PUBLICATION PART No. RFP 57

SERVICE SCHOOL DATA BOOK

STANDARD-TRIUMPH MOTOR COMPANY, INC.

1745 BROADWAY • • • • NEW YORK 19, N. Y.

TR2/3 ABRIDGED SPECIFICATION

For Full Details See Service Manual

B.H.P.	TR-2 90 at 4,800 rpm TR-3 100 at 5,000 rpm
Number of cylinders	4
Dia. of cylinder bores	3.268 ins. (83mm)
Strokes of crank	3.622 ins. (92mm)
Compression ratio	8.5
Compression pressure	125 lbs./sq. ins.
TR-3 valve clearance (cold)	.010
TR-2 valve clearance (cold)	Inlet .010 Exhaust .012
Valve timing	Inlet opens - 15° before T.D.C. Exhaust opens - 15° after T.D.C.
Spark plug gap	.025
Spark plug type	Lodge CNY
Ignition timing	4° before T.D.C. static
Distributor gap	.015 ins.
Oil Pressure	70 lbs./sq. ins. at 2000 rpm at 185°F

DIMENSIONS

Wheelbase	7 ft. 4 ins. (225cm)
Track front	3 ft. 9 ins. (114 cm)
Track rear	3 ft. 9½ ins. (115.5 cm)
Turning circle	32 ft.
Turning circle with disc brakes	35 ft.
Weight (with tools & fuel)	2128 lbs.
Overall length	12 ft. 7 ins.
Overall width	4 ft. 7½ ins.

CAPACITIES

Engine oil from dry		8.4 pints
drain & refill		7.8 pints
Gearbox		1.8 pints
with overdrive dry		4.2 pints
drain & refill		3.3 pints
Rear axle		1.8 pints
Fuel tank	TR-2	15 gallons
	TR-3	14.4 gallons
Radiator capacity		16.8 pints
Radiator capacity with heater		17.4 pints

Rear axle ratios	3.7 and 4.1
Gearbox ratios	See separate table, page 13

TIRE PRESSURES

Dunlop	front	22 lbs./sq. ins.
	rear	24 lbs./sq. ins.
Michelin	front	24 lbs./sq. ins.
	rear	28 lbs./sq. ins.

TRACK (or TOE-IN)

When fitted with Dunlop tires	$^1/_8$ ins. toe-in
When fitted with Michelin tires	Parrallel to $^1/_{16}$ ins. toe-in
Outer track rods basic length	7.68 ins.

LIST OF MAJOR CHANGES ON TR-3 and TR-3A ENGINES

CRANKSHAFT

The crankshaft now in use has been incorporated since June 1955. The part number is 301815.

BIG END BEARING

The VP3 bearing was introduced at Engine No. TS-11427-E as normal production. The part number was 113381.

BIG END BEARING

The above bearing has the running clearances increased and the part number has been altered to 117590. This bearing was introduced at TS-20780-E. See Service Information Sheet Sport 25/B.

FULL FLOW OIL FILTER

Introduced at Engine No. TS-12560-E. Replaceable element (part number 101963) is the same as for previous filters and is interchangeable. See Service Information Sheet Sport 20/B.

ALUMINUM ROCKER SHAFT PEDESTALS

Introduced at Engine No. TS-12564-E. Reduces tappet noise when engine is cold. Inlet and exhaust tappets are now set to .010 inch clearance when cold.

CYLINDER HEADS

Three types of cylinder heads have been used, see attached list. In each case the appropriate manifolds must be used.

CARBURETORS

The "SM" type needle (part number 504028) was fitted to the TR-3 carburetor type H6 from TS-10037-E. Flexible mounting of carburetor float chambers was introduced at TS-9720-E.

CLUTCH

A new type clutch center plate (part number 116638) was introduced at TS-18479-E. The new plate has a lining material which is woven as compared with the previous material which was moulded.

BRAKES

Front disc brakes were fitted from Commission Number TS-13046. "Girling" manufacture.

REAR AXLE

Rear axle changed to taper roller bearings in rear hubs from Commission Number TS-13046.

