

# HUSQVARNA

Model	Bore mm (in.)	Stroke mm (in.)	Displacement cc (cu. in.)	Drive Type
163 S, 263 CD	47.0 (1.85)	36.0 (1.42)	63.0 (3.8)	Direct
65, L65	48.0 (1.89)	36.0 (1.42)	65.0 (4.0)	Direct
77, L77, 280S, 380 CD, 380 S, 480 CB, 480 CD	52.0 (2.05)	36.0 (1.42)	77.0 (4.7)	Direct
285 CB, 285 CD	52 (2.05)	40 (1.57)	85 (5.2)	Direct
298 XP, 1100 CD, 2100, 2100 CD, 2100 XP	56 (2.2)	40 (1.57)	99 (6.0)	Direct

## MAINTENANCE

**SPARK PLUG.** Recommended spark plug is Champion CJ6 for Models 285CD, 1100CD and 2100CD or Champion RC-J7Y for all other models. Electrode gap should be 0.5 mm (0.020 in.).

**CARBURETOR.** A Tillotson Model HS diaphragm carburetor is used on all models. Refer to CARBURETOR SERVICE section for service and exploded view of carburetor.

Initial adjustment of high speed mixture screw is one turn open for Models 285CS, 298XP, 2100CD and 2101XP and  $\frac{3}{4}$  turn open for all other models. Initial adjustment of low speed mixture screw is one turn open on 65, 77 and 285CD models;  $1\frac{1}{4}$  turns open on 298XP, 480CD, 2100CD and 2101XP models and  $\frac{3}{4}$  turn open on all other models.

On all models, make final adjustment with engine warm and running. Adjust

idle speed screw so engine idles just below clutch engagement speed. Adjust low speed mixture screw so engine will accelerate cleanly without hesitation. Adjust high speed mixture screw to obtain optimum performance under cutting load.

**IGNITION.** Models 77, 263CD, 285CD, 298XP, 380CD, 480CD, 1100CD, 2100CD, 2101XP and late L77 are equipped with breakerless capacitor discharge ignition systems while all other models are equipped with breaker point flywheel magneto ignition systems.

Ignition timing on Models 77, 263CD, 285CD, 298XP, 380CD, 480CD, 1100CD, 2100CD, 2101XP and late L77 is correct when mark on stator plate is aligned with mark on crankcase. Refer to Fig. H20 or H21. On 1100CD models, ignition timing may be checked with a power timing light by running engine at

8000 rpm. Mark on flywheel should align with mark on cylinder or crankcase.

Models equipped with breaker-points should have breaker-point gap of 0.3-0.4 mm (0.012-0.016 in.). Ignition timing is adjusted by loosening stator plate mounting screws and rotating stator plate. Ignition timing is adjusted as follows: Remove flywheel and attach Husqvarna timing tool 50 25 059-01 to end of crankshaft. Turn tool until pointer is aligned with mark (A—Fig. H22) on crankcase as shown in Fig. H22. Loosen stator plate mounting screws and rotate stator plate until coil leg contacts tang (B) on timing tool. Retighten stator plate mounting screws. Using a suitable continuity tester, adjust breaker-points to just open when timing tool pointer is aligned with mark on crankcase. Air gap between ignition coil legs and flywheel should be 0.2-0.3 mm (0.008-0.012 in.). To check air gap, affix tape to coil legs until thickness equals

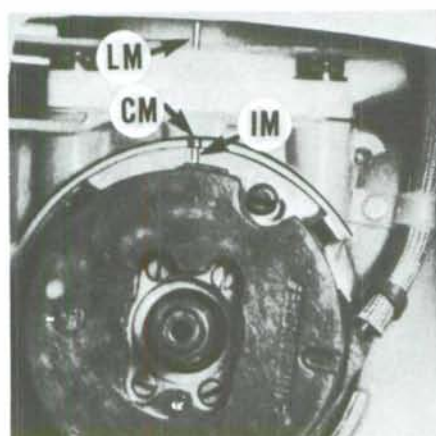


Fig. H20—View of stator plate on early 1100CD models. Ignition timing is correct when mark (IM) on stator plate is aligned with mark (CM) on crankcase. Timing mark LM on cylinder should align with mark on flywheel at 8000 rpm if timing is checked with timing light.

