causes and Solutions (Shifting & Driving) Check before replacing the clutch



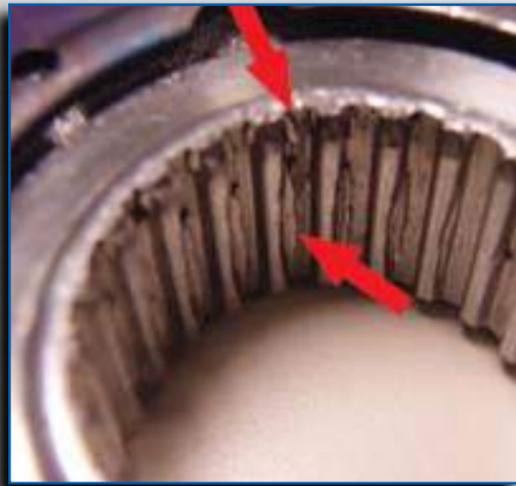
Check after removing transmission

9A	<ul style="list-style-type: none"> Is there any problem with installation of clutch cable? →Check installation of shift control system.
9B	<ul style="list-style-type: none"> Possible difficult to disengage gears. Is the pedal height or free play adequate? →Adjust the pedal free play and rod projecting amount according to a service manual. →Check the return of piston of release cylinder. Is there any problem with installation of clutch cable? →Check installation of shift control system.
9C	<ul style="list-style-type: none"> Failure of transmission, if it is a particular gear. (except reverse gear) →Check a transmission.
9D	<ul style="list-style-type: none"> Is there any problem with installation of clutch cable? →Check the backlash of shift control system.
9E	<ul style="list-style-type: none"> Is the pedal height or free play adequate? →Adjust the pedal free play and rod projecting amount according to a service manual. Check the return of piston of release cylinder. Remove hold down bolts. (Hold down bolts type only) →Check the red painted hold down bolts through inspection hole.
9F	<ul style="list-style-type: none"> Does a clutch pedal operate smoothly? →Check a release fork and lever whether they operate smoothly.
9G	<ul style="list-style-type: none"> Interference noise by driveline under heavy load. →Check breakage, cracks, installation of engine/transmission mount, also check the backlash on a drive train.
9H	<ul style="list-style-type: none"> Remove hold down bolts. (Hold down bolt type clutches only) →Check the red painted hold down bolts through inspection hole. Check the installation of shift rod and wiring, also smooth movement of a release fork and lever.
9I	<ul style="list-style-type: none"> Is the clutch pedal height and free play adequate? →Adjust it according to a service manual. Check oil leakage from a release cylinder, master cylinder and clutch line. →Overhaul or repair according to a service manual.

<ul style="list-style-type: none"> Check the backlash on a release fork and lever. Check the failure and direction on a release bearing. Check scratches on spline hub. Check whether pilot bearing rotate freely. →Always replace with new components, if failed. Check oil leakage or smooth movement on CSC, Concentrated Slave Cylinder. →Always replace with new components, if failed.
<ul style="list-style-type: none"> Remove a clutch and replace with new parts, if failed. Check a release bearing, a pilot bearing, a release fork and a pivot, when you replace a clutch. Pedal height and free play shall be adjusted, and hold down bolts and set wire shall be removed as well.
<ul style="list-style-type: none"> Inspect slide portion at release bearing/release fork. →Grease up Check oil or grease on a clutch disc. →Replace with new clutch disc, if contaminated with oil or grease.
<ul style="list-style-type: none"> Check a pressure plate whether it is shiny ground friction surface. →If a driver put his foot on a clutch pedal during driving, the clutch performance is deteriorated and results in bad semi-disengagement performance.
<ul style="list-style-type: none"> Remove the hold down bolts or set wiring. →Replace it, if failed. Inspect slide portion on a release bearing/ fork. Grease up.
<ul style="list-style-type: none"> Check the deformation of strap plate and clip, broken parts between gap as well. →Replace it, if failed. Check the backlash on a release fork/ lever →Adjust or repair it according to a service manual.

In case of a failure without known cause, please apply a request that there be an investigation based on warranty certificate. Followings, however, are not eligible

1. Failure by wear or aging variation
2. 90 days or 3,000 miles under normal driving condition after installation



PROBLEM: Contact mark on the teeth of spline and the end of hub.

SYMPTOM: Difficult to disengage gears.

CAUSE: Excessive force to fit a main drive shaft causes this problem during reinstallation of transmission.

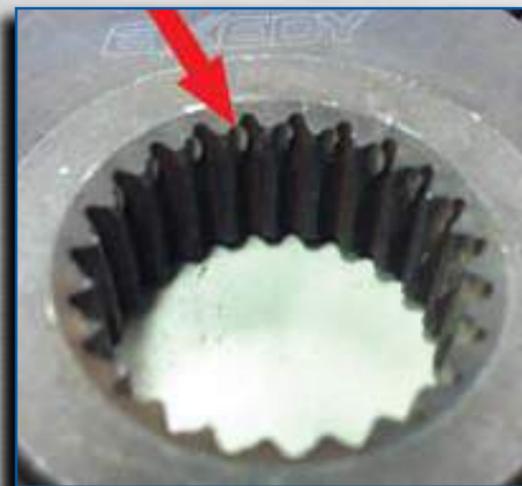
SOLUTION: During the installation of transmission, align drive line;
 -height
 -angle
 -spline teeth
 then fit without excessive force.

PROBLEM: Damaged facing material.

SYMPTOM: Difficult to disengage gears.

CAUSE: Clutch disc has been dropped possibly during installation or damaged in transit. Bulged clutch facing to contact flywheel causes this problem.

SOLUTION: Always check before installation that is intact. Treat parts carefully.



PROBLEM: Burrs at the end of hub due to uneven wear on the spline teeth.

SYMPTOM: Difficult to disengage gears.

CAUSE: Misalignment between engine crank shaft and transmission main drive shaft causes this problem during installation of transmission.

SOLUTION: 1. Replace deteriorated pilot bearing or bush.
 2. Reinstall parts after removal of contamination or scratch on the mating surface of bell housing.

PROBLEM: Oily facings.

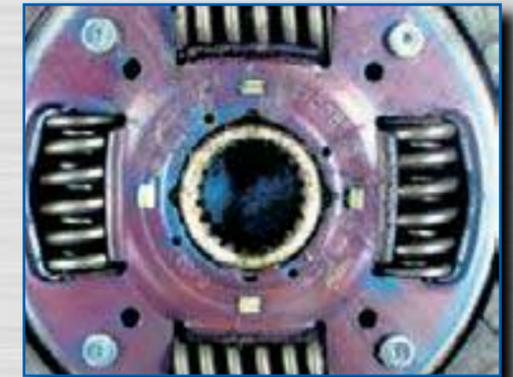
SYMPTOM: Slipping clutch/shuddering juddering clutch.

CAUSE: Excessive grease or low viscosity grease causes this problem.

Melted grease on friction material will affect the friction coefficient of disc facing causing facing failure.

SOLUTION: Lightly grease spline, wipe off excessive grease after tentative installation and ensure there is smooth sliding of clutch disc on main drive shaft.

Use grade of grease specified by vehicle manufacturer.



PROBLEM: Damaged torsion springs.

SYMPTOM: Unable to disengage gears/Noisy clutch.

CAUSE: 1. When engine torque is higher than clutch torque, this misapplication causes springs to deteriorate.

2. Misalignment between engine crank shaft and transmission main drive shaft causes this problem during installation of transmission.

SOLUTION: 1. Choose and fit appropriate EXEDY clutch to suit the application.

2. Reinstall deteriorated pilot bearing or bush parts after removal of contamination or scratch on the mating surface of bell housing.

PROBLEM: Broken facings.

SYMPTOM: Slipping clutch/Shudder/Judder/Noisy clutch unable to drive.

CAUSE: Following factors lead to high temperature of friction surface, resulting in this problem.

1. Driving with a foot on a clutch pedal
2. Overloading vehicle
3. Improper starting gear
4. Clutch pedal height or free play maladjustment
- 5) Oil/grease contamination.

SOLUTION: 1.~ 3. Driver education.

4. Adjust pedal free play according to service manual.

*Do not over grease input shaft or disc during installation.



Damaged torsion springs



Stripped Out Spline

PROBLEM 1: Stripped out or wore teeth on spline.

PROBLEM 2: Cushion spring steel segments separated from hub area.

SYMPTOM: Noisy clutch/unable to drive.

CAUSE: Misalignment between engine crank shaft and transmission main drive shaft during installation of transmission.

Excessive force to fit main drive shaft causes this problem during reinstallation of transmission.

SOLUTION: During the installation of transmission, align drive line,
-height
-angle
-spline teeth
then fit without excessive force.

Exchange the deteriorated pilot bearing or bush parts after removal of contamination or scratch on the mating surface of bell housing.



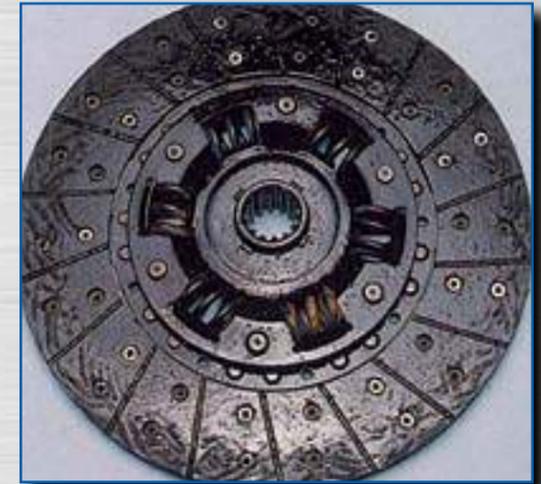
Separated clutch disc assembly

PROBLEM: Oily Facings.

SYMPTOM: Slipping clutch/shuddering/juddering clutch.

CAUSE: 1. Faulty main drive oil seal.
2. Faulty rear main bearing oil seal.

SOLUTION: 1. Replace clutch disc.
2. Replace faulty oil seals.

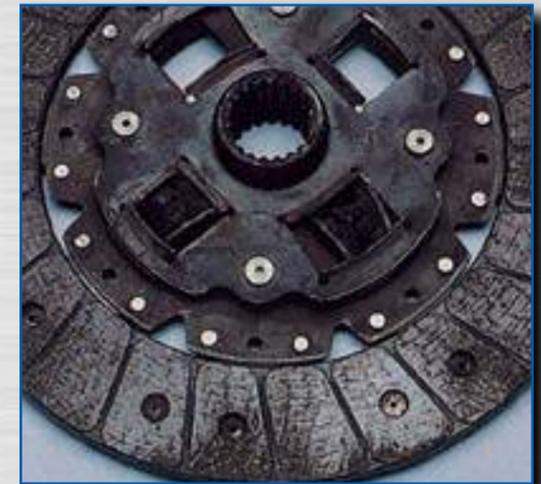


PROBLEM: Difficult gear engagement/broken rubber dampeners.

SYMPTOM: Noisy, no disengagement (rubber torque stopper type clutch disc).

CAUSE: 1. Use of inferior or imitation clutch disc.
2. Clutch wound past torque capacity.
3. Inferior rubber compound.

SOLUTION: 1. Fit genuine EXEDY/Daikin clutch.
2. Driver education.

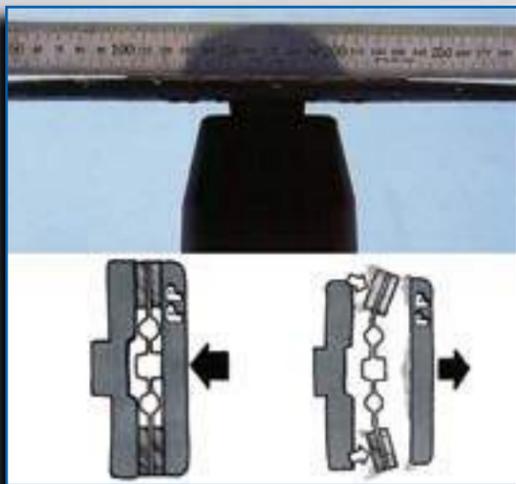


PROBLEM: 1. Crashing noise in gear box, non release.
2. Warped and bent clutch disc.

SYMPTOM: Difficult gear change.

CAUSE: 1. Hanging of gear box during installation.
2. Not aligning clutch disc and forcing main drive into the spline, therefore, bending the clutch disc hub towards the engine as seen in photo.
Note: Hanging the gear box during installation pulls the clutch disc hub towards the gear box.
3. Driver resting foot on clutch pedal causing clutch slip due to clutch being in a semi disengaged position. This has caused extreme heat which has warped the disc.

SOLUTION: 1. Do not hang gear box during clutch installation. Always use a clutch aligning tool.
2. Do not force gear box into clutch disc spline.
3. Driver education/check free travel.



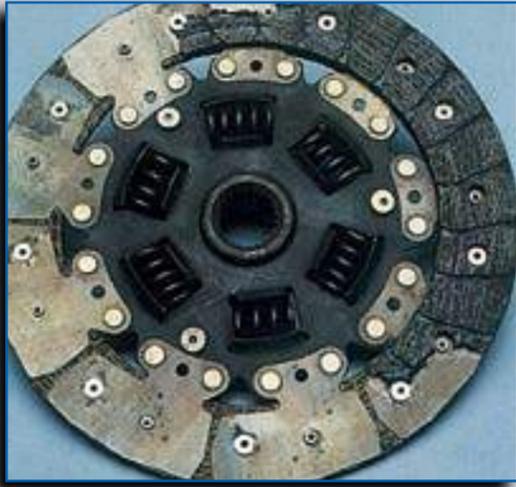
PROBLEM: Power not transmitting to drive train because of broken facings.

SYMPTOM: No drive, noisy clutch.

CAUSE: Parts of the disc friction material are broken from rivet along with part of the cushioned segment. This is due to down shifting of gear i.e. the speed of the vehicle at the rear wheels was travelling faster than the engine RPM, when gear was changed down.

SOLUTION: Driver education.





SYMPTOM: Broken clutch facings flywheel side.

PROBLEM: Clutch slips, does not disengage.

CAUSE:

1. Overloading vehicle.
2. Clutch disc has been replaced but not clutch pressure plate cover assembly.
3. Lack of applied load (inefficient diaphragm spring pressure or coil spring pressure).

SOLUTION:

1. Do not overload vehicle.
2. Replace with complete clutch kit.



PROBLEM: No drive, power not transmitted because of broken segments on clutch disc.

SYMPTOM: Sudden clutch failure.

CAUSE: Cushion spring steel segments uniformly separated from hub area due to:

1. Faulty or worn pilot bearing or bushing.
2. Hanging gear box during installation.
3. Dirt or chips between the mating surfaces of the engine bolt up areas.
4. Gearbox/transmission lock up. (i.e. Gear tooth jam).

SOLUTION:

1. Check pilot bushing or bearing and replace if necessary. Align gear box and use the assistance of a transmission jack and always clean mating surfaces before installation.
2. Check gear box for metal fragments than remove and repair as necessary.

