

The Complete Owner's Workshop Pack

Fifteen sheets covering the whole arc of owning one of these machines — identify it, measure it, record it, diagnose it, buy for it. One print job.

Fifteen sheets, in the order ownership actually goes: identify it, measure it, record it, diagnose it, buy for it. Everything here is also free on its own.

WHAT THIS PACK IS NOT

It is not a service manual, and it deliberately contains no torque figures, valve clearances, jetting or wiring colour charts. Published values for these machines contradict each other — we have seen valve clearances quoted in units that do not convert and charging voltages that disagree inside a single discussion — and a wrong number in a printed document does more harm than an absent one. What this pack does instead is establish what you have, measure it, record it, and narrow a fault to something you have observed.

PRINT THIS AT ACTUAL SIZE

Several sheets in this pack carry scales, rings and bars printed at true size that you lay a part against. Those are only correct if the pack is printed at 100%. In the print dialog choose “Actual size” or “100%”, not “Fit to page”. Each sheet that needs it carries its own millimetre rule — check one with a steel rule before you trust any dimension in the pack.

WHAT IS IN THIS PACK

01	Chinese Scooter Identification Worksheet	TSP-ID-01
	A one-sheet record of every number that identifies your machine — badge, VIN, engine number, engine family and factory. Fill it in once, photograph it, and never hunt for it again.	
02	Engine Code Decoder Card	TSP-ID-06
	Every character in the code stamped on your crankcase, what it means, and why 139QMB and 1P39QMB are the same engine.	
03	Short Case Or Long Case? Measurement Sheet	TSP-ID-04
	One measurement and one count decide which drive belt, which wheel and which brake your engine takes. Take them before you shop, not after.	
04	Mystery Part Measurement Sheet	TSP-ME-01
	You are holding a part. Nobody knows what it is called. This sheet records everything a supplier needs in order to find it for you.	
05	Bolt, Thread And Spanner Card	TSP-ME-05
	Why an 8mm bolt sometimes takes a 12mm spanner and sometimes a 13mm, how to identify a thread without a gauge, and a true-size thread pitch scale.	
06	Bearing Size Chart And Reverse Lookup	TSP-ME-09
	Measure bore, outside diameter and width, read the bearing number off the table. Works without knowing what the machine is.	
07	CVT Belt Size Chart And Measuring Sheet	TSP-ME-02
	How to read the three numbers printed on a scooter drive belt, how to measure a belt that has no readable markings left, and a record sheet for the one you have.	
08	Variator Roller Measurement Sheet	TSP-ME-03
	Diameter, width and weight are three separate things, and a roller set is only interchangeable on all three. A record sheet with true-size circles and a weighing block.	
09	Maintenance Schedule And Service Log	TSP-MA-01
	A service record you build yourself from what your machine actually needs, rather than from a schedule invented for a machine nobody can identify.	

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|--|---|-----------|
| 10 | CVT Service Record | TSP-MA-05 |
| <p>The transmission is the highest-wear system on a scooter and the least documented. One sheet for everything that goes in it, with the measurements taken each time.</p> | | |
| 11 | Parts That Fitted — Log | TSP-MA-06 |
| <p>The single most valuable page you can keep for one of these machines. What you bought, from where, and whether it actually went on.</p> | | |
| 12 | It Will Not Start — Diagnostic Chart | TSP-TS-01 |
| <p>A structured way through the four things an engine needs, ending at an observation you can make rather than a part you should buy.</p> | | |
| 13 | No Spark — Diagnostic Chart | TSP-TS-02 |
| <p>Working back along the ignition circuit from the plug, one component at a time, without replacing anything on spec.</p> | | |
| 14 | General Fault Log | TSP-TS-10 |
| <p>The sheet that makes every other diagnostic better. What happened, under what conditions, and what had changed just before.</p> | | |
| 15 | Before You Order A Part — Checklist | TSP-BU-02 |
| <p>Twelve checks that take ten minutes and prevent the single most common expensive mistake these machines produce.</p> | | |

THE RULE UNDERNEATH EVERY SHEET IN HERE

The certification record can prove two machines had engines from the same factory. It can never prove they share a part number, because these machines are assembled from several component suppliers and those suppliers change, sometimes inside a single model year. A shared factory is a research lead — a list of other badges worth searching under — and the measurement in your hand is the only thing that settles it.

FREE TO PRINT, COPY AND PASS ON

This pack costs nothing and always will. Print it, photocopy it, hand it to somebody in a club or a forum, leave a copy in a workshop. If you find a mistake in it, tell us and it gets corrected — every sheet carries a document number and a version so you can say exactly which one you mean.

CHINESE SCOOTER IDENTIFICATION WORKSHEET

Fill this in once, with the machine in front of you. Everything a parts supplier, a registry or a DMV clerk will ask for is on this sheet, in the order you will be asked for it.

1 • WHAT IT SAYS IT IS

BADGE ON THE BODYWORK

The name on the plastics

MODEL NAME / NUMBER

Often on a sticker, not the badge

MODEL YEAR

From the title or the label

ENGINE SIZE CLAIMED

 cc

What the seller or badge says

ODOMETER READING

Note miles or km

COLOUR

THE BADGE IS THE WEAKEST EVIDENCE ON THE MACHINE

In the US market the name on the bodywork usually belongs to the importer who certified the vehicle, not to the factory that built the engine. The same engine is routinely sold under a dozen different American badges. Everything below is stronger evidence than the badge, so if they disagree, believe the stamped numbers.

2 • VEHICLE IDENTIFICATION NUMBER (VIN)

One character per box. Chinese-market stampings are often shallow and the paint sits in them, so clean the area and use a torch held at a low angle. If you genuinely cannot tell two characters apart, write both and circle the one you think it is.

VIN — 17 CHARACTERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
world manufacturer							check	year								

WHERE YOU FOUND IT

e.g. steering head, under the seat

FRAME NUMBER (IF DIFFERENT)

TITLE / REGISTRATION NUMBER

The first three characters are the World Manufacturer Identifier — the code issued to whoever registered the vehicle for sale. On imported machines that is very often the US importer rather than the Chinese factory, so a WMI tells you who put it on the market, not necessarily who built the engine.

3 • ENGINE NUMBER

Stamped into the crankcase, normally on a small machined pad. On a scooter it is usually on the left-hand side of the engine near the CVT cover, or on top of the case behind the cylinder. It is not the same number as the VIN and it is not the engine family.