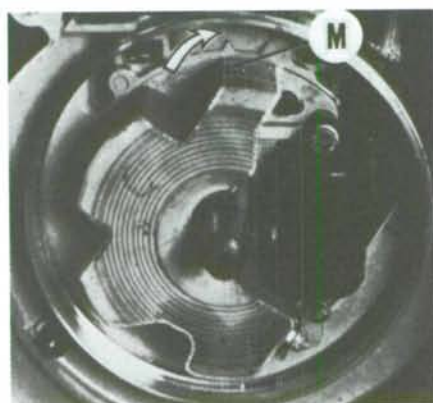


Fig. H21—View of stator plate on 77, 263CD, 298XP, 380CD, 480CD, 2100CD, 2101XP and later L77 and 1100CD models with SEM ignition. Ignition timing is correct when mark (M) on stator is aligned with crankcase mark (arrow). Ignition timing procedure is the same for 263CD, 285CD and 380CD models with Bosch ignition system.

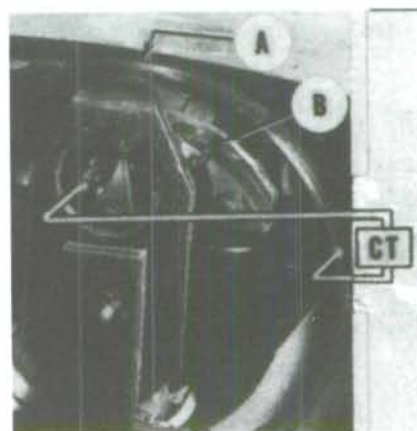


Fig. H22—View showing installation of timing tool 50 25 059-01 and connection of continuity tester (CT) on models with breaker-point ignition system. Refer to text for timing procedure.



desired air gap. Loosen coil mounting screws and push coil outward. Install flywheel and rotate slowly while noting if tape drags against flywheel. Remove flywheel and if tape dragged against flywheel, tighten coil screws to 4.0-4.5 N·m (35-40 in.-lbs.). If tape did not drag

against flywheel, elongate coil mounting holes and repeat procedure.

**LUBRICATION.** The engine is lubricated by mixing oil with the fuel. Recommended fuel:oil ratio is 50:1 when using Husqvarna Two-Stroke Oil. If Husqvarna Two-Stroke Oil is not available, fuel:oil ratio should be 25:1 using a good quality oil designed for use in air-cooled two-stroke engines.

All models are equipped with an automatic oil pump. On 65, L65, 77 and L77 models, oil pump output is determined by the stroke of plunger (17—Fig. H27). Plunger is available from the manufacturer in two sizes, 1.2 mm and 1.4 mm. Refer to OIL PUMP section for identification and replacement procedure.

On all other models, oil pump output is determined either by turning an adjusting screw (S—Fig. H23) or by changing position of cam screw (CS—Fig. H29). On models equipped with adjusting screw (S—Fig. H23), number "1" indicates minimum oil output while number "4" provides maximum oil output. If oil pump does not have adjusting screw (S—Fig. H29) located on rear of pump. Refer to OIL PUMP section.

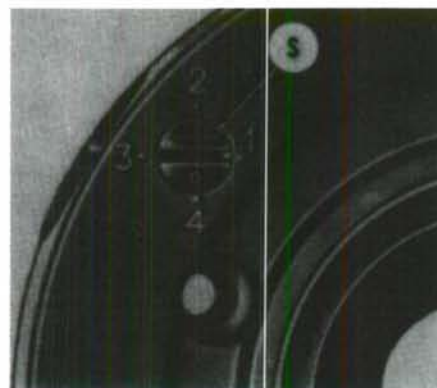


Fig. H23—View showing location of oil pump adjusting screw on models so equipped.