Two axle ratios available:	Normal ratio	3.7 to 1
	Ratio for use with overdrive	4.1 to 1

RECENT TR INCORPORATIONS

TS-20230	Restrictor valve installed in the hydraulic brake line at the 5 way connector.
TS-20832	First gear tooth profile strengthened.
TS-26656	3.7:1 axle ratio speedo calibrated for Michelin tires were installed.
TS-26704	4.1:1 axle ratio speedo calibrated for Michelin tires were installed.
TS-26825	Needle roller bearing replaced plain spigot bush on gearbox mainshaft.
TS-27689	Front disc brake dirt shields installed.
TS-32169	S.U. Carburetor flat tops with rubber connections installed.
TS-33894	Rear wheel brake cylinder diameter reduced from $^{3}/_{4}$" to $^{5}/_{8}$".
TS-34533	One piece column replaced by split steering column.
TS-38177	Line fuses to brake and parking lights installed.
TS-40104	Radiator millboard air deflector installed.
TS-50001	Silent starter motor drive including flywheel and gearbox casing installed. Gearbox oil level dipstick replaced by inspection plug.
TS-54741	Ring gear tab washers replaced by lock washers.
TS-54841	10"diameter rear brakes replaced by 9" diameter.
TS-60001	Introduction of rheostat type panel switch and Lucas patent wiring connections.

DETAILS OF DIFFERENT CYLINDER HEADS FITTED TO TR-3

There has been some confusion in the past regarding the various combustion heads, manifolds and gaskets that have been fitted to the TR-3 since its inception. The following information should help your Service Manager and Parts Manager and we should like to emphasize that these items are only interchangeable in sets.

Triumph TR-3

	Part No.	
Combustion Head	501209	
Inlet Manifold	302118	Fitted up to Commission TS9349E only.
Manifold Gasket	106937	

Le Mans Type

	Part No.	
Combustion Head	503662	
Inlet Manifold	302006	Fitted from Commission TS9350E TS12605E; TS12607E to TS13023E; TS13029E; TS13032E to TS13036E; TS13044E to TS13051E only.
Manifold Gasket	113122	

High Port Type

	Part No.	
Combustion Head	503663	
Inlet Manifold	302119	Fitted to Commission TS12606E; TS13024E to TS13028E; TS13030E to TS13031; TS13037 to TS13043E and TS13052E and future.
Manifold Gasket	113122	

Interchangeable Only In Sets

Extract from Bulletin number 71, dated July 26, 1957. Information recieved factory letter, reference July 17, 1957.

TR-3 NUT TIGHTENING TORQUE

This list only includes tightening torques on the most commonly used nuts.
A complete list is given in the TR Manual (Part No. 502602), Priced $9.75.

Operation	Description	Detail No.	Specified Torque Range lb/ft.	Remarks
Engine				
Cylinder Head	½" UNF & UNC Stud	106960 106959	100-105	Tighten nuts with engine cold
Connecting Rod Caps	$^{7}/_{16}$" UNF Bolt	105312	55-60	
Main Bearing Caps	½" x 13 NC Setscrew	57121	85-90	
Flywheel Attachment to Crankshaft	$^{3}/_{8}$" x 24 NF Setecrew	102065	42-46	
Attachment Of Oil Filters	$^{5}/_{16}$" x 18 x 24 UNC Bolts Cap Nut Bolt	HB.0874 HB.0882 DN.3408 HB.0856	18-20	
Rocker Pedestal	$^{3}/_{8}$" NF & NC Stud	108205	24-26	
Rear Axle				
Bearing Caps to Housing	$^{3}/_{8}$" x 24 UNF Setscrew	100878	34-36	
Hypoid Pinion Flange	$^{5}/_{8}$" x 18 UNF	100892	85-100	To suit split pir holes
Hub to Axle Shaft	$^{5}/_{8}$" x 18 UNF Nut-Slotted	100892 112635	110-125 125-145	From Axle No. TS8039

REMOVAL AND REPLACEMENT OF TR ENGINE

If the TR engine is to be taken out of the chassis it is taken out with the gearbox in one unit.

If the gearbox is to be removed the engine can be left in position the box being removed through the car interior.

The removal of the engine entails removal of the radiator and front apron.

Disconnect the battery.
Turn off petrol at shut off tap.
Remove the hood.
Drain coolant—two drain taps.
Drain engine oil and gearbox oil.
Disconnect head and parking lamp cables at snap connectors.
Remove apron.....this entails.....

Removing top bracket bolts, the bolt in the center of the cowling (this holds the hood lock). Release cable control at one side. Remove 12 cap screws (6 per side) holding front apron and fenders. These setscrews are located in the wheel arches. Remove crank handle bracket with steady rods and finally the belt from the steady plate and lift off apron.

To remove radiator.....

Remove top and bottom hoses.
Release tie rods.
Remove 2 base bolts (one at either side of radiator).
Remove caburetor complete.
Remove horns and lay on top of valances. (Do not disconnect wiring).
Remove generator and fanbelt.

Remove front chassis cross tube (3 bolts at each flange).

Disconnect the flex fuel pipe at shut off tap, oil pressure gauge pipe, starter motor cable, tachometer drive at knurled nut on distributor pedestal and withdraw temperature gauge bulb.

Remove seat cushion and unscrew 8 nuts from each seat base thus releasing the frame from the runners.