ENGINE NUMBER AS STAMPED

Copy every character, including letters

WHERE ON THE ENGINE YOU FOUND IT

RUBBING OR SKETCH OF THE ENGINE NUMBER PAD

- ☐ Cleaned the pad and looked at it with a torch at a low angle
- ☐ Checked both sides of the crankcase
- ☐ Checked the top of the case behind the cylinder
- ☐ Photographed the stamping close up
- ☐ Number recorded matches the photograph character for character

4 • EMISSION CONTROL INFORMATION LABEL

This is the most useful label on the whole machine and the one most owners have never read. Vehicles certified for sale in the United States carry an emission control information label — usually a white or silver sticker under the seat, inside the storage bin, on the frame under the bodywork, or on the airbox. It carries the engine family number, which is issued per certificate and ties the machine to a federal record.

ENGINE FAMILY NUMBER

12 characters, e.g. starts with a year letter

MANUFACTURER NAMED ON THE LABEL

DISPLACEMENT STATED ON THE LABEL

 CC

MODEL YEAR STATED ON THE LABEL

ANYTHING ELSE PRINTED ON THE LABEL — COPY IT OUT

IF THE LABEL IS GONE

Faded, painted over or peeled off is normal on a machine more than a few years old. Work from the engine number, the VIN and the physical measurements on the next page instead. Missing a label does not mean the machine was never certified — it means the sticker did not survive.

5 • PHYSICAL FACTS THAT PIN THE MACHINE DOWN

When the paperwork has run out, these are what a supplier can actually work with. Measure them rather than repeating what the advert said.

FRONT WHEEL RIM SIZE

 in

From the tyre sidewall

REAR WHEEL RIM SIZE

 in

TYRE SIZE FRONT

Copy the whole marking

TYRE SIZE REAR

TWO OR FOUR STROKE

Does it take premix?

AIR OR LIQUID COOLED

Is there a radiator?

WHEELBASE

 mm

NUMBER OF CVT COVER BOLTS

CARBURETTOR OR FUEL INJECTION

6 • PHOTOGRAPHS TO TAKE BEFORE THE PANELS GO BACK ON

- ☐ The VIN stamping
Close enough to read every character on a phone screen
- ☐ The engine number stamping
- ☐ The emission control information label, flat on and in focus
- ☐ The whole left side of the engine including the CVT cover

- ☐ The carburettor or throttle body from above, showing every hose
- ☐ The wiring connector block behind the headlight
- ☐ Both tyre sidewalls, showing the full size marking

Keep these in one album on your phone. Nine out of ten parts questions are answered by a photograph, and you will not want to strip the machine again to take one.

7 · WHAT THE REGISTRY SAID

ENGINE BUILT BY (FACTORY)

CERTIFIED IN THE US BY

MODEL YEARS ON RECORD

REGISTRY ID

RELATED MACHINES AND BADGE TWINS WORTH SEARCHING FOR PARTS UNDER

MEASURE, DO NOT ASSUME

Two machines that look identical, carry the same badge and were sold in the same year can still take different parts. These vehicles are assembled from several component suppliers, and suppliers change — sometimes inside a single model year. Nothing on this sheet is a statement that a part will fit. It is a record of what you actually have, so that you can compare it against what you are about to buy.

ENGINE CODE DECODER CARD

The code on your crankcase is the strongest identifier on the machine. Six positions, each carrying one fact.

POSITION BY POSITION

How the code stamped on the crankcase is read, using 1P39QMB as the example

POSITION	IN 1P39QMB	MEANS
First digit	1	Number of cylinders
Letter, if present	P	Cylinder orientation. P is horizontal; V is a V-twin; nothing at all means vertical
Two digits	39	Bore in millimetres — the single most useful character pair on the engine
Cooling letter	Q	Forced air cooling. F appears on the vertical-cylinder families
Use letter	M	Motorcycle
Final letter	B	Displacement class — see the table below

THE FINAL LETTER

The final letter and the displacement class it denotes

LETTER	CLASS	LETTER	CLASS
B	50 cc	G	100 cc
C	60 cc	H	110 cc
D	70 cc	I	125 cc
F	90 cc	J	150 cc

HOW WELL SOURCED IS THIS?

This scheme is consistent across the owner community, several retailers and enthusiast references, and it is self-consistent — the bore digits in 139QMB, 144QMC, 147QMD and 157QMJ line up with the displacements those engines are sold as. We have not found a Chinese national standard document defining it, so we describe it as a well-established convention rather than as a published specification. Letters that appear BEFORE the code identify the factory and are not part of the scheme.

THE QUESTION EVERYBODY ASKS

139QMB AND 1P39QMB ARE THE SAME ENGINE

The P records that the cylinder is horizontal. Every engine in this family has a horizontal cylinder, so some factories stamp the P and some do not, and the two codes appear on otherwise identical engines. Two claims circulate that are not supported: that 1P39QMB is a 60cc version, and that the P indicates a different valve length. Neither holds up. If you are searching for parts, search both spellings.

THE TWO CHARACTERS PEOPLE MISREAD

Q gets read as O, and 1 gets read as I. A code written down as "1P390MB" is a 1P39QMB, and "IP39QMB" is the same engine again. Before concluding your code is not in any list, try it with the Q and the 1 swapped back.

YOUR ENGINE

CODE AS STAMPED, EXACTLY

Including any letters before it

CYLINDER COUNT

P PRESENT?

Horizontal cylinder either way

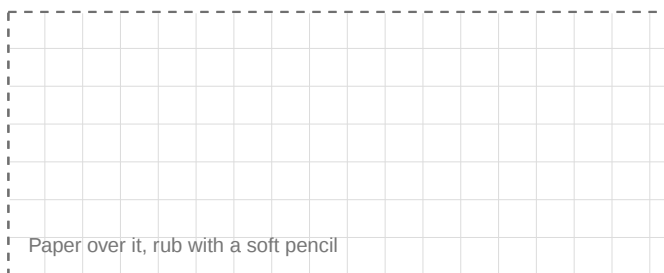
BORE FROM THE CODE

 mm

COOLING LETTER

DISPLACEMENT CLASS LETTER

RUBBING OF THE STAMPING



Paper over it, rub with a soft pencil

- ☐ Cleaned the pad and used a torch at a low angle
- ☐ Photographed the stamping close up
- ☐ Checked what I wrote against the photograph
- ☐ Tried it with Q instead of O
- ☐ Tried it with 1 instead of I

THE CODE DESCRIBES THE ENGINE AS IT WAS BUILT

If somebody has fitted a big-bore kit, the case still carries the original bore digits — nobody re-stamps a crankcase. So the code tells you what the engine started as, which is what you want for identifying the cases, the transmission and most of the chassis. For the top end, measure it.

SHORT CASE OR LONG CASE? MEASUREMENT SHEET

Two checks, five minutes, and the single most expensive guess on these machines stops being a guess.

CHECK ONE — COUNT THE CVT COVER BOLTS

The bolts around the outside of the transmission cover, on the left-hand side of the engine. Count every one, including any hidden behind the kickstart or the frame.

BOLTS COUNTED

ANY YOU COULD NOT REACH?

