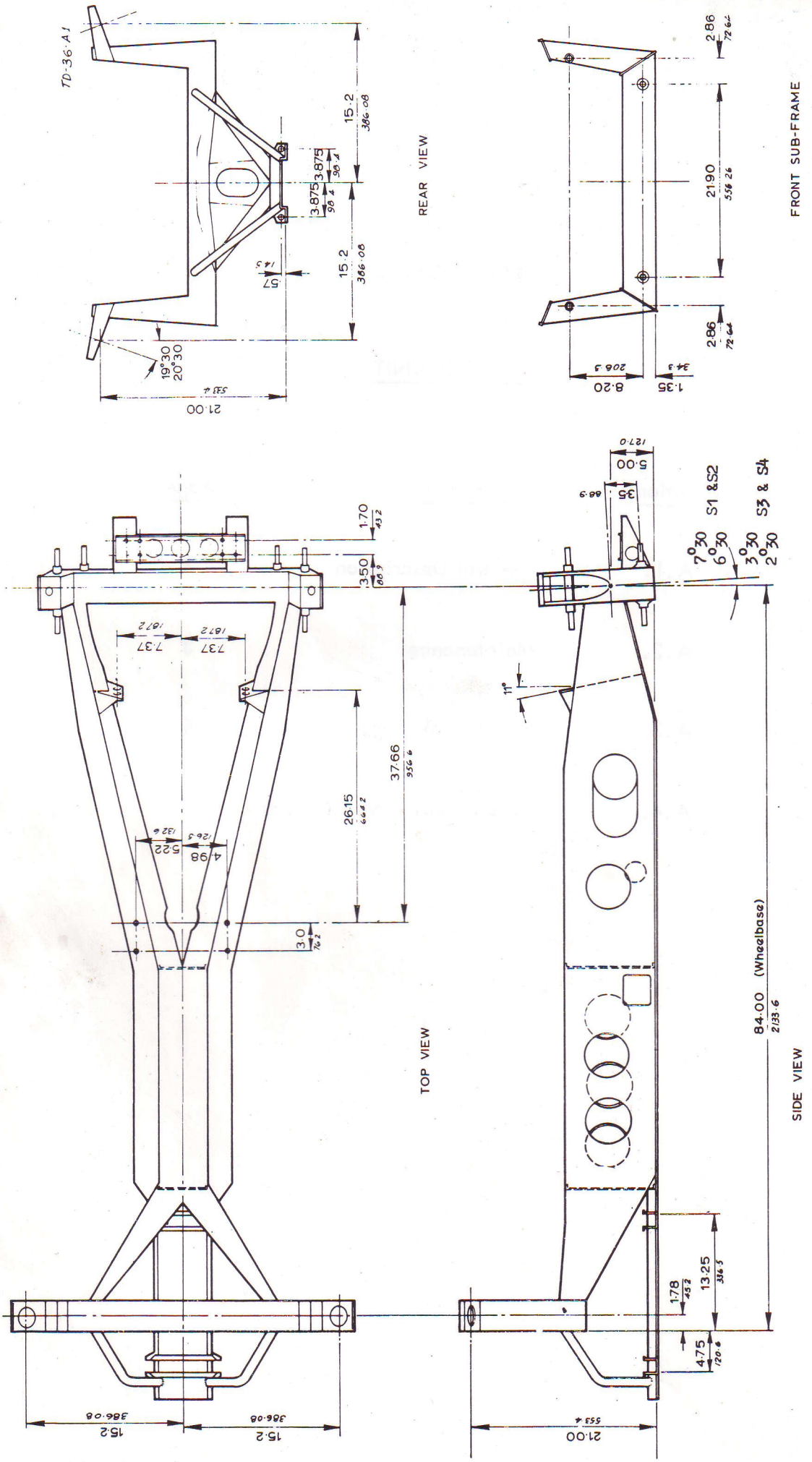
SECTION A

CHASSIS UNIT



CHASSIS - GENERAL ARRANGEMENT

A.1 - GENERAL DESCRIPTION

The chassis unit is of the backbone type with a box section spine splayed and braced at front and rear to support the suspension mounting uprights. These mounting uprights are also of fabricated box section in structure and carry the suspension spring damper top anchorages at their upper extremities. The rear suspension spring/damper units are attached at their upper points by special flexible 'Lotocone' mountings. Welded-in pivot pins provide the mounting points for the front wishbones whilst the rear wishbones are located within lugs welded to the chassis.

