Figure 1-86: Second oil filter behind the oil pump

Figure 1-87: Bypass valve

horizontally extending oil duct branches
the front of the cylinders arranged oil-
riser for supplying lubrication
put in the cylinder head. The right
Crankshaft bearing (bearing) is
the oil mist in the right engine side-
greased lid.

1.3.3.1 CRANKSHAFT, ROD

The oil nozzle and by the GE-
rod bearings are lubricated at the ex-
1-93 and 1-94 show formations.

1.3.3.2 FITTINGS, VALVES

The branch of the oil in the riser
Middle of the cross in front of the motor housing
extending oil passage is on the Figure
tion to see 1-95, while at ex-
Figure 1-96 Connection of the oil-gate
line is shown on the cylinder head.

Is in the pictures 1-97 to 1-102
the path of the engine oil to the lubrication
put the rocker arm and from there to
the cams of the camshaft by arrows
le shown.

The four camshaft bearings (Rillenku-
lar contact ball bearings) and the valve stems are
by the oil mist in the cylinder head GE
smears.

Figure 1-88: Outlet

Figure 1-89: Inlet

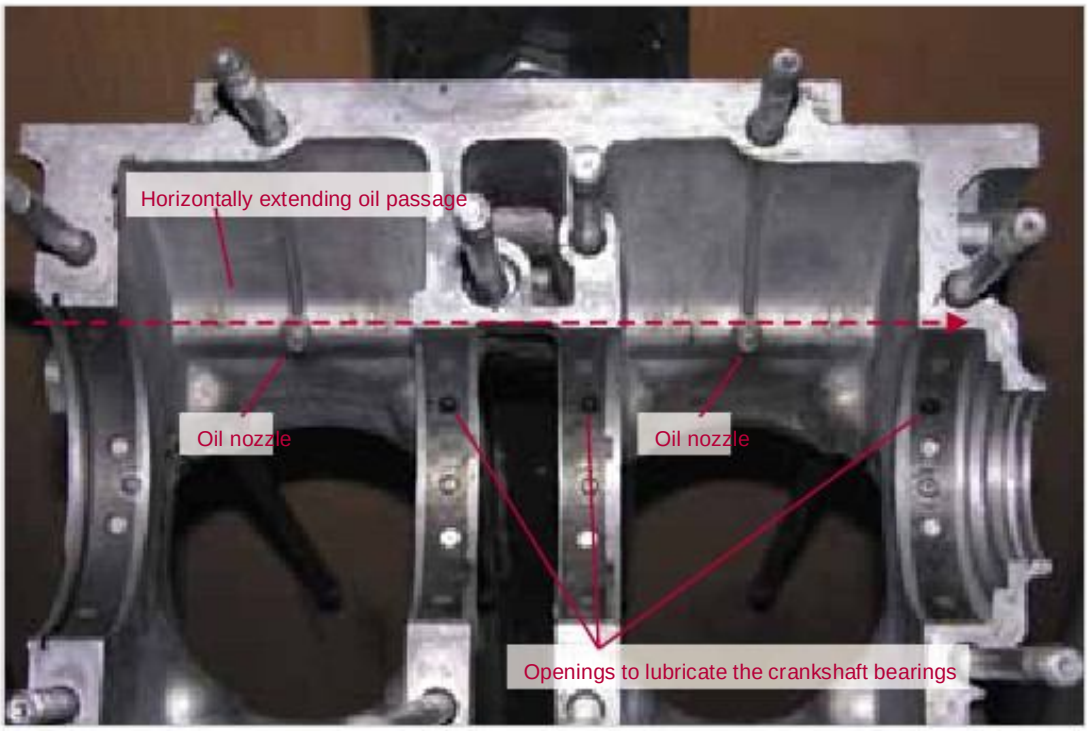

Figure 1-90: Cross in front of the motor housing extending oil passage

Figure 1-91: Oil outlet from the motor housing

Figure 1-92: Oil inlet opening in a crankshaft bearing

Figure 1-93: Oil nozzle

Figure 1-94: Connecting rod bearings

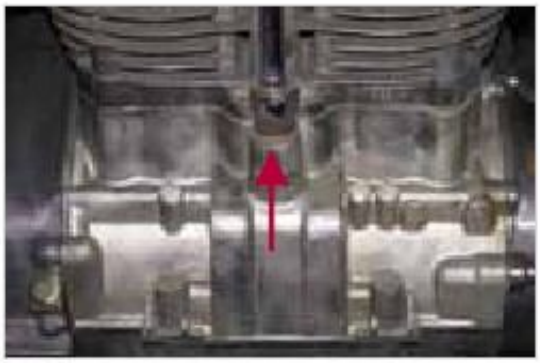

Figure 1-95: Diversion of oil riser

Figure 1-96: Connection oil riser / cylinder head

Figure 1-97: Riser connections of oil