DATE CHECKED

CHECK TWO — MEASURE CRANK CENTRE TO AXLE CENTRE

This is the measurement that actually matters. Put a tape from the centre of the crankshaft — the middle of the variator nut behind the cover — to the centre of the rear axle. Centre to centre. Measuring to the edge of the case instead gives a number that no supplier and no other owner will recognise.

CRANK CENTRE TO AXLE CENTRE

SAME, IN MILLIMETRES

MEASURED OVER OR UNDER THE CASE?

 in

 mm

The short-case and long-case split, as reported by the owner community. Measure yours rather than assuming from the badge.

WHAT TO CHECK	SHORT CASE	LONG CASE
Bolts around the CVT cover	8	10
Axle centre to case	about 9.5 in	about 11 in
Wheel usually fitted	10 in	12 in
Drive belt	Shorter	Longer

TREAT THIS AS A STRONG HINT, NOT A RULE

This split comes from the owner community rather than from a manufacturer document, and there are exceptions — nine-bolt cases have been reported. Output shaft length and final gearing also differ between the two, so a case measurement narrows the search but does not settle whether a specific part fits. Measure the machine, then check the part against the measurement.

WHAT YOUR ANSWER DECIDES

Each of these is sized by the distance between the crank and the axle, which is why the measurement is worth taking before you buy any of them.

PART	WHY CASE LENGTH DECIDES IT
Drive belt	The belt runs between the two pulleys. A longer case needs a longer belt, and a belt that is close but wrong will slip, squeal or throw itself off.
Rear wheel	The two case lengths are commonly paired with different wheel diameters, so a wheel from one will foul or sit wrong on the other.
Rear brake	Drum sizes differ between the two, so a shoe set from one case type will not seat in the other's drum.
Rear shock	The upper mount to axle distance changes with the case, so a shock of the wrong eye-to-eye length will alter the ride height or not fit at all.
Complete engine	Swapping an engine across case types puts the rear axle in a different place relative to the frame. That is a fabrication job, not a bolt-in.

WHERE THIS STOPS BEING RELIABLE

This is a community convention, not a manufacturer specification. Cases with nine bolts have been reported, sitting between the two descriptions. Output shaft length and final gearing also vary independently of case length. So treat your measurement as narrowing the search, never as proof that a specific part fits — check the part against the measurement before you buy it.

YOUR RECORD

MAKE AND MODEL

ENGINE FAMILY NUMBER

ENGINE CODE ON THE CRANKCASE

DISPLACEMENT

 CC

WHICH DOES IT LOOK LIKE?

DO THE TWO CHECKS AGREE?

Short, long, or something in between

IF THEY DISAGREE, WRITE DOWN EXACTLY WHAT YOU FOUND

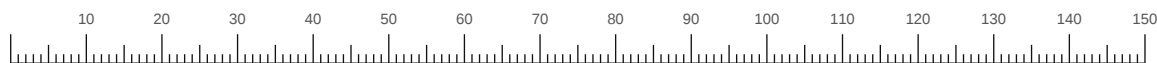
THIS SHEET RECORDS, IT DOES NOT RECOMMEND

Nothing here tells you which part to buy. It tells you what you currently have, in the units a seller works in. Machines built to the same nominal specification were fitted with different components by different suppliers, sometimes inside one model year, so the only reliable reference is the item in your hand.

MYSTERY PART MEASUREMENT SHEET

One sheet per part. If you send a seller a photograph of this filled in, you have given them more to work with than most professional enquiries.

PRINT CALIBRATION — CHECK BEFORE MEASURING



Lay a steel rule along this scale. The 150mm mark must fall at exactly 150mm. If it does not, reprint at 100% / "Actual size" with page scaling off — every measurement you take from a scaled sheet will be wrong.

WHERE IT CAME FROM

MACHINE MAKE AND MODEL

ENGINE SIZE

 CC

YEAR

WHERE ON THE MACHINE IT FITS

WHAT YOU THINK IT DOES

DATE MEASURED

THE EIGHT MEASUREMENTS

OVERALL LENGTH

 mm

OVERALL WIDTH

 mm

OVERALL THICKNESS

 mm

OUTSIDE DIAMETER

 mm

INSIDE DIAMETER

 mm

BOLT HOLE DIAMETER

 mm

BOLT HOLE SPACING

 mm

WEIGHT IF IT MATTERS

 g

MEASURING WITHOUT A CALIPER

For an outside diameter, lay the part on the grid below and read across its widest point. For an inside diameter, measure the outside and subtract twice the wall thickness. For a bolt circle on an even number of holes, measure centre to centre across opposite holes. For an odd number, trace it and measure the drawing.

TRACE THE PART HERE — 5MM GRID

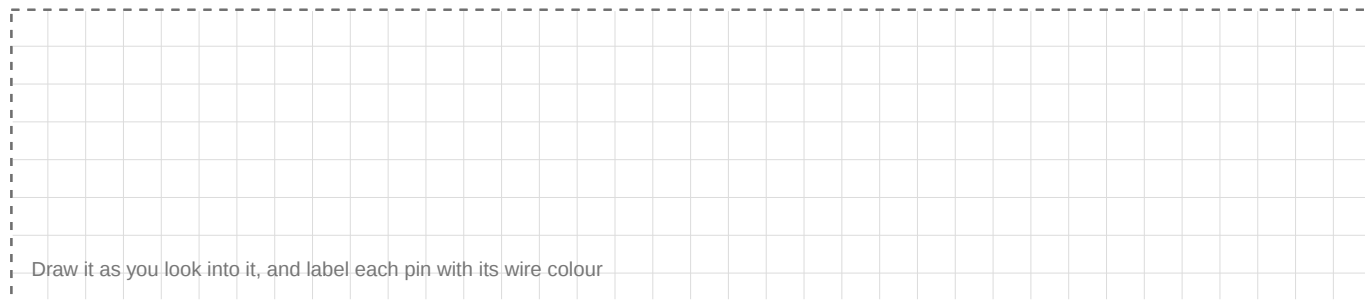
Draw round the outline. Mark every hole centre with a cross and number them.

FASTENERS AND FITTINGS

NUMBER OF MOUNTING HOLES	THREAD SIZE IF THREADED	SPANNER SIZE THAT FITS
	e.g. M6	
NUMBER OF SPLINES OR TEETH	SHAFT DIAMETER IT FITS ON	KEYWAY OR FLAT PRESENT
	mm	

ELECTRICAL CONNECTOR, IF IT HAS ONE

NUMBER OF PINS	CONNECTOR SHAPE	CONNECTOR COLOUR
	Rectangular, round, bullet	
MALE OR FEMALE	WIRE COLOURS	

SKETCH THE CONNECTOR FACE

Draw it as you look into it, and label each pin with its wire colour

EVERY MARKING ON THE PART

Copy them character for character, including ones that look meaningless. Cast and stamped numbers on Chinese components are frequently the manufacturer's own part number, and searching one of those finds the part when no description ever will.