Remove gear lever grommet (3 self tappers) and gearbox cover (13 cup screws).

Disconnect speedo cable and overdrive electric cable at snap connector.
Remove starter motor (2 bolts).
Disconnect bundy tubing from clutch hydraulic line flex (thus draining sytem) and withdraw flex from its bracket.
Disconnect front universal joint.
Remove 2 nuts from rear chassis mounting.
Remove 2 bolts from each front engine mounting.
Sling engine "nose up" and remove unit.

SIMPLIFIED LUBRICATION DATA OF ALL TRIUMPH MODELS

Engine	Over 80 °F Temperature	SAE 30
	30 - 80 °F	SAE 20
	below 30 °F	SAE 10
Gearbox	Over 30 °F Temperature	Hypoid 90
Steering box	Under 30 °F Temperature	Hypoid 80
Rear axle		
Carb dash pots	Summer	SAE 20 W
	Winter	SAE 5 W
Water pump	Use normal chassis grease	

Important:

When greasing rear hub bearing, do not use a pressure grease gun. Use only a hand gun to avoid pressure damage to the hub oil seals.

THE 16 STEPS IN S.U. CARBURETOR ADJUSTMENT

1. Remove valve cover and spark plugs, slacken off both bolts of rear throttle spindle coupling. Remove air cleaners and wash filter element. Undo clip for outer choke cable on front carb linkage and remove clevis pin from rear carb choke connecting rod.

2. Test compressions - should be approximately equal for good timing.

3. If a "C" type wrench adapter is not available remove rocker shaft assembly to torque all head bolts to 100 lbs./ft.

4. Adjust rocker clearance (.010 cold). All adjustments to be made on the back of the cam.

5. Clean and adjust dist gap (.015). Light smear of grease on cam. Check auto advance.

6. Check static ignition timing (4°B.T.D.C., subject to local fuel octane value). Using test 12V. lamp.

7. Clean and adjust spark plugs (.025"). Lodge CNY Spark Plug.

8. Check fuel level in carbs. Quick check with dash pots off - hold jets in rich position - fuel should not flood over top of jets - if it does, adjust levels to ½". Check that needles are free and not binding in jets.

9. Replace dash pots and top up dampers with oil. SAE 20 for summer SAE 5 for winter.

10. Run engine to warm up to normal temperature (185°F).

11. Screw up jet adjusting nuts (turn clockwise) to full weak position and turn back 5 flats on each nut.

12. As the carb throttle spindles are disconnected (step 1) turn each throttle adjusting screw to produce the same hissing sound at 800 rpm (or same vacuum reading on Uni Syn gauge).

13. Check that the fast idling screw is not interfering with this adjustment on the front carb.

14. Now check each carb individually for correct mixture. To check front carb, cut out rear carb by lifting rear piston all the way up, the engine will run on the front carb. The revs should rise slightly and fall immediately to about a steady 400 rpm. Check the rear carb by reversing this process. The jet adjusting nuts will probably have to be either weakened or enriched by trial and error to get desired results.

15. Recheck the "hiss" on each carb at 800 rpm - this may have risen on one or other due to improving the mixture. Adjust on throttle screws if necessary.

16. Tighten throttle spindle coupling, ensuring that the throttle screws are on their stops, lubricate throttle linkage. Replace choke linkage, making sure that there is a little slack in cable so as not to pull the jets down. Replace air cleaner and adjust fast idling screw.

TR-3 Exhaust System Vibration

Exhaust system vibration can be caused by various causes.

If the exhaust system has been assembled with the rubber mounting in torsion, then this will lead to vibration, the same can be said of the muffler and resonator clips.

To correct this condition, loosen off all exhaust pipe mount bolts, examine rubber bushing to ensure that there is no metal to metal contact, replacing bushings if necessary. Loosen off muffler and resonator clip bolts. With all the mountings and clips loose move the exhaust system sideways and up and down to ensure that the whole system assumes its normal run without any strain, then retighten all mountings and clips.

Exhaust pipe rattle or knock.

A knock can also be heard from the exhaust system under certain conditions and if this knock is apparent, the actual cause can be very difficult to locate. The cause of the knock is due to the fact that the run of the front exhaust pipe is such that where the pipe goes through the center X member of the chassis frame it is touching the frame, particularly if the engine is allowed to vibrate unduly, such as pulling slowly in top gear.

This complaint can be easily cured by slightly bending the central exhaust mount upwards. This mount is located just forward of the X frame member.

Numerous cases will be found too, where in service the vertical rubber strip of the tail pipe mounting has been replaced by a metal strip, such a condition is sure to cause a vibration and is so positioned as to allow the rubber strip to be vertical and not strained forward, as so often is the case.

