S E C T I O N A

CHASSIS UNIT

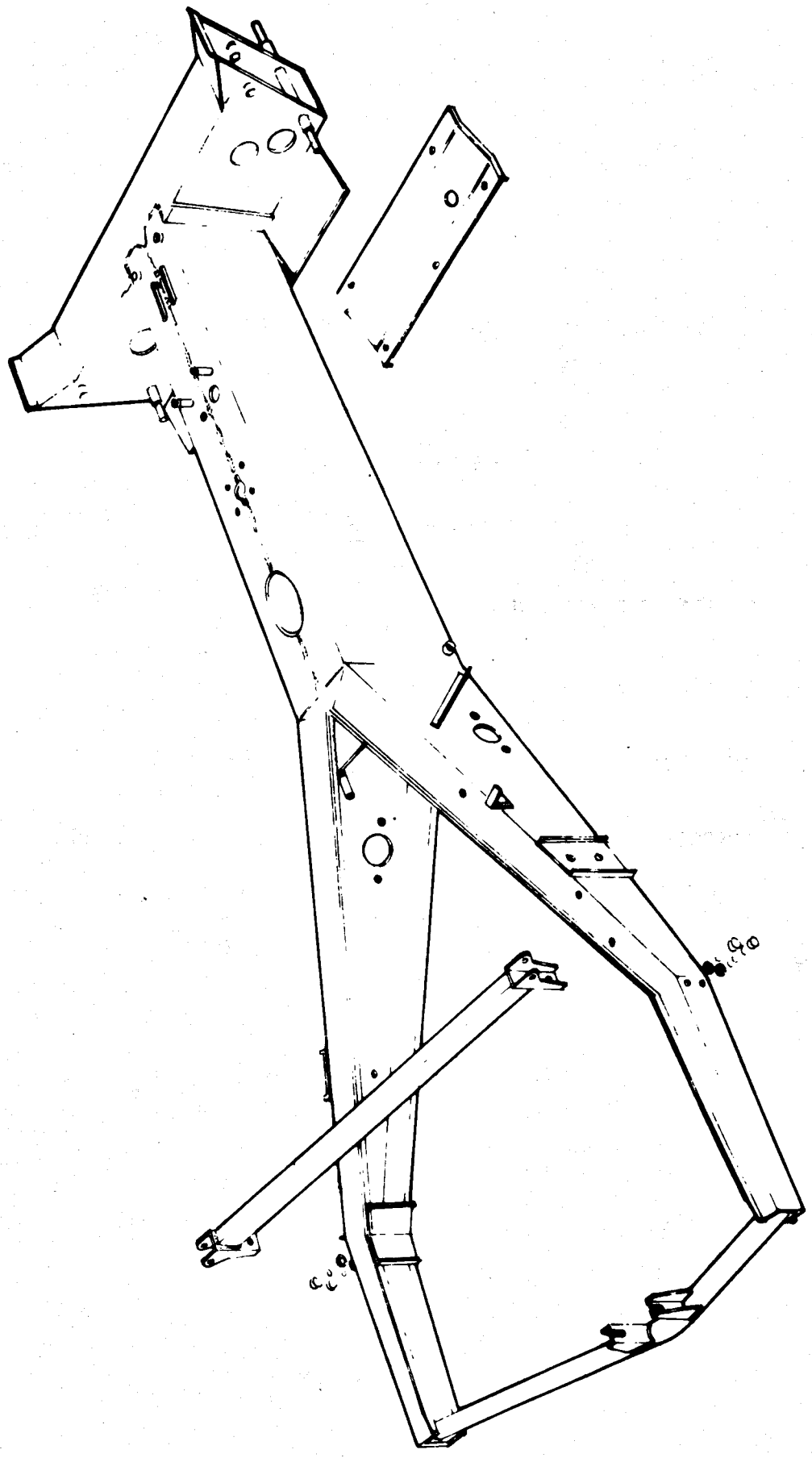


Fig. 1 - The Components of the Chassis Unit.

