Flywheel Service

How a flywheel moves through the workshop

When the clutch engages, the pressure plate clamps the lining against the flywheel's friction face. Before GTE removes any metal, the technician checks the condition of that surface and whether the design allows resurfacing. The aim is to restore the working track while preserving the dimensions the clutch needs to engage.

This guide follows a flywheel through the workshop. The photographs show how GTE measures the depth of a cut and how the technician compares different points on the finished face. Customers can add bench balancing after resurfacing. The service ends with a quality-control review.

01 **Inspection and resurfacing** — Page 2
How GTE checks the starting dimensions, selects an abrasive stone and grinds the friction track.

02 **Measuring the cut** — Page 3
How readings taken before and after grinding show how much material came off.

03 **Checking the finished face** — Pages 4–5
What the four photographed gauge readings show about local surface height, with technical references on page 5.

04 **Optional flywheel balancing** — Page 6
How GTE balances the agreed components for an additional charge and documents the result.

05 **Final quality control** — Page 7
How the technician reviews the finished track, the part-specific dimensions and any balance result before return.

Inspection and resurfacing

The COMEC flywheel grinder

GTE uses an Italian-built COMEC flywheel and clutch pressure-plate grinder. Its rotary table turns the flywheel beneath a vertical grinding head. The technician sets the depth of cut and selects the stone to suit the metal and the finish required on the clutch contact track.



Fig. 1a GTE's COMEC grinder

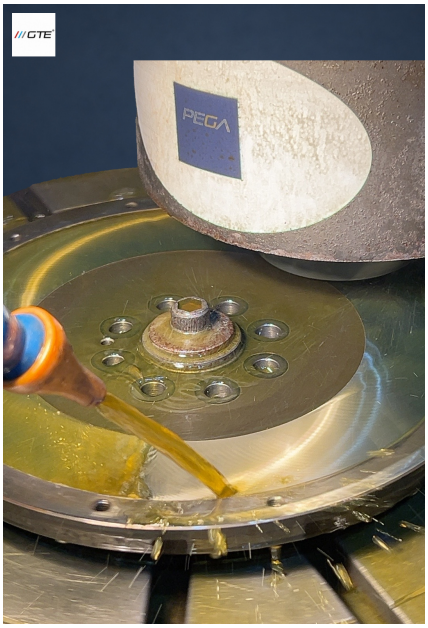


Fig. 1b Grinding under coolant

Centering the flywheel

The fixture centers and secures the flywheel. The rotary table carries the full circumference of the friction track past the stone.

Controlling the cut

The vertical head positions the stone against the track. The feed control lets the technician advance the stone as material comes off.

Cooling the contact area

A nozzle directs coolant where the stone meets the metal, carrying away heat and grinding debris.

Preparing and checking the cut

GTE checks the starting height, step where applicable, and remaining service dimensions. The technician selects from premium ceramic and silicon-carbide grinding stones according to the flywheel material. Dressing exposes fresh abrasive. After grinding, GTE looks for a continuous ground band across the working width and checks the height at several points.

How much material comes off?

GTE reports a grinder working range of 0–1,000 µm (0–1.00 mm). The flywheel's design, condition and minimum dimensions determine the allowable cut. GTE commonly removes about 100 µm or less. Some Lamborghini flywheels require more where their service dimensions permit it.

TYPICAL GTE CUT	PHOTOGRAPHED LAMBORGHINI EXAMPLE
Around 100 µm or less	**70 µm removed**

Measuring the cut

12.67 mm before cutting, 12.60 mm after resurfacing

Two views at each stage show the bridge indicator on the friction track. Subtracting the after-service reading from the before-service reading gives the depth of the cut on this sample.