BRIEF ASSEMBLY INSTRUCTIONS
TO FIT TR CROWN WHEEL AND PINION

(Full Details Must Be Read In The Service Manual)

1. Fit both pinion outer bearing rings.
2. Fit dummy pinion and torque to 15/18 lbs./ft.
3. Take gauge reading, subtract .002/.003" and make up shim pack. (Check with original).
4. Fit shim pack under pinion head bearing and press on head bearing.
5. Fit pinion spacer (chamfer to tail) and original shim pack and assemble.
6. Fit tail bearing (minus oil seal) and U/J flange.
7. Torque to 85/100 lbs./ft.
8. Check preload (15/18 ins./lbs.) and adjust if necessary.
9. Strip U/J flange, fit oil seal and reassemble and torque and split pin.
10. Fit diff bearings (no shim) and assembly in casing. Tighten cap nuts and release $^1/_4$ turn.
11. Check total end float (A) and run out on crown wheel mounting. (Should not be more than .003).
12. Remove assembly and fit diff gears (if these have been removed).
13. Fit crown wheel. Torque bolts to 22/24 lbs./ft. Tab over.
14. Refit crown wheel assembly in casing (still less shims).
15. Check end float of crown wheel.
16. This end float minus .005 (for back lash) is the thickness of the shim pack for the crown wheel side.
17. The shim pack thickness for the other side is -
    The total end float (A) minus shim pack thickness for the crown wheel side plus .005 for preload.

    Example: .062 minus .040 plus .005 = .027
18. Remove both diff bearings.
19. Fit respective shim packs and reassemble.
20. Replace diff assembly.
21. Check crown wheel teeth for back lash (.004 to .006).
22. To correct back lash if necessary, transfer shim from one side to other.
23. Make a tooth marking test.

TR-3 WHEEL SHIMMY, VIBRATION OR WHEEL TRAMP

Too often when dealing with any of the above conditions it is considered that balancing the tires and wheels is all that is necessary to rectify any or all of the above conditions.

Before wheel balancing is carried out the wheels should be checked for concentricity. In this connection, the Standard Motor Company specified by the British Society of Motor Manufacturers and Traders.

(a) Wobble

The lateral variation measured on the inside vertical flange shall not exceed $^1/_{16}$".

(b) Lift

On a wheel mounted on a truly revolving hub the difference between the high and low points, measured at any location on either side of the tire bead seat shall not exceed $^1/_{16}$".

When road wheel is found to be running out sideways or wobbling in a lateral plane by more than $^1/_{16}$" (.060") then corrective effort is required. In the case of a pressed steel wheel this can be accomplished with the use of a press and with a wire wheel adjustment can be made to the spokes to rectify.

Where the wheel is radially eccentric to the hub in excess of the above limits, in the case of a pressed steel wheel the wheel should be replaced as the corrective effort would not be economical. A wire wheel can be adjusted by adjustment to the spoke nipples provided the wheel rim is not buckled.

It will be appreciated that if a tire has been running on a wheel which is out of round radially or in other words is rising and falling when revolving, then if the tire is fitted to a new concentric wheel, the tire tread having been worn on the eccentric wheel will not run true on the new wheel. The amount of variation in the tread wear will depend on the mileage run and in extreme cases the variation will be so excessive as to require grinding of the tread or replacement of the tire.

TR-3 ROAD SPEED DATA AND GEAR RATIOS

	O.D. Top	Top	O.D. 3rd	3rd	O.D. 2nd	2nd	1st	REVERSE
Gearbox Ratios	0.82	1.00	1.09	1.325	1.64	2.00	3.38	4.28
Overall Ratios:								
3.7 Axle	3.03	3.7	4.02	4.9	6.07	7.4	12.5	15.8
4.1 Axle	3.28	4.1	4.35	5.3	6.57	8.0	13.5	17.1
Engine Speeds (3.7 axle) Using Dunlop Tires:								
at 10 M.P.H.	410	500	540	660	820	1000	1630	2130
at 10 km./hr.	250	310	340	410	510	620	1050	1320
Using Michelin X Tires:								
at 10 M.P.H.	420	515	560	680	850	1020	1720	2280
at 10 km./hr.	250	320	350	420	530	630	1070	1340
Engine Speeds (4.1 axle) Using Dunlop Tires:								
at 10 M.P.H.	440	550	580	710	890	1080	1830	2300
at 10 km./hr.	270	340	360	440	550	670	1140	1450
Using Michelin X tires:								
at 10 M.P.H.	450	565	600	730	910	1100	1860	2350
at 10 km./hr.	290	360	380	460	510	690	1160	1470

TR-3 GEAR LEVER RATTLE

In spite of the fact that the TR-3 incorporates an anti rattle device at the lower end of the gear lever complaints are still being received by the Service Department that gear lever rattle or chatter is still being experienced by some owners of TR-3s.