It should be noted that all the suspension loadings are taken by the chassis and whilst the chassis unit possesses great torsional rigidity, the ultimate strength of the vehicle as a whole is dependent on the chassis attachment to its body.

Construction of the chassis is in mild steel sheet with local stiffness, either electrically or acetylene welded as applicable. The former welding process is the only method approved in Service and is:-

'CO_2 Inert Gas'

The front cross member serves a dual purpose and acts as the supply reservoir for the operation of the headlamp retraction units.

Both the power unit and final drive units are flexibly mounted within the chassis structure. The power unit is supported by two brackets, each carrying a rubber insulation block situated one each side of the cylinder block. The rear of the unit is supported by a mounting plate also incorporating its insulating block underneath the gearbox and bridging the chassis at this point. The final drive differential assembly is mounted by two cast lugs underneath the rear suspension cross member. Each mounting incorporates a flexible component in rubber, designed to assist in sound and vibration insulation.

Commencing at Chassis No.7895 onwards, the chassis unit has been stiffened even further by the addition of extra welding, this covering the sharp corner at each side of the rear end where the backbone abuts the closing plate. This modification is desirable for all cars. Use the 'CO_2 Inert Gas' welding process.

Current production cars have their chassis undersealed.

A.2 - MAINTENANCE.

A minimum of maintenance is required on the chassis unit itself. Occasional checks should be made to see that all body attachment points are tight and that ancillaries attached to the chassis are not loose. Checks should also be made to see that the

handbrake fulcrum pivot is functioning and an inspection of all suspension attachment points for tightness and ease of operation. Should the rare event occur that the vacuum reservoir be suspected of leakage a check should be made that the take off points themselves are not at fault before resorting to pressure testing the unit.

A.3 - ACCIDENT DAMAGE

Economics, available repair facilities and delivery circumstances provide the criteria for assessment of a chassis repair or replacement.

It follows from this that when parts are subjected to an ABNORMAL load the possibility of failure is increased and indeed incipient failure may be initiated. Incipient failure is the more dangerous form, as, having no visible effect, the part may be assumed to be in good condition and then fail in ensuing normal service.

Consequently, whenever a car suspension or steering is damaged, consideration should be given to secondary or shock damage.

For example, in the case of the front suspension, both steering mechanism and chassis mountings should be carefully examined for both misalignment and micro-cracks. Even when no damage is apparent to the mounting pins, if the wishbones have been damaged it is strongly advised that a new chassis be fitted. Should the mounting pins be damaged or bent, (however slightly) A NEW CHASSIS MUST BE FITTED. These principles must always apply where driver safety is the prime consideration.

Inspection should be made of engine and gearbox mounting points where a vehicle has been involved in impact. As the unit may have travelled forward, distortion could have occured; check for broken welds, etc.

Reference should be made to the critical dimensions shown on the general arrangement drawing (fig.1) for a complete damage assessment where any impact has occured. Diagonal checks from four points will show any mis-alignment.

Where broadside impacts or fire have created severe distortion conditions a replacement unit is essential.

Patching as a repair expedient is not recommended, whilst stretching can only be achieved with heat on the buckled surface of larger sections.

A.4 - CHASSIS UNIT - REPLACEMENT

In the event of a complete chassis 'write-off', it will be necessary to fit the replacement unit to a body shell. It may be found that the body shell mounting points may not exactly match the mounting holes on the new chassis flanges.