BEFORE MINUS AFTER	MATERIAL REMOVED
12.67 mm − 12.60 mm	**0.07 mm / 70 µm**



Before cutting

12.67 mm



Gauge detail

Fig. 2 / View 1



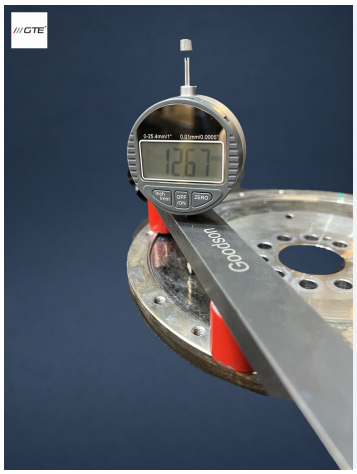
After resurfacing

12.60 mm



Gauge detail

Fig. 3 / View 1



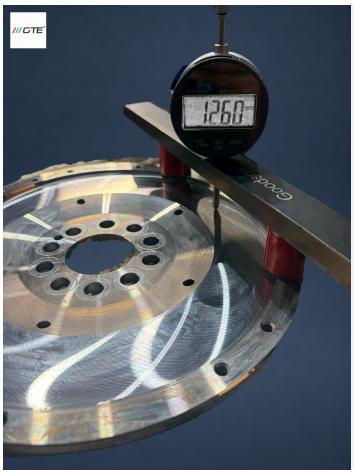
Before cutting

12.67 mm



Gauge detail

Fig. 4 / View 2



After resurfacing

12.60 mm



Gauge detail

Fig. 5 / View 2

Reading the before-and-after pair

To compare depths, use the same reference surface and gauge setup at both stages. The difference gives the amount removed. Page 4 shows how the finished face compares from one probe position to another.

Both 12.60 mm displays are enlarged from the camera photographs and brightened for readability.

Checking the finished face

Four-point check of the finished friction face

The indicator probe touches the track where the clutch lining seats. On this GTE workshop sample, the highest of four photographed readings was 0.00 mm and the lowest was −0.03 mm. The four sampled heights are within 0.03 mm (30 µm) of one another.

MATERIAL REMOVED IN THE CUTTING EXAMPLE	SPREAD AT FOUR POST-SERVICE POINTS
0.07 mm / 70 µm	**0.03 mm / 30 µm**



Point A

0.00 mm



Gauge detail

Fig. 6 / IMG_8951



Point B

0.00 mm



Gauge detail

Fig. 7 / IMG_8952



Point C

−0.03 mm



Gauge detail

Fig. 8 / IMG_8953



Point D

−0.01 mm



Gauge detail

Fig. 9 / IMG_8954

What the readings tell us about lining contact

Where the design calls for a flat face, an even track helps the lining seat across its width. A raised band can concentrate contact. Checking a suspected dome requires a common zero and readings across the track at several clock positions. These four points document local surface heights.

Technical references for the face check appear on page 5.

Technical references

ZF / SACHS · Diagnosing clutch slip

ZF identifies incorrect flywheel reworking as one possible cause of slip. Its diagnostic guidance calls for checking the flywheel and pressure-plate friction surfaces, as well as clamp and release conditions and possible contamination. Surface measurements help determine whether the suspected geometry is actually present.

ZF Aftermarket / Clutch slipping

Hamburg University of Technology · Loaded contact

Abdullah and Schlattmann modeled the flywheel, disc and pressure plate under spring and centrifugal loading. Their study examines how contact stiffness affects pressure distribution. A bridge indicator measures unloaded face geometry, while actual lining pressure develops in the clamped assembly.

Abdullah & Schlattmann (2013) / Contact Analysis of a Dry Friction Clutch System

AP Racing · Race clutch applications

AP Racing describes how the pressure plate transmits clamp load through its friction face and identifies flat and stepped flywheel mounting options. Its Formula 3 CP8662 family uses a carbon pack. These application references supply no crown tolerance or machining allowance for a Lamborghini road flywheel.

AP Racing / Metallic clutch technical information

AP Racing / Formula 3 CP8662 catalogue

ISO references for the measurement

ISO 12781-1:2011	Flatness vocabulary for nominally planar surfaces.
ISO 12781-2:2011	How the complete planar surface is evaluated.
ISO 13102:2012	Characteristics of the electronic digital indicator.
ISO 14253-1:2017	Conformity decisions using measurement uncertainty.

Goodson / FGG-12 flywheel depth gauge

Grinding stones and surface finish

GTE's shop reference lists Goodson FGW-374 for cast iron, FGW-69 for cast steel and FGW-56 for billet steel. The following manufacturer references cover wheel selection, dressing and coolant.

Goodson / Flywheel grinding stones

Goodson / Grinder setup and wheel dressing

COMEC / Flywheel and clutch pressure-plate grinders

GTE / Precision Clutch & Flywheel Balancing

GTE / Balancing vs Calibration installer guide

Optional flywheel balancing

In-house bench balancing is available for an additional charge

Ask GTE to add balancing to the resurfacing estimate. Specify whether you are sending the flywheel alone or an eligible matched clutch assembly so the quote and the certificate identify the components being balanced.



Fig. 10 GTE balancing workstation

What the machine measures

GTE fixtures the agreed component on its MBS Balans V-IVB 100 vertical balancing machine. The machine measures how unevenly the mass is distributed as the part spins. Correcting that imbalance reduces the rotating force that can cause vibration at speed. The technician then spins the part again to verify the result.