MARKINGS — EXACT CHARACTERS, INCLUDING SPACES AND DASHES

NOTES FOR THE SELLER

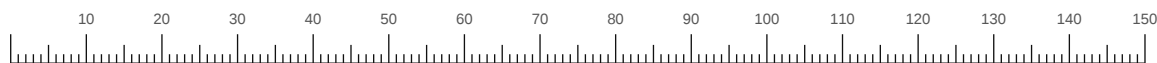
MEASURE, DO NOT ASSUME

Two machines that look identical, carry the same badge and were sold in the same year can still take different parts. These vehicles are assembled from several component suppliers, and suppliers change — sometimes inside a single model year. Nothing on this sheet is a statement that a part will fit. It is a record of what you actually have, so that you can compare it against what you are about to buy.

BOLT, THREAD AND SPANNER CARD

The thread on a Chinese scooter fastener is a standard ISO metric thread. The head is often not the size a European chart predicts. Both facts matter, and they are the reason this card exists.

PRINT CALIBRATION — CHECK BEFORE MEASURING



Lay a steel rule along this scale. The 150mm mark must fall at exactly 150mm. If it does not, reprint at 100% / "Actual size" with page scaling off — every measurement you take from a scaled sheet will be wrong.

THREAD PITCH AND HEAD SIZE

ISO metric coarse thread pitches, with hex head sizes under both conventions in common use

THREAD	COARSE PITCH	HEAD ACROSS FLATS — DIN/ISO	HEAD ACROSS FLATS — JIS
M5	0.80 mm	8 mm	8 mm
M6	1.00 mm	10 mm	10 mm
M8	1.25 mm	13 mm	12 mm
M10	1.50 mm	17 mm	14 mm
M12	1.75 mm	19 mm	17 mm
M14	2.00 mm	22 mm	19 mm

WHY THE SAME BOLT TAKES TWO DIFFERENT SPANNERS

The thread is identical either way — an M8 is an M8. What differs is how big the head is. European practice (DIN 933 / ISO 4014) uses a larger head than Japanese practice (JIS B1180), and Chinese powersports fasteners follow the Japanese sizes far more often than the European ones. That is why a chart tells you 13mm and the bolt on your scooter takes a 12mm. Pitches are ISO 261 coarse series. Always try the smaller spanner first: a 13mm on a 12mm head is how heads get rounded off.

MEASURING A BOLT PROPERLY

Diameter

Measure across the outside of the thread crests. An M8 bolt measures very close to 8.0mm across the thread — if you measure 7.8mm you still have an M8, worn or rolled slightly under.

Length

From under the head to the tip for a hex or flanged bolt. For a countersunk or flat-head bolt, from the top of the head, because the head sits inside the part.

Pitch without a gauge

Lay a steel rule along the threads, line the zero up with a crest, and count how many crests fall in 10mm. Divide 10 by that count. Six crests in 10mm is roughly a 1.5mm pitch.

The quick check

If a nut you know the size of runs freely down the thread by hand for its full depth, the diameter and pitch match. If it goes on two turns and stiffens, they do not — stop before you damage the thread.

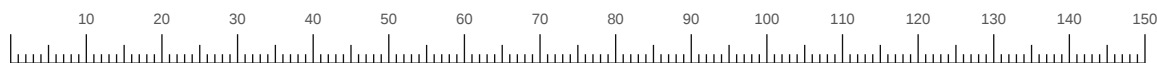
Bodywork on these machines is held together by a mix of sizes, and self-tapping screws sit next to machine screws in the same panel. Writing down where each one came from is the difference between a two-hour job and a four-hour one.

Put the fasteners for each panel into their own bag and write the row number from this sheet on it. Reassembly then becomes a matter of reading rather than remembering.

BEARING SIZE CHART AND REVERSE LOOKUP

Unlike almost everything else on one of these machines, a bearing can be identified with complete confidence from three measurements and nothing else. No model, no year, no brand.

PRINT CALIBRATION — CHECK BEFORE MEASURING



Lay a steel rule along this scale. The 150mm mark must fall at exactly 150mm. If it does not, reprint at 100% / "Actual size" with page scaling off — every measurement you take from a scaled sheet will be wrong.

READING A BEARING NUMBER

Reading a deep-groove ball bearing number, using 6203-2RS as the example

PART OF THE NUMBER	IN 6203-2RS	MEANS
First digit	6	Type — 6 is a single-row deep groove ball bearing
Second digit	2	Dimension series — how heavy-duty it is for a given bore
Last two digits	03	Bore code. From 04 upward, multiply by 5 for the bore in mm; 00, 01, 02 and 03 mean 10, 12, 15 and 17mm
Suffix	2RS	Seals and shields — ZZ or 2Z are metal shields, RS or 2RS are rubber seals, open has neither

THE REVERSE LOOKUP

ISO 15 boundary dimensions for the three series used on small powersports wheels and shafts. Measure your old bearing and read the row.

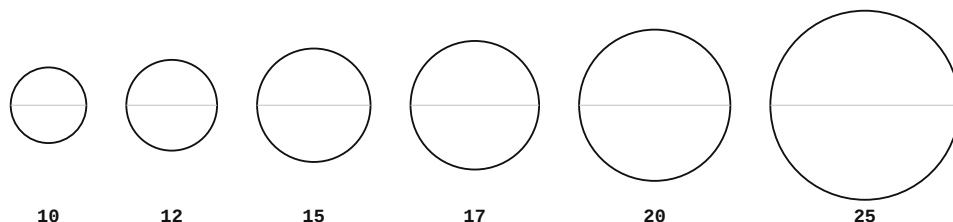
NUMBER	BORE	OUTSIDE DIA	WIDTH
6000	10 mm	26 mm	8 mm
6001	12 mm	28 mm	8 mm
6002	15 mm	32 mm	9 mm
6003	17 mm	35 mm	10 mm
6004	20 mm	42 mm	12 mm
6005	25 mm	47 mm	12 mm
6200	10 mm	30 mm	9 mm
6201	12 mm	32 mm	10 mm
6202	15 mm	35 mm	11 mm
6203	17 mm	40 mm	12 mm
6204	20 mm	47 mm	14 mm
6205	25 mm	52 mm	15 mm
6300	10 mm	35 mm	11 mm
6301	12 mm	37 mm	12 mm
6302	15 mm	42 mm	13 mm
6303	17 mm	47 mm	14 mm
6304	20 mm	52 mm	15 mm
6305	25 mm	62 mm	17 mm

WHERE THESE DIMENSIONS COME FROM

Bore, outside diameter and width for these series are fixed by ISO 15, which is why a 6203 from any maker measures $17 \times 40 \times 12$ mm. That is what makes the reverse lookup on this sheet work: you do not need to know what the machine is, only what the old bearing measures. Seal type, internal clearance and load rating are NOT fixed by the number alone — match the suffix as well as the digits.

