

SECTION E

FRAME

	<i>Section</i>
REMOVAL AND REPLACEMENT OF THE SIDE COVERS	E1
REMOVING AND REPLACING THE FUEL TANK	E2
REMOVING AND REPLACING AIR BOX COVERS & SIDE PANELS	E3
THE AIR FILTER	E4
CLEANING THE AIR FILTER ELEMENTS	E5
THE OIL TANK	E6
ADJUSTING THE REAR SUSPENSION	E7
REMOVING AND REFITTING THE REAR SUSPENSION UNITS	E8
STRIPPING AND RE-ASSEMBLING THE REAR SUSPENSION UNITS	E9
REMOVING & REPLACING THE EXHAUST SYSTEM	E10
REMOVING THE REAR SWINGING ARM	E11
SWINGING-ARM – EXAMINATION	E12
TRUING THE SWINGING ARM	E13
RENEWING THE SWINGING ARM PIVOT BEARINGS	E14
REPLACING THE SWINGING ARM	E15
FRAME – DESCRIPTION	E16
INITIAL EXAMINATION	
PROCEDURE	
FURTHER EXAMINATION	
REMOVING & REPLACING THE SIDE STAND	E17
REMOVING & REPLACING THE CENTRE STAND	E18
POSITIONING THE RIDERS FOOTRESTS	E19
REMOVING & REPLACING THE REAR BRAKE PEDAL	E20

SECTION E1

REMOVAL AND REPLACEMENT OF THE SIDE COVERS

The right side cover protects the electrical equipment, including the battery and starter relay unit, and the left side cover houses the electronic ignition and voltage control units, fuse box, direction indicator flasher unit and horn relay. Removal of both side covers is first achieved by releasing the seat and gaining access to the DZUS fastener at the forward end of each cover immediately beneath the rear of the fuel tank. Turn the slotted fastener stud 90° anti-clockwise, disengage the stud and lift the cover, at the same time guiding the rear location grommet up over the rear fixing peg.

Replacement is the reverse procedure, but care must be taken when positioning the panels prior to fitting to ensure the lower rear moulding sits snugly inboard of the rear foot-rest and silencer mounting plates. Draw the rear top grommet over the locating peg, pressing down the panel until the nose of the DZUS fastener stud can be engaged in the fastener

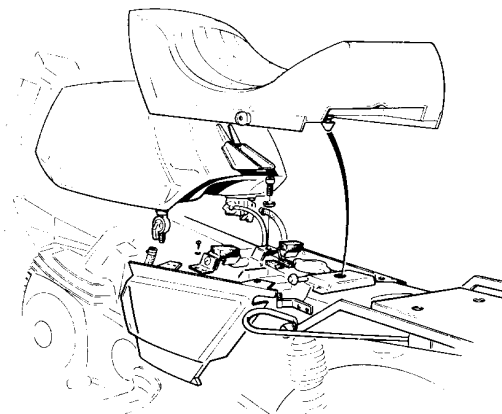


Fig. E1. Removing and Replacing the Fuel Tank and Side Covers

body. Turn the slotted stud through 90° clockwise to fix the cover in position.

SECTION E2

REMOVING AND REPLACING THE FUEL TANK

Remove the seat and turn the LH fuel tap to the "OFF" position. Turn the RH vacuum operated tap to the "ON" position. Disconnect the fuel feed pipes from the taps (both sides), release the bolt at the rear of the tank and centralise the handlebars. Pull the tank to the rear, lifting and supporting the back of the tank. It should then be possible to work the tank rearwards and off the front mounting rubber buffers.

Before attempting to replace the fuel tank, check that the wiring harness cables lie neatly in the support bracket located under the steering head, and that the clutch and choke cables are held in the support bracket on the opposite side. Ensure the throttle cable is routed above the tank front mounts and is not trapped or displaced.

Pull the choke knob – this tensions the cable and prevents it from becoming trapped or mis-located during fuel tank re-assembly. Lightly

vaseline the two forward tank mounting rubbers and offer the forward end of the tank over them, ensuring clean engagement of the forward integral tank guides. The forward tank rubbers have eccentric mountings and thus provide a tank nose height adjustment facility. Each rubber must be set to maintain a level and horizontal tank. Care must be taken at this point to avoid damage to the paint finish on the tank. Push the tank forward, lower the rear end and engage the rear fixing bolt through the plain washer, tank rear lug, rubber mounting bush and spacer sleeve. Tighten down. Refit fuel lines and seat. Reconnect the vacuum pipe from the right hand inlet port to the right hand fuel tap. Check for a trapped throttle cable by turning the forks from lock to lock with the engine running.

WARNING.

If the engine races, the motorcycle must not be ridden until the fault has been rectified.

SECTION E3

REMOVING AND REPLACING THE AIRBOX COVERS AND SIDE PANELS

To remove the front airbox covers, release the two black plastic hexagon headed screws in the bottom edge of the forward facing cover panel. Detach both the H.T. and L.T. leads from the ignition coils, and lift the panel clear of the two location pegs.