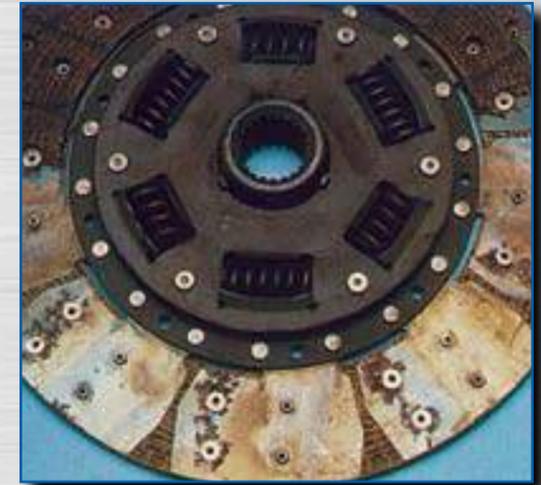


PROBLEM: Premature wear cerametallic button type clutch disc.

SYMPTOM: Slipping clutch.

CAUSE: Bedding-in procedure not observed for cerametallic buttons.

SOLUTION: Drivers education; observe bedding in procedure. Due to the weight of this type of disc it takes longer for the rotating clutch to slow down while clutch cover assembly is in a separation position away from the clutch disc. Clutch must be depressed a few seconds longer whilst shifting gear specifically when there is no clutch brake attached to the system.



PROBLEM: Broken facing of clutch disc on clutch cover assembly pressure plate side.

SYMPTOM: Noisy clutch/slipping clutch.

CAUSE:

1. Improper driving practice; down changing gear constantly.
2. The speed of the vehicle is actually higher than of the shifted to gear.
3. The gear box and drive train revolutions are turning faster than the speed of the engine at the time: sudden clamp damaged the facings.
4. Excessive grease on the transmission input shaft.

SOLUTION: Driver education. Proper fitting practice.



PROBLEM: Clutch disc completely ruined.

SYMPTOM: Sudden clutch failure.

CAUSE: Clutch disc fitted incorrectly i.e. back to front.

SOLUTION:

1. Always check clutch disc on flywheel for fouling before installation.
2. Always refer to installation procedures on EXEDY/Daikin packaging.

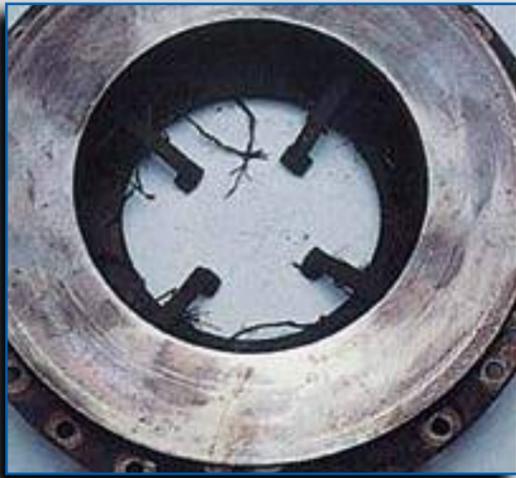


PROBLEM: Damaged torsion springs.

SYMPTOM: Gear box rattle/noisy clutch - diesel applications. Other descriptions of problem are: jarrah noise, gear box rollover noise or tick over noise.

CAUSE: When engine torque is higher than clutch torque this causes springs to deteriorate. This is due to the very different characteristics in design of this particular clutch disc.

SOLUTION: Choose and fit and appropriate EXEDY/Daikin clutch to suit this application (e.g. silent type design or LTD design).



PROBLEM: Burst clutch disc/no transmitted power.

SYMPTOM: Clutch slip.

- CAUSE:**
1. The clutch was engaged while coasting downhill causing the facings to burst through extreme shock.
 2. Gear being shifted down when the vehicle engine is revving lower than the transmission ratios, resulting in excessive RPM at the driveline end. This is beyond the capacity of the burst strength specifications of the friction material.
 3. Lock of free travel caused by faulty clutch slave cylinder or air over hydraulic system (common in Japanese truck applications). With a new clutch kit installed keeping in mind the diaphragm tips/release lever tips are further down due to the thickness of the new clutch disc. The slave cylinder piston will now be operating further towards the end of the cylinder where it has not worked for some time, depending on adjustment and travel. This area in the cylinder may possibly be corroded, again keeping in mind that brake fluid is a hygroscopic liquid, which is very absorbent of moisture and moisture corrodes and could result in the piston jamming and not returning, therefore, causing the release mechanism to activate the clutch in a semi disengaged position.

The above corrosion problem would also apply to the air canister in the air over hydraulic assist system. A partly disengaged clutch generates extreme heat affecting the clamp load of the diaphragm spring/coil spring ultimately causing the friction material to burst. This is always indicated by the blue and burnt coloring on the pressure plate cover assembly casting and clutch disc. A strong burnt smell is also noticeable.

4. Driver resting foot on clutch.
5. Lack of free travel and proper adjustment.
6. Wrong differential speed selected to match with chosen gear (trucks with 2 speed differentials.)

- SOLUTION:**
1. Driver education for 1, 2, 4, and 6.
 2. Check clutch release mechanism, air system and hydraulics for 3.
 3. Adjust clutch to manufacturer's specifications for 5.

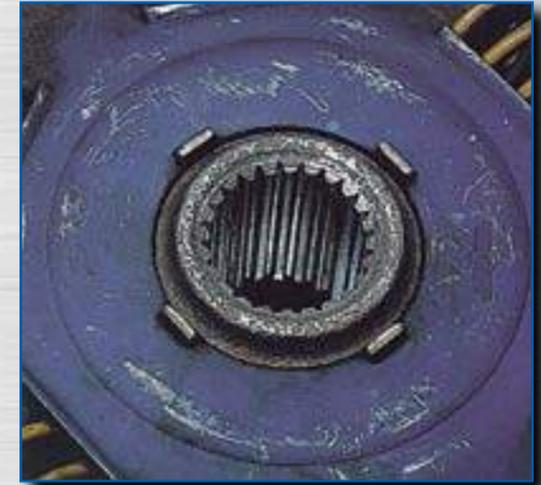


PROBLEM: Different number of spline on main drive to those on clutch disc/diameter of spline incorrect.

SYMPTOM: Unable to fit clutch disc on main drive shaft.

CAUSE: Careless fitting practice. The right clutch disc was not checked on main drive spline before installation.

- SOLUTION:**
1. Always refer to EXEDY/Daikin packaging instructions before installing clutch.
 2. Try clutch disc on main drive for smooth sliding before installation.



PROBLEM: Crashing in all gears/damaged and burred splines.

SYMPTOM: Difficult to disengage gears.

CAUSE: Defective pilot bearing or bush. This causes angular wear on the spline teeth, not allowing the clutch disc to slide on the spline teeth. It also causes the clutch disc to possibly stick on to the flywheel or not separate from the clutch cover pressure plate assembly. This results in poor separation, no disengagement.

SOLUTION: Fit new pilot bearing or bush.



PROBLEM: Noisy and cannot transfer power/splines completely disintegrated.

SYMPTOM: No drive.

CAUSE:

1. Clutch disc not tested on spline before installation.
2. Missing spigot/pilot bearing or bushing.

- SOLUTION:**
1. Always check clutch disc for smooth sliding on spline.
 2. Check and replace spigot/pilot bearing of bushing. (Mini UK and Europe: Check primary gear for worn bushing; if worn replace).



PROBLEM: Damaged facing material.

CAUSE:

1. Clutch disc has been dropped possibly during installation or;
2. Damaged in transit.

SOLUTION: Always check before installation that facing is intact. Replace clutch disc.





PROBLEM: Torsion dampener stopper springs thrown out of side plate/stop pins worn.

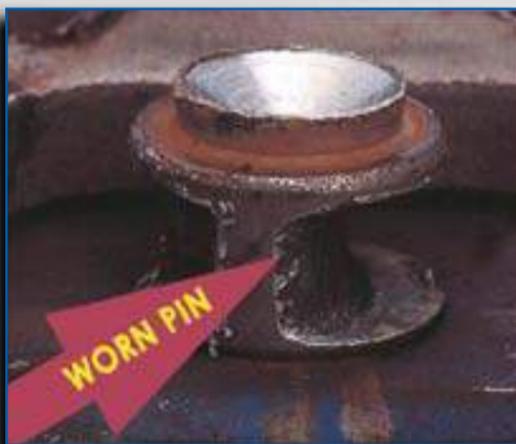
SYMPTOM: Noisy clutch/unable to engage or disengage gear.

CAUSE:

1. Improper driving practice i.e. "dropping" the clutch whilst engine is turning at extremely high revolutions.
2. Down changing of gears i.e. 5th gear to 2nd gear by low speed/high driving gear method.
3. Wear on the stop pins indicates the clutch plate has been wound past specified torque loading. This has the same affect on the springs.
4. Misalignment.

SOLUTION:

1. Driver education.
2. Refer misalignment tips
3. Vehicle used for performance driving. It is advisable to use clutch disc with higher stopper torque capacity. Refer EXEDY/Daikin Performance/Sports Clutch listings.



PROBLEM: Clutch drag leading to total clutch failure. Signs of red dust on clutch disc as seen in photo.

SYMPTOM: Clutch inoperative.

CAUSE: Severe misalignment between the mating surfaces of the bell house and the rear of motor.

SOLUTION:

1. Refer misalignment tips.
2. Engine and gearbox modifications where mating surfaces are not parallel or the engine and gear box do not mate at an absolute centre line are to be rectified.
3. Metal dust cover plates overlapping each other during installation must be avoided.



PROBLEM: Torque stopper springs broken. Difficult gear engagement which may lead to clutch failure.

SYMPTOM: Noisy clutch with vibration.

CAUSE:

1. Misalignment between engine crank-shaft centre and gearbox main drive.
2. If the torsion springs are damaged along with the torque stopper pin then it is evident that the clutch has been wound past its torque capacity.

SOLUTION: 1. Refer misalignment tips.



PROBLEM: Wrong type of lubrication on input shaft spline.

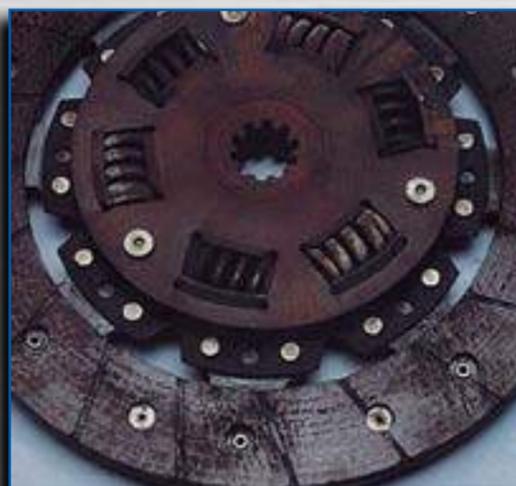
SYMPTOM: Clutch shudders/judders and/or slips.

CAUSE:

1. On this example the wrong grade of grease was used, affecting the friction coefficient of the disc material.
2. Over greasing of transmission input shaft during installation.

SOLUTION:

1. Use specified grade of grease of vehicle manufacturer (high melting point grease). Do not use anti-seize.
2. Replace clutch disc with new disc unit.
3. Proper installation practice.



PROBLEM: Melted grease on clutch disc side plate.

SYMPTOM: Clutch shudders/judders and/or slips.

CAUSE:

1. Excessive grease on transmission input shaft.
2. Melted grease on friction material will affect friction coefficient of disc facing.

SOLUTION:

1. Lightly grease spline, wiping of excessive grease and ensure there is smooth sliding of clutch disc on main drive.
2. Replace clutch disc with new disc unit.
3. Use only high melting point grease.





PROBLEM: Excessively worn diaphragm fingers.

SYMPTOM: Pedal graunch sometimes described as erratic feeling when depressing clutch pedal with engine running but OK when not running/notchy clutch pedal.

CAUSE:

1. Eccentricity between the axis of rotation of the clutch cover pressure plate assembly and that of the clutch thrust bearing.
2. Inferior clutch thrust bearing (not self centering type).
3. Worn release bearing sleeve carrier or clutch fork.
4. Lack of free travel.

SOLUTION:

1. Refer misalignment tips.
2. Fit proper self centering bearing.
3. Rectify release mechanism and align.
4. Adjust free travel to manufacturer's specification.

PROBLEM: Excessive wear on diaphragm tips.

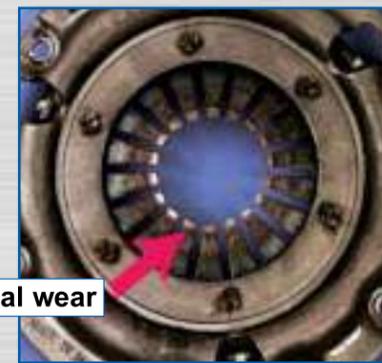
SYMPTOM: Difficult to disengage gear/ Noisy clutch.

CAUSE:

1. Misalignment between the axis of release bearing and clutch cover causes this problem. Wear on the fulcrum inside of clutch cover along with the wear on lever tips makes less pressure plate lift, results in difficult to disengage gear.
2. Improper direction of release bearing causes one of abnormal wear.

SOLUTION:

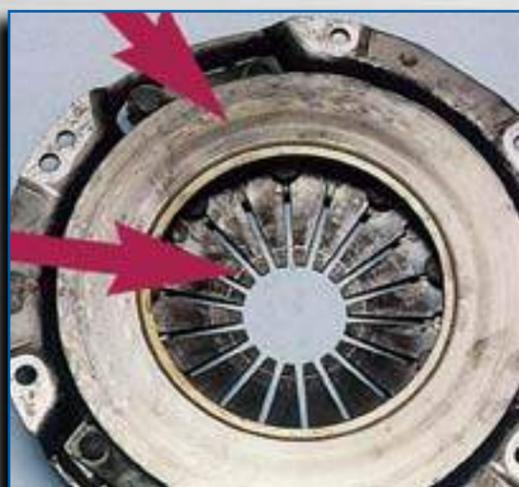
1. Replace the deteriorated bearing or bush parts. Reinstall a transmission after removal of contamination or scratch on the mating surface of bell housing. Replace the deteriorated release bearing and front cover.
2. Install a release bearing in correct direction.



1) Excessive wear on diaphragm tips



2) Excessive wear on diaphragm tips



PROBLEM: Diaphragm fouled on clutch disc. Crashing in gear and unable to obtain clutch adjustment.

SYMPTOM: Difficult to engage/disengage gear.

CAUSE:

1. Flywheel depth or step incorrect.
2. Clutch thrust bearing fallen off quill end/gear box nose cone slide.
3. Clutch disc too thick.
4. Incorrectly adjusted (overthrow of clutch mechanism).

SOLUTION:

1. Check flywheel depth or step height.
2. Check for wear on release bearing quill shaft/ gear box nose cone slide.
3. Check clutch disc thickness.
4. Refer to clutch adjustment procedure or replace cable.

PROBLEM: Burst pressure plate casting.

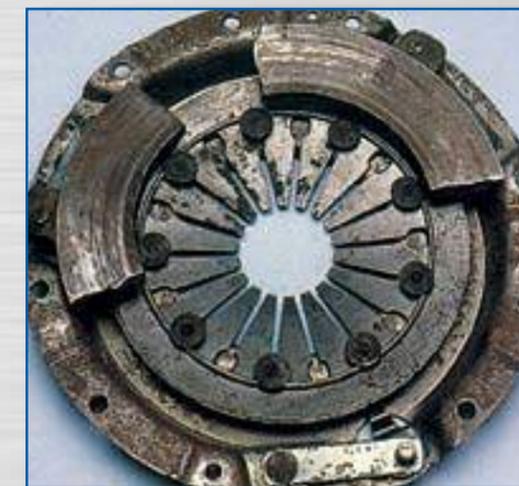
SYMPTOM: No disengagement.