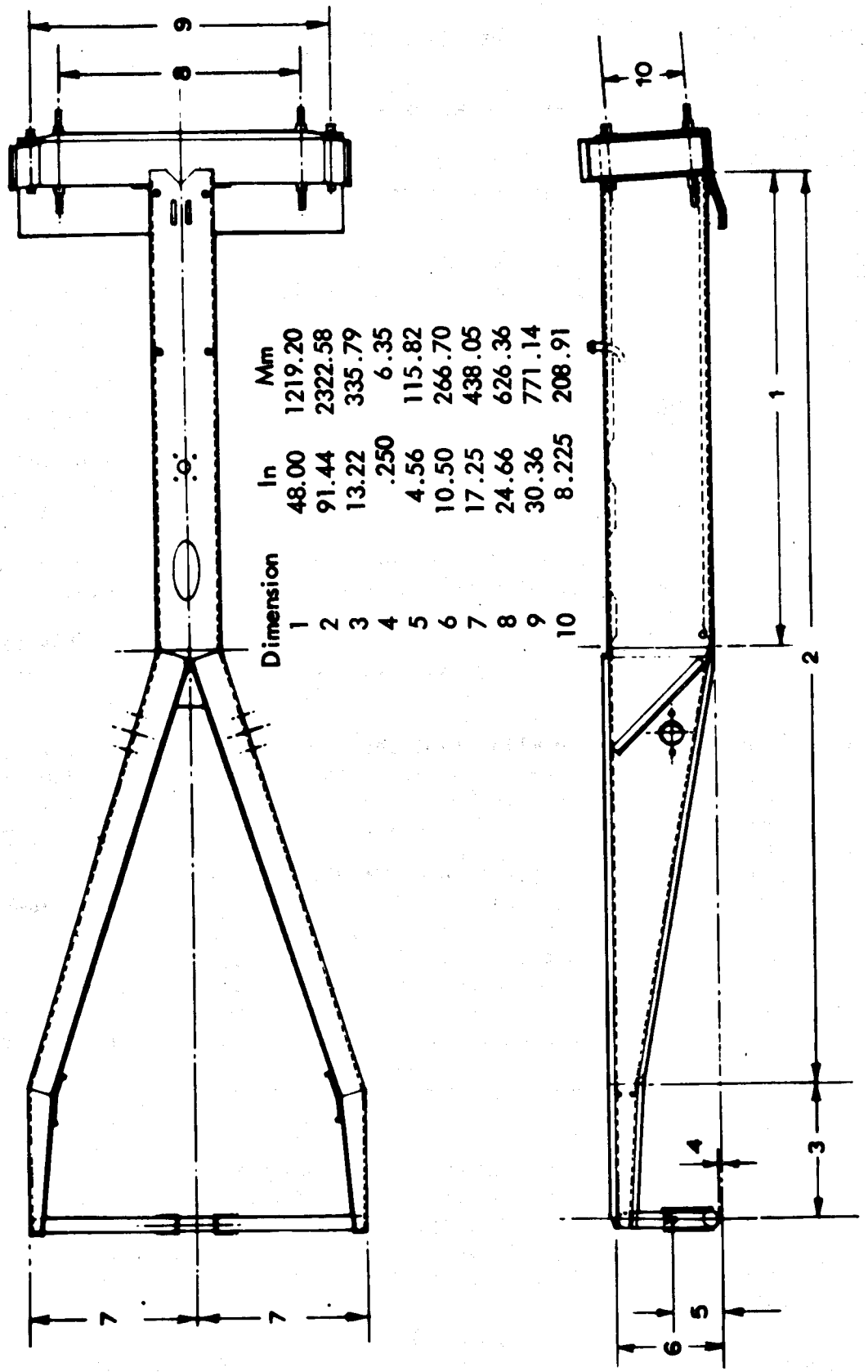
ILLUSTRATIONS

A.1 - GENERAL DESCRIPTION.