To remove the airbox side panels (where fitted) remove the front panel as described and then release the socket head bolt securing the rear of each side panel to the engine air transfer port. The panel can now be lifted clear. Replacing the covers is the reverse of removal.

SECTION E4

THE AIR FILTER

The air filter is of the fluid wetted reticulated foam type housed in a plastic 'Airbox' at the front of the engine immediately below the fuel tank. To gain access to the air filter elements it is necessary to remove the airbox front cover, (described in Section E3 above). As the air passages from the air filter assembly do not supply air directly to the carburettors, it is of the utmost importance to understand that before reaching the carburettors, the air flow acts as a coolant through the rotors and shaft, within the centre of the engine and because of this, **UNDER NO CIRCUMSTANCES WHATEVER SHOULD THE ENGINE BE RUN WITHOUT THE COMPLETE AIR FILTER ASSEMBLY FITTED IN PLACE.** Any foreign body allowed in such a way to enter the engine air passages whilst running could cause disaster from extensive damage to the engine components.

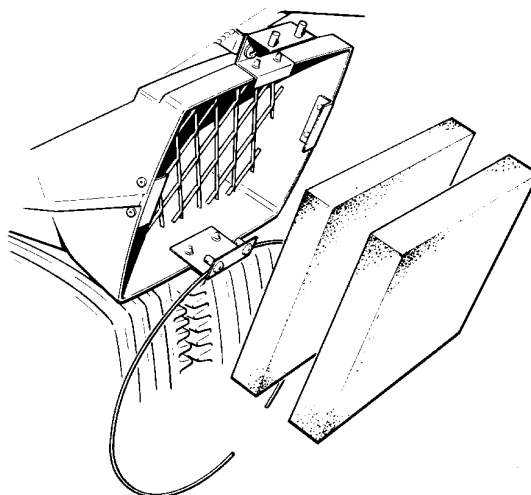


Fig. E2. The Air Filter

SECTION E5

CLEANING THE AIR FILTER ELEMENTS

Remove the front air box cover panel (Section E3). Release the large circular clip situated in the front of the airbox. Remove the filter elements and wire mesh. Clean the foam filter elements in petrol, dry and immerse in clean filter fluid. (Section GD). Squeeze out any excess and re-fit to the air box. Any damaged

filter elements should be replaced. This service need only be carried out at regular 6000 miles intervals. If, however, the machine is operated in extremely dry and dusty conditions, this service should then be repeated on a monthly basis. Adhere strictly to the Filter Fluid manufacturers instructions.

SECTION E6

THE OIL TANK

The oil tank is an integral part of the frame. Access to the filler cap is by lifting the seat. The filler cap has a built in graduated oil dipstick. Forward of the oil filler cap is the oil level warning unit. This unit can be tested for operation by switching on the ignition and pushing the oil level warning unit float to the bottom extent of its travel with the dipstick. This should illuminate the oil warning light Fig. H9. Engine oil is drawn off at the bottom LH side of the tank through a filter and via a clear plastic pipe to the oil metering unit situated on the LH end of the gearbox mainshaft. The oil metering unit is a pump combined with a metering system which supplies fresh engine oil to the power unit in quantities governed by the engine load and rpm. Removal and replacement of this unit is described in Section A4. Adjustment is critical and is described in Section A6.

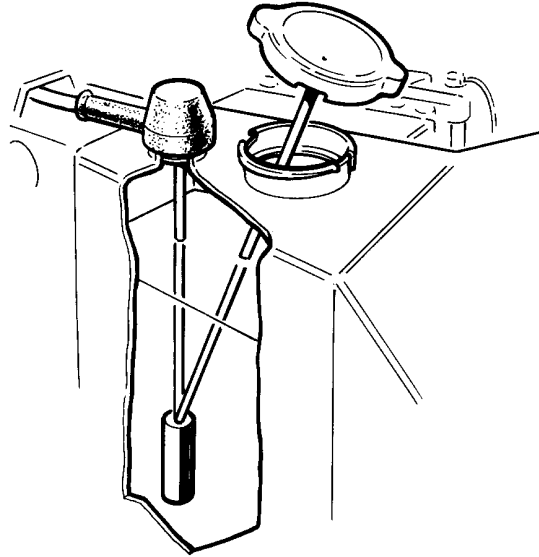


Fig. E3. Checking the Oil Level Switch Float Action

SECTION E7

ADJUSTING THE REAR SUSPENSION

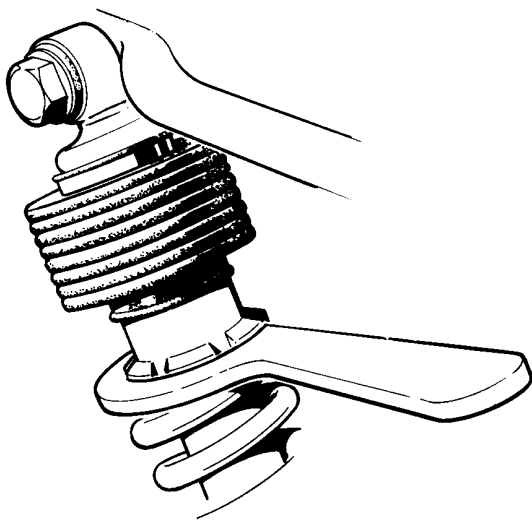


Fig. E4. Adjusting the Rear Suspension Units.