This condition is due to slight contraction of the body materials during its manufacturing and curing processes. Whilst every effort is made to keep the centre dimensions of all the bobbins within reasonable limits, it is recommended that the chassis be 'offered up' to the body before any assembly is undertaken. A visual check should be made for any holes that may not align with their respective mounting points in the body shell. These may be elongated just sufficiently to receive the mounting bolts. Drill and tap chassis (with body temporarily in position) to accept the mounting setscrews at:

a. Front suspension uprights.
b. Rear body cross-brace.
c. Intersection of top flanges of front side member.

It is suggested that prior to assembling the body unit to the chassis the fittings of certain components at this juncture will facilitate assembly; these are listed below:-
(All torque loadings are given in 'TECHNICAL DATA').

1. Remove masking tape from studs, nuts, holes etc.
2a. Locate and secure handbrake swivel tree to chassis, with spacer towards front end, longest rod to left-hand side.
b. Assemble fixings to outboard end of rods.
3a. Locate fuel pipe grommets in chassis backbone section and pass fuel pipe through grommets from front end.
b. Locate and secure nut, ferrule, and banjo connection to rear end of fuel pipe.
c. Leaving sufficient pipe at the rear, to reach the end of the chassis, tape pipe to rear cross member, and inside of chassis at the front.
d. Clip fuel pipe to chassis backbone and 'spread' clips to secure.
4a. Tap out handbrake locating bracket at front end.
b. Pass cable through bracket and chassis backbone holes.
c. Lubricate thread in bracket and wind adjuster into bracket approximately half-way. DO NOT SECURE.
d. Locate rear end of cable in clevis and secure with circlips.
5a. Apply adhesive (Dunlop 'S 919') to chassis, felt and 'Frustacone' foam grommets.
b. Cut out area of felt around seat belt mounting holes.
6. Locate and secure 'Frustacones' to chassis.
7. Locate and secure 'Lotacones' to chassis. Secure bolts with Loctite 'AV'.
8a. Position felt on saddle, press evenly to ensure a good adhesion.

b. Position 'Frustacone' foam grommets on chassis and check for secure adhesion.

9. Assemble front and rear brake hoses to mounting brackets and secure. (NOTE: The rear hoses are fitted to UNDERSIDE of mounting brackets).

10a. Slide grommet over brake pipe ('T piece to pressure switch).

b. Bend pipe, pass through hole in chassis and locate in 'T' piece.

c. Locate and secure 'T' piece and grommet to chassis.

d. Bend pipe in pressure switch and locate and secure pressure switch to chassis.

e. Locate pipe in pressure switch and locate and secure pressure switch to chassis.

f. Tighten pipe nuts to tee-piece and pressure switch, and clip pipe to chassis. TORQUE LOAD PIPE NUTS.

11a. Bend pipes from pressure switch to front hoses, locate pipes and secure in clips.

b. Tighten pipes to pressure switch and hoses. TORQUE LOAD PIPE NUTS. TORQUE LOAD HOSE NUTS.

12a. Bend pipes from 'T' piece to rear hoses. Locate pipes and secure. TORQUE LOAD PIPE NUTS. TORQUE LOAD HOSE NUTS.

13a. Position differential unit on chassis.

b. Locate two special washers between differential unit and 'Frustacones', at each side.

c. Assemble bolts (bolt head to underside of chassis) with 3 special washers next to bolthead, to differential unit and loosely secure, using Loctite (AV).

14a. Locate torque rods (NOTE: LH & RH rods are different) to chassis. From Chassis No.7035, the mounting bolt heads have been tack-welded to the chassis.

b. Assemble mounting bush to torque rod. Pass rod through differential lug, add other bush, concave washer and nut.

c. Torque load rod in differential housing.

d. Tighten torque rods to chassis.