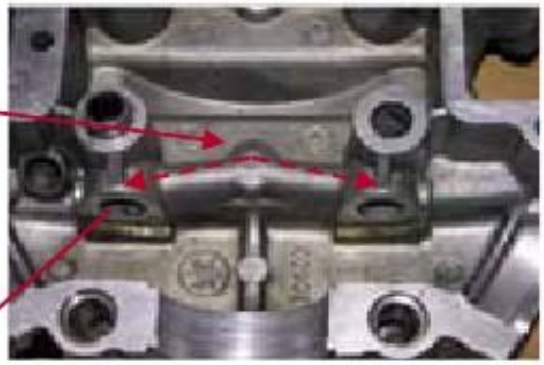

Figure 1-98: Oil passages to the rocker shafts

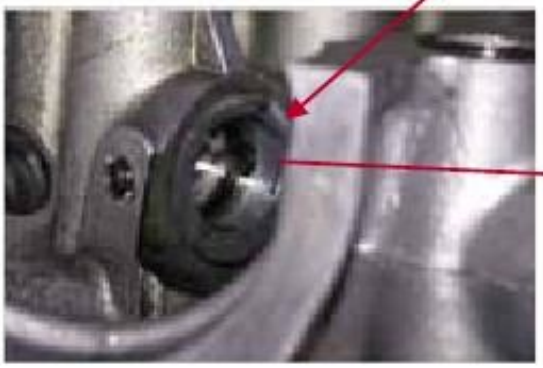

Figure 1-99: Outlet of the oil from the housing

Figure 1-100: Oil entering the rocker shaft

Figure 1-101: Storage of the rocker shaft in the housing

Figure 1-102: Oil outlet and
Sliding surface of the rocker arm

Figure 1-103: Oil drain holes in the cylinder head

Figure 1-104: Vent hole in the cylinder head

From the housing occurs on the engine oil the face of the rocker shaft in this one and then flows through a Groove (Figure 1-101) in the rocker arms. The rocker arms have a Austrittsöffition in the vicinity of the sliding surfaces, by these are lubricated.

Figures 1-103 and 1-104 show the drain holes of the engine oil from the cylinder head in the direction of the control erkettenschachtes.

The vent holes that the volume men of the motor housing to the ambient combine advertising, are in the picture See 1-103. Oil mist from the inner Ren is the engine of the purchase here suction air supplied.

1.3.4 LUBRICATION THE SWITCHING MECHANISM AND TRANSMISSION OF STOCK

From across the front of the engine housing running on the oil duct branches left side of the upper motor housing partly an oil channel to the left crankshaft and roller bearing in the direction of the needle bearing the transmission input shaft (Figure 1-105).

The bearing of the gear shafts (ballstock) by the oil mist in the motor encoder lubricated housing.