The rear swinging arm movement is controlled by two matched Girling gas assisted spring and hydraulic damper units. Constant rate damping is provided, whilst the suspension spring pre-load is adjustable using a three position cam ring located immediately below rubber bellows at the top of the suspension unit. By using a 'c' spanner located in the notches and rotating the cam ring in the direction shown, the pre-loading of the spring can be decreased and rotation in the opposite direction will increase the pre-load to the spring. Both units must be adjusted equally to maintain even spring loading. See Fig. E4.

NOTE: When replacing units always replace in pairs.

SECTION E8

REMOVING & REFITTING THE REAR SUSPENSION UNITS

Place the machine on the centre stand in order to lift the rear wheel clear of the ground. To remove the suspension units release the top mounting bolt and remove the bottom mounting nut and bolt. The unit can now be removed. Replacement is the reverse procedure. Ensure the units are fitted correctly, e.g. adjusters to the top, and at the top location are the correctly specified high tensile bolts. Check to ensure the cam adjusters are in the correct position, as incorrectly adjusted suspension units could adversely affect the handling of the machine. The correct sequence of spacer washers at the top suspension unit bolt fixing is two plain washers inboard (i.e. between the top fixing damper bush and the frame) and one plain washer outboard. Tighten the top bolts to 30 lb. ft. 4.2 Kg/m torque.

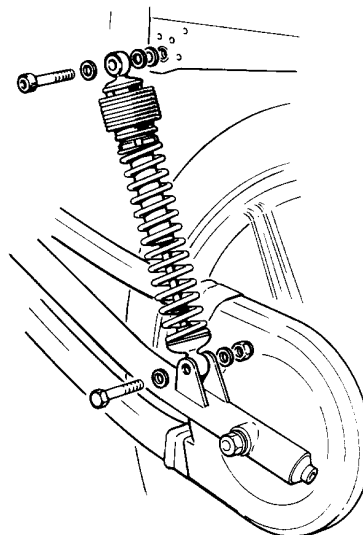


Fig. E5. Removing and Replacing the Rear Suspension Units.

SECTION E9

STRIPPING AND RE-ASSEMBLY – REAR SUSPENSION UNITS

The suspension unit consists of a sealed gas hydraulic damper unit and outer coiled spring. The static load on the spring is adjustable and should be set according to the type of conditions under which the machine is to be used (see Section E7).

To dismantle the suspension unit and remove the spring, it is required to remove the rubber gaiter and to compress the spring whilst the two semi-circular spring retainer plates are removed. To do this first turn the cam until it is in the LIGHT LOAD position, then carefully grip the top lug in a vice. Take firm hold of the spring and compress it until sufficiently shortened to allow the spring retainers to be removed.

The damper unit should be checked for leakage, bending of the plunger rod, and damping action. Check the bonded pivot bushes for wear and ensure that the sleeve is not loose in the rubber bush.

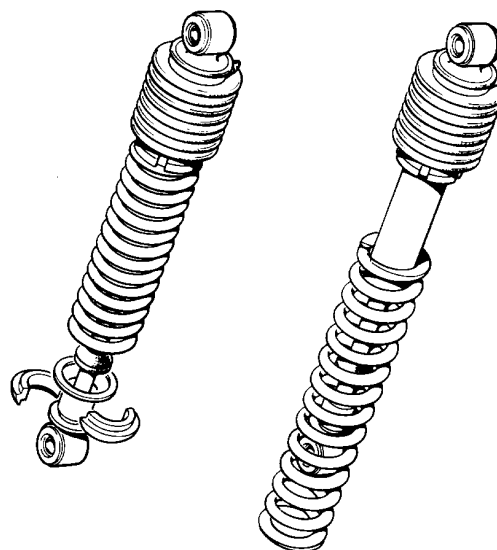


Fig. E6. Dismantling the Rear Suspension Units

Reassembly is reversal of dismantling. Check that the cam is in the light load position before compressing the spring.

NOTE: For information concerning suspension units or spare parts the local Girling agent should be consulted.

SECTION E10

REMOVING AND REPLACING THE EXHAUST SYSTEM

Remove two clamps which secure the silencers to the exhaust manifold. Approximately 1/3 way back from the front of the silencers will be found a mounting bracket secured to the silencers by two bolts.

Removal of these bolts will allow the silencers to be drawn off the exhaust manifold. Should the silencers prove difficult to remove, grasping the front end of the silencer and pulling whilst gently rotating the other end of the silencer in a circular movement will release the silencer from the exhaust manifold (See Fig. E7)

DO NOT UNDER ANY CIRCUMSTANCE attempt to bend the exhaust system, as the exhaust manifold could then be damaged.