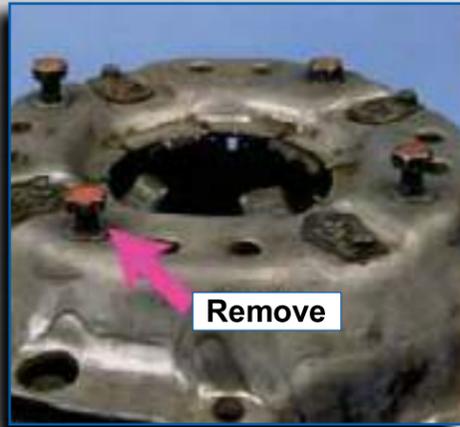
CAUSE:

1. Over revving of engine that has exceeded vehicle manufacturer's specifications.
2. Over heating of casting due to constant abuse of clutch. The main spring has weakened through extreme influence of heat.
3. Inferior part manufacture.

SOLUTION:

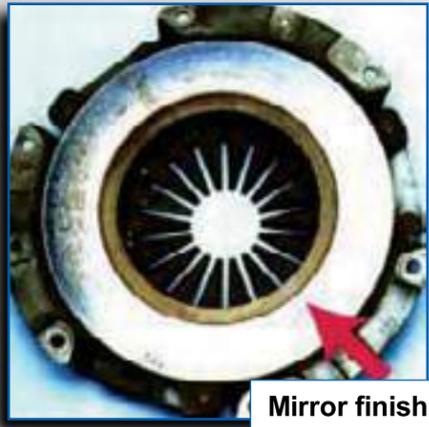
1. Driver education.
2. Do not use EXEDY/Daikin covers where engine has been modified to excess manufacturer's RPM specifications.
3. Use EXEDY/Daikin specified sports clutch. Refer to EXEDY/Daikin Catalog or EXEDY/Daikin Sports Listings where covers are manufactured with nodular iron castings.





Remove hold down bolts

PROBLEM: Hold down bolts still in cover assembly.
SYMPTOM: Clutch slipping/Noisy clutch.
CAUSE: Clutch cover pressure plate assembly hold down bolts to assist ease installation not removed.
SOLUTION: Remove hold down bolts painted in red. (Do not remove clutch lever adjustment nuts which are not painted in red)



Mirror finish on pressure plate

PROBLEM: Mirror finish on pressure plate friction surface.
SYMPTOM: Judder.
CAUSE: 1. Friction surface may be ground by worn facing fibers as abrasive compound, if you keep clutch slipping continuously i.e. hill start. It may cause judder because of too good surface to become mirror finish.
 2. Clutch slave cylinder corroded or worn and piston not returning freely.
SOLUTION: 1. Driver education not to activate the clutch in an excessive semi disengagement position.
 2. Replace slave cylinder..



Breakage of pressure plate

PROBLEM: Burst pressure plate casting.
SYMPTOM: No drive/Noisy clutch.
CAUSE: 1. Over revving of engine that has exceeded manufacturers' specifications.
 2. Overheating of casting due to constant abuse of clutch. The main spring has weakened through extreme influence of heat.
SOLUTION: 1. Do not use covers where engine has been modified to excess manufacturer's rpm specification.
 2. Driver education not to activate the clutch in excessive semi disengagement position.



Grease on friction surface

PROBLEM: Oil or grease contamination on friction surface.
SYMPTOM: Slipping clutch/Judder.
CAUSE: Excessive grease or low viscosity grease causes this problem.
 Melted grease on friction material affected friction coefficient and caused slipping or judder.
SOLUTION: Lightly grease spline, wipe off excessive grease after tentative installation and ensure there is smooth sliding of clutch disc on main drive shaft.



Friction surface, cover discoloration

PROBLEM: Discoloration on friction surface and/or clutch cover.
SYMPTOM: Slipping clutch.
CAUSE: Extreme friction surface temperature rise and slips under extreme clutch operation. This may cause discoloration of clutch.
SOLUTION: Driver education not to activate the clutch in excessive semi disengagement position.



Pressure plate heat distortion

PROBLEM: Warped clutch cover assembly by reuse.
SYMPTOM: Clutch drag.
CAUSE: Insufficient contact due to warped pressure plate. Only clutch disc was replaced which caused partial contact on friction surface and slipped during heavy load condition.
SOLUTION: Always replace a clutch disc, a clutch cover and a clutch thrust release bearing when replacing clutch system.



PROBLEM: Worn clutch disc facing fibres and dirt lodged between diaphragm spring and clutch cover housing causing loss of clamp load.

SYMPTOM: Slipping clutch and clutch drag.

CAUSE: 1. Bell housing not degreased and cleaned. Careless installation of new clutch.

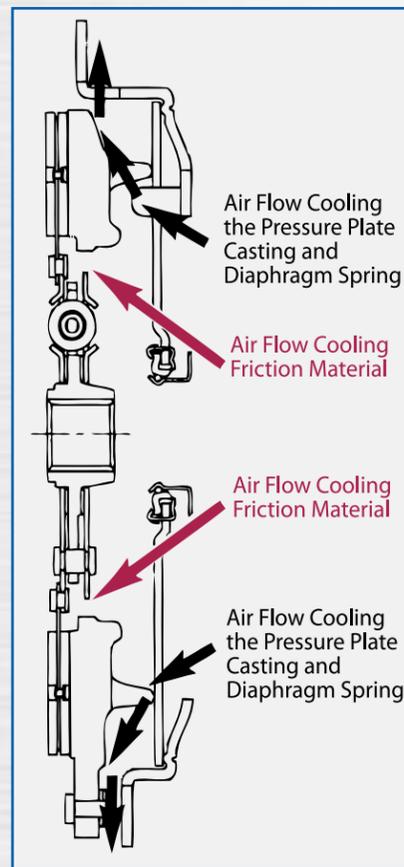
The new clutch disc has not worn but the fibres that have become lodged in the new clutch cover are that of the previously worn clutch. It is a requirement due to ventilation designs that the bell housing area be free from old fibres, dirt and grease when installing new clutch.

2. This problem is common in 4 wheel drive vehicles when an inspection cover or a clutch fork cover boot has not been replaced when installing a new clutch.

SOLUTION: 1. Ensure bell housing is thoroughly degreased and clean of dirt and fibres before installing new clutch.

2. Ensure inspection locations and boots are replaced, tightened and well located.

Note: These problems are common on farm vehicles, vehicles travelling on sand and 4x4 recreational vehicles.

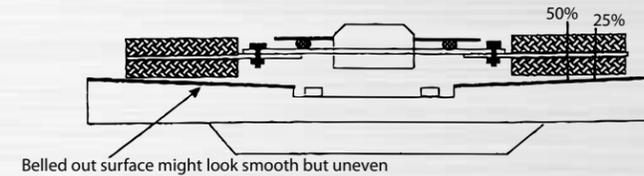


PROBLEM: 1. Vehicle vibrates/shakes when clutch is being released, at take off.

SYMPTOM: Clutch shudder/judder/chattering.

CAUSE: 1. Flywheel not even/warped.
2. Deep scoring indentations from previous worn clutch.

SOLUTION: Always resurface flywheel before installing new clutch. Refer to figure below.

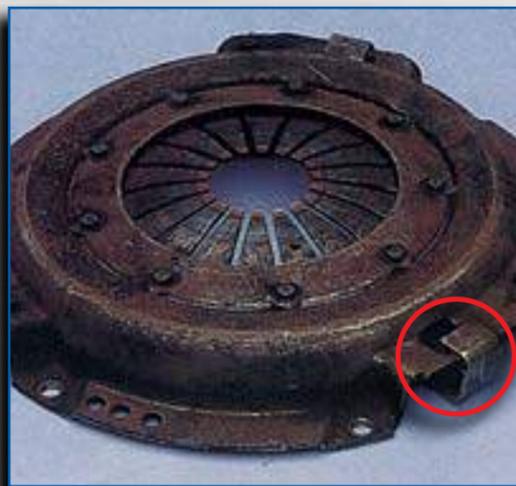
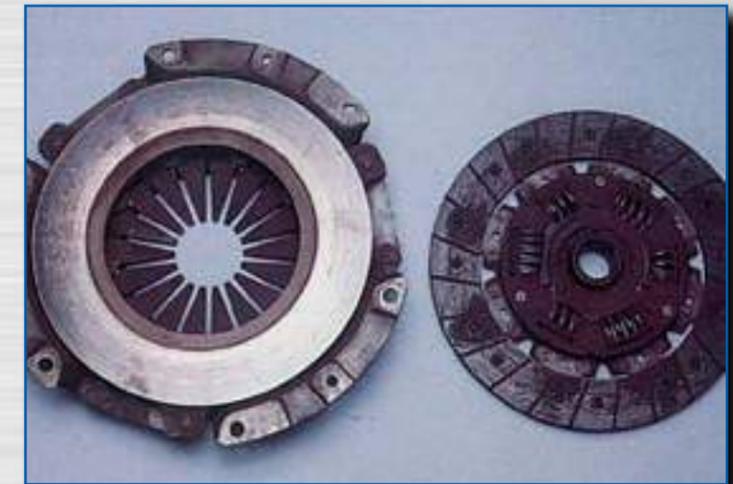


PROBLEM: Highly glazed to a mirror finish pressure plate cover assembly casting/red dust on clutch components.

SYMPTOM: Shuddering/juddering clutch.

CAUSE: 1. Installation error/misalignment (refer to misalignment tips).
2. Inferior clutch facings.
3. Diaphragm spring load not to specification.

SOLUTION: 1. Replace complete clutch and pilot (spigot) bearings.
2. Avoid misalignment on installation.



PROBLEM: 1. Installation assist clips not removed.
2. Slipping clutch/excessive free travel.
3. Unable to adjust.
4. Will not transmit power.

SYMPTOM: Clutch slipping just after installing new clutch.

CAUSE: Clutch cover pressure plate assembly hold down clips, to assist ease of installation, have not been removed.

SOLUTION: Remove clips after installation.

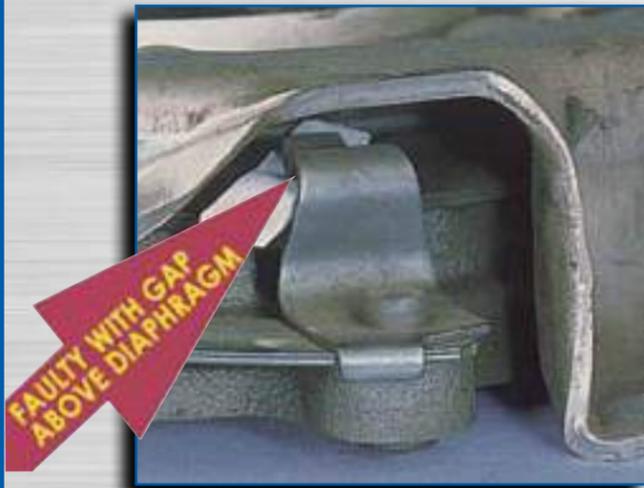
PROBLEM: No clutch adjustment (diaphragm over centre/clutch disc side plate fouling).

SYMPTOM: 1. Diaphragm over centre when bolting clutch cover pressure plate assembly to flywheel.
2. Clutch disc side plate fouls on I.D. of casting.

CAUSE: Careless mechanical fitting practices.

SOLUTION: Always mate clutch disc to pressure plate casting and flywheel. Ensure no fouling occurs before installing new clutch.





PROBLEM: No gear selection/difficult engagement. Stretched and damaged retractor clip. (Clip stretched above diaphragm).

SYMPTOM: After installation of new clutch, unable to select gear.

CAUSE: Over adjustment of clutch that has caused stretching of retractor clips on clutch cover pressure plate assembly.

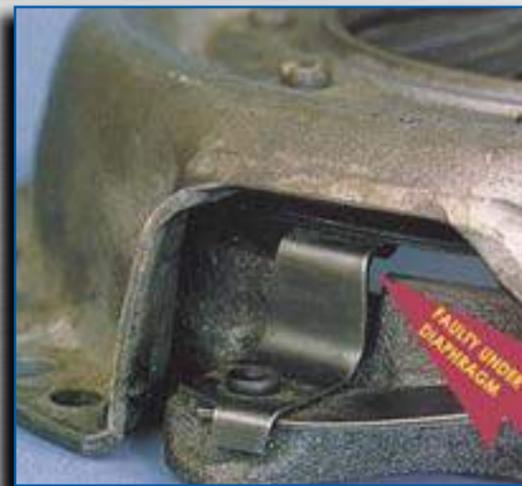
SOLUTION: 1. Fit new cover assembly
2. Adjust clutch to manufacturer's specifications.

PROBLEM: Bearing retainer clip not connected to diaphragm.

SYMPTOM: No pressure on clutch pedal - new pull type clutch just installed.

CAUSE: Proper installation procedures have not been followed. The snap-in mechanism of the release bearing has not been clipped on firmly.

SOLUTION: When the transmission is installed onto the mating area of the engine the release bearing is preliminarily set into position where the release fork of the transmission is fitted. After installation of the transmission the release lever must be pulled in the direction reverse to the release firmly. The bearing is then snapped in. (Also refer manufacturer's specifications).



PROBLEM: Crashing gears/stretched and damaged retractor clip. (Clip under diaphragm).

SYMPTOM: Difficult engagement/disengagement after installation of new clutch.

CAUSE: Clutch cover pressure plate assembly has been dropped during installation/or during transit causing damage to retractor clips.

SOLUTION: Always check components before fitting and ensure that the tip of retractor clip is resting on top of the diaphragm. This can be checked by a feeler gauge. (This is the installer's responsibility).

PROBLEM: Difficult to engage/Disengage gear, Noisy clutch.

CAUSE: 1. Interference due to release bearing over stroke.
2. An incorrect clutch disc may interfere with diaphragm, when you depress the clutch pedal.

SOLUTION: 1. Refer to clutch adjustment procedure, and adjust pedal free play.
2. Use the correct clutch disc.



Interference



Worn facing fiber

Worn facing fibers and dirt lodged

PROBLEM: Worn clutch disc facing fibers and dirt lodged between diaphragm spring and clutch cover housing.

SYMPTOM: Difficult to disengage gear/ Slipping clutch.

CAUSE: Bell housing not degreased and cleaned. Careless installation of new clutch.

SOLUTION: Ensure bell housing is thoroughly degreased and clean of dirt and fibers before installing new clutch.

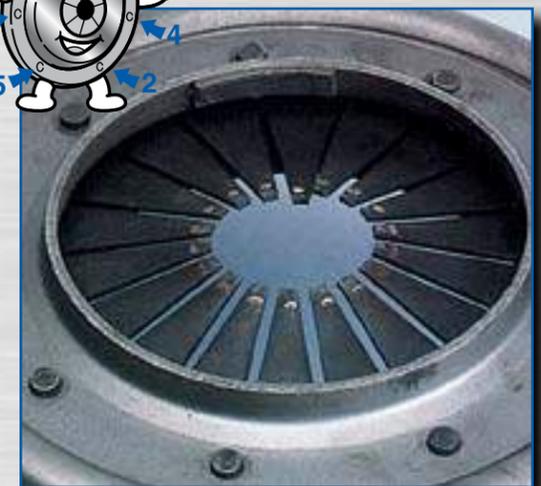
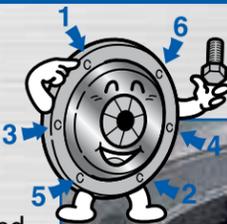
PROBLEM: Clutch diaphragm fingers or levers are uneven.