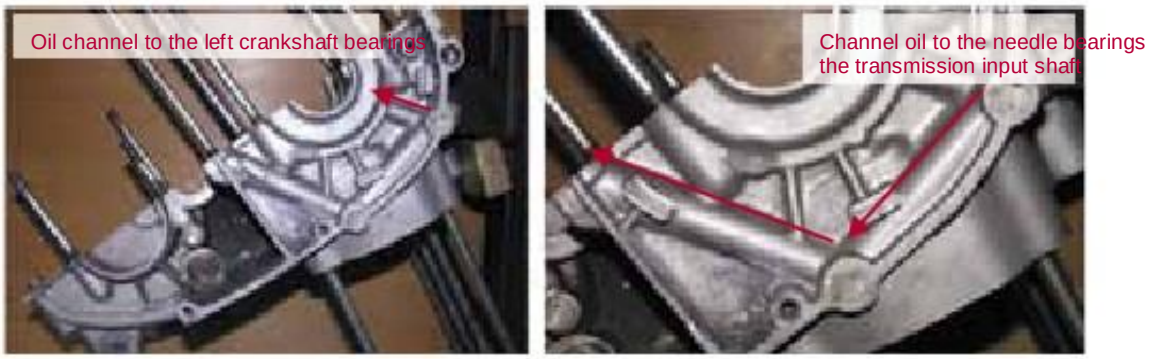

Figure 1-105: Channels to the oil lubrication of the gear

Figure 1-106: Needle bearing lubrication of the gearbox input shaft

Figure 1-107: Needle bearing gearbox input shaft

Figure 1-108: Oil pipeline through the Guide tube of the shift forks

From the needle bearings of the gearbox input wave branches off an oil channel (Figure 1 - 108) to the guide tube of the shift forks off. The guide tube has on the bottom side holes (yellow-Pfeilmarkierun gene in the figure 1-109). The forth-ejaculate oil conducts the heat of and lubricates the gears from them.

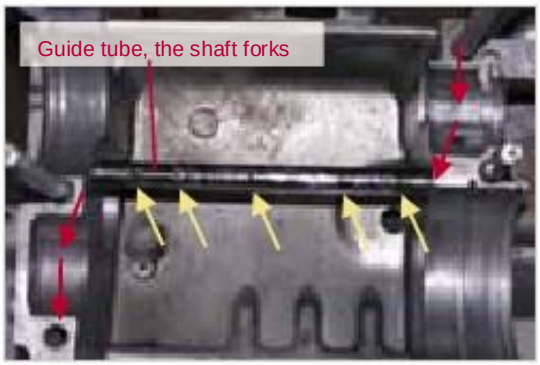

Figure 1-109: Details: oil pipeline through the Guide tube of the shift forks

Figure 1-110: Detail: bearing seat of the gearing input shaft with oil outlet

Second TOOLS

Z for disassembly and assembly of XS 650 engine, a closed Space and common tools like a Set fork and key ring, a Knarrenkasten, a torque wrench, a set of screwdrivers, a mean Pipe wrench, a string trimmer, a set By drivers and grains, a locksmith hammer and a hammer to Belzerit Are available.

If the valves are removed, you need a valve spring press. To remove the alternator rotor you need a puller (Figure 2-6).

A piston ring and piston ring pliers straps are not absolutely necesmanoeuvrable.

Unless the transmission shafts broken should be, you need a Seeger ring pliers. For this purpose, a simple Universal pliers, as on the Figure tion is shown 2-7.

Before dismantling the engine must thoroughly be cleaned. This goes on best with mineral spirits and a pinsel, but you should an outhave sufficiently large tub to the catch running gasoline.

Figure 2-1: Mounting bracket

Figure 2-2: Engine mounting bracket to hang

The cleaning of the engine, depending on
Degree of contamination and equipment
two hours or more in claim
. take Also you should have a
Opportunity available to all individual parts
le in the engine thoroughly cleaning solvent
to clean and dry with compressed air
to blow. Compressed air is also needed,
the oil passages before assembling
to check on and around this passage
to clean.

To separate the housing halves have
about 20 mm thick logs and
Wooden wedges made of ash wood proved how
they are for the installation of doors in construction
markets can buy.

Basically you do not need spe-
alwerkzeuge to the XS 650 engine to
and subsequently to dismantle these
sequent re-assemble when
time apart from work, anyway
only in Motoreninstandsetzungsbetrie-
can be carried out ben. One
However, the work can be considerably facilitated
Tern and runs less risk of something
damaging, if you look at
Tools making it, in the following
are described.

