



GENERAL SERVICE BULLETIN

Various Vehicles – Manual Transmission Clutch System Concern Analysis

Summary

This article is designed to provide examples of clutch assembly and interfacing parts conditions / damage to assist in determining if the condition is warrantable / non-warrantable, and whether involved parts are re-usable or should be replaced.

NOTE: The OASIS Part Coverage function will return a covered indication for the 7B546 (clutch disc assembly), but will be accompanied by (a) qualifying note(s) advising reference to Warranty and Policy Manual (and Parts Coverage Directory - USA only) for coverage exceptions or limitations that may apply.

Refer to the latest version of the Warranty and Policy Manual and/or Parts Coverage Directory for the latest clutch warranty coverage.

Service Information - Common Failure Modes

This article contains common clutch failure conditions that are seen in vehicles with manual transmissions. Technicians should compare the failure modes found in the vehicle being serviced to the conditions presented in this article. Understanding the operating conditions leading to various types of clutch failures can increase the accuracy of determining the root cause and whether the failure is eligible for repair under warranty terms.

Warrantable Conditions

Warrantable conditions will have to do with failure of the structural components of the clutch and related drive and actuation systems.

1. Clutch Disc Assembly -7B546-
 - a. Structural failures of pressure plate assembly, disc
 - Broken pressure plate drive straps, failed or missing drive strap rivets
 - Broken/damaged diaphragm spring (absent any evidence of clutch overheat damage or burst lining)
 - Broken clutch disc damper components (springs, drive plates, hubs, bushings)
 - Clutch launch/shift engagement shudder due to facing material quality (absent overheat)

Related Damaged Parts:

1. Clutch Slave Cylinder -7A508-
 - Leaks, if bearing carrier is still secured on clutch slave cylinder assembly (and with no evidence of clutch overheat damage)
2. Release Bearing -7548- (or as part of -7A508- assembly)
 - Release bearing noise or failure (absent any evidence of clutch overheat damage)
3. Flywheel -6375-, -6477-
 - Loose starter ring gear
 - Dual mass flywheel damper (internal) failure
 - Dual mass flywheel hub/drive rivet failure

Non-warrantable Conditions

Non-warrantable clutch failures are those related to the clutch friction facing (also referred to as lining in the customer warranty guide and in the Warranty and Policy Manual). These are considered wear or mis-use/damage failures, and fall mainly into three categories:

- normal wear
- overheat/wear due to excessive slip
- overspeed/burst of the facing

1. Normal Wear:

Normal end-of-useful-life wear will be indicated by loss of facing material to the point that wear indicator grooves in the facing surface are nearly gone, the facing retaining rivets are at or just below the remaining facing surface, and debris within the clutch housing presents only as fine dust (or oil-retained sludge) accumulated on the housing surface and on the clutch and flywheel assemblies.

2. Overheat/Wear Due To Excessive Slip:

Overheat is the result of excessive/extended clutch slip during launch or shift re-engagements due to driver engagement technique. Normal operation of the clutch should result in minimal heating of the facing, the clutch pressure plate and the flywheel contact surfaces, with no more than minor 'graying' heat indication spots. Heavy/broad evidence of grayed or blued flywheel and pressure plate contact faces, smearing of metal surfaces, along with loss of clutch disc facing binder (appearance of loosening of facing fibers within the facing material) are evidence of excessive slip/overheat damage, and are not warrantable.