TRUE-SIZE BORE CIRCLES

Stand the bearing on the circles and find the one its bore matches. This gives you the last two digits of the number without calipers.

BORE DIAMETERS**SEALS AND SHIELDS ARE PART OF THE SPECIFICATION**

An open bearing, a 2Z shielded one and a 2RS sealed one all measure the same and are all called 6203. They do not last the same length of time in a wheel that sees rain. Match the suffix on the old bearing, and if you cannot read it, a fully sealed 2RS is the conservative choice for a wheel.

EVERY BEARING ON THE MACHINE

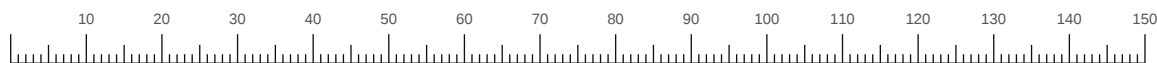
WHERE IT FITS	BORE	OD	WIDTH	NUMBER	SUFFIX	REPLACED ON

- ☐ Bearing turns roughly or notchily by hand
- ☐ Play felt when rocking the wheel at twelve and six o'clock
- ☐ Rumble or growl that changes with road speed, not engine speed
- ☐ Seal split, missing or pushed out
- ☐ Discoloured — blue or brown — which means it has been hot

CVT BELT SIZE CHART AND MEASURING SHEET

A drive belt is described by three numbers, and almost every wrong order comes from reading them in the wrong order or from measuring a belt that is already worn.

PRINT CALIBRATION — CHECK BEFORE MEASURING



Lay a steel rule along this scale. The 150mm mark must fall at exactly 150mm. If it does not, reprint at 100% / "Actual size" with page scaling off — every measurement you take from a scaled sheet will be wrong.

READING THE MARKING ON THE BELT

How a three-number belt marking is conventionally read

FIELD	EXAMPLE	WHAT IT DESCRIBES	HOW TO CHECK IT YOURSELF
First number	743	Outside length in millimetres	Run a string round the outer face of the belt and measure the string
Second number	20	Top width in millimetres	Measure across the wide flat face at its widest point
Third number	30	Angle of the sides in degrees	Compare the taper end-on against a known belt

THIS IS A TRADE CONVENTION, NOT A PUBLISHED STANDARD

Length-width-angle is how sellers, manufacturers and owners consistently use these three numbers, and it is consistent with what is printed on the belts themselves. We have not found a standards document that defines it. Treat it as a reliable reading convention and confirm it against the belt in your hand — which the width bars on this sheet let you do in about ten seconds.

THE MARKING WEARS OFF BEFORE THE BELT DOES

The printed marking sits on the flat outer face, which is the surface that runs against the clutch bell and the pulley faces. On a belt that has done real mileage it is usually the first thing to disappear. If yours is unreadable, measure instead — the next section is for exactly that.

MEASURING A BELT WITH NO READABLE MARKING

1. Lay the belt flat on a bench so it forms an oval, not a figure of eight.
2. Measure the top width — the wide flat face — with calipers, or against the true-size bars below. Take the reading at the widest point you can find, away from any glazed or frayed edge.
3. For length, lay a tape or a length of string round the OUTSIDE face of the belt, pull it snug without stretching the belt, and mark where it meets. Measure the string. That is the outside length.
4. For the angle, look at the belt end-on. Compare the taper against the profiles printed on the CVT belt gauge on the site — this sheet cannot show an angle at true size and a fraction of a degree matters.
5. Record all three below, and record how confident you are in each.

TRUE-SIZE WIDTH BARS — LAY THE BELT ACROSS THESE



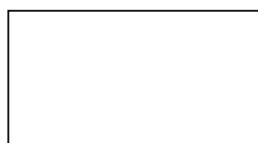
15 mm



16 mm



17 mm



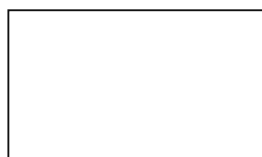
18 mm



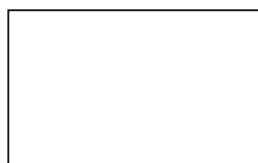
18.5 mm



19 mm



20 mm



21 mm



22 mm

Lay the belt flat across the bars and find the one whose height matches the belt's top width. If the belt falls between two bars, record the measurement to the nearest half millimetre rather than rounding to the nearer bar.

YOUR BELT

MARKING PRINTED ON BELT

Copy every character and space exactly

ANGLE IF KNOWN

BRAND OR MAKER ON BELT

ANY OTHER NUMBERS ON BELT

DATE MEASURED

WEAR CHECK

A belt that has worn narrow will still fit, and will still slip. Comparing the measured width against the width printed on the belt tells you how much life it has had — and if you have no printed width, comparing against a new belt of the same marking does the same job.

WIDTH PRINTED ON BELT

WIDTH MEASURED NOW

DIFFERENCE

☐ Cracks across the ribs on the inside face

- ☐ Glazed, shiny sides
Suggests slipping
- ☐ Frayed or missing cogs
- ☐ Edges worn to a sharp taper
- ☐ Belt sits below the outer edge of the clutch pulley faces at rest

THE MACHINE IT CAME OFF

MAKE AND MODEL

ENGINE SIZE

 cc

ENGINE FAMILY NUMBER

CASE LENGTH IF KNOWN

VARIATOR OUTSIDE DIAMETER

 mm

CLUTCH BELL INSIDE DIAMETER

 mm

Crank centre to axle centre

NOTES — WHAT THE OLD BELT WAS DOING BEFORE IT WAS REPLACED

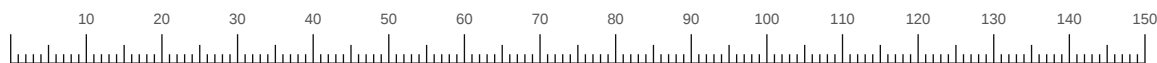
THIS SHEET RECORDS, IT DOES NOT RECOMMEND

Nothing here tells you which part to buy. It tells you what you currently have, in the units a seller works in. Machines built to the same nominal specification were fitted with different components by different suppliers, sometimes inside one model year, so the only reliable reference is the item in your hand.

VARIATOR ROLLER MEASUREMENT SHEET

Rollers are described by two dimensions and a weight. Ordering on weight alone is the commonest mistake, because the same weight is sold in more than one size.

PRINT CALIBRATION — CHECK BEFORE MEASURING



Lay a steel rule along this scale. The 150mm mark must fall at exactly 150mm. If it does not, reprint at 100% / "Actual size" with page scaling off — every measurement you take from a scaled sheet will be wrong.