This complaint can be very easily cured if the following procedure is adopted.

1. Undo lock nut and remove nut and gear lever knob.
2. Remove gear lever boot.
3. Remove the screw and bolt from the domed gear lever cap being careful not to let the gear lever rise up and disturb the anti rattle spring still in position.
4. Observing the precautions in step 3 withdraw the domed cap and domed washer leaving the coil spring still in position.
5. Examine the irregular shaped hole in the cap and if the edges of the hole show that the gear lever has been rubbing against the edges obtain more clearance at these points by filing the edges.
6. Obtain a piece of plastic hose $^{7}/_{8}$" long and $^{5}/_{8}$" bore and insert this hose over the gear lever and inside the coil spring.
7. To reassemble reverse the above procedure, smearing some grease on the top side of the domed washer before replacing the domed cap.

TR REAR AXLE RATIO IDENTIFICATION

The TR axle ratio can be determined by visual examination of the rear axle cover.

3.7:1 ratio (37T x 10T) has a dab of green paint on the cover.

4.1:1 ratio (41T x 10T) has a dab of green paint and a dab of white on the cover.

THE OVERDRIVE

THE DIAGNOSIS AND RECTIFICATION OF FAULTS

There are six symptoms under which the various Overdrive faults can be classified:

1. Overdrive does not engage
2. Overdrive operates on all gears
3. Overdrive will not remain engaged
4. Overdrive does not release
5. Clutch slip in Overdrive
6. Clutch slip in reverse or freewheel condition on overdrive.

When dealing with an Overdrive complaint really get down to what the symptoms are before tearing the Overdrive unit out of the car. Any fault can be classified under one of the above headings. 75% of Overdrive complaints can be serviced without removal of the unit from the car and quite a few can be rectified without removal of the gearbox covering.

Having classified the symptoms under one of the six headings we can now carry out a short series of tests for which each symptom is given.

For Symptom No. 1.....Overdrive does not engage.
Carry out the folowing checks.

- (a) Insufficient oil in the unit
- (b) Check elect system
- (c) Check solenoid lever setting
- (d) Check hydraulic oil pressure

For Symptom No. 2.....Overdrive operates on all gears

- (a) Check elect system (as in 1b)
- (b) Check solenoid lever setting (as in 1c)

For Symptom No. 3.....Overdrive does not remain engaged

- (a) Check operating valve for leakage - check for hydraulic pressure

For Symptom No. 4.....Overdrive does not release

- (a) Electric control not operating (see 1b)
- (b) Blocked restrictor jet in the operating valve (see 3a)
- (c) Check solenoid lever setting (see 1c)
- (d) Sticking cone clutch

For Symptom No. 5.....Clutch slip in Overdrive

- (a) Insufficient oil in the Overdrive Unit (see 1a)
- (b) Check solenoid lever setting (see 1c)
- (c) Insufficient hydraulic pressure (see 3a)
- (d) Worn or burned Cone Clutch outer lining

For Symptom No. 6.....Clutch slip in reverse of freewheel condition in Overdrive

- (a) Blocked restrictor jet in operating valve (see 3a)

OVERDRIVE TEST PROCEDURE

Having ascertained the symptom of the fault in the Overdrive carry out as described below for that particular symptom.

Symptom No. 1.....Insufficient oil in the unit.

(a) The oil lever should be checked by means of the gearbox dipstick or level plug. (The gearbox capacity with Overdrive is 4.2 pints from dry or drain and refill 3.3 pints).

(b) Electrical test checks - see notes on page 16A.

(c) To check solenoid setting lever energise solenoid when the setting lever should move to a position so that the $^{3}/_{16}$" diameter hole in the lever will line up withthe $^{3}/_{16}$" diameter hole in the casing. for adjustment procedure refer to Service Manual, Gearbox Section page 21.

(d) Check hydraulic oil pressure. The required working pressure is 470 to 510 lbs./sq.ins. To check, remove the red painted cap on the right-hand top side of unit - after ensuring that there is no pressure in the system by operating the setting lever 10 times to reduce pressure. Screw in the adaptor and attach the Churchill guage. Raise the rear wheels off the ground and run the in top gearing observe the gauge reading which should give the above reading.

Symptom No. 2.....Overdrive operates on all gears.

(a) Electrical test checks.

(b) See 1c.

Symptom No. 3.....Overdrive will not remain engaged.

(a) Check operating valve for leakage.

(b) See 1d.

Symptom No. 4.....Overdrive does not release.

(a) See 1c.

(b) Blocked restrictor jet.