15. Tighten differential unit mounting bolts to 'Frustacones'.

16. Assemble special washers and differential unit mounting fixings to 'Frustacones', DO NOT SECURE.

17. Locate rear lower wishbones and secure (NOTE: All bolt heads face away from wishbone, i.e. bolt heads towards each other).

18a. Locate and secure gearbox mounting plate to chassis.

b. Assemble fixings for gearbox to plate. DO NOT SECURE.

19. Locate and secure front cross brace to chassis, using Loctite ('AV') on bolts.

20. Locate front upper and lower wishbones. Assemble nuts but do not secure completely.

21a. Remove locknut, nut, two washers and rubber bush from top of front damper unit.

b. Locate damper end in front upright and re-assemble nuts, washers and bush.

c. Locate damper to front lower wishbones, assemble bolts. (Bolt head towards front).

22a. Locate anti-roll bar to bushes in chassis (when vertical, recessed part of securing face towards rear of car).

b. Tighten bar to bushes (bolt heads outside of chassis).

23a. Locate front hub (GREEN - RH, RED - LH) to front lower wishbones. DO NOT SECURE.

b. Locate front upper wishbones to upper ball joint assembly on front hub. NB. All bolt heads towards front. Secure all wishbones to front hub bolts.

24. Tighten front damper nuts and locknuts to chassis.

25a. Assemble bolts to outer ends of front wishbones but DO NOT SECURE. NB. All bolt heads towards front.

b. Wire top and bottom wishbones pairs together, to prevent excess movement.

26a. Locate rubber mountings to steering unit.

b. Locate steering assembly to support plate.

c. Pack assembly with shims as denoted by figures on mounting plate (i.e. 140 denotes that 3 off .040 in. (1.016 mm) and 1 off .020 in. (.508 mm) shims are required). NB. Figures may differ from each side necessitating different thickness shim packs.

d. Locate clamps to rubber mountings and secure assembly to chassis (one washer only per nut).

e. Remove rack adjuster plug, locate earthing strap, refit and secure plug.

f. Remove one rack clamp nut, and check chassis is clean and free from paint and dirt. Locate earthing strap to chassis, refit and secure nut.

27a. Remove nuts from track rod ends.

b. Locate rod ends in front hub assembly.

28. Locate and secure front brake hoses in tabs on caliper units.

29a. Locate brake pipe, hose to front caliper. NB. TORQUE LOAD PIPE NUTS. TORQUE LOAD HOSE NUTS.

b. Tighten all fixings on front suspension except nuts securing wishbones and roll bar,

these to be tightened when car is on wheels in normal road condition.

30a. Locate bolts in Rotoflex couplings.

b. Position rear suspension assemblies (GREEN - RH, RED - LH) and bolt Rotoflex couplings to differential unit drive shafts. DO NOT SECURE.

31a. Locate rear suspension assemblies to rear lower wishbones and shim as required.

b. Assemble bolts but do not fully secure.

NB. If shims cannot be fitted, assemble two 7/16 in. (11.11 mm) washers to each bolt head. Remove clamps from Rotoflex couplings.

32a. Retract rear damper rod.

b. Locate rubber dust cover over rod and position correctly.

33a. Using spring compressor, compress springs and strap up over coils.

b. Position springs over damper rods and locate with end caps.

34a. Locate rear damper rods in 'Lotocones'and fit castellated nuts.

b. Tighten damper rod nuts, align and fit split pins.

35. Tighten bolts, rear hub to wishbone.

36. Tighten Rotoflex coupling nuts and all suspension nuts.

37. Remove spring clamps and check that springs are correctly located in end caps.

38a. Bend brake pipes (rear hose - caliper).

39. Locate brake pipes and secure to hose and caliper.

NB. TORQUE LOAD PIPE NUTS. TORQUE LOAD HOSE NUTS.