WHAT THE NUMBERS MEAN

How a roller size is conventionally written

WRITTEN AS	MEANS	MEASURED HOW
16 × 13	16mm diameter, 13mm width	Diameter across the round face; width along the axis
A weight in grams	Mass of ONE roller, not the set	On a scale reading to 0.1g if you have one
A set of six	Six rollers of equal weight	Weigh each — uneven sets are common and are a fault

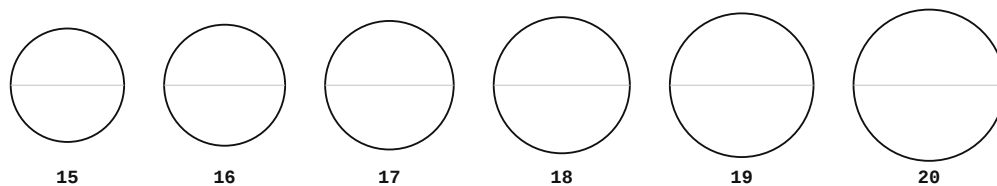
A WORN ROLLER MEASURES SMALLER THAN IT WAS SOLD AS

Rollers wear a flat where they run against the ramp. Measured across that flat, a roller sold as 16mm can read 15.2mm. Always measure across the widest part you can find, and treat the result as a minimum — if it measures 15.6mm it was almost certainly a 16.

MEASURING DIAMETER

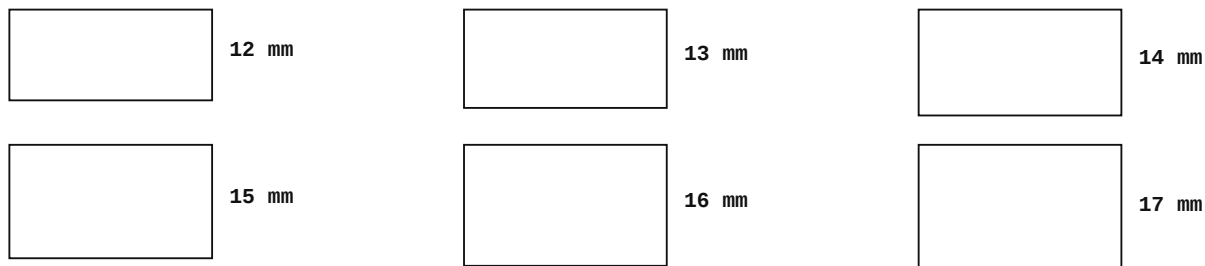
Rollers wear flat on the face that runs against the variator ramp. A worn roller measures smaller across the flat than across the round, so take the measurement across the widest point you can find and treat it as the minimum — the roller was originally at least that size, and probably the next standard size up.

TRUE-SIZE CIRCLES — STAND A ROLLER ON THESE



MEASURING WIDTH

TRUE-SIZE WIDTH BARS — LAY A ROLLER ON ITS SIDE ACROSS THESE



YOUR ROLLERS

Weigh and measure each one separately. Uneven wear across a set is itself a diagnosis: it usually means the rollers have been sticking rather than rolling.

ROLLER	DIAMETER MM	WIDTH MM	WEIGHT G	FLAT SPOT?	MARKINGS ON ROLLER

NUMBER OF ROLLERS FITTED

TOTAL SET WEIGHT

 g

WEIGHT PER ROLLER AS SOLD

 g

WEAR INSPECTION

- ☐ Flat spots on any roller
The roller has been sliding, not rolling
- ☐ Rollers of visibly different diameters in one set
- ☐ Cracked or crumbling outer material
- ☐ Scoring or grooves worn into the variator ramp plate
- ☐ Grease or oil inside the variator
Something is leaking where it should not
- ☐ Ramp plate sliders worn or missing

THE MACHINE

MAKE AND MODEL

ENGINE SIZE

 cc

ENGINE FAMILY NUMBER

VARIATOR OUTSIDE DIAMETER

 mm

BELT MARKING

DATE MEASURED

WHAT YOU WERE TRYING TO CHANGE, AND WHAT HAPPENED

THIS SHEET RECORDS, IT DOES NOT RECOMMEND

Nothing here tells you which part to buy. It tells you what you currently have, in the units a seller works in. Machines built to the same nominal specification were fitted with different components by different suppliers, sometimes inside one model year, so the only reliable reference is the item in your hand.

WHY THERE ARE NO INTERVAL FIGURES PRINTED ON THIS SHEET

Sources for these machines disagree with each other — oil change intervals quoted between seven hundred and a thousand miles, and valve clearances quoted in both thousandths of an inch and hundredths of a millimetre that do not convert to each other. Printing one of them would give it an authority it has not earned. Instead this log lets you write in the intervals from your own manual, and records what you actually did so that the machine's own history becomes the reference.

MAKE AND MODEL

VIN	ENGINE SIZE
OIL TYPE USED	OIL QUANTITY
BELT MARKING	ROLLER SIZE AND WEIGHT

Write in the interval you are working to and where it came from. “From the manual”, “from the dealer” and “my own judgement” are all valid answers, and knowing which one applies matters later.

[illegible]

Suggested rows: engine oil, gearbox/final drive oil, air filter, spark plug, drive belt, variator rollers, valve clearances, brake pads or shoes, tyres, battery, coolant if liquid cooled.

[illegible]

PARTS THAT FITTED

The single most valuable page in this log. Once you have established that a particular part fitted your machine, write down exactly what it was and where it came from. Next time it takes thirty seconds instead of an evening.

"IT FITTED MINE" IS A FACT ABOUT YOUR MACHINE ONLY

This page records what worked on the specific machine named on the front. It is not a compatibility list, and passing it on as one is how bad fitment information spreads. If you share it — and it is worth sharing — share the engine family number with it.

CVT SERVICE RECORD

Fill the machine block in once. Then one row per service, with the measurements taken before the old parts go in the bin.

THE MACHINE

MAKE AND MODEL	ENGINE FAMILY NUMBER	DISPLACEMENT
		cc
CASE: SHORT OR LONG	CVT COVER BOLT COUNT	VARIATOR OUTSIDE DIA
		mm

SERVICE LOG

DATE	MILES	WHAT WAS REPLACED	PART FITTED — EXACT MARKING	OLD PART MEASURED

BELT RECORD

DATE	MILES AT FITTING	MARKING ON BELT	WIDTH NEW MM	WIDTH AT REMOVAL MM	MILES IT LASTED

THE LAST COLUMN IS WHY THIS SHEET EXISTS

Published belt intervals for these machines vary wildly and none of them is about your machine. Two entries in that column and you have your own figure, which is the only one that accounts for how you ride and what the rest of your transmission is doing.