3. Overspeed/Burst of The Facing:

Overspeed/burst is the result of downshifting into too low a gear at too high a vehicle speed. The transmission synchronizers increase the clutch disc speed to match expected engine RPM in the gear being engaged, in advance of the driver re-engaging the clutch. Clutch engagement then forces engine speed up or down to match the clutch disc speed, so down-shifting to 1st or 2nd gear at higher vehicle speeds can result in excessive disc speeds and burst failure of the facing due to high centrifugal forces at those high disc speeds. Burst failures will typically exhibit either chunks of facing material or 'bird-nested' lining material, either loose in the clutch housing or sometimes lodged within the pressure plate assembly (often resulting in un-even pressure plate diaphragm finger height due to the presence of the facing material between the cover stamping and the diaphragm spring deforming the spring fingers). In addition, a burst facing may be accompanied by a leak failure of a clutch slave cylinder due to slave over-travel resulting from low diaphragm finger height caused by this jammed material (a release bearing carrier which has come loose from a concentric clutch slave cylinder only occurs due this type of overstroke – the bearing carrier is otherwise secured by retaining ring on slave cylinder shaft). Any slave cylinder leaks due to displaced/loose bearing carrier accompanying a lining burst failure are secondary to the burst failure.

All these conditions are considered misuse/damage, and are not warrantable.

1. Clutch Disc Assembly -7B546-

- Clutch slip due to end-of-life wear condition
- Any overheat condition, heavy graying/bluing of metal, facing damage
- Clutch launch engagement shudder due to facing material damage from overheat
- Low/uneven diaphragm fingers due to burst facing material jamming pressure plate cover fulcrum

2. Flywheel -6375-, -6477-

- Friction face overheat damage

3. Clutch Slave Cylinder -7A508-

- Release bearing noise/failure due to overheat
- Leaks due to release bearing carrier retainer ring dislodged, bearing carrier loose from assembly

4. Release Bearing -7548- (or as part of -7A508- assembly)

- Release bearing noise/failure due to overheat

Reusable Parts

Refer to Figures 32-34 and 38-39 for evidence of normal parts condition (minor heat effect, low-wear conditions which are still serviceable) as guidance on parts re-use vs replacement.

NOTE: Since a clutch is a wear/maintenance item, a clutch carries no pro-rating as partial-life offset for a customer's cost responsibility. A decision to replace parts (of convenience while apart) as means to extend clutch lifetime is to be borne by the customer as a maintenance expense.

Figures Of Non-Warrantable Clutch Failures

Clutch disc burst due to overspeed / inadvertent downshift to 1st or 2nd gear at high vehicle speed. (Figures 1-2)

Figure 1



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Figure 2



E372194

One side facing lost from each disc of a twin disc clutch due to overspeed / inadvertent downshift into 1st or 2nd gear at high vehicle speed. (Figures 3-4)

Figure 3



E372195

Figure 4



E372196

Clutch assembly is overheated due to excessive slip, with overspeed burst/'birds-nested' friction material fibers, overheated flywheel, overheated and scored pressure plate. (Figure 5)

Figure 5



Clutch disc burst due to overspeed and excessive slip/heat. Figures show clutch lining material overheated, clutch binding agents burned off, clutch fibers loose in the clutch housing, jammed in pressure plate assembly. (Figure 6-7)

Figure 6



Figure 7



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Clutch disc heat damage/wear due to excessive slip. Figures show clutch lining material overheated, binding agents burned off. (Figure 8-9)

Figure 8



E372200

Figure 9



E372201

Clutch disc lining heat damage due to excessive slip. Figures show face and edge appearance of heat-damaged lining. (Figure 10-11)

Figure 10



E372202

Figure 11



E372203

Clutch disc steel hub, pressure plate edge overheated / discolored due to excessive engagement modulation/slip. Figures show broad uniform dark/gray coloring or blue/violet coloring from excessive heat. (Figure 12-13)

Figure 12



E372204

Figure 13



E372205

Clutch pressure plate or flywheel overheated/discolored due to excessive engagement modulation/slip. Broad dark/gray coloring or blue/violet coloring, appearance of material smeared from excessive heat. (Figure 14-17)