If required at this stage remove the six hexagonal headed socket screws retaining the exhaust manifold in place onto the engine. Withdraw the manifold, gaskets and stainless steel liners from the exhaust ports. Clean and inspect the components and replace as necessary. Refit the stainless steel exhaust inner tubes into the engine exhaust ports. Under no circumstances whatsoever should any attempt be made to re-assemble the exhaust system without these sleeves in position, as irreparable damage will inevitably be caused to the engine housings. Do not attempt to substitute the original stainless

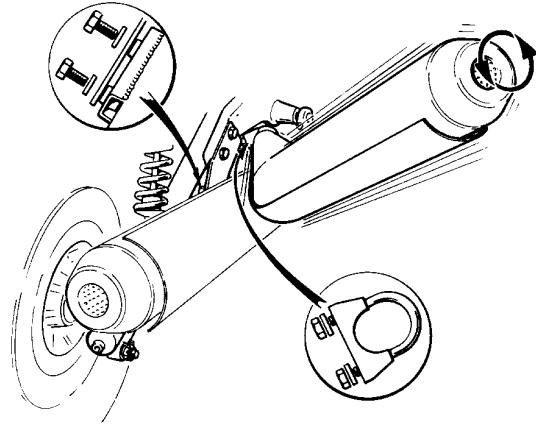


Fig. E7. Removing the Silencers

steel tube with mild steel components as these will deteriorate rapidly in the extremely high exhaust gas temperatures encountered in this engine. Fit two new exhaust manifold gaskets. Refit the manifold.

Before fitting the silencers it is advisable to lightly grease the nose bore of the silencers and the manifold pipes to assist in re-assembly. 'Rotate' the silencers in position on the pipes, bolt into position on the mounting plates, and re-tighten the 'U' bolt clamps.

SECTION E11

REMOVING THE SWINGING ARM

Place the machine on the centre stand and remove the rear wheel (Section F12) and the exhaust silencers (Section E10). Disconnect the leads from the stop light switch which is attached to the R.H. foot rest mounting plate. After detaching the rear brake fluid reservoir, remove the footrest plate as a complete assembly together with the fluid reservoir and rear caliper plate from the machine. Remove the L.H. footrest mounting plate and detach the rear suspension units at their lower fixings. Remove the nut, washer and abutment from the fixed spindle of the rear sprocket/cush drive assembly.

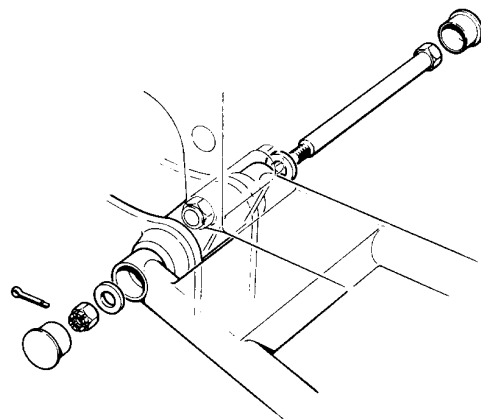


Fig. E8. Removing the Swinging Arm

Remove the plastic dust caps at both ends of the swinging arm spindle. Ensure that the split pin is removed before attempting to release the castellated nut. Using a soft metal drift, gently tap the spindle out of the swinging arm from left to right.

The swinging arm can now be lifted clear and removed. All components from the swinging arm pivot assembly should be cleaned and examined for wear or damage and, if necessary replaced.

SECTION E12

EXAMINATION OF THE SWINGING ARM

A possible cause of poor handling could be due to severe shock that has been applied to the swinging arm, which in consequence has become twisted away from the original design dimensions. The most accurate way to check for truth is to remove the swinging arm, refit the the spindle and support on a pair of 'v' blocks at both ends. Then support one end of the swinging arm on a 'v' block and, using a dial test indicator, measure the difference in height between the fork ends. If the difference between the two measurements is 6.5 mm (1/4 in.) or more, the swinging arm cannot be straightened. This also applies if the rear swinging arm is found to be tracking out of line.

If the swinging arm is found to be out of true further examination of allied components for damage must be made, with special attention given to the rear suspension units and the rear wheel.

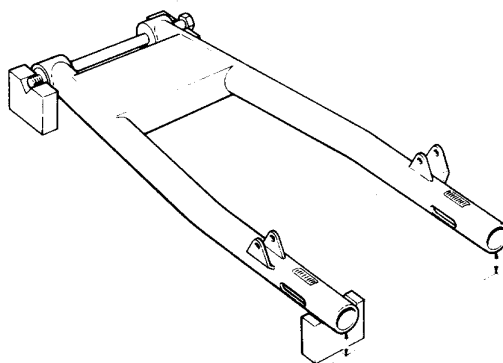


Fig. E9. Examination of the Swinging Arm.