ROLLER RECORD

DATE	MILES	SIZE FITTED	WEIGHT EACH G	OLD ONES FLAT?	WHY CHANGED

CLUTCH, SPRINGS AND SLIDERS

DATE	MILES	WHAT WAS CHANGED	DESCRIPTION OF THE PART FITTED	EFFECT NOTICED

INSPECT WHILE IT IS OPEN

- ☐ Belt: cracks across the cogs, glazed sides, frayed edges, sharp tapered edges
- ☐ Rollers: flat spots, uneven diameters within one set, crumbling material
- ☐ Ramp plate and sliders: worn, notched or missing
- ☐ Variator faces: scored, stepped or grooved where the belt runs
- ☐ Clutch shoes: material remaining, even wear, no cracking
- ☐ Clutch bell: scored, blued from heat, or worn oval
- ☐ Any oil or grease inside the case
Something is leaking that should not be
- ☐ Case vent and air duct clear of dust and debris
- ☐ Crankshaft nut and clutch nut torqued and secure

OIL INSIDE THE CVT IS A FINDING, NOT A MESS

The transmission runs dry. Oil or grease inside it means a crankshaft seal, a gearbox seal or an over-greased bearing is leaking into it, and a belt that has been contaminated will keep slipping however new it is. Find the leak before fitting a new belt, or you will be fitting another one shortly.

NOTES

PARTS THAT FITTED — LOG

One page. Fill the top block in once, then one line every time you buy something. In two years it is the parts catalogue nobody published for your machine.

THE MACHINE THIS LOG BELONGS TO

MAKE AND MODEL	ENGINE FAMILY NUMBER	ENGINE CODE ON THE CRANKCASE
VIN	CASE: SHORT OR LONG	
FACTORY, IF KNOWN	MODEL YEAR	

THIS IS A RECORD OF ONE MACHINE, NOT A COMPATIBILITY LIST

Everything below is true of the machine named above and nothing else. Two machines with the same badge and the same year were frequently built with different components, so passing this on as fitment advice is precisely how bad information spreads. If you do share it — and it is worth sharing — share the engine family number with it, so whoever reads it can judge how close their machine is.

PARTS THAT FITTED

[illegible]

PARTS THAT FITTED — CONTINUED

PARTS THAT DID NOT FIT

PART	WHAT WAS ORDERED	WHY IT DID NOT FIT	RETURNED?

PART	WHAT WAS ORDERED	WHY IT DID NOT FIT	RETURNED?

SUPPLIERS WORTH USING AGAIN

SUPPLIER	WHAT THEY WERE GOOD FOR	ANSWERED A DIMENSION QUESTION?	RETURNS EASY?

IT WILL NOT START — DIAGNOSTIC CHART

BEFORE YOU START

Petrol vapour ignites, batteries produce hydrogen, and a machine on a stand can fall. Work outdoors or with the door open, keep ignition sources away from the fuel system, disconnect the battery before touching wiring, and never run an engine in a closed space. This sheet helps you observe and record. It is not a repair manual and it does not know your machine.

An engine needs four things: a way of turning over, fuel, a spark at the right time, and enough compression to make use of them. Every no-start is one of those four. Work down in order and write down what you find.

1 Does anything happen at all when you press the starter — lights, a click, the starter turning?

YES Something is reaching the machine electrically. Go on.

NO Check the kill switch, the side stand switch if fitted, the main fuse, and that the battery is charged and its terminals are clean and tight. A machine that has stood for months is nearly always a flat battery before it is anything else.

↓ still not solved — go on

2 Does the starter turn the engine over at a healthy speed?

YES Cranking is fine. Go on.

NO A slow or clicking crank is a power delivery problem, not an engine problem: battery charge, terminal corrosion, earth strap, starter relay. Try the kickstart if it has one — if it starts on the kick, you have confirmed the fault is in the starting circuit and nowhere else.

↓ still not solved — go on

3 Is there fuel in the tank, and is it reaching the carburettor or injector?

YES Fuel is present. Go on.

NO Check the tank actually has fuel — gauges on these machines are unreliable. Check a manual tap is on. A vacuum-operated tap only opens while the engine is turning, so it will look shut when you test it cold. Look for a blocked filter and a kinked or perished hose.

↓ still not solved — go on

4 Take the plug out. Is it wet with petrol after several attempts to start?

YES Fuel is getting into the cylinder. The problem is spark or compression, not fuel delivery. Go on.

NO Dry plug means the fuel is not arriving. On a machine that has stood, a carburettor whose jets have varnished over is the usual cause and no amount of cranking will clear it.

↓ still not solved — go on

5 With the plug earthed against the engine and the engine cranking, is there a strong blue spark?

YES You have fuel and spark. Go on to compression.

NO No spark or a weak orange one is an ignition fault. The no-spark chart on this site takes it further. Hold the plug lead with insulated pliers and keep clear of the plug body.

↓ still not solved — go on

6 With your thumb over the plug hole and the engine cranking, does it push your thumb off firmly?

YES You have all four. The fault is most likely timing, or a fuel mixture that is present but wrong. Record everything and take the findings to someone who can see the machine.

NO Low compression points at the top end — valve clearances closed up, a burnt valve, or bore and ring wear. This is where a compression gauge stops being optional.

RECORD WHAT YOU FOUND

STEP	WHAT YOU OBSERVED	YES / NO	DATE

THINGS THAT ARE SPECIFIC TO A MACHINE THAT HAS BEEN STANDING

- ☐ Fuel in the float bowl has evaporated and left varnish in the jets
- ☐ Battery has self-discharged below the point where it will crank
- ☐ Vacuum tap diaphragm has perished and no longer opens
- ☐ Rubber fuel hose has hardened and is drawing air at the joint
- ☐ Rodent damage to wiring or a nest in the airbox
- ☐ Rust in a steel tank blocking the outlet
- ☐ Seized brake or a stuck clutch making it feel like it will not turn over

NOTES — WHAT YOU TRIED, AND WHAT CHANGED

WHEN TO STOP

Stop and get help if you smell burning insulation, if fuel is leaking anywhere, if the battery is hot or swollen, or if the engine turns over and then locks solid. None of those get better by trying again.

NO SPARK — DIAGNOSTIC CHART

IGNITION SYSTEMS BITE

An ignition coil produces many thousands of volts. Hold a plug lead with insulated pliers, never with bare hands, and keep clear of the plug body while cranking. Disconnect the battery before unplugging or probing connectors. If you are not comfortable doing this, this is the right point to hand it to somebody who is.

The chain runs: plug, plug cap, high tension lead, ignition coil, CDI, pickup, stator charge coil, and the kill and stand switches that can interrupt the whole thing. Check it in the order below — cheapest and most likely first.

1 Have you tried a different, known-good spark plug?

YES The plug is eliminated. Go on.

NO Do this first. A plug that is oil-fouled or cracked internally will show no spark and costs a fraction of anything else in the circuit.