The utilities are not aware of-
technical drawings by hand,
but described with photos. One
here should improvise quiet and the
Use material that is just available
bar is. The time taken for making
need of tools, saves you
Experience has shown that later in the actual
union work again. He ever-less
as you drive wrench is, the better
these should be the equipment. While
someone with considerable experience an engine
maybe fix "roadside"

Figure 2-3: Tool for holding the chain sprocket

can, should, when the engine
opens for the first time, this only
optimum condition and do it be-
to think that parts become damaged
the, most often in such an old engine
not be procured without further re-
can be.

With the homemade jig
leaves on the figures 2-1 and 2-2
the engine by 360 ° around its longitudinal
spin axis. Serve as a pivot bearing here
two 12 mm thick plates, the
together by an M 16 bolt
be maintained.

Figure 2-3 is on the one owner-occupied
to see canned tool to
to the chain sprocket to loosen the
Mother can hold. The distance between the
Bolt was originally for a 17er
Sprocket designed. After the filing of the
Bolt it also fits into a 18er Rit-
zel.

Figure 2-4 shows a self-made
Tool for holding the clutch
basket in solving the central nut. The
relevant dimensions are regis-
gen I have the tool while I
an engine broke down, made
from material that was actually in place.
Later I have the tools then - to-
Together with other parts - galvanize
. let

The apparatus of Figure 2-5
is with the long screws M8
the upper attachment points of
Engine bolted. The device
can be used as a tool
to the engine from the frame and one-
expand, or on the motor to the
Mounting bracket to attach. To expand
is the engine from the frame ever-