The balancing certificate

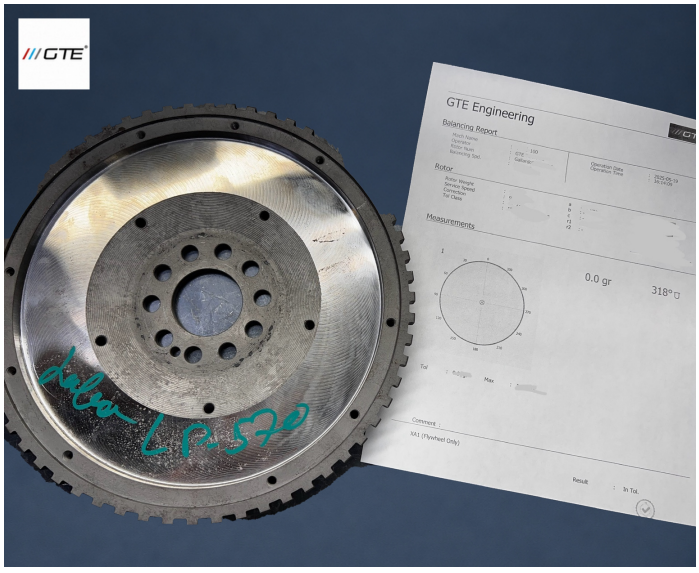


Fig. 11 Gallardo flywheel and its balancing report

Reading the sample report

This Gallardo example is marked “Flywheel Only.” The final result reads “In Tol.” for that component and test setup.



Detail from the original GTE report

Request a copy with your parts

GTE keeps a certificate for every balancing job. If you want a copy in the return shipment, request it when you authorize balancing.

GTE / Precision Clutch & Flywheel Balancing

Request a balancing quote

Final quality control

What GTE reviews before returning the flywheel

The technician reviews the completed work against the requirements for the specific flywheel. The review covers the dimensions left after machining, the condition of the clutch contact track and any balancing the customer requested.

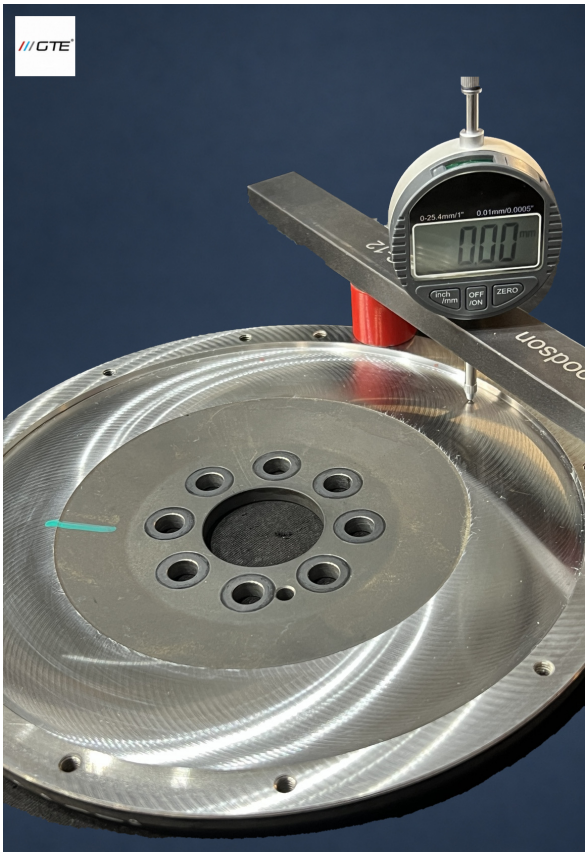


Fig. 12 Probe on the finished friction track

Finished dimensions

Compare the finished friction-face height and any specified step with the dimensions for that flywheel. The before-and-after difference records how much material the cut removed.

Friction-track profile

Inspect the ground band across the width of the track. Compare probe readings taken from a common reference at several positions. Where a profile tolerance is specified, use the applicable method and limit to assess it.

Balance record, if ordered

Review the final balance result for the component or matched assembly actually tested. The certificate identifies that setup. GTE retains it and can include a copy with the return shipment on request.

Reading the two measurements on the sample

0.07 mm removed

12.67 mm before machining and 12.60 mm after machining. This difference describes the depth of the cut.

0.03 mm across four points

The highest photographed reading was 0.00 mm and the lowest was −0.03 mm. Their difference describes the spread at those four sampled positions.

Return to the service overview