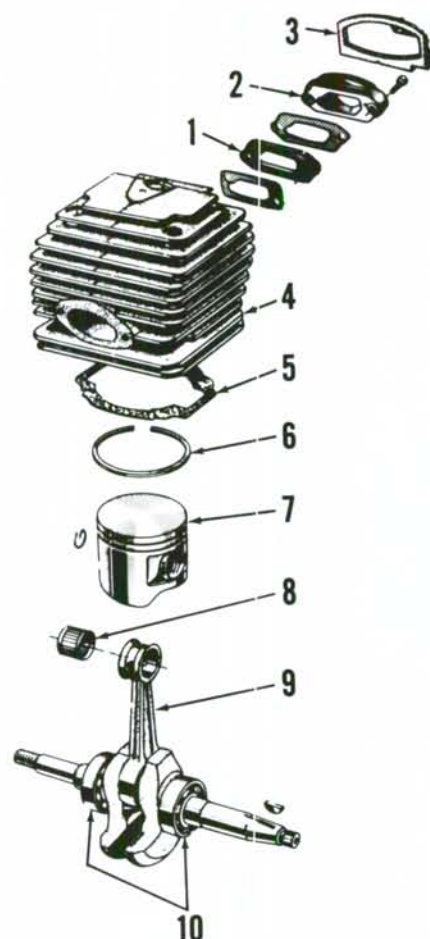


Fig. H24—Exploded view of engine.

- |                     |                           |
|---------------------|---------------------------|
| 1. Insulator        | 7. Piston                 |
| 2. Intake manifold  | 8. Roller bearing         |
| 3. Baffle           | 9. Crankshaft & rod assy. |
| 4. Cylinder         | 10. Bearings              |
| 5. Gasket           |                           |
| 6. Piston rings (2) |                           |



Fig. H25—Arrows show location of piston and cylinder letter grades. Be sure arrow stamped in piston crown points toward exhaust port when installing piston. Grade "B" is shown.



**REPAIRS**

**TIGHTENING TORQUES.** Refer to the following table when tightening fasteners:

Fastener Diameter	
4 mm	4.5-5.5 N·m (40-50 in.-lbs.)
5 mm	5.5-6.8 N·m (50-60 in.-lbs.)
6 mm	10-11.8 N·m (90-105 in.-lbs.)
8 mm	28.2-32.8 N·m (250-290 in.-lbs.)
10 mm	36.7-42.4 N·m (325-375 in.-lbs.)

**PISTON, PIN, RINGS AND CYLINDER.** Cylinder bore is chrome plated and should be inspected for excessive wear and damage to chrome surface. Inspect piston and discard if excessive wear or damage is evident.

On Models 298XP, 2101XP and late 2100CD, new cylinders are available only with fitted pistons. On all other models and early 2100CD models, piston and cylinder are graded with a letter according to size. Piston is marked on piston crown while cylinder is marked on top as shown in Fig. H25. Letter sizes range from "A" to "C" on Models 285CD, 1100CD and 2100CD and from "A" to "E" on all other models, with "A" being smallest size. Piston and cylinder grades should match although one size larger piston may be installed in a used cylinder. For instance, a piston graded "C" may be used in a cylinder graded "B."

Piston must be installed with arrow on piston crown pointing toward exhaust port. Refer to Fig. H25. Piston is equipped with two piston rings. Locating pins are present in piston ring.

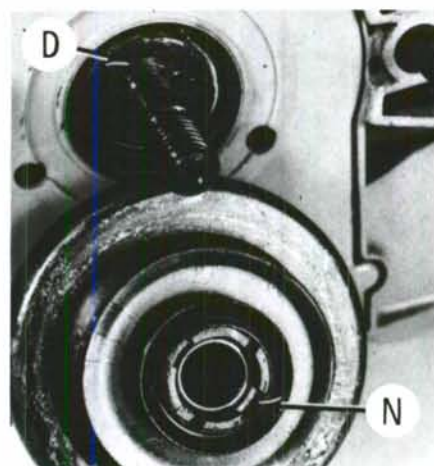


Fig. H26—Dogs (D) on oil pump drive gear must mesh with notches (N) on clutch drum.



grooves to prevent piston ring rotation. Be sure ring end gaps are around locating pins when installing cylinder.