SECTION E13

TRUING THE SWINGING ARM

Before making any attempt to rectify any misalignment in the swinging arm, examine the tubes and welding critically to ascertain the cause of deterioration. If the assembly is sound, and it is found necessary to re-straighten the swinging arm, the procedure is straight forward:-

Insert a stout steel bar through the pivot eyes at the forward end of the swinging arm and clamp the bar securely in a vice. Insert by at least 150 mm (6in.) down both tubes of the

swinging arm two snugly fitting bars of approx. 750 mm (2.5 ft.) and lever against these until the truth of the swinging arm has been restored, using the above checking procedure to examine the swinging arm at each stage of straightening. Do not apply heat to the swinging arm as this will weaken it. Move the swinging arm as little as possible to reduce the risk of damage to the leg. Finally, examine carefully for any signs of weld deterioration and restore any surface finish which may have been damaged.

SECTION E14

RENEWING THE SWINGING ARM PIVOT BEARINGS

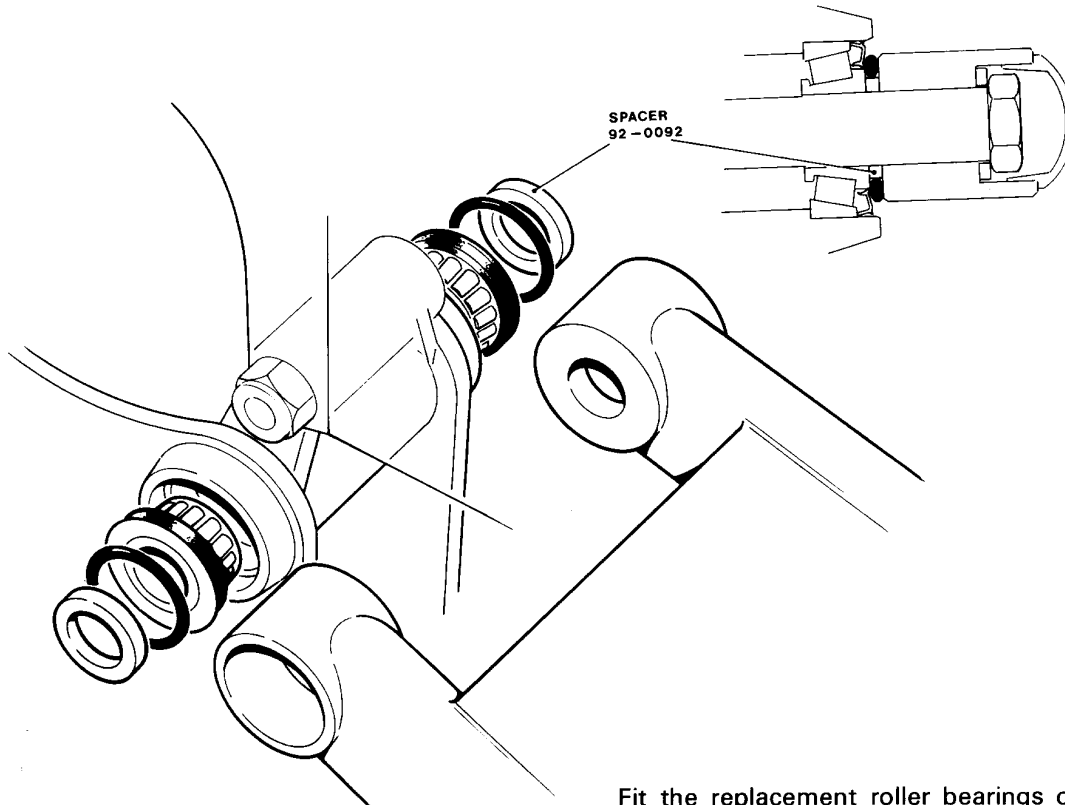


Fig. E10. Shimming the Swinging Arm Pivot Bearings

If, after examination, the spindle or bearings are found to be worn or damaged, they must be replaced. Always replace the swinging arm bearings in pairs. The bearing outer races should be removed from a heated case (85°C) using an external claw extractor to withdraw the outer race to ensure even removal from the housing. Similarly refit the new race outers until fully home whilst the case is still warm.

Fit the replacement roller bearings onto the spindle and offer into the bearing housing. Using an outside caliper measure the overall distance from the end faces of the bearings and then measure the distance between the inside faces of the swinging arm pivot and compare the two measurements. Shim the pivot equally both sides of the bearing housing to remove any play. To accommodate any variations the spacer 92-0092 is available in five different widths (See General Data).

SECTION E15

REPLACING THE SWINGING ARM

Using pivot sleeve tool Part Number 92-0572 to locate the spindle re-assemble ensuring the 'o' ring is fitted over the spacer and that the bearings are packed with a lithium based grease prior to assembly. Refer to Section A2-Lubrication System "Recommended Lubricants". After the spindle has been re-fitted from the R.H. side, check to ensure the 'O' ring is squarely in position on top of the

spacer. Torque load the spindle to the figure stated in the table and refit the following: Cotter pin, dust caps, rear chain enclosure, suspension units, L.H. footrest mounting plate, R.H. footrest mounting plate and brake fluid reservoir, rear wheel and exhaust silencers. Readjust the rear drive chain (Section D10) and check the front and rear wheel alignment (Section F19).