SYMPTOM: Clutch drag and pedal vibration.

CAUSE: 1. The pressure plate cover assembly was torqued down incorrectly i.e. not diagonally.
2. The pressure plate cover assembly was torqued down with an air wrench.

SOLUTION: 1. Refer to EXEDY/Daikin packaging for correct sequence to tighten bolts.
2. Never use air tools to torque down a clutch.

*Refer to page 70 for proper tightening specifications..





PROBLEM: Excessive wear on diaphragm tips and a highly glazed pressure plate casting.

SYMPTOM: Slipping clutch/shudder/judder.

- CAUSE:**
1. Lack of free travel/bearing riding on diaphragm.
 2. Driver resting foot on clutch pedal.
 3. Quill shaft worn/bearing stuck on a worn spot and not returning to original position.
 4. Clutch slave cylinder corroded or worn and piston not returning to allow free travel.
 5. Stretched or sticky cable.

- SOLUTION:**
1. Adjust free play in clutch to specification.
 2. Driver education.
 3. Replace quill shaft (gear box main drive nose cone).
 4. Replace clutch slave cylinder and check pressure build up in clutch master cylinder.
 5. Replace cable. (Do not re-oil old cable).

PROBLEM: Clutch diaphragm fingers or levers are uneven.

SYMPTOM: Clutch drag/Judder/Noisy clutch.

CAUSE: The pressure plate cover assembly was torqued down incorrectly i.e. not diagonally.

SOLUTION: Tighten bolts temporary by hand, then torque down in correct diagonal sequence one by one.



Uneven diaphragm tips

PROBLEM: No clamp load on to clutch disc.

SYMPTOM: Slipping clutch.

- CAUSE:**
1. Diaphragm spring load below specifications." Due to design of cover type, diaphragm has not been replaced.
 2. Inferior remanufacture/spring load not checked.

SOLUTION: Replace with only a new EXEDY/Daikin pressure plate cover assembly.

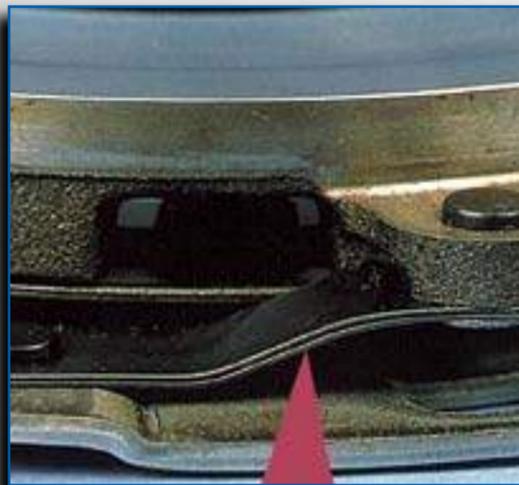


- PROBLEM:**
1. Hold down bolts still in pressure plate assembly.
 2. Unable to adjust.
 3. Will not transmit power.

SYMPTOM: Clutch slipping just after installing new clutch.

CAUSE: Clutch cover pressure plate assembly hold down bolts to assist ease of installation not removed.

- SOLUTION:** Remove hold down bolts.
1. Do not remove clutch lever adjustment nuts.
 2. Common in Japanese trucks



PROBLEM: Unable to change gear/bent drive straps.

SYMPTOM: No disengagement.

- CAUSE:**
1. Improper driving practice.
 2. Distorted retractor leaf spring caused by extreme reverse thrust load spring.
 3. Sudden down changing of gears i.e. 5th gear to 2nd gear.
 4. Wrong clutch cover assembly used due to engine turning direction.
 5. Constant "dropping" of clutch at extremely high revs when taking off.

- SOLUTION:**
1. Driver education.
 2. Install correct cover assembly for application.
 3. Fit extra straps to suit heavy duty application (optional), or use EXEDY/Daikin Sports clutch.

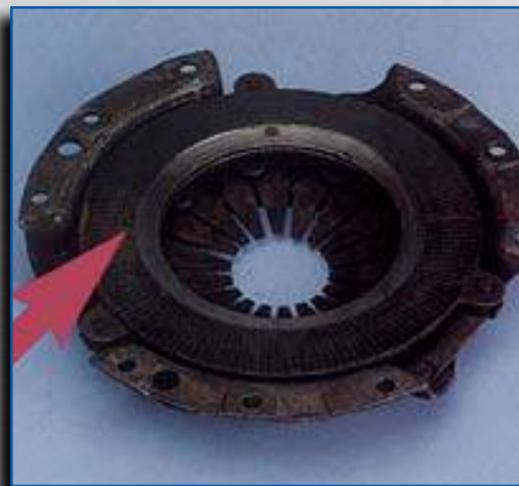


PROBLEM: Engine revving when power applied during acceleration/will not transmit power. Evidence of oil contamination on cover assembly.

SYMPTOM: Slipping clutch.

CAUSE: Clutch cover pressure plate assembly contaminated with oil.

SOLUTION: 1. Rectify oil leaks.
2. If re-using a new cover that has been contaminated with oil, de-grease the cover assembly and lightly lubricate diaphragm pivot rings before re-installing with light base oil.



PROBLEM: Excessively scored clutch cover pressure plate assembly.

SYMPTOM: No disengagement.

CAUSE: Fouling of clutch disc side plate hub on casting of pressure plate assembly, due to clutch disc and clutch cover pressure plate assembly being of two different and conflicting brands.

SOLUTION: Always use EXEDY/Daikin matching clutch disc and clutch cover pressure plate assembly to ensure Original Equipment quality and compatibility.



PROBLEM: Warped clutch cover pressure plate assembly casting.

SYMPTOM: Clutch drag/no disengagement.

CAUSE: Only clutch disc was replaced which caused a vacuum not allowing the clutch disc to separate from the clutch cover pressure plate assembly casting, when clutch is in disengaged position.

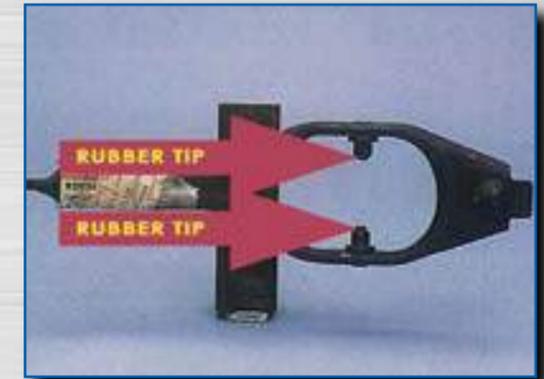
SOLUTION: Always replace clutch disc/clutch cover pressure plate assembly and clutch thrust release bearing when replacing clutch system.

PROBLEM: Rattle while idling from clutch area mostly after new clutch is installed. Worn absorber rubber tip.

SYMPTOM: Clutch fork rattle whilst idling.

CAUSE: 1. Some clutch thrust bearing carriers are held firmly by an absorber rubber bush that wears.
2. Clutch thrust bearing carrier saddle worn.

SOLUTION: 1. Rectify by fitting new absorber rubber bush to prevent the fork dropping against the bell housing window and rattle.
2. Always check for wear on clutch thrust bearing carrier saddle. Replace is necessary.



PROBLEM: Power not transmitted in first gear when taking off/or slipping for a few seconds at take off. Damaged or excessively worn dual mass flywheel.

SYMPTOM: Slipping clutch for vehicle with dual mass flywheel.

CAUSE: Worn or broken arc springs in dual mass flywheel.

SOLUTION: 1. Replace dual mass flywheel.
2. Always check dual mass flywheel thoroughly for excessive rotation travel.



PROBLEM: Clutch pedal stuck to the floor.

SYMPTOM: No disengagement.

CAUSE: broken ear on release bearing.

SOLUTION: 1. Always follow manufactures installation procedure when fitting bearing to fork.
2. Inspect bearing before installation for damage..





PROBLEM: Worn fixed gear box quill shaft/gear box nose cone slide.

SYMPTOM: Notchy clutch pedal when depressing clutch.

CAUSE: Worn quill shaft/gear box nose cone slide not replaced.

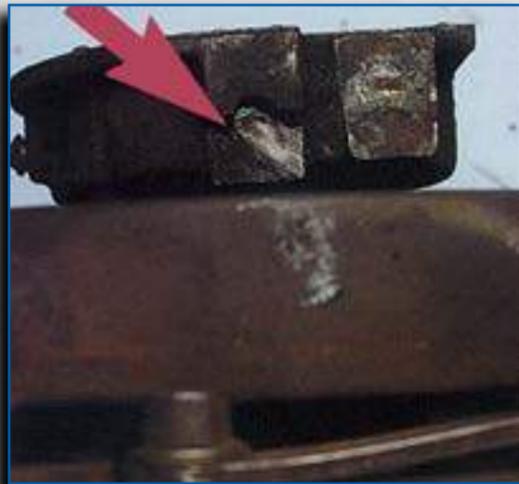
SOLUTION: Renew or re-sleeve gear box quill shaft.

PROBLEM: High pitched squeal. Excessive worn diaphragm spring.

SYMPTOM: Noisy clutch thrust bearing.

CAUSE: Clutch thrust bearing fitted incorrectly e.g. back to front.

SOLUTION: Replace with new bearing fitted correctly i.e. right way round.



PROBLEM: Unable to select gear and unable to stop rotation of main drive shaft.

SYMPTOM: Clutch brake not operating (large pull type clutch).

CAUSE:

1. Wear on fingers of the clutch release yoke mechanism, which include cross shaft bushings.
2. Excessive wear on bearing housing head fork saddle.

SOLUTION:

1. Replace all worn bushings in relation to release lever mechanism.
2. Replace bearing head assembly.
3. Readjust to specification.

PROBLEM: High pitched squealing noise. Damaged bearing.

SYMPTOM: Noisy clutch thrust bearing in new clutch (installed).

CAUSE: Bearing fitted incorrectly.

SOLUTION: Fit new clutch thrust bearing right way round.

Note: Ensure cover pressure plate assembly diaphragm has not been damaged from previous clutch thrust bearing.



PROBLEM: Worn quill shaft.

SYMPTOM:

1. Clutch fork rattle.
2. Sticky clutch pedal/pedal graunch.

CAUSE:

1. Clutch thrust bearing carrier not travelling smoothly on quill shaft/gear box nose cone slide.
2. Misalignment.

SOLUTION:

1. Always replace worn quill shaft/nose cone gear box slide when installing new clutch.
2. Refer misalignment tips.

PROBLEM: Damaged clutch thrust bearing. Diaphragm spring excessively worn.

SYMPTOM: Continuous clutch thrust bearing noise.

CAUSE: The clutch has not been adjusted correctly since installation or the clutch has never been adjusted during any routine service. The clutch thrust bearing and the diaphragm of the clutch cover pressure plate assembly have worn indentations into each other.

SOLUTION:

1. Fit new clutch kit as it is too late for adjustment of old clutch.
2. Always check free travel at service.





Malfunction of cylinder assembly

PROBLEM: Difficult to disengage gear/Slipping clutch.
SYMPTOM: Malfunction of cylinder assembly.
CAUSE: In case of CSC, Concentrated Slave Cylinder, internal piston not traveling smoothly causes system failure, and it may result in following symptom;
Difficult to disengage gear:
 1. Fixing or sticky movement causes short stroke and results in difficult to disengage.
 2. Leaking oil causes short stroke and results in difficult to disengage:
Slipping clutch:
 1. Oil on a friction facing due to leakage from cylinder assembly causes slipping clutch.
 2. In case of malfunction in regard to piston return, it causes continuous semi-disengagement and results in slipping clutch as well as facing abnormal wear and burst by burnout.
SOLUTION: Always replace with new cylinder assembly. Install cylinder assembly after ensuring smooth movement.

PROBLEM: Notchy clutch pedal/Slipping clutch.
CAUSE: Abnormal wear on front cover, notchy wear. Clutch release bearing carrier not travelling smoothly on quill shaft/gear box nose cone slide.
SOLUTION: Apply appropriate grease. Renew worn out parts or scratched parts.



Notchy wear

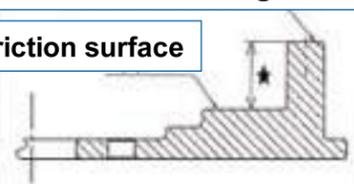
Notchy wear on front cover

PROBLEM: Difficult to engage gears. Noise when clutch is engaged.
SYMPTOM: Damaged pilot busing.
CAUSE: Improper installation practices. Forcing the input shaft/transmission on crank bushing engine block.
SOLUTION: Align the transmission to the crank/engine block during installation. Never force transmission to engine.
 Do not use bell housing bolts to force the transmission on to the engine block.
 Proper installation practices.



Clutch cover mounting surface

Friction surface

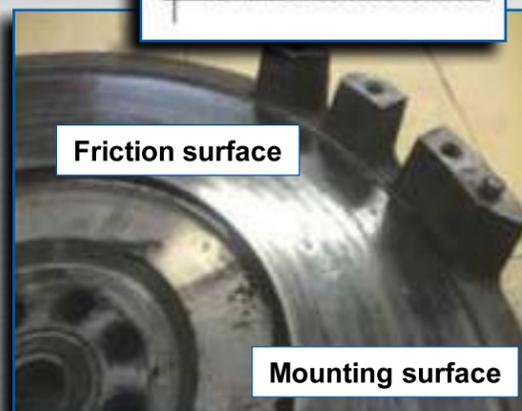


PROBLEM: Clutch slipping, premature wear.
CAUSE: **Slipping:** Not enough friction area causes less torque transmittance and results in slipping under heavy load due to reuse of worn flywheel.
Premature wear: Reuse of worn flywheel is same condition as worn clutch disc, and it results in premature wear. If you resurface friction surface only, it causes premature wear as well
SOLUTION: 1. Replace with new clutch.
 2. Use flywheel which has the same dimension as new, the height ★ between clutch cover mounting surface and friction surface shown in figure.

PROBLEM: Difficult to disengage gear/Noisy clutch.
CAUSE: Reuse of pilot bearing.
Noise: Reuse of deteriorated pilot bearing may cause abnormal noise from the bearing under depressing clutch pedal condition.
Difficult to disengage gear: Reuse of bearing which is not smooth movement causes difficult to disengage gear, because it transmits torque under disengagement condition.
SOLUTION: Always replace with new pilot bearing when you replace clutch.