**CRANKSHAFT, CONNECTING ROD AND CRANKCASE.** Crankshaft and connecting rod are a unit assembly. It will be necessary to heat crankcase halves to remove or install crankshaft and main bearings. Care should be taken not to damage mating surfaces of crankcase halves. Check rotation of connecting rod around crankpin and renew crankshaft unit if roughness or other damage is noted.

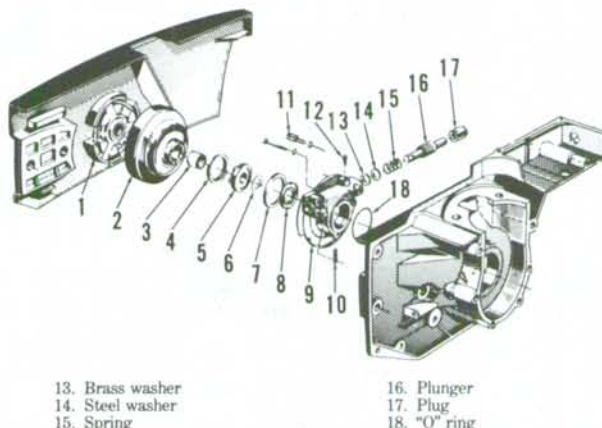
Reassemble crankshaft and crankcase halves as follows: Place a main bearing over flywheel end of crankshaft then press bearing inner race flush against bearing seat. Heat bearing seat area in corresponding crankcase half and install crankshaft. Make sure main bearing outer race seats fully in crankcase. Heat bearing seat area in drive half of crankcase and install drive side main bearing allowing for installation of oil pump. A special tool is available from the manufacturer to properly position drive side main bearing in crankcase. After assembling crankcase halves together, make certain crankshaft is centered in crankcase and will rotate freely.

**CLUTCH.** All models are equipped with a three-shoe centrifugal clutch. Clutch hub has left hand threads. Inspect clutch shoes and drum for excessive wear or damage due to overheating. Clean and inspect clutch hub, drum and bearing for damage or excessive wear. Inspect clutch bearing lubrication hole in crankshaft end and clutch bearing contact surface on crankshaft for wear or damage.

The oil pump is driven by clutch drum. Be sure notches on rear of clutch drum

**Fig. H28—Exploded view of oil pump and clutch assemblies used on all models except L65 and L77. Refer to Fig. H29 for view of non-adjustable oil pump used on some models.**

1. Clutch shoes & hub
2. Clutch drum
3. Needle bearing
4. Seal
5. Oil pump drive gear
6. Washer
7. Seal
8. Seal
9. Oil pump housing
10. Gasket
11. Adjuster screw
12. Cam screw



mesh with dogs (D—Fig. H26) of oil pump drive gear when installing clutch assembly.

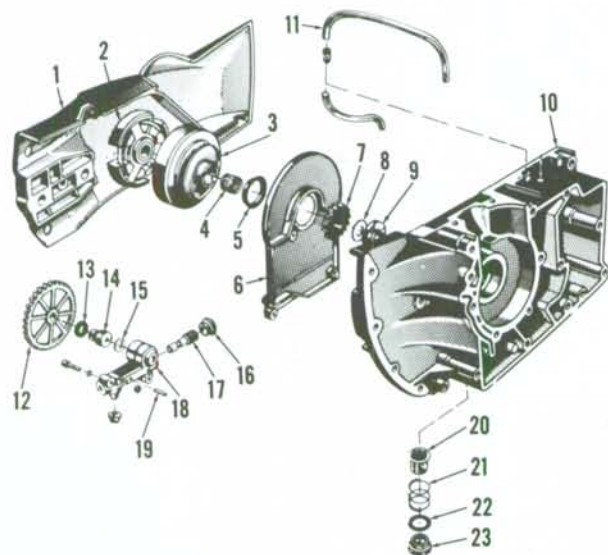
**OIL PUMP (Models 65, L65, 77 And L77.)** All models are equipped with an automatic oil pump which is driven by the clutch drum. Notches on the back of the clutch drum engage dogs on oil pump drive gear (7—Fig. H27) which rides on the crankshaft. Plunger (17) is driven by worm gear (14), through driven gear (12) from drive gear (7). Pin (19) rides in cam groove of plunger (17) resulting in reciprocating motion of plunger. Oil pump output is determined by the stroke of plunger (17). Two plungers are available from the manufacturer to vary oil pump output and are marked for output identification. Maximum oil output is obtained if plunger marked 1.4 mm is installed while minimum oil output results if plunger marked 1.2 mm is installed.