Figure 14



E372206

Figure 15



E372207

Figure 16



E372208

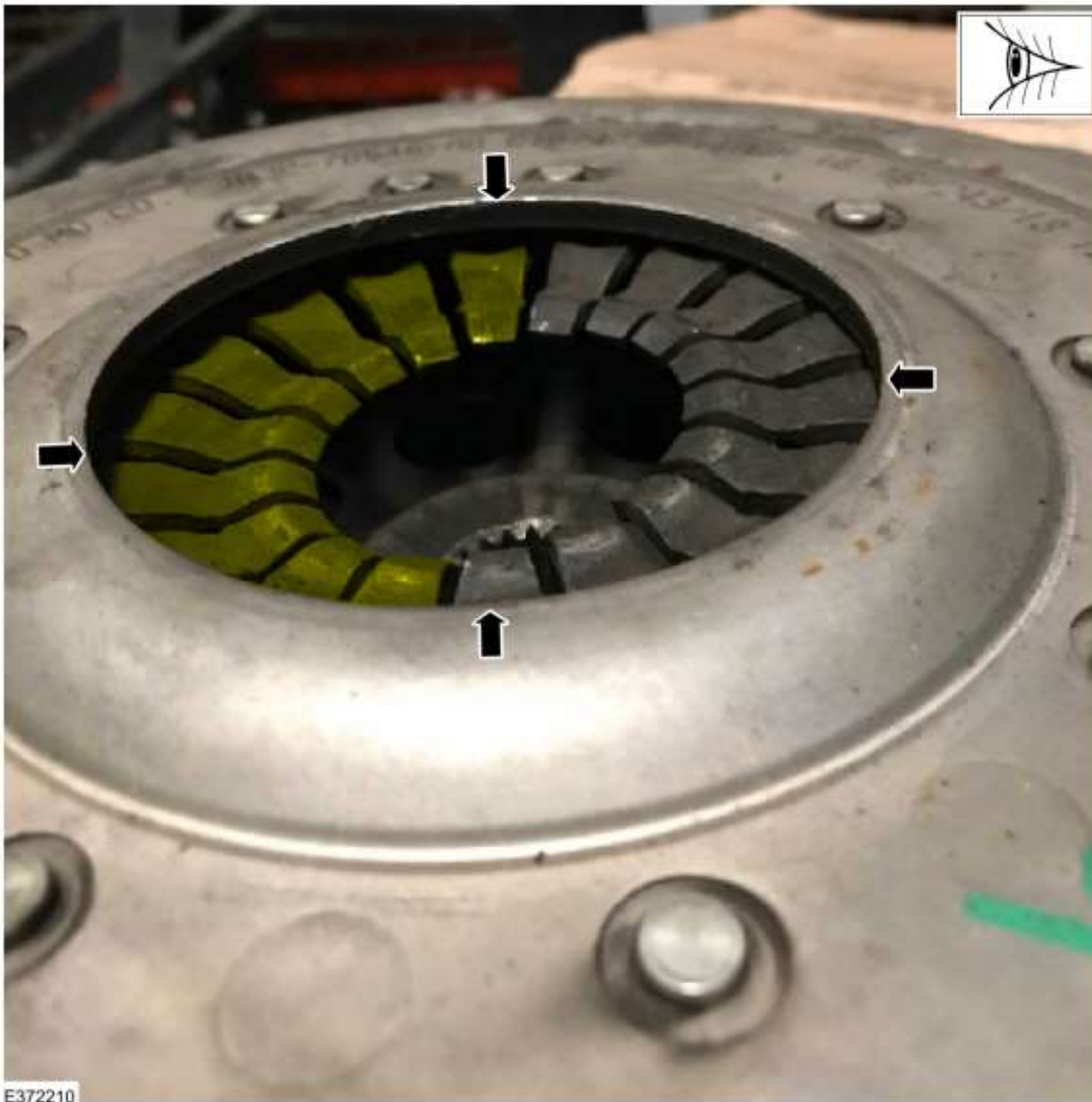
Figure 17



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Clutch pressure plate diaphragm fingers low/uneven due to burst lining material jammed lodged in cover assembly. (Figure 18)

Figure 18



Clutch slave cylinder overheat/overstroke failure – bearing/grease failure due to overheat from clutch slippage; bearing carrier/retention failed due to overheat; cylinder leak due to overtravel/failed bearing retention resulting from low pressure plate diaphragm finger height associated with burst lining. (Figure 19)

Figure 19



Figures Of Warrantable Clutch Failures

Structural failure of the clutch disc assembly (Figure 20) and its components parts (Figures 21-26) are covered.