(c) See 3a.

(d) Sticking cone clutch.

Symptom No. 5.....Clutch slip in Overdrive.

(a) See 1a.

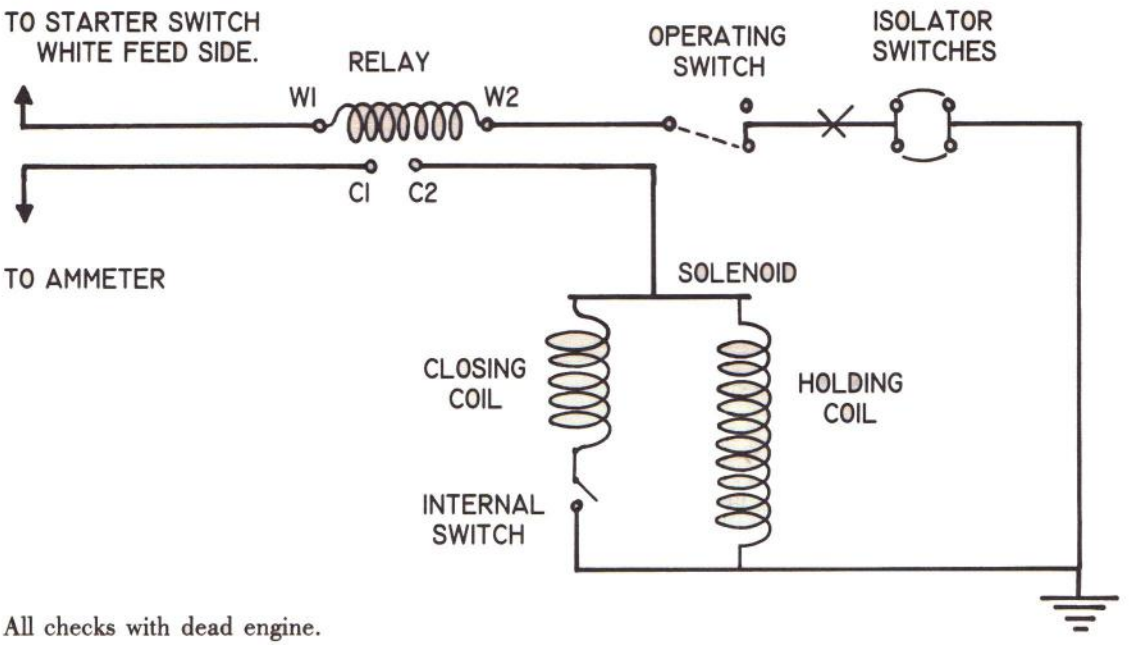
(b) See 1c.

(c) See 3a.

Symptom No. 6.....Clutch slip in reverse or freewheel condition in Overdrive.

(a) Blocked restrictor jet.

OVERDRIVE ELECTRICAL CHECKS



All checks with dead engine.

Terminal C1 on the relay should be live at all times (when battery is connected).
Terminal W1 should be live when the ignition switch is on.

There are two snap connectors in the circuit, one between relay terminal C2 and the other between the operating switch and the isolator switchs. These snap connectors are located under the drivers carpet adjustment to the gas pedal.

CHECK 1 — Check that C1 is live using a test lamp between C1 and ground.

CHECK 2 — Wiring ignition switch "On" check W1 to ground.

CHECK 3 — To check solenoid.
(a) Connect C1 to C2, when the solenoid "click" should be heard.
(b) If (a) fails, connect C1 to solenoid side of snap connector.
(c) If (a & b) checks fail remove solenoid and bench test.

CHECK 4 — To check relay.
(a) Connect W2 direct to gound. C2 should then be live. (Ignition switch "On").

CHECK 5 — To check operating switch.
(a) Connect test lamp from W2 to snap connector between operating and isolator switches. Gear shift must be in top gear for this check. (Ignition switch "On").

CHECK 6 — To check isolator switches.
(a) connect test lamp from snap connector between operating and isolator switches to ground. (Ignition switch "On").

All these checks can be completed without removing the gearbox cover or carpet.