Access to oil pump on 65, L65, 77 and L77 models is gained by removing oil pump cover plate (6). Remove pin (19),

plug (16), then withdraw plunger (17) and remove worm gear (14).

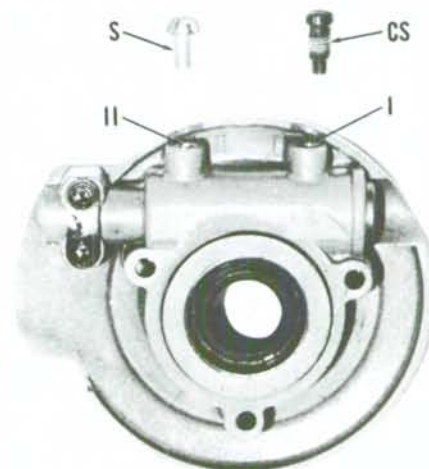
**(All other models.)** Refer to Fig. H28 for exploded view of typical oil pump used. Two variations of pump have been produced and are identified by oil adjustment method. Oil pump shown in Fig. H28 is adjusted by turning screw (11) as shown in Fig. H23. Oil pump shown in Fig. H29 is adjusted by relocating cam screw (CS). Maximum oil output is obtained if cam screw is installed in hole "II" while minimum oil output results if cam screw is installed in hole "I." Screw (S) must be installed in remaining hole. On both types of pump, oil pump drive gear (5—Fig. H28) is driven by clutch drum (2).

To disassemble pump with adjusting screw (Fig. H28), unscrew adjusting screw (11) and, on models so equipped, cam screw (12). Remove plug (17) and plunger (16) by carefully tapping pump



**Fig. H27—Exploded view of oil pump and clutch assemblies used on Models 65, 77, L65 and 77.**

1. Side cover
2. Clutch shoes & hub
3. Clutch drum
4. Needle bearing
5. Seal
6. Oil pump cover
7. Oil pump drive gear
8. Washer
9. Seal
10. Right crankcase half
11. Vent hose
12. Oil pump driven gear
13. Washer
14. Worm gear
15. Washer
16. Plug
17. Plunger
18. Oil pump housing
19. Cam pin
20. Screen
21. Spring
22. Gasket
23. Plug

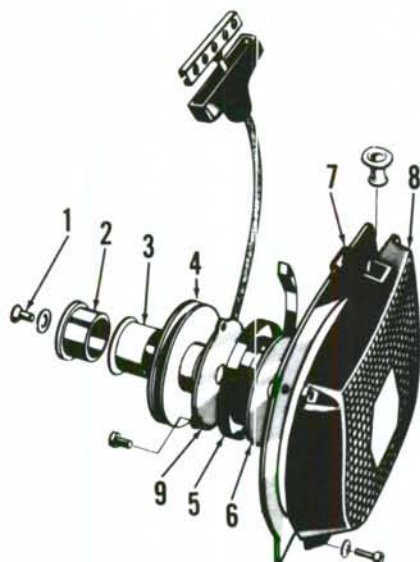


**Fig. H29—View of oil pump used on some models. Oil pump output is determined by installation of cam screw (CS) in hole (I) or hole (II). Refer to text.**



housing against a solid object. Withdraw remaining components from housing.

To disassemble pump with cam screw (CS—Fig. H29), remove cam screw (CS) and screw (S) then use the same procedure as previously outlined to withdraw plug and plunger.