Figure 20 – Clutch Disc Assembly



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Figure 21 – Plastic Washer



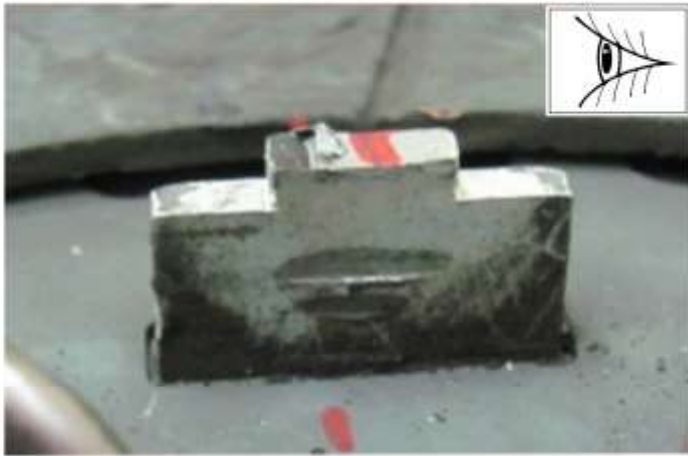
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Figure 22 – Conical Bushing



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Figure 23 – Stop Pin



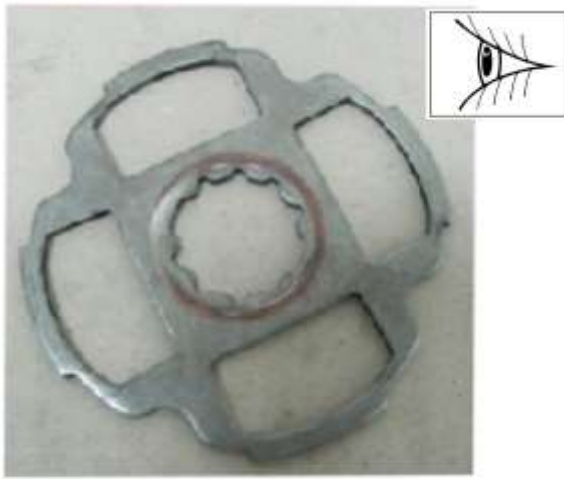
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Figure 24 – Hub