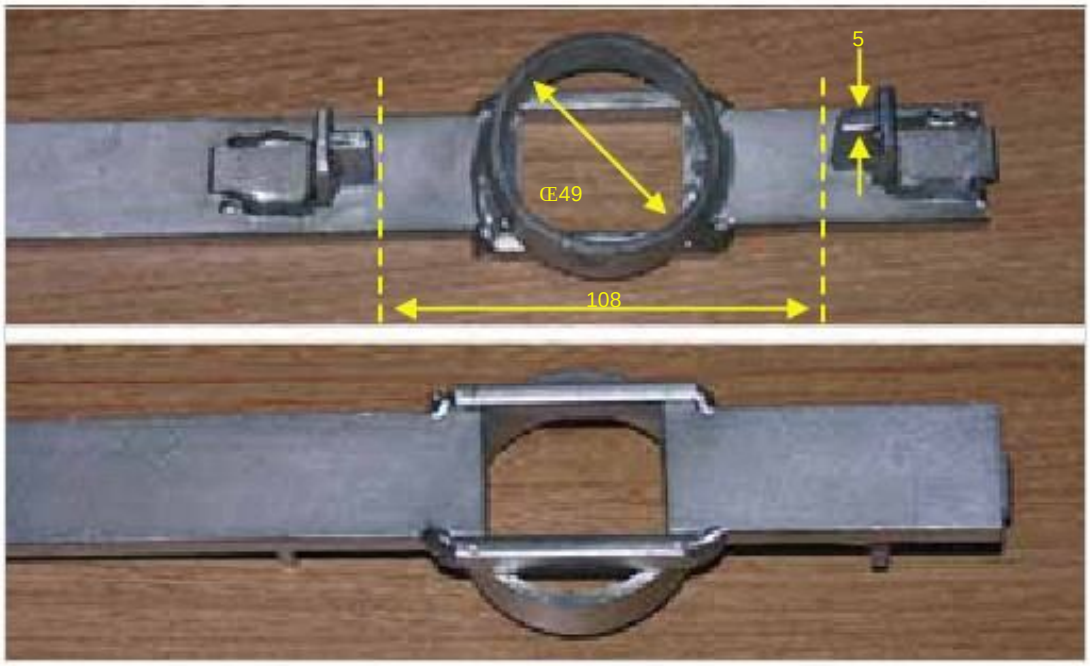

Figure 2-4: Tool for holding the clutch basket

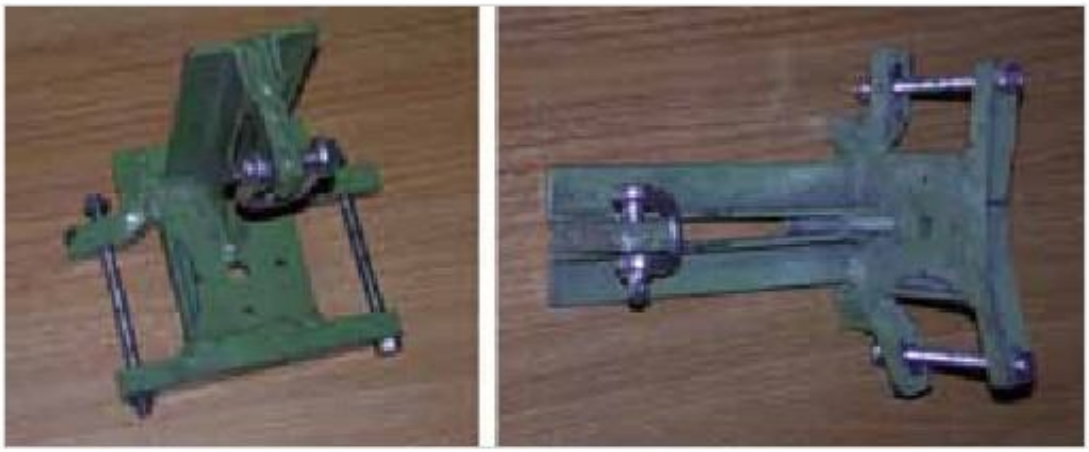

Figure 2-5: Device for lifting the motor with a pulley

But even a more suitable apparatus processing based on the figures 3-1 to 3-4 is shown in the following chapter.

The XS 650 engine is pretty simple set-building, a repair is appropriate for the preparation by people with little experience of screwdrivers "artfrem-the "Called to overcome.

If, however, two things - little he-experience and poor working conditions gen - come together, can hardly a good result to come out.

Is as an example here the method called, as in some Workshop manuals (Bucheli, page 27) the expansion of the alternator rotors and the loosening of the pinion nut described without proper tools is. In this way are probably already some rotors and engine housing destruction been disturbing.

The equipment described thus far sufficient to complete the engine to to decompose against defective parts replacement parts are le sharing and around the engine reassemble. I think However, it absolutely necessary for the Minimum. Someone who is a him un-usual work approach should stabilize, they can concentrate solely on and not with inadequate work-convincing, poor lighting or unheated work space to fight have.

Figure 2-6: Puller for the generator rotor

Figure 2-7: Universal Seegeringzange

Third REMOVAL OF Engine from the frame

The primary drive, the oil pump and the including the entire clutch Stem-and Kickstartermecha mechanism is built-in motor de-mountable. For repair and Demon-days of all other components must Engine from the frame expanded who-the. Are as preparatory work of the Tank, the exhaust manifold, the horn and reducing adapters in.
The chain must be removed and to pulled back to the rocker-who the. The carburetor can basically remain in place. As space in the frame-men but is very tight, it is recommended that also expand the carburetor. The cable from the alternator to the rectifier ter and control of the ignition contacts to the ignition coils and - if available the - to the starter are separate.

The engine is quite heavy and may without the aid of a suitable Person to be handled only with difficulty. At the bottom of the motor-being

Figure 3-1: Attachment points of the engine under

in the acorn, the easily understood
be scratched when the engine
placing them on a stone floor. The
Acorn nuts are used to seal the
Studs of the lower motor housing
second half. If the "hat part" of the nuts
is frayed, here comes from oil.
New cap nuts are not as standard
to procure original spare part and as-
some quite expensive. The upgraded engine
should therefore never easy on the Bo-
to be sold, but always
a retaining bracket, which can easily be
can make angle iron, or
a soft surface.

Figure 3-1 are on the fixing
branching points of the engine under
shown by arrows. Finally the

Figure 3-2: Auxiliary device for engine removal

Figure 3-3: Lifting the engine

lower attachment (arrow mark) GE
solves the pin-out but not yet
drawn.

Figures 3-2 and is on a 3-3
Device with which the engine without physi-
Perlich effort by one person
with the help of a bottle or
Chain hoist lifted from the frame
is to see. The suspension of
Hoist should be paid in the transverse direction
processing is not perpendicular to the sus-
Polka Dot the device are, but
from the frame as seen on the outside.
The distance between the point of suspension
Device and the hoist
should be as large (high area),
so that the motor in a horizontal
and not arcuate motion
pulled out of the frame first,
the can. First, with the help of a
Bottles or chain hoist motor
raised so far - while the
Handles of the device simultaneously
pushing down, that the lower-Bol
zen can easily pull out.