Deteriorated pilot bearing



Flywheel with deteriorated friction surface

Diagnosing Bearing Noises

1. Clutch release bearing

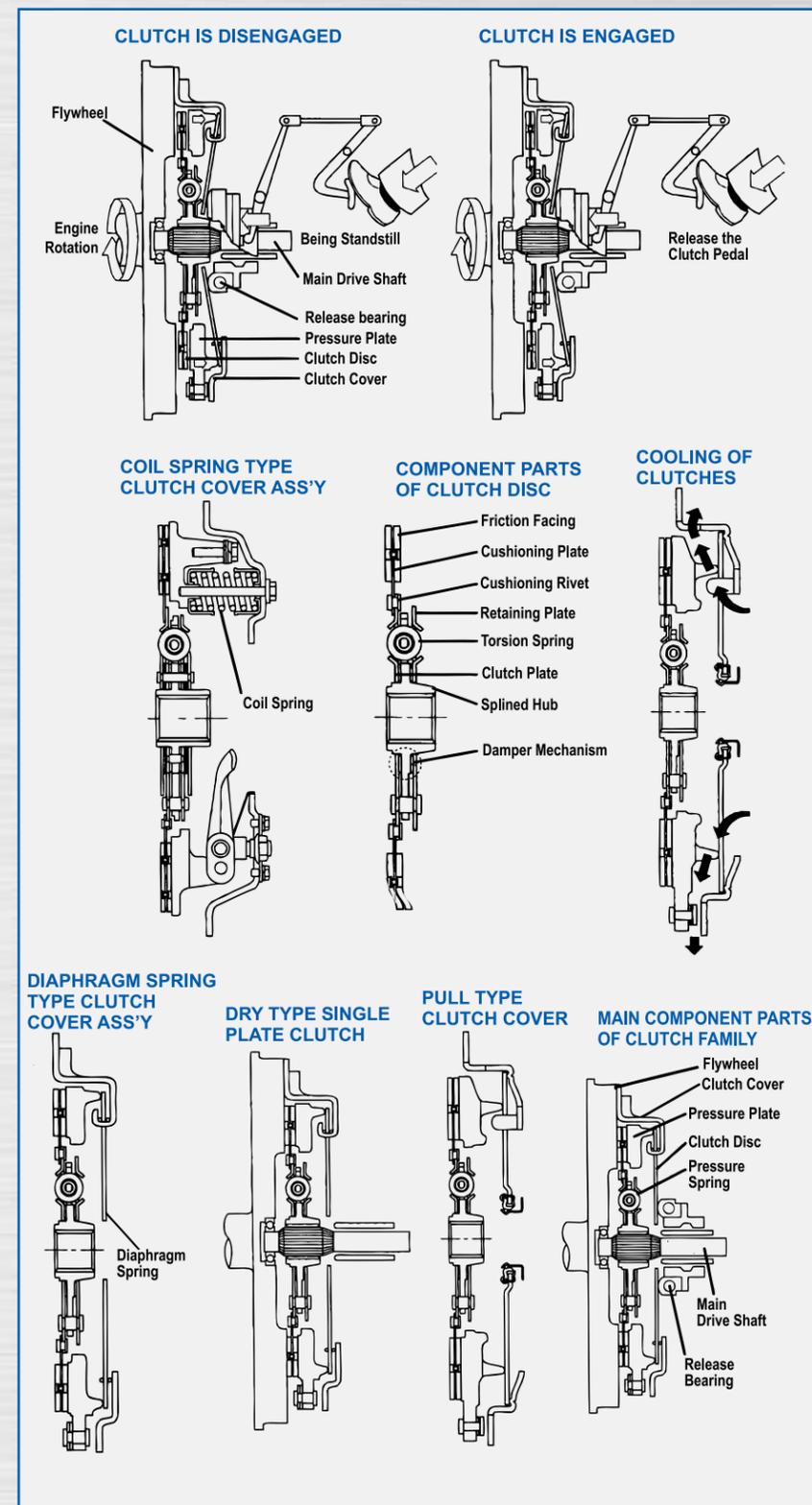
- A. Depress the clutch pedal approximately 2". the bearing is now in contact with the diaphragm. Should the bearing rumble or squeal then the clutch release bearing is most likely at fault (providing it has been pressed onto the carrier the right way around.)

2. Pilot Bearing or Bush.

- A. With engine running depress the clutch fully.
 B. Select first gear.
 C. Release the clutch.
 If the squeal is heard at the point of the clutch taking up, then the pilot bearing is faulty. In the event it is a bronze bush it will indicate lack of lubrication on the I.D. of the bush. If the bush has been lubricated on the I.D. there is a greater possibility that the O.D. of the bush is under sized and worn. The noise is then caused by the bush spinning in the end of the crank. If new pilot bush has not been pressed in evenly this could also result in the bush spinning which would cause a grumbling or squealing noise. Pilot bush noises are more apparent when engine and transmission are cold. (i.e. In the morning).

3. Front gear box bearing

- A. Drive the vehicle at approximately 30 kilometers per hour in gear. If a noticeable grumble noise is apparent, depress the clutch pedal. This will, in turn, stop the main drive and bearing from spinning. If noise ceases it is probable that the front gear box bearing is faulty (as there is no load on the bearing).



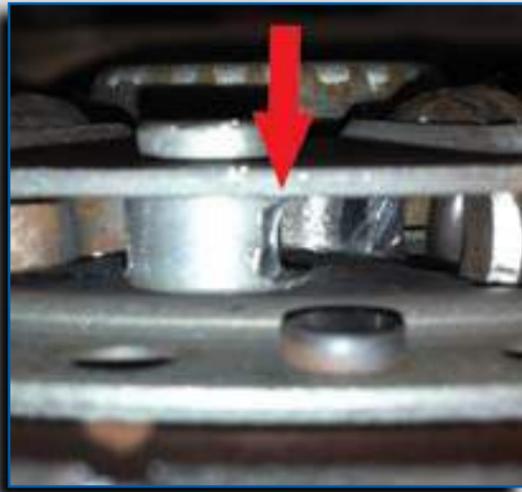
- PROBLEM:** Excessive score marks on clutch thrust bearing.
SYMPTOM: Excessive free travel/clutch does not disengage/ noisy - Japanese range of trucks.
CAUSE: Incorrectly fitted clutch thrust bearing carrier to clutch release fork causing bearing carrier to spin off the fork tips and bearing carrier saddle. This problem could also be caused if the tension on the release bearing carrier wire clip is not sufficient.
SOLUTION: 1. All care should be taken when replacing bearing carrier on the clutch fork. Also ensure the retaining spring clip has sufficient tension.
 2. Always work clutch thrust bearing carrier both forward and backward to ensure that the fork is retained firmly on the carrier saddle.



- PROBLEM:** Broken saddle clip.
SYMPTOM: Noisy rattle and difficult to engage gear.
CAUSE: Careless installation as spring retaining clip not assembled to fork during installation, or tension on wire retaining clip not correct.
SOLUTION: 1. Check tension on wire retaining clip.
 2. Always check bearing on clutch release fork after installing bearing on it. Move the fork in both directions to ensure bearing is secure before refitting gear box.



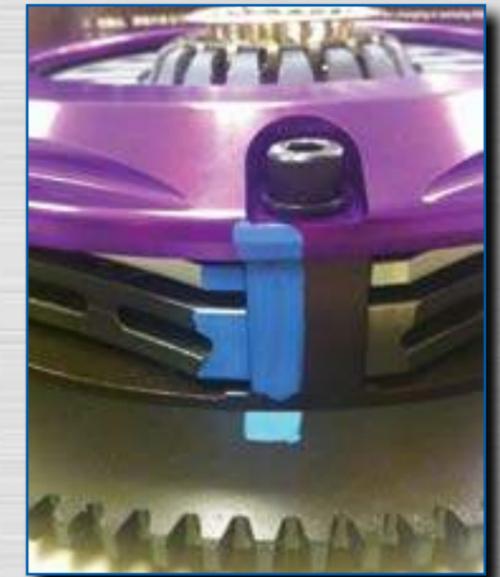
- PROBLEM:** Worn clutch thrust bearing carrier.
SYMPTOM: Pulsating pedal with engine running.
CAUSE: Faulty installation as the clutch thrust bearing carrier is worn on the saddle where the fork pivots. This also reduces the tension on the wear clip retainer. In this case, due to the lack of tension the fork has become dislodged and scored the back of the bearing.
SOLUTION: Always replace worn clutch thrust bearing carriers and worn forks.



PROBLEM: Noise, Difficulty engaging gears.
CAUSE: Broken drive hub on clutch disc. Damaged stop pin from high RPM clutch "dumping" or "side skipping" from a stop.
SOLUTION: Driver education, change driving style.



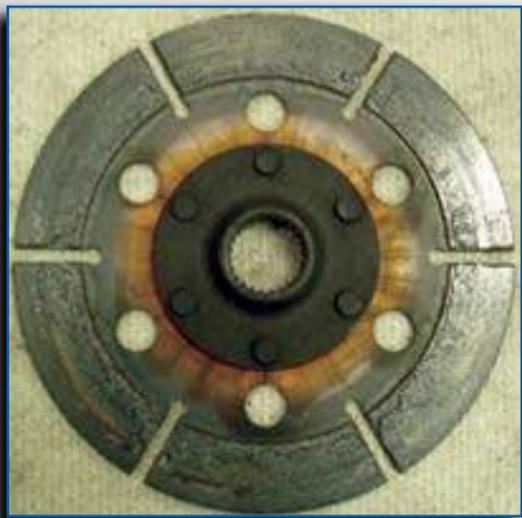
PROBLEM: Difficulty changing gears.
CAUSE: Intermediate plate not in the correct location on the flywheel.
SOLUTION: Always line up the blue marks on all the components during installation.
TECH TIP: A center punch can be used to leave an indentation on each component as the paint can be affected by chemicals



PROBLEM: Gearbox noise, difficulty changing gears.
CAUSE: Damaged spline hub and disc due to one or more of the following:
 1. Inadequate lubrication on input shaft
 2. Burrs on input shaft of transmission not allowing hub to slide freely.
 3. Too much pressure plate left from improperly adjusted pedal stop or hydraulic assembly.
 4. Bad input shaft bearing, pilot bearing or pilot bushing causing hub to wobble against discs.
SOLUTION: 1. Use proper lubrication on input shaft.
 2. Inspect input shaft on transmission for burrs or damage.
 3. Properly adjust pedal stop and/or hydraulic assembly.
 4. Measure input shaft in play, inspect pilot bearing/bushing.



PROBLEM: Clutch slippage.
CAUSE: Over greasing the input shaft.
SOLUTION: Use a thin coating of grease, uniform and evenly on input shaft.
TECH TIP: Slide clutch disc on to input shaft to evenly distribute grease on spline. Wipe away all excess grease from end of spline and disc. Be careful not to touch facing of disc with grease.





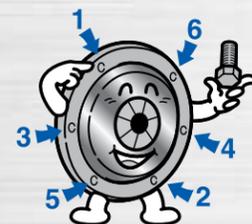
PROBLEM: Difficulty changing gears.
CAUSE: Mis-shift at high RPM or aggressive down shifting at high RPM.
SOLUTION: Driver education, Change driving style, use lug type multi plate clutch.



PROBLEM: Chipped facing.
CAUSE: Improper break in of clutch assembly.
SOLUTION: Follow manufactures break in procedures.



PROBLEM: Difficulty changing gears.
CAUSE: Spline damage on the bottom disc(s) from not being aligned properly.
SOLUTION: Use the proper alignment tool for vehicle application.
TECH TIP: Twist the alignment tool to align the bottom discs while finger tightening the cover bolts.



PROBLEM: Clutch slippage "slipping".
CAUSE: Loose cover assembly bolts from improper bolt tightening torque procedure.
SOLUTION: Use manufacture bolt torque specs. Tighten evenly. Use thread locker to ensure bolts do not loosen.
 Refer to page 70 for proper tightening specifications.



PROBLEM: Difficulty changing gears, no release.
CAUSE: Debris built up in pivot ring area between cover and diaphragm spring.
SOLUTION: Disassemble cover assembly and clean thoroughly.

1. What vehicle does the customer have? You will want to know the following.

- a. Manufactures exact model and model year.
- b. Engine size and engine code.
- c. If they have altered the vehicle by doing a engine swap or a transmission swap.
- d. If they have updated or back dated any of the engine and/or transmission components.
- e. Good to know information if at all possible
 - 1. Input shaft size (measure the outer most diameter of the input shaft spline)
 - 2. Disc size outer diameter
 - 3. Vehicle chassis code

2. How much power does the vehicle make? Always ask the customer for torque output at the wheels. Horsepower is a very subjective figure so try to avoid using this figure.

- a. If your customer is unsure about their torque output you will need to find out what modifications they have done to the vehicle. Knowing the vehicles base line torque output and basic research on how much additional power each component has added you can figure out the estimated torque output.
- b. Since your estimated torque output will generally be a flywheel torque figure you will want to remove 20% from your estimated torque output to come up with your estimated wheel torque figure.
- c. If the customer has not done any modifications there is no need for a sports/ racing clutch. Sport/racing clutches are intended to handle a increase in torque above and beyond the capacity of the OEM clutch. Sports/racing clutches are not going to last longer than that of a OEM clutch even if the vehicle is stock as that is not the purpose of a sports/racing clutch.

3. What type of driving is the customer going to be doing?

- a. Street driving
- b. Street / Strip / Weekend racer
- c. Dedicated race car

4. Now that we know the vehicle model, torque output and type of driving the vehicle is being used for we can give the customer a good recommendation on clutch type (stage).

- a. EXEDY Stage 1 clutch is great for the customer looking for a very smooth engaging clutch that is going to drive similar to the OEM unit but capable to handle moderate levels of modifications. This is a great option for the "street driver".
- b. EXEDY Stage 2, 3, 4 Cerametallic disc with sprung hub center section is a great choice for the "street / strip / weekend racer" with applications to handle moderate to aggressive levels of modifications. These units offer a very consistent operation whether being raced or daily driven. The sprung hub center offers ease of engagement and absorbs many of the driveline vibrations at idle and during acceleration/deceleration.
- c. EXEDY Stage 4, 5 Cerametallic disc with solid hub center section is a great choice for the "dedicated race car" or very highly modified "street / strip / weekend racer" who doesn't not mind sacrificing drivability for performance. This type of clutch will offer a very consistent operation however chatter and driveline vibrations will be experienced due to the solid hub center section.

- d. EXEDY Stage 3, 4 Carbon** disc with sprung hub center section is a great choice for the "dedicated race car" who wants a very smooth engaging clutch with little to no driveline vibrations. The carbon disc is a very lightweight resulting in extremely quick shifts.
- e. EXEDY Stage 3, 4, 5 Carbon** disc with solid hub center section is a great choice for the "dedicated race car" who wants a very smooth engaging clutch that is very lightweight for extremely quick shifts.

***Carbon clutches are not recommended for street use due to the inconsistent friction coefficient from hot to cold. Carbon clutches require a warm up procedure before being driven aggressively. Due to this nature we only recommend carbon clutches for race only applications or to customers who completely understand the characteristics of a carbon clutch. A very big misconception of a carbon clutch is that the vehicle is warm so isn't the clutch? These units work excellent on dedicated race cars due to the driver being able to do the warm up procedure prior to the start of the race and every time driver upshifts or downshifts at higher RPM he is continuing to add heat to the clutch disc. In a street car you often stop at lights, drive in a specific gear, or shift at a lower RPM not allowing adequate heat to be given to the clutch disc. Without heat in a carbon clutch the friction coefficient is significantly lower than when heated. It is at these points in a street car that the customer may decide to put the pedal to the metal causing the clutch to slip and wear out prematurely due to inadequate heat being in the clutch disc.*

5. Lightweight flywheels for the Stage 1, 2 clutch kits are great options to;

- a. Improve throttle response.
- b. Allow the engine to rev more quickly.
- c. Allow the clutch to operate cooler.
- d. Burst tested and SFI approved. Rated to 10,000+RPM.
- e. Remove the OEM dual mass flywheels.

All EXEDY lightweight flywheels are made from a one piece forged chromoly steel which utilize a nitrate hardening process, unique cooling ducts and distribute the weight evenly to allow for better drivability on the street.