SECTION E16

FRAME

Description

The frame is of 16 SWG sheet steel box section forming an extremely rigid basic spine, and therefore unlikely to be distorted in anything but a major accident. Should this occur the most convenient method to check for frame twist is to examine the frame for mis-alignment as indicated in Fig. E11. If a twist or bend is evident within these points, it would indicate the need for replacement as it is impractical to attempt to straighten the frame.

Initial Examination

The first check should be used to determine whether or not there is a possibility of misalignment. This is straight forward procedure which is not time consuming and requires the minimum of equipment. Whilst this check is fairly accurate, it should be remembered that it will only show that there is a discrepancy between the front and rear wheel alignment, i.e. a twist in the frame, forks, or swinging arm and if misalignment is found then the front forks, rear swinging arm and frame should be examined further.

Procedure

Position the machine on the centre stand on firm level ground. Using trammels, align the front and rear wheel and viewing the machine from the riding position examine carefully the handlebar alignment. The handlebars should be 90° to the front wheel. If they are not then if the handlebars themselves are not distorted, the front forks will need to be inspected. See Section G8. Having lined up the front and rear wheel, place an engineers vertical spirit level on the rear brake disc and pack the feet of the centre stand to obtain an exact vertical reading on the spirit level. Re-check the wheel alignment and place the spirit level on the front brake disc. This should also read exactly vertical. Any major difference in readings between the front the rear brake discs will need further investigation.

Further Examination of the Frame

If the procedure for initial frame examination indicates the machine has been involved in some form of accident, or that there may be damage to the frame, then further examination will be necessary.

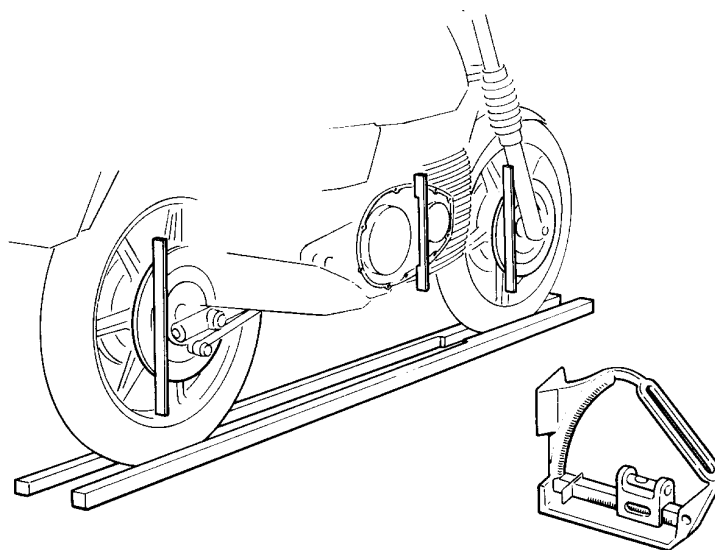


Fig. E11. Initial Examination of the Frame for Possible Misalignment

As the engine is bolted directly to the gearbox, which itself is bolted rigidly into the frame, a very convenient and accurate vertical datum line is provided by the primary chaincase joint line for alignment assessment, without need to strip the machine out for investigation.

Remove the primary chaincase cover as described in Section C1, and using suitable blocks or spacers, apply the engineers spirit level to the top and bottom edges of the chaincase joint. Adjust the setting to absolute vertical, suitably packing the centre stand, and then recheck the front and rear discs – following a re-check on wheel alignment with the trammels (See Section F19).

If the above checks indicate a mis-alignment between the primary chaincase vertical face

and the rear disc, the swinging arm will require attention. If however the alignment is unsatisfactory between the chaincase face and the front disc, the cause may be within the front fork or wheel assembly, and not the frame.

Check the front fork alignment as detailed in Section G8. If the forks are found to be satisfactory, the frame will require stripping out for complete examination. If the measurements are outside the limits in drawing (Fig. E12), the frame must be replaced as no repairs or straightening are possible with this frame.

As this procedure is not straightforward without the use of specialised equipment, it is recommended the frame be returned to the Factory Service Department, where it can be re-checked on the original manufacturing jigs.