When you lift the engine now to grow and
tilt it using the handles of the pre-
direction slightly forward, then swings
the motor by itself from the frame
out when the suspension point of the
Hoist outside the center of the frame
was chosen.

Figures 3-4 and 3-5 show an-
NEN hanger bracket on the completed engine
should be set. This can also be
Mounting bracket to serve, if-only revision
th at the cylinder head or cylinder

Figure 3-4: Stripping to the hanger bracket

Figure 3-5: Hanger bracket

and pistons are planned. Should the Crankshaft to be removed or is a transmission repair provided, This support bracket is not suitable. The off-formed hanger bracket is quite stable and is also used as a mounting bracket. The motor should only be parked on it and be kept, so rich and two 400 mm long tubes with a Diameter of 40-50 mm, as shown in Figure 3-6. By the Holes and the lower-Motorbefesti tion, a threaded rod is inserted. Then at the tightened nuts a flat-iron from about 185 mm length welded between the angle iron. This flat iron is then with the back-Teren, lower engine mount connected the. Because certainly no one of such a hanger bracket material specifically kau-Fen is, but uses what is here right now, I do not use a de-Description waisted. Here it should be quietly improvise. Never a But the engine simply not backed sit on the floor, because below the Motors located acorn nuts - such as already mentioned - who damaged-the can, which also used to seal The threaded studs are used.

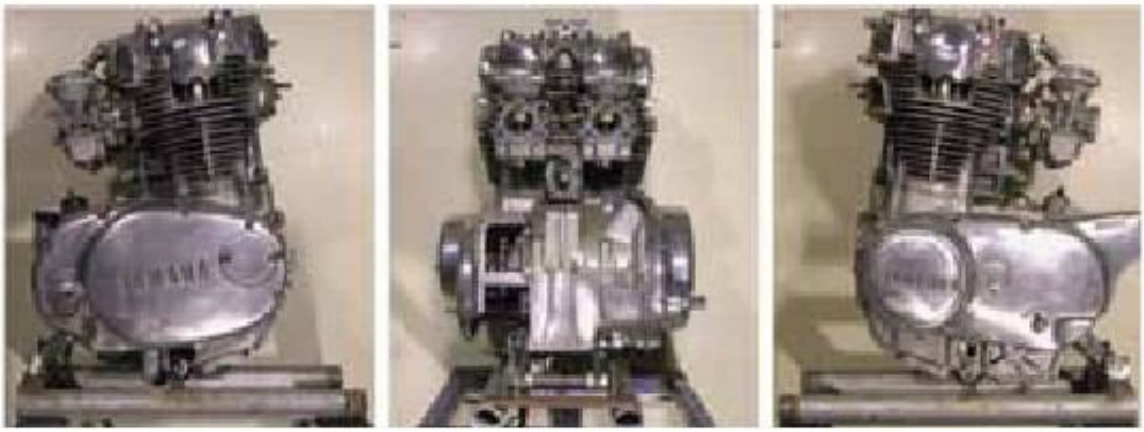

Figure 3-6: From pipes-built engine stand

4th COMPONENTS

Figure 4-1: Housing halves, cylinder and cylinder head with camshaft

An the following figures are
he components of the XS 650 motors, generators
assigned to units - similar to
which exploded in the He-
spare parts list - to see. The illustrations
to the procurement of spare parts hel-
Fen, assign the parts and to identi-
. Fizi

There are basically two types of Er-
, spare parts standard parts, "quasi-standard parts,"
Parts in other models of
Vehicle manufacturer can use
and supplies specifically for the type of vehicle
down parts that nowhere else in-
DERS occur.