6. How to set-up and what to expect from an EXEDY sport/racing product.

- a. Break in period should be that of 500 miles of city type driving, double the break in period for highway driving. No aggressive driving. No hole shots or drag launches. Gear changes should be made at 4,000 RPM or less. No speed shifting.
- b. Installing a sports/racing clutch to suit various vehicles can transfer harmonic noises from the engine to the gearbox. This is also called gearbox rattle. This can occur at idle and during acceleration/deceleration.
- c. Clutch engagement can be compromised by installing a sports/racing clutch. This is due to the heavier torsional dampening springs and/or the solid hub center on the clutch disc. Another factor is due to reduction in cushion plate thickness within an organic clutch disc and/or no cushion plate on the cerametallic and carbon clutch discs. The best way to remedy this situation is a take off at a slightly higher RPM and/or let the clutch out a bit quicker.
- d. Since most of the stage 4 and 5 multi-plate clutch kits have a free floating pressure plate and intermediate plate there will be a metal on metal noise when the clutch is depressed. This is common on most multi-plate clutches and is acceptable within the racing industry.

Flywheels

Lightweight One Piece Chromoly

EXEDY flywheels combine low weight, low inertia and high thermal capacity. They are designed for lightly tuned racing cars for drag racing, autocross and rally events, as well as street usage. They are made from solid one-piece billet chromoly steel or chromoly steel forgings. They are specifically designed to reduce weight and inertia for better engine response. Most incorporate special design features to enhance the airflow which improves the cooling of the clutch. The ring gear teeth are integrated onto the flywheel unlike an aluminum flywheel where the ring gear is pressed onto the flywheel and has the possibility of separating from the flywheel due to the different expansion coefficients of aluminum versus steel. EXEDY steel billet and forged steel flywheels have passed engineering tests to 15,000-18,000 rpm. They are guaranteed not to fail to the said rpm, and are all SFI approved.



Stage 1 — Organic Friction Disc

Ultra Fiber Disc

This advanced facing material provides the high heat resistance essential for motorsports. It was developed by reviewing both the copper wire ratio and the composition of the high strength fiber. The Ultra Fiber Disc maintains the superior half-engagement feeling specific to the Organic material. With improved high heat resistance, it provides the functionality essential for street performance and mild racing applications.

Organic Disc

Newly developed asbestos free friction facing is used, which has high heat resistance and high burst strength characteristics. No steel back is required which can cause high RPM "lock-out" and/or synchro damage. Superior in shift operations and half-engagement feel, this clutch disc is recommended for any sports/performance use.



Clutch Cover

These clutch covers are designed to achieve a clamping load that is approximately 40% higher than the genuine part allowing a higher torque transmitting capacity. Ductile material is used for all pressure plates and, high burst strength can be achieved in all temperature ranges.

Stage 2 — Cerametallic Friction Disc

EXEDY cerametallic clutches are designed to handle the abuse of high power modified engines. Our cerametallic friction material can handle much more abuse than stock type disc assemblies without slipping and fading.

All EXEDY Stage 2 cerametallic clutch discs have sprung center dampers to reduce the impact and shock loads transmitted through the drivetrain. We offer two types of cerametallic discs, "thick" and "thin."

Thick Disc

The "thick" discs have better heat capacity and therefore better durability in demanding applications. Even with the "thick" disc, our three and four puck designs typically have less inertia than a stock disc and work well for street, rally and track use.



Thin Disc

The "thin" discs offer greatly reduced inertia to improve shift effort, allow for quicker shifting, and improve synchro durability. These discs are approximately 1/2 the thickness of a stock disc and are recommended for circuit track use only.

Stage 3 — Hyper Single Clutch

The Hyper Single Clutch is engineered to optimize the performance of cars that are moderately modified, but do not require the clutch capacity of a multi-plate clutch. Similar to our multi-plate clutches, it has a purple anodized, forged aluminum cover. The aluminum cover is stiffer than a stamped cover and therefore allows a higher lever ratio to maintain the pedal efforts at a reasonable level. There is no clamp load deflection as found in a pressed metal type cover.

All Hyper Single clutches come with a chromoly steel flywheel, 6-puck cerametallic facing and a spring center damper disc assembly. The disc is generally smaller and thinner than the OEM disc making for lower inertia and therefore quicker, easier shifting and less wear and tear on the transmission synchro's. The higher clamp load and cerametallic friction facings give approximately twice the holding torque of the OEM clutch and generally higher than other single plate clutches. An additional feature of the pressure plate is a series of turbine-like, air flow enhancing vanes that keep the clutch cooler under extreme operating conditions to improve wear life.

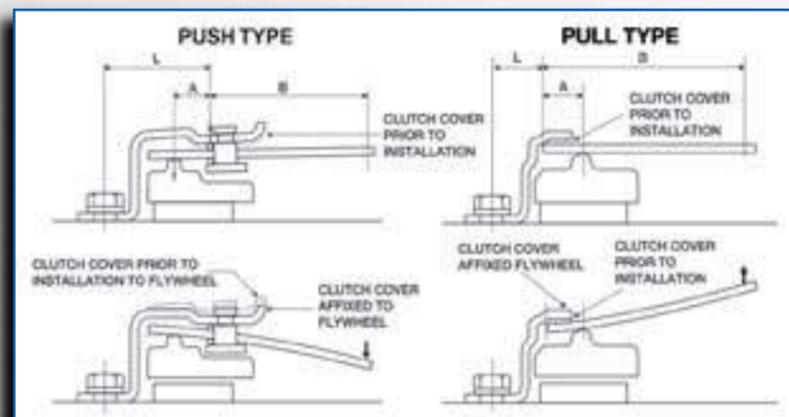
- High friction coefficient, low wear, and a special heat resistant material (T5001) has been developed enabling clutch size to be reduced and increased durability to be achieved.
- Durability is improved with the use of a stronger, smaller damper disc, specifically redesigned for the Hyper Single Clutch.
- A lower level of inertia is achieved over the genuine fitment clutch which improves shift response for faster gear changes particularly for racing applications.

Pull Type Clutch

The pull type clutch accommodates higher torque, in conjunction with lighter pedal efforts to produce a superior clutch operation, when adapted to most high-powered vehicles. An EXEDY Original design.

Advantages

- Unlike the push type cover, when a pull type cover flexes, it will flex in the direction of disengagement, assisting in positive pedal feel.
- A longer lever ratio achieves a direct decrease in pedal effort.



Patented One Touch Snap in Function

The problem of detachment difficulties is solved by the use of EXEDY original one-touch snap in bearing design. Detachment can easily be accomplished with the use of a screwdriver, alternatively, the bearing can be snapped back into place while activating the release fork.

What is Inertia?

Inertia is the tendency of the clutch and flywheel to maintain rotation even when not connected to the engine torque. This affects the responsiveness of the engine and also the feel of low rpm torque and start up drivability.

In the case of the clutch disc, lower inertia is always better to improve shift efforts and reduce the wear on the transmission synchro's.

Stage 4 & 5 — Hyper Multi-Plate Clutch

Twin and Triple Plate

For high-powered applications, EXEDY offers twin and triple Multi-Plate Clutches. These are designed for high power street action as well as drag, road and rally racing.

The twin plate clutches are rated for approximately 500 ft.lbs. TQ @ FW. The triple plate clutches are rated for up to and over 800 ft.lbs. TQ @ FW. Twins come with both spring damper discs or solid discs depending on application. Triples are all solid discs and not recommended for street use.

All of our multi-plate clutches come with a lightweight, chromoly steel flywheel and the famous purple anodized forged aluminum clutch cover. Depending on the application, we have both strap drive and lug drive models. All have T5001 cerametallic friction materials for extreme heat resistance.



SD Type

This model has been developed for high powered street cars and race cars with up to approximately 600TQ @ FW. They feature ventilated, thick intermediate plates for improved life and spring damper discs to protect your transmission and drive line.

SR Type

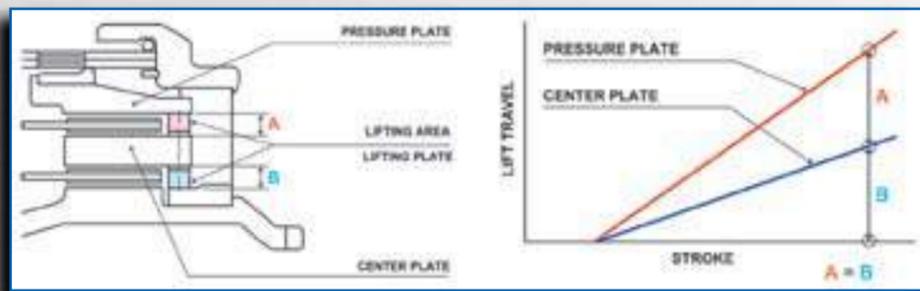
This model has twin or triple plates developed to be lightweight for quick response. The Triple plate model is available for over 800TQ @ FW and the twin plate model is rated to approximately 600TQ @ FW. The combination of ultra lightweight solid discs and a lightweight chromoly flywheel gives the driver a lightened pedal effort and quick response. This can improve your times when running at the drag strip or road course. They feature ventilated, thick intermediate plates for improved life

HR Type

This model has three plates and is developed specifically for high power applications such as over 800TQ @ FW for drag racing. It handles high torque loads and shifts smooth, and because of the lightweight clutch discs, you can reduce your shift times.

Patented Center Plate Self Leveling Function

The amount of center plate travel during release is always maintained in a neutral position by the reaction force of the lifting plate attached to both sides of the center plate.



- Improved disengagement (accelerated separation from friction surface).
- Improved disc life by eliminating unbalanced wear at the T/M and F/W side.
- Prevents and lowers mechanical noise.

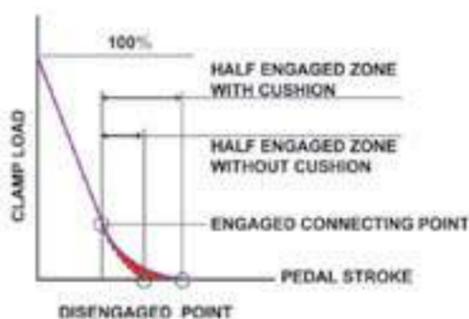
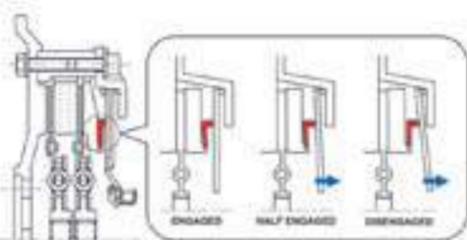
Working Theory

Due to high temperatures generated by the clutch system during operation, the pressure plate tends to absorb a large portion of that heat, accelerating the wear of the pressure plate side disc. The Lifting plate location remains steady between the location area on the pressure plate shown as (A) and F/W location area shown as (B) on the chart above. Accordingly, the wear of the pressure plate side disc is accelerated, resulting in the F/W side disc automatically being engaged earlier than the pressure plate side, which in turn increases the F/W side disc's work and wear rate. Therefore, due to an increase in workload during half engaged operations, wear on the F/W side disc will be accelerated causing a reduction in the overall friction material thickness, resulting in the F/W disc registering a similar thickness friction material to that on the pressure plate side.

Engine modifications (cam, timing, turbo modifications etc.) cause engine pulsation and vibrations. These vibrations can cause clutch rattle when the clutch pedal is depressed by movement on the intermediate separator plate, in some applications. These noises will in no way affect the performance of the EXEDY Multi-Plate Clutch. This rattle is well accepted in the performance industry where engine modifications have been carried out.

Patented Clutch Cushioning Function

The "cushion" function is a new innovation unique to EXEDY. The half engaged "zone" is expanded as a result of a decrease in rigidity of the pivot ring. Ideal pedal effort is achieved as a result of a longer lever ratio of the diaphragm spring coupled with the cushion reaction force.



Hyper Carbon Series

The flagship model of EXEDY clutches, the Carbon Steel Multi-Plate Clutch. These Clutches are lightweight, durable and resilient to high heat, contributing to an improvement in track times.

Warm Up Procedure

Due to the inherent properties of the carbon material, we must specify the proper way to bring the discs up to operating temperature.

This Process will heat the discs so they will hold the specified torque rating. The correct method is three, five second "slips" of the clutch within 30 seconds at low RPM.



High Heat Resistance

Carbon materials are baked at more than 3600 degrees Fahrenheit, which allows the carbon material to dissipate heat far better than conventional metallic material. Heat expansion rate is 1/20th of iron therefore eliminating a change in clutch feel that may happen due to distortion caused by expansion during driving. Carbon material not only has a high heat resistance but also a "non-stick" characteristic that eliminates disengagement problems.

Light Weight & Low Inertia

Light in Weight

The heaviest components of the clutch system are the clutch cover, intermediate plates and flywheel. Semi-Carbon clutches incorporate an improved cover configuration and lightened flywheel also contributing to a reduction in vehicle rotating weight.

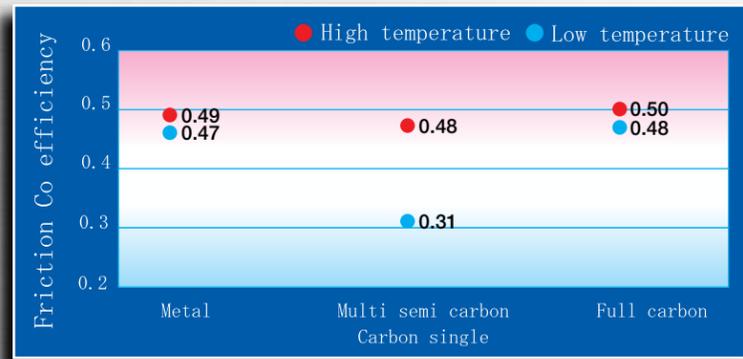


Low Inertia Design

The weight of a carbon clutch disc is one third that of a metallic disc. Utilizing a high friction coefficient Hyper Carbon disc which allows for quicker shift response. Low inertia discs allow the transmission to synchronize in a shorter space of time eliminating time loss during shift changing while also reducing the applied load to the synchronizer.

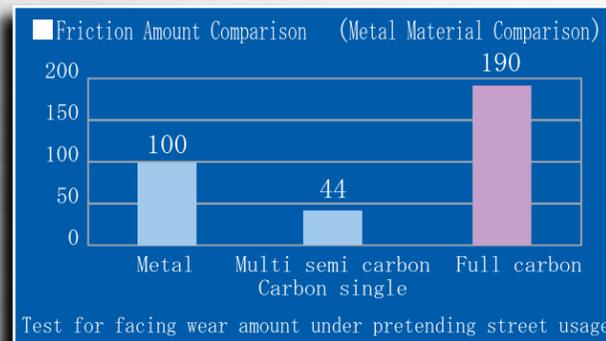
Easy to Handle

By controlling the carbon fibers and baking temperature, the cross layer type carbon material, which is the most appropriate for high revolution strength and high torque transmission, is applied to tuning car clutches. Semi-carbon clutches offer lightweight, high heat resistance and a stable friction coefficient. EXEDY Carbon clutches are tuned so that at a lower temperature, engagement feeling is improved and conversely at high temperatures, engagement is ideal for spirited driving.



Long Life

Semi-Carbon clutches allow double the life when compared to conventional metallic type material, which equates to an improved cost performance thanks to longer overhaul cycles. Full carbon clutches have more wear than metallic however, when used with over-sized pressure plates, the life is identical to metallic.