TRIUMPH SEDAN ABRIDGED DATA SHEET

(Full Data Available In Service Manual)

SAE- HP	9.84
Number of cylinders	4
Diameter of cylinder bores	2.48 inches
Stroke of cylinder bores	2.99 inches
Engine capacity	949 c.c. 57.8 cu.in.
BHP	40
Firing order	1.3.4.2.
Compression ratio	8.0
Compression pressure	120 lbs./sq. in.
Valve clearance (cold)	.010
Distributor point gap	.015
Spark plugs	Lodge (type HLN) Gap .025
Ignition timing	10° before TDC
Valve timing	(Inlet valves open 10° before TDC) Exhaust valves close 10° after TDC)
Rear axle ratio	4.55 to 1
	U.S. MEASURES
Water capacity (with heater)	9 pints 10.2 pints
Engine oil capacity (from dry) (drain and refill)	 8.4 pints 7.8 pints
Gearbox capacity	1.8 pints
Rear axle capacity	1.8 pints

Front wheel alignment	Parallel to $^1/_{16}$" toe out
Front wheel camber	+1° 55"
Front wheel castor	+45"
Wheelbase	7 ft.
Clutch clearance (measured on slave cylinder operating rod)	.090
Carburetor	Solex type B28/ZIC/2
Main jet	105*
Choke	20 mm
Air correction jet	155*
Pilot jet	50
Starter air jet (2)	8.00 mm
Starter well bleed	3 mm
Needle valve	1.5 mm

* To overcome carb flat spot fit 107.5 main jet and 80 air bleed.

PISTONS & CYLINDER GRADING DIMENSIONS

Bore Diameter	2.4802"	2.4806"	2.4810"	
	2.4799"	2.4803"	2.4807"	
				.002"
Top Diameter of	2.4779"	2.4783"	2.4787"	to
Piston	2.4775"	2.4779"	2.4783"	.0027"
				.0012"
Bottom Diameter	2.4787"	2.4791"	2.4795"	to
of Piston	2.4783"	2.4787"	2.4791"	.0019"

NUT TIGHTENING TORQUE FOR SMALL CAR

This is an abridged list. The full list will be given in the Small Car Service Manual.

Cylinder head	38/42 lbs./ft.
Rocker shaft pedestals	24/26 lbs./ft.
Big end bolts	42/46 lbs./ft.
Main bearing bolts	55/60 lbs./ft.
Rear axle pinion flange nut	75/85 lbs./ft.
Gearbox universal joint flange nut	75/85 lbs./ft.
Rear hub nuts	110 lbs./ft.

TR-10 EXHAUST PIPE FLANGE GASKET FAILURE

Early TR-10s with two stud exhaust pipe flange mounting to the manifold are rather prone to blow the gasket between the manifold and the pipe, especially so if the nuts have not been tightened on the Pre-Delivery Check. This condition can be rectified if the following routine is adopted. First, ensure that the manifold face and the exhaust pipe flange faces are not distorted. If either of these faces are distorted then they must be corrected by filing flat. Obtain from your Triumph Distributor an exhaust pipe clip part number 205415 and with the exhaust system in position offer this clip up to the pipe so that it will bolt to a corresponding bolt on the rear engine plate.

Tack weld the clip to the pipe, setting the clip if necessary to avoid upsetting the run of the exhaust pipe and bolt to the engine plate, then remove the center exhaust system mounting to the body frame - this mounting may either be in front or behind the muffler.

This procedure ensures that when the engine rocks on its mountings the exhaust system will rock with it, thus avoiding any strain on the front exhaust pipe flange.

DRIVE SHAFT VIBRATION - TR-3 & TR-10

There are various methods of curing drive shaft or propellor shaft vibration and these are given in the sequence in which they should be tried.

1. Check that the stamped arrow on the sleeve portion of the front Universal joint lines up with the arrow on the reduced diameter portion of the front end of the drive shaft.

2. Remove the four bolts from the rear Universal joint turn the drive shaft through 180° and replace bolts. Also make sure that the body of the Universal joint sits on the register of the rear flange correctly.

3. Confirm that the rear bearing of the gearbox has no play and then attach a suitable water hose clip to the drive shaft. The clip should be fitted about 6" to the rear of the front Universal joint. The screw portion of the clip is used as a balance weight. It is then a simple matter to take the car on a road test and shift the clip 45° at a time until the best position is found by trial and error. Two clips may be used together if the vibration is unusually severe.

ELECTRICAL TEST PROCEDURE

SECTION 1 IGNITION SYSTEM
SECTION 2 CHARGING SYSTEM
SECTION 3 STARTING SYSTEM

The use of an accurate voltmeter and an ammeter is all that is required for these tests, with the addition of a battery tester for section 3.

SECTION 1 IGNITION SYSTEM

CHECK 1 BATTERY

See section 3, check 1.

CHECK 2 BATTERY VOLTAGE AT "SW" TERMINAL OF COIL

Connect voltmeter:	RED lead to ground (chassis) BLACK lead to "SW" terminal
Close C.B. Points	Meter will read Battery voltage if supply line is in order.

CHECK 3 COIL PRIMARY WINDING

Connect voltmeter:	RED lead to ground (chassis) BLACK lead to "CB" terminal of coil
Close C.B. Points	Meter will read battery voltage if primary winding is serviceable.