Particularly in the last genus, the
see pre-designed for the type of vehicle
NEN parts that nowhere else
occur, you should never be a "buy-
mercial 'decision, if
you have the choice between refurbishing and
When buying a used or nearly
has nearly new replacement part. Is currently
it will always be cheaper, such as a use-
tes or a used transmission
To buy switching mechanism, as a
shift fork and worn-verschlis
Sene shift dogs on one gear wheel-
work. Under no circumstances should you
those parts of their processing

Figure 4-2: Crankshaft, pistons, timing chain and camshaft

"Commercial perspective" is now not worth throwing away, when a repair principle be possible.

Then there are "quasi-standard parts" as Colben, piston rings and valves of Parts of this specialized production learning in standardized sizes offered be th. These parts may be over The dealers listed below relate These parts in unlimited human GE are available and not to it is expected that prices in the future will increase significantly.

Standard parts are for example all screws Most shaft seals and some Lager. With the exception of the screws and the paper seals, which even can cut out paper gasket, not worth it, however, standard parts such as bearings and shaft seals differentlywhere as in the below mentioned To buy spare parts dealers, as storage and shaft seals in general only on the wholesale and packaging ckungseinheiten be sold.

4.1 Replacement SITUATION PART

Figure 4-3: Crankshaft, pistons, timing chain and camshaft

The description of the current replacement some situations a vehicle type may only ever be a snapshot, since this is constantly changing. First the supply of spare parts by the The manufacturer's dealer network ensured is. This is about up to 10 years after production of Case.

Then, still in existence Ersatzeilbestände usually sold cheap and some are consistent therewith.

Below is the Ersatzteilsituati- On the XS 650 described in the autumn of 2008 . ben The XS was 650 in their last Version of the XS 650 SE Heritage, to 1984 built. Spare parts, there was until the mid-90s at Yamaha dealers, the Repairs also exported.

In the 90 years that spare parts were
the part of dealers and classifieds
of newspapers offered cheap.
So you could then complete one-
th engine including the framework for an-
Nige hundred DM get.

Overall, the supply of spare parts
XS 650 models with restrictions as
been good. With restrictions
because many have the right,
to use only original parts, and
particularly original exhaust
parts and paint just and conse-
accordingly expensive.

On the other hand, needs no
Afraid that he has a season
can not continue because a required
Replacement part is not to obtain. It
are dealers like e.g. the XS-shop keel
Twins and Inn, on the sale of
Parts and accessories for the XS 650 spe-
cialised are. In addition, care
around these dealers reproduction
and improvements such as electronic
Scheme charge controller.

In the 650-XS scene there are essentially
union two groups of drivers - such
surface, the XS 650 already in the one-class
siker see the original as possible
should be restored and those that
the individual motorcycle-sheep
Fen want. There are currently
both in "non-rigged" originals
offered itself as the restoration project
own, and already more or-
niger or rebuilt with parts

Figure 4-4: Crankshaft, pistons, timing chain and camshaft

Figure 4-5: Bearing of the crankshaft

roadworthy held specimens as Chopper-cafe racer or otherwise as to-be built without doing a good Restoration base is lost.

Of the two o.g. Dealers are Therefore, parts for rebuilding, as moved back and footrests, tanks etc. are offered.

Another commonly used possibility speed to spare parts procurement is the Internet auction site eBay, where both Motorcycle spare parts used on specialised dealers and private individuals Spare parts to offer.

One should not be executed, the illusion ben, that an XS 650 is a cheap old Motorcycle is that you can as cheaply on Can keep running like an old VW Golf. There has been little nachgefertig-large parts, and if so, in the Quantities produced, with which no prices below normal replacement are some prices can be realized. It There is no reason why replacement parts, used by professional traders

Figure 4-6: Timing chain with cam chain tensioner

be kept available to be cheaper
intended as spare parts of new motorcycles.

At the moment it looks like that the XS
650 increasing in popularity. So
e.g. Carburetor diaphragms, gearbox
bezahnräder, silencers, and elec-
electronic load controller for the electrical system,
as
Nachfertigunsteile offered.

How has the situation in spare parts to-
future will continue to develop, is all-
However not in sight.

It is conceivable that - as with many al-
German motorcycles of the 50 th years
re - almost all spare parts available again
will be, if the Yamaha XS
650 developed a classic.

Figure 4-7: Switching mechanism