E372216

Figure 25 – Drive Plate



E372217

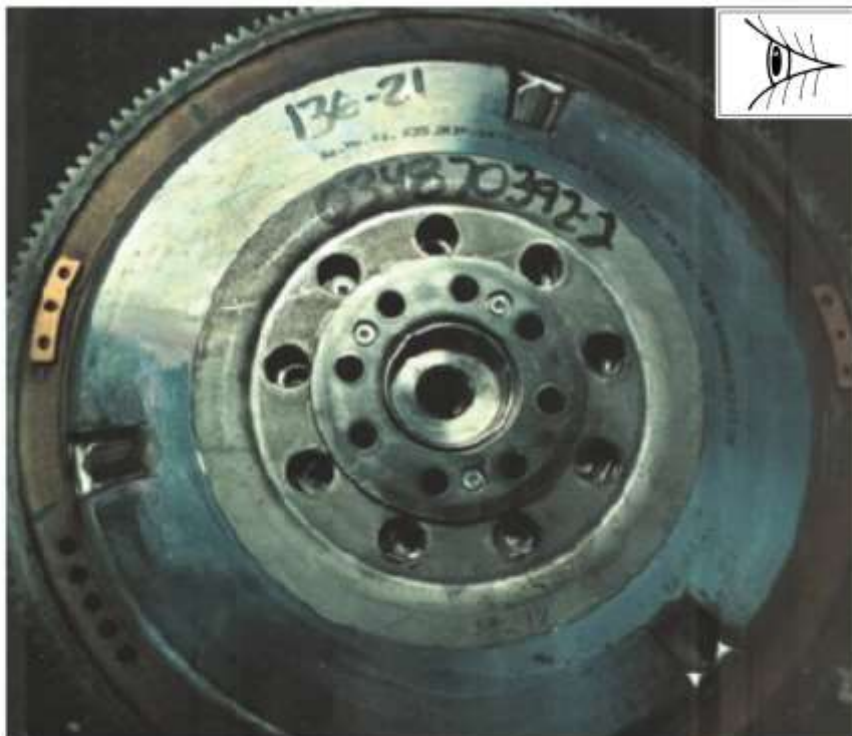
Figure 26 – Spring



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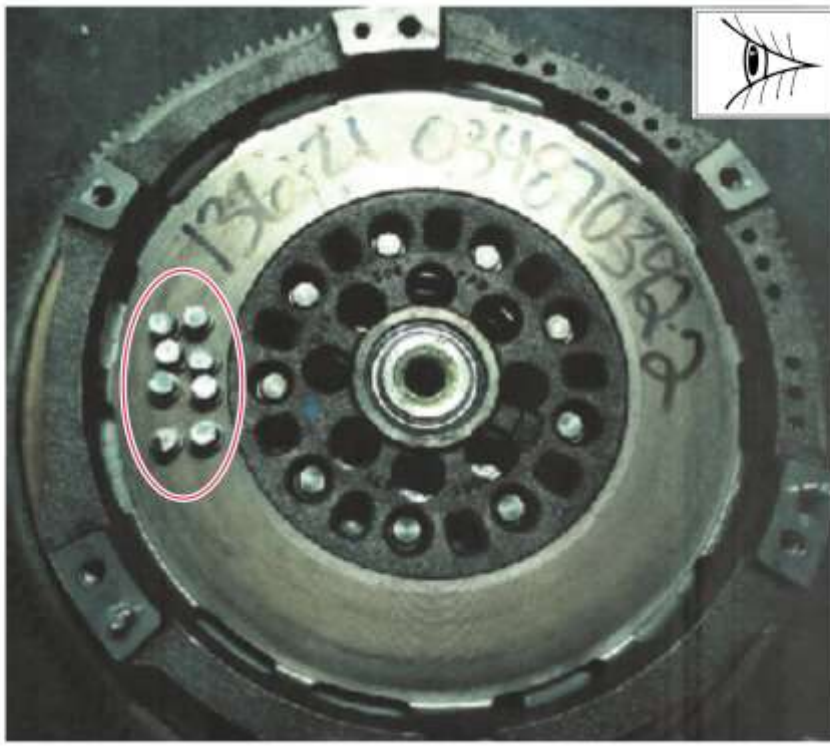
Failed dual mass flywheel rivets. (Figure 27-28)

Figure 27



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Figure 28



E372220

Structural damage to pressure plate assembly components is warrantable. Figures show broken drive straps, failed or missing drive strap rivets. Refer to Figure 13 for reference of a properly attached drive strap. (Figure 29-31)

Figure 29



E372221

Figure 30



E372222

Figure 31



E372223

Reuse - Figures 32-34 show clutch disc with sound lining, no overheat and no excessive wear.

Figure 32



E372224

Figure 33



E372225

Figure 34



E372226

Not Reusable - Clutch lining showing heat damage (Figure 35), high wear on one or both sides of the disc (Figure 36-37).

Figure 35



E372229

Figure 36



E372230

Figure 37



E372231

Reuse - Clutch flywheel showing normal heat-spotting marks that occur during break-in and normal use, with no adverse effect on function. (Figure 38-39)

Figure 38



E372227

Figure 39



E372228

Not Reusable - Clutch flywheel showing material removed, blued, excessive lining dust. (Figure 40-42)

Figure 40



E372232

Figure 41



E372233

Figure 42



E372234

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NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, workshop manual (WSM) procedures or technical training or wiring diagram information.

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