**Fig. H30—Exploded view of rewind starter used on all models except 280S, 298XP, 1100CD, 2100CD and 2101XP. Plate (9) is not used on all models.**

- |                  |                    |
|------------------|--------------------|
| 1. Screw         | 6. Washer          |
| 2. Pivot         | 7. Plate           |
| 3. Bushing       | 8. Starter housing |
| 4. Rope pulley   | 9. Plate           |
| 5. Rewind spring |                    |

On both types of pump, be sure crankshaft seal (8—Fig. H28) and “O” ring (18) are not damaged or debris will enter main bearing.

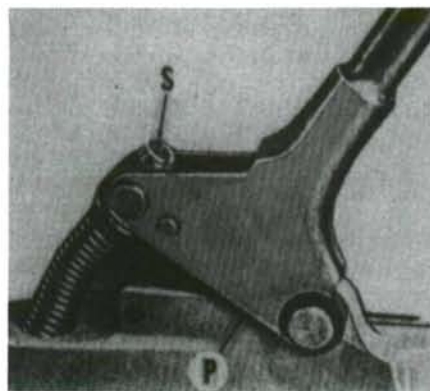
**REWIND STARTER.** Refer to Fig. H30 or H31 for an exploded view of rewind starter. Note that starter used on 163S, 263CD, 285CD, 380CD, 380S and 480CD models has an intermediate plate (7—Fig. H30) which retains rope handle. Rope handle may be knocked from notch in starter housing if plate is not held against housing during removal from saw.

To disassemble rewind starter on all models, first remove starter housing from saw. Pull starter rope and hold rope pulley with notch in pulley adjacent

to rope outlet. Pull rope back through outlet so it engages notch in pulley and allow pulley to completely unwind. Unscrew pulley retaining screw and carefully remove rope pulley. If rewind spring must be removed, care should be taken not to allow spring to uncoil uncontrolled.

Install rewind spring in starter housing with spring coiled in clockwise direction from outer spring end. Wrap starter rope around rope pulley in a clockwise direction as viewed with pulley in starter housing. Turn rope pulley two turns clockwise before passing rope through rope outlet to place tension on rewind spring. Spring tension is correct if rope pulley can be rotated approximately  $\frac{1}{2}$  turn further when rope is pulled completely out.

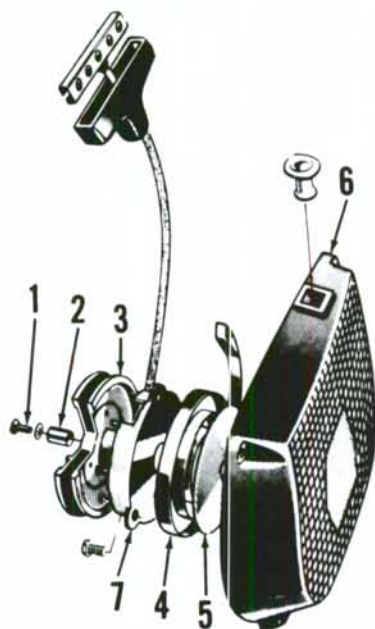
When installing starter assembly on saw, make sure starter pulley properly engages pawls on flywheel before tightening retaining cap screws.



**Fig. H32—Turn screw (S) to adjust chain brake on early models. Refer to text.**

**CHAIN BRAKE.** Some models may be equipped with a chain brake system designed to stop chain movement should kickback occur. Several types of chain brake systems have been used.

The chain brake is activated either by the operator's hand striking the brake lever (1—Fig. H33 or Fig. H34) or by sufficient force being applied to the guide bar tip during kickback to cause the front handle to contact trigger lever (6—Fig. H33) on so equipped models or trigger button (2—Fig. H34) on 298XP