The chassis unit is of the fabricated backbone type with a bar section spine splayed and braced at the rear to support the engine/transmission unit.
A box section cross member added onto the front of the backbone carries the front suspension pivots and upper spring mountings.
Welded in pivot pins provide the mounting points for the front lower wishbones whilst the upper wishbones are located by detachable pivot pins passing through bushes welded into the cross member.
It should be noted that all the suspension loadings are taken by the chassis and whilst the chassis unit possesses great tortional 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 stiffeners, either electrically or acetylene welded as applicable. This latter 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 mounting for the steering unit.
The power and final drive unit is 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 welded in tubular cross member also incorporating its insulating block at the rear of the gearbox and bridging the chassis at this point. The radius arms are pivoted at the forward end of the splayed sides of the chassis. Each radius arm mounting incorporates a flexible component in rubber, designed to assist in sound and vibration insulation.

A.2 - MAINTENANCE.

A minimum of maintenance is required on the chassis unit itself.
Occasional checks should be made to see that all body attachments points are tight and that ancillaries attached to the chassis units 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.



Dimension	In	Mm
1	48.00	1219.20
2	91.44	2322.58
3	13.22	335.79
4	.250	6.35
5	4.56	115.82
6	10.50	266.70
7	17.25	438.05
8	24.66	626.36
9	30.36	771.14
10	8.225	208.91

Fig. 2 - General Arrangement of the Chassis 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 microcracks. 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.2) 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 surfaces 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 body be 'offered up' to the chassis before any assembly is undertaken. A visual check should be made for any holes that may not align with their respective mounting bolts.
their respective mounting points in the body shell. These may be elongated just sufficiently to receive the mounting bolts.
It is suggested that prior to assembling the body unit to the chassis the fitting of certain components at this juncture will facilitate assembly.
These are listed below :-
(All Torque loadings are given in 'Technical Data').

A/- Chassis-build, Standard Phase II Model.

Place chassis on trestles, right way up.
Remove 24 pieces of masking tape. Remove 'horseshoe' from handbrake cable.
Fit long brake pipe, surround by 2 grommets.
Thread loop of handbrake cable through slit in chassis. Retain the looped cable by fitting 2 clips.
Replace horseshoe onto looped cable.
Fit 4 way union to front chassis, separated from chassis by 4 packing washers.

Thread intermediate handbrake cable through 'horseshoe'. Pull out at rear end and attach locknuts and spring. Open free end of spring for entry in chassis hole.
Fit master cylinder to front chassis, attach with retaining plate, washers, and 2 nyloc nuts.
Re-enter cable in backbone and locate spring. Re-bend end of spring to original form.
Attach handbrake cable to both chassis forks, 3 springs clips per fork.
Form end of long brake pipe to fit front 4 way union, 3 bends. Torque 7 lb/ft.
Fit two engine mountings, 4 bolts, nyloc nuts/mounting. On RH mounting attach earth strap-chassis to engine. Fit 2 radius arm mountings, 2 bolts, nyloc nuts/mounting.
Attach master cylinder brake pipe to 4 way union, 4 bends.
Torque 7 lb/ft. (non servo vehicle only).
Attach LH and RH brake pipes to 4 way union. Torque 7 lb/ft.
Tap out 2 chassis seat belt mounting points, 7/16" UNF.
Insert 4 grommets in rear end plate (5 on servo vehicles). The large gear linkage grommet has upper part removed and later used for sealing gear lever.
Large grommet is attached to chassis with DUNLOP S 758 adhesive.
Insert grommet in chassis adjacent to heater outlet. Attach 3 grommets in front chassis(or 4 on servo vehicle) and blank-off unused holes with black adhesive tape.
Clean out 8 brake clip holes : 4 on underside of backbone, 2 on each chassis fork. Attach long brake pipe to chassis with 4 spring clips and 2 screwed clips. Bend pipe to suit form of chassis.
Attach 2 flexible heater hoses to rear chassis outlet with hose clips.
Fit 4 way pressure switch union to RH rear chassis fork, separated from chassis by 6 packing washers.
Remove masking tape off steering rack.
Attach steering rack to chassis with 2 brackets, (2 bolts/brackets), bolt heads placed within chassis box section.
Attach slave steering column to rack to ensure clearance when tightening rack assembly. Ensure Bundy pipes are free from brackets.
Connect free end of long brake pipe to the pressure switch union.
Torque : 7 lb/ft.
Connect 'U' shaped brake pipe to the pressure switch union.
Torque 7 lb/ft.
Fit 2 water transfer pipes within chassis backbone. Smear grommets with liquid soap to assist movement of pipe.
Servo vehicle only :
Bend 3/8" Bundy pipe on jig (vacuum supply rear).
Cut vacuum hose into three lengths 5½", 9", and 11".
Attach 2 hose clips to 5½" and 9" hoses and 1 clip to the 11" hose.
Smear ends with Castrol Rubber Grease.
Attach 'T' piece to the 5½" hose and connect the 60",3/8" Bundy pipe to the rear, 3/8" Bundy pipe with the 9" hose.
Insert 'front and rear' vacuum supply pipe in chassis backbone.
Attach 3/8" Bundy pipe to LH water transfer pipe with 3 grommets. Separate Bundy pipe from transfer pipe by black adhesive tape.
Attach 'T' piece hose to rear 3/8" Bundy pipe and the 11" hose to the front end of the 3/8" Bundy pipe.
Attach RH water transfer pipe and battery earth lead to RH chassis fork.
Fit header tank to chassis and attach LH transfer pipe to header tank with hose and 2 clips (hose and clips sub-assembly).
Collect engine number and transmission number from Works Order. Stamp body plate and chassis. Chassis number stamped on RH rear chassis fork.