↓ still not solved — go on

2 With the plug cap removed and the bare lead held about 5mm from the engine, is there a spark?

YES The cap is suspect — many unscrew from the lead and can be replaced on their own.

NO The fault is upstream of the cap. Go on.

↓ still not solved — go on

3 Are the earth connections clean, tight and actually earthing?

YES Go on.

NO A corroded earth or an engine-to-frame strap that has rusted through produces exactly the same symptom as a dead CDI, for nothing. Clean every earth back to bright metal before buying a single part.

↓ still not solved — go on

4 Have you eliminated the kill switch, the ignition switch and the side stand switch?

YES Go on.

NO All three interrupt the ignition circuit by design. A wet or corroded switch will kill the spark permanently. Unplug or bypass each in turn to test, then reconnect it.

↓ still not solved — go on

5 Are the connectors into the CDI and the coil clean, dry and fully seated?

YES Go on.

NO Push every connector apart and back together. Green corrosion inside a multi-pin block is common on a machine that has been outdoors, and it is invisible while the block is together.

↓ still not solved — go on

6 Does the ignition coil measure within a sensible range on a meter, primary and secondary?**YES** Coil is probably fine. Go on.**NO** An open circuit on either winding is a failed coil. Note that the correct resistance values vary between coils, so what you are looking for here is an open or a dead short rather than a specific number.
 still not solved — go on
7 Does the pickup and the stator charge coil show continuity rather than an open circuit?**YES** The generating side is intact, and the CDI is now genuinely a candidate. Record your readings before you buy one.**NO** An open winding under the flywheel cover is the fault. Check the wiring back from the connector first, because a chafed wire where the loom leaves the engine is far more common than a failed winding.**METER READINGS**

WHAT YOU MEASURED	BETWEEN WHICH POINTS	READING	OPEN / SHORT / PLAUSIBLE

WHY NO RESISTANCE VALUES ARE PRINTED HERE

Published figures for these components differ between sources and between suppliers of nominally identical parts, and a wrong number leads people to condemn a good component. What a meter reliably tells you without any reference figure is whether a winding is open circuit, shorted, or somewhere plausible in between — and that distinguishes most failures on its own.

WHAT YOU FOUND, AND WHAT YOU CHANGED

GENERAL FAULT LOG

One line every time something happens. The conditions column is the one that solves intermittents, and it is the one everybody leaves blank.

MAKE AND MODEL

ENGINE FAMILY NUMBER

LOG STARTED

--

--

--

FAULT LOG

[illegible]

CONDITIONS WORTH CAPTURING EVERY TIME

Engine cold or hot. How far into the ride. Air temperature and whether it was wet. Uphill, flat or downhill. Steady throttle or accelerating. Fuel level. Whether it had stood for a while beforehand. Any of those can be the pattern, and you cannot know which until you have several entries.

WORK DONE — SO CAUSE AND EFFECT LINE UP

Keep this alongside the fault log and dated the same way. A fault that first appears the week after a job is one of the commonest patterns there is, and it is invisible unless both are written on the same page.

DATE	MILES	WHAT WAS DONE	BY WHOM	ANYTHING DIFFERENT AFTERWARDS?

WRITING IT UP FOR SOMEBODY ELSE

1. What the machine is: engine family number, displacement, and roughly how many miles.
2. What it does, in one sentence, described rather than diagnosed.
3. When it does it — the conditions column, summarised across entries.
4. When it does NOT do it, which narrows things as much as when it does.
5. What you have already checked, including everything that came back normal.
6. What was done to it most recently, and when.

THE NORMAL RESULTS ARE WORTH INCLUDING

People report only what they found wrong, which makes it look like nothing has been checked. Saying that the plug was wet, the spark was strong and the compression was unchanged eliminates three whole branches for whoever reads it — and stops them suggesting you check them.

WRITE DOWN WHAT YOU SAW, NOT WHAT YOU CONCLUDED

The observation is recoverable later and the conclusion is not. "Wheel would not spin more than half a turn" is still useful in a month. "Brake problem" is not, because you will not remember what made you think so.

BEFORE YOU ORDER A PART — CHECKLIST

Ten minutes with this sheet costs nothing. The alternative costs the part, the postage both ways, and the weekend you had set aside for the job.

THE ONE THING TO UNDERSTAND BEFORE THE LIST

The badge on your bodywork almost always belongs to the company that imported the machine, not the company that built it. The same engine is sold under many American names, and one American name may cover engines from more than one factory across different years. Searching by badge and model is searching by the weakest evidence you have.

THE TWELVE CHECKS

KNOW WHAT YOU HAVE

- ☐ Photograph the old part from three angles, including how it mounts
The single most useful thing you can do
- ☐ Measure the old part and write the measurements down
Use the mystery part measurement sheet
- ☐ Copy every marking off the old part, character for character
Cast numbers are often the real part number
- ☐ Count the mounting holes and measure the spacing between them
- ☐ Note the connector type, pin count and wire colours if it is electrical

KNOW WHAT THE MACHINE IS

- ☐ Record the VIN
- ☐ Record the engine number off the crankcase
- ☐ Record the engine family number off the emission label
- ☐ Look the machine up and note the factory and related machines
Other badges are worth searching under

BEFORE YOU CLICK BUY

- ☐ Check the listing gives dimensions, not just a model list
- ☐ Ask the seller for the dimension you care about if it is missing
A seller who cannot answer is a seller to avoid
- ☐ Check the return policy before ordering, not after

HOW TO DESCRIBE YOUR MACHINE TO A SELLER

Sellers who know these machines are working from the engine, not the badge. Give them this, in this order, and you will get a useful answer:

1. The engine family number from the emission label, if you have it.
2. The engine code stamped on the crankcase, exactly as stamped.
3. The displacement and whether it is two or four stroke, air or liquid cooled.
4. The measurement of the part you need, with what you measured.
5. A photograph of the old part next to a ruler.
6. The badge and model — last, because it is the least useful thing you can tell them.

PRE-ORDER RECORD

PART WANTED	KEY MEASUREMENT	MARKING ON OLD PART
	mm	
ENGINE FAMILY NUMBER	ENGINE CODE ON CASE	FACTORY IF KNOWN
SELLER	PRICE	RETURN WINDOW

WHAT YOU ASKED THE SELLER, AND WHAT THEY SAID

WHEN IT ARRIVES

Do not fit it straight away. Compare it against the old part on the bench first — the old-part-versus-new-part sheet on this site is built for exactly that, and the comparison is only useful while the new part is still returnable.

Need to work out what you actually own?

The Scooter Parts Registry is a free public record of the Chinese factories behind US-market scooters, ATVs and go-karts — brand, engine family, VIN prefix, factory and related machines. No account, no email.

thescooterparts.com/identify