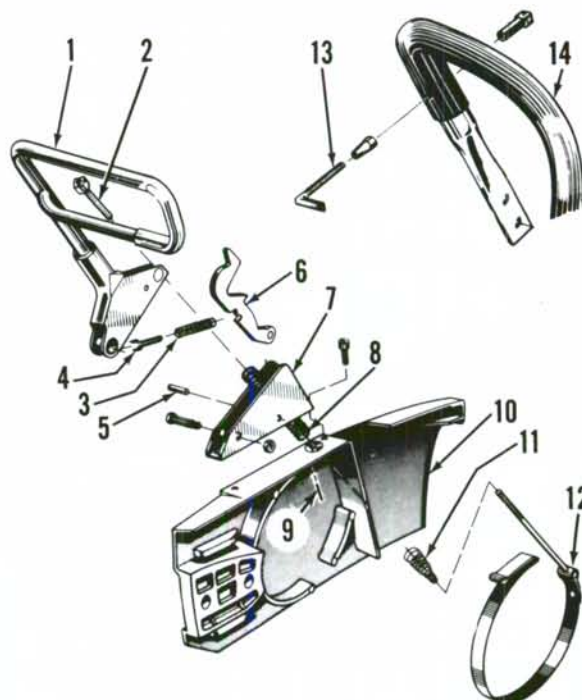


**Fig. H31—Exploded view of starter used on Models 280S, 298XP, 1100CD, 2100CD and 2101XP. Rope guide (7) is not used on Models 280S or 1100CD.**

- |                  |                    |
|------------------|--------------------|
| 1. Screw         | 5. Washer          |
| 2. Bushing       | 6. Starter housing |
| 3. Rope pulley   | 7. Rope guide      |
| 4. Rewind spring |                    |

**Fig. H33—Exploded view of typical chain brake used on later models except 298XP and 2101XP models.**

- |                      |
|----------------------|
| 1. Chain brake lever |
| 2. Adjuster screw    |
| 3. Spring            |
| 4. Spring guide      |
| 5. Pin               |
| 6. Trigger lever     |
| 7. Side plates       |
| 8. Spring            |
| 9. Pin               |
| 10. Side cover       |
| 11. Spring           |
| 12. Brake rod & band |
| 13. Trigger arm      |
| 14. Front handle     |



and 2101XP models resulting in automatic activation of brake mechanism.

To adjust chain brake shown in Fig. H33, pull back brake lever and be sure mechanism is cocked. Turn adjusting screw (2) in until chain cannot be pulled around bar then turn screw out approximately four turns. If screw has a square head, be sure screw head does not rest on brake lever side plates. Chain should rotate freely around bar. Check brake band tension adjustment by starting saw and running at wide open throttle, then manually engage chain brake. Chain should stop rotating immediately. Adjust gap between trigger lever (6) and trigger arm (13) so chain brake will automatically activate when a 12.4 N (2.8-3.4 lbs.) force is applied on guide bar tip. A suitable spring balance should be used for testing and adjustment.

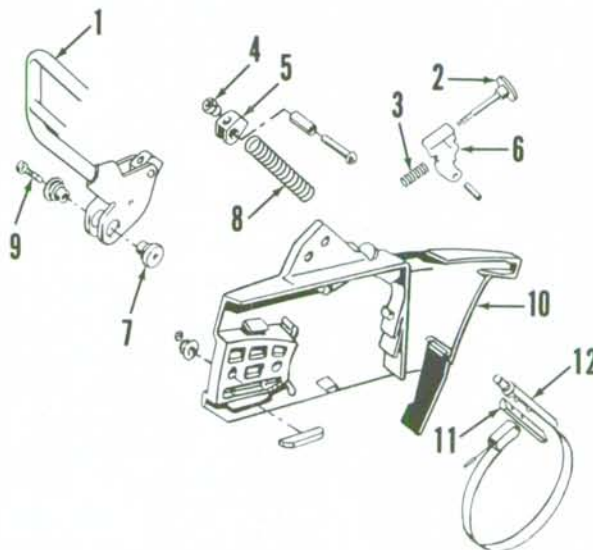
On Models 298XP and 2101XP, be sure spring retaining nut (4-Fig. H34) is tight against its seat. Gap between

trigger button (2) and front handle should be adjusted so chain brake will automatically activate when a 12.4-15.1

N (2.8-3.4 lbs.) force is applied on guide bar tip. A suitable spring balance should be used for testing and adjustment.

**Fig. H34—Exploded view of chain brake assembly used on Models 298XP and 2101XP.**

1. Chain brake lever
2. Trigger button
3. Spring
4. Nut
5. Latch
6. Trigger lever
7. Trunnion
8. Spring
9. Allen screw
10. Housing
11. Guide
12. Brake band



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