Where a radio interference suppression kit is installed, the following additional operations are required :
Drill one hole ,¼" diameter on each rear chassis fork.
Fit earthing braid tags to each chassis fork.
Fit flexible brake pipe to RH chassis fork, tighten to bracket and brake pipe. Torque : 10 lb/ft.
Fit flexible brake pipe to LH chassis fork, tighten to bracket and brake pipe. Torque : 10 lb/ft.
Sub-assemble nylon ball to gear lever with 2 circlips.
Sub-assemble 2 washers to gear lever grommet, smear with Castrol Rubber grease and fit to chassis.
Sub-assemble gear change connecting link to gear lever, with lower retaining plate in position on gear lever. Joint effected by shoulder screw, nylon washers and nyloc nut. Threaded stud on free end of connecting link in downward position w.r.t. final position of gear linkage.
Insert gear linkage in chassis, position, and lock in place with retaining plate : 4 off 4 BA screws and spring washers. Attach rubber grommet over gear lever.
Insert speedometer cable in chassis, adjacent to heater outlet connection : Thread out of chassis along RH fork to RH gearbox mounting. Coil cable within chassis and leave on RHS of gear linkage, so cable end just protrudes by heater connections.
Insert heater and choke cable assembly through oval backbone hole, guide through grommets, choke cable RHS, heater cable LHS.
Apply Dunlop adhesive S 919 to chassis.
Attach 2 pieces of pre-formed felt to chassis. Ensure even application of felt. Trim felt to fit gear lever retaining plate.
Obtain front suspension parts : LHS, RHS.
Upper and Lower Wishbones - Wheel Hub Assembly - Bushes - Anti-roll bar - Nyloc Nuts - Bolts - Washers - Damper Assembly.
Position parts at front of chassis.

FRONT SUSPENSION RHS

Attach leading and trailing lower wishbones to RHS mounting spindle.
Retain by applying washer and nyloc nut, leaving loose.
Assemble upper trailing wishbone, damper unit and upper leading wishbone to stud. Stud head positioned at rear of front chassis section.
Locate damper unit in lower wishbone mounting point with 1 bolt inserted from front. Add washer and nyloc nut, leaving loose.
Attach wheel hub assembly to upper wishbone with 2 bolts, washers, and nyloc nuts. Bolt head at front and nuts left loose.
Attach wheel hub assembly to lower wishbone with 1 bolt, washer and nyloc nut. Bolt-head at front and nut left loose.
Connect steering link to wheel hub assembly, 1 nyloc nut and washer.