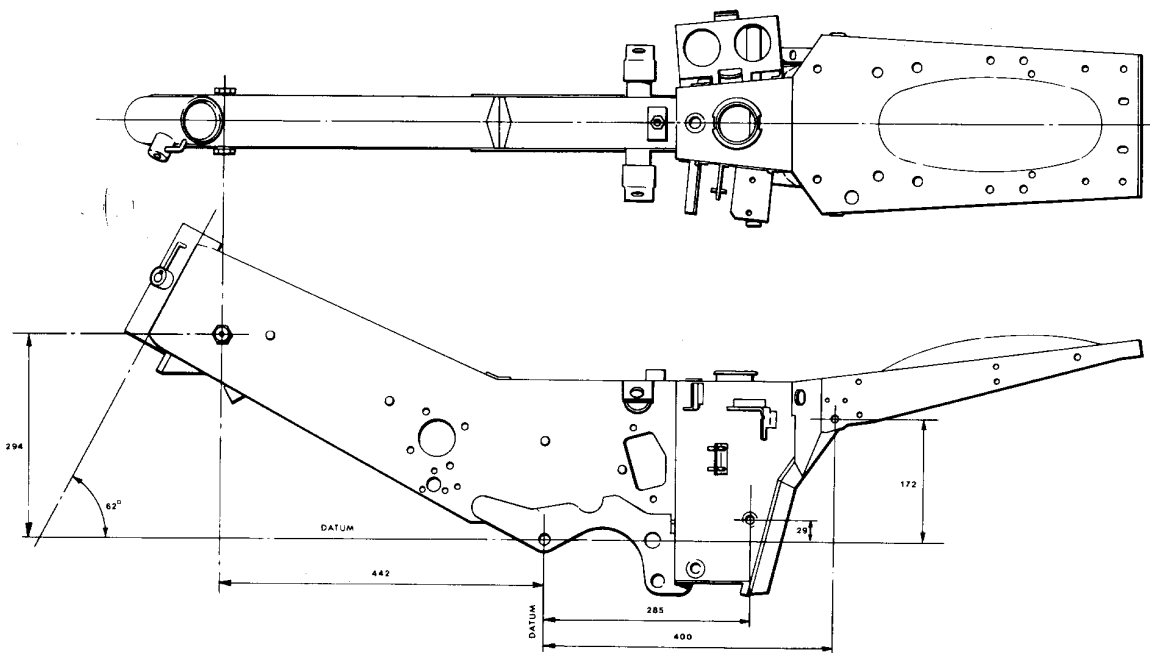


Fig. E12. Frame Dimensions

SECTION E17

REMOVING & REPLACING THE SIDE STAND

Removing and Replacing the Side Stand

The side stand pivot lug is secured to the gearbox casting by three socketed headed bolts and is removable as a complete unit. To remove the side stand assembly, disconnect the side stand warning light switch and remove the three socket headed bolts. The side stand assembly will now come away from the gearbox casing. Should excessive play

develop in the side stand pivot, the pivot bush can be replaced by removing the two tension springs and withdrawing the pivot bolt. This will give access to the pivot bush. Reassembly and refitting the side stand assembly is the reverse of the above procedure. Re-set the final position of the side stand switch in accordance with the instructions given in Section H15. "WARNING LAMP SWITCHES"

SECTION E18

REMOVING & REPLACING THE CENTRE STAND

The centre stand is secured in position by a stud, threaded at both ends, passing through the gearbox casing and supporting the stand by means of pivot spacers about which the centre stand pivots.

To remove the centre stand, support the machine securely and remove the exhaust silencers (Section E10) and L.H. exhaust silencer bracket, which encompasses the stop for the centre stand. The removal of this bracket will enable the stand to retract further than normal thereby decreasing the tension on the centre stand return springs.

Protect the paint finish on the underside of the swinging arm from damage that may have been caused by the feet of the centre stand.

Remove the nut and washers from one end of the through stud and remove the bifurcated rivets that secure the 'C' hooks to the centre stand. The through stud can then be removed. Examine the pivot spacers and bushes and replace as necessary.

Reassembly and refitting of the centre stand is the reverse of the above procedure, but be sure to grease the spindle prior to inserting into the gearbox casting bore to discourage water ingress and corrosion. Also be sure to test the centre stand for satisfactory operation before riding the machine.