CHECK 4 C.B. POINTS, DISTRIBUTOR BODY AND C.B. GROUND

Leave voltmeter as in check 3.
Close C.B. Points, Meter should read zero.

CHECK 5 COIL SECONDARY WINDING

(a) Insert one end of H.T. jumper lead into coil chimmey.
(b) Holding the other end ¼" away from engine block, flick open the C.B. points. A spark for each flick indicates secondary winding is serviceable.

CHECK 6 CONDENSER

(a) Disconnect original condenser.
(b) Connect test condenser between L.T. terminal on distributor and ground.
(c) Holding the end of H.T. jumper lead ¼" from block, flick open C.B. points. A good H.T. spark should occur between lead and block.

CHECK 7 DISTRIBUTOR ROTOR ARM

Hold H.T. lead $^1/_8$" from rotor electrode and flick open C.B. points. No spark should occur.

CHECK 8 VISUAL INSPECTION OF DISTRIBUTOR COVER AND H.T. LEADS

N.B. — C.B. Points settings:

Early type cams	.010" - .012"
High Lift type	.014" - .016"

SECTION 2 CHRGING SYSTEM

CHECK 1 DRIVE. BELT TENSION

CHECK 2 GENERATOR ARMATURE CIRCUIT

Disconnect cables from generator. Connect voltmeter
BLACK lead to "D" terminal, RED lead to ground (chassis)
Run engine at approximately 1500 rpm. Meter should read 2-4 volts.

CHECK 3 GENERATOR FIELD CIRCUIT

Leave voltmeter as in check 2. Connect ammeter:
BLACK lead to "D" terminal generator, RED lead to "F" terminal.
Increase engine speed until voltmeter reads nominal voltage of vehicle battery i.e. (12v. or 6v.). Ammeter should then read approximately 2 amps.

CHECK 4 CABLES

Reconnect cables at generator. Disconnect "D" and "F" cables at control box. Repeat Checks 2 and 3 on these cables.

CHECK 5 REGULATOR OPEN—CIRCUIT SETTING

Reconnect cables at control box. Place piece of thin card between cutout points.
Connect voltmeter:
BLACK lead to "D" terminal control box, RED lead to ground.
Rev. engine. Maximum meter reading should be between:

7.6 - 8.0 volts	6v. set at normal temp.
15.8 - 16.4 volts	12v. set

(In the case of a high reading, first substitute grounded jumper lead for control box ground lead).

CHECK 6 ADJUSTING REGULATOR

Disconnect "A" and "A1" cables, and join them together.
Test as check 5. Adjust regulator screw to give correct voltage reading. (Check 5).

CHECK 7 COMPLETE CIRCUIT

Connect ammeter in "D" lead; voltmeter between "D" terminal and ground. Run engine to charging speed. Voltage should rise and then meter needle flick back (when cutout points close).

Cutting in voltage:	6.3 - 6.7 volts 6 v. set
	12.7 - 13.3 volts 12 v. set

Ammeter should then read a charge.
Maximum discharge reading when engine stops. Before cut out points open: 5 amps.

SECTION 3 STARTING SYSTEM

CHECK 1 BATTERY

(a) Hydraulic readings:
1.270 - 1.290 S.G. Fully charged cell.
1.200 - 1.210 S.G. Half charged cell.
1.100 - 1.120 S.G. Fully discharged cell.
(b) Heavy Discharge Test:
Cell readings should remain constant for 10-15 seconds

CHECK 2 BATTERY VOLTAGE ON LOAD

Connect voltmeter across battery terminals. Close starter switch.
Note reading.

CHECK 3 VOLTAGE AT STARTER

Connect voltmeter between main starter terminal and ground.
Operate starter. Note reading: should be lower than in test 2, but difference should not exceed 5 volt.

CHECK 4 VOLTAGE DROP ON MAIN LINE

Connect voltmeter: RED lead to starter terminal.
BLACK lead to negative battery terminal. Operate starter.
Reading should not exceed 5 volt.

CHECK 5 VOLTAGE DROP AT STARTER SWITCH

Connect voltmeter across starter switch terminals.
Operate starter. Reading should not exceed 5 volt.

CHECK 6 VOLTAGE DROP ON EARTH LINE

Connect voltmeter between positive battery terminal and ground.
Operate starter. Reading should not exceed 5 volt.
If reading is excessive, check all ground connections, in particular the engine bonding strip.

CHECK 7 "OUT OF MESH"CLEARANCE

Distance between flywheel ring gear and starter pinion in the rest position, with armature pushed towards drive end:
$^1/_8$" + $^1/_{32}$" on Normal drives
$^1/_{16}$" to $^3/_{16}$" on Eclipse DRIVES only.