FRONT SUSPENSION LHS

Repeat the above operations for LHS.
Attach LHS flexible brake pipe from wheel hub assembly to chassis bracket and tighten to Bundy pipe. Torque 10 lb/ft.
Repeat the same operation for RHS.
Remove locknuts, cup, bush and cup off anti-roll bar location on underside of each damper unit, LHS and RHS.
Apply anti-roll bar to one damper unit mounting, secure with cups, bush and locknuts (leave nuts loose). Compress free end of anti-roll bar to other damper mounting point, retain with cups, bush and locknuts. (Leave

nuts loose). Locate anti-roll bar support struts on upper wishbone mountings LH and RH and secure with washers and nyloc nuts.
Tighten all suspension - anti-roll bar nuts and bolts.
Apply underseal compound to black masking tape at front of chassis.
Attach closing plate to front of chassis.
Check sub-assembled engine unit.
Attach silencer to engine unit with 2 brackets.
Tighten exhaust pipe clip and manifold clamp.
Attach bottom links to LH and RH gearbox brackets. Insert bushes.
Position gear change rod along RHS of engine.
Lift engine off trolley and locate in chassis mounting brackets.
Bolt engine to RH engine mounting bracket, leave nuts loose.
Bolt engine to LH engine mounting bracket, leave nuts loose.
Further assembly is divided between upper and lower builds :-

LOWER BUILD
Attach radius arm - drive shaft - wheel hub sub-assembly to RHS resilient chassis mounting.
Attach flexible brake pipe to bracket on RH radius arm and tighten to Bundy pipe. Torque 10 lb/ft.

Locate RH drive shaft on gearbox spline shaft. Lock in place with sub-assembled 'mecanindus' tension pins.
Repeat the three above operations for LHS.
Attach rear suspension cross-beam to chassis.
Locate damper unit in RH cross-beam mounting. Attach lower end of wheel hub unit. Connect lower link to wheel hub unit. Leave all nuts loose.
Attach handbrake cable to RH radius arm bracket. Cable not connected to brake unit.
Repeat the above two operations for LHS.
Tighten rear suspension nuts - 10 off.
Attach rear brake drums.

UPPER BUILD
Tighten engine-gearbox unit to flexible mounting brackets.
Connect earth strap to RHS of engine block.
Connect gear cross-over linkage.
Connect flexible water hoses :
a) Heater hose to heater control valve.
b) Header tank to engine block.
c) Heater control valve to engine block.
d) Heater hose to engine blook.
e) RH transfer pipe to engine block.
Where servo assisted brakes are fitted, cut carburettor manifold vacuum hose and insert 'T' piece.
Connect choke control cable to carburettor.
Connect heater control cable to control valve.
Connect speedometer angle drive to cable end. Insert gearbox end cover, and lock in position.
Re-route H.T ignition coil lead.
Stick rubber pad to RH chassis battery support bracket.
Coat chassis number with Plus Gas Formula 'B'.

B/- Chassis - Build Federal Specification Phase II Model.

Place chassis on trestles, right way up.
Remove 24 pieces of masking tape.
Remove 'Horseshoe' from handbrake cable.
Fit long brake pipe, surround by 2 grommets.
Thread loop of handbrake cable through slit in chassis. Retain the looped cable by fitting 2 clips.
Replace 'horseshoe' onto looped cable.
Bolt 'blanked' three way union to RHS of front chassis, separated from cha chassis by 4 packing washers.
Thread intermediate handbrake cable through 'horseshoe'. Pull out at rear end and attach locknuts and spring. Open free end of spring for entry in chassis hole.
Bolt three way union to LHS, separated from chassis by 4 packing washers.
Bend end of long brake pipe to fit RH union, 3 bends. Torque 7 lbs/ft.
Re-enter handbrake cable in backbone and locate spring. Re-bend end of spring to original form.
Attach LH brake pipe to LH union, straight pipe. Torque : 7 lbs/ft.
Attach RH brake pipe to LH union. 4 bends. Torque : 7 lbs/ft.
Attach handbrake cable to both chassis forks, 3 springs clips per fork.
Clean out 8 brake clip holes, 4 on underside of backbone, 2 on each chassis fork. Drill extra hole for screwed clip at intersection of backbone and RH chassis fork.
Fit 2 engine mountings, 4 bolts, nyloc nuts, washers/mounting. On RH mounting attach earth strap - chassis to engine.
Fit two radius arm mountings, 2 bolts, nyloc nuts, washers/mounting.
Attach long brake pipe to chassis with 4 spring clips and two screwed clips.
Bend pipe to suit form of chassis.
Fit 4 way pressure switch union to chassis, separated from chassis by 6 packing washers.
Tap out 2 chassis seat belt mounting points, 7/16" UNF.
Connect free end of long brake pipe to the pressure switch union.
Torque : 7 lbs/ft.