SECTION E19

POSITIONING THE RIDERS FOOTRESTS

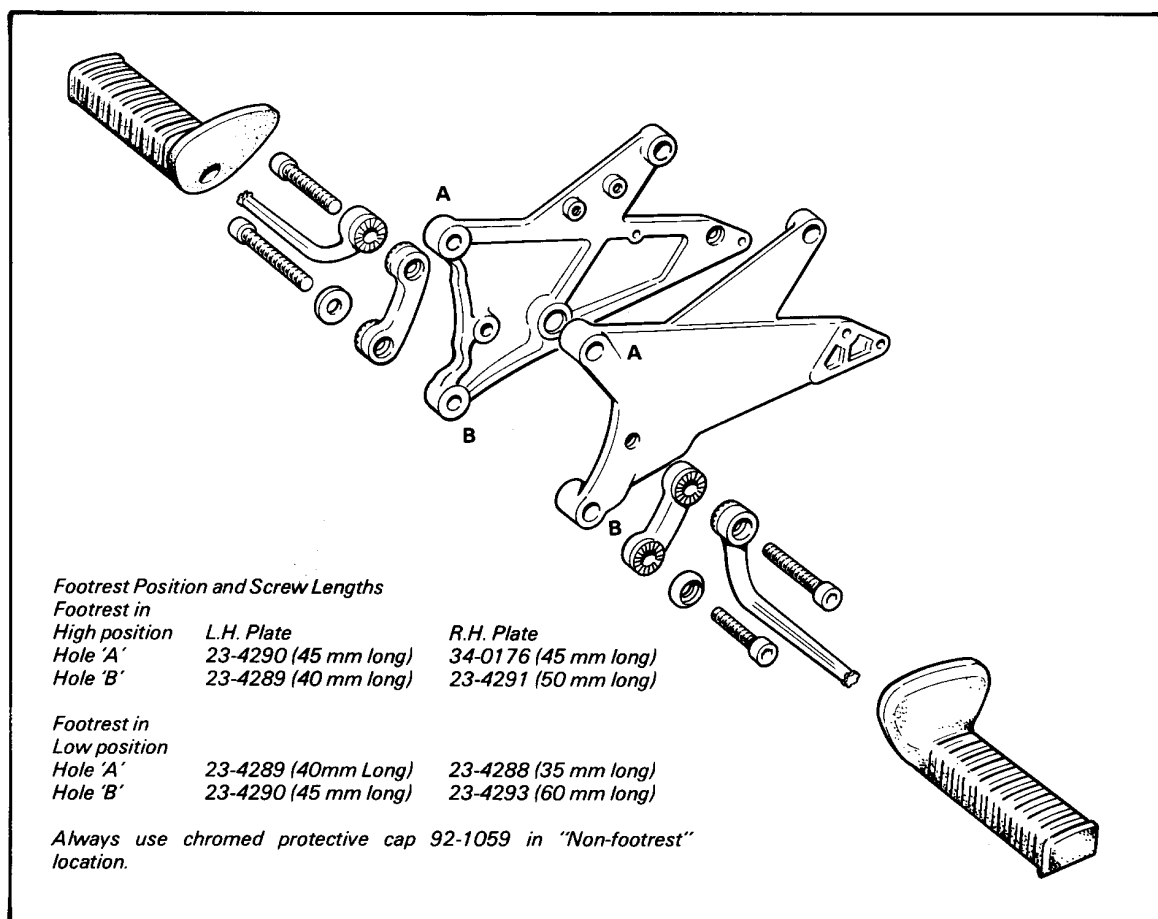


Fig. E13. Footrest Mountings

The riders footrests are adjustable for height throughout a usefully large range of movement and are interchangeable between upper and lower mounting points.

To change the footrests from the lower to upper mounting points proceed as follows:-

Left Footrest

Remove the upper mounting point bolt and chrome protecting collar from the footrest mounting plate. Remove the footrest with its mounting bolt and fit to upper mounting point. Refit upper mounting point bolt and chrome protecting collar to bottom mounting point.

Right Footrest

Remove footrest and mounting bolt, remove upper mounting point bolt and chrome protecting collar, fit the footrest to the upper

mounting point using bolt Part No. 34-0176 (length 45 mm).

Fit bolt Part No. 23-4291 (length 50 mm) with the chrome protecting collar to the lower mounting point.

WARNING

1. Always use the recommended alternative bolts on the right footrest when moving to the upper position. Use of the existing bolts could result in insufficient thread being engaged with resulting weakening of the footrest mounting. Always ensure a minimum of six threads of screw engagement. Torque to 4.2 Kg.M (30lb.ft).
2. Check rear brake pedal for full operational movement when footrests have been fitted.

SECTION E20

REMOVING AND REPLACING THE REAR BRAKE PEDAL

Should the rear brake pedal operation become stiff at any time it will be necessary to remove the brake pedal spindle in order to clean the affected parts.

To remove the brake pedal spindle, detach the brake pedal by releasing the clamp screw at the rear of the brake pedal and withdraw it from the splined shaft. Remove the two silencer mounting bolts being careful to support the silencer to avoid applying unnecessary strain on the exhaust manifold. Remove the three socket headed bolts securing the right footrest mounting plate to the frame and gearbox noting their individual lengths and locations and carefully pull the mounting plate clear of the machine.

Unclip and remove the two brake actuating rod pivot pins and remove the actuating rod. The rear brake pedal pivot can now be removed.

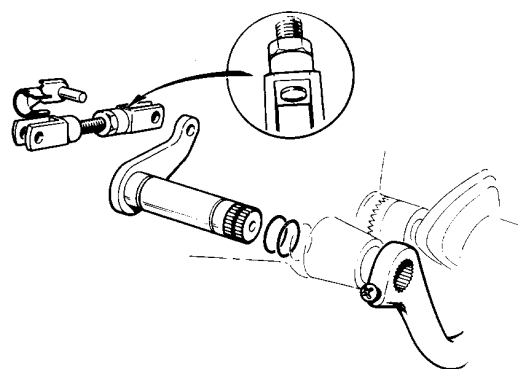


Fig. E14. Rear Brake Pedal Spindle

Clean the brake pedal pivot and pivot bore and inspect the sealing 'O' rings, replace if necessary. Lubricate the pivot with the recommended grease (Section A2) and reassemble in the reverse order to that given above making sure that the brake rod pivots are lubricated and firmly secured in place.