Hyper Carbon Series-D

Introducing the Next Generation of clutch systems by EXEDY – Carbon-D, the revolutionary Carbon Clutch System.

Carbon-D was developed to achieve the ultimate goal of comfort and drivability by absorbing noise and vibration emitted from drivetrain components such as the differential, transmission and engine. The Carbon-D system is designed to protect the drivetrain by absorbing and dissipating “shock torque” by utilizing EXEDY Patented Technology. Superior engineering enables the Carbon-D clutch system to possess an ideal clutch engagement position, increased clamp loads and lower pedal effort, while the unique Carbon Fiber friction material allows comfortable half-engaged clutch operation and responsive gear changes.



Carbon-D Single

- Introduction of a damper to absorb and dissipate noise and vibration
- High clamp load, lower pedal effort and ideal clutch engagement is obtained with the use of the re-engineered diaphragm spring
- Quiet Strap Drive design to minimize mechanical noise
- Patent Pending Disc System



Carbon-D Twin

- Introduction of a damper to absorb and dissipate noise and vibration
- With a reduction in pedal effort and an increase in disc size to 225mm, the Carbon-D Twin clutch is ideally suited to high performance street vehicles
- By optimizing the weight and inertia of the Carbon-D Clutch System, drivability is improved at low speeds

Gear Noise and Fluctuations in Engine Rotation (rpm)

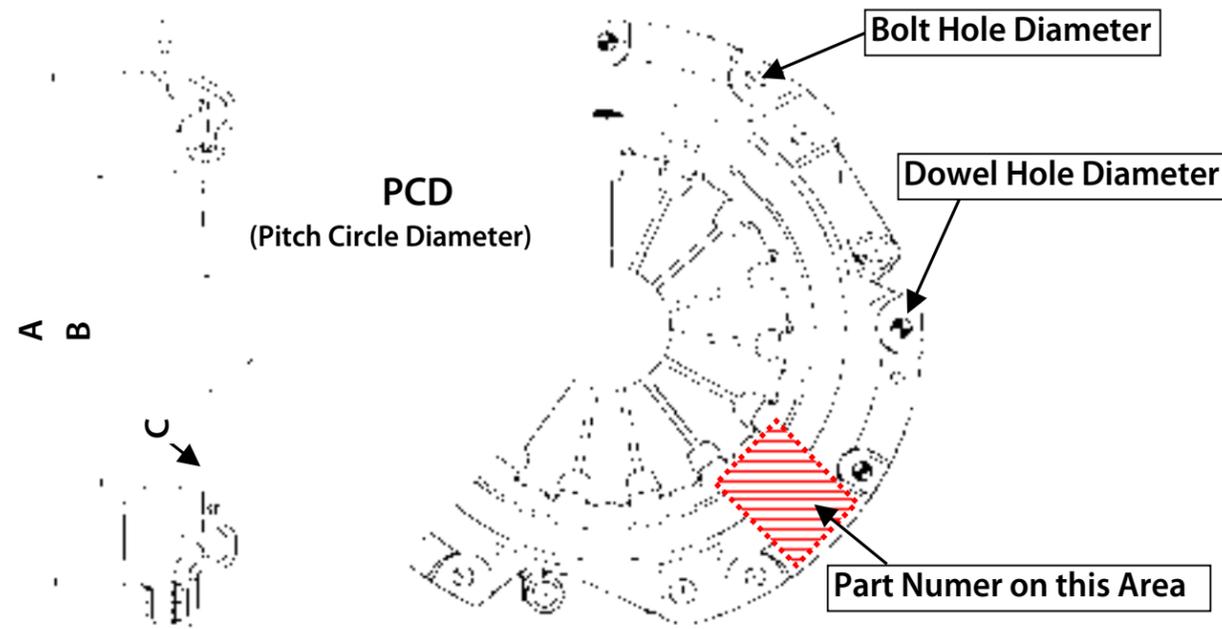
Even engines that seem to run very smoothly always have some amount of fluctuation in engine rotation. These fluctuations, when transferred from the engine to the transmission, cause gear teeth carrying no torque to strike mating teeth, resulting in noise (“tooth hammer”). The noise is louder in the interior as well as outside the vehicle because the clutch housing acts as a speaker and magnifies the noise. Although the noise level and noise-generating speed depend on the type and model of car, such noise is more frequent in a 6-speed vehicle than in a 5-speed vehicle.

Vibration-Absorbing Damper

The conventional damper used in most sports clutches is designed to protect the transmission from shock torque caused by abrupt clutch engagement, so it does little to absorb vibration. Efficient absorption of fluctuations in engine speed requires a very flexible spring and proper setting of the hysteresis torque. The flexibility of the spring, however, is likely to run counter to the damper capacity. For this reason, Carbon-D is equipped with a new dual stage damper, a low-load stage and rapid-acceleration stage, both of which are perfectly tuned for each car type. This tuning technology is available only from EXEDY, the specialist in high performance clutch systems.

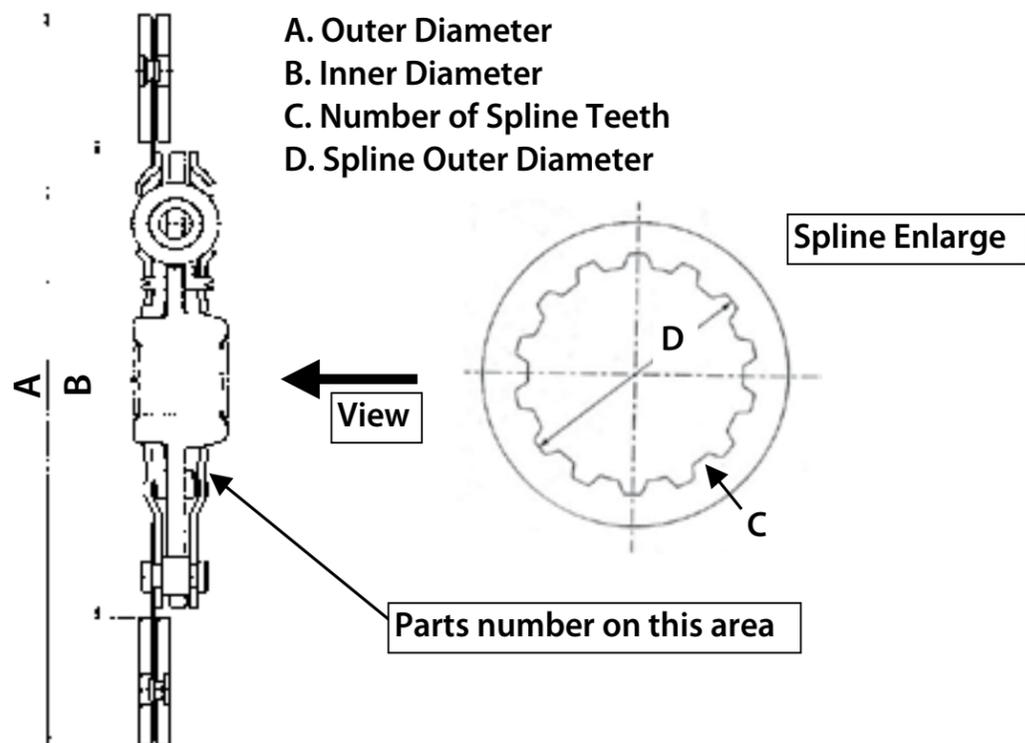
How to Identify Your Clutch

1. Pressure Plate (Clutch Cover)



- A: Pressure Plate Outer Diameter
- B: Pressure Plate Inner Diameter
- C: 6 digit number on spring surface (Flywheel side)

2. Clutch Disc



More Floating Space

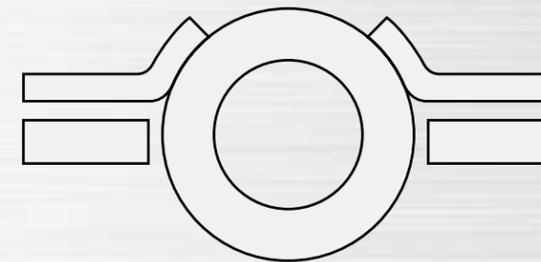


Alternating Points of Friction and Wear



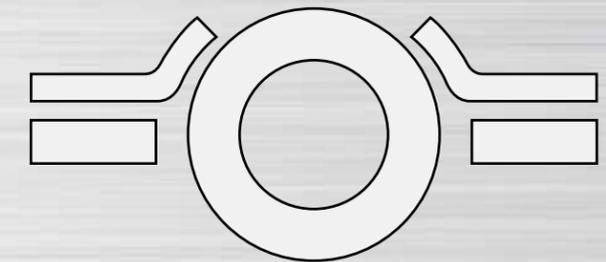
Increased Durability and Superior Performance

The Old



The Points of contact change, Causing premature wear on both the spring and the window.

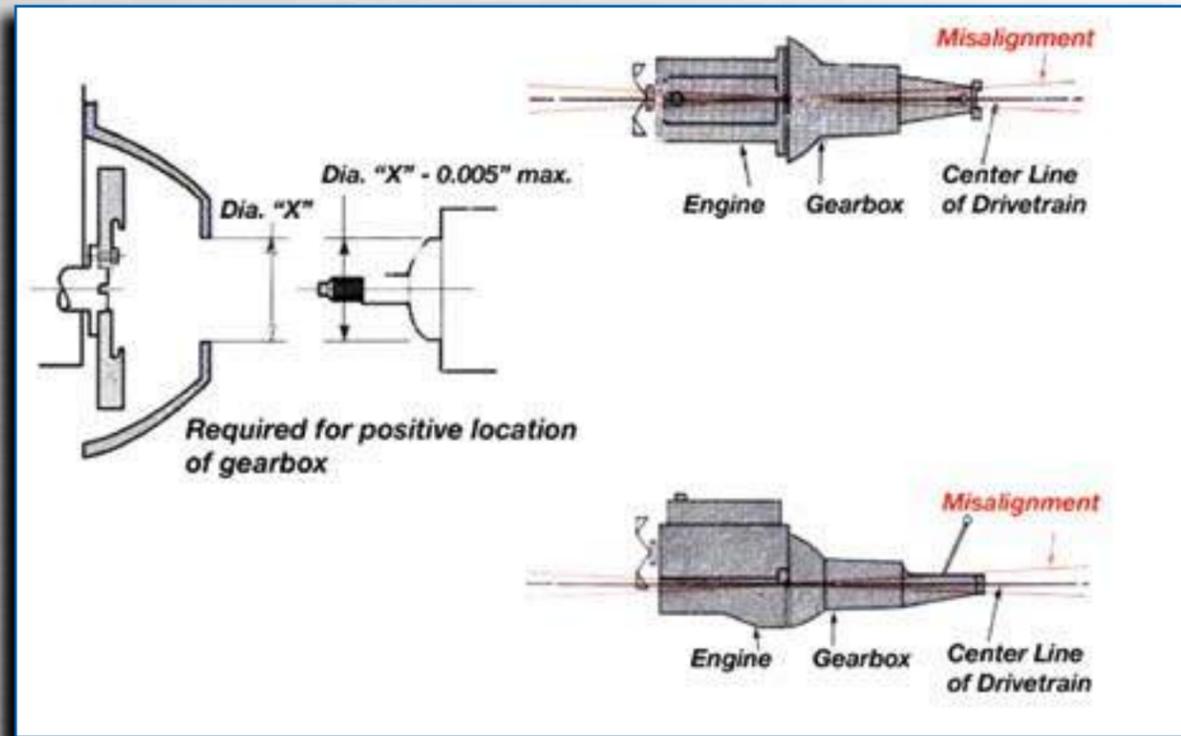
Unity



While the disc is not in operation, the spring can now move.* Therefore, when the disc starts moving area contacting the again, the spring's the window will be different.

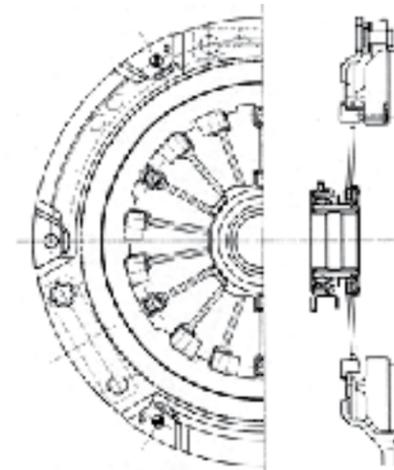
*Because this same movement does not occur during operation, there is no spring rattle.

Driveline Misalignment in General/Tips



1. Warped alloy bell housing
2. Tubular dowel pin guides crushed during fitting of bell housing to mating dowel pin hole and/or missing dowel pins.
3. Worn gear box quill/gear box main drive nose cone bearing slide: causing bearing to come in contact with the diaphragm of cover assembly off centre line whilst actuating clutch.
4. Dirt-chips-wiring harness clips-hydraulic pipe clamp clips – thick grease build up interfering between the mating surface of the gear box bell housing and motor.
5. Worn Spigot bushes and pilot bearings along with front gear box main bearings to be checked for wear.
6. Exchange engines and gear boxes have missing dowel pins. Ensure you remove pins from your product when you send your core for remanufacture and refit when installing the new clutch.

STUDY BEFORE ASSEMBLY

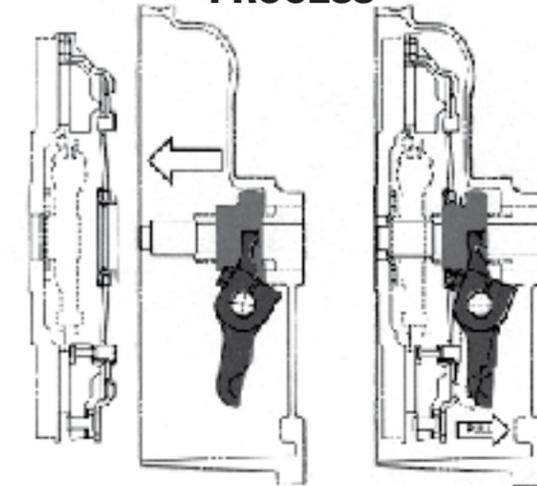


PATENTS PENDING

One for Pull Clutch
Four for Release Bearing Mechanism

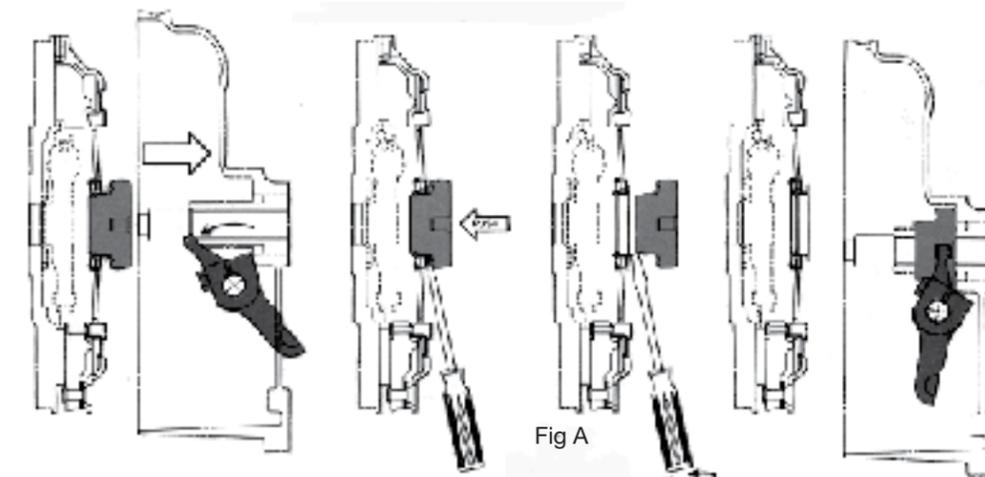
STUDY BEFORE INSTALLATION

INSTALLATION AND SNAP-IN PROCESS



Install bearing on to clutch fork, install transmission (G/Box) then the release fork must be pulled in the direction reverse to the release firmly. The bearing is then snapped in.