Fit 4 grommets to rear end plate. The large gear linkage grommet has upper part removed and later used for sealing gear lever. The large grommet is attached to chassis with Dunlop S 758 adhesive.
Insert grommet in chassis adjacent to heater outlet. Attach 3 grommets in front chassis and blank-off unused holes with black adhesive tape.
Attach 2 flexible heater hoses to rear chassis outlets with hose clips.
Connect 'U' shaped brake pipe to the pressure switch union.
Torque : 7 lbs/ft.
Remove masking tape off steering rack. Attach steering rack to chassis with 2 brackets (3 bolts/bracket), bolt heads placed within chassis box section.
Attach slave steering column to rack to ensure clearance when tightening rack assembly.
Ensure Bundy pipes are free from bracket.
Connect 'V' shaped brake pipe to the pressure switch union. Attach to chassis with 3 spring clips. Torque : 7 lbs/ft.
Fit 2 water transfer pipes within chassis backbone. Smear grommets with liquid soap to assist movement of pipe.
Fit header tank to chassis and attach LH transfer pipe to header tank with hose and 2 clips. (Hose and clips sub-assembled).
Attach RH water transfer pipe and battery earth lead to RH chassis fork.
Collect engine number and transmission number from Works Order. Stamp body plate and chassis. Chassis number stamped on RH rear chassis fork.

Locate anti-roll bar support struts on upper wishbone mountings. LH and RH and secure with washers and nyloc nuts.
Tighten all suspension - anti-roll bar nuts and bolts.
Apply underseal compound to black masking tape at front of chassis.
Check sub-assembled engine unit.
Attach silencer to engine unit with 2 brackets. Tighten exhaust pipe clip and manifold clamp.
Attach bottom links to LH and RH gearbox brackets, insert bushes.
Position gear change rod along RHS of engine.
Lift engine off trolley and locate in chassis mounting brackets.
Bolt engine to RH engine mounting bracket, leave nuts loose.
Bolt engine to LH engine mounting bracket ; leave nuts loose.
Further assembly is divided between upper and lower builds :-

LOWER BUILD.
Attach radius arm - drive shaft - wheel hub and assembly to RHS resilient chassis mounting.
Attach flexible brake pipe to bracket on RH radius arm and tighten to Bundy pipe. Torque : 10 lbs/ft.
Locate RH drive shaft on gearbox spline shaft. Lock in place with sub-assembled 'mecanindus' tension pins.
Repeat the above three operations for LHS.
Attach rear suspension cross-beam to chassis.
Locate damper unit in RH cross-beam mounting. Attach lower end of wheel hub unit. Connect lower link to wheel hub unit, Leave all nuts loose.
Attach handbrake cable to RH radius arm bracket. Cable not connected to brake unit.
Repeat the above two operations for LHS.
Tighten rear suspension nuts -10 off.
Attach rear brake drums.

UPPER BUILD.
Tighten engine-gearbox unit to flexible mounting brackets.
Connect earth strap to RHS of engine block.
Connect gear cross-over linkage.
Connect flexible water hoses :-
a) Heater hose to heater control valve.
b) Header tank to engine block.
c) Heater control valve to engine block.
d) Heater hose to engine block.
e) RH transfer pipe to engine block.
Connect choke control cable to carburettor.
Connect heater control cable to control valve.
Connect speedometer angle drive to cable end. Insert in gearbox end cover, and lock in position.
Re-route H.T. ignition coil lead.
Stick rubber pad to RH chassis battery support bracket.
Coat chassis number with Plus Gas Formula 'B'.