40. Remove differential unit filler/level plug and fill with oil (see Section 'O').

41. Locate and secure handbrake operating rods to rear calipers, ensuring that spacers are correctly located.

42. Tape up all loose wires, pipes, etc., to prevent excess movement.

43. Assemble chassis to body.

To Replace Front Suspension Lower Fulcrum Pin

1. Remove the front suspension as required (see Section 'C').
2. Remove the damaged pin by cutting through the supporting cupwashers. Grind the remaining parts of the cupwashers flat with the chassis.
3. After the cupwashers have been ground flush with the chassis, during which operation, the minimum amount only should be removed, the end of the fulcrum pin should be drilled and tapped 3/8 in. UNC to accept the threaded pilot of the tool. Use the short ended thread on the pilot to screw into the fulcrum pin.
4. After inserting the threaded pilot into the fulcrum pin, the body of the tool is placed over the pilot, followed by the feed nut which in its turn, is screwed down until the cutting edges of the tool just engage the surface to be cut. As each turn is made to the body of the tool, so the feed nut is screwed down a little until the cut is made. A ratchet handle is also available which facilitates the use of the tool.
5. The tool, known as:-

   'Cooke's Improved Hole Cutter' ($\frac{3}{4}$ in. o/d conduit)

   and

   'Cooke's Ratchet Handle'

   is available from Buck & Hickman Ltd., 2 Whitechapel Road, London, E.1., England.
6. Following the dimensions given in Fig. 2 and ensuring that the cupwasher (Part No. 026 A 0219) is vertical to the pin, weld one cupwasher in position on the new fulcrum pin (Part No. 026 A 0218), using ONLY a 'CO_2 Inert Gas' or 'Arc' welding process. The welding MUST be a CONTINUOUS WELD around the pin and to a high standard The correct welding rod for the materials used MUST always be chosen. Remove all 'slag' after welding.

Materials used are:		
	Chassis	'EN.2' mild steel
	Fulcrum pin	'EN.16T' steel
	Cupwasher	'EN.2' mild steel
7. Ensure that there is no combustible material (i.e., petrol or paint) in the vicinity of the pin location in the chassis. Remember that the cross-member is also the vacuum tank and petrol vapour could be present within it.

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8. Insert the pin into its location in the chassis and place remaining cupwasher in position. Ensure that the pin is parallel to the chassis and to the existing pin (see dimensions in illustration on page 'A.2'). Using the same welding procedure given above, weld the cupwasher to the pin and chassis.
9. After repair, the chassis cross-member must be vacuum tested.
10. Rebuild front suspension (see Section 'C').

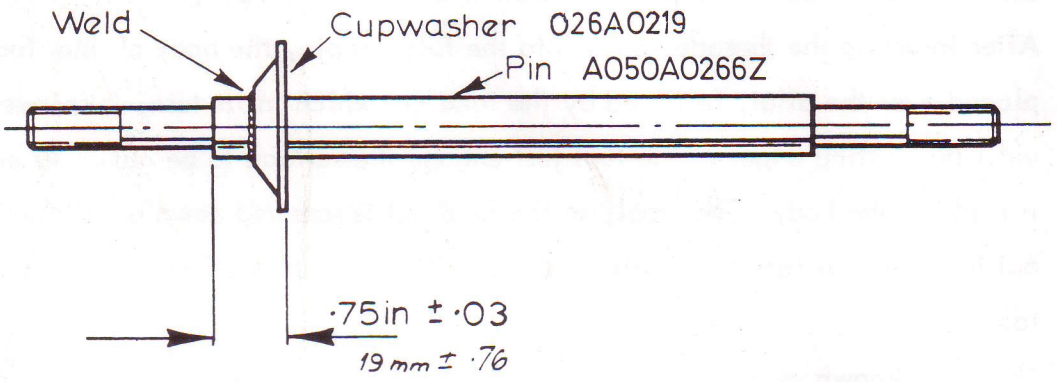

Fig. 2 WELDING CUP WASHER TO PIN