DISASSEMBLY



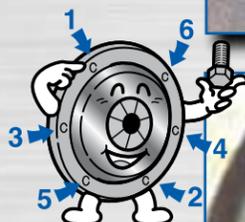
SNAP - OUT PROCESS

Move bellhousing back approximately 30 to 40mm, insert screwdriver and twist as in figure A. Bearing will then snap out from clip mechanism.

Flywheels and pressure plates need to be torqued down to proper specifications

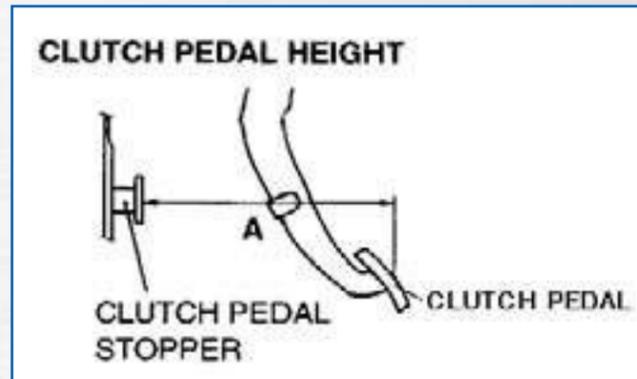
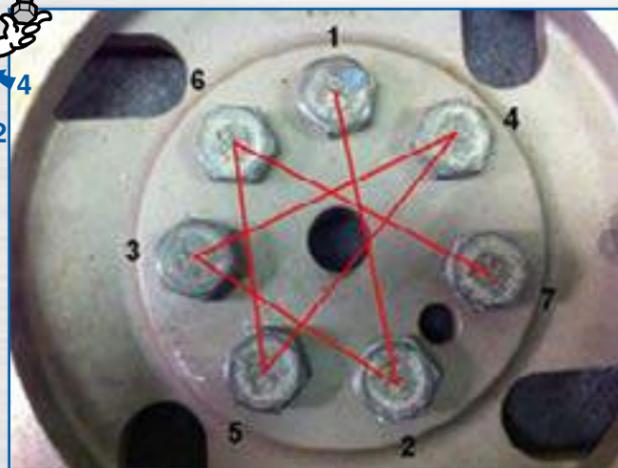
The reason why these components need to be torqued down to a specific value is to ensure that the components do not loosen up and function improperly. The clutch and flywheel spin to thousands of RPM's and have varied harmonics sent through them by the engine and drivetrain.

When one side has a greater torque value combined with centrifugal force and harmonic vibrations it allows the opposing side with a lesser torque value to loosen up. Improper torque is the number one reason for a given rotating component to become loose whether it is a wheel and tire or a flywheel. For these reasons it is imperative to torque to proper specifications.



When tightening flywheel or pressure plate bolts you should tighten each bolt a little bit at a time using a star pattern to tighten. This ensures that each bolt receives an equal torque value. When tightening bolts that require a specific torque value NEVER use power tools such as impact guns or air tools. When tightening bolts use a calibrated torque wrench to ensure the proper torque is being applied evenly to the specific bolts. ALWAYS refer to the vehicle's factory service manual for proper torque specifications for a given bolt or component.

The use of thread locker or Loctite on each flywheel bolt and pressure plate bolt gives added insurance to avoid bolts backing out resulting in damage to the vehicle and its components. Damage to the crank and transmission may occur when bolts back out due to balance being thrown off and/or contact damage of components that have loosened up.

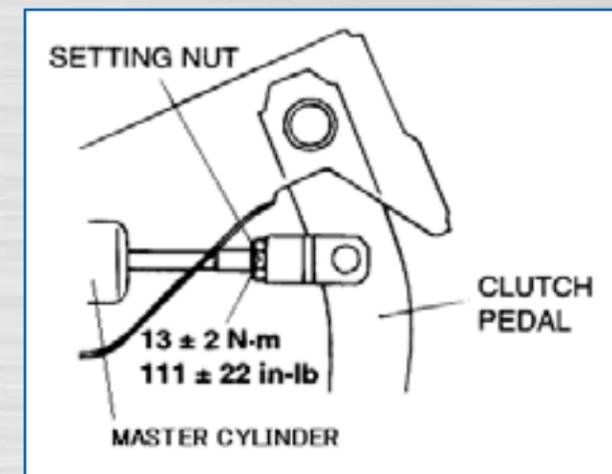


Measure the clutch pedal height. Standard value (A): 202.1 - 206.1 mm (7.96 - 8.11 inch)

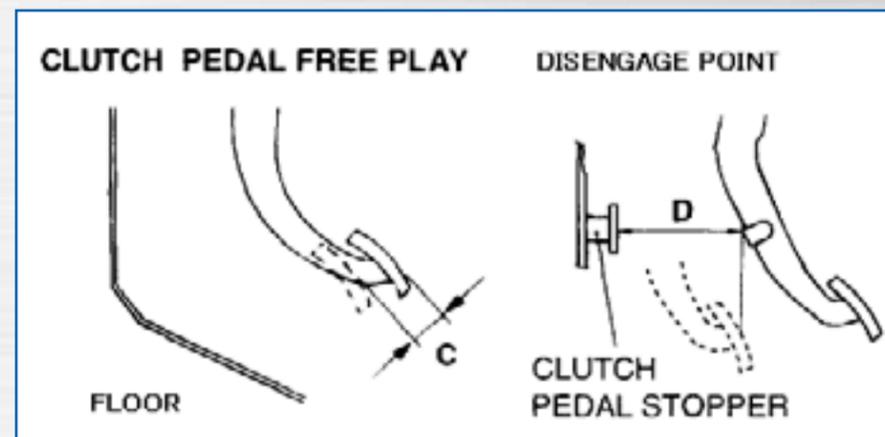
CAUTION: Do not push in the master cylinder push rod at this time, otherwise the clutch will not operate properly.

Measure the clutch pedal clevis pin play. Standard value (B): 1 - 3 mm (0.04 - 0.12 inch)

CAUTION: Do not push in the master cylinder push rod at this time, otherwise the clutch will not operate properly.



After completing the adjustments, confirm that the clutch pedal free play (measured at the face of the pedal pad) and the distance between the clutch pedal (the face of the pedal pad) and the clutch pedal stopper when the clutch is disengaged are within the standard value ranges. Standard value (C): 4 - 13 mm (0.16 - 0.51 inch) Standard value (D): 114.3 mm (4.5 inches) or more



ATTENTION

Please read before installation

HYPER CLUTCH
TWIN CLUTCH
TRIPLE PLATE CLUTCH
CARBON CLUTCH SYSTEMS

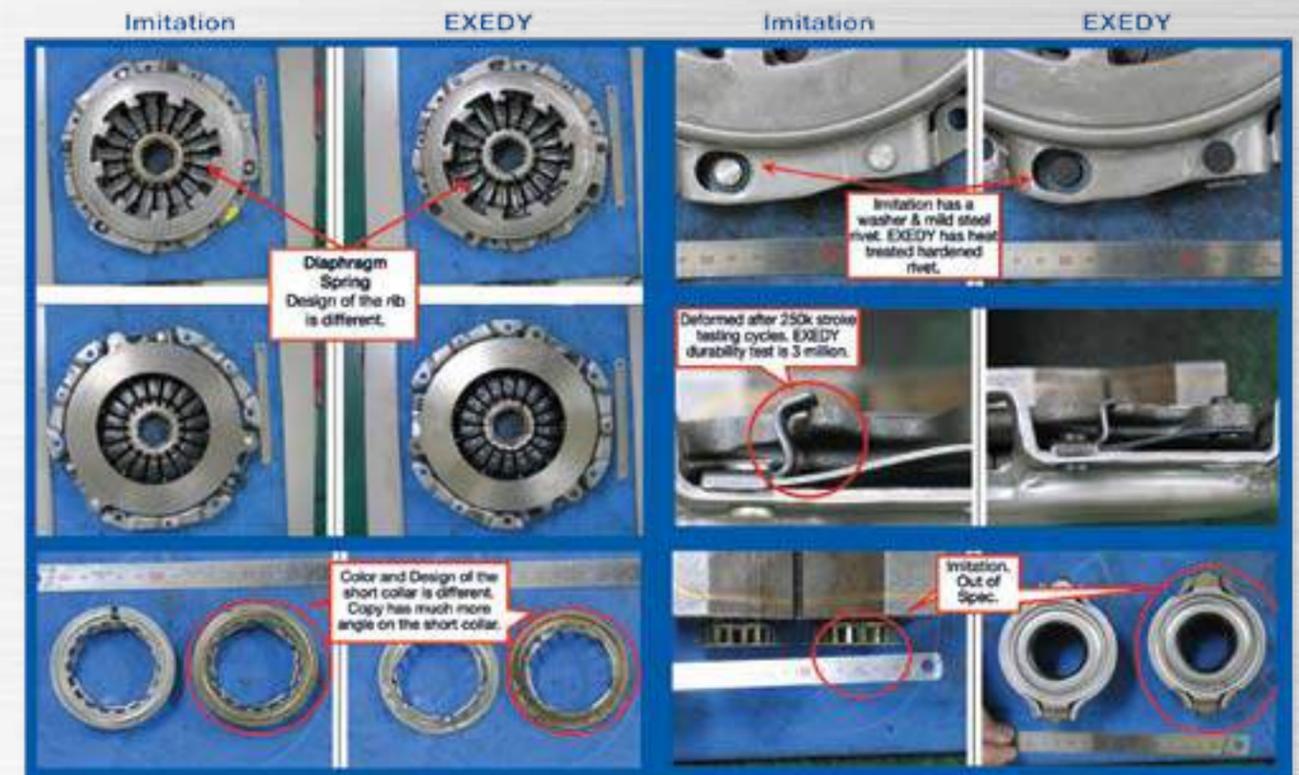


PLEASE ADVISE DRIVER OF VEHICLE:

Installing a sports/performance clutch to suit various vehicles, can transfer harmonic transmitted noises from the engine to the gearbox. This may also cause gearbox rattle. These transmitted noises will in no way effect the performance of the clutch or vehicle and is accepted in the performance industry where engine/clutch modifications have been carried out.

Reference cause, replacement of an EXEDY Silent Design long travel clutch disc to a high torque center EXEDY sports/performance clutch disc is generally the known cause of this transmitted noise.

Knockoffs are Imported into the US and are used in Substandard Clutch Kits

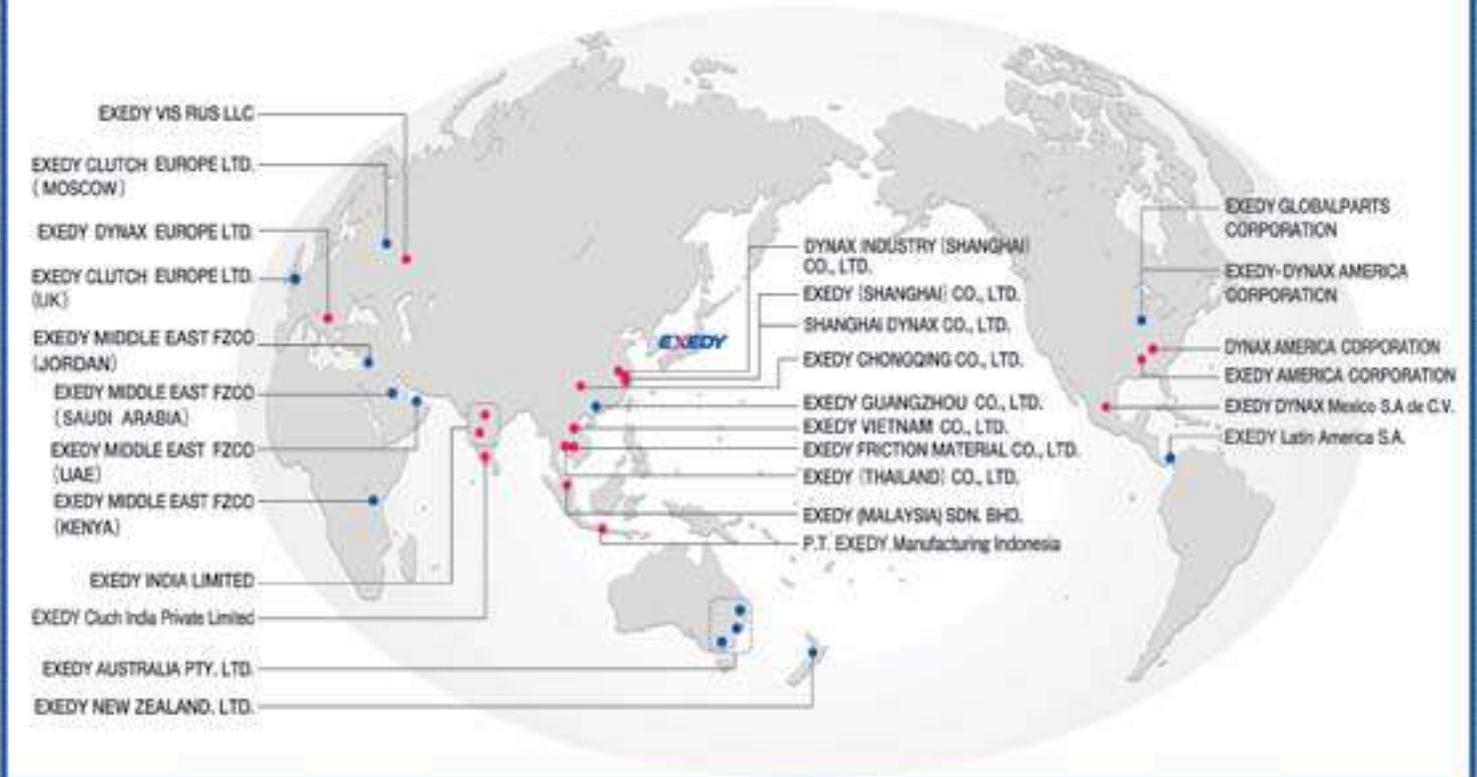


- Clutch Drag = poor disengagement i.e., commonly known as Gear Box Grouch/Gear Crash.
- Malfunction of hydraulic actuation system, due to incorrect set finger height.
- Vibration or clicking noise in clutch fork, also due to incorrect set finger height.
- Premature ware of clutch disc, due to PP (pressure plate) tilt lift.
- Damage to clutch disc splines, due to uneven landing of the PP casting on the clutch friction facings.
- All of the above will lead to premature total clutch failure and will snap-out the snap-in bearing.

For more information on Imitations/Inferior Products, please visit our website www.exedyusa.com

Global Network

● Direct Investment (Production) ● Direct Investment (Sales/Production)



EXEDY



**DAIKIN
CLUTCH**

8601 Haggerty Road • Belleville, MI 48111

800.346.6091 • Fax: 734.397.7300 • www.exedyusa.com

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Prepared by Evan Cline, Steve Kaminski and Jennifer Sinclair
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